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EXPLORING ARTICLE 14 OF THE EU AI PROPOSAL: HUMAN IN THE LOOP CHALLENGES WHEN OVERSEEING HIGH-RISK AI SYSTEMS IN PUBLIC SERVICE ORGANISATIONS

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Abstract

The European Commission has given emphasis to a human-centric approach to allow the deployment of "safe" Artificial Intelligence (AI) systems in our society. However, Article 14 (human oversight obligations) of the EU AI Act Proposal provides little emphasis on human overseers' responsibilities when tasked to perform meaningful human oversight. This paper tests Article 14 against different challenges of public service organisations such as police departments (street-level bureaucracies) and argues why Article 14 may not be a success in street-level bureaucracies, which could ultimately harm fundamental rights.

Keywords: human oversight, street-level bureaucracies' challenges, decision-making, AI systems, Article 14 EU AI Act Proposal.

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I. Introduction

Artificial Intelligence (AI) is being implemented in different government agencies (street-level bureaucracies) to allegedly support the work of public servants and bring better services to citizens.[1] Supporters of AI systems implementation in government claim that it can alleviate the excessive work and lack of resources in government agencies.[2] It is proven that AI systems that provide recommendations or predictions can cause serious effects on citizens, even deadly effects, if improperly used or implemented.[3] The European Commission has emphasised that any deployment of AI systems, particularly high-risk systems, must follow a human-centric approach meaning that these systems should benefit humankind. This paper questions whether the *Regulation on the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts* (hereafter the EU AI proposal) to impose a high level of human oversight compliance onto developers or producers of AI systems would be enough to provide safe and reliable AI decision-making support in public service.[4] The argument follows that it appears that Article 14 has left unclear or unregulated the actual scope of responsibility of human overseers of high-risk AI systems working as humans in the loop (for example, street-level bureaucrats).[5] The author does not argue against human oversight obligations imposed to developers or designers of high-risk AI systems. Rather, the argument put forward is that the Commission should also address human oversight obligations of human overseers to best support a human-centric approach, which will result in more robust safeguards to protect humans from harmful AI deployment. Thus, this paper will analyse the accountability challenges that Article 14 (human oversight obligations) may encounter when implemented in street-level bureaucracies.

In part two, this paper explores some of the challenges in public administration that could trigger the success or failure of the aims of Article 14 EU AI proposal. For instance, we discuss the need for clear scope when drafting legislation to achieve desirable results in delivering policy aims in public service. Similarly, we discuss whether street-level bureaucrats working in key services would have enough financial and human resources incentives to undertake meaningful human oversight duties. In part three, we discuss the risks of AI systems in street-level bureaucracies which can cause harm to citizen's fundamental rights. Additionally, we explore the meaning and standard of the human in the loop in Europe, suggesting that meaningful human oversight requires autonomous and competent street-level bureaucrats (working as humans in the loop) who can effectively oversee AI systems' outcomes or suggestions.[6] Part four, tests Article 14 of the EU AI proposal against the different sociological, moral, and legal challenges of street-level bureaucracies when tasked to undertake meaningful human control

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[1] Madalina Busuioc, *Accountable Artificial Intelligence: Holding Algorithms to Account* (Vol. 81, Iss. 5, pp. 825–836, Public Administration Review, 2020) 825.

[2] Stephan Grimmelikhuijsen and Albert Meijer, *Legitimacy of Algorithmic Decision-Making: Six Threats and the Need for a Calibrated Institutional Response* (Perspectives on Public Management and Governance, Oxford University Press, XX, 1–11, 2022) 1.

[3] Peter Whiteford, *Debt by design: The anatomy of a social policy fiasco– Or was it something worse?* (Aust J Publ Admin: 80, Wiley, 2021) 341-2.

[4] Proposal for Regulation on the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts (EU AI proposal), Art.14.

[5] Fair Trials Report, *Automating Injustice: The use of artificial intelligence and automated decision-making systems in criminal justice in Europe* (2021) 34-6.

[6] Maciej Kuziemski and Gianluca Misuraca, *AI governance in the public sector: Three tales from the frontiers of automated decision-making in democratic settings* (Telecommunications policy, *44*(6), 101976, 2020) 3.

of AI systems' outcomes. We argue the importance of ascertaining a clear scope of responsibilities on the role of human overseers. Otherwise, the good intentions of the EU Commission could be rendered into a simple token of gesture in the battle to combat the negative effects of high-risk AI systems.[7] Furthermore, the limited financial and human resources to acquire the right knowledge and skills to approach AI systems in street-level bureaucracies could also limit the success of Article 14.

II. The Challenges of Public Administration

One of the goals of public administration is to deliver effective administration. Thus, governments are interested in implementing digital services with the aim to maximise the effectiveness of public administration.[8] However, implementing technologies in public service agencies would also require an examination of the different challenges that these agencies may go through,[9] such as the lack of financial resources or lack of adequate staff who can understand technologies' shortcomings. Hence, the struggles of these street-level bureaucracies would be materialised in the work of street-level bureaucrats (such as police officers, judicial officers, welfare officers, etc.) who will directly provide government services to the public.[10]

2.1. *Street-level bureaucrats' scope of work*

Hasenfeld describes bureaucracy as the model adopted by an accepted authority to provide formal rules or regulations aiming to best achieve control and compliance in organisations.[11] Likewise, authorities such as legislators ("top-level bureaucrats"), on some occasions, may draft laws with good intentions to benefit the public. However, top-level bureaucrats sometimes forget to consider whether street-level bureaucrats and their organisations understand the scope of new responsibilities under the new legislations.[12] Thus, the lack of scope or ambiguity of policy objectives under new legislations represent a first constraint that street-level bureaucrats face when presented with new legislations. Thus, if street-level bureaucrats' scope of work is vague or undefined, then community's concerns (for instance fears of misuse of AI in government) are unlikely to be addressed. [13] As Enarsson said, clear scope of legislation can assist decision-makers to achieve effective decision-making.[14] Hence, clarity on the scope of the legislation and how a reform is going to be delivered would determine the success, or failure, of street-level bureaucrats delivering policy aims for the benefit of citizens. These bureaucratic

