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# The Role of open government data in improving public service delivery: a case of Nairobi County Government

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# THE ROLE OF OPEN GOVERNMENT DATA IN IMPROVING PUBLIC SERVICE DELIVERY: A CASE OF NAIROBI COUNTY GOVERNMENT

**BY**

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**DECLARATION**

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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**Approval**

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## ABSTRACT

Open government data is data and information produced or commissioned by a government or government-controlled entities, available to all to help the public better understand what the government does and how well it performs, and to hold it accountable for wrongdoing or unachieved results. The purpose of this study was to investigate the role of open government data in improving public service delivery in the County of Nairobi. Specific objectives are: To examine the extent to which government's open data availability influences public service delivery in the County; to examine the extent to which knowledge level on government's open data influences public service delivery in the County; to examine the extent to which application of government's open data influences public service delivery in the County of Nairobi. The research design applied was exploratory design to show the influence of open government data on public service delivery. The study targeted all thirteen County Government Sectors. The selected sample size from the target County Sectors was 172 employees. Out of the selected sample size, the researcher only managed to get a response from 132 employees (76.7%). The researcher used questionnaires as the main instrument for this study. The data were analyzed using descriptive analysis and multiple regression analysis to study the relationship between public service delivery and availability, knowledge level, and application of government open data. From the study findings, the availability of county government's open data has the least influence in the role open data plays in public service delivery at the county. This is mainly affected by inadequate and non-comprehensive open data platforms and inadequate requisite infrastructure and knowledge on the value of open government data. For the existing open data, datasets are not wide-ranging and do not cover all the areas of county service provision/mandate. Also, these datasets are not released systematically and on time. On knowledge level about open data, the study found that most of the respondents are inadequately familiar with the concept and features of open data. On the application of government open data, most respondents strongly agreed that data accessibility and citizens' engagement with the government are the main reasons for availing government open data. The study concludes that the County Government of Nairobi's open data is not publicly available or not sufficiently provided to be considered open. The existing data falls short of availing adequate and enriched open data to the public to offer comprehensive access and use as well as play a significant role in the provision of public services. The study thus recommends that the County Government of Nairobi avails more data to the public through collaborative efforts with various stakeholders, implement better open data platforms that will offer real-time engagement with citizens and other stakeholders such as a citizens dashboard and enhance capacity building to its employees on ICT skills and the value of open data. Also, substantial reforms/initiatives are needed at the county government to guarantee open government data platforms, policies on open data, and availability of high-quality data that is timely, easily accessible, and easy to use.



**Keywords:** *Open Data, Open Government Data, Knowledge Level, Data Availability, Public Service, and Service Delivery.*

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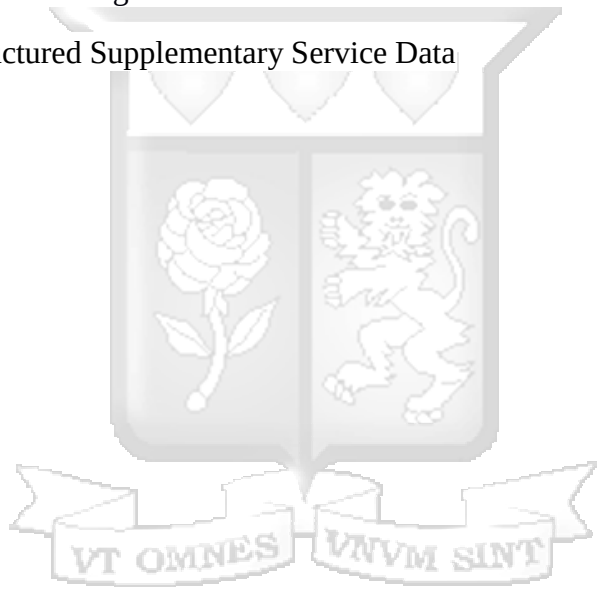
## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **CSOs** | Civil Society Organizations |
| **GODI** | Global Open Data Initiative |
| **ICT** | Information, Communication and Technology |
| **NACOSTI** | National Commission for Science, Technology and Innovation |
| **NGOs** | Non-Governmental Organizations |
| **OECD** | Organization for Economic Co-operation and Development |
| **OGD** | Open Government Data |
| **OKF** | Open Knowledge Foundation |
| **USSD** | Unstructured Supplementary Service Data |



## DEFINITIONS OF KEY TERMS

| | |
|---|---|
| **Data Availability** | Free accessibility and obtainability of a wide variety of different types of data in technology-driven platforms such as online web platforms in order to perform different tasks such as delivery of public services |
| **Knowledge Level** | A level of information and civics literacy necessary to understand open data and its value |
| **Open Data** | Data that is available and accessible freely online or in digital platforms, without limitations to re-use, under open access license and for use across different 'fields of endeavor' |
| **Open Government Data** | Datasets that is made available by public institutions to help the public better understand what the government does and how well it performs, and to hold it accountable for wrongdoing or unachieved results. |
| **Public Service** | Service provided for the public or rendered in the public interest by either government or non-government entities. |
| **Service Delivery** | Provision of public services to citizens by the government in a prompt; effective; impartial and equitable manner and with transparency and accountability |

# CHAPTER ONE

# INTRODUCTION

## 1.1. Background Information

The open government philosophy has stimulated a global transparency movement with goals of innovation, participation, and accountability. National and subnational governments in every part of the world are adopting open data programs with the expectation that free and open publication of government data will lead naturally to an array of economic, social, and political benefits (Reggi & Dawes, 2016).

The importance of government open data is often associated with efficient public service delivery through increased public engagement, trust, and accountable governance (Xiao et al., 2019). Open data is usually vital for public policy development and delivery of services, but other users can also benefit from it (Janssen, Charalabidis & Zuiderwijk, 2012). Xiao et al. (2019) point out that, proactively disseminating data that is frequently requested in an automated way frees up resources. OECD (2013) notes that an effective and efficient public service delivery is vital to the economic growth and development of a nation. To achieve this, OECD observes that open data can generate an innovative and transformative approach to how governments consider service provision to citizens and how they evaluate efficiency and users' satisfaction in service delivery.

Ubaldi (2013) notes that the openness of data is ultimately projected to advance how both governments and people make their decisions. She further notes that citizens are expected to have the ability to use government data to generate better decisions and enhance their lives; on the other hand, governments are expected to more easily access a broader range of datasets to enable decision-making that is evidence-based. Sivarajah et al. (2015) add to this by noting that, with the increased opening of policy-related data, governments provide a shared information platform for all stakeholders to partake in policy formulation and decision-making.

Davies (2012), notes that the current open data movements draw upon diverse roots, they burst on to the policy scene in 2009, when US President Barack Obama signed a Memorandum on Transparency and Open Government as one of his first acts in office, leading to the creation of the data.gov platform hosting hundreds of federal datasets for public access. The White House's

interest in transparency was soon replaced by an interest in using open data to spur economic activity; Data.gov spurred a world-wide movement of data.gov-style catalogs in cities and countries throughout the world (Tauberer, 2014). This US move was quickly followed by the UK launching data.gov.uk in early 2010 and starting a program of open data reforms across government that continued and were expanded under a new administration from mid-2010 onwards. In April 2010, the World Bank launched its data portal, providing free access to hundreds of economic and social indicators. The Open Government Partnership, launched in 2011, is a multi-government effort to advance parallel transparency reforms in participating countries, focusing on disclosure, citizen participation, integrity, and technology (Tauberer, 2014).

This study is important in providing more insights into how the national and county governments can enhance public service delivery through effective use of open government data. In providing efficient public service delivery throughout the country and recognizing each region's unique challenges and circumstantial differences, there is a need to respond to the unique needs and preferences of different users across the country, with support of sufficient and real-time open government data. Public service providers will gain from this study in adopting an approach that builds on open data availability, access, and use which is key in providing services, undertaking development projects, initiatives, and providing policies that are evidence-based, innovative, citizens oriented, and supported by sufficient data.

### 1.1.1. Public Service

Public Service is a service rendered in the interest of the public (Webster, 2019). Public services according to Spicker (2009) are about provision for the public whether done by public authorities or not. These services can or are provided by the government, or on behalf of the government. He observes that these services may be connected to activities of the government, but are not confined to it. The Constitution of Kenya, 2010 defines "public service" to mean individuals, other than Government officers, collectively performing a function within a State organ. Public service is meant to ensure that provision of public services is prompt; effective; impartial; equitable transparent and accountable. Public Service Transformation Framework for Kenya, (2017) defines Public Services as services offered by a Government to its citizens, directly, through individual Public Service organizations or by financing the private sector to provide the service.

Public services are different from the public sector despite how they are identified in standard texts (Bailey, 2002, Flynn, 2007). While the government owns or at least controls the public sector; the public services may not be. They are about provision for the public, whether or not public authorities do it (Spicker, 2009). He further states that, even though public services may be related to the activities of the government, they are not government confined and the full range of such activities are not covered by the government

### 1.1.2. Open Data

Open Knowledge Foundation (2012) defines open data as data that one can access online without any charges, obtainable with no procedural restraints to re-use, and delivered under an open-access license that permits re-use of the data with no restrictions. Janssen, Charalabidis, and Zuiderwijk (2012) define open data as data that is public, without restriction and confidentiality, obtained and processed with public funds and availed without any restraints on how to use or distribute it. They further note, public and private organizations can provide this data because the key thing is that it is financed by public money. According to Bvuma & Joseph (2019), the concept of open data has quickly pervaded how local government systems are designed and implemented. They further note, combined with proper and requisite Information and Communication Technologies (ICTs), public services are provided on open domains and fields, which lead to public sectors that are more transparent and accountable.

As operationally defined by Kassen (2017), the phenomenon of open data is an amalgamation of different types and formats of government files and datasets with statistical data, socio-economic information, historic records, and files relating to or constituting archives. He notes that this data must be available in the public, in government repositories as a certain raw material, configured and handled in different applications developed by third-party suppliers, computer programs, or both mobile and online platforms devoid of any patent restraints on re-use.

Open Data Institute (2018) points out that, data that is considered as open needs to be accessible, meaning that that data is available on the internet; availed in a machine-readable format, and its license permits accessibility, usage, and sharing by anyone whether in a commercial or non-commercial manner. Global Open Data Index Survey considers various parameters concerning data openness by different governments (Knowledge, 2019). These considerations include data stored in formats that one could quickly find and use, data licensed for use without restraints, data

stored in an open format and a form that a computer can read and process, downloadable at one go, current, available in public domains and available without charges. Comprehensibility of data is also key to effective open government data (Mabillard & Zumofen, 2015).

Jeztek et al. (2013) looked at the following features on data openness: accessibility of datasets; comprehensiveness of data policies; validity of the data, comprehensive datasets; sufficiency of metadata, in addition to enabled, consistent and unambiguous access and exchange of data across borders.

### 1.1.3. Open Government Data

Open data and open government are two terms that are often linked to each other (Oyatsi, 2015). Although the terms are often used together, they can exist independently of each other, she further states. According to Kassen (2017), open government is a political approach that integrally proliferates the benefits of enhanced participation, collaboration with different stakeholders, transparency in public institutions, and associated reforms in the political or public sector. OKF (2012) defines Open Government Data (OGD) to mean "data and information produced or commissioned by the government or government-controlled entities" that are made open for utilization by agents of public and private sectors. According to Jetzek et al. (2013), government datasets are a fascinating subcategory of open data because they have been collected for a certain purpose, publicly funded, and provide relevancy and value that is beyond what the initial collection and intention for the data were.

Open government data is government data available to all (Ubaldi, 2013). Datasets that are made available by public institutions to assist the public to understand better what the government does, measure its performance, and to hold it accountable for things done wrong or results not achieved. According to the OECD (2019), Open Government Data (OGD) is a philosophy- and increasingly a set of policies - that promotes transparency, accountability and creates value by availing government data to all. OECD also observes that public institutions become more open and answerable to citizens when they avail their datasets.

On the openness of government data, 2016, Global Open Data Index Survey ranked Kenya position 78 against other places in the world with a score of 15%, eighth in Africa after South Africa, Tunisia, Tanzania, Zambia, Lesotho, Ghana, and Namibia (Knowledge, 2019). On the openness of specific data such as key national statistics on Gross Domestic Product, Government Budget

data, unemployment, and population statistics, Kenya scored 45%, which was rank 77 worldwide (Knowledge, 2019). This is because this data is not under an open license, not in an open and in a format that can be read and processed by a computer, cannot be downloaded at once, it is not current, not available to the public and the data is not available to free of charge. This is as presented in Appendix V.

With the need for governments to incorporate open data to address more fundamental challenges around political and economic processes, Oyatsi (2015) takes cognizance of Heller's (2011) observation. He observes that there was a concern shared among some open government advocates that open data affords a less difficult solution for some governments to escape the much difficult and likely more transformative reforms on open government that perhaps ought to top on their lists.

### 1.1.4 Public Service Delivery

Over the preceding few years, service delivery in the public sector has been the focus of momentous study by scholars and by governments with regards to the needs of citizens, and concerning best practices in the delivery of services (Savoie, 2009). Provision of services has at all times been one of the main roles played by the government. For some reason, Savoie notes, emphasis on the better provision of services has been increasing over the last few years. Savoie (2009) continues to state that, provision of better services has derived a definition further to delivering a better widget, which is getting in touch with citizens to guarantee that the services provided are of the kind and quality they desire.

Byuma et al, (2019) observe that open data provides a basis for empowering communities and improving the delivery of public services through availing government data to the public. This enables public institutions to become more transparent and accountable to the citizens. They further note that governments can leverage open government data to establish innovative public sector processes and the delivery of public services. This can enhance the internal effectiveness of public sector institutions and aid in promoting the provision of innovative, citizen-centric services.

OECD (2013) notes that public service delivery which is effective and efficient is key to economic growth and development of a nation. To achieve this, OECD observes that data that is opened possesses the prospective to generate a radical approach to how governments think about service provision, efficiency in service delivery, and satisfaction of the users. However, for the public

sector to undertake its crucial mandate in development, there must be a transformation of public servant approaches as regards performance, attitude, and management (Public Service Transformation Framework for Kenya, 2017). From the Framework, the delivery of quality services to Kenyans will be ensured by this transformation.

