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E-government actor's perspective: a case of local municipalities in South Africa

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Abstract—The public sector in developing countries experience various challenges that have stagnated the implementation of e-government-for-citizens especially in local municipalities. The specific focal point is to highlight the e-government actor's viewpoint on what causes the failures of e-government implementation within local municipalities. The actors are perceived as the creators and transformers of systems and their input is critical in providing a critical reflection on e-government. A purposive sample of 35 e-government actors was interviewed to give their perspectives on factors that hinder the implementation of fully functional e-government portals at the municipal level.

Keywords—e-government, e-portal, actors, implementation, municipality, citizens

I. INTRODUCTION

The primary purpose of this study seeks to investigate factors that hinder the implementation of e-government-for-citizens in the local municipality of South Africa (LMSA). The LMSA has developed electronic portals in South Africa throughout the country to service its constituency, however, the e-portals do not provide fully functional services for citizens. South Africa has approximately 231 local municipalities and it is one of the developing countries that are still struggling to develop fully functional e-government services for their citizens. The research paper mainly focuses on investigating factors that hinder the implementation of e-government-for-citizens (G2C) through the lens of e-government actors. The primary research questions include but not limited to:

- “what factors cause the lack of implementing a fully-fledged e-government-for-citizens in South Africa's local municipalities?”
- What are the causes of the slow pace in implementing citizen-centric e-government services within local municipalities?
- What impact do policies have in implementing e-government services within the local municipalities of South Africa?
- What implementation strategies that e-government actors have used in implementing the existing incoherent e-government portals?

The research will indicate the factors that contribute to this problem, including the current methods that are used during the process of implementing e-service for citizens within municipalities.

II. RESEARCH METHODOLOGY

This study seeks to explore, interpret and understand the challenges that negatively affect the implementation of a fully-fledged e-service for citizens within the local municipalities of South Africa. A purposive sample size of 35

which consists of e-government actors was selected mainly because they are directly involved in the implementation of e-government. The e-government actors play a very important role mainly because they are regarded as creators and transformers of any system (Hashim and Jones, 2007). The Research respondents (e-government actors) are based on what constitutes an organizational structure as suggested by Mintzberg (1989).

- **Strategic apex:** The home of top management which includes the Premier, Chief Information Officer, and Senior Managers, who are mainly responsible for providing a strategic direction and decision making for e-government in the Western Cape.
- **Middle-management:** Managers who stand in a direct-line relationship between the strategic apex and the operating core, who are responsible for managing projects. The actors are project managers and policymakers.
- **Technostructure:** The staff analysts who design the systems by which work processes and outputs are standardized in the organization. The technostructure, in the context of this research, is mostly external organizations that are contracted to design and develop the systems.
- **Support staff:** The specialists who provide support to the organization outside of its operating workflow.

The aim of interviewing these informants is to critically analyze the complexities within an e-government social structure to unearth factors that hinder the implementation of a fully fledged e-government-for-citizens in SA.

III. E-GOVERNMENT IMPLEMENTATION PROCESS AND CHALLENGES

The empirical findings in this research revealed that there are challenges that affect the way the implementation processes of e-government are carried out within municipalities, and among various stakeholders. The researcher has found that there are structural incoherencies concerning the implementation of e-government. One of the senior e-government actors revealed that “e-government activities are treated as a separate structure from the core business activities and most of the time they are not clearly defined.” The Research respondent who is the Premier of provincial government elucidated further that:

“When it comes to us [government units], the fundamental problem with the e-government initiatives in South Africa is how it has been carried out and also its school of thought. The local government considers e-government as separate from the actual practice of the public service. It is [regarded] as a standalone entity

which is not part of their business improvement process”.

According to the research respondents on the annual basis, municipalities review and update their ICT plans to help to identify information and communication technology (ICT) initiatives to address the citizen needs. The funds are set aside and implementing actors are identified whether internally or outsource (see figure 1 below). However, some challenges persist in every step.