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[7] Therese Enarsson and others, *Approaching the human in the loop – legal perspectives on hybrid human/algorithmic decision-making in three contexts* (Information & Communications Technology Law, 31:1, 123-153, 2022) 151.
[8] Ibid 128.
[9] Barry Bozeman and Jan Youtie, *Robotic Bureaucracy: Administrative Burden and Red Tape in University Research* (Public Administration Review, Vol. 80, Iss. 1, pp. 157–162, 2019) 157.
[10] Rik Peeters and Arjan Widlak, *The digital cage: Administrative exclusion through information architecture – The case of the Dutch civil registry's master data management system* (Government Information Quarterly, 35, (2), 175-183, 2018) 176; Michael Lipsky, *Street-Level Bureaucracy* (30th Ann. Ed. Book Subtitle: Dilemmas of the Individual in Public Service, Russell Sage Foundation Stable, 2010) 3.
[11] Yeheskel Hasenfeld, *Human Service Organizations* (Prentice Hall, Inc. Englewood Cliffs, New Jersey, 1983) 15-6.
[12] Sidha Zedekia, *Street Level Bureaucrats as the Ultimate Policy Makers* (J Pol Sci Pub Aff 5: 306, 2017) 1.
[13] Ben Shneiderman, *Bridging the Gap Between Ethics and Practice: Guidelines for Reliable, Safe, and Trustworthy Human-centered AI Systems* (ACM Trans. Interact. Intell. Syst. 10, 4, Article 26, 2020) 17.
[14] Enarsson (n 7)128.

challenges and the inability of citizens to access essential services such as justice, education, mental health, social and economic wellbeing, will eventually cause social harm and could wear out government legitimacy when implementing different policies.[15] For this reason it is important to ascertain a clear scope of work, roles, and responsibilities so street-level bureaucrats can adequately execute policy's aims.[16]

2.2. *Resources*

Financial

Another constraint that street-level bureaucrats usually face is limited financial resources to satisfy public demand and implement public policy.[17] The lack of resources can be visible through budget limitations in the allocation of government funds that street-level bureaucrats which would trigger the quality of delivering government services to citizens.[18] For instance, a police officer who may be faced with a dilemma to decide whether to allocate their time in gathering information about a particular case, or whether to make a quick decision, without further investigation, because they have other matters waiting for them and there is not enough time to cover all the different tasks assigned to the officer in question.[19] Therefore, adequate funding in street-level bureaucracies is highly important so street-level bureaucrats can be incentivised to deliver the best of quality in government services.

Human

The limitation in financial resources also affects the training required among street-level bureaucracy to effectively do their job and delivery policy aims.[20] Lipsky points out that the lack of proper training of street-level bureaucrats to exercise their functions represents a problem in the delivery of government services.[21] Studies show that training among street-level bureaucrats can improve their involvement with policy's aims which consequently leads to better results in policy delivery.[22] Moreover, training is important because it can also allow street-level bureaucrats to reflect on the performance of their own work and improve their performance.[23] Comparable to teachers or lawyers that trained for several years to undertake their role in society; training is an essential key to assist street-level bureaucrats (such as social services officers or police officers) to remind them about their responsibility in relation to the role assigned to them.[24] Thus, without proper training it is challenging to expect street-level bureaucrats to conduct meaningful work.

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[15] Peeters and Widlak (n 10) 177.
[16] Lipsky (n 10) 6, 8.
[17] Zedekia (n 12).
[18] Eve Garrow and Yeheskel Hasenfeld, *Institutional Logics, Moral Frames, and Advocacy: Explaining the Purpose of Advocacy Among Nonprofit Human-Service Organizations* (Vol. 43(1) 80–98, Sage 2014) 81; Simon Slavin, *Reviewed Work: Human Service Organizations by Yeheskel Hasenfeld, Social Service Review* (Vol. 57, No. 4, Chicago Press 1983) 685-6.
[19] Lipsky (n 10) 29-30.
[20] Hillel Schmid and Michal Almog-Bar, *A Tribute to Yeheskel "Zeke" Hasenfeld: Theoretical Legacy and Contribution to Human Service Organizations and Management* (Human Service Organizations: Management, Leadership & Governance, 44(2), 97-109, 2020) 100.
[21] Lipsky (n 10) 230-1.
[22] Neomi Frisch-Aviram and others, *How policy entrepreneurship training affects policy entrepreneurship behavior among street-level bureaucrats – a randomized field experiment* (Journal of European Public Policy, 28:5, 698-7222021) 717.
[23] Lisa Borrelli, *The Border Inside – Organizational Socialization of Street-level Bureaucrats in the European Migration Regime* (, Journal of Borderlands Studies, 36:4, 579-5982019) 582-3.
[24] Ibid 585.

2.3. Street-level bureaucrats and technologies

Successful deployment of technologies in public service is subject to barriers such as lack of upskill street-level bureaucrats who have literacy to meaningfully audit commissioned technologies.[25] Hence, the implementation of technologies in the public sector cannot be taken lightly, rather it requires a well-planned approach.[26] The challenges of successful deployment of technologies change from organisation to organisation. For instance, some organisations do not have adequate street-level bureaucrats who understand technologies; while other organisations have street-level bureaucrats who may not be incentivised to use technologies to benefit citizens.[27] There is literature showing that many police officers have trouble understanding algorithm advice when using predictive policing AI systems.[28] This lack of understanding of technologies results in a number of undesirable outcomes such as making arrests against innocent people based on biased AI advice.[29] Furthermore, literature suggests that there is risk of overreliance of street-level bureaucrats on AI systems,[30] reducing their capacity or incentives to exercise discretion and fairness when assisted by AI technologies during decision-making process.[31] The risk of overreliance on AI technologies reduces human discretionary powers, rendering the work of the street-level bureaucrat to a "computer says no".[32] Thus the importance to provide the necessary funding and training so street-level bureaucrats can adequately understand the ins and outs of technologies and be successful at exercising control over different technologies.[33] Although, yes, it is true that training alone is not the answer to fix the technological challenges in street-level bureaucracies.[34] However, training (as one of the many elements) can assist street-level bureaucrats to understand technologies and be prepared to exercise discretion during decision-making to override a technology that does not contribute to providing better services to citizens.[35] The improper use of technologies can undermine the legitimacy of its implementation in government agencies and therefore undermines government legitimacy in decision-making.[36]

