


Challenges and best practices for e-municipalities



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Background: Electronic-municipality (e-municipality) is a reflection of e-government service in the local sphere of government, described as a way of producing useful information for citizens. Electronic-municipalities play a significant role in delivering effective and efficient services to citizens.

Aim: To analyse the role of electronic municipal systems in improving the general welfare of citizens by means of service delivery. This article clarified the concepts of e-municipality by reviewing relevant literatures and further outlined critical factors that are affecting the implementation and adoption e-municipality intensively.

Setting: The article focused on both international and South African local government best practices of electronic municipal systems. International best practices from developed countries, outline lessons that the South African local government can learn.

Methods: The article used mainly the secondary data analysis, gathered from various sources such as articles, document analysis, government documents, amongst others. The analysis is based on various secondary sources linked to the aim of this article.

Results: Key findings of the study showed that most municipalities particularly in developing countries experience challenges in adopting and implementing e-municipality. The concept of e-municipality has been derived from both global and local contexts.

Conclusion: It concludes that just like any innovation, there are challenges related to the successful implementation of e-municipality, such as the digital divide issue, trust issues and technical, economical and social issues. Recommendations include that the local government should invest more in Information Communication Technologies infrastructure for e-municipality development.

Contribution: The results of this research provides best practices for local government in transitioning to e-municipality, the best practice guidelines provide inputs for decision-making in local government.

Keywords: E-municipality; traditional municipality; information and communications technology; e-governance; e-government.

Introduction

According to Notice 886 of 2017 from the Department of Telecommunications and Postal Services, because of population expansion and growth, the South African government, particularly the local government, is struggling to deliver public services effectively and efficiently and reduce the administrative burden challenges, for example, information leaks. Because every employee has access to every file, the government's information is not secure, because it is not kept in a protected database. There is no secure mechanism in place to transmit the data and paperwork between various governmental entities; hence, files and paperwork are also moved manually using hard copies. Technological advancements like the high mobile penetration rate can help to resolve these issues.

Between 2004 and 2016, there were, on average, 94 protests per year in South Africa, according to Municipal IQ (2017), a research organisation that gathers data on service delivery-related protests against municipalities. This finding suggests that, as Bratton (2012) argues, municipal public service delivery mechanisms are perceived as ineffective, and accountability for service delivery is perceived as lacking in many South African communities. The use of traditional approaches in municipalities increases poor public service delivery. Handwritten records and manual processes are examples of traditional approaches. Traditional systems are regarded as being centralised, which prevents effective democratic participation, reduces public trust in the municipal operations and leads to a high level of dissatisfaction (Mathekgwa & Buccus 2006). Data transfers between

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municipalities and citizens under traditional methods of public service delivery are expensive and time-consuming, because there are some situations where one must travel to another location to obtain or deliver data. Previously, South African municipalities facilitated paper-based service enquiries, which resulted in long queues and huge municipal service backlogs. By demonstrating relevance, impact, social significance and innovation for better services, Twinomurinzi and Visser (2004) argue that governance can be improved through the use of information and communications technology (ICT) for improved municipal service delivery in South Africa that goes beyond traditional approaches, structures or inadequacies and puts citizens first. Prior to the coronavirus disease 2019 (COVID-19) pandemic, most municipalities were using traditional-oriented approaches which mostly concentrated on in-person or on-site services, lacking an integrated hybrid model with integrated technologies for better local administration. During the COVID-19 outbreak, most municipalities implemented ICTs in their municipality to improve the general welfare of the citizens by means of service delivery. The City of Johannesburg used the Joburg website (<https://www.joburg.org.za/>) to inform residents about water and power outages, community events, open positions in government and public appointments (Joseph & Williams 2022). The City of Johannesburg launched the e-Joburg portal to enable citizens to access municipal customer services online, which operates 24 hours a day, 7 days a week. E-municipalities streamline government to ensure quick responsiveness to citizen needs by combining redundant systems, making it possible for citizens to access information, simplify government processes and decrease expenses (Haung, Siau & Wie 2005).

The concept of 'electronic municipality' has been derived from both global and local influences. It has been conceptualised in different contexts. An e-municipality is a reflection of e-government service in the local sphere of government, described as a way of producing useful information for the citizens. An e-municipality incorporates the use of ICTs to improve the general welfare of the citizens by means of service delivery. An e-municipality can be defined as the municipality delivering public services online and realising new technologies. This article aims to outline the role of e-municipalities in improving the general welfare of the citizens by means of service delivery. The increase in demand for public service delivery highlights the insufficiency of traditional municipalities and their service delivery challenges such as poor quality of public services, high cost and decline in revenues. Traditional municipalities and approaches have a poor standard of service delivery, information and administration, as well as a poor use of ICTs. Within municipality activities, satisfaction intensely relies upon the nature in which administration offered, quality of the public services, interaction between various sectors (public and private sectors) and information flow between the municipality and citizens. E-municipalities play a significant role in the decrease of government obligation by introducing electronic administration, delivering public

services online, reducing the expense of the public sector through integrating systems and increasing the accessibility of public services. E-municipalities enforce democratic values such as transparency and accountability by ensuring the accessibility and availability of municipal information (Misuraca 2007:66). Digital divide issues, trust issues and technical, economic and social issues are some of the challenges related to the successful implementation of e-municipality.

