Smart Cities Modelling in Uganda: Insights from the Africa Smart Cities Investment Summit (ASCIS 2024) November 20 – 22, 2024 – Nairobi, Kenya

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1. Introduction

The African Smart Cities Investment Summit (ASCIS 2024) was hosted in Nairobi, Kenya in November 2024 at the Radisson Blue Hotel, Upper Hill. The DataCities Consortium and particularly, ToroDev – ODA were well represented. The event provided an invaluable platform for African city leaders, experts, researchers in smart city spaces and innovators to exchange strategies and insights on leveraging data and Artificial Intelligence (AI) to build more sustainable, inclusive, and resilient urban environments. With urbanisation rapidly accelerating, particularly in Africa, the summit underscored the urgent need for innovative solutions that harness technology to address the challenges of growing populations while promoting inclusivity, sustainability, equity, and economic growth. World Bank (2023) reports that over 80% of the world's Growth Domestic Product (GDP) is generated in cities – demonstrating the centrality and potentiality such urban centres have on productivity and innovation, if governed and managed well, specially using modern digital technology.

A smart city governance framework may be modelled on an ideology which is based on three strands and/or dimensions: *clarity of purpose*, *technology appropriateness* and *resources availability*. Central to understanding the above strands, is the availability of contextual facts (data) and optimisation of AI to use such data for insights generation and vise-versa.

Look out for a future article in which we will try to expound more on these strands

In this article, we will focus on the general overview of learnings from the ASCIS 2024.This article syntheses- and summarises key takeaways and actionable insights for ToroDev-ODA and the entire DataCities Consortium from the ASCIS 2024 Summit, offering guidance on how cities can navigate the complexities of using the opportunities provided by data analytics and integrating AI technologies into urban development. Take a few minutes to read through the following thought lines.

2. Visioning for Smart Cities in Africa

The theme for ASCIS 2024 was a need for a positive and holistic definition of a smart city in the African context. Such a city is envisioned as people-centric, where the needs and well-being of citizens are prioritised – incorporating social, economic and environmental sustainability aspects (Franke & Gailhofer, 2021; Gahnberg, 2021). This city should be open and attractive, fostering innovation, collaboration, and growth (Helbing et al., 2021; Camilleri, 2023). Inclusivity ensures that all individuals, regardless of background, have equal access to opportunities and resources, including incorporating such considerations and values in the data generation, analytics algorithms and/or AI tools deployed in a smart city.

Further, smart cities may also be characterised by their use of cutting-edge technology to enhance daily life and urban operations. They ought to be innovative, adaptable, and maintain high standards of service, infrastructure, and governance to address evolving challenges.

3. How to Model an "Inclusive" [Data-Enabled] AI Smart City

Emphasis was placed on the importance of creating "people-centred" smart cities, focusing on best practices and a global outlook from policy development (governance) to implementation (management).

In our view, the foregoing directly speaks to the current need for refining and/or reforming previous smart city conceptualisations that largely focused just on cities' economic growth, at the expense of people's well-being and environmental conservation (Camilleri, 2023). As digital data and AI become increasingly integrated into urban management, concerns regarding fairness, privacy, transparency and making cities liveable for the poor, have gained significant attention.

Key discussions at the ASCIS 2024 highlighted that- data and AI systems must be developed within strong ethical frameworks, with clear and balanced data and AI governance policies – targeting to harvest the opportunities, but at same time being mindful of misuse and/or abuse, transparent algorithmic decision-making processes, and robust mechanisms to prevent biases and protect citizens' rights.

1. A prime example of these principles in action was in Barcelona in April 2023, the Advisory Council on Artificial Intelligence, Ethics, and Digital Rights was established Barcelona City Council (2023).

. Comprising fifteen independent experts from diverse academic fields, the council advises the City Council on ethical AI deployment. Its responsibilities include assessing the impact of high-risk algorithmic systems and promoting collaboration with various stakeholders to position Barcelona as a leader in technological humanism. Barcelona City, where ethical AI frameworks have been established to guide the use of this technology in public services. These frameworks ensure AI transparency and accountability, with a focus on benefiting all residents, especially marginalised groups.

In light of the foregoing, the ASCIS 2024 summit stressed the need for African cities to adapt related efforts, but "contextualise" data and AI governance and management frameworks, to ensure data and AI technologies serve the entire city population and promote equity. The foregoing principle is at the heart of the DataCities program interventions in Uganda's emerging cities.

3.1 Thoughts for Smart City's Data & AI Policy and Regulatory Frameworks Designing and Development in Uganda's New Cities

3.1.1 *Defining the Purpose of Smart Cities:* Clear goals for innovation, sustainability, and social inclusivity should be outlined, with technology as a driver of progress, not just a tool for adoption.

3.1.2 *Stakeholder Engagement:* Engaging diverse stakeholders—including local communities, businesses, and civic organisation s and key government agencies—is crucial for overcoming resistance and ensuring broad support for smart city initiatives. This should also encompass education and skills development to enable citizens to actively contribute to the city's growth.

3.1.3 *Sustainability and adaptability:* The frameworks must prioritise long-term sustainability, ensuring digital technologies and infrastructures are environmentally responsible and resilient.

3.1.4 *Governance and Regulatory Guidelines:* Clear rules for implementation at both national and city local levels are essential to promote transparency, accountability, and effective management of smart city projects.

3.1.5 *Skills Development:* A focus on digital technology skills development is essential to equip both the workforce and citizens with the necessary knowledge to thrive in a rapidly evolving urban environment.

