

Smart City Governance in South African Municipalities: A Quest for Methodological Framework

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Abstract

In developing World, some cities have a plethora of socio-economic and administrative complexities which smart city agenda has specific and measurable capacities to resolve. Yet, institutions of governance in South Africa seems not to have working methodology for identifying what is needed to be institutionalised by government and the expected roles of the citizens towards the enhancement of smart city governance. While, the national and provincial governments have begun to provide e-services as agenda for smart city administration, with less emphasis on the complementary roles of citizens for sustainable and resilient smart city governance. Currently, municipal governments are stressing the development of cross-border models of smart city governance. Hence, methodology becomes imperative for identifying most appropriate steps and actions to be taken by governmental organisation, the citizenry and technology to be used for government-citizens collaboration towards the governance of smart cities, either in single municipality, dual or multi-municipality linkages. Hence, this paper focusses on which methods can enhance the provisioning of functional service co-production between citizens and government at the lowest ebb of governmental administration. It also investigates the steps or methods which can enhance the components of smart governance in providing functional service co-production and alternative governance models required for smart cities.

Keywords: Smart City Governance, Collaboration, Governance, Innovation, e-Government

1. Introduction

Many cities in the world struggle with implementing an ICT agenda for governance objectives. The growth of cities worldwide has shown how ecological, socio-cultural, and economic values influence their trajectory (Inayatullah, 2011). Nevertheless, there has been an ongoing discussion about smart city governance, particularly focused on developing solutions that address the current demands of communities while also considering their future needs. The existing body of research has shown the understanding and objectives of smart city governance in relation to its many elements and dynamics, as well as its significance for urban sustainability (Paskaleva, 2009; Roman and Miller, 2013; Yigitcanlar and Lee, 2014, Sampson, 2017). Several research have continuously highlighted the importance of ICT-enabled cooperation and its understanding and consequences (Winters, 2011; Lazarious and Roscia, 2012; Hollands, 2015). However, there is currently a lack of focus on the techniques of incorporating citizens-government interaction as the central aspect of smart city administration.

Furthermore, there are noticeable variations in the organizational framework of smart city governance across different cultures, which may be attributed to the varying degrees of technical progress within the

government and the amount of adherence to information and communication technology (ICT) by the population (Meijer and Thaens, 2016). In the developing world, several cities have many socio-economic and administrative challenges that may be effectively addressed via the implementation of smart city initiatives, which provide distinct and quantifiable solutions (Sampson, 2017). However, it seems that governance institutions in the Global South lack an effective framework for determining what needs to be institutionalized by the government and the specific responsibilities that citizens are expected to play in improving smart city governance.

In smaller cities, the government has started offering electronic services as part of its smart city administration strategy. However, there is less focus on the involvement of people in supporting sustainable and resilient governance in smart cities. Presently, prominent urban areas are emphasizing the advancement of transnational frameworks for intelligent urban government (Yigitcanlar and Lee, 2014). Therefore, it is crucial to have a methodology in place to determine the most suitable steps and actions that should be taken by government organizations, citizens, and technology for the collaboration between government and citizens in the governance of smart cities, whether it is within a single state or involves multiple states.

A smart city is a result of effective ICT governance practices. In the developing world, several cities possess many socio-economic and administrative intricacies that may be effectively managed via the implementation of a smart city agenda. Nevertheless, research has examined the abilities of smart city government in public affairs, specifically emphasizing the utilization of ICT technologies (Walters, 2011; Hong, 2015; Zheng, 2015; Meijer, 2016; Sampson, 2017). However, there is a widespread skepticism over the many methods used to include technology in order to improve residents' participation, which is a crucial aspect of smart city administration. Studies have not specifically examined the methods used for citizens' involvement in the smart city agenda, the establishment of data, institutional, and legal capabilities for smart cities that prioritize people, and the integration of differing values across different social groups.

