

# **PUBLIC SECTOR ARTIFICIAL INTELLIGENCE STRATEGIES: CONSIDERATIONS FOR A PUBLIC VALUE APPROACH**

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## INTRODUCTION

Artificial intelligence (AI) is becoming an increasingly common part of public sector technology and digitalization agendas. In the last review, the joint research centre (JRC) has compiled a database of 680 AI programs used within the EU public sector (JRC 2022). These solutions are positioned across multiple areas of public sector activities, giving evidence for a wide diversity of public sector interest for internal AI usage and external deployment to improve or create novel public services. This serves as a considerable growth on the previous database of 143 solutions<sup>1</sup>, denoting both increasing investment in AI for public sector programs and an interest from the private markets in developing public sector solutions (JRC 2022).

With rising investment and usage has come a parallel interest and demand for evaluating AI solutions from an ethical standpoint, identifying not only the social risks but the risks to fundamental rights, values, and obligations between citizens, society, and the state. While ethical reviews are increasingly common within public sector AI programs, researchers and policymakers need to better understand how the model of public administration impacts what kind of functions AI performs in the public sector and its impact on how the public sector can address public needs over time.

This paper provides a brief introduction to a public value approach to public sector AI strategy development. The author argues that AI solutions deployed within neoliberal and new public management contexts will reinforce neoliberal and new public management ends. For instance, whether AI solutions, designed with public value intentions and operational context, may end up facilitating the reduced capability and privatisation of public sector and welfare creating activities.

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<sup>1</sup> The JRC has conducted an extensive review of public sector AI cases, compiling an initial dataset of 143 public sector AI cases. The JRC classification provided an overview by title, description, country, administrative level, AI type, along with function of government first and second levels. The OECD classification of the functions of government (COFOG) delineates government activities and expenditures into 10 core functional groups and 9 sub-groups per functional group (OECD 2011).

I provide an overview of the existing theoretical intersection between public value and public sector AI across three prevailing public value approaches: public entrepreneurship, public norm, and collective public value creation. These are considered relative to potential challenges to using AI for public value rationales. The paper ends with recommendations based on the expected challenges.

## **PUBLIC VALUE AND PUBLIC ADMINISTRATION**

Theories of public administration organise and codify how public sector actors and civil servants should both understand their goals and organise the government in order to pursue them. Since the 1990s, new public management (NPM) approaches have dominated public administration practices and education within the United States and Europe (Hammerschmid et al, 2018; Kattel and Mazzucato, 2020; Mazzucato, 2018). Within NPM frameworks, the role of the state is limited and the scope for entrepreneurial activities from public sector actors tends to be disincentivized (Moore, 1995). Within such contexts, value is taken to be created by the market and is at best de-risked or facilitated by government activities and investments (Mazzucato 2013, Kattel and Mazzucato 2020).

In response, public value theories (PVT) emerged to frame both the potential for a dynamic public sector and to rethink what value creation looks like (Veale, 2019; Kattel and Mazzucato 2020). These positions have emerged in parallel with a broader hypothesis on the nature of welfare creation under systemic and global problems. Where an improvement to the overall national growth can be assumed to translate into aggregate improving national welfare, general welfare based economic strategies can have extensive spill over benefits. However, the scope of spill overs from welfare improvement for addressing key shared problems and wellbeing, whether at a local, national, or global level, is now argued to be fundamentally insufficient (Acemoglu et al, 2012; Raworth, 2017; Perez, 2017; Mazzucato, 2018). This insufficiency is due to the need to organise society, business, and the public sector more explicitly around pressing challenges to source better solutions and improve how problems are addressed on a better timeline, particularly when these problems are a result of prior coordination issues (Acemoglu et al, 2012). This demand has given rise to grand challenge-based coordination mechanisms, such as the sustainable development goals (SDGs), millennium development goals (MDGs), and mission selection (Mazzucato, 2013; Kattel and Mazzucato, 2020). In response has come renewed interest in challenge-oriented and mission-oriented innovation, pushing on state and non-state actors to identify and select how to address these problems.

These approaches served to change the remit for public sector actors from efficiency towards identifying the social ends demanded in a society, ensuring these ends and values are delivered, and mitigating public value failures. What is in question is the legitimate scope and responsible use of public sector resources and time for what purposes. This section provides a brief and non-academic overview of three perspectives on public value approaches. As a pre-emptive note, the positions below of Moore, Bozeman, Mazzucato, and Kattel are not de facto arguments for larger states. Instead, the concern is on the kinds of goods, services, infrastructure, and institutions needed in society and the conditions under which different actors create, supply, and maintain them. PVT is an argument for a smarter state.

## FRAMING PUBLIC VALUE FOR PUBLIC SECTOR ARTIFICIAL INTELLIGENCE

The EU and states within the EU remain dominated by public administrative approaches which centralise efficiency and market failure. AI deployed by new public management administrators will service new public management ends. Efficiency frameworks extend to demands and capacity for internal AI development, the functions which AI performs in the public sector relative to citizens and society, the business models by which external actors develop AI solutions for the public sector, and the conditionalities in procurement of AI solutions. The question of alternative public administrative approaches to AI concerns, “What do we want AI to do and for what do we want AI to serve as a solution.” The first and most immediate point from a public value perspective is that just as markets for kidneys may be public value failures, the automation of some features of society through AI may not only exacerbate existing public value failures (e.g., biased criminal justice institutions) but be public value failures in themselves.<sup>2</sup>

The lack of a singular agreed classification of public sector problems susceptible to AI solutions, as well as potential AI solutions relative to public sector problems represents a core research gap.<sup>3</sup> The AI act positions further attention on the large diversity of

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<sup>2</sup> However, single point evaluations of AI as a holistic and internally complete solution independent of how and where it is deployed will remain a categorization and evaluation problem. AI as a multi-technology solution, being the convergence of improvements across data creation, storage, and management, compute hardware, operations pipelines creation, as well as cloud distributions of access to resources, along with multiple other areas, creates evaluative concerns. For the purposes of this brief paper, AI will be used for purposes of convenience; the author recognizes and acknowledges that this ‘convenience’ based usage is part of the problem for representing and classifying technical programs for regulatory and public value ends.