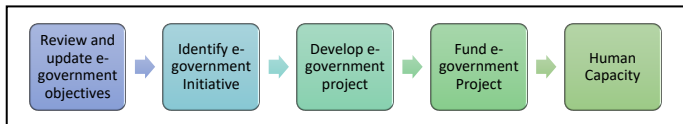


Figure 1: Implementation process of e-government

A. Review and Update E-government Objectives

The review of e-government objectives is one of the critical steps to identify the need to implement e-government projects. According to the research respondents, the existing e-government plans are not coherent nor align with the local government’s day-to-day business, hence, the implementation of a fully-fledged e-government platform will be a mammoth task to achieve. For instance, the Govern Mbeki local municipality recognized that the use of ICTs is key to the realization of their vision, goals, and objectives. Some of the Govern Mbeki Municipality strategic objectives (2020-2021) are to ensure that:

- ICT is properly structured and managed to minimize operational and business risk;
- Effective systems and technologies are implemented to create a customer-centric working environment;
- Business is appropriately governed and a framework is implemented to ensure policies and procedures are being adhered to;
- Appropriate ICT Infrastructure and solutions are put in place to sustain the overall business capabilities and needs and in turn, improving productivity and enhancing service delivery;
- ICT is appropriately structured and capacitated with the appropriate number of appropriately skilled personnel to support business in delivering services to its residents and customers;
- ICT appropriately plans and budgets for ICT investments and that investment spending aligns with the municipality’s business priorities and that current ICT investments are maintained to maximize their business value.

The Govern Mbeki municipality strategic objectives are well and good, however, research respondents revealed that the municipality cannot implement their ICT strategic objectives because e-government goes beyond listing the strategic plans, the municipality must develop plans that are implementable and are within their ability to execute them. Research respondents stated that the ICT plans that are developed are not always aligned with the core functions of the government business and they often lack the details on how they will be implemented. According to the research respondents, the integration of the public sector’s business

process is paramount to eliminate silos. It is difficult to implement a fully functional e-government system with disintegrated business processes. The respondent revealed that there is a need for a clearly defined business process during the planning phase to integrate the use of ICTs. For instance, e-government is defined as the use of ICTs to improve day-to-day government operations. [The existing municipal business processes are not as inclusive as they should be to ease the ICT infusion to ensure an ICT enabled environment.](#)

Another respondent emphasized that as much as numerous e-government policies have been promulgated over time and the major problem is that the municipalities have not developed their business strategies that are aligned with the e-government policies. Therefore, the existing social structure does not have any form of resolution that influences the advancement of e-government at the municipal level. Devadoss, Pan & Huang (2002: 261) stated that “the realm of social structure combines factors that influence the adoption of e-government, the organizational needs of e-government.” Without e-government business strategies that are aligned with the work of the municipality, the current human action towards the advancement of e-services is not yielding any positive results. What the respondents also revealed is that the municipal strategic documents do not articulate anything with regards to how the infusion of e-government would be carried out. According to Reffat (2006:9) “policymakers need to develop specific and reasonably attainable goals and understand what resources are available to achieve those goals.”

B. Identify E-government Projects

The development of ICT plans often leads to identifying the e-government projects to address the public sector challenges. The research respondents stated that the existing model that is used in identifying e-government projects does not support nor encourage the development of a fully-fledged e-government portal. The e-government projects are identified based on problems that the municipality seeks to address, hence, e-government projects are implemented in silos. There is a need to identify e-government projects that address the needs of the citizens as a whole. The problem is that the development of fully functional e-government would not be realized if e-projects are identified in this manner.

C. Develop E-government Projects

The development of e-government lies in the manner in which it has been planned and identified. The ICT projects are easy to identify, however, the research respondents feel that there are no e-government programmes to support the projects. The programmes may include infusion of e-government services to citizens, training and development of back-end and front end support staff, etc. The lack of establishing programmes stifles the swift development of e-government. According to Mnquma Local Municipality (2020), their strategic plan is to “develop a self-sustainable municipality that empowers its citizens socially and economically to ensure sustainable livelihood through promoting the cutting edge technological innovation.” The desire to create an environment that is conducive for citizens is vividly clear but the ‘proof of the pudding is in eating’ which is about producing results. For example, the e-portal system of Mnquma municipality and many other municipalities do not reflect services that are citizen-centric rather than displaying information about the municipality. Electronic services are either underdeveloped or do not exist.

