A framework for web archiving for municipalities in the KwaZulu-Natal Province in South Africa

by

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ABSTRACT

A website is one of the tools that an organisation can use to communicate information to the outside world. Some of the records published on websites are often in paper format in record-keeping systems. Other records, on the other hand, are created in a digital environment and are not captured in record-keeping systems. While it is considered a record, many organisations, including municipalities, do not manage websites as such. This study used the web archiving life cycle theory to explore the development of a framework for the archiving of websites in the municipalities of KwaZulu-Natal (KZN) in South Africa. This qualitative study triangulated data from interviews and document analysis with a purposively selected sample of 53 municipalities in KZN. The study discovered that municipalities did not regard websites as historical records, and there were no measures in place to ensure website preservation. It was also revealed that municipalities rely heavily on service providers to keep their websites operational. It was also discovered that, even though municipalities in KZN have ICT and records management policies in place, no provisions for web archiving were in place. To provide effective service delivery, the study recommends that government institutions in South Africa, particularly municipalities, have explicit rules for web archiving. Municipalities, it was also stated, must reinvest in skills training to better equip their staff. The study continues to recommend that municipalities in KZN implement a web archiving system to ensure that all information posted on websites is accessible. The study also proposes a framework for supporting municipalities with website archiving.

Key words: web archiving, municipalities, KZN, websites, liquid communication, harvesting, long-term digital content, preservation, government, accountability

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DEDICATION

This work is dedicated to all my children.

Nothing is impossible in life. You can achieve anything you want as long as you work hard and put God first.

To my mother, Nonhlahla Eunice Mbuyazi, and Regina Luthuli (gran), we did it!

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DECLARATION

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A framework for web archiving for municipalities in the KwaZulu-Natal Province in South Africa

I declare that the above thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

…….. ……

LP Luthuli

Signature Date

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LIST OF ABBREVIATIONS

ICA: International Council on Archives

ICT: Information and Communication Technology

IRMT: International Records Management Trust

ISO: International Standards Organisation

IT: Information Technology

KZN: KwaZulu-Natal

NAA: National Archives of Australia

NARA: National Archives and Records Administration

NARS: National Archives and Records Service

NARSSA: National Archives and Records Services of South Africa

SA: South Africa

UK: United Kingdom

UNISA: University of South Africa

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CHAPTER ONE
INTRODUCTION: PUTTING THINGS INTO PERSPECTIVE

1.1 Introduction and background to the study

As anecdotal evidence suggests, websites are commonly used as communication systems that keep in touch with communities or society. Many organisations, including municipalities, use websites to communicate with stakeholders because they are considered to be fast, current, and effective. Content, which is considered a record, is created during the process of communicating through websites (Bragg & Kristine 2013). As a result, information communicated via websites is critical and should be managed and preserved as records for future use. While some records published on websites are often found in paper format in record-keeping systems, others are created in the digital environment and are not captured in record-keeping systems (paper records as first created before being published on websites and filled in cabinats, scanned into digital format, etc). Indeed, many national archival institutions around the world, including the National Archives and Records Service of South Africa (2007), consider websites to be records other than correspondence systems. The National Archives and Records Service Act (Act No. 43 of 1996), for example, defines a record as "recorded information regardless of form or medium, created or received by a governmental body in pursuance of its activities." In this context, a governmental body is defined as any "legislative, judicial, or administrative organ of the state," including municipalities. This implies that records, including websites, must be managed.

The National Archives and Records Service of South Africa (NARSSA) requires all governmental bodies, including municipalities, to have a strategy in place for effective digital record management. This implies that government entities should ensure that digital records are managed in accordance with NARSSA guidelines. Municipalities in South Africa, which are at the front lines of service delivery, use websites to communicate with their constituents. Many organisations, including municipalities, are, however, having difficulty managing websites as records throughout their entire life cycle. Tsabedze (2018), for example, notes that in the government of Eswatini (previously Swaziland), there was a lack of proper record management, rendering the e-government strategy ineffective because the government websites were down. Furthermore, the Eswatini Government (2015) notes that there is no government-wide coordinated e-records policy or strategy that cuts across and integrates e-

records management across all ministries. The situation is similar in Botswana, according to Mosweu (2018), where the government lacks policies and strategies to ensure the long-term preservation of liquid communication generated by social media. Web content is also regarded as a form of liquid communication. According to Mosweu and Ngoepe (2019), liquid communication is content that flows and is not rigid. Furthermore, Duranti (2014) defines "liquid communication" as "an ongoing communication and movement of material from one circle of people to another, crossing public-private lines, such as social media content." This definition clearly includes websites, e-mails, and social media content. As Mosweu and Ngoepe (2020) would attest, such content requires a faucet to be controlled. According to Ngulube (2012:128), "many government websites that are archived may lack metadata that can help inform and document disposal decisions." Some of the challenges that have been noted include IT security and legal frameworks; web development; portals/government-public interface applications; ICT human resources development and training; mainstreaming of e-government activities; the absence of a government-wide framework for managing electronic information resources; and various legal issues (Ngulube 2012).