Methodology

The article used a qualitative research design in order to gain insight on the best practices and challenges of e-municipalities in the South African and global contexts. This article is theoretical by nature and its justification is based on secondary data such as journal articles, Internet sources and books. Multiple secondary sources were utilised to reduce errors as well as to ensure the validity and reliability of this article. Unobtrusive research techniques were used to analyse secondary data that support the aim of this article. In this article, conceptual analysis reduces misinterpretations of key concepts. This article is qualitative by nature; it is therefore based on secondary data and desktop analysis, and this includes the use of unobtrusive research, for example, conceptual and documentary analyses. New public management (NPM) is used as a theoretical lens for the article. New public management offers a significant body of concepts that form the foundation for many of the current e-government initiatives, such as e-municipalities. International context shows the best practices that the local context can learn from with regard to successful implementation of e-municipalities. Furthermore, the study used international case studies from developed and developing countries to compare the South African local government e-municipalities to international local governments. According to Creswell (2013:97), the case study method explores a real-life, contemporary bounded system or multiple cases over time, through detailed, in-depth data collection involving multiple sources of information, and reports a case description and case themes. This article compared the results with the facts in published literature to fully understand the findings. For the purposes of this article, the multiple-case study methodology proposed by Goodrick (2014:13), namely the collective case study framework, was used to understand the similarities and differences between cases. The use of multiple-case design in this article created a more compelling story, thus making this research more robust. According to Byrne and Charles (2009:56), 'qualitative comparative analysis involves comparing the configurations of different case studies to identify the components that appear to be most responsible for producing specific outcomes'. In addition, comparative analysis provides a contrast of different contexts (Smelser 2003:643).

The article used a systematic literature review (SLR). The SLR is 'a means of evaluating and interpreting all available research relevant to a particular research question or topic area or phenomenon of interest' (Brereton et al. 2007).

The methods used in conducting an SLR include choosing the right sources and keywords, combining the most advantageous keyword strings using logical operators, determining the search areas for articles and carrying out the search to find relevant empirical studies by screening according to predetermined inclusion and exclusion criteria (Dieste, Griman & Juristo 2009). The article picked appropriate sources and key concepts such as e-governance, e-government, e-municipality and traditional municipality; integrated best concepts; established search locations for articles; and carried out the search process to find relevant empirical studies by screening based on precise inclusion and exclusion criteria. Choosing the best information sources (such as digital libraries or bibliographic databases), choosing the fields of the article to search, deciding on the best search string to find relevant empirical studies and then conducting a search are all decisions that go into defining an effective search strategy (Dieste, Griman & Juristo 2009):

A pre-defined protocol is often necessary to reduce the possibility of researcher bias. The main information about the search strategy contained in the protocol include (1) the most appropriate search terms identified, (2) the resources to be searched (including databases, specific journals, and conference proceedings), and (3) the criteria for inclusion/exclusion of studies in the review. (Chiarini et al. 2013:8)

The article has undertaken three stages to the review: firstly, finding the initial list of studies; secondly, evaluating relevance; and thirdly, extraction and analysis of data. This was carried out in accordance with the experimental strategy recommended by Dieste, Griman and Juristo (2009). While searching each database, the following search concepts were utilised: e-governance Or e-government, E-municipality OR ICTs, local government AND traditional approaches, traditional municipality.

In order to locate the initial list of research articles, six website databases were searched after the keywords had been decided (see Table 1). The search took into account titles, key concepts, abstracts and full texts, and it was not restricted by publication year. The following online databases were used: Sage Publications Inc., Google Scholar, CiteSeerX, Wiley Online Library, government websites and ResearchGate.

After carefully reviewing the titles, keywords, abstracts and complete texts, relevant articles were manually chosen from the initial list, while irrelevant articles were eliminated. Evaluating the relevance of the sources included selecting relevant sources gathered in the first stage, which was the initial list. Irrelevant sources were eliminated. The following exclusion criteria were applied to remove irrelevant sources and articles from the initial list: (1) the article did not focus on e-governance, e-government, ICTs, local government, municipalities, service delivery or e-municipalities; (2) the articles were repeating; (3) the articles were not written in English; (4) there was no access to the full articles; (5) abstract and key concepts.

During the extraction stage, important information was taken into account in order to extract and analyse data based on inclusion and exclusion criteria relevant for the article. In addition, it includes removing repeating articles, books, conference papers, outcomes, context and context, location and outcomes the year of publication, adoption, area of application, geographical area, type of communication, outcome measures and results (Racine et al. 2012). In this article, there was no limitation with regard to the year of publication because there are few recent articles that can be used to synthesise and unpack the research topic. Fifty-eight sources were used in the study; these include journal articles, books, official documents, conference papers and online databases (see Figure 1).