The guiding Policy for the study is the National Information and Communications Technology (ICT) Policy, 2016. The Policy guides the orderly development of the ICT sector in a manner to ensure optimal developmental impact that will benefit all Kenyans. The Policy is meant to offer a straightforward and convincing strategy for driving social, economic, cultural, and political transformation through the best use of Information and Communications Technology (ICT) in the Country. The policy complements and builds upon Vision 2030 and provides many of the key strategies essential for achieving Kenya's national development targets. The study also looked at the provisions of Vision 2030 on national development and service delivery; the Public Service Charter model that is used to reinforce transparency, accountability, and involvement of the public in public service delivery; Privacy and Data Protection Policy among others.

### 1.2 Statement of the Problem

While there is a myriad of benefits of open government data, the obtainable literature indicates that numerous datasets on open government do not provide adequate accessibility and usability for the various users (Janssen, Charalabidis, and Zuiderwijk, 2012, Bvuma et al 2019, Ubaldi, 2013). Global Open Data Index Survey 2016 ranked Kenya lowly on the state of open government data publication with a score of 15%, position 78 against other places in the world. On the openness of key national statistics on Gross Domestic Product, National unemployment, and National population, Kenya scored 45% (Knowledge, 2019). The survey indicates that this statistic data is hidden in files full of text, graphs, and tabular data and not very easy to quickly find and use. On Government Budget data openness, Kenya scored 45%, same as procurement, national laws, and draft legislation (Knowledge, 2019). From the Survey, Kenya scored 0% on data openness on government spending, national maps, locations, weather forecast, company register, election results, water quality, air quality, administrative boundaries, and land ownership. This is because this data is not openly licensed, not in an open and machine-readable format, not downloadable at once, it is not up-to-date, not publicly available and the data is not available to free of charge.

The survey indicates that most Kenyan government data is not publicly available or not sufficiently provided to be considered open. This also means that the available open data is not adequately opened up for use and re-use by both the public and private actors. This highly inhibits accessibility, use, and re-use of the existing open datasets despite availability. This also reduces/stifles the value of open government data such as transparency and accountability, efficiency in service provision, innovation in service delivery, collaboration and participation of different actors in government institutions, and connected reforms in the political or public realm.

Kenya's open data is only accessed through the Kenya Open Data Portal (opendata.go.ke). According to Oyatsi, (2015), since the launch of the Kenya Open Data Initiative in 2011, access to and utilization of open datasets by the population has remained low, despite availability on the main portal opendata.go.ke. Access to open data promotes the achievement of its economic and social value (Kundra, 2012). According to OECD, (2018), improved accessibility to data can enhance greater collaboration within governments, as well as among government agencies, the private sector, civil society organizations, and citizens

To respond to the aforementioned problems, this study investigated the following aspects: the nature of information (active or constrained release) – whether there is a systematic and timely release of data or the release is occasional and constrained; the disclosure process (fast or slow), the completeness of the information (how much do citizens get quantitatively) and the comprehensibility of information (how much do citizens get qualitatively).

### 1.3 Objectives of the Study

The purpose of this study was to establish the role of open government data in improving public service delivery.

i. To investigate the influence of availability of government's open data on public service delivery in Nairobi County.
ii. To examine the influence of knowledge level on the government's open data on public service delivery in Nairobi County.
iii. To investigate the influence of the application of the government's open data on public service delivery in Nairobi County.

## 1.4 Research Questions

The study seeks information to address the following questions:

i. How does the availability of the government's open data influence public service delivery in Nairobi County?
ii. How does knowledge level on government's open data influence public service delivery in Nairobi County?
iii. How does the application of government's open data influence public service delivery in Nairobi County?

## 1.5 Significance of the Study

Open data is now being used by individuals, businesses, government, startups, and communities as a means to drive innovation. To enhance public service delivery through effective open government data, there is a need to respond to the unique needs and preferences of different users across the country, recognizing each region's unique challenges and circumstantial differences with support of sufficient and real-time open government data.

### 1.5.1 To Public Service Providers

This study will assist public service providers both at the national and county government level in adopting an approach that builds on open data availability, access, and use which is key in providing services, development projects, initiatives, and policies that are evidence-based, innovative, citizens oriented and supported by sufficient data.

Effective open government data is key to improving public service delivery. According to Kenya Vision 2030, the Government is prioritizing achieving an information society and knowledge economy towards attaining goals and objectives of development. This study, therefore, provides research knowledge on the way government open data can be used efficiently and innovatively to contribute to the Vision and enhance public service delivery in the country.

The study findings inform both the National Government and the County Governments on the significance of government open data in improving the delivery of public services. The study discusses the significance of open data to the governments to provide services efficiently, effectively, and innovatively, benefit the communities especially in prioritizing their needs, and

promoting their participation in development matters, and, most significantly, provide essential features for government officers to consider or think through before formalizing policies on service delivery as well as accountability.

### 1.5.2 To Policy Makers

To policymakers, the study will provide a knowledge base on open government data policies, and support the development of a framework to evaluate economic, social, and governance impacts and value through open government data initiatives.

### 1.5.3 To the Academia

The study is also important for students and scholars as it provides a basis for future research areas.

## 1.6 Scope of the Study

The study focused on open government data in Nairobi County. Being a city-county and Kenya's capital city, Nairobi offers a good institutional setting to exhibit the concept of open government data in providing public service, taking into account its dense population, the large size of its public sector, and economy. To achieve this, the study focused on the following independent variables:- data availability, knowledge level about government open data, and application of open data in public service delivery.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1. Introduction

In this chapter, a review of relevant literature is undertaken and the theoretical foundation of the study as well as an empirical review of the literature is discussed in length. The chapter deals with a review of literature following past studies and establishes what theories already exist on open government data and public service delivery. The review details the specific objectives and what past scholars pointed out that was relevant and instrumental to this research. The interest of the researcher is to examine what other people have written on the topic or other allied documented resources that may assist him understand comprehensively and thoroughly the problem being investigated. This literature is led by the study objectives and the research questions.

## 2.2 Theoretical Review

Theoretically, the concept of open data is still in the early stages both in science and practice (Kassen, 2017), from when it developed as a political and socio-economic phenomenon alongside the start of open government philosophy. As it is considered today, notes Kassen, President Obama first proposed this just after his presidential inauguration at the start of 2009 in his cognominal memorandum and subsequently several executive Acts. This study is guided by system and institutional theories.

### 2.2.1 Systems Theory

Biologist Ludwig von Bertalanffy (General Systems Theory, 1968) first proposed the theory in the 1940s and advanced by Ashby Ross in 1956. The former was both responding against analysis and description of a complex phenomenon in its simple or fundamental constituents and endeavoring to bring around the harmony of science. Ludwig stressed that actual systems are open to their environments, and work in harmony, and these systems can acquire new features that are qualitative through appearance, ensuing in frequent development. He notes that rather than breaking down a unit e.g. the human body to its constituent parts such as organs or cells, this theory centers on the arrangement of the parts and how as a whole, they associate and coordinate. Ludwig explains that the particular arrangement defines a system, which does not rely on the actual composition of the involved elements e.g. particles, cells, transistors, people, etc. Therefore, he notes, similar thoughts and principles of organization underlie the

different fields: physics, biology, technology, sociology, etc., offering grounds for their merger. On open data availability, the theory infers that by providing open data, a change is made from traditionally closed systems to systems that are open influencing governance, service delivery, and creating loops where the public can provide feedback. The latter enables public service entities to learn from the public linking to the study objective of application of open data where service delivery is enhanced through engaging the citizens on their specific needs.

The public is external to the administrative boundaries and outside hierarchical control (Janssen et al., 2012). They further note, the public turns out to be a component of the data processing system and could process data, enhance and integrate it with other sources as well as gather their own. This bears a resemblance to a shift from the old confines between public and governmental organizations where essentially any person can have access to data. This opens the system and vanishes its outmoded boundaries thus improving the availability of open data and its application by both public and the administrations.

In systems theory, the study objectives on the availability and application of open data are inferred. The inference of the concept of feedback is that when governments open their data, they should seek feedback from the public and be able to make sense of it and not merely instigate a single way of communication of their data. Janssen et al, (2012) note that the opening of systems offers the prospect for forming feedback platforms where the public entities can learn from other entities. They also observe that data should be published, as well as actively be sought for response and engagement with the various stakeholders to increase the value of the data and delivery of public services. According to Ubaldi (2013), it is imperative for public entities to pursue public response on the effectiveness, applicability, and ease of access to their data, to permit constant enrichment. Janssen et al., (2012) note that when you open a system, you can gain from the combined public intelligence.

The institutional theory addresses the study objectives of data availability and knowledge level in affirming that the public needs to have access to government data and information free of charge and be able to share it among themselves and others. In a proper functioning, open and democratic society, people ought to be acquainted with what their government is doing (Oyatsi, 2015). She argues that the public should have access to information held by the government and be informed of what the government is doing to enhance meaningful engagement and collaboration with the government. She acknowledges Chernoff's argument that the meaning of open government has extended to embrace

expectations for increased citizen participation and partnership in government undertakings using modern, open technologies.

Under this theory, the researcher sought to establish the influence of government data availability and application in service delivery by looking into how the county government of Nairobi, citizens, and other actors can interact within a public service delivery ecosystem through meaningful engagement in and effective collaborations availing data, accessing it and applying it to enhance service delivery. The theory borrows from various researches done on objectives such as the correlation concerning the availability of government data, its application, and how both government and non-government actors are integrated into the system through data availability, increased knowledge level by civil servants on open data, and effective application of open government to improve public service delivery.

### 2.2.2 Institutional Theory

Institutional theory is a prominent perspective in contemporary organizational research (David et al., 2019). It encompasses a large, diverse body of theoretical and empirical work connected by a common emphasis on cultural understandings and shared expectations. David et al., (2019) continue to observe that, the institutional theory is often used to explain the adoption and spread of formal organizational structures, including written policies, standard practices, and new forms of organization. Tracing its roots to the writings of Max Weber on legitimacy and authority, they note, the perspective originated in the 1950s and 1960s with the work of Talcott Parsons, Philip Selznick, and Alvin Gouldner on an organization–environment relations. It subsequently underwent a "cognitive turn" in the 1970s, with an emphasis on taken-for-granted habits and assumptions, and became commonly known as "neo-institutionalism" in organizational studies. According to them, recent work based on the perspective has shifted from a focus on processes involved in producing isomorphism to a focus on institutional change, exemplified by studies of the emergence of new laws and regulations, products, services, and occupations.

The theory attends to the more resilient and deeper aspects of social configuration. It is applied to forecast that the opening of data will strengthen present structures rather than change them and change is needed to take gain from open data (Janssen et al., 2012). To analyze the deeper and more resilient features of social configuration, the theory considers the processes by which structures are developed.

In this theory, ICT is understood and applied on account of earlier existing institutional sectors and engagements that are stable such as legal, cultural, or sociological (Janssen, Charalabidis & Zuiderwijk

2012). Stability is essential for institutions to function (Oyatsi, 2015). Oyatsi takes note of what Orlikowski (2000) states, that technological development is largely influenced by human agents do and the decisions they make, and that structures are enacted by technology. This suggests that institutions might both enable and inhibit the adoption of open data. Janssen, Charalabidis & Zuiderwijk (2012) argue that providing more information does not always lead to the making of decisions that are enhanced, more democratic, or more logical and that public institutions may restrict the use of open data to avoid criticism from the public.

External to the confines of government, mechanisms of authority and control cannot be used (Janssen et al., 2012). They note that civic leaders are faced with the challenge of having to deal with diverse stakeholders (conceivably unidentified) that could assist them in realizing open data benefits but might also be seen as a threat if not well handled. This perspective helps to challenge whether data opening will unequivocally bring about a more transparent, open, and accountable government. Jassen et al (2012) note that even though the application of open data seems like a shared responsibility, it is possible when something ensues; the public will hold the government responsible and will expect it to get involved. They also note that the theory cautions for the danger of new approaches being used for imposing structures that are in existence. They further note that, if there is no organized investigation, on which data is authorized to be published, and what the users of open data expect from the data, reinforcing existing structures will occur and this provides points of view for not publishing data.

In this study, this theory was utilized to predict how the opening of data (availability, access, knowledge level, and application) would reinforce existing structures in the County Government of Nairobi instead of changing them and that transformation in its public service delivery is required to acquire the benefits of open data. This is to suggest that the application of efficient open government data in the County will not change the institution but rather reinforce the current service delivery practices and organizational structures for improved delivery of services.

## 2.3 Empirical Review

### 2.3.1 Data Availability and Service Delivery

Ubaldi, B. (2013), numerous public organizations produce and collect a wide range of different types of data to enable efficient execution of their tasks. The large quantity of data collected by governments and their centrality makes these data significantly resourceful for improved public service delivery through transparency, accountability, efficiency, and innovation. According to Jetzek et al., (2013), more than

280 government data files have been published and governments around the world have released over a million datasets. Davies, (2010) observes that having Open Government Data (OGD) means that the public sector surrenders its role as an information gatekeeper and becomes an information provider.

Open data is available in different technology-driven platforms such as online web platforms, (Kassen, 2017; Sivarajah et al., 2015; Open Data Institute, 2018). To understand the various open data technology-driven platforms, Kassen, (2017) identifies the following open data triangulation: Political dimension i.e. e-government systems, e-voting systems, and e-democracy systems; Economic dimensions which include e-government systems, e-commerce systems, and e-banking systems and finally social dimensions to include e-commerce systems, e-participation systems, and e-democracy systems.

Kassen, (2017) further identifies how these systems exist in the public, private and civic sectors. In the public sector, they include e-government systems, e-banking systems as well as e-voting systems. In the private sector, this includes e-banking systems, e-commerce systems, and e-participation systems. The civic sector includes e-participation systems, e-democracy systems, and e-voting systems. According to Savoie (2009), access to government data brings the public sector in touch with citizens to make sure that the services provided by the public sector are of the type and quality citizens desire. Data access is not simply the act of making data available as different authors suggest. It entails enriching the data to provide meaningful access and use. Janssen, Charalabidis, and Zuiderwijk (2012) put forward the argument that raw data requires quality assessment, modification, and processing and cannot often be immediately utilized. They argue that data cannot be easily traced if important meta-data like the publisher, authors, timeliness, etc. are missing. To access open data easily, they further argue, meta-data is required to overcome challenges of searching the data, interpret it, and so on, akin to how you search a document in a library.