Websites come in a variety of shapes and sizes, each of which presents a unique set of challenges when it comes to managing the site as a record (Brügger 2005). A website, for example, can be static, with a collection of hyperlinked documents stored in folders on a database. The only activity on the site in this regard is the movement between the hyperlinked documents. These sites are relatively simple to preserve; for example, snapshots can be taken or the entire site can be written to a CD, and version control can be used when the site changes (Brügger 2005). Documents published on such websites can also be managed through the databases in which they are stored. Websites, according to the NARS guidelines, facilitate business transitions and should be treated as a record that can be accessed and used as needed. Governmental bodies would not have to worry about harvesting websites if websites were properly managed, as records could be retrieved from anywhere.

Second, a website can be dynamic, which presents preservation and management challenges. On a dynamic website, users can make requests for data contained in a database on the server that was assembled on the fly, based on what is requested, using an e-form (Niu 2012). Users can search for all available resources to answer a specific query on dynamic websites that are linked to the internet (Niu 2012). These types of websites are difficult to manage as records, and they necessitate a proper strategy for managing and archiving them. Finally, a website can

be interactive, allowing organisations to communicate with their stakeholders. For the record, this type of website falls under the umbrella of liquid communication, as defined by Mosweu (2019) and Mosweu and Ngoepe (2019). This type of communication can easily be passed back and forth between the participants (Mosweu & Ngoepe 2020). The content emitted by such interactions is difficult to manage and archive in the context of this study. However, if such records are of long-term value, they should be archived for posterity. This archiving process is referred to as "web archiving" in this study.

Web archiving is defined as "the process of harvesting data that has been recorded on the World Wide Web (WWW), storing it, to ensure that it is preserved in an institutional repository, and making the collected data available for future research" (Niu 2012:1). Many organisations and individuals have relied on the retracement of information published on websites using URLs, HTML, XML, and WC3. Only South Korea, Japan, China, and Singapore have implemented web archiving in their respective national libraries in Asia. The same cannot be said for African cultural institutions, let alone municipalities. Web archiving at the National Library of Singapore is regarded as one of the most important steps in ensuring the preservation of national digital heritage (Cadavid2 et al. 2013). According to Cadavid, Basha and Kaleeswaran (2013), web archiving is a global concern. Each country's cultural, legal, economic, and political values affect how it grows, what it aims to do, how it works, and how important it is.

It is worth noting that the web has been perceived as an immeasurable tool that is constantly growing and changing in terms of information being added or removed; thus, Mosweu and Ngoepe (2019) classify it as liquid communication. Since the 1990s, web archiving content has been examined in search of materials that are available and accessible to future generations (Canadian Research Association of Libraries 2014). Certain challenges, however, have hampered the preservation of web content, both digital and physical records, across the entire web. For instance, injecting spam posts onto a website, stealing customer information, and bypassing authentication to gain complete control of a website—all of these attacks threaten the longevity of web content (Canadian Research Association of Libraries 2014). Because municipalities communicate with the public via websites, it is necessary to establish how websites are managed and archived at the local government level to ensure future access. This raises several questions, including how we ensure that the contents of websites, as well as the websites themselves, are preserved for future generations' benefit. In the face of ever-changing technology, how do governmental bodies, particularly municipalities, ensure the dependability

and accessibility of web content? What happens to websites after they have been decommissioned?

The issues raised by the Canadian Research Association of Libraries (2014) regarding web archiving, such as legal challenges, imitation of web crawlers, economic issues, quality issues, malware, and technological challenges, add to the complexity of the questions. The Canadian Research Association of Libraries states that (2014:11):

> The challenges facing web archiving that are mentioned above, such as: The legal challenge is one of the most significant challenges to web archiving initiatives as most web archiving organisations do not have the legal right to make copies of the web content and to provide access outside of the original site without the permission of the owner. Furthermore, it requires indicating clear copyright law.

Web crawler limitations include harvesting content from database-driven web pages, streaming multimedia files, script codes, password-protected content, JavaScript-driven menus, and more (Niu 2012). Furthermore, all web archiving organisations are affected by economic issues as their mission is to preserve and provide web documents for many years. Since these organisations are difficult to maintain and require maintenance, web archiving necessitates a significant initial investment to cover technology, research, and development. Another issue (Canadian Research Association of Libraries 2014) is malware, a software programme used by attackers to collect sensitive information and disrupt computer operations. Malware manifests itself as viruses, worms, and ransomware. Last but not least, there are technical challenges that arise as technology evolves to accommodate the expansion of web content. What has been said thus far provides an indication of how web content is affected and the importance of preserving it for posterity. According to the Canadian Research Association of Libraries (2014:7):

> If the web is not preserved, eventually valuable content will be lost forever. Web information via government websites is a very valuable source of information, and several governments and private institutions are involved in archiving parts of it for various purposes in Europe.

In the United Kingdom, web archiving governmental associations use a single source to archive their governmental websites (National Archives of the United Kingdom 2011). As a result, the main challenge that Africa and other countries face is that the dynamic nature of websites

makes them difficult to manage and preserve for posterity. The web archiving life cycle theory was used in this study to explore the development of a framework for the archiving of websites in the municipality of KwaZulu-Natal (KZN) in South Africa, with the goal of developing a framework. The archiving life cycle constructs "preservation, policy, appraisal, data capture, and access" were used to guide the study's objectives, which informed the literature review, data collection, and presentation.