The lack of information in this area motivates this research effort to enhance smart city governance by analyzing the necessary measures for government organizations and citizens to use urban technology. The governance of smart cities is a systematic process that involves evaluating the strengths, weaknesses,

opportunities, and threats (SWOT analysis) of cities. This paper focuses on the dedication of government organizations and the ability of citizens to adapt to the use of information and communication technology (ICT) in relation to the various aspects of smart city development. Therefore, this paper concentrates on identifying approaches that might improve the facilitation of functional service co-production between people and government. Therefore, this research aims to explore the processes or approaches that may improve the elements of smart governance in order to provide functional service co-production and alternative governance models necessary for smart cities.

2. Literature Review

Smart city governance is widely recognized as a key aspect of contemporary urban development. To meet the research topic stated above, this study offers to undertake a comprehensive literature review. Cooper and Hedges (2009) established the issue of formulation which has been rationally stated in the backdrop and description of research topic. Additionally, this article provides a comprehensive literature evaluation of current research works on this subject area. A comprehensive analysis of existing literature will not only allow for the identification of current knowledge on smart governance and its impacts, but also give a more accurate assessment of the usefulness of different research methods for cities in the developing world. This literature review creates a series of principles that outline the criteria for determining the eligibility of studies and reports. These criteria include the subject and search keywords for the conceptual review, as well as the research and empirical analysis.

To cover all dimensions of this paper in an integrated way, this study combined search terms: e-governance participation, e-governance sustainability, citizen e-participation urban sustainability, smart city participation sustainability, smart city governance, city participation ICT sustainability, ICT governance processes, governance e-collaboration citizen sustainability, smart city citizen sustainability, urban technology, e-services, e-participation co-creation sustainability and collaborative e-governance. The aim is to find articles dealing with the topic in its entirety, and addressing, in particular, the relationship between smart governance and sustainability, rather than its distinct elements separately (such as collaboration, governance, innovation, e-government, participation, sustainability, etc.).

The bulk of smart city research focuses on conceptualization—on mapping the meanings,

components, and goals of the smart city from the perspectives of particular fields of study, such as public administration, information science, and urban development (Meijer and Thaens, 2016; Bolívar and Meijer, 2016; Krenjova and Raudla, 2017; Bifulco et al., 2015; Hollands, 2015). Although these studies consider interactive governance to be an essential component of smart cities, they fail to examine methodology in any great depth (GilGarcia et al., 2015; Paskaleva, 2009; Lin and Geertman, 2016; Hamza, 2015). This study includes the review of large number of existing studies with a goal of covering the full breadth of the research field to compensate the identified shortcomings in scope and depth in the scientific literature.

3. Theoretical Framework

This article utilizes the theoretical framework of smart city government based on the public value approach. Adopting a public value-based approach to smart city evaluation enables us to effectively deal with the complex, interconnected, and ever-changing structure of smart city government. Additionally, it enables us to understand the changing nature of the smart city ecosystem (Baccarne et al., 2014), where performance outcomes may be used to allocate resources and modify methods in order to consistently enhance the production of public value (Epstein & Yuthas, 2014).

Also, it allows us to emphasize the crucial involvement of residents in the decision-making process, granting them an active role in shaping, implementing, and assessing the city's policies and services (Savoldelli, Codagnone, & Misuraca, 2014). Citizens' acceptance of a service is affected by their judgments of its worth and the extent to which the decision-making process is transparent (Feeney & Welch, 2012; Van Ryzin, 2009). Citizens' trust in policy makers and public administration is enhanced by positive perceptions of a service's ability to provide public value, as well as the transparency and accountability of the decision-making process. Additionally, the engagement of citizens and other urban stakeholders contributes to this increased trust (Savoldelli, Misuraca, & Codagnone, 2014; Welch, 2012). Additionally, it may encourage a city to embrace and implement various services (Cosgrave, Tryfonas, & Crick, 2014; Feeney & Welch, 2012; Savoldelli, Codagnone & Misuraca, 2014).