A well-established infrastructure provides access to open data with ease. Ease of access to open data promotes the achievement of its economic and social value (Kundra, 2012). Open Data Institute, (2018) observes that data cannot be considered ‘open’ if it is not accessible. Ubaldi, (2013) notes that open government data is government data available to everyone and according to OECD, (2018), improved accessibility to data can enhance greater collaboration within governments, as well as among government agencies, the private sector, civil society organizations, and citizens. Proper ICT infrastructure enables availability and access to open data, taking into consideration the differential

capabilities of data users to promote inclusion as evidenced in open data projects in São Paulo, Brazil (Janssen, Charalabidis & Zuiderwijk, 2012). The project failed to fully promote inclusion because the enthusiasm of the diverse group of citizens that gathered in a poor and often excluded part of the city, was thwarted by a lack of internet connectivity despite their high levels of interest in using open budget data to monitor the city government.

According to Bvuma & Joseph (2019), public services are delivered on open platforms and domains coupled with suitable required Information and Communication Technologies, further enabling transparency and accountability in governments. Oyatsi (2015) observes that governments today rely on ICT to involve the public in democratic processes as well as support the processes connected to opening up their data.

Mutuku & Mahihu (2014) identified corrupt networks in public institutions as a major hindrance in accessing open government data. This is because the networks benefit immensely from hogging access to information, and they use this monopoly of access to progress private interest, habitually at citizens' expense. Jeztek et al., (2013) identified a lack of motivation, technical skills, data literacy, and technical ability within the public sector and the existence of too disjointed and incongruent open data community as factors that hinder the successive implementation of open government data in public service realm.

According to Kandiri, (2006), leveraging ICT is key in improving the delivery of public services through open government data. Information Communication and Technology can be an influential instrument for development, both because of its intrinsic features and the growing empirical evidence that suggests it can contribute a great deal to development goals. He notes that ICT can be leveraged both locally and nationally, by enhancing the effectiveness and reach of development interventions, promoting good governance, and reducing the costs of delivering public services. The concept of open data has rapidly permeated the design and implementation of local government systems through ICT (Byuma et al., 2019).

### 2.3.2 Knowledge Level and Service Delivery

According to Bertot et al., (2010), the ability to use open government data is predicated on requisite information and civics literacy. Open data tends to be complex and more sophisticated. Janssen, Charalabidis, and Zuiderwijk (2012) observed that skills availability of all kinds and users' knowledge levels in using sophisticated data seems to be an undervalued subject. They note that a lot of effort currently is dedicated to easier use of data set in software applications, even though it necessitates refined

sets of skills and knowledge by users to link and combine data. They further argue that, because of the differential capabilities of users, the expectation cannot be that the public and researchers possess a similar extent or knowledge level and skills. As a result, open data that require a low knowledge level to use is key to its large-scale dissemination.

In their study, Mutuku and Mahihu (2014) observed that, despite the efforts for availing government datasets openly through the Kenya Open Data Initiative, data utilization from this platform was not as far-reaching rapidly as expected. To respond to this, they noted, an initiative named Code4Kenya was conceptualized for fellowship and outreach purposes. They also noted that the initiative was also developed to fast track public awareness and the capability to understand and find meaning or coherence in data and to stimulate dialogue and engage the public around critical public matters. According to Oyatsi (2015), the board of ICT established a communications office through which information about the Code4Kenya was released and circulated, and undertook activities aimed to increase awareness of the portal within the academia, technology, media, etc. as well as engage with communities. Even with this commitment, Mutuku, and Mahihu, (2014) note, few people were aware of the initiative.

OKF (2012) suggests that if you have a bunch of open datasets, it's certainly worth spending a bit of time ensure that people are aware or can at least find out that you have done so to reduce access barriers emanating from lack of awareness. OKF suggests several ways one can consider in creating open data awareness in addition to common methods such as press releases, announcing on the website, and so on. They include getting in touch with prominent organizations or persons who work/are interested in open data, writing to apposite mailing lists or social networking groups, and directly getting in touch with potential users who you know may be interested in your data.

In a study undertaken by the Global Open Data Initiative [GODI] in 23 countries in 2014, a majority of public sector employees claimed to know nothing or very little about open data whereas those more familiar with the concept of open data were individuals working on technology and open government (Oyatsi, 2015). Jeztek et al. (2013) identified a lack of technical skills, technical ability, and data literacy as the main factors that impede the public realm from successfully and continuously implementing open government data.

According to Oyatsi (2015), the gains of open data will only be realized once the concept of open data becomes familiar to stakeholders: citizens, CSOs, private sector, government, as well as app developers, and they put it to use. Predictably, she further observes, open data knowledge is characteristically

isolated within relevant departments and branches of government. She also identifies what Muigai (2014) opines, that open data has been 'siloed' as a technology conversation and this could be contributing to its low awareness. She states that open data goes beyond creating an open data portal, disseminating data, and building apps and suggests that in striving to achieve a more transparent, accountable, and effective government, engagement on open data or the conversations around it should go beyond just the technology itself.

According to Canares et al. (2014), governments are required to put important government data out in the public domain as well as enable the public to engage meaningfully with governments through the use of open government data. According to them, this requires policies that will need observance of standards of open government data and a process for capacity building to make certain that the public, to whom the data is intended, is aware and able to use the data to promote more transparent and accountable governance.

Knowledge of the value of open government data and the need for transparency and accountability for effective public service delivery is key to politicians and public servants because they are the policymakers and implementers respectively (Mulgan, 2012). He identifies the need to have the necessary bureaucratic cultural change to increase the knowledge levels of the data publishers and users. He notes that what would facilitate this is when politicians and public servants commit and become assured of the benefits of transparency in government, both to the general public as well as to governments themselves in the discharge of their duties. According to him, this entails increasing awareness across the public sphere of the value of open data, and enhancing the digital abilities of civil servants to support government departments in publishing datasets that are beneficial to society.

### 2.3.3 Application of Open Data and Service Delivery

Many governments have realized the potential economic value that open data has (Kassen, 2017; Sivarajah et al., 2015). According to Jetzek et al., (2013), more than 280 government data files have been published and governments around the world have released over a million datasets spawning new businesses and social projects. This is because as stated earlier, open government data is normally viewed to drive efficiency, a means to increase transparency, promote citizen participation, and as a vehicle to societal innovation.

Open Knowledge Foundation, (2012) outlines the following as the areas where open data is generating value: transparency and democratic control, participation, self-empowerment, improved or new private

products and services, innovation, improved efficiency of government services, improved effectiveness of government services, measurement of policies impact and new knowledge from pooled data sources and patterns in large volumes of data. Sivarajah et al., (2015) observe that currently there is a bigger opportunity for transparency, accountability, and policymaking process that is evidence-based when public entities open data. They further note that, by utilizing historical open data that is publicly available, citizens can now evaluate the impacts and benefits of the policies that their leaders introduce and demand accountability.

According to OECD, (2013), policies, programs, and initiatives on government open data have the prospective to offer a myriad of public governance and socio-economic benefits. Byuma et al, (2019) observe that open data provides a basis for empowering communities and improving the delivery of public services through availing government data to the public. This enables public institutions to become more transparent and accountable to the citizens. They further note that governments can leverage open government data to establish innovative public sector processes and the delivery of public services. This can aid in promoting the provision of innovative, citizen-centric services. Savoie (2009) notes that better service provision includes delivering a better widget and getting in touch with citizens to make sure they receive services that are of the kind and quality they desire.

Jetzek et al., (2013) identify two discrete ideologies that appear to drive most of the open government data initiatives today i.e. 're-use of data' and the 'open government' perspective. According to them, the literature on the former is mostly dedicated to the economic value of government data, while the literature on the latter is focused on government policy and centered on how the use of open government data can add to the development of social value in a collaborative nature. They recognize this economic value by noting that governments around the world have produced new businesses and social projects by releasing over a million datasets. They conclude their research paper by acknowledging that, if opening up data is accompanied by proper resource management, enabled society, and good infrastructure, the use of open government data will generate value economically and socially through efficiency, innovation, transparency, and participation.

Government open data presents the opportunity to include actors from within and outside of governments in creating innovative ways to provide solutions to old and new problems (O'Reilly, 2013). This can help to increase the government's effectiveness and efficiency, in addition to improving the provision of services and the operations of the public sector internally. Open data, Reilly notes, can help

to develop more efficient service delivery chains; help in improving access to public services; as well as enable the development of more informed policies. As O'Reilly (2013) notes, by publishing data in a programmatically accessible way, agencies find cheaper and more modular service delivery possible through reusable data sources.

Nevertheless, what makes open government data valuable in the context of public service delivery? According to Xiao et al., (2019), the value and usability of open government data depend on the kind of information users need when they access open datasets. They note that the benefits of open government data are commonly associated with high public trust, civic engagement, and institutions that are accountable. Ubaldi, (2013) notes that open government data is as well seen as a key source of economic growth, social innovation, and new entrepreneurship, which are crucial in public service delivery.

Transparency and Accountability are considered essential pillars of good governance, as shown in practice (Mabillard & Zumofen, 2015) and availability of open government data enables citizens to control administrative decisions and processes thus promoting transparency and accountability. According to Xiao et al., (2019), open government data is being accredited as a valued resource for enhancing transparency in policymaking, has been widely gained access to for numerous economic and social development projects as well as being used to promote accountability in governance. Oyatsi, (2015) observes that opening up data enables citizens to be much more informed and directly involved in policymaking. She notes that this is more than transparency because by creating a full "read/write" society, citizens will know what is happening in the governance process and be able to make their contributions and demand feedback and accountability.

In a research report by Mabillard & Zumofen (2015), transparency promotes both vertical and horizontal accountability and by accessing public data, citizens become aware of what their administrations are doing and are enabled to condemn that which is dysfunctional. Sivarajah et al. (2015) observe that citizens require enhanced methods to analyze and assess the impact of public policies that policymakers present, using empirical facts and evidence. They also note that there is a need to avail appropriate tools that can facilitate in evaluating past as well as present and future policy decisions. Public officials can achieve this through the utilization of open data for evidence-based policymaking and evaluation. However, notes Janssen, Charalabidis, and Zuiderwijk (2012), public officials and managers of data have a habit of avoiding opening their data, because it would grant the public new insights, which might make them start asking critical questions.

Moussa et al. (2018) define innovation as successfully implementing ideas and processes to solve current problems and advance in new areas and opportunities. They however note that a consistent definition of the concept of innovation in the existing literature is lacking and in today's world, innovation and data reliance lead the way in public service delivery. Manuel (2001) notes that, through information and communication technologies, we are living through one of those rare intervals in history. An interval styled by a change of our "material" culture by the workings of a new technological model structured around information technologies.

At present, the role of governments is changing from being the sole problem solver to an expeditor, offering the platform for both institutional and non-institutional actors to work together and find shared solutions (O'Reilly, 2013). Reilly notes that open data that is well published and up to date, will assist other people and organizations to generate new information, analysis, and services. Collectively, non-institutional actors are also using government open data to create new solutions that are innovative and valuable, directly contributing to innovation in the public sector (O'Reilly, 2013). However, Moussa et al., (2018) note that governance behaviors that promote public sector innovation differ significantly from one country to another.

Kassen (2017) notes that open data is being utilized in different countries to promote innovations in the public sector and enhance socio-economic development. As a moderately emerging socio-economic phenomenon in Estonia, Kassen, (2017) notes that open data is aggressively promoted among experts of e-government and enthusiasts of open data with different results as a seemingly promising sociopolitical platform to unveil new technology startups and enhance innovations in the public sector, as well as non-governmental and civic sectors. From the time when Kenya Open Data Initiative was launched in 2011, there have been several community applications developed using open data available on the main portal opendata.go.ke, extracting data from it, and presenting that data in a more non-complex manner for the population to consume (Oyatsi, 2015).

Increased data availability and accessibility offer a base for civic partaking and collaboration in providing innovative, enhanced services (Ubaldi, 2013). This was further noted by Byuma et al., (2019) when they stated that, by encouraging and availing open data, public entities can help promote innovative, citizen-oriented services. The latter note that open government data can be used to support innovation in the public sector processes and delivery of public services.

OECD's comparative study (2013), on how government open data can aid in driving innovation derived the following: transforming the public's experience, creating new generations of empowered public servants, revolutionizing public procurement, progressing the internal dynamics of a public sector, recognizing emerging governmental and societal needs through Predictive Data Analytics and promoting mutual learning, shared intellect and community participation in the delivery of services and policymaking.

### 2.4 Summary of Research Gaps

The research gap identified during the literature review is the lack of observed evidence that open government data promotes accountability and transparency. Many research studies on OGD do not adequately show whether the availability of open government data enables citizens to control administrative decisions and processes thus promoting transparency and accountability Application of open data is not consistent in cross-border regimes and transparency and accountability are looked at at differently across different regimes. Zuiderwijk & Janssen (2014) observe that there lacks an apposite framework for matching open data policies across regimes, as open data is a new phenomenon and is currently in the early stages of development. Oyatsi, (2015) takes notice of Robinson and Yu's argument that open data does not always translate to accountability.