1.1.1 Contextual setting

The municipalities of the KZN province serve as the study's context (see Figure 1.1). KZN is a rapidly growing province that is technologically advanced. Municipalities, which are at the coalface of service delivery, use websites to communicate with their constituents. These factors piqued people's interest in learning about the system they currently use to manage the information they publish on their websites.

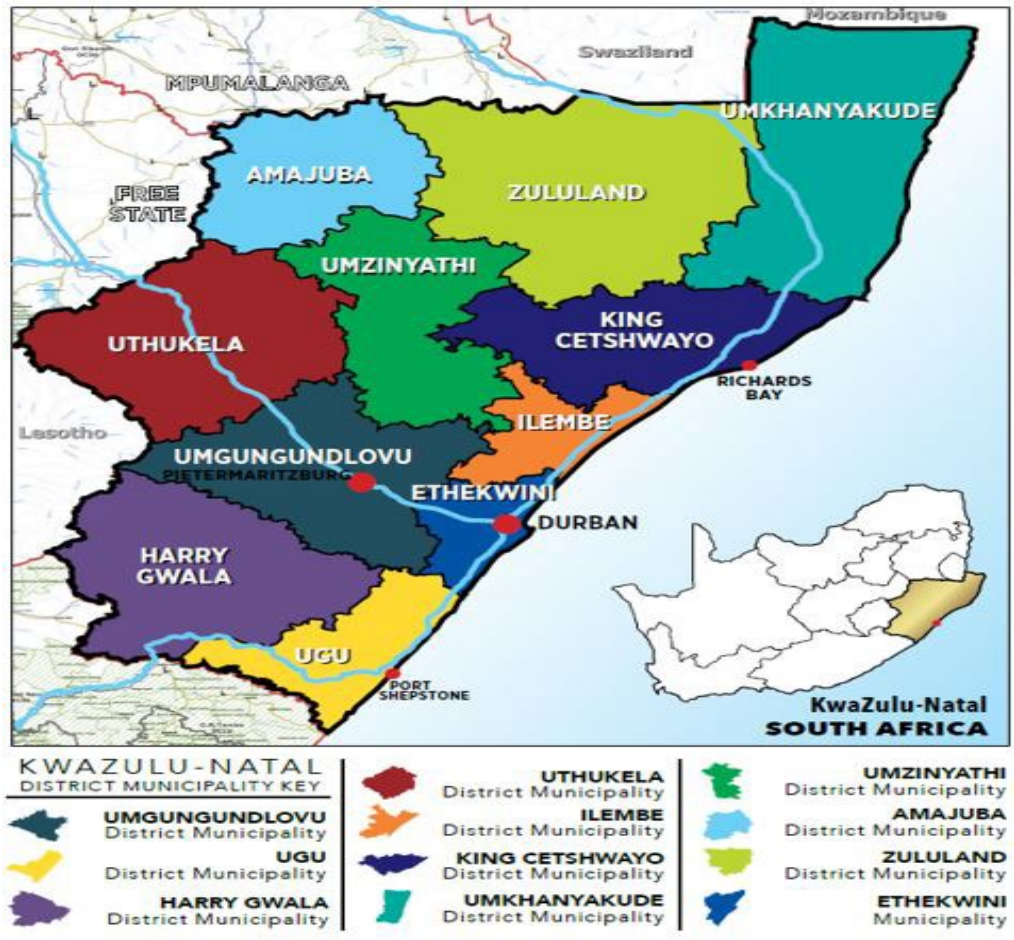

Figure: 1.1 KZN Map (eThekwini Municipality IDP 2017)

Furthermore, the overall aim of this study was to develop a framework for archiving municipal websites in KZN. The KZN province used to have 61 municipalities but now has 54, as some have been merged to form single municipalities. There is one metro, nine district municipalities, and 44 local municipalities among these. According to the eThekwini Municipality IDP (2017: ND):

> The KZN is in South Africa's southeast, bordering the Indian Ocean... Richards Bay is the centre of operations for South Africa's aluminium industry. Agriculture is also central to the economy. The sugar cane plantations along the coastal belt are the mainstay of KwaZulu-Natal's agriculture. The coastal belt is also a large producer of subtropical fruit, while the farmers inland concentrate on vegetables, dairy, and stock farming. Another source of income is forestry in the areas around Vryheid, Eshowe, Richmond, Harding, and Ngome. KwaZulu-Natal is divided into one metropolitan municipality (eThekwini Metropolitan Municipality) and ten district municipalities, which are further subdivided into 43 local municipalities. The capital is Pietermaritzburg.