2.4. Moral challenges

Discretion in decision-making

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[25] Kuziemski and Misuraca (n 6) 4.
[26] Oliver Neumann and others, *Exploring artificial intelligence adoption in public organizations: a comparative case study* (Public Management Review, 2022) 5.
[27] Peeters and Widlak (n 10) 177.
[28] Ben Green, *The Flaws of Policies Requiring Human Oversight of Government Algorithms* (Computer Law & Security Review, Volume 45, 105681, 2022) 1, 3.
[29] Madalina Busuioc (n 1) 825; Albert Meijer and Martijn Wessels, *Predictive Policing: Review of Benefits and Drawbacks* (International Journal of Public Administration, 42:12, 1031-1039, 2019) 1035-6.
[30] Grimmelikhuijsen and Meijer (n 2) 8.
[31] Neumann (n 26) 4.
[32] Reuben Binns, *Human Judgement in Algorithmic loops: individual justice and automated decision-making* (Regulation & Governance 16, 197-211, 2022) 200.
[33] Bertelsmann Stiftung, *Automating Society, Taking Stock of Automated Decision-making in the EU* (AW AlgorithmWatch gGmbH, 2019) 14.
[34] Bozeman and Youtie (n 9)161.
[35] Jeanne Gaakeer, *Control, Alt, and/or Delete? Some observations on Technologies and the Human* (Human law and computer law: comparative perspectives, Ius Gentium: Comparative Perspectives on Law and Justice, Springer, 25, 2013)154.
[36] Mireille Hildebrandt, *Algorithmic regulation and the rule of law* (Phil. Trans. R. Soc. A376:20170355, 2018) 3.

Street-level bureaucrats' discretionary powers are compatible with the rule of law, which requires the decision-maker to provide reasons for their decisions and holds the decision-maker to be accountable for those decisions.[37] Discretion in street-level bureaucracies translates in the freedom that the street-level bureaucrat (police officer, or judge, or teacher, etc.) has to decide regarding the "sort, quantity, and quality of sanctions and rewards [applies] when implementing a policy".[38] For instance, teachers use discretion to adapt certain teaching materials to certain students to satisfy their learning needs. Teachers may use discretion in the allocation of time to certain students who need more academic support, thereby providing a fairer or more meaningful policy delivery to people.[39] Police officers exercise discretion over matters that could affect the future livelihood of citizens, for instance whether to open an investigation or not.[40] Social security officers would interact with recipients of social benefits and would decide whether certain citizen would have access to better living conditions.[41] From this point of view, discretion is desirable because it allows a fair balance of strict rules applied on case-by-case basis to avoid tyrannical formalisms.[42] However, discretionary powers vested on street-level bureaucrats should be exercised with responsibility, being aware that their actions or inactions will impact someone's life and society.[43]

Fairness

Fairness requires providing equal and non-discriminatory treatment to all individuals, including to marginalised groups in society.[44] It appears though that the challenge among street-level bureaucracies is that the frontline workers may have their own values and ideas about decision-making, discretion, and delivering justice, which on occasion can be disadvantageous to vulnerable groups. Street-level bureaucrats are required the apply discretion with fairness from a moral (and of course legal) perspective; measuring cases on the merits and considering whether generalising or individualising cases would sum up to the virtue of justice that is 'centrally about fairness [and] closely related to equality'.[45] For this reason, it is important to apply fairness (and transparency) during the decision-making process because provides trust about the outcome,[46] and strengthens the principle of justice in our society.[47]

Values

The values within the organisation in which street-bureaucrats work are important in the delivery of public services and policy ambitions that will impact citizens.[48] Lipsky, emphasises

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[37] Hege Helland, *Reasoning between Rules and Discretion: A Comparative Study of the Normative Platform for Best Interest Decision-Making on Adoption in England and Norway* (International Journal of Law, Policy and The Family, Volume 35, Issue 1, 2021) 1, 3-4.
[38] Lars Tummers and Victor Bekkers, *Policy Implementation, Street-level Bureaucracy, and the Importance of Discretion* (Public Management Review, Volume 16, Issue 4, 527-547, 2014) 529-30.
[39] Ibid 528.
[40] Lipsky (n 10) 2010) 3, 4, 8.
[41] Hasenfeld (n 11) 4.
[42] Reuben Binns (n 32) 199-200.
[43] Riikka Koulu, *Proceduralizing control and discretion: Human oversight in artificial intelligence policy* (Maastricht Journal of European and Comparative Law, Vol. 27(6) 720–735, 2020) 734.
[44] Francien Dechesne and others, *AI & Ethics at the Police: Towards Responsible use of Artificial Intelligence in the Dutch Police* (Leiden University Center for Law and Digital Technologies (eLaw) and TU Delft Institute of Design For Values, Version 1.2, 2019) 16.
[45] Frederick Schauer, *Profiles, Probabilities, and Stereotypes* (Harvard University Press, 2006) 300.
[46] OECD/NEA, *The Societal Aspects of Decision Making in Complex Radiological Situations* (Workshop Proceedings, Villigen, Switzerland, OECD Publishing: 115, 1998) 143.
[47] John Rawls, *A Theory of justice* (Belknap Press of Harvard University Press 1971) 11-13.
[48] Peeters and Widlak (n 10) 180-1.

that street-level bureaucracies' values should be aligned with a client-centric approach; in a way that decisions from street-level bureaucrats must be ultimately motivated by an outcome that will favour the citizen.[49] Street-level bureaucrats' values may be reflected on their own perception of justice and fairness, which would ultimately shape the way for adopting legal and ethical decisions.[50] From a moral perspective, the author argues that street-level bureaucrats and their bureaucracies have a duty to focus on the well-being of their constituents rather than their own internal interests.[51] However, sometimes inevitably street-level bureaucracies are confronted by the dilemma of prioritising between their own interests or adhering to goals of public service.[52] For instance, street-level bureaucrats are often challenged by the pressures of time and overdemand of public services, sometimes the better service they provide the more demand they have. Hence some street-level bureaucrats prefer to provide a mediocre service so the demand for their service is less which could allow the street-level bureaucrat to have more time to manage other tasks.[53] All these challenges and incentives (or disincentives) in street-level bureaucracies would trigger the success (or failure) in the delivery of policy aims.

Accountability

Government accountability in decision-making responds to the heart of the rule of law, which is binding on all government employees from top-level to street-level bureaucrats.[54] For instance, top-level bureaucrats (policy makers, government ministers) are accountable for their decisions whether to grant funding to street-level bureaucracies and how much funding is allowed.[55] The level of funding will determine or will trigger the incentives for street-level bureaucracies to delivery policy aims such as adequately implementing digital technologies and human overseers to better serve their constituents. [56] Similarly, accountability in public service requires street-level bureaucrats not to blindly trust AI systems, rather demands street-level bureaucrats to question AI systems.[57] Although, again, we may be running into circles because to demand street-level bureaucrats' accountability when tasked to work as human overseers, then we need to consider for instance the financial or human resources constrains of their agencies.