<sup>3</sup> Hila Mehr (2017) proposes an initial heuristic typology for government purposes appropriate for AI applications: resource allocation, large data sets, experts shortage, predictable scenario, procedural, and diverse data. Noordt and Misuraca (2020) delineate organisational, individual, innovation, and environmental antecedents for public sector AI cases to augment case based analysis of public sector AI uses. This quad-antecedent model qualifies AI enabled public sector innovation with the traditional insight of a

solutions, but equal attention is needed on the technical context of deployment and management. But this further creates a definitional concern, as noted by Bryson (2022) where focus on the extant diversity of solutions can under address the information processing aim of these solutions, such that a broader definition of intelligence may help for classification purposes. As desired use for AI in a larger group of problems across sectors and industries grow, the susceptibility of any problem (such as addressing internal reviewer biases for insurance claims) to solutions such as neural networks remains unclear, particularly when considered relative to potential sources of failure in AI application.

New public sector programs need to better understand both what kinds of problems can be feasible and desirably addressed through AI, as well as what kind of AI solution best works when AI is identified as a means of addressing the problem. Evgeny Morozov (2013), arguing on the notion of solutionism, proposes that efforts to apply technical solutions to social and technical problems without either understanding the problem or while over-prioritizing the solution can end up creating undesirable unintended consequences, as well as undesirable restructuring of social relationships. AI is not a solution for every problem; instead, what matters is understanding what problems may most benefit from a given solution or solution mix, for which AI may be one piece. Output and maintenance review process and auditing for AI solutions in the public sector may happen too late. A problem-solution fit framework, as a parallel to a product-market fit framework, will be required as the conditions of application of, for instance, computer vision to a law enforcement problem gives insufficient details on the associate harms, business model, organisational capabilities, or societal demands. As such, a non-robust case library remains of limited value for public value assessment and endorsement. Veale (2019) in a public value classification notes a need for assessing and reviewing public sector AI applications and related public values relative to the public sector's connection to its environments, its employees, its citizens, or itself (231).

Bozeman (2007) positions public values in a spectrum between consensus and contest. The more a value is subject to consensus, the easier the agreement on actions; however, as a corollary, the higher the consensus the more blind actors are to alternative values and more likely to engage in standardised, bureaucratic behaviour. Taking a Bozeman

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need for high quality data, data maintenance, data sharing, and data driven services ecosystem for powering AI innovation (Ibid, 13). A fundamental insight remains the issue of consistent classification of AI systems on case analysis within the public sector due to competing individual attributes and understandings of the key features of a given AI project (ibid, 15); furthermore, than the kinds of public sector capabilities needed exceed effective prior data management skills, despite their centrality, as represented by the organisational and individual antecedents.

(2007) contestation and consensus-based division of values, the below table assembles a preliminary overview of the state of nationally endorsed values across European states, alongside further values noted in critical literature.

**TABLE 1.0. National Strategies and identified AI values**

Value	Status within European AI strategies
Autonomy	Contested
Control one's own data	Contested
Democracy	Contested
Dignity	Contested
Equality	Contested
Freedom	Consensus
Justice and fairness	Consensus
Privacy	Contested
Respect for human rights	Contested
Responsibility	Consensus
Rule of law	Contested
Solidarity	Contested
Sustainability	Contested
Transparency	Contested
Trust	Contested

Source : adapted from Viscusi et al (2020)

The only values subject to consensus directly referenced within existing strategies were freedom, justice and fairness, and responsibility. However, as noted within existing ethical AI frameworks, the degree to which consensus values translate into clear deployments of AI, in terms of what to monitor for and what to understand in the development stages, remains unresolved.

In direct terms, the concern for a public value as norm and production model for AI is not whether the primary “values” such as freedom have been sufficiently endorsed by the public, by the public sector, civil sector, and private sector. Instead, the concern extends to how the relationship between AI and freedom changes as AI changes, as well as how understandings of freedom further change. The implication of this approach is that there are no such things as merely technical deployments of AI within the public sector. All uses shape how the existing administrative model functions and which values are reinforced. For instance, a simple document automation process, for which the risk from solution failure may be minimal in terms of a secondary human review of inputs, functions to improve the operational efficiency of the administrative division. The concern here from Moore (1995) public value approach is how that deployment then relates to the mission of the organisation, whether the automation facilitates a further reduction in staff, a change in how the organisation seeks to engage with the public with its changed time, or whether this functions to outsource operation of internal public sector infrastructure to external actors.

