From New Public Management to Digital Public Administration. Examining the Role of Technology in Shaping Super Smart Societies.

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ABSTRACT

This paper explores the paradigmatic shift from New Public Management (NPM) to Digital Public Administration (DPA) and its impact on the development of Super Smart Cities. NPM, characterized by market-driven and efficiency-oriented reforms, is giving way to DPA, which leverages digital technologies such as artificial intelligence, big data, Internet of Things (IoT), and blockchain to enhance public service delivery, transparency, and citizen engagement. The study situates this transition within the broader evolution toward Super Smart Societies, emphasizing inclusive, sustainable, and human-centric technological integration. Using a qualitative research design and thematic analysis of global and Zimbabwean policy documents, the paper identifies key enablers of DPA, including interoperable digital platforms, cloud computing, and AI-driven governance tools. It also highlights barriers such as the digital divide, data privacy concerns, lack of policy coherence, and resistance to change. Special attention is given to equity and inclusion as essential elements for sustainable urban transformation. A comprehensive framework is proposed for integrating DPA into smart city initiatives, focusing on inclusive policies, robust data governance, public-private partnerships, citizen engagement platforms, and sustainable digital infrastructure. The paper concludes that while technological advancements offer transformative potential for urban governance, realizing equitable super smart societies requires overcoming socio-technical challenges through collaborative, ethical, and inclusive governance models. Future research is encouraged to evaluate longitudinal outcomes and explore emerging technologies in diverse urban contexts.

Keywords: Digital Public Administration (DPA), Smart cities, New Public Management (NPM), technological governance and local governance

INTRODUCTION

The shift from New Public Management (NPM) to Digital Public Administration (DPA) represents a paradigmatic change in the governance of public services, with significant implications for urban development. NPM, with its emphasis on efficiency and market-oriented reforms (Hood, 1991), has given way to DPA, which is characterized by the integration of digital technologies and data analytics to enhance service delivery and citizen engagement (Bekkers & van der Voort, 2017). This transition is particularly evident in the development of Super Smart Cities, where technology plays a pivotal role in creating sustainable, efficient, and livable urban environments. The importance of investigating the role of technology in shaping these societies cannot be overstated, as it informs the design of policies that promote inclusive growth and innovation in urban settings (Giffinger et al., 2007).

This study aims to delineate the influence of the NPM to DPA transition on the advancement of Super Smart Cities through the following concise objectives: (1) to evaluate the impact of digitization in public administration on the adoption of smart city technologies; (2) to identify the technological enablers and barriers in the context of the NPM to DPA shift; and (3) to propose a framework for integrating digital public administration practices that support the equitable development of Super Smart Cities. By doing so, the research intends to contribute to the scholarly literature on digital governance and urban development, providing actionable insights for policymakers and practitioners.

LITERATURE REVIEW

New Public Management and Digital Public Administration Definitions and Evolution of NPM

New Public Management (NPM) refers to a set of administrative practices and reforms in the public sector that emerged in the 1980s and 1990s, primarily in response to the growing demand for more efficient, responsive, and cost-effective public services. NPM draws heavily from private sector management practices, emphasizing market-driven approaches, customer satisfaction, decentralization, and performance measurement (Hood, 1991). It aims to improve public sector efficiency by introducing techniques such as competition, performance-based budgeting, and a focus on service outcomes (Osborne & Gaebler, 1992).

The evolution of NPM is characterized by an increasing emphasis on managerialism, where government agencies are expected to operate with the same efficiency as private companies. This shift included the adoption of concepts like outsourcing, privatization, and the establishment of quasi-market structures within public service delivery. However, over time, critiques of NPM arose, focusing on its excessive reliance on market mechanisms and its inability to address broader social goals, such as equity and public accountability (Pollitt & Bouckaert, 2017).

Definitions and Evolution of DPA

Digital Public Administration (DPA) represents the next stage in the evolution of public sector governance, marked by the integration of digital technologies to enhance the efficiency, transparency, and accessibility of public administration. DPA emerged in the early 21st century as governments began adopting digital tools and platforms to transform their operations and engage citizens more effectively (Scholl, 2020). Unlike NPM, DPA is more focused on using digital innovations such as e-government, big data, artificial intelligence, and cloud computing to modernize public administration systems, improve decision-making processes, and facilitate public service delivery in a more citizen-centric manner (Mergel, 2016).

DPA emphasizes open government, data-driven policies, and the seamless integration of technology across public administration functions. In contrast to NPM's market-oriented approach, DPA seeks to provide more inclusive, transparent, and responsive governance (Lundblad, 2020). The evolution of DPA has been shaped by global technological trends, including the rise of the internet, mobile connectivity, and data analytics, which have provided new opportunities for digital transformation in government operations.