Conceptual and theoretical framework

This article conceptualises key concepts for clarity of purpose, as well as to identify the ones suitable for the current study. Concepts are often used interchangeably; this article therefore conceptualises them to reduce confusion.

According to the *South Africa Municipal Structures Act No. 44 of 2003*, a municipality is the institution that consists of political office-bearers, administration of the municipality and the people that live in a particular local or geographic area. In addition, the concept of municipality can be defined as an area which falls within a 'municipal boundary'. The Government of South Africa undoubtedly faces various challenges in delivering services, including

TABLE 1: Initial list of inclusion and exclusion criteria using all relevant sources, irrespective of years of publications. The inclusion criteria entail using any relevant document that unpacks the search topic and achieves the research aim.

Database	Type of document	Filtered by Key Concepts, abstract, title	Total Number	Total number of relevant documents used	Types of sources used	Total Number of Sources Used
Sage Publications Inc	All	E-governance, e-government, ICTs, E-municipality.	15	5	Journal Articles	31
Google Scholar	All	E-governance, e-government, ICTs, E-municipality	87	19	Conference papers	4
CiteSeer	All	ICTs, E-governance, E-services	11	6	Official documents	7
wiley online library	All	E-government, e-governance	7	3	Books	10
Government website	All	Public service delivery, traditional approach, traditional municipalities	121	11	Others (interne sources, notices etc)	6
ResearchGate	Journal	E-municipality, traditional approach, ICTs, service delivery	18	14	-	-
Total	-	-	259	58	-	58

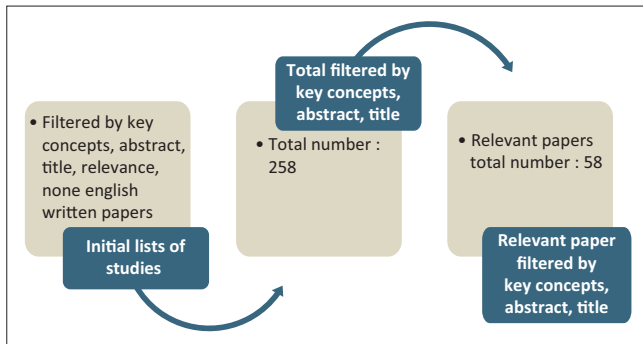


FIGURE 1: Search processes.

slow response rates to citizens' requests, a lack of customer service orientation from public sector staff, limited and inconvenient hours offered by government institutions and long distances to reach government offices (particularly in rural areas). It is argued that local government is at the forefront of understanding citizens' needs and is the 'delivery arm' of government. It is the obligation of municipalities to ensure that there is an improvement in services for underdeveloped communities. This will ensure that there is an equitable provision of services to all citizens (South African Local Government Association [SALGA] 2014).

Traditional municipality can be defined as traditional governance that uses 'paper and pen' to deliver service to the citizens, and 'bureaucratic culture' still prevails. Traditional municipality is characterised by little use of technologies, poor service delivery, customers' dissatisfaction and a lack of auto-control systems. E-municipalities are a subfield in e-government that aim to transform the manner in which the local government and local officials interact with the citizens. Any discussion on e-municipality would be incomplete without e-government. E-municipality is a vital component of e-government and is a project of wider scope that can accelerate municipalities' contribution to national development and welfare in almost all aspects. An e-municipality can be defined as a municipality that delivers online services and realises new technologies (Costake 2007). An e-municipality is the local reflection of e-government services:

E-municipality, aims to be a substantial part in the communication chain of the entire e-government model and it is regarded as a comprehensive implementation towards the national development. E-municipality is a multi-disciplinary model covering fields e.g. public administration, law and business administration, as well as technology based. (Mahallesi & Caddesi 2009:30)

The role of an e-municipality in the context of e-government is to influence citizens to adopt the e-government mechanism. The best practices in the e-municipality model enable successful implementation of e-government. According to Rasoulilian, Bagheri and Rasooli (2012):

The organization process of the e-Municipality at the municipality level basically consists of three dimensions: The automation of finance, staff, editorial department, development planning and similar management processes within the municipality; the

online management of services such as the delivery of complaints, wishes and views of the residents living in the city; requests for information regarding the practices and procedures that are under the authority of the municipality; applications that are submitted to the municipality regarding permits, approvals, legitimations for starting a business and implementing a project; the collection of legal payments by the municipality; and finally the sharing of primary data and information regarding the local governments in association with other public institutions and organizations. (p. 1065)

Heeks (2008:12) described e-government as the use of ICTs within the public sector. E-government delivers public services and information to every citizen effectively and efficiently. E-government includes the use of various technologies, for example, wide area networks (WANs) and Internet, to improve the general welfare of the citizens. E-government builds sound working relationships between different stakeholders, for example, the private sector and government (State Information Technology Agency [SITA] 2002:34). Information and communication technologies are applications that operate through the Internet and technology. Information and communication technologies include television, computers, software, network systems and cellular phones (Rodgers & Streluk 2002:21).