For example, each municipality portal provides a section that displays vacancies, however, citizens may only view the available vacancies and apply for the vacancies using a traditional approach (download a form, fill it, and send it through a post office). The research respondents highlighted that identifying a project may be easy but developing such a project is plagued with problematic where the e-government projects do not reach their full potential.

D. Funding for E-government Projects

According to the research respondents, funding is one of the major hindrances that cause e-government projects to be stagnant. For instance, creating jobs is one of the government's major priorities. Although the use of ICTs is regarded as the enabler, at the local government level, the decision-makers are under-pressure to priorities the most pertinent issues such as unemployment to please their constituency, and the budget is often redirected to address socio-economic needs.

The research respondents also revealed that e-government initiatives costly to initiate, maintain and support them but most importantly, the public sector has not established how to leverage its cost-effectiveness. One research respondent believed that the e-government projects are very costly to implement and they play an important role in enabling various process that the government battles with however, on the flip side, the infusion of ICTs is one of the major contributors to the increasing unemployment rate and government cannot be seen as an entity that shed jobs. One respondent argued that sourcing for funds for e-government projects is secondary as compared to addressing the legacy of apartheid which excluded the majority of citizens from participating in the economic activities of the Republic. The apartheid government was just defeated 25 years ago but its legacy still has its effects and building an inclusive government structure will take more than the use of technology.

E. Human Capacity

According to Mhlonto municipality (2018-2022), the use of ICTs is one of its priority areas and its objective is "to ensure adequate availability of critical ICT Infrastructure in line with ICT strategy and governance policies" however, "the municipality experiences a major weakness which is the lack of IT personnel to implement the e-government projects." The lack of human capital within the public sector poses a threat and human action is one of the most critical components during the implementation process of e-service for citizens portals. According to the former Premier of the provincial government, when asked to comment on the slow pace of e-government development, she said:

"There is a shortage of ICT skills both within government but also in the broader population of South Africa. There are ways to address this shortage, but they all take time to come to fruition. This is not saying there are no skills, just a shortage. The available skills are in high demand and usually captured by the corporate sector."

The shortage of IT personnel is one of the major factors that hinder the implementation of e-government. Engetou (2017) stated that insufficient personnel in the organization have an impact on its performance. Another example is Metsimaholo local municipality, (2018) that revealed that "they do not have sufficient internal capacity to deal with its

IT needs". In 2018, Fezile Dabi's local municipality revealed that the municipality is unable to implement the use of technologies on its own due to capacity issue however it plans to cooperate with the private sector to available the benefits of new technologies".

IV. LACK OF KNOWLEDGEABLE E-GOVERNMENT DECISION-MAKERS

The research respondents revealed that the implementation of e-government systems is based on a prerogative of decision-makers and the current state of e-government in local government reflects their intentions. The fact that e-portals are not fully functional nor citizen-centric depicts the level of how decision-makers perceive what e-government should be. One of the fundamental problems that cause a lack of progression as far as e-government is concerned is that the decision-makers are not technocrats and are not knowledgeable or schooled on e-government. An e-government specialist noted that municipalities are often led by non-IT personnel, and the IT skill shortage is the major problem especially at the senior management level where decisions are made. Non-technical personnel is responsible for the promulgation of e-government policies without consulting the techy minds so that their plans are technologically savvy from the onset. Since the technocrats are not decision-makers but expected to implement the e-government policies. This often leaves a vacuum where the advancement of e-government is not supported by technologically sound policies that are relevant and work towards achieving the goals of the municipality.