### **AI and Public Entrepreneurship**

From a Moore PVT perspective, the first area of interest is to understand how AI can assist public institutions with achieving their mission or with adapting to create value outside of the normal scope of their missions. Particularly, how does AI improve the organisational capabilities and orientation of an organisation towards value creation. This, first and foremost, concerns understanding how and when AI impacts an organisation's mission, scope, and orientation. A library which improves its internal search process may have scope to improve its overall recommendation system for a larger variety of products and services available.<sup>4 5</sup> For instance, in the organisation of a larger curated directory of academic material for students and the public. Automating internal managerial tasks for public sector schools may free up administrative burdens between staff and teachers. However, the concern is not simply the direct and immediate change in time and duties, but the impact which such change has on any existing relationships. Public sector educational environments have high administrative burdens as well as high

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<sup>4</sup> Evgeny Morozov's work on the Syllabus, an academic content curation system, has been positioned as filling an existing market gap which Google should have provided given its Scholar program. Morozov further positions this as being a solution which may eventually benefit from becoming a non-market institution, provided by the public sector itself.

<sup>5</sup> Discretion and automated discretion will remain of fundamental concern within mission change for public sector institutions.



discretion; over-automating such environments and removing discretion may disproportionately harm students while benefiting administrative roles.

Higher educational institutions, such as universities, may be an important test-case for the selective use of AI to change the relationship between teachers, administration, students, and communities for public value purposes. Directly, as financial pressure increases for educational institutions, they will likely become an environment where financial incentives overtake public value and public interest incentives for education, which can harm the student-teacher relationship and over-prioritize administrative activities. However, merely automating administrative activities can likewise have unintended consequences in the reorganisation of needed capabilities among teachers and students in terms of navigating the educational system.

The impact of a given AI solution on the mission of the organisation relative to the capacity for public value creation must come before concerns on the erasure of suspected redundancies from a purely financial accounting perspective.

### **AI and Normative Consensus**

From a Bozeman PVT perspective, a first area of interest is evaluating what kinds of normative demands are implicated in or created by the increasing use of AI. The increasing centrality of ethics within national and public sector AI agendas is a critical point. However, the relative power of ethical positions within public sector, national, and private sector agendas remains a highly contested point. AI ethics teams may serve as 'ethics washing' instead of endowing actors capable of identifying and detecting potential social harms from AI usage with the power to either change the deployment or fully alert public sector actors to secure larger reviews or algorithmic recalls. From an operational perspective, the Bozeman PVT framework will establish a set of questions and concerns which need to be asked and addressed, as well as their answers made transparent. The normative consensus approach is not intended to be a replacement for microeconomic and cost-benefit analysis approaches, but to provide means for discussing what these approaches tend to marginalise and ignore.

The most immediate area of evaluation concerns the degree to which different kinds of algorithmic solutions and different kinds of data, in so far as they are used and distributed through market practices, are generating public value failures. Carissa Veliz (2020) argues that the market for personal data is itself a public value failure; whereby, any AI solution which relies on the use of this data are implicated in the public value failure. An essential analytic question is whether any given solution relies on a public value failure in the prior

market for data required for that solution to be effective or be created at all. Markets for health and locational data, among other data sources, may effectively be positioned as such public value failures. Likewise, the market for remote biometric identification may similarly be a public value failure.

Changing the conditions of access to this information by rewarding citizens through payments for making such data available does not resolve the primary source of the public value failure.<sup>6</sup>

### AI and Collective Value Creation

From a Mazzucato and Kattel perspective, the distribution of AI in society is a function of how the public and private sector relate to shape the existing market structures, such that some kinds of AI solutions are developed and diffused, and others are disincentivized and shut down. A pre-distributive approach to AI development is needed which better aligns the existing incentives of a given national innovation system, and the sub-systems around AI development as a technological innovation system. The public sector is positioned here as market shaper through procurement, as well as legal-institutional changes to how the innovation process for AI in society works and whether it's aligned with public purpose. Improvements to how the public sector procures and uses AI is a key first step but ultimately incomplete for shaping how public value is created through AI. For instance, the issues concerning facial recognition were heavily noted and pressure created through the American Civil Liberties Union and the Algorithmic Justice League. Improvements around public failure mitigation will remain critical.

### Varieties of Public Value Failure

In framing public value, Bozeman is careful to distinguish between cases of public value success and public value failure. The aim is less to provide a categorization of all markets and activities in society; instead, the aim is best understood as providing for public interest rationales what market failures provide for market fixing and neoliberal rationales. For Bozeman, public value failures occurs under one of seven conditions: “(1)

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<sup>6</sup> This will create a need for understanding the potential tradeoffs among these options while avoiding basic fallacies. An understanding of the potential aggregate economic value created by locational data for firms relative to advertising is not equivalent directly with the potential risks from having this data used by either malicious actors or benign actors. However, further uses for this data and similar data, such as keystrokes, have already been identified by major technology firms, where such information could be used for additional predictive purposes, such as identifying health issues in keystroke behaviour change over time.

mechanisms for values articulation and aggregation have broken down; (2) “imperfect monopolies” occur; (3) benefit hoarding occurs; (4) there is a scarcity of providers of public value; (5) a short time horizon threatens public value; (6) a focus on substitutability of assets threatens conservation of public resources; and (7) market transactions threaten fundamental human subsistence (Bozeman 2002).”

However, it is further important to note that a violation of public values and a public value failure are not the same thing (Bozeman, 2002). A violation of public values concerns when agents act in ways which break normative agreements about society; a public value failure concerns an issue in the means of creating public value, either by the public sector or overall. The relationship between the existing risk of government failure, the risk of public value failure, and the development of public sector AI strategies remains paramount. The most immediate hypothetical case at the intersection of these areas would concern the development of public sector surveillance initiatives which use public data for the purposes of privacy and agency violating insight, while granting the development and market space for this under monopolistic conditions.