In summary, some challenges in street-level bureaucracies are the lack of clarity on the scope of work that street-level bureaucrats do. Thus, providing clear scope when passing new legislation could improve the delivery of policy aims such as protecting citizens from the harms of AI systems. On the other hand, before the implementation of any policy, it is necessary to assess whether the ambitions of new legislation can be executed by street-level bureaucrats and their agencies, and whether they have the required resources and incentives to deliver policy work because they can shape the lives of people.[58] Street-level bureaucrats' commitment and capacity to execute policy is highly important because street-level bureaucrats are the keys to

[49] Michael Lipsky (n 10) 10.
[50] Enarsson (n 7) 128.
[51] Schmid and Almog-Bar (n 20) 100.
[52] Simon Slavin (n 18) 687.
[53] Lipsky (n 10) 38; Tina van der Linden-Smith, *Een duidelijk geval: geautomatiseerde afhandeling* (National Programma Informatietechnologie en Recht, Stu Uitgevers Den Haag, 2001) 14.
[54] Hildebrandt (n 36) 8.
[55] Madalina Busuioc (n 1) 833.
[56] Lipsky (n 10) 4-5; Hildebrandt (n 36) 6.
[57] Kashmir Hill, *Another Arrest, and Jail Time, Due to a Bad Facial Recognition Match* (The New York Times, 2020).
[58] Hasenfeld (n 11) 4.

deliver policy outcomes through their actions when deciding whether or not to recognise or deny rights and benefits to citizens.[59]

III. Legal Basis for Human Oversight in Europe

This section explains the potential risks that AI systems can bring and seeks to ascertain the roots and purpose of human oversight ("the human in the loop") when tasked to control AI systems under European policy.

3.1. Artificial Intelligence (AI) systems

The European Commission has proposed to define AI systems as a software that is developed using machine learning techniques (including deep learning) for a "set of human-defined objectives", which can generate predictions, recommendations, even decisions, capable of shaping the environments they interact with.[60] AI deep learning feeds from data input to learn and produce an output, it is not exactly clear how the machine processed those inputs to produce its outputs (recommendations, suggestions, decisions).[61] The different layers involving deep learning are inscrutable,[62] which makes it almost impossible for human decision-makers to comprehend the features of the systems that produce outcomes.[63]

The Ministry of Justice from the Dutch government is exploring ways in which AI systems can be implemented in their organisation.[64] Similarly, the Dutch police force is piloting the use of the Crime Anticipation System (CAS), a predictive policing AI system introduced in 2013 to predict when and where crime is likely to occur in cities such as The Hague and Amsterdam.[65] It is alleged that the CAS utilises a variety of data such as 'historic crime rates, data from Statistics Netherlands, and information about recidivists (e.g. dates of birth and addresses), after which the likelihood of these crimes occurring is indicated in the form of a heat map.'[66] These predictive policing AI systems have an imminent risk that the inbuilt and training data of these systems can have data that is out of date, irrelevant, biased, inaccurate, and negatively discriminatory data.[67] All these factors pose a serious risk to the development and deployment of predictive policing AI systems. For instance, in the United States of America (USA), there have been three reported cases of innocent people of colour being unlawfully arrested and detained for several days due to AI systems' failure to properly recognise people's faces and police officers' relying on the outcome of those AI tools.[68] The consequences of these events are that risk people's freedoms

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[59] Lipsky (n 10) 6.
[60] EU AI proposal (n 4) Art. 3 and Annex I.
[61] Terry Carney, *Artificial Intelligence In Welfare: Striking The Vulnerability Balance?* (Monash University Law Review , Vol. 46, Issue 2, 2020) 3.
[62] Busuioc (n 1) 828-9.
[63] Ibid 830.
[64] Gijs van Til and Bertelsmann Stiftung, *Automating Society, Taking Stock of Automated Decision-making in the EU* (AW AlgorithmWatch gGmbH, 2019) 96.
[65] Oscar Gstrein and others, *Ethical, Legal and Social Challenges of Predictive Policing* (Católica Law Review, 3(3), 77-98, 2019) 79, 84.
[66] Van Til and Stiftung (n 64) 100.
[67] Gstrein (n 65) 8.
[68] Gloria Gonzalez Fuster, *Artificial Intelligence and Law Enforcement Impact on Fundamental Rights* (Policy Department for Citizen's Rights and Constitutional Affairs, European Parliament, 2020) 25; Victoria

and brings to them unwanted legal costs. Additionally, AI technologies may lead street-level bureaucrats to behave as plain enforcers reducing their capacity to apply meaningful decision-making.[69] Considering these precedents of unreliable AI systems, in the supposed scenario that predictive policing AI systems are permanently deployed in the Netherlands, they pose a risk to incorrectly predict crime and harming people's civil rights. For instance, Article 27 of the *Wetboek van Strafvordering* (Code of Criminal Procedure) requires that before initiating criminal proceedings, a person should be regarded as a suspect. However, inaccurate and unreliable AI systems' outcomes in police work in the Netherlands could potentially undermine Article 27 because the AI system would lead to self-fulfilling prophecies such as treating innocent people as criminals, increasing criminality rates and leading to more unfairness.[70] Additionally, alike the unlawful arrest in USA jurisdiction, the possibility of AI overreliance by police officers (street-level bureaucrats) would undermine Article 27 because they may proceed to arrests without providing or seeking any further explanations as to how or why a certain individual is a suspect subject to arrest.[71] The unjustified use of AI systems by street-level bureaucrats to prevent or deter crime would violate the principles of justice, fairness, and discretion in decision-making to assess each matter based on their merits.[72] Overall, the unfair and unjustified usage of AI systems against citizens not only harms the individual who may be innocent, it also harms our democracy and the rule of law.[73]

Another example of the risk of AI systems in government is its deployment in social security services to target fraud. AI systems used in social services can negatively affect people because these AI systems precisely target the one who is in most need of assistance.[74] The deployment of AI systems in social services is a paradox because governments and street-level bureaucracies, in theory, are there to provide protection to vulnerable citizens. However, the unjustified and even unlawful use of these AI systems in social security have demonstrated that instead of assisting the most vulnerable, they have caused detriment to the most vulnerable.[75] For example, the *Systeem Risico Indicatie* (SyRI) that was implemented by the Dutch government in 2014 with the purpose to profile citizens who were suspected of committing welfare fraud,[76] turned out to be a failure. Under a court order, the Dutch government had to discontinue the deployment of SyRI because the AI system was not transparent nor was the government willing to disclose the inner workings of the system.[77] The SyRI case demonstrates the importance of the overall concept of accountability that lays on public servants when deploying AI systems and reveals the importance of understanding the limitations and capabilities of AI systems.