Smart governance refers to the integration of technology and government in the governance process. From a technological perspective, smart governance refers to the integration of several societal components into a novel ecosystem. This includes the use of modern e-commerce technology and government e-government platforms to effectively

address public health disasters and emergencies. Rapid incident reaction is crucial for the local government to achieve a modernized form of governance (Jinjun, 2014). Thus, technology serves as the foundation of intelligent government. The local government can promptly comprehend the issues that occur from the use of diverse contemporary technology.

The main issue is to promptly and effectively address the requirements of the general public, and finally accomplish the objective of transparent, inclusive, intelligent, and efficient government. However, while considering the matter more profoundly, intelligence serves just as a tool for establishing efficient governance, while the use of contemporary technology aims to more effectively address the challenges encountered in government administration (Dongmei, 2015; Jun, 2018). Smart governance refers to the integration of technology and government in the governance process. The essence of technology's functionality rests in the synergistic integration of contemporary technology and local government operations. "Smart governance" refers to the ability of the local government to effectively manage a wide range of services.

Smart governance prioritizes catering to the distinct service requirements of diverse persons, in contrast to the conventional grassroots government governing approach. By integrating advanced technology and effective governance mechanisms, it is possible to maximize the fulfillment of everyone's interests. This, in turn, contributes to enhancing the reputation of the local government, improving the quality of services provided, and increasing public satisfaction (Liren, 2016). The essence of grassroots government's smart governance is to enhance the quality of services provided to the local population and to establish a contemporary service-oriented government that successfully meets the diverse and multi-level requirements of the people.

Smart governance refers to a kind of government that prioritizes the needs and interests of the people. The main objective of the grassroots government is to cater to the general population. The effective administration of local government must prioritize the concept of "people-oriented" by placing utmost importance on respecting the interests of the people and opposing any actions that disregard or undermine their well-being. This exemplifies the embodiment of values that prioritize the well-being and interests of humans (Dongmei, 2015; Changbo, 2018). Effective governance prioritizes the interchange of information and emotional contact between individuals, as well as between the government and the general population. It aims to create a compassionate society that supports the idea of serving the people (Shuigen, Lidong &

Jingrui, 2015). The core principle of "smart governance" is a focus on people, and this people-centric approach is a fundamental prerequisite of the scientific development philosophy. Simultaneously, individuals are the paramount and dynamic driving force in the development of society. In order to encourage the development of "smart governance" at the local level, it is essential to fully use the involvement and proactive efforts of people and non-governmental groups.

3.1 Smart City Governance in South African Municipalities

Currently, South Africa lacks a comprehensive national smart city policy, resulting in the local level taking the lead in the transition towards smart city designation. The Integrated Development Plan (IDP) is the primary legally mandated governing tool for municipalities. Every municipality is required to create, approve, and execute an Integrated Development Plan (IDP) every five years to fulfill its broader constitutional responsibilities (Yang, 2016). The IDP was created in 2000 to integrate several levels of government in development planning, specifically aiming to address the segregation and division inherent in the apartheid spatial planning strategy. Nevertheless, the IDP has increasingly become inward-looking in its implementation and is primarily used by local authorities to strategize and guide future growth, without effectively incorporating the various tiers of government (Xiufang, 2019).

Within the framework of these laws, the concept of a smart city for a municipality may be partially expressed in the city's Integrated Development Plan (IDP), with more detailed goals and actions outlined in a separate plan. The IDP serves as the comprehensive structure for the development of the region and employs a participatory approach to engage locals (Xuling, 2019). Hence, for smart city programs to become an essential part of the city's progress, it is crucial to ensure that smart city goals and ambitions are explicitly included and merged into the Integrated Development Plan (IDP). Smart city projects in South Africa mostly revolve on the use of information and communication technology (ICT). These initiatives are closely connected to the municipality's organizational culture, goals, objectives, and strategic vision. The commitment to that goal is shown via the distribution of resources and the development of capabilities.