**Table 1.1: Knowledge Gaps**

| Variable | Author | Findings | Knowledge Gap |
|---|---|---|---|
| Data Availability | Savoie (2009) | Access to government data brings the public sector closer to the people to ensure that they receive services that they desire. Data access is not simply the act of making data available, it entails enriching the data to provide meaningful access and use. | The research study has explored the types of services that the County Government of Nairobi provides through open government and the different platforms the county has for providing open data including the engagement mechanisms it has with the general public and other actors to enhance public service delivery. |
| Knowledge Level | Oyatsi (2015) | Understanding of the concept of open data is usually secluded within specific departments and divisions of government and open data is extends beyond developing open data portals, building apps, and disseminating data | To attain a more effective, transparent, and accountable Nairobi county government, the study went beyond just the technology itself and data release |

| | | | |
|---|---|---|---|
| Application | Janssen, et al. (2012) | There lacks appropriate metrics for evaluating if opening data is a success and benefits of open data are general without saying much about the single data sets. | The study has researched further to determine the benefits and significance of open data and made appropriate recommendations in the context of Nairobi County |

*Source: Researcher (2019)*

## 2.5 Conceptual Framework

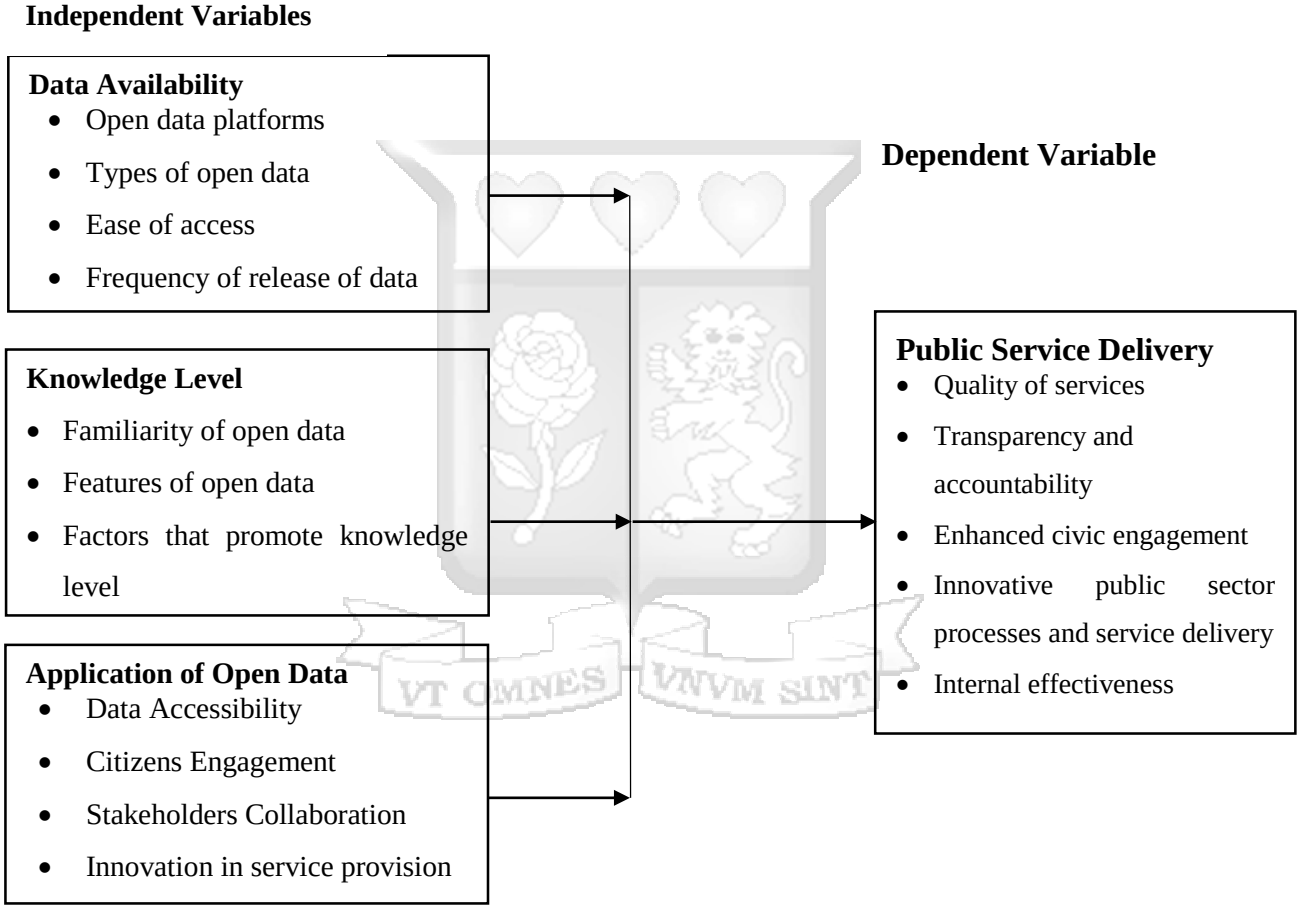



**Figure 2.1: Conceptual Framework** (*Source: Researcher, 2019*)

## 2.6 Operationalization of Study Variables in the Conceptual Framework

Figure 2.1 above shows the relationship between factors influencing the role of open government data in improving public service delivery. There are three independent variables namely: data availability in terms of the different types of open data, the various platforms that open data exist on, data catalog, ease

of accessing the data and, the systematic or release of data promptly. The second variable is the knowledge level of civil servants on open data; lastly the application of open government data in the different areas to gain its value. The dependent variable is public service delivery. The outcome of effectively implementing open government data is improved delivery of public services. The level of public service delivery is assessed using the indicators: improved quality of services, improved transparency and accountability, efficiency in the delivery of services, enhanced civic engagement, innovative public sector processes, and service delivery as well as internal effectiveness of the public sector.

**Table 2.2: Operationalization of Variables**

| **Objective** | **Type of Variable** | **Indicator** | **Measurement Scale** | **Tools of Analysis** |
|---|---|---|---|---|
| To investigate the influence of availability of government's open data on public service delivery in Nairobi County. | Independent | Open data platforms<br>Types of open data<br>Ease of access<br>Frequency of release of data | Quantitative data 5-point Likert scale | Mean, Standard Deviation and Correlation |
| To examine the influence of knowledge level on the government's open data on public service delivery in Nairobi County. | Independent | The familiarity of open data<br>Features of open data<br>Factors that promote knowledge level | Quantitative data 5-point Likert scale | Mean, Standard Deviation and Correlation |
| To investigate the influence of application of government's open data on public service delivery in Nairobi County | Independent | Data Accessibility<br>Citizens Engagement<br>Stakeholders Collaboration<br>Innovation in service provision | Quantitative data 5-point Likert scale | Mean, Standard Deviation and Correlation |
| Public Service Delivery | Dependent | Quality of services<br>Transparency and accountability<br>Enhanced civic engagement<br>Innovative public sector processes and service delivery<br>Internal effectiveness | Ratio | Correlation |

## 2.7 Summary of Literature Review

The literature review started by examining the two theories that guided the study i.e. systems and institutional theories. In summary, systems theory suggests that open data associates to a reduced amount of control and accountability over data while the latter suggests that opening up data reinforces the available structures without altering them to take advantage of emerging developments. The literature review has established that public service has every time been one of the fundamental roles played by the government. In line with this, this literature review has empirically examined the correlation between open government data and public service delivery; data availability, knowledge level application of open data, and service delivery.

The chapter has examined the role of open data initiatives with prominence on government open data and public service delivery. The literature has discussed the various factors that influence the effective application of government open data. These factors include; the type of data released to the public, data accessibility and ability to use, knowledge levels of data publishers and users, availability of proper infrastructure, and provision of support environments such as adequate legal, policy, and institutional framework. The literature has looked at the various benefits of open data and the possible barriers to access and use it. The common understanding is that public service institutions will not realize these benefits if they do not address the barriers appropriately and overcome them. To realize public value from open data, the deduction is on establishing a good balance of management, organization, and effectiveness to guarantee the quality, create trust, reduce risks, proliferate public value, promote innovation and strengthen transparency.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter discusses the main research methodology that was followed in carrying out the study. The research design, target population, sampling procedures, sampling framework, sample size, research instrument, data collection instruments, data collection procedures, data analysis, ethical considerations, operational definition of variables, and research quality issues have been discussed in this chapter.

## 3.2 Research Design

Research design is viewed as "a way to systematically solve the research problem." (Kothari, 2004). A method that provides a framework through which the researcher gathers and presents data. The study adopted an exploratory research design. The researcher identified the exploratory research design as appropriate for assessing the link between open data and service delivery. Exploratory research design is conducted to determine the nature of the problem and helps the researcher to develop a better understanding of the problem.

This research study adopted a quantitative emphasis to find correlational relationships between variables and facilitated by the use of primary data. The survey involved administering questionnaires to the county employees. The researcher collected and analyzed data to establish the influence of availability of open government data, knowledge level on open data, and application of government open data using a case of the County Government of Nairobi. This study provided the researcher with an opportunity to give a detailed analysis of the prevailing situation. This also helped give an in-depth understanding of phenomena under study.

## 3.3 Target Population

A study population can be defined as "the group that a researcher has in mind from whom he or she can obtain information" (Sharma, 1984). The study targeted all thirteen County Government Sectors. These Sectors are Information Communication Technology & e-Government; Devolution, Public Service and Administration; Education, Youth and Social Services; Lands, Urban planning, Urban renewal, Housing and building services; Agriculture, Fisheries and Livestock Development; Environment, Energy, Water and Sanitation; Finance and Economic Planning; Health Services; Roads, Public Works, and Transport;

Trade and Industrialization; Legal Affairs; Security and Compliance and Disaster Management. The total population of all the county government employees from the thirteen sectors was 11,444 (County's Human Resource Development Department, 2020). From the thirteen sectors, the study targeted the heads of sectors (County Executive Committee Members and County Chief Officers), heads of departments (County Directors), and mid-level staff because these are the people largely in charge of formulating and implementing policy decisions as well as managing and coordinating service delivery in the County. The target population of the heads of sectors, heads of departments, and the mid-level staff was 410. This represented 10 respondents from each of the 41 departments.

**Table 3.1: County Sectors, Departments and Number of Employees**

| S/No | Sector | Departments | Total Population |
|---|---|---|---|
| 1) | Information Communication Technology & e-Government | 1 | 60 |
| 2) | Devolution, Public Service and Administration | 21 | 4133 |
| 3) | Education, Youth and Social Services | 2 | 746 |
| 4) | Lands, Urban planning, Urban renewal, Housing, and building services | 3 | 369 |
| 5) | Agriculture, Fisheries and Livestock Development | 2 | 22 |
| 6) | Environment, Energy, Water, and Sanitation | 1 | 462 |
| 7) | Finance and Economic Planning | 3 | 956 |
| 8) | Health Services | 2 | 1813 |
| 9) | Roads, Public Works, and Transport | 1 | 591 |
| 10) | Trade and Industrialization | 1 | 262 |
| 11) | Legal Affairs | 1 | 68 |
| 12) | Security and Compliance | 2 | 1848 |
| 13) | Disaster Management | 1 | 114 |
| | **Total** | **41** | **11,444** |

*Source: County Government of Nairobi's Human Resource Development Department, 2020*

A sampling of the sectors and respondents is presented in the following sections.

## 3.4 Sampling Procedure and the Sample of the Study

### 3.4.1 Sampling Procedure

Sampling is the "selection of individuals from the population in such a way that it is a representative of the whole" (Sharma, 1984). From the thirteen county sectors, the research study sampled 300 respondents from seven County Sectors. The seven-county sectors have 30 departments, representing

10 respondents from each department. The County Sectors sampled were: Information Communication Technology & e-Government; Devolution, Public Service and Administration; Education, Youth and Social Services; Lands, Urban planning, Urban renewal, Housing and building services; Environment, Energy, Water, and Sanitation; Roads, Public Works and Transport and Trade and Industrialization. The reason the researcher selected these seven Sectors for sampling was that they are the ones majorly involved in public service delivery. The study used purposive/judgmental sampling to select key informants from the seven Sectors. The main strength of using purposive sampling lies in selecting information-rich cases for depth analysis related to the central issues being studied (Kombo and Tromp, 2006). For the study, 'information-rich' respondents were identified based on their roles and unique characteristics (technocrats, heads of sectors, and departments).

### 3.4.2 Sample Size

A sample is a representation of the population from which it is selected and a sample size refers to the number of items to be selected from the population to constitute a sample (Gay & Airaisian, 2000). They further point out that "an optimum sample is one which fulfills the requirements of efficiency, representativeness, reliability, and flexibility."

Given the research was quantitative; respondents from the seven-county Sectors were grouped according to their designations in each sector/department. To get the total number of respondents, the researcher used the Yamane formulae to calculate the proportion sample of the seven County Sectors at a 5% estimation error, as indicated below:

$$n = \frac{N}{1 + N(e^{2})}$$

Where: n is the sample size, *e* is the error term, and N is the total target population

N = 300

$$n = \frac{300}{1+300\ (.05*.05)} = 172 \text{ respondents}$$

The sample size for the research was172 respondents (Heads of the Sectors, Senior and Mid-level Staff) representing 6 respondents from each of the 30 Departments. The study conducted a census sample of all the respondents.

**Table 3.2: Sampling Framework**

| Area of Study | Total number of Sectors | Total number of Departments | Total Population | Sample Sectors | Target Population | Sample Size | % of the target population |
|---|---|---|---|---|---|---|---|
| County Government of Nairobi | 13 | 41 | 11,444 | 7 | 300 | 172 | 57.3 |

### 3.5 Data Collection Instruments

The researcher used research questionnaires for the respondents (see appendix III). The study tools were developed from study objectives and literature review to make sure that they retain relevancy to the research problem. The use of questionnaires was preferred because it allowed the researcher to acquire data from a varied number of respondents at a lower cost. It also guarantees fairness and protects the respondent's identity. The research questionnaires contained closed-ended questions. This was intended to draw deeper underlying issues regarding the subject matter and other issues that cannot be captured in previous studies

### 3.6 Data Collection Procedures

This study used primary data, which refers to information obtained from survey respondents. The protocol for data collection was followed by attentively. The researcher first sought approval from the University Ethics Board before the research study began. Thereafter, approval was sought for the collection of data from the National Commission for Science, Technology, and Innovation (NACOSTI) in Kenya, an agent of the Ministry of Education. Upon receiving the approvals, the researcher visited respondents from the county departments selected to participate in the study. Upon visiting the offices, the researcher explained in detail the purpose of the visit to the administration and created a rapport with the officials as well as the respondents. The researcher adopted a drop and pick technique in collecting data and responses were collected as agreed with the respondents.

### 3.7 Research Quality

The researcher observed research quality by ensuring that the techniques and reports used were reliable to produce consistent reports when used by other researchers. Completeness and accuracy of the filled questionnaires were checked to guarantee data reliability. The researcher undertook a pilot study in two of the County Sectors that were not involved in the actual study (a sample of 30 respondents) to test the survey instrument i.e. Agriculture, Fisheries and Livestock Development, and Health Services Sectors.

This helped to validate the questions, remove errors of omission and commission, rectify mistakes, and check the general structure of the questionnaire. The study employed a small sample of randomly selected county staff who did not form part of the population under study to measure the reliability of the questionnaire. This was done before proceeding to collect the actual data for analysis in the other seven Sectors as earlier indicated.

### 3.7.1 Validity of the Research Instruments

The validity of all the research instruments was established through consultation with the researcher's supervisor. The supervisor carefully examined all the items in the instruments to ascertain if they had content validity and the revisions were done accordingly. The validity of the questionnaires was further determined by pre-testing on a small sample of respondents who were not involved in the actual study; responses were assessed, items incorrectly prepared were reviewed and ambiguous questions rephrased thus enhancing the validity.

### 3.7.2 Reliability of the Research Instruments

The researcher undertook a pilot study to enhance the reliability of the research instruments. A test-retest technique was used to test the reliability of the questionnaires using the steps outlined by Orodho (2005). The responses were manually scored, and a comparison between answers obtained in both cases was made and a coefficient of reliability was established.

