Ensuring the ethical development and use of AI in local governance

Dirk J. Brand[1]

Stellenbosch University
Dirkjbrand1@gmail.com

Abstract: The rapid development and use of digital technology, including artificial intelligence (AI), have a significant impact on society in general, but specifically also on the public sector. In this data driven digital era the use of AI in government has become a crucial tool to help shape the future of public governance. Automated decision-making or algorithmic decision-making enables more informed and evidence-based decision-making in government. The variety of applications of AI is growing rapidly and spans all functional areas of government. AI based technologies create opportunities to transform the way in which local governments deliver municipal services. Also, in other spheres of government it enhances efficiency, and proactive and responsive decision-making to the benefit of citizens. It has huge potential and offers many benefits, but also includes many risks. This requires a responsible approach that will include mechanisms for safeguarding fundamental rights, inclusivity and a process of constant participation with citizens, and ensuring that the performance of AI systems is proportionate, supervised and reasoned. Responsible AI based on a set of key principles such as accountability, explainability and respect for privacy and other human rights should be the foundation for the use of AI in public governance. Various policy and legislative initiatives around the world aim to create clear, workable frameworks for the development and use of responsible AI. An example is the AI Act in the European Union which was approved by the European Parliament in June 2023, and which follows a risk-based approach that acknowledges the protection of human rights in the development and use of AI. Various local and regional policy and legal developments to support responsible AI at sub-national level are also in process. How can AI be used to improve public governance? What safeguards should be put in place to ensure ethical and responsible AI and the protection of human rights? How can AI be used to co-create public services? In presenting the paper, these critical questions will be considered. This paper explores the development of responsible and ethical AI policies and initiatives in public governance, with a specific focus on AI in cities. It discusses key initiatives such as the establishment of an algorithmic register in Amsterdam and Barcelona, as well as specific AI applications that enhances service delivery. It will conclude with some recommendations for building blocks in ensuring responsible AI in public governance in local government.

Keywords: ethical AI, local government, algorithm register, AI governance

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[1] BComm LLB LLM LLD, https://www.linkedin.com/in/dirkbrand/

1. Introduction

Local government, being the closest form of government to the citizens, is generally responsible for the provision of a menu of basic services such as water, electricity, and waste removal. The spectrum of services differs from one country to another. Interaction with citizens can take various forms, ranging from public meetings to interactive websites and provision of digital services, such as e-billing and online issuing of licenses and permits. In some countries there is a specific focus or legal mandate to promote citizen engagement or public participation. In South Africa, for example, the Constitution includes public participation as one of the objects of local government (Constitution, sec. 152).

Increasing urbanisation is a global phenomenon, which confirms the need for social and technological innovation in urban environments. Modernisation in local government implies some degree of digitalisation with the aim of strengthening efficient, economic and effective public governance, which is important in the administration as well as in the delivery of services.

Modern technology enables cities to collect and use data in various ways to support their service delivery and to develop an open and collaborative working culture in which citizens are active participants. The increasing use of AI in cities is transforming urban environments and has the potential to address many challenges cities currently face. The use of AI could enhance efficiency in the administration for example by using AI systems to strengthen evidence-based decision making. It could also be applied directly in the context of delivery of services, e.g. smart parking systems advising where the closest open parking spot in a city is, predictive planning in disaster management, and improved urban planning by utilising a combination of data bases and AI systems that include location (digital maps), mobility data, and public health data. These are only some examples of the application of AI in cities, but there are already many more use cases, and it is expected that innovation will lead to more useful applications of AI to the benefit of citizens.

While a variety of modern technology such as Internet of Things (IoT), digital twins, robotics and blockchain are relevant in the development of smart cities, this article only focuses on the use of AI. Burgess distinguished three types of algorithms based on how they are used, which helps to understand how AI could be optimised in cities, namely:

a. Capturing information (e.g. through image and speech recognition);
b. Determining what is happening (e.g. natural language processing, prediction); and

c. Understanding why it is happening (analysing and interpreting data) (Burgess, 2018).