The mandate to implement e-government is at the hands of those who do not understand its potential. Research respondents stated that it is important to note that the human action towards the implementation of e-government systems often depends on how informed the decision-makers with regards to integrating information, data, systems, and processes that would be utilized by various stakeholders. The existing decision-makers do not think like that, to some, the use of ICTs is having emails and website to display the information only. The research respondents raised another concern that there is a need for a mindset to be transformed, especially at the executive level. For example, if the municipality experiences long queues and the decision will be to employ more people instead of automation. The decision-makers will use their power to sanction what actions are to be taken and they will communicate such actions to the relevant stakeholders. Hence, the state of e-government is not progressive as it should be because the current knowledge about the deployment of e-government rests only with certain IT personnel (technocrats) who are not decision-makers.

V. LACK OF COORDINATION

It is quite clear that the implementation of e-government involves multi-stakeholders from various units of government. The e-government systems are designed, developed, and implemented by actors using their knowledge and available resources. However, the e-government actors that are responsible for the implementation must also be able to collaborate and work together. According to the structuration theory, the agents must be able to make sense of, understand, and communicate ongoing business processes (Giddens, 1984; Sydow and Windeler, 1998). The research respondents revealed what affects the implementation of e-government is that municipalities are always work in silos and

there is a lack of coordination among them, hence, various e-portal systems depict disjointed e-government projects. The respondents feel that the implementation of a single e-government portal is not yet possible because the implementation process of e-services has not been properly managed due to incoherent human activities (action) towards developing e-portal services. There are many problematic issues that the e-government actors have identified during the face-to-face interviews, especially when it comes to the coordination of their work activities. The head of the provincial government also revealed that ICT projects are mostly taking place in different municipalities and the coordination of work activities can be difficult and regular meetings and broad communication are required to facilitate some actionable deliverables. One e-government actor highlighted that the implementation of e-government requires coordinated work activities from various stakeholders to meet its objectives.

VI. LACK OF PUBLIC SECTOR'S ICT ARCHITECTURE

Sanati, Lu & Farzad (2007: 3) states that "technology solutions rarely deliver agility unless they are primarily focused on the business objectives." The use of ICTs plays an incremental role in improving the public sector's day-to-day operation and without having an ICT architecture in place that defines its telecommunication structure then the potential of ICTs would not be realized. The respondents are adamant that the public sector's inability to invest in its ICT framework stifles the implementation process of e-government. According to the research respondents, the ICT architecture should emphasize how to improve government internal and external systems to streamline business processes by providing integrated services that eliminate the silos.

VII. LACK OF INTEROPERABLE GOVERNMENT SYSTEMS

The research respondents agreed that the implementation of fully-fledged e-services for citizens require the development of interoperable platforms that provide an interconnected e-service. According to Pardo, Nam & Burke (2012: 7), "e-government interoperability represents a set of multidimensional, complementary, and dynamic capabilities needed among the organizational networks to achieve successful information sharing." The creation of connectivity among networks, the development of new service integration capability, or as part of the countless efforts to leverage technology at all levels of government, interoperability is recognized as a key determinant for e-government maturity and development (Estermann, Riedl, & Neuroni, 2009; Hjort-Madsen, 2006). The implementation of a fully-fledged e-service platform for citizens should ensure that interoperability to "help government use technology to improve government services and operations" (Pardo, Nam & Burke, 2012).

During the in-depth, face-to-face interviews, the e-government actors stated there is a need to consolidate the e-services to ensure the lack of interoperability of government systems is addressed. The consolidation of e-service systems is about creating technology-to-technology services that allow municipalities to be interconnected and be able to speak to one another seamlessly. The key focus is consolidating existing e-portals to use technology in a manner that improves government operations and makes a smart decision that would reduce cost and time. The public sector is already plugged into various inefficiencies that technology has a solution for. It is

a matter of applying the appropriate information system tools. For example, in the context of South Africa, this research has revealed that there are 231 local government municipalities and only 80.95% (187 out of 231) that have an online presence (active e-portals). These systems operate in silos and all of them offer similar services.