Generally, the potential for failure always exceeds the potential and conditions for success. As such, preparing for and identifying how AI can exacerbate both market failures and public value failures can be an effective first step in improving and generating public value strategies. The aim is to produce strategies which account for and can systematically avoid when AI usage can create harm, violate public values, or drive public value failure. For instance, the over-focusing on a technology and its potential makes AI-centric public sector and public value approaches highly susceptible to solutionism (Morozov 2014), whereby a given technical solution is developed and deployed independent of an in depth understanding of the problem and whether the solution in any way either fits the problem, or is needed, or even if improving efficiency, generates the kind of social outcome that drives increasing democratic improvements.

In turn, the aim is not merely an understanding of the internal public sector capabilities but the diversity of institutions and actors which, through their coordination and organisation, can open up and close down different current configurations of AI in society as well as different directions for AI innovation and diffusion (Stirling, 2008). The capabilities to detect, avoid, mitigate, and reverse public value failures from AI need further clarification and enumeration.

## **CHALLENGES FOR STRATEGIES**

Below is a non-systematic list of challenges which emerge for public value strategies,

both in terms of driving the potential for public value failure and which may cause unintended harms independent of successful deployment with public value intentions.

### Capacity Challenge

Public value creation depends on the capabilities of the actors to successfully deliver or guarantee the public values identified in a society. A lack of capacity, and commensurate likelihood of failure, means the legitimacy of the public sector as actor is in jeopardy (Collington and Mazzucato 2022) This creates a public value failure spiral, where decreasing skills and capabilities of the public sector leads to reduction in operational and perceived operational capabilities for the public sector, which leads to reduced legitimacy of the public sector, which incentivizes further outsourcing and reduction of internal skills and capabilities. Equally, the use of AI within the public sector has been noted for the potential to drive efficiency through automating bureaucratic and redundant tasks.<sup>7</sup> The scope of application of AI to internal public sector activities needs to be evaluated in light of both its impact on public sector mission drift, organisational design, operational risks, and impacts on long-term public sector capacity. The use of AI for internal automation needs to work in support of public sector agents and be evaluated relative to the potential for supporting public entrepreneurial efforts from a Mark Moore PVT approach.

Lastly for this section, the design of public value forward strategies must ensure that AI does not become a way of privatising by other means, by outsourcing internal tasks to private actors while reducing internal skills to evaluate and manage the developed solutions.

### Political Economy Challenge

All current AI development and innovation occurs within the context of a global AI innovation ecosystem. AI capabilities and competencies are unequally distributed among global players and national players (Hogarth, 2019, 2020). The US and the UK have extended histories of state investment into national and sectoral AI capabilities beginning in the 1950s. The capability for different countries to domestically produce AI solutions within the EU is likewise unequal, with varying levels of maturity in domestic

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<sup>7</sup> The use of AI for this automation and task displacement function can change the organisational structure of public sector actors as well as their mission.

AI innovation systems (Forthcoming Entsminger et al; Tortoise Media). The political economy context is intended to focus policymaker attention on how the existing wealth creative and extractive dynamics of the AI innovation system are both impacted and impacting how the public sector uses, develops, and procures AI solutions and the technical means of using AI solutions - such as data access, compute access, machine resources, and related infrastructure. Mazzucato et al (2020) note these companies do not simply take high margins but are leveraging digital economic and algorithmic rents to secure economic advantages which then generate market failures. Digital economic rents exist when firms leverage specific features of digital environments to capture revenue without improving the productive features of the associated products or services. Algorithmic rents exist when firms leverage the specific features of algorithmic design to capture values without an improvement to the core features of the digital services. The unfair positioning of products and interfaces by Apple's iTunes, Amazon's webpage, and Google search have been noted as digital economic rents. Whereby a change in the order of priority of products reinforces income capture (Khan; Mazzucato et al).

AI has been a fundamental feature of the creation of digital economic rents, where firms leverage strategic market positions or algorithmic novelty to extract value without improving the value-creating activity of the primary products or services (Mazzucato et al, 2020). Public sectors looking to leverage AI within public sector activities need to address whether or not they are unduly supporting value-extracting and rent-creating activities. These stand alongside and independently of conventional rent-extracting contracting mechanisms understood within government failure models, where a government grant helps secure a monopolistic provision (Mazzucato, 2018; Mazzucato et al 2020). The conditions of public sector involvement in value-extraction are not limited to direct procurement of value-extraction mechanisms, or the procurement from companies using value-extraction mechanisms in other services. Public sector involvement in the distribution of access to core features of AI capability improvement shape features of this system - notably in the conditions of access to government data and the conditions of access to compute resources. In this regard, it becomes incumbent on the public sector to ask how and when the relationship is parasitic or mutualistic, such that the dynamics of public-private engagement on national AI capabilities reinforce the use of public spending for research & innovation investments instead of organisational and financial level extraction.<sup>8</sup>

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<sup>8</sup> Financialization processes tend to reinforce value-extractive behavior over value creative behavior. The existing AI industry has been highly financialized, leading to concerns over how use of financialized actors can reinforce value-extraction or introduce value-extraction based products into the public sector. Predominantly, however, such financialization in AI is implicated through existing major "big tech" players (Fernandez et al 2020, 51-53). Investment in and improvement of AI contracts or gov-tech development

## Structural Inequality Challenge

The existing state of digital inequality and digital inclusion can be deepened by the deployment of AI in asymmetries in quality-of-service improvements from AI (whether internally in basic tasks, such as improved document processing automation or externally in automated language translation for real-time conversations with public agents) as well as exposure to risks from AI services. All societies face various inequity challenges. Relative to digitalization and digital technologies, the global digital divide has been well studied. This has been further evaluated at national, subnational, urban, and further levels. The sources of these inequalities can be multiply determined, with financial access, infrastructural access, usability access, and life-relevance access<sup>9</sup>, among other features. However, in addition to basic access-based inequities, there are further inequities on the quality and capabilities for using digital technologies, for instance, in terms of sophistication of equipment and compute power.