4. Ethical Principles for Smart City Modelling

These principles aim to create a balanced, inclusive, and sustainable modelling of smart cities, ensuring that digital technological advancements benefit all citizens and are grounded in contextualised and acceptable norms that foster inclusive growth and development.

4.1 Building Trust Through Data Privacy and Security Mechanisms: Data privacy emerged as another recurring theme during the summit. As smart cities rely on vast amounts of data and AI capabilities to optimise urban services, ensuring the security of this data and maintaining public trust is crucial. The summit cited international privacy laws such as GDPR, as benchmarks for cities looking to establish or refine their own data protection standards. A core recommendation was for cities to engage transparently with their residents regarding data usage. Ensuring that citizens feel comfortable with how their data is collected, stored, and shared is vital to fostering trust.

4.2 Fostering Inclusion and Equity: The rapid adoption of data and AI in urban settings raises concerns about the potential exclusion of certain low-resourced stakeholder groups from the benefits of these technologies. The summit stressed the need for smart city solutions to be inclusive, ensuring that data and AI technologies are accessible to all residents, particularly those from underserved and vulnerable communities. One model highlighted was the delivery of government services through mobile AI platforms, ensuring that even those in under-resourced outskirts areas of the city can benefit from digital advancements. By prioritising digital literacy, affordable access to technology and energy, and community-based solutions – especially mobile tools, cities can ensure that no one is left behind in the transition to smarter, more connected urban spaces.

4.3 Collaborative Governance for Effective Policy Development: Effective governance is central to the success of data and AI-powered cities. The summit discussed the importance of multi-stakeholder collaboration between government agencies, tech companies, and civil society groups in shaping data and AI policies. Singapore's model of collaborative governance, where government, industry, and academia work together to develop data and AI strategies, was cited as a successful example. By establishing clear roles and responsibilities for each stakeholder, cities can ensure that data and AI policies are aligned with public interests.

4.4 Sustainability and Environmental Conservation Considerations: As urban populations grow; the environmental impact of urbanisation becomes an increasing concern. AI offers significant potential to help cities optimise energy consumption, improve waste management, and support the transition to renewable energy sources. The Africa Smart Cities Investment Summit 2024 in Nairobi-Kenya underscored the importance of integrating AI with energy grids, to reduce consumption and improve the efficiency of waste management systems. Such innovations can significantly contribute to a city's environmental conservation sustainability.

4.5 Collaborative Models and Implementation Partnerships: Successful smart city development requires cooperation among a wide range of stakeholders, including city governments, private sector partners, and international organisation s - which seem to have substantial smart city investment resources. The summit highlighted the importance of fostering public-private partnerships (PPPs) and "Multi-Stakeholder Advisory Boards" to drive innovation and ensure that smart city projects meet the needs of all residents.

4.6 Adaptability, Contextualiability and Scalability of Smart Solutions: A central theme throughout the summit was the necessity for data and AI solutions to be adaptable and scalable across diverse urban environments in Africa. Given the varying challenges of different cities, AI applications must be designed with flexibility to accommodate evolving needs and local contexts. In Africa, there is a significant opportunity to leverage data and AI governance research and development for sustainable management of the same technologies in cities. Smart city tools must be relevant to local situations, inclusive, accessible to all citizens, promote green practices, and foster economic opportunities.

4.7 Workforce Transformation and Skill Development: The transition to data and AI-driven urban environments also has implications for the existing and incoming city workforce. The summit emphasised the importance of "re-skilling" and "upskilling" programs to ensure that workers are prepared for the job opportunities that data science, AI and automation will create. Collaboration with educational institutions by the city authorities, and the promotion of lifelong learning were deemed essential to prepare the workforce for the cities' digitalisation future. AI was recognised as a vital tool for enhancing resource efficiency across city sectors. Predictive AI models were discussed for optimising energy consumption, improving waste management, and ensuring water conservation. AI-powered smart grids were highlighted as essential for managing energy loads and integrating renewable sources, such as solar and wind power.

Moreover, data analytics and AI also play a significant role in transforming urban transportation systems. AI-powered systems can reduce traffic congestion, predict traffic patterns, and optimise public transport schedules, contributing to lower carbon emissions and enhanced urban mobility. By focusing on building a skilled workforce in data science, AI and other related digital technologies, African cities can ensure sustainable and successful smart city development.

To re-emphasise, the summit identified several high-impact areas where data and AI-driven solutions could attract significant investments, including renewable energy, healthcare, and transportation. Investment in AI-powered smart grids can help integrate renewable energy, optimise energy flow, and improve energy storage. It was pointed out that Africa's renewable energy potential remains underutilised, and AI can help meet the continent's growing energy demands sustainably.

5. Conclusion

The experiences and best practices shared at the summit provide a valuable and viable roadmap for cities across Africa, enabling them to navigate the complexities of digital data generation, analytics AI adaptation to innovation, collaboration and trust for inclusive urban growth and development. The DataCities program (2023 – 2031) by the DataCities Consortium (ToroDev, UNGP and Sunbird AI), has an enormous task ahead, yet with many opportunities available, if the above insights from the ASCIS 2024 can be reflected on frequently and incorporated in the design and implementation of the program interventions. With the current piloting of supporting practical and resilient data systems in Jinja and Fort Portal cities (2023-2025) there is hope that the newly established cities in Uganda will develop into smart cities with global outlook.

6. References

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