Brain-be 2.0

PILLAR 3

STATE OF THE ART

DIGI4FED
Digital (R)evolution in Belgian Federal Government: An Open Governance Ecosystem for Big Data, Artificial Intelligence, and Blockchain.

Promotor(s)

Prof. Dr. Joep Crompvoets

Keywords
big data, artificial intelligence, blockchain, social security infringements, tax frauds

DIGI4FED

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Introduction

DIGI4FED aims to understand how big data (BD) can be used in the Belgian federal administration system to enable better public service provision through new technologies such as artificial intelligence (AI) and blockchain technology (BCT). By focusing on the technical, moral, legal and organisational conditions within the internal and external federal decision-making processes, DIGI4FED aims to develop a governance design that serves the administrative and public service processes of the Belgian federal government and makes full use of the potential offered by BD and its application via AI and BCT. Three factors define the context by which DIGI4FED is influenced. The first factor is the growing attention for the potential impact of BD and AI on traditional government information processes. The second factor is the growing expectation of society from public administrations, to adopt new technological means to advance efficient and effective governance and public service delivery whilst ensuring the core democratic and moral values are not lost out of sight. The third factor concerns the Belgian federal administration itself. Although in the past, several steps were taken towards the digital transformation of the Belgian federal state, challenges remain.

State of the art

While the use of data in the public sector is not new, the potential and actual use of BD applications affects aspects of the theoretical and practical considerations of decision-making, learning and process optimisation in the public sector both theoretically and practically (Giest, 2017). The impact of BD is driven not only by the data revolution but also the accompanying development of new technologies (e.g. AI-driven technologies, BCT, distributed ledger technology etc.) and advanced analytics (e.g. machine learning algorithms). Many public administration organisations around the world have already started to deploy AI-powered interfaces for citizen response systems, legal adjudication processes, fraud detection, and infrastructure planning. Lember et al. (2019) argue that BD creates the opportunity to go from descriptive analysis to predictive and even prescriptive analysis and consequential policy development. Several other authors stated that better use of BD can result in benefits to the public sector (Maciejewski, 2017; Mergel, et al. 2016). Nevertheless, when it comes to describing the actual applications and advantages, authors diverge considerably in their approach and conclusions (Pencheva, et al. 2018). As Janssen and Kuk (2016) underline, the design and training of the algorithms that exploit BD are not neutral, not free from human interferences and not free from biases. Ensuring transparency and accountability is according to the authors a critical success factor. Furthermore, Klievink et al. (2017) found in the case of the Netherlands, the public sector organisations may be technically capable of using BD, but they will not significantly gain from BD if the applications do not fit their organisations and statutory tasks.

DIGI4FED provides an innovative response to these challenges, as it starts from those challenges and aims to develop a governance design that serves the internal administrative and public service processes of the Belgian federal government; a governance design that is embedded in the open governance ecosystem and makes full use of the potential offered by BD and its application via AI and BCT.

In particular, three contextual factors define the context by which DIGI4FED is influenced. The first factor is the growing attention for the potential impact of BD and AI on traditional government information processes. Indeed, in recent years the concepts of BD and AI led to rethinking the design of traditional government information processes in the Belgian public administrations (Heijlen et al., 2018). There are, however, several challenges related to the exploitation of BD through AI, such as the risk for goal displacement due to a potential overreliance on performance metrics and predictive analytics as well as a potential lack of precision in those performance metrics (Lavertu, 2015). Indeed, the objective function to be optimised through AI heavily depends on the data used to train the algorithms. Furthermore, individuals may lose trust in public administration due to a potential lack of transparency and accountability in how policy is made and the high level of required technical expertise (Lavertu, 2015). Bouckaert (2012)argues that there are three clusters of trust in the public sector: Trust from society to the public sector, trust from the public sector to society, and trust within the public sector. Six and Verhoest (2017) point out the citizens' trust in the governance of the involved regulatory regime is fostered by trust between the actors in that regime.