These inequities may be resolved infrastructurally over time. However, what remains of more pressing concern is how and whether the positively intended use of AI may entrench, exacerbate, or create new kinds of inequalities of benefit<sup>10</sup> and structural injustices, noted as injustices for which the responsibility of resolving cannot analytically or pragmatically be placed on the individuals undergoing the injustice (McKeown 2021). These concern how and when AI reinforces an existing set of actors and relationships which are producing socially unjust outcomes, such as poverty and institutional discrimination (such as on race, sex, creed, gender, and identity); how and when can the use of AI deepen or widen the systems creating unjust outcomes, whether intentionally or unintentionally; furthermore, how and when does the use of AI by the public sector change the distribution of risk and reward (Mazzucato et al 2020).

Since 2014, the Dutch Government, to improve fraud investigations, has been leveraging a data intensive system risk indication (SyRI) to evaluate “unlikely citizen profiles”.<sup>11</sup> This system was accessible by public authorities to evaluate fraud cases around benefits, allowances, and taxes within limited geographic areas. Citizens when flagged are

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within a financialized sector will reinforce financialization dynamics, further entrenching value-extractive positions within the sector.

<sup>9</sup> Attempts to improve digital inclusion in the UK for generations over 50 noted an issue in terms of identified relevance and value of home computers to daily life.

<sup>10</sup> Discretion has been associated as a core driver of public sector service quality, as well as the state of engagement of public sector actors within their services (Tummers and Bekkers 2014). Automation of specific sub-features of a given application, such as tax-filing or information search, need to be further positioned within the set of sub-tasks and their social impact. For which task is there an inequality of benefits depending on the state of public sector actor discretion? More directly, for which task in a society with income inequality does reducing discretion through automation create lower options and higher service navigation costs for lower income portions of the population?

<sup>11</sup> <https://algorithmwatch.org/en/syri-netherlands-algorithm/>

investigated. Though when a given neighbourhood is being analysed, the municipality performing the investigation has no obligation to inform the citizens of the analysis. Over 5 years of application, the system had limited use and was leveraged for a limited number of investigations.<sup>12</sup> Most problematically, the system worked as a black box. In February 2020, the Court of the Hague found SyRI to be a violation of the European Convention of Human Rights (ECHR) section 8, deemed to be too opaque and a misfit between its potential benefits and harms. The “waterproof” system, the predecessor of SyRI in the Netherlands, was likewise deemed illegal as a privacy violation in 2007.<sup>13</sup> This precedent is expected to have spill-over effects given the related use of similar systems in other European jurisdictions, with impact beyond privacy violation into systematic misuse to disproportionately impact vulnerable and poverty-stricken populations.<sup>14 15</sup>

All public sector AI usage within economic and digitally divided societies will yield a parallel set of AI facilitated inequalities. Long-term impact cases are in need of further theorization and elaboration.

## Dual Use Challenge

Public value theory tends to presume benevolent state actors, as well as the internal and external institutional checks to restrict public value violating activities from the public sector, whether in isolated cases or at scale. This presumption remains highly contested, both with public value theory and within public choice theory. The concern remains in terms of case evaluation for how a given public sector AI usage or application, regardless of its prior use for public value, can create the future potential for violating public values, creating government failures, or creating public value failure.

The dual use problem extends to broader potential negative consequences. For instance, automated drone management can be used to conduct brute force assaults by launching drones into other drones or people. A solution designed to assess degree of skin tanning

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<sup>12</sup> <https://www.volkskrant.nl/nieuws-achtergrond/syri-het-fraudesysteem-van-de-overheid-faalt-nog-niet-een-fraudegeval-opgespoord-b789bc3a/?referrer=https%3A%2F%2Falgorithmwatch.org%2F>

<sup>13</sup> <https://algorithmwatch.org/en/syri-netherlands-algorithm/>

<sup>14</sup> <https://www.theguardian.com/technology/2019/oct/14/automating-poverty-algorithms-punish-poor>

<sup>15</sup> AI and related technologies change the features of public values and the public value relevant features of public services and public sector activities. The dimensions of feature change will remain contested. Epistemic approaches to AI pose a change in the distribution of knowledge and social attitudes towards knowledge claims among involved actors. Public sector automation, for instance of fairness judgements, rely on the acceptable epistemic properties of the expected analysis - for instance, whether its both accurate and precise; likewise, whether its free from human cognitive biases.

in post-vacation photos for non-melinated Europeans may be used to assist with racial profiling.

### Non-Market Challenge

The use of AI and neural information processing systems for large and small data driven concerns establishes a need to understand how ownership and access are organised for compute power, existing data, means of data creation, feedback infrastructure, and processing systems. Market and non-market institutions provide alternative mechanisms and incentives for the organisation of economic behaviour and innovative outcomes in society. The initial paper from Page and Brin on the anatomy of a large-scale hypertext web search engine notes that advertising creates mixed motives, “...inherently biased towards the advertisers and away from the needs of the consumers” (18). Further intermediary actors are increasingly being considered to organise access to data, such as information fiduciaries and data commons, to address potential principal-agent problems within digital markets. A larger review of first principles on market and non-market mechanisms for public value creation in digital markets is needed.