## 3.8 Data Analysis

Upon completion of data collection, the researcher checked the questionnaires for errors and entered data in Statistical Package for Social Scientists (SPSS V.25) software for analysis. The software was used because of its flexibility and is most commonly used. During analysis, both descriptive and inferential statistics which included percentages, means, standard deviations, frequencies, and cross-tabulation were executed. Data collected were analyzed through descriptive analysis procedures. The analysis procedures included frequencies, percentages, summated ratings, and mean. The analyzed data was presented using tables. The researcher employed multiple regression analysis to show the relationship between public service delivery and availability of open data, knowledge level, and application of open data. Regression was useful for its ability to test the nature of the influence of independent variables on a dependent variable. The analyzed data was presented using summary data tables and text to explain what the tables are showing.

The multiple regression model that was used is given by

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

Where:

Y= Public Service Delivery

$\beta_0$ = constant term, $\beta_1, \beta_2, and\ \beta_3$are coefficients of

Availability ($X_1$),

Knowledge Level ($X_2$),

Application ($X_3$),

### 3.9 Ethical Considerations

The researcher sort necessary approvals before the research study began. The researcher produced a letter of introduction from the University and a participant information sheet and consent form to respondents to assure them that the research will be purely for academic purposes. Measures to get access to the respondent's premises were obtained through building rapport with personal networks and presenting the letter of introduction from the University. Thereafter, the researcher introduced himself to the target respondents to explain what the study entails, the purpose of the study, and the benefits of the study to the respondents. It was necessary to make clear that the purpose of the study was purely academic to enhance knowledge and the researcher purposes to share the final research document with the County Government. The research upheld the ethical rights of the respondents when seeking access. The researcher stressed that responding to the questionnaire was voluntary. The respondents maintained the right to withdraw from the study at any point in the study. The respondents were also assured that their identity and information provided will remain confidential and will not be used against them.

# CHAPTER FOUR

# DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

## 4.1 Introduction

This chapter presents the results of the data analysis based on the three broad objectives of this study, the presentation, and the interpretation of the results. It presents the findings of the study organized in terms of the review themes under the following sub-headings: questionnaire response rate, demographic characteristics of the respondents, government's open data availability, open data knowledge level, and application of government's open data at the county level. The chapter also provides an interpretation of the data presented.

## 4.2 Response Rate

The study was conducted on a sample of 172 respondents to whom questionnaires were administered. Out of the 172 questionnaires distributed in the study, 132 were duly filled and collected representing a response rate of 76.74%.

## 4.3 Demographic Information

This section discusses the demographic profile of the respondents in this study. This distribution includes distribution by age, gender, and years of experience.

### 4.3.1 Distribution of Respondents by Age

The researcher sought to establish the age distribution of the respondents, which gave a clear image of the demographic profile of senior and mid-level management staff at the County Government of Nairobi.

**Table 4.1: Respondents Age Distribution**

| Age Profile | Mid-Level Staff | | Senior Level Staff | | |
|---|---|---|---|---|---|
| 20-24 | 0 | 0.0% | 0 | 0.0% | 0 |
| 25-29 | 1 | 1.9% | 0 | 0.0% | 1 |
| 30-34 | 3 | 5.7% | 1 | 1.3% | 4 |
| 35-39 | 12 | 22.6% | 3 | 3.8% | 15 |
| 40-44 | 13 | 24.5% | 15 | 19.0% | 28 |
| 45-49 | 12 | 22.6% | 27 | 34.2% | 39 |
| 50-54 | 8 | 15.1% | 24 | 30.4% | 32 |

| | | | | | |
|---|---|---|---|---|---|
| 55-59 | 4 | 7.5% | 7 | 8.9% | 11 |
| Above 60 | 0 | 0.0% | 2 | 2.5% | 2 |
| **Total** | **53** | **100** | **79** | **100** | **132** |

From the respondents' age distribution table, it is observed that most respondents from the middle-level staff category were in the 40-44 years age bracket while the majority in the senior level staff category were in the 45-49 years age bracket. The lowest percentages of the respondents were in the age brackets of below 35 years and above 60 years in both staff level categories

### 4.3.2 Distribution by Gender

The researcher also sought to establish the gender demographic profile of the respondents from this survey.

**Table 4.2: Distribution by Gender**

| Gender | Male | | Female | | No. |
|---|---|---|---|---|---|
| 20-24 | 0 | 0.0% | 0 | 0.0% | 0 |
| 25-29 | 0 | 0.0% | 1 | 2.2% | 1 |
| 30-34 | 1 | 1.2% | 3 | 6.5% | 4 |
| 35-39 | 6 | 7.0% | 9 | 19.6% | 15 |
| 40-44 | 15 | 17.4% | 13 | 28.3% | 28 |
| 45-49 | 28 | 32.6% | 11 | 23.9% | 39 |
| 50-54 | 26 | 30.2% | 6 | 13.0% | 32 |
| 55-59 | 8 | 9.3% | 3 | 6.5% | 11 |
| Above 60 | 2 | 2.3% | 0 | 0.0% | 2 |
| **Total** | **86** | **100** | **46** | **100** | **132** |

From the gender distribution table, it was observed that the clear majority was male; however, most of them were in the 45-49 years age bracket. Most females were in the 40-44 years age bracket and present a younger population as the majority fall between 35-49 years compared to males whose majority fall between 40-54 years of age. With the movement up the age groups, female proportional representation dropped more steeply than that of men. Overall, 63% of the respondents were over the age of 45 years representing an aging workforce.

### 4.3.3 Distribution by Number of Years Worked at the County Government of Nairobi

The researcher also sought to investigate the distribution by years the respondents have worked in the County Government of Nairobi to better understand the staff members and their work experience at the county.

**Table 4.3: Distribution of Respondents by Number of Years Worked**

| Years of Work | Number of Respondents | % |
|---|---|---|
| 0-1 years | 6 | 4.5% |
| 2-3 years | 28 | 21.2% |
| 4-5 years | 54 | 40.9% |
| 6-7 years | 44 | 33.3% |
| **Total** | **132** | **100** |

From table 4.3 on respondents' distribution by the number of years worked, most of the respondents have worked with the County Government of Nairobi for 4-5 years representing 40.9%. 33% of the respondents have worked with the County Government since the advent of devolved governments (6-7 years).

### 4.3.4 Distribution of Respondents by Academic Qualifications

The study also sought to study the distribution of the respondents by their highest levels of academic achievements.

**Table 4.4: Respondents Distribution by Academic Qualifications**

| Academic Qualifications | Number of Respondents | % |
|---|---|---|
| Post Graduate | 24 | 18.2% |
| Graduate | 96 | 72.7% |
| Diploma/College Certificate | 9 | 6.8% |
| Form 4 Certificate | 3 | 2.3% |
| **Total** | **132** | **100** |

From table 4.4 on respondents' distribution by academic qualifications, most respondents have attained a minimum of a bachelor's degree representing 74.2% while the least (3%) have only attained a form 4 certificate.

## 4.4 The Influence of Availability of County Government Open Data in Improving Public Service Delivery

The survey aimed to determine the availability of government open data at the county level. The findings are as shown in the subsequent headings

### 4.4.1 Platforms for Accessing County Government's Open Data

The survey carried out yielded the following results on the available County Government of Nairobi's open data platforms.

**Table 4.5: County Government's Open Data Platforms**

| Open Data Platform | Availability | |
|---|---|---|
| | Yes | No |
| Department Website | 6% | 94% |
| County Website | 92% | 8% |
| Open Data Websites | 30% | 70% |
| Mobile or Mobile Apps | 84% | 16% |
| Customer Service Portal | 68% | 32% |

From the study findings, most of the county government's open data or information is accessible through the county's website (92%) while departments provide the least open data or information (6%). The County government's data/information is also largely accessible through mobile USSD services and Nairobi City County mobile app. However, the latter is mainly for paying county services with ease. The statistics from the survey indicate a high centralization of county information on one platform which could hinder large-scale dissemination of data to different users as well as a cause among others, information bias due to lack of independent open data-driven projects, inadequate open data on the website, low stakeholders engagement and data sharing, and system crash due to overload.

### 4.4.2 Descriptive Statistics of Availability of Open Government Data on Public Service Delivery

The survey yielded the following results on the availability of County Government of Nairobi's open data. The scale level ranges were from 1 – 5

**5= Strongly Agree 4=Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

**Table 4.6: Availability of County Government's Open Data**

| Availability | 1 | 2 | 3 | 4 | 5 | Total | Mean | SD |
|---|---|---|---|---|---|---|---|---|
| Data from your department is publicly available online or in digital formats | 4 | 15 | 39 | 47 | 27 | 132 | **3.59** | **1.03** |
| | 3.0% | 11.4% | 29.6% | 35.6% | 20.5% | 100.0% | | |
| Data from your department is easily accessible online or in digital formats and quick to find and use | 7 | 25 | 37 | 31 | 32 | 132 | **3.42** | **0.965** |
| | 5.3% | 18.9% | 28.0% | 23.5% | 24.2% | 100.0% | | |
| Datasets on your open data platforms cover all your areas of service provision/mandate | 23 | 44 | 31 | 20 | 14 | 132 | **2.68** | **0.994** |
| | 17.4% | 33.3% | 23.5% | 15.2% | 10.6% | 100.0% | | |
| Datasets available on your open data platforms are free for anyone to access, use and share it | 34 | 29 | 27 | 23 | 19 | 132 | **2.73** | **1.356** |
| | 25.8% | 21.9% | 20.5% | 17.4% | 14.4% | 100.0% | | |
| | | | | | | | | |
| **Overall** | **17.0%** | **28.3%** | **33.5%** | **30.3%** | **23.0%** | | **3.11** | |

According to the study findings, most respondents agree that data from their department is publicly available online or in digital formats (mean = 3.59). However, most respondents disagree that county datasets publicly available on digital platforms or online cover all the areas of service provision/mandate (mean = 2.68). The survey statistics indicate that, despite the county government efforts to provide data publicly through open data platforms, it does not provide adequate and enriched data to the public to provide meaningful access and use. The implication is that data sets that are not readily available to users such as development agencies and citizenry pose a serious impediment to efficient, transparent, and effective public service delivery.

### 4.4.3 Relationship between Availability of Government Open Data and Public Service Delivery

The relationship between the application of government open data and public service delivery was assessed through a simple regression model and the results are presented in Table 4.7

**Table 4.7: The Relationship between Open Data Availability and Public Service Delivery**

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.585834976 |
| R Square | 0.343202619 |
| Adjusted R Square | -1.666666667 |
| Standard Error | 26.08864183 |
| Observations | 1 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 1066.948302 | 213.3896604 | 1.567618701 | 0.000 |
| Residual | 3 | 2041.851698 | 680.6172327 | | |
| Total | 8 | 3108.8 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | | | | | | | 0 | 0 |
| X Variable 1 | | | | | | | -2.2143E-307 | 2.2143E-307 |
| X Variable 2 | | | | | | | 0 | 0 |
| X Variable 3 | | | | | | | 0 | 0 |
| X Variable 4 | 12.78303 | 54.31465 | 0.23535 | 0.82909 | -160.07043 | 185.63650 | -160.07043 | 185.63650 |
| X Variable 5 | 0.62895 | 0.50234 | 1.25205 | 0.29928 | -0.96971 | 2.22761 | -0.96971 | 2.22761 |

From the findings in Table 4.7, the value of R=0.586 represents the simple correlation between the availability of government open data (independent variable) and public service delivery (dependent variable). It indicates that there exists a moderately strong positive correlation between the availability of government open data (independent variable) and public service delivery (dependent variable) in the county. The value of R square = 0.343 indicates how much of the total variation in the public service delivery (dependent variable) is explained by the availability of open data in the county (independent variable). In this case, 34% of the variation in public service delivery (dependent variable) is accounted for by the availability of open data (independent variables).

### 4.5 The Influence of Knowledge Level about Government Open Data on Public Service Delivery

The survey aimed to determine the level of familiarity with government open data at the county level. The findings are as shown in the subsequent headings

### 4.5.1 Familiarity with the Concept of Government Open Data

To determine the respondents' familiarity with the concept of government open data, the survey yielded the following results

**Table 4.8: Familiarity with the Concept of Government Open Data**

| Level of Familiarity | Total | Percentage (%) |
|---|---|---|
| Not at all familiar | 16 | 12 |
| Slightly familiar | 47 | 36 |
| Moderately familiar | 58 | 44 |
| Very familiar | 11 | 8 |
| Extremely familiar | 0 | 0 |
| **Total** | **132** | **100** |

From the survey findings, most respondents reported to be moderately familiar with the concept of government open data (44%) whilst those very familiar with the concept were the least (8%). These statistics indicate a moderate to low awareness across the county government of the benefits of open data. This implies that county government open data has been 'siloed' as a technology conversation and this could be contributing to its low awareness. A factor that could hinder the successful implementation of government open data at the county level.

### 4.5.2 Descriptive Statistics of Knowledge Level on Features of Open Data

To determine the respondents' familiarity with the features of open data, the survey yielded the following results. The scale level ranges were from 1 – 5

**5= Strongly Agree 4=Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

**Table 4.9: Features of Open Data**

| Features | 1 | 2 | 3 | 4 | 5 | Total | Mean | SD |
|---|---|---|---|---|---|---|---|---|
| Open data is available for use by anybody | 23 | 33 | 40 | 24 | 12 | 132 | **2.77** | **1.199** |
| | 17.4% | 25.0% | 30.3% | 18.2% | 9.1% | 100.0% | | |
| Open data is easily accessible by anybody | 24 | 29 | 35 | 26 | 18 | 132 | **2.89** | **1.222** |
| | 18.2% | 21.9% | 26.5% | 19.7% | 13.6% | 100.0% | | |
| Open data is easy to use by anybody | 36 | 34 | 25 | 20 | 17 | 132 | **2.61** | **1.364** |
| | 27.3% | 25.8% | 18.9% | 15.2% | 12.9% | 100.0% | | |
| | 11 | 15 | 24 | 38 | 44 | 132 | **3.67** | **1.035** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Open data is released systematically and in timely manner | 8.3% | 11.4% | 18.2% | 28.8% | 33.3% | 100.0% | | |
| Government data is public data by law and should be made open and available for others to use | 16 | 25 | 41 | 29 | 21 | 132 | **3.11** | **1.108** |
| | 12.1% | 18.9% | 31.1% | 21.9% | 15.9% | 100.0% | | |
| **Overall** | **22.00** | **27.20** | **33.00** | **27.40** | **22.40** | | **3.01** | |

According to the study findings, most respondents strongly believe that open data should be released systematically and in a timely manner (mean = 3.67) and that government data is legally public and ought to be made open and availed to others to use (mean = 3.11). This is an indication that the respondents are aware of the critical issues around public service delivery such as resource efficiency and transparency. However, most respondents did not agree that open data is easy to use by anybody (mean = 2.61). The latter indicates that the respondents do not quite understand that open data should be easy to use by anybody because open data users have differential capabilities, which is key to large-scale dissemination of the data. This may imply that some public servants still want to hold on to the role of information gatekeeper without releasing it to the public for use or scrutiny despite highly agreeing that government data is legally public data and ought to be made open and availed to others to use and re-use.

