Re-enchanted by AuroraAI: AI Policy and its Implementation in Finland

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Abstract

In 2020, Finland launched its own national Artificial Intelligence (AI) program called AuroraAI. The goal of the program was to develop a more human-centric approach to public and private services using AI. AuroraAI was conceptualised as a type of AI assistant for citizens, which would help improve the human condition and at the same time help alleviate the financial burden of the state through more efficient service provision and empowering individuals. Using the notion of 'enchanted determinism' developed by Campolo and Crawford (2020) I explore the ambiguous position that Finland's national AI program occupied within contemporary discourses of technological progress and development. I explore the operation of AuroraAI as a platform for public service development through two examples. First, I look at visual representation of the operation of AuroraAI, and second, how AI was envisioned to provide insight for self-improvement. The two examples provide insights of how the logic of AuroraAI was conceptualised as a type of Master Algorithm (Domingos, 2015) that would have embodied many of the characteristics that Campolo and Crawford have described as re-enchantment. AuroraAI's approach to the use of AI was a mixture of modernist and positivist thinking infused with visions of imagined capabilities attributed to AI.

Keywords: Artificial Intelligence, Governance, AI Policy, AuroraAI, Max Weber

Introduction

During the past few years, several countries have developed or are developing national AI programs and governance schemes through which they seek to develop and implement AI in a broad spectrum of public and private sectors (Birkstedt et al., 2023; Dutton, 2018). Nordic countries, such as Finland have been undertaking and introducing digitalisation projects for almost two decades as a means of developing more inclusive and cost-effective public services. This phenomenon has been characterised by some as a political economy of digitalisation (Collington, 2022). AI has in some senses become a political and bureaucratic pre-occupation in that it is seen by some to solve many of the political, economic, and social challenges faced by societies. Along these lines, AI pundit and academic turned business executive, Pedro Domingos, proclaimed in his popular book *The Master Algorithm* (Domingos, 2015) that there might come a day when there will be a 'Master Algorithm' that "can derive all knowledge in the world – past, present, and future – from data" (Domingos, 2015: xvii). This perspective is in line

with much of the hype and expectations that have surrounded AI technologies recently.

In 2020, Finland launched its own national AI program called AuroraAI. The goal of the program was to develop a more human-centric approach to public and private services using AI. AuroraAI was conceptualised as a type of AI assistant for citizens (Ministry of Finance, 2019), which would have had far reaching implications to how data on citizens was collected and used by public and private service providers. Surprisingly, despite being meant for public use, AuroraAI was almost invisible to the public with meetings and development being geared mainly towards the public and private sector stakeholders. One of the goals of the program was to use AI to analyse both publicly and privately generated data on populations and individuals to provide service recommendations. The AuroraAI program can be considered as part of a broader movement in public services to experiment and pilot new ideas and processes and develop innovative societal experiments (Leino and Åkerman, 2022) whereby the country itself becomes a type of testbed nation (Tupasela, 2022). This approach builds on notions of the 'virtual state' (Fountain, 2001), which entail "a restructuring of the relationship between state and citizen" (Kempeneer and Heylen, 2023). An implicit assumption or starting point for AuroraAI was that public services were in crisis and AI-based solutions were the answer. In part, the proponents of AuroraAI argued that this crisis was the result of an ageing population, but also an outcome of what was termed 'disruptive behaviour' (*häiriökäyttäytyminen*) whereby the users of public services were using services inefficiently or incorrectly because the service system was not designed properly. The solution to this problem was to make better use of the vast amounts of data that the Finnish public sector maintains and collects on its population and the services it provides (Kopponen et al., 2023). Much of the AI programming was outsourced to consulting companies. One of the main companies, however, withdrew during the program due to the lack of clarity of what they were expected to produce.

An interesting feature of AuroraAI was that it appeared to carry many of the promises and functionalities that Domingos envisioned in his book regarding a 'Master Algorithm' whereby all knowledge could be derived and made productive from data that the state and business maintained and collected from us. Not only would AuroraAI help predict individual needs and help in knowledge-based decision-making, but it would also serve as a platform through which the individual condition of Finns could be enhanced and improved. The role of AI was central to this vision, in that it would perform complex tasks which humans were incapable of performing. How this would be achieved was never, however, clearly articulated in the program. Rather, AI remained a black box technology throughout the program's history. Räisänen (2025) has suggested that AuroraAI carried with it many of the characteristics of what Hallonsten (2023) has termed empty innovation in which there is a gap between what is promised and what is developed or delivered. As the program ended at the end of 2022, many questions remained regarding AuroraAI, not least the realisation that the program had not developed any AI that could be in any way evaluated or tested in practice.

Taking Max Weber's notion of 'enchantment' and 'disenchantment' as a salient feature of modernisation, this article looks at two examples from the AuroraAI program to explore the way in which AI was positioned to solve social, political, and economic challenges within the Finnish public services. Building on the notion of Weber's enchantment and its re-interpretation in the context of artificial intelligence as a form of re-enchantment (Campolo and Crawford, 2020), I argue that although many of the goals of the AuroraAI program were commendable, there was a lack of basic understanding and even ignorance regarding the ethics and social challenges of AI, its development and application in the public sector. Furthermore, it appeared as if there was also a lack of understanding regarding the challenges associated with the capabilities of AI in interpreting different types of data to produce meaningful results and outcomes. I explore the work associated with AuroraAI as a public service experiment through the cases of 1. visual representation of the operation of AuroraAI, and 2. AI for self-improvement. The two examples provide insights of how the logic of AuroraAI was concep-

tualised as a type of Master Algorithm that would have embodied many of the characteristics that Campolo and Crawford (2020) have described as re-enchantment.