1.1.2 Importance of website archiving and preservation in the public sector

The State Library of North Carolina and the North Carolina State Archives archive their websites using the web life cycle model (Martin & Eubank 2007). Websites play an important role in the community because they allow citizens to interact with the government. This, however, implies that proper record management by the public sector or governmental bodies benefits them in terms of accountability, transparency, and service delivery (Martin & Eubank 2007). According to Luthuli and Kalusopa (2017), South Africa is one of many developing countries grappling with ways to improve state-owned facilities to provide the best public service to its citizens. Some of the advantages of proper management and inessential archiving include the ability to easily retrieve and access records, as well as the ability to prevent and track fraud, corruption, and cybercrime attacks on websites and databases of various organisations. This is related to the incident in the City of Johannesburg where the website was hacked but had the organisation's information been archived, it would not have lost its data from their portal (ENCA News 2019). The issue of hacking dates back to 2019, when the city of Los Angeles (LA) was faced with cyber-crime. This situation was seen as being so prevalent that they wanted to control all information being used by developing a precaution for the LA

police to deal with cyber-crime in their laboratory (Chang 2019). Citizens can interact with the government or the system by using websites. According to Bhana (2008:7), proper record management enables the government to ensure transparency in areas such as auditing and financial management. Records can aid in decision-making and other aspects of government business. This, however, is relevant to the study because the study is aimed at the government and municipalities are affiliated with government stakeholders. Archiving digital material is similar to archiving physical formats in that both require evaluation and authenticity. This, however, does not preclude harvesting websites to digitise them for future access. Ngoepe (2012:68) states that "good governance, accountability, and transparency have long been established as the basic principles of governing organisations, particularly public institutions." These principles hinge on the availability of information to members of the public, as well as on being open about how institutions are governed and decisions are made."

1.1.3 Conceptual setting

The process of leading the most commonly used terminology in an ongoing study to provide clarity and aid in the formation of the framework is known as conceptual setting (Cornford 1991). The study looked at the concepts that underpin website archiving as well as how web archiving came to be. When dealing with the preservation of digitised content, the term "archivalisation" is used, which leads to web archiving. While there are several search engines on the WWW, it is important to let your readers understand that the WWW in itself is not a search engine (Brügger 2005). But the various web search engines help to find information stored on it fast. However, various studies have shown that the WWW contains ever-changing content, which is expected to be accessed by fewer people and degrade over time (Ngulube 2012; Mosweu & Ngoepe 2019; Brügger 2013; Davis 2010). According to Brügger (2005), information fades over time and approximately 80% of online content is lost every day, making the digitisation process difficult. SalahEldeen and Nelson (2012:125) conducted a study on the persistence of public social media posts, and their findings revealed that "after the first year of publishing, nearly 11% of shared resources will be lost, and after that, we will continue to lose 0.02% per day." This, however, demonstrates how web content or online content can cause institutional amnesia, which means that more history is lost every day. The research looked into the long-term digital preservation and storage of websites, as well as the strategies that can be used when archiving web content.

The study went on to discuss the risks of web archiving. However, it has been established that alteration is now a thing of the past, as people can modify information posted online (Davis 2010:127). Furthermore, Davis (2011:127) denotes "highly volatile content, easily modified or removed by its authors and editors, with no guarantee that previously published versions, or any record of the change, will persist." Web archiving is the solution to all of the challenges that digital preservation faces due to its complex systems that allow web content harvesting. Following this, the preservation process will continue indefinitely, allowing future access. As a result, "web archivists aim to capture and preserve the dynamic and functional aspects of web pages, including active links, embedded media, and animation, while also maintaining the context and relationships between files" (Ball 2010:7).

1.2 PROBLEM STATEMENT

Even though the NARS Act considers websites to be records, many South African public organisations, including municipalities, do not manage their websites as records (NARSSA 2006). As a result, these records simply disappear, resulting in institutional amnesia or gaps in information posted online, similar to the liquid communication identified by Mosweu and Ngoepe (2019). All governmental bodies, including municipalities, are required by NARSSA to have a strategy for the effective management of digital records, which includes web content. This means that accounting officers in government agencies must make sure that all electronic records systems, such as e-mail and websites, electronic correspondence systems, and electronic records systems other than correspondence systems, are managed in accordance with NARSSA record-keeping guidelines and standards. According to Perry (2014), Mutula (2014), Le Roux (2016), and Adu and Ngulube (2017), some of the challenges of digital preservation include obsolescence of older technology and formats, human error, copyright issues, errors, or data loss, as the underlying threats to archival provenance of integrity, authenticity, and web archiving that are not well established. Several scholars have identified issues that must be addressed to ensure long-term digital material preservation, such as long-term digital preservation, data loss, and human error (Kalusopa 2018; Ngoepe 2017; Ngoepe & Keakopa 2011; Ngoepe & Saurombe 2016; Ngulube 2012). So, it's likely that the study tried to come up with a plan for web archiving that would make it easier for municipalities, which are at the front lines of service delivery at the local government level, to talk to their citizens. A framework for long-term digital preservation elements is required to assist municipalities in operating efficiently and have a useful web archiving strategy. This framework will enable

municipalities to adopt and implement practical plans for long-term digital preservation to improve accessibility and information flow at all times. It also has a South African component in terms of the challenges that African municipalities face. Furthermore, the framework provides clear guidance for the public and the municipalities on how to operate the websites.