The notion of a smart city was first introduced in Cape Town's 2002 Integrated Development Plan (IDP) and later in Johannesburg's 2013 IDP. Cape Town aimed to become a smart city, with a focus on leveraging technology to enhance the connectedness

and efficiency of government officials and better accessibility of public figures to the general public (Jun, 2018). The 2003 and 2008 IDPs lack substantial mention of smart initiatives, however this does not imply that policymakers were unconcerned about ICT. Cape Town quickly formed partnerships with commercial entities to foster the growth of technology hubs (Sampson, 2017). The growth in smart city dimensions since 2013 signifies a shift in the perception of cities, moving away from a focus on economic growth towards the establishment of technology hubs that support economic development and enhance transportation systems by improving traffic flow and providing real-time public transport information.

The 2017 IDP only focused on gathering data on the expectations of residents in relation to smart governance. The 2013 Integrated Development Plan (IDP) in South African municipalities defined a smart city as a means to provide tailored and efficient services to inhabitants in a sustainable manner. The 2017 IDP defines a smart city as the use of data and information technology to enhance governance. An example of this is the implementation of an Intelligent Operations Centre (Changbo, 2018). This seems to be an expansion of certain initiatives that were not originally included in the development of a smart city. As an example, the IDP has included the Information Technology Department and the Chief Operations Officer since 2003 (Cooper & Hedges, 2009).

The origin of the present smart city idea remains uncertain, since it is unclear whether it is a product of deliberate political action or a consequence of past initiatives that encouraged the city to prioritize smart governance. The level of integration of smart city initiatives and plans into the city's Integrated Development Plan (IDP) determines the official allocation of financial and other resources to smart city and ICT projects (Changzhao & Shuhua, 2011). There is a significant amount of skepticism in South Africa among the governmental, business, and civil society sectors about smart city policies. These strategies are seen as being self-centered or just a way to pay for software licenses. An issue of worry is that the smart cities sector has significant promise for the corporate sector, although it remains underdeveloped and lacking coordination.

South African municipalities have adopted diverse strategies for implementing smart cities, as seen by variations in their legislation, organizational structure, and financial allocations (Das, 2020).

The smart city plan seeks to empower both the municipal administration and its inhabitants to actively participate in achieving its objectives, while also addressing socio-economic circumstances and enhancing service delivery (Bingxuan & Tao, 2016).

According to Xuling (2019), the goal of most South African municipalities is to become a smart city that is adaptable and capable of effectively addressing its current and future difficulties. The Smart City project is a key focus for the city, since it is one of the nine main goals. The municipal administration established a specific strategy for implementing smart city interventions, which was approved by the Mayoral Committee in 2013 (Clement, Manjon & Crutzen, 2022). Integrating a Smart City vision into the IDP implies the allocation of a budget, however this does not guarantee the excellence of the resulting initiatives.

A smart city is a city that uses information technology and data to enhance the effectiveness of urban services and infrastructure, while also encouraging the growth of creative small companies. The revised strategy of the Smart City Office states that South African municipalities are undergoing digital transformation in order to become citizen-centric, inclusive smart cities. These cities will make decisions and govern through technologically enhanced engagement with citizens, who will have universal access to services and information. This will contribute to pro-poor socioeconomic development and efficient service delivery, making the city safe, sustainable, liveable, and resilient (Lin & Geertman, 2015). The smart city policies focus on enhancing public services via the use of technology and tackling wider concerns by establishing collaborations with knowledge partners, technological firms, and academic organizations.