### 4.5.3 Descriptive Statistics of Factors that Promote Knowledge Level about Government Open Data

To determine the respondents' agreement with factors that promote knowledge level about government open data in the public sector, the survey yielded the following results.

The scale level ranges were from 1 – 5

**5= Strongly Agree 4=Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

**Table 4.10: Factors that Promote Knowledge Level about Government Open Data**

| **Factors that promote knowledge level about government open data in the public sector** | **1** | **2** | **3** | **4** | **5** | **Total** | **Mean** | **SD** |
|---|---|---|---|---|---|---|---|---|
| A fellowship and outreach initiative to sensitize people is required | 11 | 14 | 35 | 40 | 32 | 132 | **3.52** | **1.203** |
| | 8.3% | 10.6% | 26.5% | 30.3% | 24.2% | 100.0% | | |
| Every department should have an active communications office | 25 | 28 | 27 | 24 | 28 | 132 | **3.02** | **1.395** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| through which information about open data platforms and initiatives is disseminated | 18.9% | 21.2% | 20.5% | 18.2% | 21.2% | 100.0% | | |
| Public sector training on IT skills and general awareness on open data should be done regularly across all departments | 10 | 23 | 27 | 32 | 40 | 132 | **3.52** | **1.107** |
| | 7.6% | 17.4% | 20.5% | 24.2% | 30.3% | 100.0% | | |
| Knowledge of open data should not be isolated within relevant departments and branches of government i.e. ICT department | 13 | 29 | 37 | 28 | 25 | 132 | **3.17** | **1.239** |
| | 9.9% | 21.9% | 28.0% | 21.2% | 18.9% | 100.0% | | |
| **Overall** | **14.75** | **23.50** | **31.50** | **31.00** | **31.25** | | **3.31** | |

From the survey findings on factors that promote knowledge level about government open data, most respondents agreed that public sector training on Information Technology skills and general awareness on open data should be done regularly across all departments alongside fellowship and outreach initiative to sensitize people is required (mean = 3.52). This indicates that the respondents understand that the ability to deliver services and to promote engagement around critical public issues through open data platforms is necessary and this is predicated on information, civics literacy, and general awareness on open data. Most respondents however strongly disagreed on every department having an active communications office through which information about open data platforms and initiatives is disseminated (mean = 3.02). This, as a few departmental heads noted, was mainly due to the existence of limited government resources as well as the need for centralization of information for proper dissemination, management, and coordination.

### 4.5.4 Relationship between Knowledge Level about Government Open Data and Public Service Delivery

The relationship between knowledge level about government open data and public service delivery was assessed through a simple regression model and the results are presented in Table 4.11

**Table 4.11: The Relationship between Open Data Availability and Public Service Delivery**

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.268918624 |
| R Square | 0.072317227 |
| Adjusted R Square | -1.666666667 |
| Standard Error | 22.43156562 |
| Observations | 1 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 117.6745911 | 23.53491821 | 0.233864081 | 0.000 |
| Residual | 3 | 1509.525409 | 503.1751363 | | |
| Total | 8 | 1627.2 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | | | | | | | 0 | 0 |
| X Variable 1 | | | | | | | -9.1945E-273 | 9.1945E-273 |
| X Variable 2 | 0 | 0 | 1.23146E-09 | 1 | 0 | 0 | 0 | 0 |
| X Variable 3 | | | | | | | 0 | 0 |
| X Variable 4 | 2.55803 | 50.31179 | 0.05084 | 0.96265 | -157.55655 | 162.67260 | -157.55655 | 162.67260 |
| X Variable 5 | 0.90311 | 1.86749 | 0.48360 | 0.66178 | -5.04006 | 6.84627 | -5.04006 | 6.84627 |

From the findings in Table 4.11, the value of R=0.2689 represents the simple correlation between knowledge level about government open data (independent variable) and public service delivery (dependent variable). It indicates that there exists a weak positive correlation between knowledge level about government open data (independent variable) and public service delivery (dependent variable) in the county. The value of R square = 0.072 indicates how much of the total variation in the public service delivery (dependent variable) is explained by the availability of open data in the county (independent variable). In this case, 7% of the variation in the public service delivery (dependent variable) is accounted for by knowledge level about open data (independent variable).

### 4.6 Influence of Application of Government Open Data in Improving Public Service Delivery

The survey sought to determine what the respondents think about the application of government open data. The findings are as shown in the subsequent headings

#### 4.6.1 Descriptive Statistics of Application of Government Open Data

To determine the respondents' take on the application of government open data, the survey yielded the following results.

The scale level ranges were from 1 – 5

**5= Strongly Agree 4=Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

**Table 4.12: Application of Government Open Data**

| Application of Government Open Data | 1 | 2 | 3 | 4 | 5 | Total | Mean | SD |
|---|---|---|---|---|---|---|---|---|
| Data accessibility | 9 | 23 | 23 | 37 | 40 | 132 | **3.58** | **1.095** |
| | 6.81% | 17.42% | 17.42% | 28.03% | 30.30% | 100.% | | |
| Citizens engagement with the government | 9 | 21 | 38 | 31 | 33 | 132 | **3.44** | **1.104** |
| | 6.81% | 15.90% | 28.79% | 23.48% | 25.00% | 100.% | | |
| Innovation in public service provision | 20 | 26 | 33 | 29 | 24 | 132 | **3.08** | **1.209** |
| | 15.15% | 19.69% | 25.00% | 21.96% | 18.18% | 100.% | | |
| Collaboration with other stakeholders in provision of public services | 29 | 35 | 40 | 18 | 10 | 132 | **2.58** | **1.154** |
| | 21.96% | 26.52% | 30.30% | 13.64% | 7.58% | 100.% | | |
| **Overall** | **12.68** | **19.88** | **25.38** | **21.78** | **20.27** | | **3.32** | |

From the survey findings, most respondents strongly agreed that data accessibility is the main reason for availing government open data (mean = 3.58). A significant proportion of respondents considered collaboration with other stakeholders in the provision of public services as the least use of government open data (mean = 2.58). Nonetheless, agreement on the application of government data did not vary so much among the respondents. The survey findings imply that, other than availing data to citizens and engaging them through service portals, the majority of the respondents do not sufficiently understand that public service delivery is multi-sectoral and opening up government data provides the opportunity to involve and collaborate with actors from inside and outside governments.

### 4.6.2 Relationship between Application of Government Open Data and Public Service Delivery

The relationship between Application of Government Open Data and Public Service Delivery was assessed through a simple regression model and the results are presented in Table 4.13

**Table 4.13: Relationship between Application of Government Open Data and Public Service Delivery**

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.607588988 |
| R Square | 0.369164378 |
| Adjusted R Square | -1.666666667 |
| Standard Error | 10.92950054 |
| Observations | 1 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 209.713054 | 41.9426108 | 1.755597013 | 0.000 |
| Residual | 3 | 358.361946 | 119.453982 | | |
| Total | 8 | 568.075 | | | |

| | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
|---|---|---|---|---|---|---|---|---|
| Intercept | | | | | | | -1.1324E-306 | 1.1338E-306 |
| X Variable 1 | | | | | | | 7.2198E+230 | 7.2198E+230 |
| X Variable 2 | | | | | | | 0 | 0 |
| X Variable 3 | | | | | | | 0 | 0 |
| X Variable 4 | -4.89913 | 24.12256 | -0.20309 | 0.85206 | -81.66788 | 71.86962 | -81.66786 | 71.86962 |
| X Variable 5 | 1.18557 | 0.89478 | 1.32499 | 0.27705 | -1.66201 | 4.03316 | -1.66201 | 4.03316 |

From the findings in Table 4.13, the value of R=0.608 represents the simple correlation between the application of government data (independent variable) and public service delivery (dependent variable). It indicates that there exists a moderately strong positive correlation between the application of government data (independent variable) and public service delivery (dependent variable) in the county. The value of R square = 0.369 indicates how much of the total variation in public service delivery (dependent variable) is explained by the application of government data (independent variable). In this case, 36.9% of the variation in the public service delivery (dependent variable) is accounted for by the application of government data (independent variable).

### 4.7 Public Service Delivery

To evaluate the respondents' take on public service delivery, the survey generated the following results.

The scale level ranges were from 1 – 5

**5= Strongly Agree 4=Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

**Table 4.14: Public Service Delivery**

| Public Service Delivery | 1 | 2 | 3 | 4 | 5 | Total | Mean | SD |
|---|---|---|---|---|---|---|---|---|
| Availability of adequate, up to date and easy to use open government data enhances citizen engagement with the government | 9 | 15 | 25 | 39 | 44 | 132 | **3.71212** | **1.228** |
| | 6.82% | 11.36% | 18.94% | 29.55% | 33.33% | 100% | | |
| By opening up data, citizens are enabled to be much more directly informed and participate in governance and decision-making | 17 | 21 | 24 | 36 | 34 | 132 | **3.37** | **1.356** |
| | 12.9% | 15.9% | 18.2% | 27.3% | 25.8% | 100% | | |
| Availing quality and adequate open government data increases efficiency in service delivery by reducing the cost of service provision, cost of data acquisition, and acquisition of accurate information to enable prioritization of projects | 8 | 13 | 29 | 39 | 43 | 132 | **3.72727** | **0.995** |
| | 6.06% | 9.85% | 21.97% | 29.55% | 32.58% | 100% | | |
| Knowledge level on open data provides a basis for providing quality data for efficient public service delivery as well as enhancing citizens engagement with the service providers | 15 | 18 | 29 | 36 | 34 | 132 | **3.42424** | **1.151** |
| | 11.36% | 13.64% | 21.97% | 27.27% | 25.76% | 100% | | |
| Open government data is a vehicle for increasing transparency and accountability in public service delivery | 5 | 9 | 26 | 53 | 39 | 132 | **3.85** | **1.041** |
| | 3.8% | 6.8% | 19.7% | 40.2% | 29.5% | 100% | | |
| Open government data improves quality of services delivered to the citizens | 12 | 12 | 33 | 36 | 39 | 132 | **3.59091** | **1.09** |
| | 9.09% | 9.09% | 25.00% | 27.27% | 29.55% | 100% | | |
| Open government data promotes internal effectiveness of a public institution | 15 | 27 | 31 | 31 | 28 | 132 | **3.22727** | **1.192** |
| | 11.36% | 20.45% | 23.48% | 23.48% | 21.21% | 100% | | |
| Open government data is a driver and a vehicle for promoting innovation in a society to enhance public service delivery | 12 | 22 | 29 | 34 | 35 | 132 | **3.43939** | **1.234** |
| | 9.09% | 16.67% | 21.97% | 25.76% | 26.52% | 100% | | |

From the survey findings, most respondents strongly agree that open government data is a vehicle for increasing transparency and accountability in public service delivery (mean = 3.85). The promotion of the internal effectiveness of a public institution through open government data was considered the least likely benefit of government open data (mean =.3.22). The survey results indicate that most respondents identify positively with the role of government data in improving public service delivery, which means reduced hindrances to the successful implementation of open government data in the public realm.

Nonetheless, the responses imply a varying degree of government open data awareness across the respondents.

### 4.8 Overall Relationship between Open Government Data and Public Service Delivery

In investigating the overall relationship between open government data and public service delivery, the following results were obtained to provide information showing whether open government data contribute statistically significantly to public service delivery in the county. The model can precisely be written as follows:

**Public Service Delivery = 10.442 + 0.629 Availability + 0.903 Knowledge Level + 1.186 Application**

From this model, in all the objectives open data contribute positively towards public service delivery. However, of the three objectives, availability of County Government Open Data was established to have the least positive correlation (R=0.585) with public service delivery while the application of government open data has the strongest positive correlation (R=0.607) with public service delivery.

| | Regression Coefficient | Comment |
|---|---|---|
| Objective 1 | 0.585834976 | Moderately Strong Positive Correlation |
| Objective 2 | 0.268918624 | Weak Positive Correlation |
| Objective 3 | 0.607588988 | Moderately Strong Positive Correlation |

# CHAPTER FIVE

# SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

## 5.1 Introduction

This chapter presents a summary of the findings from the study, a discussion of the findings, conclusions drawn, and the recommendations of the study and suggestions for further research. These conclusions and recommendations are drawn in a quest to address the purpose of the study, which was to establish the role of open government data in improving public service delivery.

## 5.2 Summary of Findings

This section outlines the summary of the findings from the three main objectives to determine the extent each of the objectives influences public service delivery.

The first objective aimed to investigate the extent to which the availability of the government's open data influences public service delivery Nairobi County. From the study findings, most of the County Government of Nairobi's open data or information is accessible through the county's website (92%). Other platforms for accessing the county's open data include Nairobi City County mobile app and mobile USSD services, customer service portal, and Kenya Open Data. However, as much as data from the county is publicly available online or in digital formats, the available datasets are few and do not cover all the areas of the county's service provision/mandate (mean = 2.68).

The second objective aimed at investigating the extent to which knowledge level on the government's open data influences public service delivery in Nairobi County. From the survey findings, most respondents were either moderately to slightly familiar with the concept of government open data or did not know about it (92%). This lack of general awareness of open data implies a major hindering factor in the availability and application of open government data in the county. Despite this, most respondents strongly agreed that government data is by law public data and should be opened and availed to others for use.

The third objective aimed to investigate the extent to which the application of the government's open data influences public service delivery in Nairobi County. From the survey findings, most respondents identified data accessibility as the main reason for availing government open data (mean = 3.58) followed by citizens' engagement with the government (mean=3.44). They however considered

collaboration with other stakeholders in the provision of public services as the least use of government open data (mean=2.58).