VIII. LACK OF E-GOVERNMENT LEGISLATIVE FRAMEWORK FOR LOCAL GOVERNMENT

Municipalities are regarded as entities that provide direct services to the citizens. According to section 152 (1) of the Republic of South Africa constitution (1996), one of the local government objectives is to ensure the provision of services to communities in a sustainable manner and encourage the involvement of communities in the matters of local government. The research respondents emphasize that the lack of an e-government legislative framework for municipalities hampered the process of implementing e-services for communities and discourage their involvement in the matters of local government. The legislative framework/ policy forms part of the e-government structure, however, there is a lack of commitment shown in terms of developing the framework that will guide the implementation of e-services makes it difficult to ascertain which direction municipalities must take as far as e-government is concerned. The national and provincial governments have promulgated e-government policies meaning they recognize the importance of incorporating ICTs to enable some of their processes, however, local government still lags. According to Research respondents, the factors that hinder the implementation of e-government systems do not start at the implementing agencies but with policies that must set the agenda as far as e-government is concerned. The lack thereof delays the success and the potential of e-government.

IX. LACK OF CYBER-SECURE E-PORTALS

Cyber-security plays a very important role in terms of keeping the interconnect connection secured and safeguard any sensitive data that is being sent between two systems to prevent criminals from reading and modifying any information transferred (DigiCert, 2021). According to the data analysis of the e-portal systems, only 2% of e-portals that contained a secure sockets layer (SSL) in South Africa's local government. An e-portal system is a place where the information of citizens can be accessed, and transactions can also be performed. One of the biggest threats for e-government adoption by citizens is the lack of cyber-secure systems, and over the years there have been high e-Crime incidents reported (e-Crime, 2017). Cyber-security becomes an important feature for e-portals as far as having the capability to protect both citizens and government from cyber-crime related incidents. The citizens and government conduct financial transactions with ranges from government tax, driver licenses and vehicle registration, identity document and passports, levies, fines, electricity, and so forth. These financial transactions must be performed in a secured e-platform that is constantly monitored for cyber-attacks. Cyber-attacks have a direct negative impact that affects the adoption of e-services and, if these e-portals are not secured, the delivery of services, especially transactional services, will be negatively affected. According to research respondents revealed that municipalities do not have cyber-security experts hence the existing e-portals are mostly sharing information that is not secured.

X. LACK OF SYSTEM COMPATIBILITY

The research respondents feel that there is a lack of systems compatibility which makes it difficult to integrate systems of one unit to the other. Section VII retaliated the issue of lack of interoperability among government systems of which one of the hindering factors is developing compatible systems that will be easy to integrate. For example, the national department of Home Affairs has every citizen's personal information such as date of birth, place of birth, home address, identify document number, etc. However, the municipalities are unable to retrieve such data into their systems because of the lack of system compatibility. According to Ace Project (2021) compatible ensures that various kinds of files such as word processing documents, spreadsheets, data files, and email can be shared between staff in various locations without any concerns about data conversion or inability to read other files.

The issue of compatibility is not addressed during the initiation phase to influence the development of the e-portal system. It is evident that the implementation of a fully-fledged e-portal does not happen overnight, it takes time. The e-portal perspective encompasses not only the services to the citizens and for the government, but its level of compatibility is paramount. The e-portal is used for various services such as citizen services, government services (government-to-government), e-government actors (employees) services, and tourism (outsiders) services, etc. The compatibility of the portal is important because the end-users have different levels of expertise and knowledge in terms of using the e-portal, and the users also make use of different devices to access the e-portal. The compatibility of e-portals refers to building a system that also caters to mobile devices. The penetration of mobile devices has revolutionized how services can be offered to what are called mobile services (m-Services). The mServices can make services available at a citizen's fingertips anywhere and anytime: hence, the development of e-portals should be able to adapt to mobile applications such as Android and the iPhone Operation System (IOS).