Differences Between NPM and DPA

While NPM and DPA share some common goals—such as improving efficiency, accountability, and service quality—their approaches differ significantly. NPM is primarily focused on introducing private sector management techniques into public administration, while DPA seeks to leverage digital technologies to fundamentally reshape how public services are delivered and how citizens interact with government institutions.

Focus on Technology: NPM does not inherently rely on technology but emphasizes managerial practices like decentralization, outsourcing, and performance measurement. In contrast, DPA is inherently digital, relying on the integration of technology like e-government platforms, data analytics, and AI to enhance public administration (Luna-Reyes & Gil-Garcia, 2014).

Service Delivery Models: NPM adopts a market-based model for service delivery, where competition and customer satisfaction are central. DPA, however, embraces a citizen-centric approach, where the use of digital tools enables more personalized, efficient, and transparent interactions between citizens and the government (United Nations, 2020).

Role of Data: In NPM, performance measurement is primarily driven by outputs and financial efficiency. DPA, on the other hand, uses data-driven decision-making to improve public services, with a focus on transparency, real-time information, and proactive engagement with citizens (Scholl, 2020).

Accountability and Governance: NPM emphasizes accountability through market-based mechanisms, whereas DPA focuses on improving accountability through technological solutions such as open data platforms, digital feedback systems, and participatory governance models (Mergel, 2016).

Role of Technology in Transitioning from NPM to DPA

The transition from NPM to DPA is primarily driven by advances in technology, which have enabled a more integrated, transparent, and efficient public administration system. Technology has played a pivotal role in reshaping public administration by:

Enhancing Public Service Delivery: Digital tools such as e-government platforms, mobile apps, and cloud-based systems have streamlined service delivery, making it more accessible and responsive to citizens' needs (Mergel, 2016). These technologies support the shift from a hierarchical, bureaucratic model of governance under NPM to a more flexible, collaborative, and citizen-focused model under DPA.

Improving Efficiency and Transparency: Technologies such as big data, machine learning, and artificial intelligence allow governments to analyze vast amounts of data to improve decision-making and optimize resource allocation. This technology-driven efficiency is a significant departure from NPM’s focus on financial efficiency through market-based competition (Luna-Reyes & Gil-Garcia, 2014).

Facilitating Citizen Engagement: Digital technologies enable direct communication and collaboration between governments and citizens, fostering greater transparency and public participation. This contrasts with NPM’s more top-down, service-provider model (Scholl, 2020).

Enabling Data-Driven Governance: The use of digital platforms facilitates the collection and analysis of data in real time, which improves the accuracy of decision-making, enables predictive analytics, and supports evidence-based policy-making. DPA represents a more sophisticated, data-intensive approach to governance than the performance-based measurement common in NPM (United Nations, 2020).

The shift from NPM to DPA represents a fundamental transformation in the role of technology in public administration. While NPM focused on introducing market-like mechanisms to enhance public service delivery, DPA leverages digital technologies to create more efficient, transparent, and responsive governance models that are more aligned with the needs of a digital, interconnected society.

Smart Cities and Super Smart Cities

Conceptualizing Smart Cities

A smart city is typically defined as an urban area that leverages digital technologies to enhance the quality of life for its citizens, optimize resource utilization, and promote sustainable development. The concept of smart cities emerged in response to rapid urbanization and the challenges associated with managing complex urban systems, including transportation, energy, healthcare, and waste management (Chourabi et al., 2012). Smart cities utilize technologies such as the Internet of Things (IoT), artificial intelligence (AI), big data, and cloud computing to enable real-time monitoring, data-driven decision-making, and seamless integration of services (Batty et al., 2012). These technologies aim to improve urban living conditions by making city operations more efficient, sustainable, and responsive to citizens' needs.

From Smart Cities to Super Smart Societies

The concept of "Super Smart Societies" extends beyond the traditional smart city framework. Originating from Japan’s Society 5.0 initiative, a super-smart society envisions a future where digital transformation is not limited to urban areas but encompasses all aspects of human life, including education, healthcare, and governance, while emphasizing inclusivity and sustainability (Fukuyama, 2018).

Super-smart societies prioritize: (1) Human-Centric Solutions: Technologies are used to address individual needs while ensuring inclusivity. (2) Sustainability: Focus on balancing technological innovation with environmental preservation and social equity. (3) Integration of Physical and Cyber Systems: Seamless integration of the real world with cyberspace for enhanced efficiency and accessibility (Uchiyama, 2020).