The above two cases allow us to reflect on how important is to call decision-makers (top-level and street-level bureaucrats) to account to provide reasons to the people being subjected to

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Burton-Harris and Phillip Mayor, *Wrongfully Arrested Because Face Recognition Can't Tell Black People Apart* (American Civil Liberties Union (ACLU), 2020).

[69] Peeters and Widlak (n 10) 181-2.

[70] Busuioc (n 1) 826.

[71] See above at 2.3 'Street-level bureaucrats and technologies'.

[72] Dechesne (n 44) 16.

[73] Gstrein (n 65) 11-12.

[74] Carney (n 61) 4.

[75] Marvin van Bekkum and Frederik Zuiderveen Borgesius, *Digital Welfare Fraud Detection and the Dutch SyRI Judgment* (*European Journal of Social Security* 23, No. 4, 2017) 336-7.

[76] Tijmen Wisman, *The SyRI Victory: Holding Profiling Practices to Account* (Digital Freedom Fund, 2020); *NJCM and others. v The Dutch State* (2020) The Hague District Court ECLI: NL: RBDHA:2020:1878 (SyRI), [4.17].

[77] *NJCM and others v The Dutch State* (2020) (n 76) [6.5-7], [6.27], [6.32-33], [6.41].

these AI systems, even when it is inconvenient to the one in a position of power.[78] As the deployment of AI systems is set to increase in the Netherlands, academics and the civil society need to be alert about the pitfalls and ethics of the use of AI systems in government and call both top-level and street-level bureaucrats to account.[79]

3.2. A human-centric approach

The expert group appointed by the European Commission and many other academics have pressed for adopting AI systems from a human-centric approach perspective. This human-centric approach requires implementing AI systems in a safe and reliable way to benefit humanity, proposing that the human being is at the centre and that the development of AI systems should be at the service of humanity, responding to the needs and satisfaction of humans.[80] It follows that AI systems should have regard for fundamental rights found in Treaties of the European Union and Charter of Fundamental Rights of the European Union, which fundamentally seek to safeguard human dignity.[81] This human-centric approach also entails respect for key principles of accountability, explainability, fairness, professional responsibility, and promoting human values within organisations.[82] The human-centric approach supports the human oversight principle to control the impact of algorithmic decisions or recommendations,[83] stipulating that human control must be meaningful.[84] Thus, it can be said that, following a human-centric approach, human oversight should act as a safeguard or quality control to protect citizens from AI systems' malfunctions.[85]

3.3. The standard of meaningful human oversight in Europe

There is no clear guidance about the standard of meaningful human oversight under EU policy,[86] perhaps the closest measurement to ascertain a standard on meaningful human oversight can be found in the guidelines by the *Article 29 Data Protection Working Party*; where it emphasises that quality is a key element during the human control process so the decision-making process can be regarded as meaningful and not just a token of gesture.[87] Furthermore, Article 22 of the GDPR hints at human oversight as a safeguard against wicked AI systems, [88] stating that decisions cannot be the sole result of automated systems.[89] Although Article 22 of the GDPR and the guidelines of the *Article 29 Data Protection Working Party* are not straightforward in providing a clear-cut guidance as to the requirements of human oversight, at first glance, it can be inferred that meaningful human oversight requires at least some quality of human

[78] Carney (n 61) 6.
[79] Van Til and Stiftung (n 64) 94.
[80] High-Level Expert Group on AI (AI HLEG) (Ethics Guidelines for Trustworthy Artificial Intelligence, European Commission 2019) 4.
[81] Ibid 37.
[82] Shneiderman (n 13) 3.
[83] Binns (n 32) 197.
[84] Ibid 2.
[85] Enarsson (n 7) 124; Green (n 28) 2.
[86] Koulu (n 43) 735.
[87] Article 29 *Data Protection Working Party* (*Guidelines on Automated individual decision-making Profiling for the purposes of Regulation* 2016/679, European Commission, 2018) 21.
[88] Green (n 28) 5.
[89] General Data Protection Regulation (GDPR), Art. 22(1).

involvement.[90] For instance, this means that to effectively protect people's rights, humans in the loop are required to avoid acting as a rubber stamp.[91] Rather, humans in the loop are called to provide effective safeguard measures against AI systems' negative outcomes.[92]

Autonomy and competence

Meaningful human oversight means that the human in the loop should have autonomy or authority to override or interrupt the AI system when required to do so;[93] and should also have the competence (the skill) to exercise human judgment when interacting with AI systems.[94] Thus, if the human in the loop is granted the authority to override the AI system, then the human in the loop should also have the competence to question the AI system and decide whether the system's recommendations or decisions are acceptable or not.[95] Competence requires having the knowledge and qualifications to fruitfully perform human oversight.[96] It would require a comprehensive understanding of how AI systems operate, how they are built through algorithms and how they produce outcomes, so the human in the loop can be aware of the possible flaws of AI. One may suggest that requiring competence, as a quality feature of meaningful human oversight, would enrich the human-centric approach that seeks to uphold respect for human dignity and fundamental rights.[97]

Discretion and fairness

Quality of meaningful human oversight requires having no dependency or relying on algorithms during the decision-making process, rather it requires approaching algorithmic information on a discretionary basis as a guiding tool to provide better results (services) to citizens.[98] Logically, discretion must be applied when the merits of the case requires it, aiming for a fair outcome.[99] We argue that applying discretion and fairness can support the very core of a human-centric approach because it can protect vulnerable people who may be exposed to the negative effects of AI systems.[100] When tasked with human oversight, street-level bureaucrats should aim to avoid the idiosyncrasies of street-level bureaucracies and opt to duly apply discretion and fairness in the decision-making process.[101] Human overseers have an opportunity to apply creative judgement with responsibility so as to arrive to the most desirable outcome to minimise the potential risks of AI systems and benefit their fellow humans.[102] At this point, it worth acknowledging that there are some critiques and resistance to human decision-making and discretion, arguing that human discretion to intervene in AI systems is