XI. LACK OF EVALUATING THE E-PORTAL SYSTEM TO ENSURE E-SERVICE QUALITY

The e-portal system evaluation mainly refers to the functionality of the electronic systems. One of the problems identified in this research was the lack of evaluation of e-portal systems. The e-portal systems are developed left, right and centre and there are many duplications across different government spheres. The development of an e-portal has several building blocks that are often not evaluated such as 'identifying which services are problematic for the citizens' (Dudley, et al, 2015). There is a need for the government to measure the extent of citizen dissatisfaction which is one of the ways governments can prioritize areas. The research respondents feel that for improvement of the e-portal systems. This phase is more about measuring the effectiveness and efficiency of the developed portal, and the process of determining the adequacy of the e-government portal. This is one of the most critical stages as it can identify the success or failure of the project through "measuring the development towards the attainment of project goals/outcomes" (Cloete, Wissink & De Coning, 2006:248).

The evaluation must be applied in every stage of e-government, starting from the analysis until the implementation. Each stage is evaluated to establish whether

a project or programme should continue, discontinue, be limited in certain aspects; or be expanded (Cloete et al, 2006:248). According to Gupta and Jana (2003: 366), "government organizations should make a performance evaluation and see whether they are capable of doing the task and delivering services as expected." Wang and Liao (2008) state that it is therefore important to measure the success of G2C e-government systems from the citizen's perspective. The evaluation of e-service systems becomes paramount to ascertain the next step to consider. The proper evaluation will guarantee the service quality, and the system development phase must be re-examined and consider the report's findings. It is critical to identify measures that would guarantee the service quality before moving into e-service quality. Some of the identified issues/challenges during the evaluation process might have to do with the interconnected e-service maturity model that has been applied which may have affected the e-portal development. The e-service quality refers to the extent to which end-user satisfaction has been met as far as the delivery of online services is concerned. The reason that information system projects often fail is because the service quality is not measured. The analysis of service quality is the deciding factor of whether the e-service project must go ahead to deployment, be referred back to previous phases for review, or be canceled.

XII. DISCUSSION

As much as the public sector has had numerous transitions on how it serves its citizens, the developing countries still experience various major setback such as addressing colonial atrocities that have ravaged the lives of the majority. The impact of apartheid in South Africa for instance has caused a high illiterate rate and underdevelopment. These have direct implications in terms of how SA as a country can easily progress. Developing nations have their plate full in terms of reversing the past realities that still affect their developmental goals.

Poor governance is identified as one of the biggest hindrances. It is highly critical for developing nations to strengthen good governance in all their spheres of government. South Africa's civil servants have so much to learn as its infant democratic state is still in the process of finding its grip. For instance, the implementation of a theoretical framework requires expertise that is not readily available (theory to practice). It is easy to identify the shortcomings, however, countries like South Africa have made meaningful strides irrespective of what it has to overcome. The issue of governance is not only affecting developing nations, but even the developed nations are also battling, and authoritarian tendencies are vividly clear even though they have over 200 years of democracy. The practical experience on governance for developing nations is far too early as compared to matured democracies.

Back to technology, it is clear its use in the public sector is highly beneficial but because there is a lack of knowledge by municipal decision-makers hamper the realization of e-government. Knowledge is the foundation that leads to project execution, hence, there is limited or no attempt at all in terms of drive e-government to such a way it should be. The other research findings are more based on the current state of e-government portals.

XIII. CONCLUSION

The implementation of e-government in South Africa's local government has made significant strides through developing e-portals. Although the developed e-portals do not provide citizen-centric services nor fully functional services, there are 80.95% of e-portals mainly share information about the municipalities. The research findings provide an insight into the challenges that are facing local municipalities in the struggle to address citizens' needs through electronic means. The implementation process plays an important role to ensure the effective delivery of e-government projects and the study have found that this process is overcome by endless factors that make it difficult for e-government projects to be successful. The human actors who are regarded as the creator and transformers of any systems do not have the capacity nor technical knowledge especially the senior management who are the decision-makers. A policy framework to guide implementation is not promulgated hence the implementation process is not well coordinated to meet the objectives of e-government.

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