1.3 PURPOSE AND OBJECTIVES OF THE STUDY

To explore the development of a framework for the archiving of websites in the municipality of KwaZulu-Natal in South Africa, to develop a framework. The specific objectives were to:

- analyse the legislative, standards, and policy framework governing web archiving in KwaZulu-Natal municipalities;
- assess the strategies for long-term digital preservation for websites in KwaZulu-Natal municipalities;
- analyse the risks of web archiving on municipal websites in KwaZulu-Natal;
- determine the selection process for municipalities in KwaZulu-Natal when archiving websites;
- determine the storage of published content when archiving websites in KwaZulu-Natal municipalities;
- assess the process of harvesting municipalities websites into the trusted e-records digital repositories in KwaZulu-Natal;
- examine the access of archived web content in KwaZulu-Natal municipalities; and
- design a framework for web archiving to assist in the proper management of websites in KwaZulu-Natal municipalities .

1.3.1 Research questions

- Which legislative, standards, and policy framework governs web archiving in KwaZulu-Natal municipalities?
- What strategies are being used for long-term digital preservation for websites in KwaZulu-Natal municipalities?
- What are the risks of web archiving on municipal websites in KwaZulu-Natal?
- How do you determine the selection process for municipalities in KwaZulu-Natal when archiving websites?
- Who determines the storage of published content when archiving websites in KwaZulu-Natal municipalities?

- Who assesses the process of harvesting municipal websites into the trusted e-records digital repositories in KwaZulu-Natal?
- Who examines the access of archived web content in KwaZulu-Natal municipalities?
- KwaZulu-Natal municipalities will create a framework for web archiving to help them manage their websites in the right way.

1.4 JUSTIFICATION AND SIGNIFICANCE OF THE STUDY

According to Smart (2011:1), a study's justification provides a clear understanding of the need for the specific study that was conducted. Municipalities, without exception, should be transparent and accountable to the people at all times as evidence of good governance. Furthermore, Smart (2011:1) asserts that government information is an important source of regular information for keeping society informed about debates and decisions that have an impact on social and economic policies in the development of political priorities for citizens. The study seeks to improve the system of these sectors through web archiving in the African context by introducing ideas related to the web archiving field and additional contributions to knowledge that can be used by government sectors and archivists. The purpose of this research was to develop a framework or model for the archivalisation of websites in KZN in order to ensure the authenticity, reliability, usability, and trustworthiness of archives in local governments. This research informs the local government by revealing, identifying, and recommending the appropriate records management systems to be used specifically for web archiving or archivalisation to ensure the long-term preservation of web content using South African procedures. Furthermore, many organisations in South Africa create websites as part of their information transfer when communicating with the public. As websites are regarded as records, the study will contribute to new knowledge on how to retrace web content information posted on websites. The study will further help personnel learn how to manage records and harvest digital content from websites. The personnel consist of IT experts, information managers, web administrators, department directors, communication managers, and website managers or designers.

1.5 ORIGINALITY OF THE STUDY

The originality of a doctoral study is regarded as critical, and it is one of the requirements for this level of study when conducting research. According to Cryer (2006), the following are some of the factors that can influence the study's originality:

- When a researcher employs novel tools, methods, and procedures to address research problems.
- When a researcher explores an area that is indefinite or where little research has been conducted in that particular area.
- When a researcher explores a well-explored subject area, but the results reveal unexpected and uncharted sub-areas within that actual field of study.
- When a researcher gathers original data.
- When the findings of a study have the potential to be published.

The study employed the multiple case studies method, which is a method used in areas where not much research has been conducted, to address issues related to web archiving through the preservation of web content in municipalities. The study contributes to the body of knowledge in liquid communication and web archiving, and collects original data from the field through interviews and document analysis, intending to publish the results in scientific journals. This study addresses several issues related to web archiving by using the phenomenological research method to collect original qualitative data directly from KZN municipalities through the use of a literature review. The qualitative research approach enables the researcher to gain in-depth knowledge and understanding of the phenomenon under investigation. The web archiving life cycle model aided this study in contrasting a feasible framework for South African municipalities to use. This is significant because many studies focus on preservation, but very few have focused solely on the archiving of local government websites. The study will influence policy development related to web archiving in South African municipalities, and it will bridge the gap between web archivalisation and preservation in general. The study will contribute to the existing body of literature in information science and archiving from an African perspective.

The review of the literature revealed the significance of e-records management, which is thought to be too fast and effective for digital content. Various authors have emphasised the

significance of digital content, arguing that it is part of the record and should be treated as such (Ngulube 2012; Netshakhuma 2019; Katuu & Ngoepe 2015; Kalusopa 2011). The study discusses the archivalisation of websites as well as cybercrime as it arises from web archiving and digitisation considerations. A review of the literature revealed that, in comparison to European countries, very little has been done in terms of web archiving of websites in Africa. Some countries regard their websites as a record and one of the important communication tools that must be managed as a record. The research focused on the digitisation of websites or web content, as well as digital preservation. Some light was shed on how municipal records managers, communications experts, and archivists manage web content through websites while also digitising web content. This was addressed by employing an interpretivism research design to collect multiple-case qualitative data directly from municipalities' communication departments and records practitioners.