The rapid development and use of digital technology, including artificial intelligence (AI), have a significant impact on society in general, but specifically also on the public sector. In this data driven digital era the use of AI in government has become a crucial tool to help shape the future of public governance. There are various definitions of AI, such as the definition in the EU AI Act:

> "a machine-based system that is designed to operate with varying levels of autonomy and that can, for explicit or implicit objectives, generate outputs such as prediction, recommendations, or decisions that influence physical or virtual environments" (Art.3)

Automated decision-making or algorithmic decision-making enables more informed and evidence-based decision-making in government. In the context of local government, it includes the use of AI-based systems that sort and analyse data that supports decision-making by officials. It has huge potential and offers many benefits, but also includes many risks such as a negative impact on people's human rights due to its socio-technical character (Leslie et al, 2021). This requires a responsible approach that will include mechanisms for safeguarding fundamental rights, inclusivity and a process of constant participation with citizens, and ensuring that the performance of AI systems is proportionate, supervised and reasoned.

The importance of a human rights-based approach to the use of digital technology in local government was confirmed in a report by UN Habitat:

> "When a municipality or city fails to safeguard human rights in digital environments, what is at stake is the unequal treatment of residents. In such cases, some residents may be - even if unintentionally -, disadvantaged by digital systems, resulting in unfair access to services, unjust decision-making, or unwanted surveillance" (Serale et al, 2023).

Responsible AI based on a set of key principles such as accountability, explainability and respect for privacy and other human rights should be the foundation for the use of AI in public governance. Various policy and legislative initiatives around the world aim to create clear, workable frameworks for the development and use of responsible AI. An example is the AI Act in the European Union which was approved by the European Parliament in June 2023 (European Parliament, 2023), and which follows a risk-based approach that acknowledges the protection of human rights in the development and use of AI. In addition to these international or multi-national ini-

tiatives, there are also various local policy and legal developments to support responsible AI at sub-national level in different parts of the world.

How can AI be used to improve public governance? What safeguards should be put in place to ensure ethical and responsible AI? What AI governance mechanisms could be developed by cities? In presenting the paper, these critical questions are considered. This paper explores the development of responsible and ethical AI policies and initiatives in public governance, with a specific focus on AI in cities. It discusses key initiatives such as the establishment of an algorithmic register in Amsterdam and Barcelona, as well as specific AI applications that enhances service delivery. It will conclude with some recommendations for building blocks in ensuring responsible AI in public governance in local government.

2. AI initiatives in urban environments

From global to local

At a global level two key initiatives are worth noting, namely the development of an AI Convention by the Council of Europe (Council of Europe, 2023) and the UNESCO Recommendation on the Ethics of Artificial Intelligence (UNESCO, 2022). Both these policy frameworks follow a principled approach recognising the protection of human rights, and both set international standards. The AI Convention is still work in progress but will be open for adoption not only by member states of the Council of Europe, but also by any other state, thus creating a significant international impact. It is based on principles such as human dignity, non-discrimination, and transparency (Leslie et al, 2021). The UNESCO Recommendation is a broad policy framework that could be used by any country. UNESCO proposes the following key principles for ethical AI:

- Proportionality and do no harm.
- Fairness and non-discrimination
- Safety and security
- Sustainability
- Right to privacy and data protection
- Human oversight and determination
- Transparency and explainability
- Responsibility and accountability
- Awareness and literacy
- Multi-stakeholder and adaptive governance and collaboration

While these initiatives are aimed at creating common international standards that would form the basis of national policy and legal frameworks on AI, it does not determine what needs to be done in cities to regulate the use of AI. There are, however, other initiatives that provide specific guidance to cities, as presented here below.

The Paris based think-tank, Urban AI, which focuses on the practical implementation of AI in cities around the world, published the Urban AI Guide, which aims to provide guidelines to cities about the development of policy and legal frameworks for the responsible use of AI in urban environments (Popelka et al, 2023). It specifically views the elements of an AI system in an urban context, which could form the basis of innovation in cities. This report defines 'urban AI' as

> "any system that incorporates data derived from the urban environment, which is then processed by algorithms, the result of which has useful applications in the socio-spatial nexus of the city".