It may be more beneficial that non-market institutions and incentives are used in the creation and distribution of key resources and knowledge to both improve public sector AI solutions, review proposals for public sector AI usage, and share learnings.

### Epistemic Challenge

AI is a widely diverse field of applications, techniques, and tasks. Areas such as facial recognition have gained critical attention due to their potential failure, misuse, and violation of privacy. Facial recognition, feature identification, and sentiment analysis also creates a further divide in the recording and accessibility of levels of information at different times to specific agents. This changes the degree of agency different actors have relative to individuals; for instance, to understand how and when your face responded to different events. Agents with immediately accessible records about these kinds of phenomena place a risk not only on privacy but on potential unbalanced agency. It remains unclear what level of social information asymmetry (in terms of access to data, data creation capability, and knowledge attribution relative to data) among actors, notably among public and private, a society should tolerate. On a further level, the use of AI for analytic purposes can change how people qualify information and make decisions within organisations and individually. Changes in how individuals attribute knowledge



and create preferences for sources of knowledge/information in interactions can change the social epistemic features of relationships. Changes in the epistemic and folk epistemic (how people attribute viable knowledge claims) features of relationships between states, citizens, and society should be highly scrutinised.

Equally, the use of AI relative to the kinds of social epistemic harms means a change in what kind of information and which kinds of actors need to be involved in the evaluation process.<sup>16</sup>

## PRELIMINARY RECOMMENDATIONS

The three public value approaches described in this short paper create alternative demands on both organisational strategy creation and cross-EU organisational strategy creation and assessment. While public value creation is highly feasible, this paper has positioned a need to better account for the potential sources of failure and identify the key challenges facing public sector AI development more broadly. The below recommendations concern positions which are under-represented within current EU discourses; this was to provide a parallel to the existing recommendations within the EU concerning regulatory capabilities, trustworthy AI development, sustainability improvements, and related areas (JRC 2022).<sup>17</sup>

Further on this point, these recommendations are intended to be taken in parallel with the existing state of discourse on the organisation of markets for algorithms and markets for data.

### Recommendation 1

As the EU explores alternatives to prevailing public administrative models, establishing and framing a public value framework for public sector AI development and deployment can help establish a consistent point of reference. Such a strategy would benefit from establishing a three way division among expected uses of public value as rationale and evaluation framework: at the level of public entrepreneurship, where actors seek to perform actions otherwise outside of the original scope of their organisation; public value

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<sup>16</sup> Existing endeavours such as human in the loop and community in the loop can be modified through theories of social epistemic approaches and testimonial injustice.

<sup>17</sup> [https://ai-watch.ec.europa.eu/publications/ai-watch-road-adoption-artificial-intelligence-public-sector\\_en](https://ai-watch.ec.europa.eu/publications/ai-watch-road-adoption-artificial-intelligence-public-sector_en)

as norm, where the specific values demanded and pursued by that organisation, that society, and the broader EU can be clarified, collected, and be made subject to clear debate; public value creation, where the capabilities required among the public and private sectors in society to collectively create value relative to and through AI can be understood and developed.

This strategy needs to further account for both how AI usage by the public sector impacts the existing socio-economic features of society, with direct attention to changes to the distribution of risk and reward in daily life and innovative activities. For instance, when does AI usage and automation introduce new tail risks, such as from automated sewage management? The use and deployment of AI by the public sector can introduce new risks, epistemic features, and pragmatic changes in how citizens relate to and interact with the state.

## **Recommendation 2**

Efforts to solely focus on identifying public value within the algorithm itself may be misleading, as it under-determines the relationship between initial AI procurement and adoption and the pursuit of value creating activities by that organisation over time. What a given system does is a function of the organisation, its specific context and deployment, and conditions for use. This is to say, having a diverse portfolio of AI for the public sector market is conditional on how the public sector understands what value it wants to create. Improving the kinds of value offerings within the AI market will be a low hanging fruit and will have higher flexibility, but improving the value offerings of AI towards inclusive, human-centric, and trustworthy solutions will never be a complete solution - but nor is it represented as such by the EU currently. A public value change means understanding how and when the existing ethos of a public sector organisation and its intended use for AI is already geared towards a value-creating mission. Value and mission drift can occur as administrative change occurs, and the internal dual-use risk will remain. The problem will not be resolved by improving the clarity of value frameworks nor of clarifying the norms demanded of AI alone. However, securing long-term infrastructure commitments independent of administrative change can create incentives for vendor lock-in and technology lock-in.

These changes need to be better monitored and understood. In particular, an improving codification system for the existing public sector AI database needs to be generated with both a core public service assessment as well as a longitudinal assessment of public perspectives on the solution over time. This needs to be in parallel to a public value classification program whereby the position of an AI solution in terms of the relationships between the citizen and the state, the associated public values relative to the public

sector, and the associated public values in terms of overall normative consensus on societal demands (privacy, trust) need to be framed. Socio-economic risk categories can thus be improved through a better understanding of the kinds of public value harms implicated as well as clarity on the primary sources of public value success.