E-governance is the use of ICTs for 'intra-governmental operations'; this includes communication between the three spheres of government, namely national, provincial and local (Department of Public Service Administration [DPSA] 2001:8). 'This includes paperless messaging and reporting; electronic document management and archiving; integrated systems for finance; asset and human resource management (including training)' (DPSA 2001:9). E-governance can be described as the governing of the public sector through ICTs. E-governance is an approach that facilitates government processes through ICTs in order to increase public service delivery (Shailendra, Palvia & Sharma 2007:13). Different theories were developed under public sector reform.

New public management drivers have been the major initiators of the use of ICTs in government. New public management and the efficiency paradigm have been the main drivers for the development of government ICT policies and their evaluation, including its e-government initiatives. As Wilkins (2010:45) pointed out, 'NPM is basically about focusing upon efficiency'. This shows that NPM does not describe what changes are happening inside public sector reform, but it recommends a new approach if government seeks to increase efficiency in service delivery. The core idea of NPM and its relationship to e-government is therefore explained by the potential benefits that ICTs bring to the re-organisation of the public sector's internal strategy for e-municipalities. Building on private sector experience, ICT is recognised as a powerful tool for streamlining, rationalising and transforming organisational processes (Cordella 2007:266). The main aim of e-government is to improve government performance, procedures and the general welfare of the citizens by means of improved service delivery.

It therefore tends to be viewed as a result of the changes made 'by the NPM as an outcome-oriented, demand-driven approach that gives premium to providing high quality service to citizens' (Schedler & Scharf 2001:77).

Comparison between traditional municipality and e-municipality systems

Municipality customers are important to municipality systems, and their interests should be taken into consideration. Therefore, the customers' issues are reflected in the use of traditional methods (pen and paper) and the way the municipality interacts with the citizens. Customer satisfaction and customer maturity are two important aspects of the relationship between the customers and municipality. Customer satisfaction includes ensuring the municipality works better and costs less; the municipal services should be customised on standards such as timeliness, courtesy, accuracy and accessibility. The relationship between customer satisfaction and the traditional system is a direct opposite. Constant customer satisfaction in public service delivery, as well as effective and efficient service delivery, reflect a good system. A traditional municipality is not accessible 24 h a day, 7 days a week (24/7) because of the low use of ICTs (Layne & Lee 2001:124). Customer maturity includes high literacy culture and the ability to use new technologies. Transparency and public participation are key principles for democracy; however, a traditional municipality does not promote engagement principles because of the low use of ICTs, and traditional systems are described as centralised systems, which eradicate public participation (Mathekga & Buccus 2006:12). A traditional municipality uses manual archiving systems which are inaccessible to the citizens. Traditional ways of performing duties take much time, and therefore the speed in which the tasks are undertaken is slow, because traditional systems include manual procedures, visual analyses and manual archives. The cost of services in traditional municipality is high, for example, data transfers between municipalities and other relevant stakeholders between different places within the geographical area. An e-municipality enhances public participation through the introduction of digital platforms such as web pages and social media.

An e-municipality provides municipality customers with accurate and accessible information, simplifies municipal processes and reduces costs by implementing integrated systems. An e-municipality delivers public services effectively and efficiently. An e-municipality is characterised by providing development opportunities especially benefiting rural and traditional communities (Nkohkwo & Islam 2013:253). The goal of an e-municipality is to create a more dynamic government with greater citizen involvement. For local governments to discharge their duties effectively, municipal governments must be able to use information effectively, mobilise data intensively and share the data it produces with the general public (Geymen & Yomralioglu 2010:78):

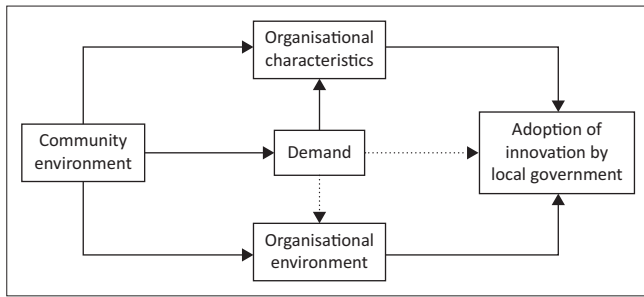
The most important advantage of these systems is that it is easy and clear to access information. More importantly, it aims to help strengthen government's drive towards effective governance and increased transparency to better manage a country's social and economic resources for development. (Bojang & Bwando 2018:6)

Best practices of e-municipalities in South African municipalities

The SALGA celebrates excellence and partnership with In.KNOW.vation (<http://www.salga.org.za/Knowledge%20Hub%20KP.html>) with and municipal innovations. In.KNOW.vation (<http://iKNOW.vation>) aims to accelerate knowledge-sharing and learning to allow for replication of good practices and innovation solutions in line with SALGA's mandate of profiling, knowledge and information sharing (SALGA 2018:11). Viability and Validations of Innovations for Service Delivery Program (VVISDP) is a programme executed by the Department of Science and Innovation (DSI) in partnership with the SALGA and the Department of Cooperative Governance and Traditional Affairs (CoGTA), with financing from the European Union Sector Budget Support Programme and the National Treasury to help municipalities pilot innovation that could improve the general welfare of citizens by means of service delivery (Department of Science and Technology [DST] 2021:1). This call is focused on municipalities that are willing to do the following:

- Participate in the steering and piloting of could improve general welfare for citizens by means of service delivery.
- Adopt innovative methods of service delivery and build their institutional ability to oversee and embrace innovation-based choices, as well as technology-based options.
- Learn by doing and to do things another way.
- Increase their performance through innovation and technology to utilise science, technology and innovation (STI) to influence policy and to make new models or alternatives utilising innovation and technology.
- Support government's work and efforts to establish an enabling environment for innovation uptake in local government (DST 2021:2).