Technological Aspects of Smart Cities

Smart cities leverage advanced technologies to enhance urban living, improve sustainability, and optimise resource management. Key technologies include Internet of Things (IoT), Big Data Analytics, and 5G connectivity. IoT enables realtime data collection through interconnected sensors, improving traffic management, waste disposal, and energy efficiency (Batty et al., 2012) AI enhances decision making by analyzing urban data, predicting infrastructure failures and automating city services (Kitchin, 2014). Big data analytics process vast amounts of urban information to optimize public services, while 5G ensures fast, reliable communication for smart applications (Alawadhi et al., 2012). Blockchain ensures data security and transparency in services such as digital identity management and smart contracts for public procurement (Zheng et al., 2017).

These technologies contribute to environmental sustainability and citizen engagement. Smart grids integrate renewable energy sources, reducing carbon footprints and ensuring efficient energy distribution (Graham & Marvin, 2001). Digital platforms enhance governance by facilitating real-time citizen feedback and participation (Meijer & Bolivar, 2016). However, challenges such as cybersecurity threats and digital inequality must be addressed to ensure inclusive and secure smart city development. Ultimately, technology plays a crucial role in shaping the cities of the future, making them more responsive, efficient and livable.

Social Aspects of Smart Cities

While technology plays a central role, smart cities must also address the social dimensions of urban living to achieve their goals. Key social aspects include:

Citizen Engagement: Successful smart cities actively involve citizens in the design and implementation of smart solutions. Digital platforms such as mobile apps and social media channels foster two-way communication between governments and residents (Caragliu et al., 2011). Equity and Inclusivity: A primary criticism of many smart city initiatives is the digital divide, which often excludes marginalized populations from reaping the benefits of digital transformation (Hollands, 2008). Policies must focus on bridging this gap to ensure equitable access to technology-driven services. Governance and Collaboration: Smart cities require collaborative governance models that integrate public and private stakeholders to deliver effective solutions. Open data initiatives can enhance transparency and foster trust between citizens and government entities (Nam & Pardo, 2011).

Super Smart Societies: Bridging Technology and Society

Super-smart societies expand upon the technological and social aspects of smart cities by emphasizing a harmonious relationship between humans, technology, and the environment. For instance, technologies like AI and IoT are integrated into healthcare systems to provide personalized medical services, while renewable energy sources are optimized through smart grids for sustainable urban development (Uchiyama, 2020). Moreover, super-smart societies adopt a holistic approach that combines digital infrastructure with ethical governance frameworks, ensuring that technological innovation aligns with broader societal values, such as sustainability, inclusivity, and well-being (Fukuyama, 2018).

Smart cities focus on leveraging technology to improve urban management and quality of life, while super-smart societies broaden this vision to include societal transformation, inclusivity, and sustainability. These frameworks provide a foundation for understanding how digital public administration can drive the transition to super-smart societies.

Technological Enablers and Barriers

Key Technological Advancements Enabling Smart City Development

Technological advancements are at the core of smart city development, providing innovative solutions to urban challenges. Key enablers include:

Internet of Things (IoT): IoT devices, such as sensors and connected infrastructure, enable real-time data collection and analysis, leading to optimized city operations like traffic management and energy distribution (Zanella et al., 2014). Almost 20 years after its first use as a solution looking for a problem, the IOT descends into the lives of many as a real, tangible infrastructure of hundreds of millions of new devices that collaborate and distribute data among them or over the internet; however, it means different things to many (Berte, 2018). Sensors and connected devices provide real-time data for efficient city management, such as traffic control, waste collection, and energy distribution (GhaffarianHoseini et al., 2017).

Artificial Intelligence (AI): AI-powered algorithms enhance decision-making, automate public services, and improve predictive capabilities in areas like disaster management and public safety (Batty et al., 2012). AI enhances automation, from smart traffic systems to public safety monitoring. Machine learning models continuously improve the efficiency of city services. Artificial Intelligence (AI) has emerged as a transformative tool in public service delivery, revolutionizing the interaction between governments and citizens while enhancing operational efficiency. Key applications of AI include automating repetitive tasks, enabling data-driven decision-making, and improving accessibility. AI-powered technologies such as chatbots and robotic process automation (RPA) streamline administrative functions, reducing response times and enhancing productivity (Kim et al., 2018; Sun & Medaglia, 2019). AI also facilitates data-driven governance by analyzing vast datasets to inform policies and optimize resource allocation. Predictive analytics, for instance, forecasts urban trends, enabling proactive interventions in areas like traffic management, public safety, and disaster response (Batty et al., 2012). Moreover, AI tools improve citizen experiences by personalizing services, such as healthcare recommendations and educational content, tailored to individual needs (Holmes et al., 2019; Topol, 2019).