The implementation of AuroraAI would have inevitably increased surveillance of the public based on existing population registries and records, as well as data collected using the system. Methodologically, this paper draws on first-hand experience as an appointed member of the AuroraAI ethics review board and the public documents that were generated through-out the course of the program. Despite being a national pilot on using AI in public services, I argue that AuroraAI reflected a political vision where neoliberal ideals of self-help and responsibility were to be embedded into technology. In the following I will first describe the theoretical underpinning of the paper. I will then briefly describe the methods and empirical material that I draw on. Then I will present the two examples taken from the AuroraAI in which I exemplify how AI was to operate in public services. Finally, I will discuss the relevance of AuroraAI as a type of vision of a Master Algorithm.

Theoretical background

Drawing on the work of Friedrich Schiller, Max Weber elaborated on the notion of "the disenchantment of the world" (see Jenkins, 2000: 11), whereby the world around us "become experienced and understood as less mysterious" through the processes of understanding and observational acuity provided by science and rational government (Jenkins, 2000: 12). This process of disenchantment was, according to Weber, a central feature of modernisation. Jenkins (2000) notes, however, that Weber was acutely aware that progress was always mixed and contradictory in that despite the emergence of secularisation and the decline of magic, there inevitably remained significant forces of (re)enchantment. This could be seen, for example in areas such as politics and nationalism, where systems of belief and symbolism continued to play a crucial role. The role of technology alongside this tension within rationalisation and scientific progress has also remained contradictory in that much of today's technological development and investment is driven through hype, hope and theatre (Beckert, 2016; Räisänen, 2024), despite its strong grounding in science. Züger et al. (2023) have suggested how AI tends to trigger ubiquitous promises and polarisation, while at the same time initiating critical discourse on its promissory discourses. Technology hype and promissory discourses can be seen as a form of (re)enchantment in the Weberian sense since their functioning within the real world has yet to be proven and demonstrated.

Against this backdrop of the role of technology in modernisation, Campolo and Crawford (2020) have developed the notion of 'enchanted determinism' to underscore the ambiguous position that deep learning technologies occupy within contemporary discourses of technological progress and development. According to Campolo and Crawford, technologies which rely on deep learning systems have been able to generate successes in their operation and application. At the same time, the underlying mechanisms of operation remain mysterious. Furthermore, the authors argue that the success of deep learning systems are often described as being "superhuman" in nature. This discourse on the nature of deep learning techniques falls firmly within the discourses of magic. According to Campolo and Crawford (2020) deep learning systems represent a form of enchantment in that the creators of the system are not accountable for the outputs of the system since they remain black boxed. The systems are, however, deterministic in that they succeed in increasing the processes of classification and control, both central features of modernisation. Although AuroraAI was not able to develop any type of AI in practice, many of the capabilities that were ascribed to it resemble enchanted determinism.

In the context of this article, enchanted determinism is used to describe the role that the AuroraAI program ascribed to AI as a technology to resolve social problems. Below (see Figure 1), I suggest that images of a "brain" on PowerPoint slides are indicative of this type of thinking. Furthermore, I see enchanted determinism to be an extension of (re)enchantment, which reflects the hype and policy discourses that are being adopted in relation to AI as a solution to all manner

of challenges. These two conceptions obviously overlap and are closely interrelated, but AuroraAI is a concrete example of enchanted determinism, which has resulted from policies and beliefs that reflect a form of (re)enchantment based on technological solutionism.

The role of AuroraAI in developing Finnish public services fit well into the longer process of digital transformation policies in Finland. Not only has Finland historically seen itself as an important forerunner in technological adoption in public services, but it has also had a long-lasting commitment to make better use of its public data resources, such as public health and welfare data registries and other national statistics (Tupasela, 2020). Kempeneer and Heylen (2023) have noted that in implementing and transforming state activities in a digital transformation "the benefits of using data and technology to remake government seem almost infinite (Kempeneer and Heylen, 2023: 1). Hoeyer (2016) has noted that there has emerged a tendency in today's data saturated governance practices to seek more data, on more people and of better quality. Data is considered an instrumental component of testing and piloting in that it is seen to provide an empirical or real basis for decision-making. This general vision of the power of data, I argue, represents a novel form of (re)enchantment of society, which lack a critical understanding on the limits of data.

The use of state generated and maintained data and the adoption of new technologies to provide better levels of productivity is in part based on the notion of experimenting nation and what some have called the Nordic data imaginary (Tupasela et al., 2020). According to Leino and Åkerman (2022) experimentalist governance began to gain interest at the beginning of 2010 (James et al., 2017; Overdevest et al., 2010) whereby there emerged a policy interest to trying new experiments, pilots and test, which are then followed by evaluations and a revision of practices. Such an approach has been termed as governance by experimenting.

The practices associated with experimenting are strongly related to the modernist project in that their goal is to produce evidence that serves as a basis of rational decision making and policy setting. In relation to Weber's understanding of disenchantment, experiments at the national level form a new type of knowledge production where learning is rooted in experiments and thus produces a new way of thinking. The role of civil servants is central in this task in that they conceptualise, implement, and often evaluate the outcomes of their experiments (Leino and Åkerman, 2022). These experiments are also strongly rooted in the political will of the government, which is in power at that time, thus reflecting in many instances an aspiration towards politically driven notions of governance. As Leikas et al. (2022) have noted, however, the public sector has less flexibility in conducting experiments since it is expected to maximise public value and public good as opposed to other outcomes, such as profit.