Introducing innovation in the South African local government contributes positively towards building a capable, ethical and developmental state, which is one of the six priorities laid out in the National Development Plan (Vision 2030). The realisation of this priority necessitates that the public sector, specifically municipalities, adopt innovation and use technology to deliver public services effectively and efficiently. There are numerous issues with public service delivery in municipalities, for example, rotting fundamental assistance foundation for water, disinfection, squander the executives and public vehicle. Local government possessed availability models are arising, however have not been completely received. Advancements can likewise add to tending to well-being, development and joblessness challenges (DST 2021:2). Bingham's (1976:213) research on the use of 'technological innovations' in local government in the United



Source: Bingham, R.D., 1976, *The Adoption of Innovation by Local Government* (p. 23). Lexington, Lexington Books

FIGURE 2: A model for the adoption of technological innovation by local government.

States of America (USA) gives significant data and information on e-municipalities. There are three factors contributing to the adoption of innovation by municipalities, namely community environment, organisational environment and organisational characteristics (see Figure 2). When joined with interest for better approaches or new ways for working, innovation is bound to happen.

Bingham (1976:216) notes that the community environment affects innovation adoption significantly, but only indirectly. 'The community environment is a significant determinant of all three intervening variables but is not the direct determinants of innovation adoption.' Importantly, Bingham (1976) found that the most constant relationship in the adoption of innovation by local government was the relationship between the community environment and demand. This environment generates demand variables and works through organisational factors to affect the adoption of innovation:

Organisational environment of its industry, market, etc. For the public organisation, it consists of its relationship with other governmental units, the private sector as it effects the organisation, and other similar entities. In other words, the organisational environment is that environment within which the organisation operates above and beyond the local community. (Bingham's 1976:216)

Governments the nature of the political, legislative and administrative environment at the state level has as a significant influence on individual local authorities. South African mechanisms for revenue sharing and allocations by National Treasury also have an interest and influence the workings of local government organisations. Environmental factors affect the adoption of innovation, because they primarily determine the extent to which extra-organisational resources and information are available to local governments for supporting innovation. Innovation does not happen on its own; it requires special knowledge and funding. Socio-economic issues such as the unemployment rate will negatively influence all phases of innovation adoption.

Organisational characteristics incorporate people who are more educated, more cosmopolitan and more professionally oriented, are those more likely to contribute to the innovation adoption process. Organisational characteristics impacting the innovation process Bingham (1976:12) framed hypotheses

relating organisational characteristics to innovation adoption. These hypotheses were:

[...]he adoption of innovation is positively related to an appointed (versus elected) decision making body. Governmental units directed by elected officials have a high propensity to adopt innovation based on their value. centralised decision making structure is negatively related the adoption of innovation. The level of organisational funding is positively related to the adoption of innovation. The presence of a large number of professionally oriented individuals in an organisation is positively related to the adoption of innovation. (p. 12)

The increased acknowledgment and recognition of various stakeholders of innovation and e-government play a significant role in ensuring success of the e-governments. Regardless of the complexity, municipalities need to 'know more about who their stakeholders are, and what they want, to succeed in e-government service adoption' (Rowley 2011:54). Figure 3 and Figure 4 show examples of South African e-municipality best practices.

International best practices of e-municipalities

Qualitative research was conducted to evaluate dimensions from the chosen municipalities – namely New York City (NYC), New York, USA; the Seoul Metropolitan Government, Korea; Madrid, Spain; and Tallinn, Estonia – by comparing their experience of using e-governance.