South Africa prioritizes ICT operations with a focus on digital and networking infrastructure. The connection between this and urban and social development agendas is ambiguous (Meijer, 2016). The municipality seems to be implementing a policy that prioritizes enhancing the city's functionality via the use of technology. Officials emphasize the adoption of a digital city plan rather than a smart city strategy (Xiufang, 2019). The smart city project, created in 2013, describes smart governance as the use of digital governance initiatives that utilize information and communication technology (ICT) to enhance the delivery of services. It fosters creativity and enhances engagement between citizens and the government. The objective is to enhance the digital infrastructure by implementing a government-provided fiber network and promoting digital inclusiveness. The primary emphasis is on deploying IT infrastructure in public areas like municipal libraries (Meijer & Thaens, 2016). The objective is for municipalities to become the most interconnected city in Africa, with a particular emphasis on digital government, digital citizenry, digital infrastructure, and digital inclusion. Smart governance aims to

enhance security and police effectiveness by leveraging technology, optimize transportation efficiency, digitize procurement processes to increase transparency in the public sector, and improve monitoring and evaluation efficiency (Paskaleva, 2014; Sampson, 2017). Another significant area of emphasis is infrastructure, with the goal of enhancing public access to digital services to facilitate a more inclusive and participatory governing process.

The placement of smart city projects inside a city's organizational structure may indicate the underlying governance reasons or political intentions. Smart city initiatives need collaboration across several ministries and stakeholders, pooling together their human and financial resources (Walters, 2011). The smart city effort is spearheaded by the Information and Technology Services (I&TS) section of the Infrastructure Branch, situated inside the Corporate Services Unit. The Corporate Services department is accountable for implementing the city's strategic plans and governance frameworks, as well as managing the use of data. In 2019, the I&TS Department initiated a comprehensive effort to undertake smart city development (Mahesa, Yudoko & Anggoro, 2019).

The budget for the smart city agenda is primarily aimed at harmonizing with the Integrated Development Plan (IDP) and prioritizing innovation and efficiency via the implementation of a smart city program. The majority of the money is allocated towards increasing ICT equipment and software, as well as boosting access to ICT infrastructure, including the provision of free Wi-Fi services (Jun, 2018). The budget is anticipated to gradually rise over time. Financial resources are dedicated to enhancing the system for documenting and overseeing council and committee actions, as well as developing a more intelligent and streamlined procurement procedure. A portion of financial resources is dedicated to the implementation of intelligent infrastructure, particularly in the energy services sector, via the use of smart and automated prepayment meters.

3.2 Methodological Framework for Smart City Governance in South African Municipalities

Smart governance is a novel governance paradigm that relies on information technology, with the advancement of emerging technologies being the central factor in driving smart governance forward. Smart governance in urban community governance primarily involves utilizing the Internet, big data, artificial intelligence, and the Internet of Things, along with other emerging technologies. This results in a diverse range of governance practices in areas such as intelligent security, intelligent decision-making, comprehensive governance platforms, property

management, and community public services (Yigitcanler & Lee, 2014). The widespread use of information technology is essential for advancing grassroots smart governance in the context of intelligent government. Undoubtedly, when new technologies become part of the intricate landscape of intelligent governance, they will inevitably face technical obstacles (Zheng, 2015; Yang, 2016).

Social variables often have an impact on the precision and genuineness of new technology. Hence, it is essential to progress in terms of both "knowledge" and "technology". Continuous improvement of the support capacity of science and technology is essential. This includes enhancing the knowledge supply capacity of smart governance, strengthening the ability of data collection and analysis, and providing more scientific and accurate decision-making data. It is important to promote the construction of a science and technology governance system, deepen the integration of smart governance and science and technology governance, ensure the objectivity and accuracy of data, and reduce the risk associated with data use. The deep integration of smart governance with the new technological revolution can only be achieved via the acceleration of innovation in smart governance systems and mechanisms. In the current period of rapid technological advancement, the field of technology is always evolving. In order to effectively rule in this new era, it is necessary to comprehensively redesign the plan for intelligent governance (Lazarious & Roscia, 2012).