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[90] Green (n 28) 6- 8.
[91] Ben Wagner, *Liable, but Not in Control? Ensuring Meaningful Human Agency in Automated Decision-Making Systems* (Policy and Internet, Vol. 11, 104-122, 2019) 115, 118.
[92] Green (n 28) 1.
[93] Article 29 Data Protection Working Party (n 87); Ben Shneiderman, *Human-Centered Artificial Intelligence: Reliable, Safe & Trustworthy* (International Journal of Human–Computer Interaction, 36:6, 495-504, 2020) 502.
[94] Peeters and Widlak (n 10)178.
[95] Jannik Rosemeyer and others, *Towards artificial intelligence in production: A competence profile for shop floor managers* (Proceedings of the 12th Conference on Learning Factories, 2022) 4.
[96] Ibid 2.
[97] Green (n 28) 8-9.
[98] Ibid 6-7.
[99] Binns (n 32) 207.
[100] Hildebrandt (n 36) 7.
[101] David Engstrom and others, *Algorithmic Accountability in the Administrative State* (Yale Journal on Regulation, Vol. 37: 800, 2020) 820-1.
[102] Ben Shneiderman (n 93) 118.

considered costly, ineffective, and prone to error, leading to arbitrariness and unfair treatment[103] However, AI systems are equally prone to error, bias, and sometimes produce undesirable or harmful outcomes.[104] For instance, studies have shown that algorithms are not as accurate as hoped, rather they are full of errors and usually show prejudice against women and vulnerable groups.[105] Undoubtedly, both human or machine decision-making are prone to error. However, the difference is that most humans have the capacity to understand and process human emotions, whilst AI machines have not achieved this level (yet), therefore, unable to apply discretion and fairness where needed.[106]

Concluding this section, we submit that the risks of inaccurate AI systems and lack of meaningful human intervention can cause serious harm to citizens' fundamental rights.

IV. Exploring Article 14: street-level bureaucracies' challenges

This section attempts to test Article 14 of the EU AI proposal against those street-level bureaucracies challenges identified above such as lack of scope or lack of financial resources to have the best human overseers at the service of the public.

4.1. The scope of Article 14: human oversight obligations

The EU AI proposal considers the legal and ethical issues concerning the implementation of AI systems. [107] For instance, Article 14(2) of the EU AI establishes that the aim of human oversight is to prevent or minimise risks of high-risk AI systems infringing fundamental rights. It can be inferred that the principle behind human oversight is to support a human-centric approach to provide safeguards against the risks of AI systems.[108] However, the proposal does not provide clear guidelines on responsibility of human overseers or what constitutes meaningful human oversight under the AI Act proposal, which arguably undermines a human-centric approach.[109] Primarily, the introduction of Article 14 of EU AI proposal, is set to govern the design and manufacturing of high-risk AI systems, seeking to regulate high-risk AI technologies such as predictive policing AI systems used in the police force, or fraud detection systems used in social security services, or predictive justice systems used in judicial matters.[110] Article 14 does not consider at what stage a person affected by the high-risk AI system would have the right to request assistance of the human in the loop.[111] Would human oversight start at the own initiative of the human overseer or at the request of the person being affected by the AI system?

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[103] Enarsson (n 7) 128.
[104] Hildebrandt (n 36) 3.
[105] Ben Green (n 28) 3-4.
[106] So Yeop Yoo and OkRan Jeong, Yoo, *EP-bot: Empathetic chatbot using auto-growing knowledge graph* (Computers, Materials, & Continua, 67(3), 2807-2817, 2021) 2808.
[107] Martin Ebers and others, *The European Commission's Proposal for an Artificial Intelligence Act—A Critical Assessment by Members of the Robotics and AI Law Society (RAILS)* (J 4, 589-603, 2021) 589.
[108] Sebastian Felix Schwemer and others, *Legal AI Systems in the EU's proposed Artificial Intelligence Act* (Proceedings of the Second International Workshop on AI and Intelligent Assistance for Legal Professionals in the Digital Workplace (LegalAIIA 2021) (pp. 51-58). CEUR Workshop Proceedings Vol. 2880, 2021) 8.
[109] Ines de Matos Pinto, *The Draft AI Act: a success story of strengthening Parliament's right to legislative initiative?* (ERA Forum, 22: 619-641, 2021) 635.
[110] Ibid 631.
[111] Martin Ebers (n 107) 596-7.

In short, when is the human in the loop required to act to protect citizens from the different risks of AI systems? In this sense, introducing human oversight as part of new legislation, to provide safeguards against the negative effects of AI systems, without properly measuring how effective the new initiative could be, is comparable as enacting legislation for the sake of allowing a rubber stamp to justify compliance.[112] The way human oversight is currently drafted under Article 14 does not provide appropriate safeguards to prompt human overseers (the human in the loop) to act in preventing or to remedy the possible harms caused by AI systems. Thus, if human intervention is a key element to safeguard people's rights,[113] then the proposal could perhaps take a more active approach to explicitly define the responsibilities of the human in the loop when tasked to oversee high-risk AI systems.

As currently drafted, Article 14(1) of the EU AI proposal would require AI designers to allow human control or human interference with the AI system, with the aim to achieve effective human oversight.[114] It can be inferred that the primary purpose of Article 14(1) is compelling high-risk AI designers to integrate in their products a human control function as part of a safeguard against the malfunctions of AI.[115] Thus, human oversight obligations is ambiguous in the sense that Article 14 could create a legal loophole to justify the shifting of responsibilities (and accountability) from one party (users of AI systems such as street-level bureaucrats working as human overseers) to another (designers of AI systems); creating more legal challenges and chaos because human overseers could argue that Article 14 is not intended to regulate them.[116]