In addition, AI promotes inclusivity by bridging accessibility gaps. AI-driven language translation tools empower non-native speakers, while assistive technologies such as voice recognition enhance access for differently-abled individuals (Marmolejo-Ramos et al., 2020). Public safety has also benefited from AI, with applications in crime prediction, threat detection, and emergency response coordination (Cui et al., 2020; Perry et al., 2013). Despite these advancements, AI adoption in public service delivery is not without challenges. Ethical concerns surrounding bias, fairness, and transparency remain critical, while issues of data privacy and cybersecurity demand robust governance frameworks (Binns, 2018; Zhang et al., 2019). Addressing these challenges is essential to ensure AI-driven solutions align with principles of equity and trust.

AI's role in service delivery demonstrates its potential to enhance public administration by optimizing processes, improving inclusivity, and fostering citizen engagement. However, realizing this potential requires careful navigation of ethical and governance considerations to ensure that its benefits are equitably distributed.

Big Data Analytics: The ability to process large datasets allows for insights into urban patterns, enabling smarter resource allocation and improved citizen services (Hashem et al., 2015). Big Data analytics is a key technological advancement driving the development of smart cities by enabling data-driven decision-making, resource optimization, and enhanced citizen engagement. As smart cities become increasingly interconnected through IoT devices, sensors, and other technologies, the vast amounts of data generated are analyzed to optimize urban systems and improve overall quality of life (Hashem et al., 2016; Kitchin, 2014).

In urban planning and infrastructure, Big Data analytics supports informed decision-making by analyzing patterns of growth, mobility, and resource utilization. Real-time traffic data collected from sensors and GPS systems is used to optimize traffic flow, reduce congestion, and improve the efficiency of public transportation systems (Batty et al., 2012). Similarly, smart grids leverage Big Data to forecast energy demand, reduce waste, and facilitate the integration of renewable energy sources, enhancing the sustainability and resilience of urban infrastructure (Hashem et al., 2016).

Public services in smart cities are significantly improved through the application of Big Data analytics. In healthcare, for example, data from electronic health records and real-time monitoring systems enables predictive analysis for disease outbreaks, efficient allocation of resources, and better public health outcomes (Raghupathi & Raghupathi, 2014). Similarly, waste management systems benefit from data analytics that optimizes collection routes, reduces operational costs, and improves waste disposal mechanisms (Gupta et al., 2020).

Big Data analytics also plays a crucial role in predictive and proactive governance, allowing city administrators to anticipate and address urban challenges. Predictive models analyze environmental and weather data to enhance disaster preparedness and response strategies (Cui et al., 2020). In law enforcement, crime data analytics identifies high-risk areas and optimizes resource allocation, contributing to safer urban environments (Perry et al., 2013). Sustainability goals are supported by Big Data analytics, which helps cities address environmental challenges. Air quality monitoring systems utilize real-time data to identify pollution hotspots and evaluate the effectiveness of environmental policies (Zanella et al., 2014). Similarly, water management systems analyze consumption patterns to minimize waste and ensure equitable distribution of resources (Kitchin, 2014).

Citizen engagement is enhanced through the integration of Big Data analytics into smart city frameworks. Participatory platforms analyze feedback from social media and mobile apps, allowing policymakers to align urban policies with public needs and preferences (Nam & Pardo, 2011). Additionally, data-driven insights enable the personalization of public services, such as transportation, education, and healthcare, improving the overall citizen experience (Giffinger et al., 2007).

Cloud Computing: Cloud platforms facilitate seamless data storage, sharing, and processing, promoting collaboration across government departments (Chen et al., 2018). Cloud computing plays a crucial role in smart city development by providing scalable, on-demand resources for data storage, processing, and analysis. It supports the integration of diverse technologies, such as IoT and Big Data analytics, enabling real-time data sharing and decision-making across urban systems. For example, cloud platforms enhance traffic management by processing data from sensors and GPS devices to optimize routes and reduce congestion. Similarly, cloud-based services improve resource management in energy and water systems by enabling predictive analytics and efficient allocation (Botta et al., 2016). The flexibility and cost-effectiveness of cloud computing make it indispensable for municipalities with limited IT infrastructure, facilitating rapid deployment of smart city solutions. Moreover, it promotes collaboration between stakeholders by enabling seamless data exchange and integration across departments (Hashem et al., 2015). Despite its advantages, challenges such as data security and privacy remain critical concerns that require robust governance frameworks to mitigate risks.

Blockchain Technology: Blockchain enhances security, transparency, and accountability in transactions, such as in smart contracts and digital identity management (Zheng et al., 2017). Blockchain technology plays a vital role in smart city development by ensuring transparency, security, and efficiency in urban systems. Its decentralized nature enables secure data sharing across stakeholders, reducing the risk of fraud and unauthorized access. For instance, blockchain can streamline public services such as land registry, ensuring tamper-proof records and faster transactions (Saberi et al., 2019). In energy management, blockchain supports peer-to-peer energy trading within smart grids, allowing citizens to buy and sell surplus energy transparently. It also facilitates real-time tracking of supply chains, improving efficiency in resource management and waste reduction. Additionally, blockchain enhances public trust by enabling verifiable voting systems and transparent governance mechanisms (Clohessy et al., 2019).