The particular nature of urban environments includes a diversity of sectors and stakeholders in a multi-layered and complex system. In view of the focus on citizens in the delivery of services, citizens would also be in focus in the development and use of urban AI. Popelka et al. rightly argue that urban AI should be the result of co-production, utilising data produced in the city and applying AI to improve service delivery and increase efficiency in local governance (Popelka, et al, 2023).

Fjeld et al described eight key principles, similar to those included in various international AI policy documents, that should be applied in developing and using urban AI, namely:

- Privacy
- Accountability
- Safety and security
- Transparency and explainability
- Fairness and non-discrimination
- Human control of technology
- Professional responsibility, and
- The promotion of human values (Fjeld, et al, 2020).

These principles are designed to ensure a human-centred approach that includes specific safeguards to protect human rights. A useful practical way to support responsible AI in cities is data visualisation, which provides an important communication tool with citizens, and contributes to transparency. It also creates an opportunity for citizens to engage with the data and to contribute to further development and use of AI.

In its publication 'Mainstreaming human rights in the digital transformation of cities' the UN Habitat emphasizes the importance of embedding human rights related to digital spaces in the core values of a city to guide the development and use of digital technology (not only AI) in the city (Nonose & Jansen, 2022). It confirmed the following foundational values, namely:

- Freedom and autonomy
- Privacy, safety, security and protection
- Community participation and public engagement
- Transparency and accountability
- Openness.

It is evident that there is a great deal of common ground between the various international AI and digital policy initiatives, which cities could use in charting their own course in ensuring the ethical and responsible use of AI. While international and national AI policy frameworks are important, they are high level instruments not specifically focused on local issues. There is thus a need to establish clear policy and practical guidance by cities regarding the use of AI in their respective jurisdictions. In absence thereof, citizens would find it very difficult to keep government to account regarding the use of AI.

Specific initiatives in cities

More and more cities use AI within their administrations and as part of their service delivery to citizens (Galceran-Vercher, 2023). It is thus no surprise that there are various local initiatives to provide policy and regulatory frameworks for the ethical use of AI. Some of the pioneering initiatives by cities that developed their own AI policies and strategies to guide them in the development and deployment of AI, are discussed below.

The first AI regulation by a city was in **New York** in 2018, when the city council approved Local Law No. 49 on the use of automated decision systems by agencies within the local government (New York City Council, 2018). This law established an Automated Decision Systems Task Force to support the responsible use of algorithms in the New York city administration, including all its agencies[2]. This Task Force has a mandate to investigate and make recommendations about how AI is used by local government and how information about it is shared with the public. This legislation provided an important foundation for further policy and legal developments, such as the establishment of an Algorithms Management and Policy Officer within the

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[2] https://www.nyc.gov/assets/adstaskforce/downloads/pdf/ADS-Report-11192019.pdf

office of the mayor of New York in 2019[3]. The aim of this initiative is to have a centralised resource on algorithm policy and best practices within the city of New York. The key principles of fairness, equity and accountability underpin this initiative and the work of this office.

Amsterdam, one of the first cities to develop an AI policy which provides a framework for the use of AI by the City of Amsterdam (City of Amsterdam, 2021), emphasized the ethical approach to the use of AI, which could improve the lives of citizens of Amsterdam. In laying the groundwork for an AI policy it was argued that:

> "Amsterdam is a living lab where AI tests and applications are used to solve urban issues" and "The City of Amsterdam wants to use data and technology to improve and streamline services and make them cheaper" (City of Amsterdam, 2021).

Amsterdam was also instrumental in developing an 'Algorithmic Transparency Standard' together with Barcelona, Brussels, Eindhoven, Mannheim, Rotterdam, Sofia and the Eurocities' Digital Forum Lab (Eurocities, 2022). The Algorithmic Transparency Standard is a comprehensive set of categories of information that could be used by cities to provide information about their algorithms in an easily understandable way. It forms the basis of an algorithm register, which is accessible by the public, thus adhering to the principle of transparency in the use of AI and supporting algorithmic accountability. It is a tool for the effective management of AI in a city. Amsterdam established an AI Register, which provides an overview of all the AI systems and algorithms used by the City of Amsterdam[4]. This algorithmic register includes information about the data sets, data processing, non-discrimination, human oversight and risk management, in addition to a description of the AI system and how it is used. It could be asked why there is a need for AI governance tools such as these. In view of the potential risks posed by AI systems, such as the risk of bias that leads to discrimination, and the harm it could cause to citizens, it is clear that specific tools that can enhance AI governance are necessary to ensure a human-centred approach (Marcucci, Kalkar & Verhulst, 2022).