Transparency and accountability about decision-making seem to be also crucial in fostering trust (Grimmelikhuijsen & Meijer 2014). However, the impacts of BCT and AI on these trust relationships is underresearched. While authors on BCT argue (e.g. Ølnes et al., 2017) that the trust relationship will improve as a result of the use of the technology, there is currently no research on how both concepts are exactly related. The use of AI also creates questions on how trust can be created in relation to both the internal users of the technology and the external users of technology. Winfield and Jirotka (2018) argue in this respect that to create trust in new technologies – such as AI – certain ethical principles should become practice – among other legally binding frameworks or the creation of new institutions. DIGI4FED aims to make an innovative contribution via the inclusion of technology in the trust clusters that exist both within the public sector as well as in relation to the society to improve our understanding of this complex relationship.

The second factor is the growing expectation of society from public administrations, to adopt new technological means to advance efficient and effective governance and public service delivery whilst ensuring the core democratic and moral values are not lost out of sight (European Commission, 2013). Here the developments in two IT technologies, AI and BCT, are particularly important for the effective uptake of the BD solutions by the public administration. On the one hand, AI enables public administrations to gain new policy insight and to develop improved policies and action through effective exploitation of the public data. On the other hand, BCT can support the pursuance for public values such as transparency and democratic accountability (Casino et al, 2019; Ølnes, et al., 2017) by giving control of the data to users. As such BCT has the potential to enhance the usage of private data in public processes without undermining the ethical and legal rights on user data. DIGI4FED investigates the application of BCT and AI in a complementary way, thereby addresses the challenges of the BD in the public administration domain. Until now various studies have looked at the application of either BCT or AI in public administration (see Casino et al, 2019; Dwivedi et al, 2019) but did not integrate those two technologies into one cohesive approach and therefore were unable to detect what a combination of both technologies would lead to. Indeed, the possibility for the federal administration to make use of BCT and/or AI will necessitate the administration to make policy and design choices, by taking into account the internal and external factors, the trade-off conditions (e.g. policy effectiveness and efficiency vs. transparency and control of data by users) and the broader societal, legal and political context in which the administration is functioning. DIGI4FED will deliver a framework of reference on the governance design conditions to effectively apply these two technologies in the exploitation of BD in public administration and service provision.

A final and third factor concerns the Belgian federal administration itself. So far, several initiatives have been launched by federal scientific research and public service organisations to explore the potential and application of the BD, BCT and AI in Belgian federal administration. Examples of federal organisations working on those topics are the FOD Economy, FOD Financiën, the Federal Agency for the safety of the food chain, Sciensano, and SMALS. Although in the past, several steps were taken towards the digital transformation of the Belgian federal state, challenges remain. The BELSPO BRAIN-be projects "FLEXPUB" and "PSI-CO" have demonstrated that the federal level has certain requirements and faces challenges concerning digitalisation and innovation. The FLEXPUB research project for example, found that the challenges related to digitalisation, and more precisely the development of flexible and innovative geo-spatial e-services, are not so much related to technical difficulties, but much more to organizational, legal and cultural aspects. Those challenges exist both within the federal public administration but are also related to the collaboration with the Belgian regional administrations. At the same time, the project found a clear and continuous interest from federal organizations to stimulate and improve their collaboration and functioning, in order to improve the service delivery towards their end-users, i.e. citizens, businesses and other public administrations. The PSI-CO project, which focused on collaborative innovation, demonstrated that there is a need to further invest in the building of networks among public administrations, the development of active participation from various partners, the investment in information exchange and learning to generate new ideas, and the investment in managing organizational rules as well as testing and evaluating of the implementation of innovation.

Overall, it can be argued that a further digitalisation is welcomed, both in and outside the administration. Identified challenges include trust and equity embedded in digital tools, transparency of data and data use, the human dimension of digital judgments, technical difficulties, human and cultural factors, a gap between ambition and reality, and an imbalance between in- and outsourcing. The implementation of these technologies would require not only a different governance design but also a redesign of processes and information streams, an analysis of the legal and moral constraints and answers, a reflection on the role of decision-makers and their independence, etc. Via the application of a novel governance design based on the 'Open Government Data (OGD) Ecosystem' developed by Reggi

and Dawes (2016), DIGI4FED makes a working connection between transparency and innovation policies in the governance of public data. Further refining of this relationship lies at the heart of the project, and thereby, DIGI4FED aims to enhance the policy-making capacity of Belgian federal organisations on data management, open government policies, and policy innovation.

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