Barriers to Implementing Smart City Technologies and DPA Practices

Despite the potential of technology, several barriers hinder the implementation of smart city initiatives and Digital Public Administration (DPA) practices. The digital divide remains a critical barrier, exacerbating inequalities in access to smart city services. While DPA aims to enhance citizen participation and service delivery through digital platforms, disparities in internet access and digital literacy prevent marginalized populations from benefiting fully (van Deursen & van Dijk, 2019; Hollands, 2008). in developing regions like Zimbabwe, inadequate digital infrastructure further limits the effectiveness of Smart city technologies, thereby restricting the equitable distribution of public services (Castells, 2010).

interoperability challenges arise due to fragmented technological ecosystems and inconsistent data standards across different governmental agencies. Smart cities rely on interconnected systems to manage transportation, energy, and public safety, but lack of standardization impedes seamless integration (Anthopoulos, 2017; Nam & Pardo, 2011). Without effective interoperability frameworks, cities struggle to leverage real-time data for governance, ultimately delaying the transition to fully digitalized public administration (Janseen et al., 2020).

Data Privacy and Security Concerns is a serious obstacle. Increased reliance on data collection raises issues of privacy, cybersecurity, and trust among citizens (Zhang et al., 2019). Despite its transformative potential, the implementation of Big Data analytics in smart cities faces challenges such as data privacy and security concerns, integration of diverse data sources, and the need for advanced technical skills (Taylor et al., 2016). Addressing these issues is essential to fully realize the benefits of Big Data and ensure its effective application in creating sustainable, efficient, and citizen-focused urban environments

The initial investment required for smart city infrastructure, including IoT devices, AI systems, and broadband connectivity, is often prohibitive for governments (Caragliu et al., 2011). The financial burden of transitioning from NPA to DPA is another major obstacle. Developing super smart cities requires significant investment in ICT infrastructure, cybersecurity, and workforce training (Alawadhi et al., 2012. Budget constraints in many municipalities limit their ability to deploy smart solutions comprehensively, often resulting in uneven implementation and delayed progress (Nam & Pardo, 2011).Public-private partnerships (PPPs) have emerged as a potential solution, but concerns regarding data privacy and governance complicate collaboration (Bolivar, 2018)

A lack of clear policies, regulatory frameworks, and collaborative governance models impedes the effective adoption of DPA practices (Mergel, 2016). Governance and policy gaps significantly hinder the implementation of smart city technologies and Digital Public Administration (DPA) practices by creating inconsistencies, inefficiencies, and a lack of accountability. One major issue is the absence of cohesive policies and regulatory frameworks to guide the deployment and integration of smart technologies. Fragmented governance structures across municipal, regional, and national levels lead to misaligned objectives, duplication of efforts, and slow decision-making processes (Meijer & Bolívar, 2016).

Policy gaps also affect data governance, a critical component of smart cities and DPA. Without clear regulations on data ownership, privacy, and sharing, stakeholders often face legal ambiguities that impede collaboration. This lack of clarity fosters mistrust among citizens, reducing their willingness to engage with smart city initiatives (Taylor et al., 2016). Additionally, governance gaps in public procurement and funding mechanisms delay the adoption of smart technologies. Traditional bureaucratic processes may not align with the dynamic and iterative nature of technological development, leading to delays and increased costs (Nam & Pardo, 2011). Moreover, the lack of policies addressing digital inclusion exacerbates social inequities, limiting access to smart services for marginalized populations.

Addressing these governance and policy gaps requires the development of comprehensive frameworks that ensure interoperability, data protection, and equitable access to services. Collaborative governance models involving public, private, and civil society stakeholders are crucial for bridging these gaps and enabling the successful implementation of smart city technologies and DPA practices. Overcoming these barriers requires addressing socio-economic inequalities, enhancing public trust in digital systems, and fostering multi-stakeholder collaboration.