Although AuroraAI can be seen as part of the modernist and rational government movement by seeking to use existing public authority data sources as the basis of its decision-making, it reflected heavily the re-enchantment phenomenon described by Campolo and Crawford and best described by Domingos' vision of a Master Algorithm. It ascribed almost magical and mythical qualities to AI and algorithms and saw data as a panacea to all manner of social problems. The idea that an algorithm or AI system could provide such far reaching and significant solutions to social, political, and economic problems highlights the way in which AI was seen as a tool for repair. One main shortcoming of AuroraAI was that it failed to see the political history and context of its own emergence and thus also saw technology and the goals that they entailed as neutral and non-political in nature. In the following section I will present the materials and methods used in this article.

Material and methods

The material and data for this article has been drawn from two main sources and activities. The first relates to material that the AuroraAI program generated for general release, as well as reports published by the Ministry of Finance, which spearheaded the program. These documents include the decision to establish the program, its interim evaluation report, situation reports, white papers, the final report of the program evaluation, the

final report of the ethics working group, and the final report of the program. These documents were published between 2019 and 2023. In addition, the corpus includes concept visualisations, reports and visualisations from different project associated with AuroraAI, as well as meeting notes with various stakeholders, such as municipalities involved with AuroraAI.

The second source of material used in the analysis was produced by the program and various stakeholders and provided to the ethics advisory group. These documents include reports, PowerPoint presentations, and memorandums. These categorisations are general in nature since many of the reports, for example, contain visualisations. There is also some overlap between these two sources, but I have tried to differentiate them as best as possible since their target audience (public vs ethics advisory board) have been different. A challenge associated with AuroraAI was that it was very porous, which meant that it was open to any stakeholder who wanted to join meetings and development sessions. This means that there were dozens of different stakeholders, ranging from municipalities to government agencies, who participated in the program and developed a varying amount of their own material pertaining to AuroraAI.

Much of the material is visual in nature since many of the outputs of the program were presented as PowerPoint presentations. The ethics advisory group met regularly during the program to discuss developments, as well as hear presentations from various partners and participants in the program. The participants included cities and municipalities, public institutions, as well and NGOS, such as the Evangelical Lutheran Church of Finland. These participants would also provide documents and presentations which were included in the analytical corpus and listed in Table 1.

The analysis of the corpus of material that has been collected over the years has been guided by frame analysis (Goffman, 1974) whereby images, texts, messages, and metaphors are looked at to gain an understanding of how various actors understand and thus frame their activities. Frame analysis provided a way through which specific themes and topics could be identified in the material that had been collected (van Dijk, 2023; Scheufele, 1999). At the outset of the analytical work, it was evident that AuroraAI operated and communicated through visual representations. In my initial analysis I identified the following frames which appeared most salient in the documents. The first relates to the processual nature of AI's role in solving complex problems. This was often highlighted by process or flow charts in which there were different types of inputs (data), an analytical or computations component (AI), feedback component (users provides feedback) and an output (recommendation). This frame can be called the engineering frame since it draws heavily on process engineering to provide solutions.

Table 1. Material collected and analysed for the article.

Material	N
Reports (interim and general situation)	14
Final reports	3
White papers	2
Reports from projects associated with AuroraAI	7
Concept visualisations	12
Stakeholder meeting notes	8
Personal meeting notes	11

A second major frame related to the central role of data in facilitating solutions and repair. The role of data in documents and visualisations is central yet unproblematic. Data is a given and a raw material that can be entered as an input to the AI which then provides and answer. The third frame that emerged in the AuroraAI documents relates to self-improvement through what the proponents of the program called a human centric approach. In this frame both technology (AI) and data (both self-generated and official register data) help to develop a type of digital twin of oneself that can be improved and developed. In this frame, technology facilitated self-help through a type of neo-liberal vision where responsibility for oneself was made possible through AI tools. Ironically, however, it was the state that was seeking to develop and implement this tool whereby the normative expectations and assumptions of what a good or productive citizen are would be set by government officials.

There were also other frames which I identified, such as AI as a tool for de-infrastructuring (breaking down bureaucratic boundaries), and AI as a mechanism of depoliticising decision-making and priorities in public service. I have chosen, however, two cases through which to highlight how the artificial or algorithmic component in AuroraAI was conceptualised as a type of master algorithm, which maintained many of the qualities that Campolo and Crawford discuss in their notion of re-enchantment. One of the challenges associated with writing about AuroraAI is that it touched so many areas of public and private digitalisation projects that it is almost impossible to define only a few salient examples of how it was conceptualised. I also see the examples presented below as instructive in better understanding what types of visions have guided Finnish AI policy and digitalisations strategies at the beginning of the 2020s.

Re-enchantment of public services

AuroraAI

Although AuroraAI did not specify explicitly what type of AI it was going to use – in fact AuroraAI never managed to produce any AI-driven system in the end – the observations by Campolo and Crawford is emblematic of how AuroraAI was represented. On the one hand, it was an unexplainable black box, while at the same time it was seen as a powerful tool that could help rationalise public services and improve the human condition through mechanisms of control and nudging. Despite numerous visual representations of how the platform would work in general, the program did not generate any publicly available pilot, program or experiment that would combine different data sources using an AI, algorithm or any other type of calculation such as deep learning that could be scrutinised or analysed.

The AuroraAI budget was around 11 million euros, and it sought to provide a paradigm shift for solving societal problems. According to Kopponen et al., (2020: 97) this could be achieved by

> using a holistic model of digital twin paradigm for societal applications. The proposal builds on using a citizen 360-data model that reflects the characteristics of citizens that act as service users. Based on the data model, societal information systems can propose actions and provide proactive services that are mass-tailored to meet individuals' needs.