1.6 THEORETICAL FRAMEWORK

The web archiving life cycle model (see Figure 1.2) was used as a theoretical framework to inform the objectives, literature review, and data collection in this study. The web archive life cycle model attempts to represent common workflows and the development of a measurable model to which organisations can refer when developing or improving their web archiving programmes (Bragg 2012). The model aims to represent the types of decisions and challenges that arise during the course of a web archiving project, as well as the steps that organisations take throughout the life cycle of their web archiving programmes (Bragg & Kristine 2013). The Web Archiving Model informed the development of the framework generated by this study by providing a specified view of a model required by the municipalities in South Africa to run an effective website for their municipality. The model further described the use of the websites as a record, not just a communication platform for communities, as some are used as interactive tools. The web archive life cycle model represents common workflows as well as the development of a measurable model to which organisations can refer when developing or improving their web archiving programmes. The Archive-It team developed this model based on their practical experience in web archiving, as well as feedback and lessons learnt from their partnerships with web archiving organisations. The model is circular and is divided into steps that overlap and intertwine. Neuman (2011:205) defines conceptualisation in qualitative research as a method for formulating the rationale between theoretical definitions while attempting to configure the main ideas that relate to them. Ngulube (2013:1995) and Ngulube

(2019:543) go on to say that "qualitative methods are linked to the paradigms of constructivism and interpretivism, while quantitative methods are related to those of positivism." According to Ngulube (2020), developing a good theory leads to improved research comprehension and advanced articulations of key points and knowledge. He further states that a good theory is essential for knowledge production. Ngulube (2020:4), on the other hand, observes that "theories connect a discipline's body of knowledge to broader fields." Research, on the other hand, tests and develops theories. " Ngulube (2020) adds that a theory is defined as a collection or sequence of models. In other words, models serve as models for the formulation of theories. Theoretical frameworks are useful for qualitative research because they "uncover" the "strengths and weaknesses" of specific theories and phenomena relevant to that research. Researchers should measure all the variables in their theory to avoid theory dropping (Ngulube 2020). The study uses the theory of dropping as it is considered "one of the problems encountered in the use of theory by researchers." This, however, implies that in qualitative research, various concepts may appear during data collection. Sometimes these new concepts may accumulate, and it should remain open for these concepts to be accommodated. This conceptual problem can be solved by understanding the difference between the conceptual and theoretical frameworks and applying these analytic tools appropriately. All the variables or concepts in the theory must be operationalised if a theoretical framework is used" (Ngulube 2020:27). According to Ngulube (2019:27), the researcher must identify a specific theory that can answer the research questions and design of that specific study, as well as apply the theory to various stages of the inquiry and analyse it. He further states that the theory's application may include theory generation and theory testing. In terms of theory generation, it serves as the foundation for data collection and analysis to generate theoretical examinations of social reality (Ngulube 2019).