An example of one of the use cases in the Amsterdam Algorithm Register is automated parking control. Parked cars are checked to confirm if they have the right to park in a specific place, and cameras and AI-based identification services are used in this process. Object recognition software scan and identify the license plates of cars, which is checked against the Nation-

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[3] https://www.nyc.gov/office-of-the-mayor/news/554-19/mayor-de-blasio-signs-executive-order-establish-algorithms-management-policy-officer
[4] https://algoritmeregister.amsterdam.nl/en/more-information/

al Parking Register. A human parking inspector verifies if the license plate was recognized correctly and if there is a legitimate reason for the car to be parked in a specific place. In case of non-compliance, a parking ticket is issued.

Another example of AI initiatives in cities, is that of the Spanish city of **Barcelona**, which is one of the pioneers in the Cities Coalition for Digital Rights[5]. Barcelona followed a two-phase approach in the development of policies regarding the use of AI. In 2021 the first phase was the adoption of an AI strategy, which provided a policy framework for the use of AI in the municipal administration and the provision of public services. An important motivating factor underpinning Barcelona's approach appears in its AI Strategy, namely:

> "Applying emerging technologies based on human rights will help to bring about stronger public services and better institutional and democratic quality, as well as save time and money."

In view of the increasing use of digital technology, the city administration argued that there was an urgent need for a policy that will guarantee the privacy and digital rights of citizens, in particular when AI is used by the City Council. In this AI strategy the Barcelona City Council expressed its commitment to 'a fair digital transition that safeguards citizens' rights and promotes the city's progress and adaptation to the global technological revolution of the 21st century' (Barcelona, 2021). There is thus a clear commitment to technological progress that embraces the protection of human rights.

In view of its leading role in the Coalition of Cities for Digital Rights, Barcelona aims to export its model AI strategy that focuses on innovation in urban governance and safeguarding citizens' digital rights. The following key areas are targeted in this AI strategy, namely:

- Co-production of public policies
- Internal municipal management
- Provision of public services
- Designing and building AI-based systems
- Public procurement of systems/solutions based on AI technologies.

Identifying co-production of public policies as a key target area in this AI strategy, confirms the importance of a human-centred approach and the need to involve citizens in shaping the further development of AI and other related policies. It is evident in this AI strategy that the City Council wants to harness the possibilities that AI bring to contribute to economic growth and

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[5] https://citiesfordigitalrights.org

well-being of the citizens (Marcucci, Kalkar & Verhulst, 2022). The involvement of citizens in giving effect to this AI strategy is also clearly expressed by stipulating the need for human supervision in the deployment of AI and by providing the basis for the establishment of a public algorithmic register (Barcelona, 2021). The adoption of such an AI strategy with a broad scope is an important step that gives direction to the City Council and administration, as well as the local community. It is, however, just the beginning and should be followed by practical guidance and action.

Following on the publication of the AI Strategy, the second phase for Barcelona City Council was the adoption of an AI protocol, which is a more technical document that deals with methodologies and protocols for the implementation of algorithmic systems (Barcelona, 2023). This AI protocol implements the principles and standards established in the AI Strategy as well as in related Spanish and EU legislation and policies. It thus does not operate in a vacuum but is in line with the broader legal and policy framework within in the EU. Ensuring the ethical development and use of AI is not an ex post facto exercise but must apply to the whole AI life cycle.