At the centre of the AuroraAI approach was a strong commitment to a perspective centred around the individual, which would be made possible by the development of a Citizen Digital Twin (CDT). According to its proponents, the CDT model would allow for individuals to "discover their own future paths to their desired futures state with a technique we call AI lenses" (Kopponen et al., 2023: 94). In this perspective, AI was seen to empower individuals to improve their condition by enabling them to better take care of their own matters, whether they be financial, health, social or cultural matters. In a 2020 report by AlgorithmWatch, however, it was noted that

> The project's promoters say that AuroraAI empowers individuals by giving them control over the decisions they make. However, it is well established that "nudging" – by means of the design of choice architecture and appropriately timed suggestions (or lack thereof) – has an effect on the choices made. AuroraAI would, therefore, act as a decision guidance system, affecting, for example, which social benefits to apply for, or which health and wellbeing services to make use of. Effective recommendations would increase or decrease service use, and would, therefore have financial consequences for the public sector (Ruckenstein and Lehtiniemi, 2020: 88).

One of the difficulties related to AuroraAI was that many of its goals were quite diffuse and unclear. The three main goals of AuroraAI at the beginning of the project were the development of human-centric AI to help individuals in their daily tasks, the decrease in institutional silos or compartments through a better integration of both public and private services to individuals, and finally the development of three life event-based processes through which AuroraAI could be piloted.

The vision of Aurora was to develop a type of seamlessness (cf. Wadmann and Hoeyer, 2018) between organisations so that individuals would not have to move from one service provider to another to take care of their problems when dealing with public services. At the heart of this

vision was the notion that one of the fundamental problems of existing public services was that it was inefficient especially when it came to how it managed information on individuals and their needs since this information was not shared efficiently between different government agencies. Different public authorities collected and processed information on individuals, but this information did not travel well between different government agencies. It was at this junction between individual needs, service provision and the data that the state has on individuals that AI would be of crucial importance in providing a solution. According to Kopponen et al. (2022: 7) this blueprint would provide "a rational framework for service development based on CDTs and serves as a basis for strategic guidance of service development."

A fundamental challenge, however, was that AuroraAI generated two types of ambiguities. The first ambiguity related to the ways in which data on individuals would move between different organisations and individuals. This question was and remained fundamentally a political and governance issue in that it did not require AI to be implemented, but rather political decisions on where responsibilities and duties rested in how personal data was shared between public authorities. The second ambiguity related to the nature and type of AI that would help to make recommendations. This ambiguity relates to the 'black box' problem in that the program never explicitly described what technology (LLM, deep neural network, machine learning etc…) would be used to implement the service recommendations.

As Leikas et al (2022: 4) have noted "AuroraAI points citizens to potential public services. […] This will give citizens better access to personalised services based both on the personal data they provide […] and on population-level data." One of AuroraAI central positions of operation centred around the role of data that the Finnish welfare state collected and maintained on individuals and how this could be better made to use in tailoring services to individuals. Räisänen (2024) has noted in his study of AuroraAI's operation that AuroraAI was heavily influenced by notions in which government intervention gives rise to a new type of responsible consumer within the welfare state system; a consumer built around public-private service markets which are mediated by AI (see also Giesler and Veresiu, 2014). One of the many challenges of AuroraAI was that the program was headed by the Ministry of Finance, but the implications for its possible impact would have touched upon how services were offered in multiple domains including health and social welfare services. Given that one of the goals of AuroraAI was to reduce the siloed nature of government institutions, the implications for the program would not only be limited to how data was managed and shared across domains. It would inevitably also imply a restructuring of the political division of power between current institutions. Such a restructuring, however, would have required a significant political discussion, debate and analysis of the implications, as well as challenges and benefits that such a change would create. In this sense AuroraAI's technical solutions to the problem of data sharing for service provision reflected much more significant and foundational questions related to the functioning of the modern state. As Archer and colleagues (2025) have noted, increased interoperability through 'desiloisation' has tended to reflect visions of implementing platform capitalism within the public sector. These implications alone raised significant political questions regarding power relations between different ministries and their domains of control and oversight.

In the following I will explore two examples of work surrounding AuroraAI that highlight the role that was envisioned for AI and algorithms within the project.

Case 1. Visual representation of the operation of AuroraAI

One of the salient features of the AuroraAI program was the large number of visual representations that it produced relating to its operation. Visual representations are important tools in conveying messages and ideas quickly. They also compress a large amount of information into compact images. The compaction of information into images also creates distortions or simplification whereby processes that entail high levels of complexity and uncertainty are represented as self-evident and unproblematic.

In an early version of the AuroraAI concept that was presented as a PowerPoint presentation and created in October 2020 the basic flow of information, data sources, data analytics, algorithmic or AI analysis and output are presented. The slide in Figure 1 is part of a 13-slide presentation in which AuroraAI's main operating logic is presented. As the image shows, AuroraAI's works as a type of process or flowchart to solve complex problems. Many of the visual representations that were generated within AuroraAI were presented in a similar manner and thus were classified within the engineering frame since they draw heavily on process engineering to provide solutions.