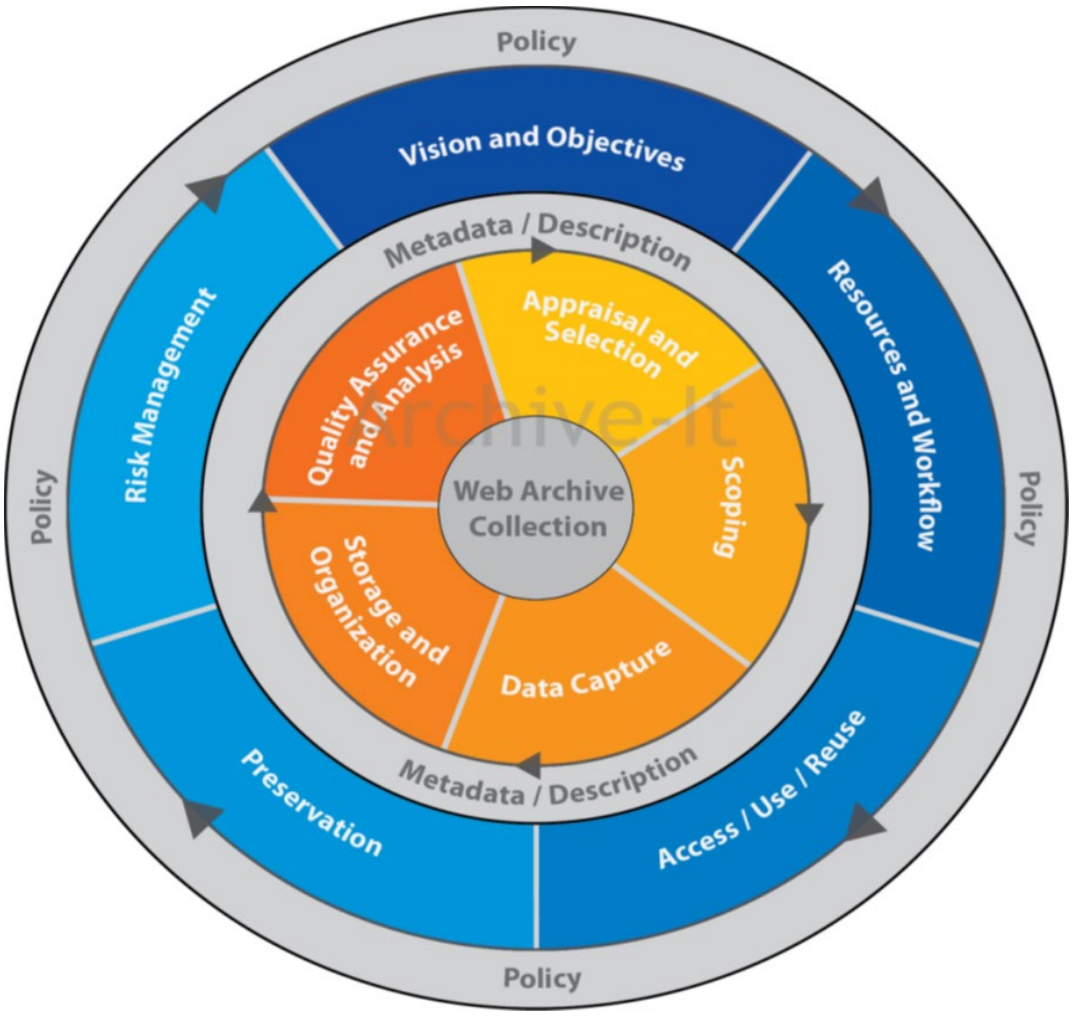

Figure 1.2: Web archiving life cycle (Bragg & Kristine 2013)

The web archiving life cycle model allows users to return to the beginning of the cycle or to repeat specific steps based on their tasks. For example, the process could include adding to an existing collection, creating an entirely new collection, or reviewing archived contents, as well as modifying the crawl settings or scope (Bragg & Kristine 2013:2).

The policy band, which represents some of the high-level decisions made by institutions, is located at the model's periphery. Risk management, vision, objective, resource, workflow, preservation, access/use, and reuse are all steps in the policy band. The inner circle of the model, on the other hand, represents the more day-to-day management activities of the web archiving lifecycle, which are quality assurance, analysis, appraisal, selection, storage, organisation, scoping, data, and capture. The web archival collection, also known as web content, is located in the centre of the life cycle. According to Bragg and Kristine (2013), web

content contains the data that is the end result of all preceding steps and is what is considered for preservation.

> These terms inform us of how web archives are being utilised when digitising information on the web or publishing on the web. Policies play a vital role in making sure organisations conform to laws that help ensure sustainability in organisations. Whenever organisations create or preserve new information, they require policies to be able to facilitate uniformity to sustain the working conditions in an organisation (Bragg & Kristine 2013:5).

Making decisions about whether and how to provide access to their collections, as well as how to monitor how patrons use the contents, falls under the purview of access. In turn, preservation assists organisations in determining which collections must be archived. It consists of both data files and metadata. Scoping allows you to choose which parts of the website to archive (text, videos, audio), as well as whether to archive entire sites or even entire web domains. The evaluation gives organisations specific options for which websites they want to collect. The archived data is then stored in either a short-term or long-term storage plan (Bragg & Kristine 2013).

Municipalities require a framework that will guide the path of their functionality. A lifecycle model can aid in the development of a framework that municipalities can use when archiving websites. Policy, preservation, access, appraisal, storage, and scoping are the constructs to be used in the web archiving cycle model. The lifecycle model aided in comprehending the stages of web archiving. Importantly, this model was used to answer research questions and create a feasible framework for local government web archiving in South Africa. The web life cycle model, according to Bragg and Kristine (2013), is made up of various cycles that were used to kickstart the web archiving programme. It is considered to be as follows:

- Policy: the blue circle just inside the policy band represents the high-level decisions an institution faces as it sets up and manages its web archiving programme.
- Vision and objectives: institutions clarify the goals of their web archiving programme.

- Resources and workflow: institutions review their available resources, including finances, expertise, staff, potential collaborators, and others to determine how to proceed with developing or changing their web archiving programme.
- Access / Use / Reuse: institutions make decisions about whether, and how, to provide access to their collections and monitor how patrons use the content.
- Preservation: institutions make decisions about how they want to preserve the data they collect in their web archiving activities. This includes both data files and metadata.
- Risk management: institutions consider their approach to risk in creating a web archiving programme, they look at copyright and permissions as well as access.

The inner orange circle describes the day-to-day activities involved with the web archiving business. Among these tasks are the following:

- Appraisal and selection: institutions decide specifically which websites they want to collect.
- Scoping: institutions may opt to archive portions of a website, whole sites, or even entire web domains.
- Data capture: institutions fine-tune how they want to capture their data through decisions about crawl (capture) frequency and types of files to archive or not archive.
- The scoping and data capture phases of the life cycle often overlap as they involve similar activities and decisions.
- Storage and organisation: this step includes a temporary or long-term storage plan for the archived data. For some institutions, the storage and organisation phase of the life cycle might also constitute their preservation activities.

The model explained

- Quality assurance and analysis: institutions review what they have archived and how well the resulting collection satisfies the goals they set at the beginning of the life cycle.
- At the centre of the life cycle is the collection itself, the archived web content.
- This data is the end result of all preceding steps, and it is what will be preserved. Capturing and preserving collections of data is at the heart of all web archiving activities and is therefore the centre of the model.

1.7 DEFINITION OF KEY TERMS

This section defined the terms used in the study. Web archiving, digital preservation, archivalisation, websites, and web content are the key terms identified.

1.7.1 Web archiving

Web archiving, according to Niu (2012:1), is "the process of gathering up data that has been recorded on the World Wide Web, storing it, ensuring the data is preserved in an archive, and making the collected data available for future research." Web archiving is the preservation of websites and their contents for future use. It ensures that the contents of these websites are not permanently removed. Due to the massive size and amount of information on the web, web archivists typically use web crawlers for automated capture. Web archiving is a method of preserving information that has been posted on a website. Furthermore, NARSSA (2006) regards websites as the structures and public faces of governmental bodies. Government entities must accurately document their websites over time so that they can reliably establish the content they carried at any given point in time. If websites are not properly managed, governmental bodies risk losing all information posted online and being unable to retrace it.