The correct approach taken by Barcelona is reflected in the AI Protocol which contains four key elements, namely:

The life cycle of an ICT service in Barcelona City Council,

1. Conception of the service

- Procurement
- Development
- Production
- Operation
- Dismantling

2. The life cycle of an algorithmic system,

- Formulation of the problem
- Data gathering and processing
- Model selection and building
- Development and monitoring

3. The existing data protection measures in Barcelona City Council, and

4. The ethical standards underpinning the responsible use of AI.

The AI Protocol provides a practical guide to the procurement and use of AI by the Barcelona City Council which is in line with the requirements stipulated in the proposed AI Act for the European Union (European Parliament, 2023). It therefore follows a risk-based approach to categorise AI systems. It also includes a requirement that an AI impact assessment must

be done for high-risk AI systems before an AI system could be procured by the City Council. This measure is aimed at the protection of fundamental rights of citizens and ensuring transparency and accountability of algorithmic systems. The Barcelona AI Protocol looks at the whole AI life cycle and gives effect to the principles in the overall AI Strategy. A next development is the establishment of an algorithm register which will provide detailed information about the AI systems used by the City Council, and which will be open to the public.

The practical initiatives described above are aimed at guiding the use of AI in an ethical and responsible way, while also improving service delivery and administrative efficiency in the respective cities.

3. AI governance in local government

Adopting an AI policy and a practical AI protocol are important steps in ensuring an overall ethical AI approach within an urban environment. More must, however, be done to ensure good AI governance. The practical implementation of an AI policy and protocol also requires additional measures to ensure appropriate AI governance and accountability. AI governance includes effective risk management aimed at ensuring trustworthy AI (OECD, 2023). AI governance does not only have an internal organisational focus but should also reflect on the complex relationships between the use of AI, the economy, individual citizens and society, and the environment (WEF, 2019).

AI governance is defined as:

> "A system of policies, practices and processes organizations implement to manage and oversee their use of AI technology and associated risks to ensure the AI aligns with an organization's objectives, is developed and used responsibly and ethically, and complies with applicable legal requirements" (IAPP, 2023).

A city government must therefore also develop and implement relevant practices and processes to manage their use of AI technology. Provision must also be made for proper oversight mechanisms and risk management to support the responsible and ethical use of AI by the city government. AI governance is not a stand-alone function but is closely linked with the AI life cycle as well as the data protection mechanisms used by a city government.

An important practical AI governance step in New York was the establishment of an Automated Decision Systems Task Force, which was an advisory body that included senior local government officials as well as academics. It had to advise the city council on procedures to ensure the ethical and responsible use of AI in the local administration, including procedures to

address harm caused by AI systems[6]. This approach confirms the notion that AI has a socio-technical character, implying that the impact of AI on society must be properly considered.

The Barcelona City Council has gone further than New York and created specific governance mechanisms to ensure proper AI governance in line with the AI Protocol. These AI governance mechanisms are:

a. Committee for the Promotion of an ethical AI in Barcelona City Council, in which all municipal areas and entities related to the implementation of AI are represented. Its role is to validate AI systems for use in the City Council, to resolve disputes regarding the use of AI systems and to ensure that the public's views are considered.

b. IMI (Institute for Information Technology in the City Council) Technical AI Office. This office defines the technical standards, tools, uses and implementations of AI technology in the City Council.

c. Advisory Board on Artificial Intelligence, Ethics and Digital Rights. This is an external body consisting of members of the academic environment. It must advise the City Council on the impact of the use of AI systems and may issue prescriptive and non-binding algorithmic impact assessments for high-risk AI systems (Barcelona City Council, 2023).

The importance of AI impact assessments is described as follows in the Barcelona AI Protocol:

> "AIAs are crucial for giving the parties concerned an opportunity to discuss and assess the system's adoption, for ensuring its transparency, for guaranteeing citizen access to information that concerns them and for assessing its suitability, bearing in mind the use case it is meant to apply in, both before and during the production stage."

This comprehensive and inclusive approach of the Barcelona City Council is in line with the above definition of AI governance, and also gives effect to the principle of accountability.

The City of Amsterdam views the establishment of its algorithm register as an important AI governance tool, which also gives effect to the principle of transparency[7]. This register provides an overview of all the AI used in the city administration, what each algorithm does, how and where it is used and who is responsible for it.

The City of Amsterdam follows an AI life cycle approach in developing specific governance measures that could avoid risks when using AI and strengthen effective governance. The City Council approved detailed Con-

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[6]   https://www.nyc.gov/site/adstaskforce/
[7]   https://algoritmeregister.amsterdam.nl

tractual Terms for the Procurement of Trustworthy Algorithmic Systems that determine what information is required from suppliers of AI systems to the City (El Yassini, et al, 2022). Another governance tool used by the City of Amsterdam is regular AI audits, which are aimed at checking if appropriate risk management measures relating to the use of AI systems are in place.