I would like to focus on two features of this image and some of the challenges that were associated with it. The first feature that is circled in green represents the stage in which both public and private service providers have attached their services to the AuroraAI service network. This is a database of possible services that the algorithm or AI can choose from when it is trying to identify a service that an individual may need. AuroraAI was conceptualised as a service which would allow for both public and private actors to provide services to its users. During discussions, however, several stakeholders asked if there were any limitations on the private actors who could add their services to the system. Since AuroraAI's task was to serve as a gateway to both public and private services, limiting private service providers could be seen as being anti-competitive. At the same time, however, many stakeholders noted that it was un-ethical if a government run service would start to recommend crystal healing services to patients who were undergoing cancer treatments. Public healthcare service providers especially voiced a concern regarding the ethical duties that they must provide evidence-based recommendations to patients and people in need and that having an open service portal to all types of private services was highly problematic.

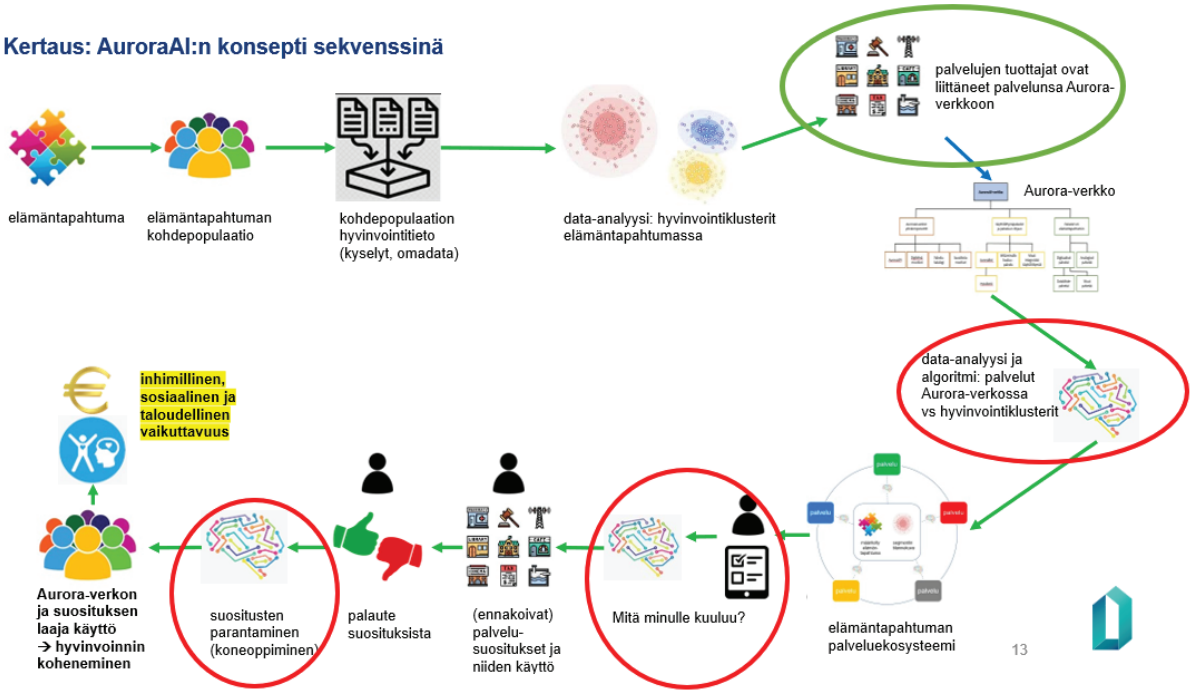

Figure 1. The AuroraAI analysis process. "The AuroraAI concept as a sequence". Translation of process points starting from top left: Life event; life event target population; target populations welfare data (surveys, mydata); Data-analysis, well-being clusters in different life events; service providers who have joined the Aurora network; Aurora network; data analysis and algorithm: services in the Aurora network vs well-being clusters; life event service ecosystem; How am I doing?; (predictive) service recommendations and their use; feedback recommendations; improvement of recommendations (machine learning); the broad use of the Aurora network improvement of wellbeing; humane, social and economic impact.

The second feature of the figure that I would like to draw attention to are the images in the red circle where there is a brain made up of circuits. These stages of the process represent stages where an algorithm or AI system will be used to conduct some type of analysis of data to provide recommendations or to further refine them depending on input and user preferences. As mentioned above, AuroraAI never actually developed an algorithm or AI system. Although some basic operational functionalities were developed and suggested by a consulting company, these features were never actualised. These stages represent a type of black box within the AuroraAI system which is somehow able to take different types of data on individuals and population clusters, combine it with different service providers and make recommendations on individual needs. This type of solutionist approach is reminiscent of both the Master Algorithm idea, as well as a form of re-enchantment.

On the surface, AuroraAI is based on using existing data sources, such as population registers, healthcare records, population statistics etc… All of which are strongly rooted in the modernist state project whereby official statistics and state collected population data makes the population both legible and actionable (Scott, 1998). This can be seen as a type of disenchantment in that superstition and magic is replaced by scientific methods of making the population visible through various statistical methods. In this sense, AuroraAI had its footing well within the modernist and scientific realm of calculation. At the same time, however, the black box of algorithm and AI as a solution to the problems of governance and prediction are a form of re-enchantment whereby the calculus offered by algorithms will solve the problems outlined in the AuroraAI policy documents.

The algorithm in this process flow chart would, therefore, in some way replace the poorly functioning government agencies who are not able to allocate resources effectively or pre-emptively provide predictions that could help individuals to solve existing problems and avoid future challenges. What the image conceals, however, are the multitude of ethical, legal, and political obstacles that stood in the way of allowing AI to combine different data sources. Many of these obstacles are there to ensure the basic rights of citizens to unwarranted or excessive use of personal data by authorities. Not to mention the challenges associated with the validity of the output that the AI would produce in terms of the reliability and relevance of any type of recommendation that it would make. The challenge of developing personalised services hung in a balance between the limits on how much personal information could be collected and used on individuals (which was very limited to ensure privacy) vs the usefulness or accuracy of general findings derived from clustering of anonymous big data.