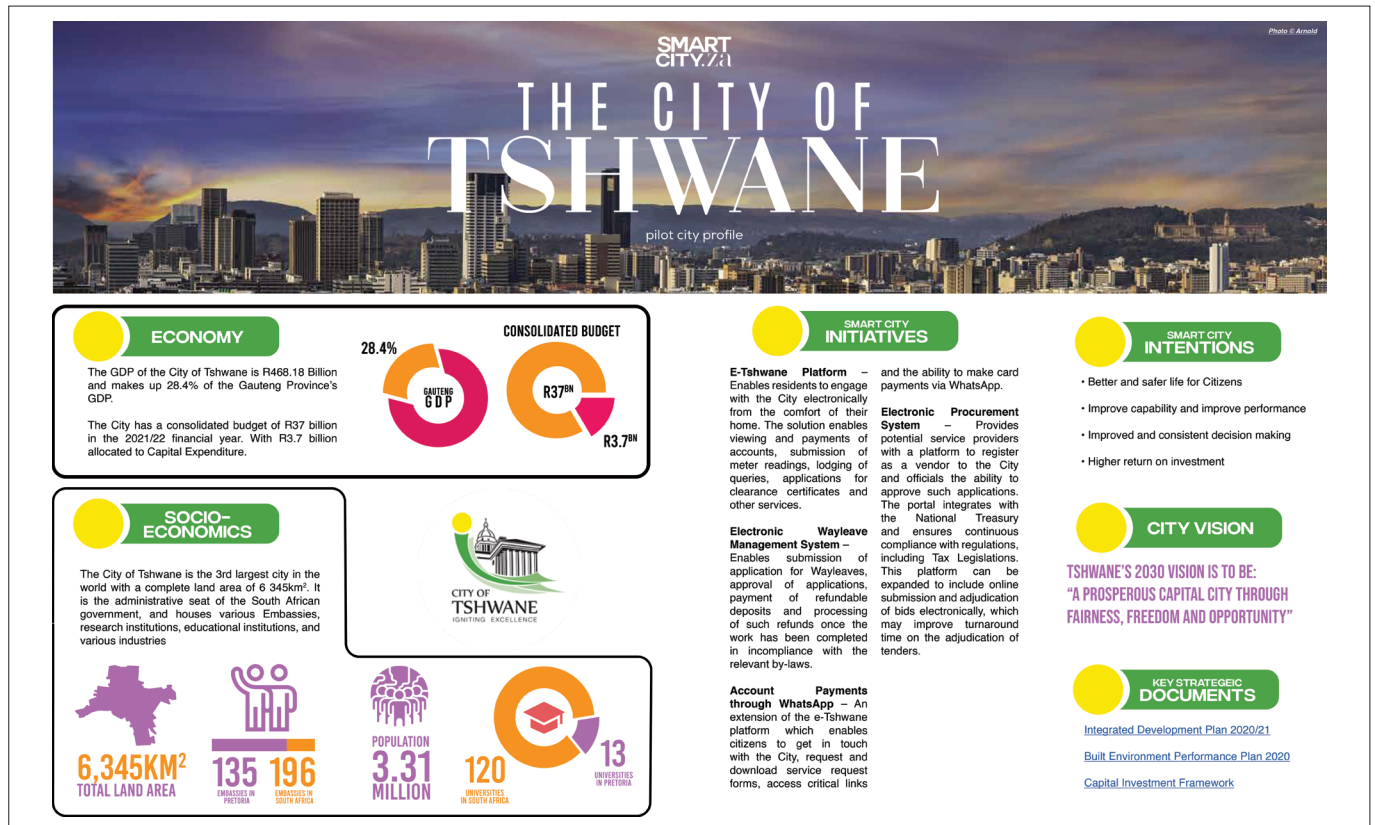
New York City (United States of America)

Emergency services in the local government of NYC are recognised as one of the best practices. NYC311 online was launched in 2009 as a mobile application for the use of citizens to request government information and to file services. The city utilises technology to ensure that important public data is available; this includes NYC311, geocoding, performance and regulatory data. New York City Open Data (<https://opendata.cityofnewyork.us/>) publishes data from NYC311 to the public. Furthermore, the NYC website plays a significance role in providing information related to business, civic services, culture and recreation, education, housing, environment, transportation and social science (Marvin, Luque-Ayala & McFarlane 2015:87). Even though the South African emergency services department delivers on specific legislative mandates delegated to local government, the lesson that can learned from the NYC system is that it offers various public services, for example, alternate side parking (ASP), rather than offering services for health-related emergencies only.

According to Manoharana et al. (2020):

[...]One of the unique features of the NYC website is the 'Connect' facility which integrates all 342 of NYC's official social media channels and provides more avenues for direct communication between citizens and the government. (p. 4)

The city uses social media as a communication tool to make public announcements and to gather citizens' inputs.



Source: Development Bank of Southern Africa (DBSA), 2021, "Smart city" the South African context: Preparing common ground: The four pilot city profiles, pp. 14–15, Development Bank of Southern Africa, Johannesburg

FIGURE 3: The City of Tshwane e-municipality.



Source: Development Bank of Southern Africa (DBSA), 2021, "Smart city" the South African context: Preparing common ground: The four pilot city profiles, pp. 20–21, Development Bank of Southern Africa, Johannesburg

FIGURE 4: The City of Johannesburg e-municipality.

The city government considers citizens to be their eyes and ears for monitoring performance; therefore, the city encourages citizens to send all information that is related to city performance. This sound relationship and connection between the local government and citizens is the outcome of the NYC website (Manoharan et al. 2020:4)

The Seoul Metropolitan Government (South Korea)

Korea introduced an e-governance system for two significant reasons. Firstly, the focus was on achieving effective and efficient public service delivery through service delivery innovation. Secondly, e-governance was introduced as a part of a broader national strategy to use technology to shift Korea's economic paradigm from an industrial-based growth economy to a knowledge-based economy and information society.