Since bias remains a serious concern in the development and use of AI, the City of Amsterdam developed a bias analysis guide which is used together with a Fairness Handbook by the city administration to assess the fairness of an AI model, and to identify and mitigate bias in the use of AI in Amsterdam (El Yassini et al, 2022). This focus on fairness and mitigation of bias is an important step to address concerns of citizens that AI used by government could be discriminatory.

AI governance is not only about systems and processes, but it also includes the issue of digital rights. The UN Habitat research report on digital human rights in local governance identified some practical initiatives that strengthen AI governance in cities as identified in four pilot studies. These actions include a focus on digital inclusion and protection of digital rights (Brussels), increasing capacities of local authority staff and creating AI awareness (Dublin), creation of a digital rights action plan (Sofia) and capacity building and development of a digital rights agenda (Tirana) (Serale et al, 2023).

The recognition and protection of digital rights within cities also contributes to the overall governance framework of AI. The Cities Coalition for Digital Rights promotes the strengthening of digital governance inclusive of digital rights in cities. In a joint publication with UN HABITAT it defines digital rights as 'existing human rights which need to be protected in the context of digital technologies, as physical and digital spaces are increasingly intertwined. Digital rights assess how digital technology affects previously recognized rights, i.e. civil, political, economic, social and cultural rights' (Nonose & Jansen, 2022). The increasing development and use of digital technologies create a new context in which human rights must be recognized and protected. The scope of digital human rights is diverse and includes data protection and privacy in view of the use of data-driven technologies such as AI, but it also includes questions about fairness and bias, and access to digital technology.

In promoting digital rights and including it in AI policies and strategies, cities will not only strengthen their own AI governance frameworks but also contribute to creating public awareness and enabling citizens to engage local government on AI policy and regulatory matters. The development of a digital rights charter as part of an overall AI policy framework is a useful practical step that cities could take in this regard.

4. Conclusions and recommendations

Digital transformation of cities is an ongoing process and happens at different speeds in the vast number of urban environments in the world. Nevertheless, technological advancement, in particular the increasing use of AI in cities, holds many benefits for citizens such as improved service delivery, increased participation opportunities in local governance and access to digital technology and capacity development. In view of the inherent risks and potential harm of the use of AI, policy and legal frameworks must ensure the protection of human rights. This paper confirms the importance of a human-centred approach to the use of AI in local governance. This implies a focus on the protection of human digital rights, as well as ensuring proper AI governance in cities. In view of the complex nature of AI systems, initiatives that give effect to transparency and accountability such as an algorithm register, provide an important tool for citizens to engage a city government on the use of AI, while also contributing to the effective governance of AI in the city administration.

It is evident from the initiatives in cities like Amsterdam and Barcelona that a comprehensive approach to fostering digital innovation in cities is necessary. Such an approach includes an AI policy or strategy and various practical measures to ensure proper AI governance and recognition of digital human rights. Innovation does not only imply the use of new technology, but it also means that innovative approaches to ensure ethical AI in local government should be adopted. While only a few cities in the world have initiated policy, regulatory and practical initiatives to guide the use of AI in local governance, it is evident that cities around the world will inevitably have to deal with these matters. Therefore, the following recommendations that form important building blocks in a local governance AI journey are provided:

• Develop a broad policy framework for ethical and responsible AI, that includes a digital human rights declaration.
• Digital transformation, including the development of policy and regulatory frameworks and practical initiatives, must be inclusive and should follow a co-creative approach.
• Consider developing an AI register that gives effect to transparency and accountability regarding the use of AI in the city.
• Develop and use a multi-disciplinary team to guide the development and use of AI in the city,
• Create appropriate AI governance mechanisms, e.g. an AI advisory council on AI ethics and digital transformation in which academic, professional and community representation is included.

- Build capacity among staff and create AI awareness through creative and relevant initiatives.
- Engage in bilateral and multi-lateral cooperation to learn from international experience.

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