Human oversight obligations can be ambiguous in the sense that human oversight can be seen as the obligation of human overseers to do something when interacting with AI systems; whilst human oversight can also be interpreted as the obligation on the designer of AI systems to include in the design tools that will allow human intervention. Perhaps, Article 14(3)(a) would allow us to argue that the core aim of Article 14 is to regulate human oversight obligations of designers of high-risk AI systems, to require them to include human oversight as a safety tool before putting their products into the market.[117] Thus, it seems to be the case that the core of Article 14 does not intend to regulate human oversight obligations of human overseers working as humans in the loop. Although the author is conscious of a counterargument outlining that Article 14(3)(b) could be interpreted in such a way that the intention of the legislator is to create responsibilities for both users of high-risk AI systems (for example street-level bureaucrats) and providers of high-risk AI systems.[118] Recital 48 of the EU AI proposal supports a certain burden of responsibility on the human in the loop by requiring them to have the necessary "competence, training and authority to carry out the role".[119] We argue, however, that the current drafting of the proposal does not explicitly impose a concrete level of responsibility on the human in the loop in relation to their role as overseers.[120] It would be useful if the proposal could incorporate a set of responsibilities or define responsibilities of human oversight in relation to human overseers (the human in the loop) in order to address accountability of the

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[112] Green (n 28) 7.
[113] Article 29 Data Protection Working Party (n 87) 27.
[114] EU AI proposal (n 4) Art. 14(1).
[115] Schwemer (n 108) 8.
[116] Green (n 28) 9.
[117] De Matos Pinto (n 109) 637.
[118] Ibid 631.
[119] EU AI proposal (n 4) Recital 48.
[120] Michael Veale and Frederik Zuiderveen Borgesius, *Demystifying the Draft EU Artificial Intelligence Act — Analysing the good, the bad, and the unclear elements of the proposed approach* (Computer Law Review International, (4) 97-112, 2021) 104.

human in the loop and support a human-centric approach.[121] This measure could also add a level of legal certainty and would create human responsibility for all actors involved in the deployment of AI systems.[122]

In summary, Article 14 of the proposal appears to implement rigid human oversight obligations in relation to designers or developers of high-risk AI systems.[123] However, the proposal currently has limitations regulating the scope of responsibilities of human overseers controlling high-risk AI systems.[124] Hence, the lack on the scope of work, as discussed in 2.1 'Street-level bureaucrats' scope of work', would be the first challenge that Article 14 would encounter in street-level bureaucracies. We recommend that the Commission draft a specific section outlining or setting out standards for the work of meaningful human control to clearly ascertain responsibilities of human overseers. Establishing norms is necessary so public servants can be bound by those norms when exercising decision-making (for example, requiring the human in the loop to provide reasons as to why they followed or did not follow the suggestions of AI systems).[125] Adding concrete responsibilities and standards for meaningful human oversight can also strengthen the principles of government accountability starting from the street-level bureaucrat to the top-level bureaucrat.

4.2. *Other challenges:*

Understanding AI

Arguably, Article 14(4) sets out some requirements or standards regarding meaningful human oversight undertaken by human overseers such as requiring human overseers to fully understand high-risk AI systems.[126] However, as discussed above in 2.3 'Street-level bureaucrats and technologies', understanding AI systems could be a daunting task for some humans because it requires certain skill and training that even algorithmic developers would struggle to fully scrutinise the capabilities or limitations of AI systems.[127] If the most skilled professionals in AI would struggle to understand algorithmic behaviour, street-level bureaucrats would also struggle to fully understand high-risk AI system's outputs. Accordingly, the lack of understanding AI technologies' complexities would be a second challenge that Article 14 would encounter in street-level bureaucracies. This issue is critical because the deployment of AI technologies should overall be used to serve constituents.[128]

Training

Without practical training, it is unlikely that the human in the loop would be able to have the understanding or competence to undertake AI human oversight tasks.[129] As discussed in 2.2. 'Resources', the lack of sufficient resources to obtain adequate training for street-level

[121] Grimmelikhuijsen and Meijer (n 2) 7; Maranke Wieringa, *What to account for when accounting for algorithms: A systematic literature review on algorithmic accountability* (In Conference on Fairness, Accountability, and Transparency (FAT* '20), ACM, 2020) 2.
[122] Shneiderman (n 93) 497.
[123] W. Gregory Voss, *AI Act: The European Union's Proposed Framework Regulation For Artificial Intelligence Governance* (Journal of Internet Law, 25(4), 8-17, Aspen Publishers, 2021) 15.
[124] De Matos Pinto (n 109) 640.
[125] Mireille Hildebrandt (n 36) 6.
[126] EU AI proposal (n 4) Art.14(4)(a).
[127] Phillip Hacker, *Teaching fairness to artificial intelligence: Existing and novel strategies against algorithmic discrimination under EU law* (Common Market Law Review, 55(4): 1143-1185, 2018) 1155.
[128] Neumann (n 26) 4.
[129] Rosemeyer (n 95) 1.

bureaucrats' to understand the capabilities and limitations of high-risk AI systems would influence the success of Article 14.[130] Providing adequate training to street-level bureaucrats would allow them to at least acquire awareness about the limitations of AI systems and will contribute to having competent human overseers when interacting with AI systems.[131] The use of AI systems in government requires street-level bureaucrats to assess the validity of the algorithmic assumptions, the input data, or how the AI system interacts with the real world.[132] Shneiderman provides an example that even IBM or Microsoft conduct regular well-designed training to foresee and be prepared for emergencies when dealing with AI systems which has reduced unwanted outcomes.[133] Thus, on the other hand, it would be frightening to have "quality control" overseers that do not possess specific training or competence to understand high-risk AI systems. [134] Consequently, the lack of adequate training would be a third challenge that Article 14 would encounter in street-level bureaucracies. However, not everything has to be discouraging, considering the earlier discussion about the financial constraints in public service, the minimum we can look forward is to promote adequate AI training of leaders or managers from public organisations so they could disseminate what they have learnt about high-risk AI systems to their colleagues.[135] Training street-level bureaucrats in understanding AI systems' capabilities and limitations can provide the adequate staff to intervene where required, bringing hope for citizens to receive a fairer service from the government agencies.[136]

Financial resources

From the exposed above, it follows that obtaining adequate staff and training them to oversee high-risk systems would require government expenditure. Therefore, having a qualified human in the loop would require budgetary resources, having two humans in the loop, as per Article 14(5), would even increase the financial pressures on street-level bureaucracies. For instance, who is going to cover training costs of human overseers: the users (street-level bureaucracies) or the providers of AI systems? It is estimated that to implement one high-risk AI system that is compliant with the EU AI proposal the costs are expected to be around €400,000.[137] One may question whether is it achievable to incorporate meaningful human oversight in public administration? Would the government be ready to increase wages and expenditure to incentivise meaningful human oversight among street-level bureaucracies?[138] Clearly, it depends on the political will of top-level bureaucrats to make available these budgets so we can empower street-level bureaucrats to "live up to the task."[139] On the other hand, in the search for the most efficient way to provide meaningful human oversight, it would also depend on the ability of managers and leaders from street-level bureaucracies to wisely allocate budgets and resources to promote meaningful human oversight.[140] Overall, we believe that financial resources would be a fourth challenge that Article 14 would encounter in street-level bureaucracies.