Equity and Inclusion in Smart Cities

Equity and inclusion are critical to the success of smart cities, ensuring that technological advancements benefit all citizens, particularly marginalized communities. Key strategies for promoting equity include bridging the digital divide where programs aimed at providing affordable internet access, digital literacy training, and technology distribution help reduce socio-economic disparities (Kitchin, 2014). Participatory governance sees citizen engagement platforms enabling inclusive decision-making by giving underrepresented groups a voice in urban planning and policy development (Nam & Pardo, 2011). Universal Access to Services allows smart city frameworks to prioritize universal access to essential services, such as healthcare, education, and public transportation, using digital platforms to reach under-served populations (Hollands, 2008). Focus on Accessibility entails smart city solutions to accommodate the needs of people with disabilities and the elderly by integrating accessible design principles in digital infrastructure (Caragliu et al., 2011). Targeted policies for marginalized communities facilitate tailored interventions, such as subsidized housing and access to affordable smart utilities, ensure that low-income communities are not excluded from the benefits of urban digitization

(Giffinger et al., 2007). Equity and inclusion are not merely ethical imperatives but also practical necessities for the sustainability and resilience of smart cities. By addressing these concerns, cities can ensure that technological advancements lead to balanced and inclusive urban growth.

METHODOLOGY

This study employs a qualitative research design to examine how the transition from New Public Management (NPM) to Digital Public Administration (DPA) has influenced the development of super smart cities. A qualitative, exploratory approach is most suitable for this study, as it seeks to understand complex governance transformations rather than quantify their effects (Creswell & Poth, 2018). Qualitative research allows for an in-depth examination of how technological advancements in public administration are shaping governance structures in super smart cities. The study focuses on analyzing narratives, policies, and expert discussions rather than statistical relationships. Given the evolving nature of digital governance and smart city initiatives, a qualitative approach enables a flexible, interpretative analysis of policy shifts and emerging governance models (Yin, 2020). The literature review establishes the conceptual foundation for analyzing smart city governance and technology's role in shaping digital public administration. Policy documents provide valuable insights into how governments operationalize digital governance models, while industry reports highlight technological advancements and challenges in implementing super smart cities (Kitchin, 2015). The study adopts thematic analysis to systematically identify, code, and categorize recurring themes across the literature and policy reports (Braun & Clarke, 2006). Thematic coding enables the extraction of patterns related to governance evolution, technology adoption, and citizen engagement.

To maintain credibility and reliability, the study employs triangulation, using multiple sources; academic literature, policy documents, and governance reports to validate findings (Lincoln & Guba, 1985). Expert reviews from scholars and practitioners in digital governance further ensure the robustness of interpretations. Additionally, the research process follows rigorous documentation to maintain transparency in data collection and coding. Since the study relies on secondary data, ethical concerns are minimal. Additionally, the study avoids misrepresentation of policy documents and ensures objectivity in the analysis.

FINDINGS

A comprehensive thematic analysis of policy documents from Zimbabwe and other countries reveals critical insights into the implementation of smart city technologies and Digital Public Administration (DPA) practices. This analysis focuses on five key themes: governance evolution, challenges and risks, policy implications, technological innovations, and a framework for integrating DPA to support equitable development of super smart cities.

Governance Evolution

In Zimbabwe, the "Smart Zimbabwe 2030 Master Plan" outlines a strategic framework to leverage Information and Communication Technologies (ICTs) for national development, aiming to transform the country into an upper-middle-income economy by 2030. This plan emphasizes the integration of ICTs across various sectors to enhance service delivery and economic growth. Internationally, countries like South Korea have institutionalized smart city initiatives, establishing dedicated agencies and legal frameworks to oversee and implement smart city projects. This structured approach has facilitated coordinated efforts and resource allocation, contributing to the successful development of smart cities.

Challenges and Risks

Implementing smart city technologies presents several challenges. In Zimbabwe, issues such as inadequate infrastructure, limited financial resources, and concerns over data privacy and security have been identified as significant barriers. Additionally, the lack of public awareness and engagement poses challenges to the adoption of smart city initiatives. Globally, challenges include managing the vast amounts of data generated by smart city technologies, ensuring interoperability between different systems, and addressing cyber security threats. Moreover, there is a risk of exacerbating social inequalities if access to smart city benefits is not equitably

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distributed.

Policy Implications

The development of comprehensive policies is crucial for the successful implementation of smart city initiatives. In Zimbabwe, the alignment of the National ICT Policy (2022-2027) with the Smart Zimbabwe 2030 Master Plan underscores the government's commitment to integrating ICTs into national development strategies. This policy coherence is essential for providing clear guidelines and fostering an enabling environment for smart city projects. policy frameworks that promote public-private partnerships, standardize data governance practices, and ensure citizen participation have been effective in advancing smart city initiatives. For instance, the European Union's policy recommendations emphasize the importance of collaborative approaches and the need for policies that support innovation while safeguarding public interests.