It became clear very early on that the possibilities and vision of AI as a tool for providing accurate service recommendations was either not possible to operationalise or it would be so general that it was of no use to anyone. The promissory discourses around the power of AI were therefore not realised.

Case 2. AI for self-improvement

The second example that I draw on from AuroraAI relates to the idea of a digital mirror as a tool for social improvement through which the AI-driven recommendation system would operate. As mentioned above, AuroraAI was envisioned as a personalised AI assistant for individuals. At the outset it was emphasised that it was not just a search engine that would search for both public and private services, but rather that it would tailor services based on the needs of an individual. In addition, the service would also help individuals reach different goals that they may have.

In a publication from 2022 which covers the digital twin aspects of AuroraAI, Kopponen et al. (2022: 10) present the image found in Figure 2 where the individual is related to their digital self as well as to the distributed services that they may need. A key component of this visualisation relates to the need of individuals to better understand themselves and based on those findings seek to improve their condition using AuroraAI.

The CDT model also represents how individual improvement is mediated or being a good citizen is increasingly mediated through state collected and managed data. Citizenship in the future Finland model is data-based and made possible through algorithmic or AI-based calculations.

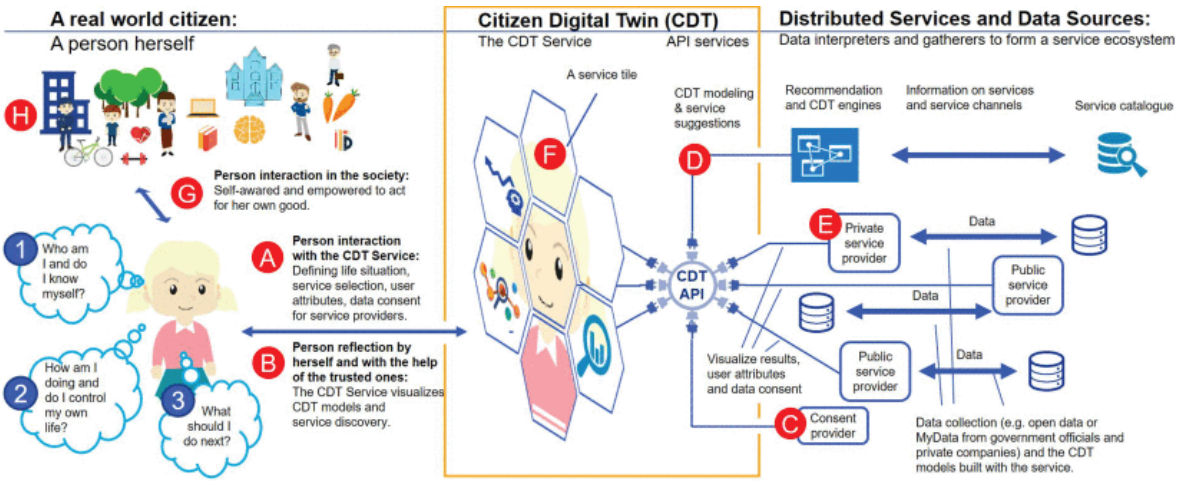

Figure 2. Presentation of the Citizen Digital Twin (CDT) and its relationship to public and private service providers (Kopponen et al., 2022: 10).

Social interaction, therefore, is predicated on there being enough data on all citizens to be able to make meaningful recommendations to support self-fulfilment.

The CDT model was related to the development of the "How am I doing" service concept (*Mitä minulle kuuluu?)*. In the previous example I described the overall service and data flow concept behind AuroraAI. An important component of the analytical data that was to be used would be based on different types of questionnaires that the user would answer to provide data to the algorithm or AI system to get as complete an understanding regarding the life situation of the user. The "How am I doing?" concept was one approach that was based on the human-centric perspective that AuroraAI sought to implement in its design thinking. In this approach, users would be presented with 10 questions about their life situation and based on those answers an algorithm or AI would calculate and provide service recommendations to individuals. This approach was seen as being particularly useful in recommending services to young people.

The approach was based on a questionnaire battery that was developed between 2015 and 2019 by several NGO's and funded by the government to develop tools for identifying needs of young people (Kainulainen, 2019). The result was the 3X10D®-survey which contained questions regarding different facets of a young person's life (Kainulainen and Valkeinen, 2023). These questions included subject areas on physical, social, cognitive, and general performance. This self-test which young people could do on an app, for example, would then provide recommendations on what they could do in case some of the results suggested that there were issues, such as social marginalisation or mental health issues.

During the AuroraAI program, this approach was adopted and further developed, among others, by the Evangelical Lutheran Church, which wanted to develop an app that could be used when 15-year-olds attended confirmation camp. The Church wanted to develop a tool which would provide them with a better understanding of how young people are doing in their everyday life. The app would also provide a way for young people and the counsellors to have discussions of what types of challenges young people faced in their everyday life and what could be done to alleviate such issues.

In addition to the program evaluating your status in relation to wellbeing, it would also help individuals improve their life situations. The idea was that AI would not just describe services but rather help individuals achieve goals that the individual could set for themselves. For example, graduate from high school or university, find a job, lose weight, learn a new skill, save money etc… Based on the targets that everyone could set for themselves the AI would outline a plan on how to achieve those targets.