Seoul is the capital and largest metropolis of South Korea, with a population of 9.7 million. The Seoul Metropolitan Government is one of the leading local governments in the world in smart administration because it makes use of rapid developments in smart technologies worldwide to realise the corresponding innovations in its public services under the new paradigm of a citizen-centric administration based on communication, transparency, sharing and collaboration (MOGAHA 2008:2). The Special Committee for E-Government (2003:14) indicated that Seoul has established successful participatory governance with the citizens by using technology. Since 2003, Seoul has been ranked first in municipal e-governance international surveys, and during the last decade, Seoul has become the benchmark for different municipalities (cities) globally in digital governance (SCEG 2003:16).

Madrid (Spain)

The progress of e-governance in Spain has undoubtedly been favoured not only by the greater predisposition shown by potential users but also by the planning and legislative efforts made by Spain's public sector. Among researchers and practitioners in public administration (Osborne & Brown 2005:43), 'innovation in the public sector has been a topic of considerable interest'. Innovation in the public sector refers to new processes or organisational change, the process of turning an idea into a service and the support provided to facilitate such a process (Nählinder & Eriksson 2019:443).

As indicated by Clift (2003:Internet Source), e-governance in Madrid focuses on improving legislative choices, increasing public trust in public administration and accomplishing better straightforwardness and accountability of public institutions. Furthermore, Chadwick and May (2003:271) indicated that the Spanish government utilised ICTs to consider citizens' needs and to resolve social problems. As a result, e-governance in Madrid offers new chances to improve administration. The intelligent idea of the web, along with its ability to quicken correspondence, implies it can possibly make the cycle of administration work in a way that is better than before. As indicated by Moon (2003:424), ICTs can help governments to restore public trust in the public sector by

improving straightforwardness, proficiency, adequacy and political participation. Building up a similar idea, Nählinder and Eriksson (2019:443) contend that the implementation of e-governance in the long term ought not to exclusively be viewed as a revolution regarding service delivery but rather as a tool to improve people's authority over public sector.

The lesson learned from the use of ICTs in the municipality or City of Madrid is that it plays a significant role in management, planning and administration. Therefore, the lesson learned is that ICTs in Madrid base their application in public administration having as purpose to contribute positively towards to the utilisation of ICT for:

- improving services and access to information
- improving and simplifying the process of institutional support
- facilitating the establishment of communication channels that can increase transparency and citizen participation (Osborne & Brown 2005:43).

Tallinn (Estonia)

The development of Internet and mobile communication has prompted the development of totally new spaces of business, as well as achieving transformation in how current states are governed. Nowadays, the citizens of a country are primarily connected digitally rather than physically. Estonia is a remarkable country on the planet as far as the speed and level of e-society development are concerned. 'E-Estonia' is the term ordinarily used to portray Estonia's development as one of the most exceptional e-societies in the world – a success that outgrew the partnership between a forward-thinking government, a proactive ICT sector and a switched-on, tech-savvy population. In addition to quick broadband connections, the rapid advancement of this digital society was supported by the 'application of secured data exchange solutions and the introduction of an electronic identity (eID – see <https://etaotlus.politsei.ee/>) – key ICT projects that have been operating smoothly for more than 15 years' Menkhoff (2018:Internet Source). Therefore, e-services have become normal routine for residents of Estonia, for example, 'I-voting, e-taxes, e-police, e-health care, e-notary, e-banking, e-census, e-school and much more'. The broadly acclaimed and announced success of Estonia to transform their public service to online was essentially determined by the widespread utilisation of electronic ID-cards (see <https://etaotlus.politsei.ee/>) (Maaten 2004:83). According to Menkhoff (2018:Internet Source) since 2002, over 1.2 m of these personal ID documents (see <https://etaotlus.politsei.ee/>), 'which are the size of credit cards, have been issued, and they allow inhabitants to digitally identify themselves and also sign for actions or documents'.

Accessibility, interoperability and user-friendliness play a significant role in measuring the success of e-governance. The common denominator is the user. The user is the true decision-maker and the artisan of the successful transition, because technology only exists if everyone adopts it. The capital of Estonia fills in as a 'smart city role model', attracting

the whole country in its wake. The accomplishment of its digital transformation depends on three pillars: availability, 'interoperability, and user-friendly. In 2015, Tallinn made its property (land) register available to everybody online' (City of Tallinn 2020:Internet Source).

AvaLinn (Open City) is used by the to get deliver the feedback related to their city, for example, development projects and town planning. Tallinn gives an enormous number of e-services, also accessible in a mobile version for use on a cell phone or tablet. From these services, lessons can be learned because Tallinn is delivering these services efficiently and effectively using e-governance as alternative service delivery (ASD) to achieve service delivery innovation. For example, 'the official city plan, which remembers nitty gritty and forward-thinking data for the advancement of Tallinn from an urbanistic perspective'. In addition, one of the best practices that Tallinn delivers efficiently and effectively using ICTs is the 'traffic' app, which gathers information on traffic jams or roadblocks in the city centre intersections, utilising cameras. The other best practice of Tallinn in delivering e-services is the 'public transport' app, with schedules, continuous updates and a city map (United Nations 2016:Internet Source). This is only a brief, as Tallinn has no under 86 premium full digital services.