Primarily, it is imperative to prioritize the advancement of technology through a comprehensive and strategic approach. This entails gaining a holistic understanding of intelligent governance by considering integrity as a key perspective. Additionally, it is crucial to establish a sustainable mechanism that connects grassroots governance with national governance (Hollands, 2015). By implementing an effective coordination mechanism, we can attain a well-organized system of intelligent governance, foster the harmonization and consolidation of local governments, prioritize the resolution of challenges and obstacles in grassroots governance, and actively advance the pioneering role of pilot initiatives (Hongs, 2015). The second objective is to build and enhance the relevant legal and regulatory framework for intelligent governance, and expedite the process of legalizing "smart governance". The legalization of smart governance in the new era should incorporate the idea of wisdom, redefine the meaning of smart governance, promote smart governance as a necessary aspect of local governance, and establish the principles and values of smart governance with distinct Chinese characteristics

(Inayatullah, 2011; Paskaleva, 2014; Das, 2020). By enacting comprehensive rules and regulations, we must establish rigorous criteria for intelligent governance, clearly define the responsibilities and status of the governing entity, and enhance the efficiency of the governing process.

The key to achieving smart governance in grassroots government lies in ensuring efficient data flow and interoperability. To achieve seamless data flow inside the government, society, and between the government and society, it is crucial to overcome data fragmentation (Gupta, Pfeffer, Verrest & Ros-Tonen, 2015). When promoting grassroots smart governance, it is important to have a methodological framework that guarantees the accuracy and timeliness of grassroots data. This framework should also aim to minimize data lag and expedite the utilization of data resources as a scientific foundation for governance measures such as prediction, supervision, and intervention. To expedite the development of a social data open sharing system, it is essential to integrate and disseminate information while minimizing scientific and technical risks via institutional limits and social oversight (Fromhold-Eisebith & Eisebith, 2019).

In order to address future challenges, it is imperative that we establish a comprehensive and technologically advanced system for grassroots government. This system should integrate information from many sources and facilitate numerous forms of interaction. By transitioning from fragmented grassroots governance to a cohesive and intelligent grassroots governance, we can ensure effective decision-making and efficient management of resources (Clement, Manjon & Crutzen, 2022). Disrupt the current grassroots governance model, facilitate the incorporation of technologies, promptly and effectively identify relevant behaviors and events in various grass-roots governance scenarios, acquire interactive information and data, and generate more precise and valuable information through technical analysis. Establish a data sharing platform to enable timely access to information for grass-roots individuals and enhance their trust in the grass-roots government (Gunawan, 2018).

To achieve effective governance and enhance the modernization of governance capabilities, it is essential to establish a well-designed data processing system and ensure adequate scientific and technological support. Additionally, the presence of scientific and technological talents plays a crucial role in enhancing governance capabilities (Mahesa, Yudoko & Anggoro, 2019). The rapid advancement of science and technology has also resulted in a trend of new technologies that are more scientific, intelligent, and data-driven. Incorporating new technologies into

grassroots government decision-making requires the presence of skilled technical professionals who can create and implement these technologies to achieve the desired outcomes (Pedro & Bolivar, 2018). In the absence of a skilled and capable workforce to provide assistance, the implementation of data-driven intelligent governance may result in instability in water and soil conditions. Hence, constructing a varied and multi-tiered talent support system is a crucial assurance for enhancing the governing capacity of smart cities. To effectively educate and introduce talents, the local government should use innovative approaches to talent training, ensuring that it is current and scientifically grounded (Mashau, Kroeze & Howard, 2021). Furthermore, it is necessary to revamp the incentive structure and provide an advantageous remuneration system and working conditions in order to entice highly skilled individuals to engage in grassroots government governance. This will ultimately bolster the talent pool available for grassroots government positions (Vu & Hartey, 2018).