In Figure 3 there is an image from one of the slides in the presentation where the AI has

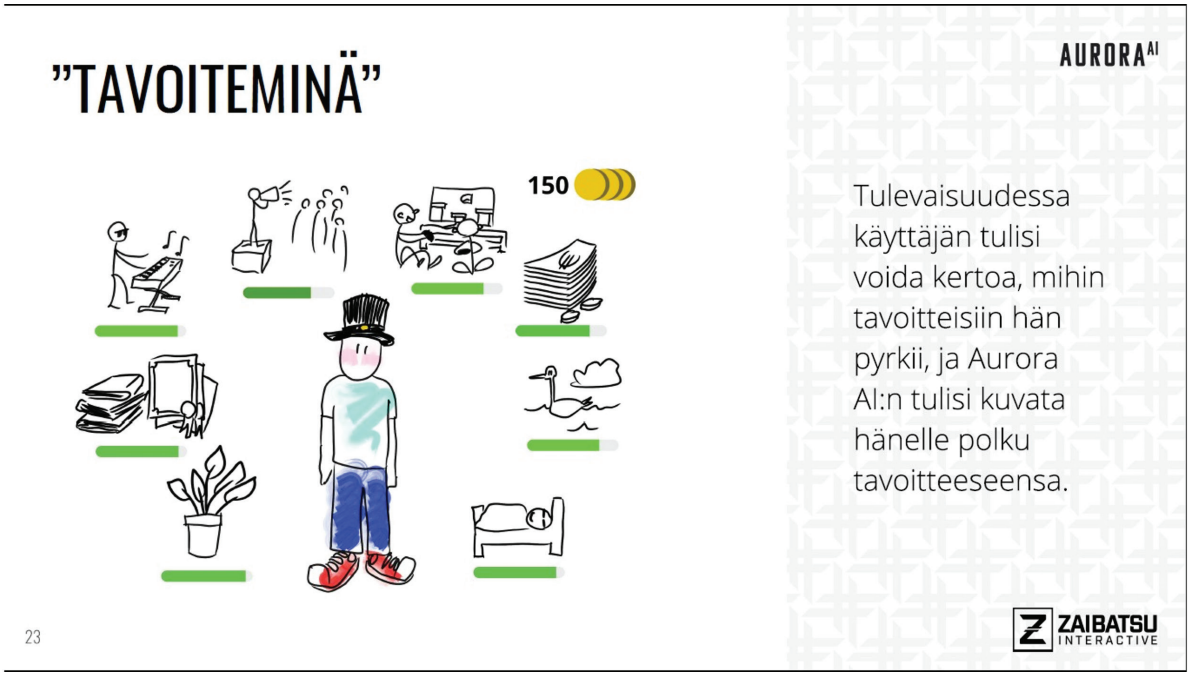

Figure 3. "Tavoiteminä" slide [My ideal self]. The text on the rights states: "In the future the user should be able to define what goals they are seeking to achieve and AuroraAI should be able to describe a path to reach that goal."

provided examples of how a user can achieve their goals. The previous slide in the deck describes and visualises how the AI would first help the individual evaluate their life situation. In this vision of AuroraAI capabilities, the individual is actively involved in improving themselves through a type of digital self-help application. This normative approach raised several concerns in relation to what would constitute improvement, who would define an appropriate goal and why would anyone do this. One slide in this slide deck focused on motivators to encourage individuals to adopt such a plan or way of life. One suggested approach was the gamification of the process to get people to use the service. Some of the rationale for this were that gamification was a good way of "hooking" (*koukuttaa*) people into improving their own life condition, gamification was a good way of achieving economic savings when people are encouraged to take care of themselves, as well as "why not?" (*Miksi ei?* [sic]) (Zaibatsu, 2022).

The slide deck also discusses ways in which gamification can encourage individuals to continue using the service and set new goals for themselves. This would be solved by providing individuals with rewards for achieving their goals. What exactly these rewards would be were not explicated, but the approach resembled in many ways a form of social scoring (Backer, 2019; Liang et al., 2018). This approach was ultimately abandoned by the developers since they came to understand that any reward system set by the government would take a strong normative stance on what was considered "a good life" by authorities. At one point it was discussed that individuals would set the goals themselves, but this approach was also abandoned since it suffered from similar shortcomings as the first approach. Namely, what constituted an appropriate life goal and who decided this? Could an individual set a life goal to be drinking beer and lying on the beach and if so, who decided what was right and wrong? Since AuroraAI ended, the EU's AI Act has listed social scoring as possibly being prohibited since there is a high likelihood of it influences people's decisions or possibly manipulates their behavior (Novelli et al., 2024).

AuroraAI's attempts at improving the quality of life or social repair through technology were often pre-emptively halted due to the lack of understanding the inherently political nature of the technology that had been envisioned. In this perspective, AuroraAI was not only seen as a way of identifying underlying problems in the life of individuals, but it was also seen as a tool for on-going restoration and improvement of

one's life. AuroraAI was seen as a restorative tool provided for individual so they could take control of their lives and well-being. In this approach AI would provide the magical perspective and insight that individuals could follow to become better versions of themselves.

Discussion

This article has explored how AI was envisioned to work within the Finnish context and how this was presented in two examples: visual representations and AI for self-improvement. Using the frames of process and data I have sought to explain how AuroraAI represented both a form of dis-enchantment, as well as enchanted determinism in seeking to develop public services in Finland. AuroraAI's goals and visions were far-reaching and ambitious. Legal and ethical concerns aside, the role that AI was seen to play was in many ways magical in nature but essentially based on the modernist vision of data serving as a basis for decision-making. Many of the images developed in the program drew heavily from and engineering type of process thinking, where society and its challenges can be solved through calculation and a type of in-put – out-put thinking.