Main challenges of e-municipalities

Just like any innovation, there are challenges related to the implementation and development of e-municipalities. Challenges include the digital divide issue, trust issues and technical, economic and social issues.

Digital divide

The digital divide is the gap between the people with access to ICTs and the Internet and those with little access to technologies. It results from poor physical access to technologies and the lack of skills required to fully participate in the utilisation of ICTs. The digital divide is the failure to effectively participate as a digital citizen. The dimensions of the digital divide particularly include the issues of accessibility (ICT infrastructure), skills (computer literacy) and economic differences (Rice 2002:108). The digital divide shows a gap between those who are computer illiterate and those who are computer literate. In developing countries like South Africa, the digital divide is a major challenge because the majority of the citizens cannot operate computers. Citizens are experiencing challenges in using e-municipality systems because of little or no access to the Internet and new technologies (Shahzad & Sandhu 2007:67).

Trust issues

One of the major challenges in e-municipality systems, particularly in developing countries, is customers' or citizens' trust. Trust issues in the context of e-municipalities include citizens' willingness to use e-municipal systems. Other concepts that are associated with trust are privacy and security.

In the context of e-municipalities, privacy is the protection of personal information such as ID and account details that citizens use on municipal systems. Security refers to the protection of information systems against unauthorised persons. Municipalities often experience a challenge of leakages of passwords. In cases where citizens have privacy concerns about their information, citizens or customers will not go online to interact with the municipality (Belanger & Carter 2006:6). This means citizens will not trust online systems over the traditional systems. Privacy and security are critical challenges in the implementation of e-municipalities.

Technical, economic and social challenges

An e-municipality as e-government is a better way to deliver public service effectively and efficiently; however, there are technical, economic and social challenges. Using alternative methods such as an e-municipality rather than traditional methods will increase challenges from the technical point of view, particularly in the interoperability and data contexts. Social interaction and acceptance play important roles in the transformation of service delivery approaches. Transforming from traditional approaches to online approaches will increase economic issues such as costs in data bundles. Internet connection is a challenge among disadvantaged communities. Citizens with mobile phones raise concerns over the high cost of data bundles (Signore, Chesi & Pallotti 2005:5). This challenge was likewise seen in Muller's (2010) remark that concerning broadband valuing, South African data bundles' prices rank high in comparison to other nations.

Recommendations

The previous section outlined the challenges of e-municipalities, particularly in developing countries. Internet connectivity and computer access are important in the implementation of an e-municipality. Public facilities such as libraries and schools (early childhood development, primary, secondary and tertiary facilities) should be equipped with proper computers and a high-speed Internet connection, particularly in poor communities and rural areas. The article recommends that the local government should invest more in ICT infrastructure, ICT maintenance and monitoring of ICT infrastructure. The content incorporated into the e-municipality initiatives must be appropriate and helpful to the people and their needs. The article recommends that local languages and content should be used in order to create increased acceptance of new technology, as well as to reduce the digital divide.

It is important for municipalities to ensure the protection of users' information. Safe measures should be in place to reduce unauthorised access and password leakages. Regular monitoring and evaluation of e-municipality systems should be implemented to identify hacks and leakages, as well as to identify aspects or features that need to be improved to improve the standard of service delivery. The cost of Internet connectivity is a challenge to the utilisation of online services by citizens in disadvantaged communities. The government, local government in particular, should develop mechanisms to expand the gross

domestic product (GDP) per capita of their residents. The government should find strategies to create employment opportunities, especially for young people, in order to reduce economical and social challenges.

Conclusion

Both traditional and electronic municipalities have a common objective, which is to deliver public services efficiently and effectively; however, the two use different approaches to achieve their desired goal. An e-municipality is the easiest way of delivering public services. The use of e-municipalities simply means the delivery of online public services to the citizens by making it possible for municipal customers and clients to find information easily and reducing costs through integration of systems. In conclusion, the implementation of e-municipalities has challenges; therefore, it is critical for municipalities to familiarise themselves with these challenges. It is important for municipalities to ensure the protection of users' information to enhance citizens' trust. Best practices and successful implementation of e-municipalities include efficient and effective public service delivery in municipalities. Close interaction between citizens and municipality, closer interaction between municipality and relevant stakeholders and the effective use of technology are the characteristics of successful implementation of e-municipalities.

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Authors' contributions

D.N.-S. was responsible for conceptualisation, methodology, formal analysis, writing the initial draft and the reviewing and editing thereof. A.P.M. contributed to the conceptualisation, formal analysis, investigation, providing resources and writing the initial draft.

Ethical considerations

The research has been reviewed by the School of Public Management, Governance and Public Policy Research Ethics Committee at the University of Johannesburg. Clearance was granted by the School of Public Management, Governance and Public Policy Ethics Committee (reference number: 2019SPMG05).

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Data availability

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