## 5.3 Discussion of the Findings

The following is the discussion of the findings from the three study objectives

### 5.3.1 The Extent Government's Open Data Availability influences Public Service Delivery

From the study findings, the County government's open data is largely found on the county website (92%). The other platforms (mobile app and mobile USSD services, customer service portal) are basically for accessing the county's services such as making payments or inquiries. The study findings indicate that, despite the county government efforts to provide county data publicly through the existing digital platforms, it falls short of providing adequate and enriched data to the public to provide comprehensive access and use as well as promote meaningful engagement between the county government and other stakeholders including the citizens of Nairobi County. This is mainly because the available datasets from the county website and Kenya Open Data are very few and do not cover all the areas of the county's service provision/mandate.

As noted by Ubaldi, B. (2013), large quantities of data collected by governments make open data particularly significant as a resource for increased public service delivery through transparency, accountability, efficiency, and innovation. Davies, (2010) also noted that with Government Open Data, the implication is that the public sector hands over its role as caretaker of information to being a provider of the information.

Kassen, (2017) identifies phenomena of open data in a broad set of the digital society in three dimensions i.e. political, economic, and non-governmental/social dimensions. Looking at Kassen's triangulation of open data phenomena concerning Nairobi County, the social dimension is largely missing as the current open data platforms do not provide a proper platform for citizens to engage effectively in development matters and on a real-time basis. Access to government data connects the public sector with citizens to make certain that the sector provides services that are of desired kind and quality, Savoie (2009).

When properly availed and managed, notes Ubaldi, B. (2013), open data is often more useful to the public on a daily basis (e.g. public health issues, transportations services, infrastructure provision, and management), including startups, small-to-medium enterprises, and the wider civil society. She further notes that opening up data is ultimately expected to improve how governments and individuals make

their decisions. According to her, the public is expected to have the capability of using government data to improve their decision-making and enhance their living quality, while public entities are expected to have the ability to access with ease, a broader variety of datasets to undertake evidence-based decision making. This engagement between the public and the government is crucial in creating a transparent and accountable society as well as meaningful collaborations between the government and stakeholders. According to Canares et al. (2014), openness requires public entities to put their meaningful data out in the public domain as well as allowing the citizens to engage meaningfully with them through the use of government open data.

The presented empirical data and study findings are supported by systems theory, which states that, by providing open data, a change is made from traditionally closed systems to systems that are open influencing governance, service delivery, and creating loops where the public can provide their feedback. The latter enables public service entities to learn from the public. This feedback notion implies that governments should always actively pursue or seek feedback from the public and act accordingly instead of having one-way communication of their data. Janssen, Charalabidis, and Zuiderwijk (2012) support this view by observing that openness offers the opportunity for governments to create feedback channels where they can learn from the public. They further observe that data should be published and governments should actively seek feedback and engage the various stakeholders to increase the value of the data and improve public service delivery. Having understood this, one of the main benefits the County Government of Nairobi is set to gain by effectively opening their system to the public is the ability to tap into the shared intellect of the people of Nairobi. This will essentially improve public service delivery through the use of evidence-based decision-making, the creation of a transparent and accountable society as well as meaningful collaborations between the county government and stakeholders.

On factors that hinder the availability of open government data at the county level, the study established that lack of adequate knowledge on the value of open government data, lack of requisite infrastructure as well as lack of motivation within the public sector has a negative bearing in availing county government's open data.

The study findings agree with what Jeztek et al., (2013) identified as factors that hinder the successful implementation of open government data in the public service realm. They include lack of motivation within the public sector; lack of technical skills; lack of data literacy and technical ability and existence

of too disjointed and incongruent open data community. Both findings are a clear indication that sufficient information and civics literacy necessary to understand the value of open data is key to the availability, access, and use of government open data. Bertot et al., (2010) note that the ability to use open government data is predicated on information and civics literacy necessary to understand the efficiency, effectiveness, and transparency in the governments.

The institutional theory adds value to these findings in predicting that creating data awareness and opening of data will strengthen available County Government structures rather than altering them. Besides, digital literacy is key in creating stability in the opening, accessing, and use of open data at the county level. In institutional theory, ICT is understood and applied on account of earlier existing institutional sectors and engagements that are stable such as legal, cultural, or sociological (Janssen, Charalabidis & Zuiderwijk 2012). Oyatsi, (2015) notes that stability is requisite for the proper functioning of the organizations. Janssen et al., (2012) also note that institutional theory cautions for the dangers of creating new initiatives to enforce the existing structures. To avoid arguments for not publishing data and reinforcing existing structures as Janssen suggests, it is imperative to have organized and regular analysis of the type of data that should be released to the public as well as undertake analysis to find out what users of open data expect. This can be achieved by providing adequate information and civics literacy that is critical to comprehend the benefits of open data to both civil servants and the public.

### 5.3.2 The Extent Knowledge Level about Government's Open Data Influences Public Service Delivery

Survey findings show that most (92%) respondents who are familiar with the concept of open data ranged from moderately familiar to lack of familiarity. Those who disclosed as very familiar with the concept of open data were the least (8%). These are largely the heads of departments and county employees from the Department of Information Communication Technology & e-Government. These findings indicate a moderate to low awareness across the county government of the value of open data. There is also a clear indication that open data has been 'siloed' as a technology conversation and this could be contributing to its low awareness. A factor that could hinder the successful implementation of government open data in the public realm as noted by Jeztek et al. (2013).

Mulgan, (2012) acknowledges that knowledge on the value of open government data and the need for transparency and accountability for effective public service delivery is key to politicians and public

servants because they are the policymakers and implementers respectively. According to him, this entails increasing awareness across the public sphere of the value of open data, and enhancing the digital abilities of civil servants to support government departments in publishing datasets that are beneficial to society.

In a study carried out by the Global Open Data Initiative [GODI] in 23 countries, a majority of public sector employees claimed to know nothing or very little about open data whereas those more familiar with the concept of open data were individuals working on technology and open government (Oyatsi, 2015). On respondents' familiarity with features of open data, the survey results showed that most respondents strongly agreed that open data should be released systematically, promptly and government data is public data by law, and governments should make it open and avail it for others to use. This is a positive indicator from the respondents despite the low level of awareness on the value of open data. However, both features of open data are lacking in the existing county government open data platforms. Data available on the platforms is not current and the available datasets are not comprehensive, as they do not cover all the areas of county government's service delivery or mandate. Savoie, (2009) notes that data access is not simply the act of making data available as different authors suggest. It entails enriching the data to provide meaningful access and use.

Mulgan, (2012) identifies the need to have the necessary bureaucratic cultural change to increase knowledge levels of the data publishers and users. He notes that what would facilitate this is when politicians and public servants commit and become assured of the benefits of transparency in government, both to the general public as well as to governments themselves in the discharge of their duties. Institutional theory suggests the adoption of open data might be enabled or get constrained by institutions. By changing the status quo and enabling more County Government of Nairobi employees to be conversant with government open data, acquire data literacy, and technical skills, adoption of open data will certainly be enabled. Conversely, maintaining the status quo will constrain or hinder the successful implementation of open data at the county level. Institutional theory in this case is used to predict that creating data awareness and opening of data will strengthen available County Government structures rather than changing them and such change is necessary to obtain the advantages open data provide.

### 5.3.3 The Extent Application of Government's Open Data Influences Public Service Delivery

From the survey findings, most respondents identified data accessibility as the main reason for availing government open data, followed on by citizens' engagement with the government. This agrees with what Sivarajah et al., (2015) observed, that currently there is a bigger opportunity for transparency, accountability, and policymaking process that is evidence-based when public entities open data. They further note that, by utilizing historical open data that is publicly available, citizens can now evaluate the impacts and benefits of the policies that their leaders introduce and demand accountability. This creates feedback loops as discussed earlier in which the government can learn from the public and be able to make sense of this feedback. In this case, providing citizens access to government data is at the core of open governance.

Also, Byuma et al, (2019) observe that open data provides a basis for empowering communities and improving public services through opening up government data to citizens. This way, as noted by Byuma, increases transparency and accountability of public institutions to the people they serve. According to Savoie (2009), better service provision includes delivering a better widget and getting in touch with citizens to make sure they receive services that are of the kind and quality they desire

Nevertheless, most respondents considered collaboration with other stakeholders in the provision of public services as the least use of government open data. Observation by O'Reilly, (2013) differs from this study's findings. He observes that government open data presents the opportunity to include actors from within and outside of governments in creating innovative ways to provide solutions to old and new problems. This has the prospective to enhance efficiency and effectiveness in government, as well as the delivery of services. Ubaldi, (2013) observes that open government data is as well seen as a key source of economic growth, social innovation, and new entrepreneurship, which are crucial in public service delivery. Improved accessibility to data enables more cooperation within governments, between government agencies and the larger society, including the private sector, civil society organizations, and citizens (OECD, 2018). This acknowledgment by the respondents indicates a lack of adequate knowledge on the concept and value of open data by the county employees as noted earlier.

On public service delivery, most respondents strongly agreed that open government data is a vehicle for increasing transparency and accountability in public service delivery. However, the promotion of the internal effectiveness of a public institution through open government data was considered the least likely benefit of government open data. OECD observes that open data can generate an innovative and

transformative approach to how governments consider service provision to citizens and how they evaluate efficiency and users' satisfaction in service delivery. As noted by Savoie (2009), access to government data brings the public sector close to citizens to make certain that it provides services that the citizens desire or need. The importance of open government data is often related to efficient public service delivery through increased public trust, civic engagement, and accountable administrations (Xiao et al., 2019). However, for these benefits to be realized, it will require governments such as the County Government of Nairobi to avail to the public data that is meaningful as well as allowing the public to engage with them in a meaningful manner through the use of government open data.

Although institutional theory cautions for the dangers of new initiatives being used to strengthen available structures and that public institutions may restrict the use of open data to avoid criticism from the public, this theory helps to predict how the opening of data (availability, access, and application) will reinforce existing structures in the County Government of Nairobi instead of changing them. This is to suggest that the application of efficient open government data in the County will not change the institution but rather reinforce the current service delivery practices and organizational structures for improved service delivery. The institutional theory also helps to understand that civic leaders are faced with the challenge of having to deal with diverse stakeholders (conceivably unidentified) that could assist them in realizing open data benefits but might also be seen as a threat if not well handled. This indicates that organizations might restrain the implementation of open data.

The benefits of open data correspond with systems theory which states that, by having open data, a change is made from traditionally closed systems to systems that are open influencing governance, service delivery, and creating loops where the public can provide feedback. By opening the systems through government open data, the public turns out to be a component of the data processing system and could process data, enhance and integrate it with other sources as well as gather their own. This helps free up public resources. Opening up systems allow public data to be published, actively sought feedback, and enhance engagement with the various stakeholders to improve its value and that of public service delivery. In conclusion, for the benefits of open data to be realized, systems theory suggests that governments must seek feedback and collective intelligence of the public on the effectiveness, application, and ease of access of their data, to constantly improve it.

### 5.4 Conclusions

County Government's open data is not publicly available or not sufficiently provided to be considered open. Despite the county government efforts to provide county data publicly through the existing digital platforms, it falls short of providing adequate and enriched data to the public to provide comprehensive access and use as well as promote significant engagement between the County Government and other stakeholders including the citizens of Nairobi County. The available datasets are few, do not cover all the areas of the county's service provision/mandate, they are not systematically released and on a timely basis. This means that the available open data is not adequately opened up for use and re-use by public and private agents alike and that the concept of open data at the County Government of Nairobi is less developed despite the availability of the county's data online or in digital formats.

Most county government employees are not very familiar with the concept of government open data. Those conversant with the concept are largely the heads of departments and county employees from the Department of Information Communication Technology & e-Government, which indicates that open data has been 'siloed' as a technology conversation and this could be contributing to its low awareness. This lack of general awareness on the concept and value of open data indicate a major hindering factor in availing and using county government's open data to improve service delivery.

On the application of open data at the county, the available open platforms provide limited data availability and do not provide adequate avenues for citizens of Nairobi and other stakeholders to engage with the county government adequately and in real-time based. Citizens' engagement with the County Government of Nairobi is largely when seeking county services online or when making payments through e-payments platforms. This limits citizens' engagement on matters of public service delivery, as well as innovation in service delivery and collaboration with other stakeholders in the provision of public services.

### 5.5 Recommendations

i. To the County Government of Nairobi, accessible, useful, and timely open data is key to support, among other things, social, economic, and political outcomes. Most of the county's open data platforms are not fully developed to enable proper access and use of county government's open data. In this regard, the study calls for increased availability of county government information to the public, implement better platforms for real-time engagement with citizens and other stakeholders such as a citizens' dashboard. The availability of comprehensive open data from the county

government will increase transparency and accountability at the county leading to increased public trust, as well as enhanced collaboration with other stakeholders to efficiently and effectively provide services to the residents of Nairobi. This will also lead to more innovations in service delivery as well as the internal effectiveness of county departments.

ii. Also, substantial reforms/initiatives are needed at the county government to guarantee open data platforms, open data policies, and availability of high-quality data that is timely, easily accessible, and easy to use. Understanding the prerequisites that facilitate efficient and effective implementation of these initiatives is vital for attaining their overall objectives. For example, it is imperative to have strategic interventions such as the provision of requisite ICT infrastructure and collaboration with strategic actors to ensure there is a continuous supply of high quality and easy to use data sets that both the county governments and other stakeholders can use to achieve impact. There is also the need for the county government to commit to maintaining, an effective and sustainable open data program under which they publish data following an 'open by default' approach. The county government needs to help foster innovation using open government data. This way, it can come up with support and reward programs where people can come up or develop innovative ways under which the county government can publish data, and use it innovatively to enhance public service delivery, improve accountability and promote socio-economic impact

iii. This research project takes the view that for more open county governance, county governments need to engage actively with national government and other stakeholders such as civil society groups, general citizens, media, and the business sector, through open government data to achieve transparency and accountability, or deliver better service delivery to citizens. In this case, it is important to note that while significant efforts have been made by the county government to open data to the public; this should be matched with a capacity-building program that would enable citizens to engage with government data.

iv. To policymakers, this study will help form a knowledge base on open government data policies, strategies, and initiatives to help improve public service delivery. In that regard, County Government employees should be trained adequately on technical skills (e.g. data collection, cleaning, processing, analysis, visualizing and reporting open government data) and data literacy as well as the role government open data plays in improving service delivery. This will enable effective and successive implementation of open government data in the public realm. However, short-term, random, one-time buzz training, or off-the-shelf training programs, which is the prevailing modes

of capacity building delivery in most government agencies, will not yield to actual open data awareness needed to achieve the purpose. This therefore should be made an integral feature of all the county governments' undertakings. The study findings will inform both the National Government and the County Governments of Kenya on the significance of open government data in improving public service delivery.

v. The National Government through the national open data portal (Kenya open data portal) can liaise with the county governments to implement agency-specific initiatives that would require more stakeholders in and out of government to proactively, make available open data to the public. National Government can also come up with open government policies such as a Full Disclosure Policy through the National Treasury to try to make County Governments post public finance documents including receipt and utilization of funds on their websites as an incentive to receive an extra share of the national revenue. The objective is to make county governments more open and accountable.

vi. To researchers, this research provides a basis for future research areas such as factors that hinder the implementation of open government in the counties, level of citizens' knowledge level on the availability, and application of government open data among others.