Ultimately, the methodological framework for smart city government should build and enhance the assessment system for smart governance. Smart governance may be seen as a novel form of governance that incorporates developing technological innovations. By integrating technical aspects, smart governance is able to continuously evolve and enhance its meaning (Williams & Moser, 2019). An instance of data governance, known as "number based governance," is integrated into the process of intelligent governance. This approach relies on data mining and advanced processing and analysis technology. As a result, the concept of intelligent governance is increasingly associated with the use of "number based" technology (Zhang, Bayulken, Skitmore, Lu & Huisingh, 2018). To enhance future research, it is crucial to construct a robust assessment system and set of criteria to assure the sustainable growth of smart governance.

3.3 Concluding Remarks

The progressive advancement of a new wave of information technology, including cloud computing, big data, and the Internet of Things, has propelled humanity into a novel age of interconnected, digitized, and intelligent administration. The use of intelligent governance has greatly contributed to the modernization of local government administration (Mosco, 2019). Opportunities inherently include the presence of risks and obstacles. In order to enhance the governance capability of grassroots government, it is imperative to both mitigate these dangers and acknowledge the problem at hand. The development of infrastructure for local government falls behind the

knowledge and expertise of local governance (Scholl & Alwadh, 2016). Currently, we are in the early stages of implementing smart governance to advance the modernization of local government.

The implementation of its policies and methods is slower than the pace of technology innovation, which will impede the comprehensive advancement of grassroots governance modernization. The distribution of technological resources for smart governance does not attain regional or individual equilibrium, resulting in uneven ownership of information resources by governance bodies of varying social standing (Sampson, 2017). There exists a substantial disparity between the rate at which technology becomes widely used and the pace at which smart governance is developed, and the disparity in data is growing more severe. Furthermore, there is a lack of clear definitions for the terms "smart guidelines" and "smart standards" in the context of smart governance. Consequently, it is not feasible to scientifically evaluate the impact of smart governance on the progress of grassroots government governance modernization (Petzer, Kruger, Sebake & Cooper, 2020). The development of the grassroots government data open system is still ongoing, and there is currently no established standard for data openness. When it comes to measuring the effectiveness of grassroots government governance, there is currently no scientific foundation for doing so.

The extent of data transparency regulated by local governments is insufficient, the frequency of updates to open data is low, and the availability of data resources in high-demand sectors like education and healthcare is limited. This leads to issues such as difficulties in accessing education and healthcare services (Scholl & School, 2014). The limited infrastructure, lack of funding, inadequate human resources, and other deficiencies contribute to a basic level of governance. As a result, the progress of smart governance in terms of technological innovation is slow, and its technical capabilities are insufficient to guarantee the absolute security of public information at the grassroots level in a timely manner. Consequently, some individuals in the general population are hesitant to disclose their information inside the smart governance network as a result of concerns over information security. This, in turn, leads to a loss of confidence in the local government among the public (Das, 2020).

The article proposes a smart governance approach that would assist traditional grassroots governments in enhancing their governing capacities and achieving high service quality. This would result in the establishment of a new form of service-oriented government that meets people's satisfaction.

Smart governance is characterized by the use of scientific methods to enhance the grassroots

government's capacities in governing. It encompasses the following features in its governance process: Smart governance is proactive. Utilizing big data for the purpose of mining and analyzing vast quantities of information enables the generation of forecasts across multiple domains. This, in turn, provides a solid scientific foundation for grassroots government management bodies when formulating future policies, rather than relying on uninformed decision-making. Relying on one's prior experience and intuition may enhance the scientific rigor of decision-making and serve as a foundation for future strategic growth (Testoni & Boeri, 2015). Smart governance is characterized by its capacity for innovation. Smart governance refers to the integration of advanced technology with government practices and attitudes. Due to the low level of digitalization in the grassroots government and the absence of scientific decision-making, the major choices made are mostly procedural in nature. This results in a rigid decision-making approach in governance. By implementing intelligent governance, the integration of big data is facilitated, allowing for the adoption of information-driven decision-making approaches. This leads to the establishment of a contemporary decision-making platform, which in turn promotes innovation in grassroots government decision-making and enhances decision-making efficiency.

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