### **Recommendation 3**

A review framework is needed to evaluate how and when the public sector may be subsidising a rent-extractive AI industry through procurement, advisory contracts, and grants. This requires heavy focus on three initial concerns: first is the diversity of actors developing these solutions and their relative capacity to navigate existing procurement procedures (e.g. whether existing procurement legislation reinforces winners among existing large actors); second is the degree to which public sector conditionalities on procurement may help drive improved alignment of early stage development processes with long term visions for value creation; third, the assessment of whether public sector money is enabling and improving the business models of actors that are producing other kinds of public value failures (e.g. are public contracts going to companies developing privacy violating solutions).

All public sector AI development is happening in the context of a larger digital economic transition. This current transition within the North Atlantic is particularly dominated by competition policy concerns relative to the existing dominance of major firms, whose dominance is directly impacted by their ability to secure and retain AI capability leadership.

### **Recommendation 4**

The use and development of AI solutions, when so desired, needs to be considered in terms of the organisation and long-term capabilities of the relevant administration and organisation. AI deployment within existing neoliberal models tends to incentivize the automation of public sector tasks without or with reduced corollary improvement or changes to public sector capabilities. The desire for AI can introduce a two-way major issue: first, the reduction of internal capabilities through direction automation, which increases further technical skill requirement; second the outsourcing of key internal tasks to third party firms, such as major consultancies.

The EU needs a systematic review at the supra-national, national, ministerial, and urban levels to identify how and when existing AI deployments are incentivizing a loss of public sector capabilities through direct automation, increasing the privatisation of the public

sector through digital means (Collington, 2022), and when external consulting agencies are reorganizing the relationship between that public agency and the citizens. A loss of capabilities in the public sector can induce a corollary loss in potential legitimacy for public sector actors to serve as key actors in the overall public value creation process (Collington and Mazzucato 2022).

### **Recommendation 5**

The dedicated improvement of public value-oriented AI solutions needs to be clarified at the technical level. EU level resource sharing and collaboration on both technical expertise on developing solutions for public sector and public value purposes, as well as non-technical expertise on reviewing and monitoring need to be improved. The EU has an opportunity to create an alternative form of conference and research engagement through a cross-European public neural information processing systems conference, aligning both technical developments for public sector purposes with social science research on the capabilities of evaluating and regulating any new developments within the field. The existing NeuroIPS program provides a space for identifying state of the art developments. However, the specific model of review, selection, and ethical curation for public information needs to be more refined. Establishing a conference provides a venue for aggregation of the state of the art while refining and making more transparent the means of evaluating public information processing state of the art.

AI is a late-stage deployment across additional and larger IT infrastructure. Focusing on AI without focusing on data storage, data pre-processing, analytics systems from AI outputs, compute distribution... can create systematically misleading evaluations. An improved understanding of the distribution of infrastructure ownership relative to the capabilities of the public sector and the political economy of AI development within the EU is required. This requires an improved research and analytic program within the EU through a joint public-private initiative.

The promise and enthusiasm for AI and data-intensive public sectors need a corollary improvement in how both the EU as well as national actors view the future of government and the digitalization of relationships between states and citizens. In the short run, this means an improved clarification of which features of the existing digital market may benefit from being non-market institutions; further, which kinds of digital markets or markets for AI services and data, are themselves public value failures in addition to or as well as being market failures.

A public value-based indexing of existing public sector AI solutions is needed to clarify what norms are implicated within the design and deployment. The features of the solution need to be subject to an external review board to identify what values may be implicated and the conditions of monitoring for changes from that solution to those values within the direct context (organisational environment), direct outcome context (relationship between that organisation and citizen outcomes), and indirect outcomes (relationship between the created citizen outcomes and related public values and desired outcomes).

Such an indexing program should expand to both short-term evaluations and long-term evaluations. A long-term evaluation team is needed to identify how and where AI deployment is creating and reinforcing inequities and injustices.

### **Recommendation 6**

Sustainability and public value need further clarification for their intersection. Sustainability is increasingly demanded, and deep learning solutions are highly energy intensive. The carbon performance of AI depends on the energy mixture of a given society, as well as the energy efficiency of a given solution and its related hardware. However, what becomes most relevant is to what degree energy efficiency should be a competitive advantage in a public value-oriented market.

The establishment of a European AI commons for best-in-class algorithms for public value-oriented contexts should be considered to enable improved access to best-in-class systems for a variety of tasks which are collectively agreed to have benefits which exceed individual differentiation and sectoral differentiation. Energy efficiency may be such a task relative to the increasing existential threat of climate change.

## **CONCLUSION**

This paper has attempted to provide a preliminary basis for building and assessing public value strategies for public sector artificial intelligence. In turn, establishing an initial roadmap for aligning future applied and foundational research at the intersection of public value and AI. The aim behind this paper is best described as “alertive” rather than purely descriptive, exploratory, or to provide a systematic evaluation.<sup>18</sup>

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<sup>18</sup> Alertive work seeks to call attention to problems without necessarily positioning the research effort through problematization.

At a fundamental level, the concern for this paper was whether AI developed and deployed in new public management contexts would serve neoliberal and new public management ends. The extant literature on AI for public value argues yes. That AI with public value intention deployed in a predominantly new public management context will still be monitored and evaluated for new public management concerns. Creating a public value strategy can drive improvements to how AI is procured and deployed but demands a further re-orientation of capabilities and perspectives within the public sector.

Isaiah Berlin writes, “Where ends are agreed, the only questions left are those of means, and these are not political but technical, that is to say, capable of being settled by experts or machines, like arguments between engineers and doctors.” The position of this paper is that a public value perspective pre-supposes that there are no such things as ‘merely technical’ AI deployments within the public sector. Furthermore, the ends of a society, for which AI solutions can be evaluated by their potential to create value or drive failure, will and should remain politicised and contested. The EU must ensure that AI is not a vehicle for mass depoliticization of the kind of society and economies which technological developments drive and reinforce.