Tupasela et al (2020) have termed the notion of Nordic data imaginary to describe how Nordic welfare states "try to adjust and benefit from new pressures and opportunities to utilise their data resources in data markets". Within the AuroraAI program data played a central role; it sought to use existing data on the population and combine it with self-reported data to provide service recommendations to individuals. In many ways the vision behind AuroraAI aligned with McQuillan's (2015) notion of 'algorithmic states of exception' in that governmentality is increasingly based on notions of mass surveillance. In this sense, the project was highly modernist in nature. What made AuroraAI different, however, was that in this line of thinking AI would accomplish what different service providers, such as social services, health care providers, school counsellors, for example, were not able to provide; insight based on a multitude of different data sources at a cost-effective price.

Testing and piloting in public services and administration always implies piloting and testing a mixture of both existing (old) technology or practices and innovative (new) approaches or solutions. These two worlds exist simultaneously whereby the various agents of development and testing (civil servants, tech developers, start-ups, and new technologies) attempt to make inroads and interventions into that which exists. A major challenge in this has been fitting new visions on which pilots and experiments are based into existing frameworks of operation.

For Weber, the emergence of the modern state and its ability to collect and use statistics on its population for governance formed a central feature of what he referred to as disenchantment. The process figures provided by AuroraAI drew on this tradition to a certain extent but also introduce what Campolo and Crawford (2020) refer to as re-enchantment. Within the AuroraAI program data, data-driven decision-making, calculation and a penchant towards rationality served as the basis of dis-enchantment. In this configuration, however, re-enchantment was represented by AI and its assumed powers of calculation and computation that would solve the so-called problem of governance by proposing new ways of organising services, thus making them more efficient. How AuroraAI would have achieved this, remained undefined and un-tested, leaving the claims made by the program unproven and without plausible demonstration – as a type of hype (Züger at al., 2023). An unintended consequence of AuroraAI was, however, a type of economisation of life through algorithmic calculation. In her research on the rise of infrastructures of calculation Michelle Murphy (2007: 89-90) notes that "Experimental intervention often aimed at individualised and minimised cost-effective technological fixes that have at their most durable outcome the reproduction of an infrastructure of experiment." AuroraAI's legacy can perhaps also be seen as that of re-shaping modernist practices of statistical reasoning within the state (Desrosières, 1998) into practices where AI and algorithmic solutionism is presented as a valid and justifiable approach to resolving political and governance challenges relating to the population.

What appeared to come as a surprise to the proponents of AuroraAI was an unintended consequence whereby the AI system would become a normative tool through which life-worth could be calculated and translated (cf. Svendsen et al., 2018). AuroraAI would become a platform through which value and meaning was assigned to individuals through tasks and goals that they would set for themselves with the help of an algorithm. The goals of self-improvement through a personal assistant continued to become increasingly nebulous and fuzzy, making it increasingly difficult to operationalise in practice in any type of a pilot or actual test. One of the goals of a test or a pilot is to be able to evaluate the possibility of using or implementing a system in public service. Since AuroraAI did not actually produce such a system it became difficult to evaluate its ability to deliver what it promised.

One of AuroraAI's successes could be said to be its promotion of a type of thinking and activity between different public agencies whereby they increasingly seek to identify ways in which service provision for people can be made more efficient using digital tools. AuroraAI continues to be mentioned in presentations by different public service actors working in the field of digitalisation of services as a pioneering project that has helped to pave the way for new projects that seek to deliver a more human-centric approach to services. The degree to which AI or algorithms are present in these pilots varies greatly, but they remain far from the idea of a Master Algorithm that would be able to make use of a broad range of different data sources on individuals to make predictions of service recommendations.

Conclusion

One of AuroraAI's legacies is that more recent AI programs, such as The Finnish national AI ecosystem for social and health services (SOTE), which is led by the Ministry of Social Affairs and Health (Sosiaali- ja terveysministeriö, 2024) take a more pragmatic approach to their view on the ability of AI in addressing problems. The informal network of stakeholders in the social and healthcare sector, including authorities, businesses and researchers explores, develops and pilots almost a dozen different AI tools in different sectors. These include translation service and medical decision-support systems in different fields. This more grounded approach suggests that the grand vision that AuroraAI sought to achieve, and which Domingo's (2015) has sought to elaborate have been abandoned for a more pragmatic and context specific approach where expertise within specific knowledge domains is leveraged to better understand the possibilities and challenges of developing and using AI.

Another consequence that appears to have emerged is the role that AI is seen to play, or rather not play in what Archer and colleagues call "desiloisation" (2025). Although digitalisation remains an important and on-going national and local project in Finland, there has perhaps appeared an appreciation for the need for silos. Concerns over data security and domain-specific expertise can also be seen as strengths and necessary features of a modern state. The role for different authorities who have legal jurisdiction over these different data domains remains to facilitate the movement of only necessary data to facilitate improved services as opposed to developing a singular system such as AuroraAI envisioned. Perhaps the greatest achievement of AuroraAI was that it helped us identify and appreciate the importance and function of the existing data infrastructure in Finland and subsequently explore and implement repair through a more modest and subtle approach.

Acknowledgements

The article is based on research conducted within the "Designing Inclusive & Trustworthy Digital Public Services for Migrants in Finland" (Trust-M) funded by the Strategic Research Council (funding decision number 353510) as well as the "Data Literacy for Responsible Decision-making" (DataLit) funded by the Strategic Research Council (funding decision number 358245).

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