### 5.6 Limitations of the Study

There were several limitations expected in the course of the study, for instance, biased respondents. The researcher might have encountered respondents who gave misleading information, knowingly or unknowingly. The way to solve this challenge was through obtaining much of the information from more respondents using questionnaires. Some of this information was also corroborated through a scrutiny of existing county government open data platforms.

Additionally, the researcher faced time constraints due to the coronavirus pandemic which led to the suspension of data collection given that the majority of county staff (respondents), who would be the ideal respondents, were working from home. Their unavailability coupled with constrained movements in the study area and limited interactions with people led to delays in data collection as well as possible follow up interviews with the respondents. To curb this limitation, the help of a research assistant was sought, to reduce the workload and be able to cover as many respondents in a shorter period.

### 5.7 Suggestions for Further Research

From the findings, discussions, and conclusions of this study, the following suggestions are formulated for further investigations.

i. Given that the study was conducted only on open government data providers, it is requisite to explore further the correlations between providers of data and policymakers, open data intermediaries (researchers, CSOs, academics, corporates, media), and users of data at the county level to help evaluate further the role of government data in improving public service delivery.

ii. There is a need to study factors that hinder the availability and use of open data at the counties as well as at the national government level.

iii. There is also the need to study further the knowledge level of citizens about government data as well as the type of datasets different data users need from data providers, challenges they face when accessing government data as well as what collaborative efforts are there among the different open data providers and users in the country.

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# APPENDICES

## APPENDIX I:

## ETHICAL CLEARANCE LETTER

Strathmore UNIVERSITY

24th March 2020

Mr Kamau, Simon
ksnjoroge.me@gmail.com

Dear Mr Kamau,

**RE: The Role of Open Government Data in Improving Public Service Delivery**

This is to inform you that SU-IERC has reviewed and **approved** your above research proposal. Your application approval number is **SU-IERC0672/20**. The approval period is **24th March, 2020 to 23rd March, 2021.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

Dr Virginia Gichuru,
**Secretary; SU-IERC**

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24 MAR 2020
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**APPENDIX II**

**LETTER OF INTRODUCTION**

Off Langata Rd, Madaraka Estate,
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Cell: +254 703 414/6/7, Twitter: @SBSKenya
Email: info@sbs.ac.ke or visit www.sbs.strathmore.edu

Strathmore UNIVERSITY
BUSINESS SCHOOL

Tuesday, 21 January 2020

**RE: FACILITATION OF RESEARCH – SIMON KAMAU**

This is to introduce Simon Kamau who is a Master of Public Policy Student at Strathmore University Business School, admission number MPPM 101797/17. As part of our MPPM Program, Simon is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MPPM course. To this effect, he would like to request for appropriate data from your organization.

Simon is undertaking a research paper on **"The Role of Open Government Data in Improving Public Service Delivery."** The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

Our MPPM seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

Veronica Muniu

Program Manager.

**APPENDIX III: RESEARCH LICENSE**

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 652318

Date of Issue: 28/March/2020

## RESEARCH LICENSE

This is to Certify that Mr.. Simon Njoroge Kamau of Strathmore University, has been licensed to conduct research in Nairobi on the topic: ROLE OF OPEN GOVERNMENT DATA IN IMPROVING PUBLIC SERVICE DELIVERY for the period ending : 28/March/2021.

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**APPENDIX IV:**

**RESEARCH QUESTIONNAIRE FOR THE COUNTY GOVERNMENT OF NAIROBI EMPLOYEES**

*DECLARATION: information generated through this questionnaire will be held confidentially and will only be used for Research Project in Partial Fulfillment of the Requirements for the Award of Degree of Master of Public Policy and Management, Strathmore University Business School.*

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**Questionnaire No:** ……..

Instructions: There are five sections in this questionnaire. Please take your time and read it carefully. Please indicate with a tick [√ **]** in the box next to the answer of your choice or fill in the information in the spaces provided or where necessary.

**SECTION A: RESPONDENT PROFILE**

1. **Age**……
2. **Occupation/Profession:** …….
3. **Highest level of education attained…**……
4. **Position held in the Department**
    a) **Senior……..**
    b) **Middle Level ……**
5. **Duration of time worked in Nairobi County Government in years**…….

**SECTION B: AVAILABILITY OF GOVERNMENT OPEN DATA**

**6.** Please indicate in the table with a tick (√) if data from your department is available or can be accessed from the following open data platforms

| No | Open Data Platform | Availability | |
|---|---|---|---|
| | | Yes | No |
| 1. | Department Website | | |
| 2. | County Website | | |
| 3. | Open Data Websites | | |
| 4. | Mobile Apps | | |
| 5. | Customer Service Portal | | |

**7. Please indicate in the table with a tick (√)with a scale of**

**5= Strongly Agree 4=Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

Kindly answer the following questions based on your agreement with the availability of your department's data. The scale level ranges from 1 – 5

| No | Availability | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| **1.** | Data from your department is publicly available online or in digital formats | | | | | |
| **2.** | Data from your department is easily accessible online or in digital formats and quick to find and use | | | | | |
| **3.** | Datasets on your open data platforms cover all your areas of service provision/mandate | | | | | |
| **4.** | Datasets available on your open data platforms are free for anyone to access, use and share it | | | | | |

## SECTION C: KNOWLEDGE LEVEL ABOUT GOVERNMENT OPEN DATA

**8. Please indicate with a tick (√) with a scale of**

**5= Extremely familiar 4=Very familiar 3= Moderately familiar 2= Slightly familiar**

**1= Not at all familiar**

Kindly answer the following questions based on your agreement with your level of familiarity with government open data. The scale level ranges from 1 – 5.

How familiar are you with the concept of government open data?

1= Not at all familiar [ ]

2= Slightly familiar [ ]

3= Moderately familiar [ ]

4= Very familiar [ ]

5= Extremely familiar [ ]

**9. Please indicate in the table with a tick (√)with a scale of**

**5= Strongly Agree 4=Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

Kindly answer the following questions based on your agreement with the features of open data. The scale level ranges from 1 – 5.

| No | Features of open data | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| **1.** | Open data is available for use by anybody | | | | | |
| **2.** | Open data is easily accessible by anybody | | | | | |
| **3.** | Open data is easy to use by anybody | | | | | |
| **4.** | Open data is released systematically and on time | | | | | |
| **5.** | Government data is public data by law and should be made open and available for others to use | | | | | |

**10. Please indicate in the table with a tick (√)with a scale of**

**5= Strongly Agree 4=Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

Kindly answer the following questions based on your agreement with how the following factors promote knowledge level about government open data. The scale level ranges from 1 – 5.

| No | Factors that promote knowledge level about government open data | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| **1.** | A fellowship and outreach initiative to sensitize people is required | | | | | |
| **2.** | Every department should have an active communications office through which information about open data platforms and initiatives is disseminated | | | | | |
| **3.** | Public sector training on IT skills and general awareness on open data should be done regularly across all departments | | | | | |
| **4.** | Knowledge of open data should not be isolated within relevant departments and branches of government i.e. ICT department | | | | | |

## SECTION D: APPLICATION OF GOVERNMENT OPEN DATA

**11. Please indicate in the table with a tick (√) with a scale of**

**5= Strongly Agree 4= Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

Kindly answer the following questions based on your agreement with the application of government open data in public service delivery. The scale level ranges from 1 – 5

| **Application of government open data** | **5** | **4** | **3** | **2** | **1** |
|---|---|---|---|---|---|
| 1. Data accessibility | | | | | |
| 2. Citizens engagement with the government | | | | | |
| 3. Collaboration with other stakeholders in the provision of public services | | | | | |
| 4. Innovation in service provision | | | | | |

## SECTION E: PUBLIC SERVICE DELIVERY

**12. Please indicate in the table with a tick (√) with a scale of**

**5= Strongly Agree 4= Agree 3= Moderately Agreed 2= Disagree 1= Strongly Disagree**

Kindly answer the following questions based on your agreement with the role of government open data in public service delivery. The scale level ranges from 1 – 5

| **Public Service Delivery** | **5** | **4** | **3** | **2** | **1** |
|---|---|---|---|---|---|
| 1. Availability of adequate, up to date and easy to use open government data enhances citizen engagement with the government | | | | | |
| 2. By opening up data, citizens are enabled to be much more directly informed and participate in governance and decision-making | | | | | |
| 3. Availing quality and adequate open government data increases efficiency in service delivery by reducing the cost of service provision, cost of data acquisition, and acquisition of accurate information to enable prioritization of projects | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4. | Knowledge level on open data provides a basis for providing quality data for efficient public service delivery as well as enhancing citizens engagement with the service providers | | | | | |
| 5. | Open government data is a vehicle for increasing transparency and accountability in public service delivery | | | | | |
| 6. | Open government data improves the quality of services delivered to the citizens | | | | | |
| 7. | Open government data promotes internal effectiveness of a public institution | | | | | |
| 8. | Open government data serves as a driver and a vehicle for promoting innovation in society to enhance public service delivery | | | | | |

***Thank You for Your Cooperation***

## APPENDIX V: COUNTRIES RANK ON OPENNESS OF GOVERNMENT DATA

| S/No | Name of the Country | Rank | Score (%) |
|---|---|---|---|
| 1. | Taiwan | 1 | 90 |
| 2. | Australia | 2 | 79 |
| 3. | Great Britain | 2 | 79 |
| 4. | France | 4 | 70 |
| 5. | Finland | 5 | 69 |
| 6. | Canada | 5 | 69 |
| 7. | Norway | 5 | 69 |
| 8. | Brazil | 8 | 68 |
| 9. | New Zealand | 8 | 68 |
| 10. | Northern Ireland | 10 | 67 |
| 11. | United States | 11 | 65 |
| 12. | Denmark | 11 | 65 |
| 13. | Mexico | 11 | 65 |
| 14. | Colombia | 14 | 64 |
| 15. | Latvia | 14 | 64 |
| 16. | Japan | 16 | 61 |
| 17. | Argentina | 17 | 60 |
| 18. | Singapore | 17 | 60 |
| 19. | Uruguay | 19 | 55 |
| 20. | Netherlands | 20 | 54 |
| 21. | Sweden | 21 | 53 |
| 22. | Belgium | 22 | 52 |
| 23. | Chile | 22 | 52 |
| 24. | Germany | 24 | 51 |
| 25. | Hong Kong | 24 | 51 |
| 26. | Romania | 24 | 51 |
| 27. | Czech Republic | 27 | 50 |
| 28. | Poland | 28 | 49 |
| 29. | Austria | 28 | 49 |

| | | | |
|---|---|---|---|
| 30. | Slovenia | 28 | 49 |
| 31. | Ukraine | 31 | 48 |
| 32. | India | 32 | 47 |
| 33. | Italy | 32 | 47 |
| 34. | Slovakia | 32 | 47 |
| 35. | Greece | 35 | 46 |
| 36. | Bulgaria | 36 | 45 |
| 37. | Paraguay | 37 | 44 |
| 38. | Puerto Rico | 38 | 43 |
| 39. | Russia | 38 | 43 |
| 40. | Isle of Man | 38 | 43 |
| 41. | Serbia | 41 | 41 |
| 42. | Israel | 41 | 41 |
| 43. | South Africa | 43 | 40 |
| 44. | Croatia | 44 | 39 |
| 45. | Portugal | 45 | 37 |
| 46. | Turkey | 45 | 37 |
| 47. | Albania | 47 | 36 |
| 48. | Switzerland | 47 | 36 |
| 49. | El Salvador | 49 | 35 |
| 50. | Montenegro | 49 | 35 |
| 51. | Thailand | 51 | 34 |
| 52. | Macedonia | 52 | 31 |
| 53. | Bolivia | 53 | 30 |
| 54. | Philippines | 53 | 30 |
| 55. | Peru | 55 | 29 |
| 56. | Guatemala | 56 | 28 |
| 57. | Dominican Republic | 57 | 27 |
| 58. | Bosnia and Herzegovina | 58 | 26 |
| 59. | Kosovo | 58 | 26 |
| 60. | Jamaica | 58 | 26 |
| 61. | Indonesia | 61 | 25 |
| 62. | Panama | 61 | 25 |

| | | | |
|---|---|---|---|
| 63. | Bangladesh | 61 | 25 |
| 64. | Costa Rica | 64 | 23 |
| 65. | Bhutan | 64 | 23 |
| 66. | Tunisia | 66 | 22 |
| 67. | Iran | 67 | 21 |
| 68. | Trinidad and Tobago | 67 | 21 |
| 69. | Nepal | 69 | 20 |
| 70. | Tanzania | 69 | 20 |
| 71. | Guyana | 69 | 20 |
| 72. | Pakistan | 72 | 19 |
| 73. | Zambia | 72 | 19 |
| 74. | Cambodia | 74 | 17 |
| 75. | The Bahamas | 74 | 17 |
| 76. | Lesotho | 76 | 16 |
| 77. | Ghana | 76 | 16 |
| 78. | Namibia | 78 | 15 |
| 79. | Saint Lucia | 78 | 15 |
| 80. | Kenya | 78 | 15 |
| 81. | Oman | 81 | 14 |
| 82. | Venezuela | 81 | 14 |
| 83. | Zimbabwe | 83 | 13 |
| 84. | Mozambique | 84 | 12 |
| 85. | Afghanistan | 84 | 12 |
| 86. | Cameroon | 86 | 11 |
| 87. | Malaysia | 87 | 10 |
| 88. | Botswana | 88 | 9 |
| 89. | Saint Vincent and the Grenadines | 89 | 7 |
| 90. | Antigua and Barbuda | 90 | 5 |
| 91. | Malawi | 90 | 5 |
| 92. | Barbados | 92 | 4 |
| 93. | Saint Kitts and Nevis | 92 | 4 |
| 94. | Myanmar | 94 | 1 |

*Source: Global Open Data Index Survey, 2016*

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