## APPENDIX

### Public Sector and Public Value Intersection

Jørgensen and Bozeman (2007) endeavour to create an inventory of public values to contextualise the current and future role of the public sector. These values are split into constellations “...based solely on which aspects of public administration or public organisation the value affects” (359).

**TABLE 2.0. Public Sector Relationship to Values**

Value Category	Value Set
Public sector's contribution to society	Common good; public interest and social cohesion
	Altruism; human dignity
	Sustainability; voice of the future
	Regime dignity; regime stability
Transformation of interests to decisions	Majority rule; democracy, will of the people, and collective choice
	User democracy; local governance and citizen involvement
	Protection of minorities; protection of individual rights
Relationship between public administrators and politicals	Political loyalty; accountability and responsiveness
Relationship between public administrators and their environment	Openness-secrecy; responsiveness and listening to public opinion
	Advocacy-neutrality; compromise and balancing of interests
	Competitiveness-cooperativeness; stakeholder or shareholder value
Intra Organisational aspects of public administration	Robustness; adaptability, stability, reliability, timeliness
	Innovation; enthusiasm and risk readiness
	Productivity; effectiveness, parsimony, and business-like approach
	Self-development of employees; good working environment

Behaviour of public-sector employees	Accountability; professionalism, honesty, moral standards, ethical consciousness, and integrity
Relationship between public administration and the citizens	Legality; protection of the rights of the individual, equal treatment, rule of law, justice
	Equity; reasonableness, fairness, and professionalism
	Dialogue; responsiveness, user democracy, citizen involvement, and citizen's self-development
	User orientation; timeliness and friendliness

Source : adapted from Jørgensen and Bozeman, 2007; Author additions

## PVT Theory

### *Public Value as Public Entrepreneurship*

The first PVT concerns Mark Moore's work out of Harvard. The framework is intended to reposition how public sector actors view their mission and their potential for providing services, goods, and environments that benefit citizens. Within the US, public choice and market failure models frame out of scope work for public sector actors as potentially damaging. PVT provides justification, rationale, and guidance for public sector actors to work as entrepreneurs within a constrained environment.

Mark Moore (1995) positioned public value theory as a strategy for neutral civil and public sector actors to perform entrepreneurial actions to create public value. The primary attention of the theory was how to understand within the potential, wide universe of value creating actions, what made a public value strategy feasible. Moore (1995) positioned attention on assessing the organisation's strategy and whether it was oriented towards value; whether the strategy was legitimate and sustainable; and whether the strategy is feasible relative to existing public sector capabilities.

### *Public Value as Normative Consensus*

The second core frame for PVT comes from Barry Bozeman. For Bozeman, public value was not merely 'value' created by the state or the public sector. Instead, public values



helped to organise analytic attention and work within public interest rationales for both public and private action. Bozeman argues that public values

*... provid(e) normative consensus about (a) the rights, benefits, and prerogatives to which citizens should (and should not) be entitled; (b) the obligations of citizens to society, the state, and one another; and (c) the principles on which governments and policies should be based*(Bozeman 2007, p 132)<sup>19</sup>

Where Moore positioned against efficiency dominant frameworks, Bozeman positioned against the dominant microeconomic approach framing evaluation and state goals, highlighted by public goods theories. He argues that public value theory is needed because market failure theory does not provide an exhaustive treatment for the kinds of problems and values problems commonly experienced in democratic societies. Consider for instance the potential for market mechanisms to address the allocative problem for organ donation in democratic societies, such as for Kidneys. The concern is not simply whether market mechanisms can perform the allocative function, but whether or not the use of market mechanisms (e.g. price and sale) for kidney allocation is itself a public value failure in how it shapes access to lifesaving donations. Not every market should exist, nor should everything be part of a market.

### ***Public Value as Collective Value Creation***

The intersection between Moore and Bozeman positions a need to rethink how public sector actors can pursue out of scope entrepreneurial work, when market failure rationales fail to identify what should be provided in a society as well as failing to frame and identify the norms informing what value be produced and how. Within this intersection, value and price are not equivalence; rather, value is always under-determined by price and requires further information and understanding. The work of Mariana Mazzucato and Rainer Kattel (2020) positions dynamic capabilities for public value creation and entrepreneurial state action at this intersection. Value, not understood as price, is co-created among public, private, and third sector actors. But the state plays a key role in both maintaining the conditions by which markets and ‘free markets’ function (from public infrastructure to legal-institutional features), investing in

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<sup>19</sup> This definition relies on a prior characterization of value by Bozeman (2007) as:

“...A complex and broad-based assessment of an object or set of objects...characterised by both cognitive and emotive elements, arrived at after some deliverable, and, because a value is part of the individual’s definition of self, it is not easily changed and it has the potential elicit action”

key areas of the economy too risky for other actors, and providing key public services, among other areas. This framework positions public value as a model of value production and creation, rather than norm evaluation or internal public entrepreneurial facilitation.

Value creation in society depends on the capabilities of public sector actors to perform essential functions; absent these capabilities, the provision and guarantee of “public value” from a Bozeman perspective or a Moore perspective is undermined. Of further note, public value creation can occur through the role of the state in driving collective change towards long-term missions and coordinating actors around wicked problems which have existing coordination and structural systems failures.

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