Technological Innovations

Technological advancements are at the core of smart city development. In Zimbabwe, initiatives such as the Zimbabwe Smart Sustainable Cities Initiative aim to harness technologies like biometric surveillance systems to enhance urban management and security. However, these initiatives have faced criticism from digital rights activists concerned about potential privacy infringements. Globally, innovations such as the Internet of Things (IoT), artificial intelligence (AI), and blockchain are being integrated into urban systems to improve efficiency and service delivery. For example, smart grids utilizing IoT devices have been implemented to optimize energy consumption and reduce costs in various cities.

DISCUSSION

The integration of Digital Public Administration (DPA) practices into smart city development is a multifaceted endeavor that necessitates a comprehensive understanding of various theoretical frameworks. This discussion delves into the implications of digitalization on smart city technology adoption, examines the role of technological enablers and barriers in the transition from New Public Management (NPM) to DPA, and explores the application of a proposed framework in real-world scenarios to foster equitable super smart cities.

Implications of Digitalization on Smart City Technology Adoption

Digitalization has emerged as a pivotal force in transforming urban governance and service delivery. By leveraging digital technologies, cities can enhance operational efficiency, improve citizen engagement, and promote sustainable development. The adoption of smart city technologies, such as the Internet of Things (IoT), artificial intelligence (AI), and big data analytics, enables real-time monitoring and data-driven decision-making, leading to more responsive and adaptive urban management. For instance, the implementation of IoT devices in traffic management systems can optimize traffic flow and reduce congestion, thereby improving urban mobility (Maccani et al., 2013).

However, the digitalization process also presents challenges. Issues related to data privacy, cybersecurity, and the digital divide can hinder the widespread adoption of smart city technologies. Ensuring that all citizens have access to digital services is crucial to prevent the exacerbation of existing social inequalities. Moreover, the rapid pace of technological advancement necessitates continuous updates to infrastructure and skills, posing a significant challenge for public administrations (Maccani et al., 2013).

Technological Enablers and Barriers in the Transition from NPM to DPA

The shift from New Public Management (NPM) to Digital Public Administration (DPA) represents a paradigm change in public sector governance. NPM emphasizes efficiency, performance measurement, and market-oriented reforms, often leading to fragmented service delivery. In contrast, DPA focuses on integrating digital technologies to create more cohesive, transparent, and participatory governance structures (Meijer & Bolívar, 2016).

Technological enablers play a crucial role in facilitating this transition. The deployment of interoperable digital platforms allows for seamless communication and data exchange between different government departments, enhancing coordination and reducing redundancy. Advanced data analytics can provide insights into citizen needs and service performance, informing policy decisions and resource allocation. Furthermore, digital tools can facilitate citizen engagement, enabling more inclusive and participatory decision-making processes (Meijer & Bolívar, 2016).

Conversely, several barriers can impede the transition to DPA. Legacy systems and outdated infrastructure may not support new digital applications, necessitating substantial investments in modernization. Resistance to change among public sector employees and a lack of digital skills can also hinder the adoption of new technologies. Additionally, concerns over data security and privacy can limit the willingness of both citizens and administrators to embrace digital solutions (Meijer & Bolívar, 2016).

Framework for Integrating Digital Public Administration (DPA) Practices

To support the equitable development of super smart cities, a comprehensive framework for integrating DPA practices is essential. This framework should include the following components and strategies:

1. Inclusive Policy Development: Formulate policies that ensure equal access to smart city services for all citizens, addressing potential digital divides and promoting social equity.

2. Robust Data Governance: Establish clear guidelines for data collection, storage, and usage, ensuring data privacy and security while enabling data-driven decision-making.

3. Public-Private Partnerships: Encourage collaboration between government entities, private sector companies, and civil society organizations to leverage resources and expertise.

4. Citizen Engagement Platforms: Develop digital platforms that facilitate citizen participation in governance processes, enhancing transparency and accountability.

5. Capacity Building: Invest in training programs to enhance the digital literacy of public officials and citizens, ensuring effective utilization of smart city technologies.

6. Sustainable Infrastructure Development: Prioritize the development of sustainable and resilient infrastructure that can support advanced technologies and adapt to future needs.

Application of the Proposed Framework in Real-World Scenarios

The proposed framework for integrating DPA practices into smart city development encompasses several key components: inclusive policy development, robust data governance, public-private partnerships, citizen engagement platforms, capacity building, and sustainable infrastructure development. Applying this framework in real-world scenarios involves a strategic and context-specific approach.

1. Inclusive Policy Development: Governments should formulate policies that ensure equitable access to smart city services. This includes addressing the digital divide by providing affordable internet access and digital literacy programs, particularly targeting marginalized communities. For example, implementing community Wi-Fi initiatives in underserved areas can promote digital inclusion (Maccani et al., 2013).

2. Robust Data Governance: Establishing clear guidelines for data management is essential to protect citizen privacy and build public trust. This involves implementing data protection regulations, ensuring transparency in data usage, and enabling citizens to have control over their personal information. The General Data Protection Regulation (GDPR) in the European Union serves as a model for comprehensive data governance (Meijer & Bolívar, 2016).