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[130] Hildebrandt (n 36) 2.
[131] Rosemeyer (n 95) 4.
[132] Busuioc (n 1) 830-1.
[133] Shneiderman (n 13) 12.
[134] Gstrein (n 65) 9.
[135] Rosemeyer (n 95) 1, 4.
[136] Lipsky (n 10)12.
[137] Benjamin Mueller, *How much will the Artificial Intelligence Act Cost Europe?* (Center for Data Innovation, 2021) 8.
[138] Benjamin Mueller, *Comments to the European Commission on the Proposed Artificial Intelligence Act* (Center for Data Innovation, 2021) 4.
[139] Bertelsmann Stiftung (n 33) 15.
[140] Neumann (n 26) 18-9.

Overreliance and real autonomy

According to studies, less than "1 in 100 decisions made by the algorithm have been questioned by the responsible clerks."[141] Based on this information, we argue that street-level bureaucrats in many instances would be unable to provide reliable human oversight because they would intentionally or unintentionally rely on algorithmic suggestions.[142] It is noted that Article 14(4)(d) and (e) empower the human in the loop to have autonomy in decision-making when it comes to intervene whether to disregard, override, stop, interrupt, or reverse the output of high-risk AI systems. However, the application of meaningful decision-making to intervene against the malfunctions of AI systems would depend on the willingness and constraints that street-level bureaucrats are often exposed to.[143] Thus, achieving the aims of Article 14(4)(d) and (e) would significantly depend on the incentives provided to street-level bureaucrats working as human overseers to safeguard people's fundamental rights.[144] Possibly, an attempt to avoid overreliance may be the drafting of Article 14(5) to require those users of AI systems (such as street-level bureaucracies) to have two natural persons to verify and confirm the work of AI systems in cases of biometric identification or categorisation of natural persons in 'real time'.[145] The idea of having more than one natural person questioning the AI system is healthy to our democracy. The European Commission could broaden this approach and request perhaps a group of specialised humans in the loop to question all high-risk AI systems. The work of an oversight body or ombudsperson to supervise the work of human overseers could result in agency oversight, promoting a more rigorous approach to human oversight responsibilities within street-level bureaucracies. Arguably, a more feasible initiative in street-level bureaucracies could be to implement specific teams, managers, or directors from their organisations to have meetings with their staff; assess their work and hear outcomes or feedback in relation exercising meaningful human oversight over high-risk AI systems. This measure may contribute to support human oversight policy aims from a human-centric approach.[146] The risk of overreliance and real autonomy in street-level bureaucracies are set to challenge the success of Article 14.

Finally, we suspect that Article 14 would also be challenged by those moral challenges of street level bureaucracies such as moving away from overreliance and opting for independent decision-making measured by discretion, fairness, and transparency. The author ventures to outline that an introspective redesign of government agencies to shape in a positive way the roles and standards of meaningful human oversight would strengthen government legitimacy when deploying AI systems.[147] This change of attitude concerning their interactions with AI systems, requires managerial street-level bureaucrats to commit in leading their organisations towards a culture of values and safety in order to deliver better services to the public they serve.[148] It requires leaders from street-level bureaucracies to search for the most appropriate staff who would share the same values for providing safe algorithmic deployment in government organisations.[149] This redesign approach has enormous potential to improve government

[141] Kuziemski and Misuraca (n 6) 8.
[142] Green (n 28) 7, 8.
[143] Binns (n 32) 204.
[144] Boriss Cilevics, *Justice by algorithm – the role of artificial intelligence in policing and criminal justice systems* (Council of Europe, Doc. 15156 Report, 2020) 9.
[145] EU AI proposal (n 4) 1(a) Annex III.
[146] Shneiderman (n 13) 11, 16.
[147] Grimmelikhuijsen and Meijer (n 2) 8.
[148] Shneiderman (n 13) 11.
[149] Shneiderman (n 93) 120.

services when using AI systems, it could improve the interactions between street-level bureaucrats and citizens.[150]

To summarise many street-level bureaucracies' constraints would challenge the fulfilment of Article 14. Primarily, adequate scope of work and suitable financial resources would significantly determine the success of human oversight as a human-centric approach safeguard. Without healthy and reliable budgets, we cannot aspire at having competent and well-trained human overseers to control AI systems in public administration.[151] Thus, human oversight, particularly in street-level bureaucracies, requires a more holistic and amplified analysis of the foreseeability of applying this policy in the public service.[152]

Final conclusions

Article 14 of the EU AI Act needs to be more specific to ascertain the scope of responsibilities of human overseers (in this research the street-level bureaucrats) in relation to the tasks of meaningful human oversight. This supports the approach of having humanity's interest always at the centre when deploying AI systems. Other challenges in street-level bureaucracies such as resources (staff, funding, time, among others) would trigger the incentives of street-level bureaucrats to deliver public policy (for instance, applying meaningful human oversight to prevent AI systems' malfunctions). Understanding technologies such as AI systems in street-level bureaucrats is a challenge that the government must attend to avoid AI overreliance of street-level bureaucrats. We have emphasised that exercising meaningful human oversight to combat the imperfections of AI systems includes undertaking decision-making being accompanied by discretion and fairness based on the merits of the case. Achieving this standard of meaningful human oversight can bring a balance between citizen's freedom and government control, providing legal certainty and accountability, which are the basis of a democratic society that is bound by the rule of law. If the government is interested in having more competent street-level bureaucrats working as human overseers, it is necessary to deploy financial resources to obtain the right training and hire the most adequate people. AI deployment in government should be used to assist in the delivery of quality government services to benefit citizens.[153] AI systems should not be used in an illegal or harmful way because it diminishes the very core of the rule of law.[154]

[150] Grimmelikhuijsen and Meijer (n 2) 9.
[151] Neumann (n 26) 5.
[152] Enarsson (n 7) 149-50.
[153] Neumann (n 26) 1.
[154] De Matos Pinto (n 109) 621.