3. Public-Private Partnerships: Collaborations between government agencies, private sector companies, and non-profit organizations can leverage diverse resources and expertise. For instance, partnering with technology firms can facilitate the development and deployment of innovative solutions, such as smart energy grids or

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intelligent transportation systems (Maccani et al., 2013).

4. Citizen Engagement Platforms: Developing digital platforms that facilitate citizen participation can enhance transparency and accountability. Tools such as mobile applications for reporting municipal issues or online portals for public consultations enable citizens to actively engage in governance processes (Meijer & Bolívar, 2016).

5. Capacity Building: Investing in training programs to enhance the digital competencies of public officials and citizens is crucial. This includes offering workshops, online courses, and certification programs focused on digital skills and literacy (Maccani et al., 2013).

6. Sustainable Infrastructure Development: Prioritizing the development of infrastructure that supports digital technologies and is resilient to future challenges is essential. This encompasses building energy-efficient data centers, deploying smart utility systems, and ensuring that infrastructure can adapt to emerging technologies (Meijer & Bolívar, 2016).

Study Limitations and Future Research Directions

While this analysis provides valuable insights into the integration of DPA practices in smart city development, it is not without limitations. The rapidly evolving nature of digital technologies means that findings may become outdated as new innovations emerge. Additionally, the diversity of urban contexts implies that strategies effective in one city may not be directly applicable to another.

Future research should focus on longitudinal studies to assess the long-term impacts of DPA integration on urban governance and service delivery. Comparative studies across different cities and regions can also provide a deeper understanding of how contextual factors influence the success of smart city initiatives. Furthermore, exploring the role of emerging technologies, such as blockchain and digital twins, in enhancing DPA practices offers promising avenues for future investigation (Maccani et al., 2013).

Policy and Practical Recommendations

Based on the findings of this study, several policy and practical recommendations can be proposed to facilitate the effective integration of Digital Public Administration (DPA) practices into smart city development.

Strengthening Institutional Frameworks

Governments should establish dedicated smart city governance bodies to oversee the implementation of digital public administration strategies. These institutions can coordinate efforts across various sectors, ensuring a holistic and integrated approach to urban digitalization. Countries such as Singapore and South Korea have demonstrated success in this area by creating centralized smart city management agencies (Meijer & Bolívar, 2016).

Enhancing Digital Infrastructure

Investing in robust digital infrastructure, including high-speed broadband networks, cloud computing facilities, and cybersecurity systems, is crucial for supporting smart city initiatives. Governments should collaborate with private sector stakeholders to develop scalable and resilient digital infrastructures that can accommodate future technological advancements (Maccani et al., 2013).

Developing Inclusive Smart City Policies

Policy frameworks should emphasize inclusivity by ensuring that digital transformation efforts benefit all segments of society. This includes implementing measures to bridge the digital divide, such as subsidized internet access for low-income households, digital literacy programs, and assistive technologies for persons with disabilities (Meijer & Bolívar, 2016).

Promoting Public-Private Partnerships (PPPs)

Governments should foster partnerships with technology firms, academic institutions, and civil society organizations to leverage expertise, innovation, and financial resources. Successful PPPs have been instrumental in deploying smart solutions in cities like Barcelona, where collaboration with tech firms has facilitated the development of open data platforms for urban management (Meijer & Bolívar, 2016).

Ensuring Data Privacy and Cybersecurity

Establishing comprehensive data governance frameworks is essential to protect citizen privacy and mitigate cybersecurity threats. Governments should implement stringent data protection regulations, conduct regular cybersecurity audits, and promote awareness campaigns on digital safety (Maccani et al., 2013).

Encouraging Citizen Participation and Co-Governance

Smart cities should prioritize citizen engagement by utilizing digital platforms that allow residents to contribute to decision-making processes. Participatory governance models, such as online feedback portals and e-democracy initiatives, can enhance transparency, trust, and accountability in public administration (Meijer & Bolívar, 2016).

CONCLUSION

The transition from New Public Management (NPM) to Digital Public Administration (DPA) represents a significant paradigm shift in urban governance. Digitalization has proven to be a transformative force, enabling smart city technologies to enhance efficiency, transparency, and service delivery. However, the successful implementation of smart city initiatives depends on overcoming challenges such as governance gaps, digital divides, and cybersecurity risks. By applying a structured framework that integrates inclusive policies, robust data governance, technological infrastructure, and multi-stakeholder collaboration, cities can create more equitable and sustainable smart urban environments. Future research should continue exploring innovative technological solutions and best practices for integrating DPA in smart cities worldwide.

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