1.7.2 Digital preservation

Digital preservation, according to Mukasa and Kamusiime (2012:75), is "a set of processes, activities, and management of digital information over time to ensure its long-term accessibility." Digital preservation, according to Hedstrom (1998:190), is a new set of challenges for libraries and archives in addition to the existing task of preserving a legacy of materials in traditional formats. Hudstrom (1998) defines digital preservation as the planning, resource allocation, and implementation of preservation methods and technologies required to ensure that digital information of continuing value remains accessible and viable.

1.7.3 Digital repository

According to the InterPARES Trust, a digital repository is "one whose mission is to provide reliable, long-term access to managed digital resources to its designated community, now and in the future." Institutional repositories and digital archives are other terms for digital

repositories (DR). The process of digitising digital content is known as digital repositories, and they provide a suitable infrastructure for storage-management, preservation, re-use, and curating of digital materials. The InterPARES Trust (2002) further states that digital repositories are important not only for the repository's long-term viability, but also for the digital information for which it is responsible to demonstrate fiscal responsibility and sustainability; design its system(s) in accordance with commonly accepted conventions and standards to ensure the ongoing management, access, and security of materials deposited into it; and establish methodologies for system evaluation. It is also expected to openly and explicitly carry out its long-term responsibilities to depositors and users. The process also includes policies, practices, and performance that can be audited and be measured.

The Texas Digital Library (2019) notes that “digital repository is like the electronic equivalent of the library stacks; digital items are organized and searchable there, and they have a specific, persistent location so repository managers maintain intellectual control and researchers can find what they’re looking for. A digital repository does more than simply house digital objects online, it preserves their integrity in the long term”.

1.7.4 Archivalisation

Archivalisation, also known as documentation, is the process of preserving documents through re-inscription (reproduction). It entails a series of events within newly generated documents (Ketelaar 1997). Archivalisation has to sweep the world for something to light up in the archival sense, before we proceed to register, record, and file it (in short, before we archive it). We gain insight into the social and cultural factors, standards and values, and ideology that, as Jackson Armstrong-Ingram writes, infuse the creation of "archivalai" by distinguishing archivalisation from archiving.

Archivalisation is defined by the Society of American Archivists (2005-2020) as "process of selecting records for retention in an archive and preparing them for research use and the process of determining or sensing that a record has the necessary qualities for it to become part of an archive or to be archival." They also point out that this process is distinct from appraisal, which is an orderly process of determining which records should be archived. Therefore, archivalisation precedes the archiving process.

1.7.5 Websites

A website is defined as a page or collection of pages on the World Wide Web that contain specific information provided by one person or entity and trace back to a common Uniform Resource Locator (URL). Websites such as Facebook and MySpace are examples (Yourdictionary websites 2019). It is also stated that another name for a website is a 'portal,' which is a website that covers a specific topic or industry, and that 'search engines' are sites that index all of the content on the WWW. 'Social networking sites,' 'blogs,' and 'wikis' are examples of sites with user-generated content. A password-protected website for subscribers or business partners is referred to as a 'extranet'.

1.7.6 Web content

The web content is a component of the online content. It is considered as a series of pages. Each webpage has an unique address that, when input into a web browser, directs you to that page. "Most web addresses begin with the letters www (World Wide Web)" (Failte Island 2013:4). Web content is seen as a platform that facilitates access to information. As a result, most organisations must efficiently manage their web material to guarantee that all individuals can simply go to the information they seek and assess whether it is accurate and up to date (Minnesota Historical Society Electronic Records Management Guidelines 2012).

Web content management holds the government accountable b ecause websites, like paper records, may contain records that track government activities and the use of tax dollars, government organisations must manage web material with a properly crafted and enforced policy (Minnesota Historical Society Electronic Records Management Guidelines 2012:1). Therefore, each organisation should devise a strategy for the proper management of public records held on its website. The plan should be integrated into the broader records management programme of each organisation.

1.7.7 Liquid communication

According to Mosweu (2019:36), "liquid communication is the type of communication that can easily go back and forth between the participants involved." Zapata (2013:ii), further states that communication is viewed as a continuous process that transcends time and space and is

unaffected by social status. For customer service, access to information, and direct community engagement, liquid communication is considered to be created by an interaction between government and people on social media (Duranti 2014).

1.8 LITERATURE REVIEW

Creswell (2014a:31) defines literature as "research studies as well as conceptual articles or opinion pieces that provide a framework for thinking about the topic." According to Neuman (2011), one of the greatest ways to find out what is well-known about the subject before attempting to find answers yourself is to conduct a literature study. Researchers are led in question formulation in this manner to ensure that the identical questions that have previously been addressed are not repeated. The literature on web arching and website preservation was reviewed.

The literature review focused on themes derived from the study's objectives and developed from the constructs of the web archiving life cycle. In this context, the preliminary literature from the following themes will be reviewed, guided by the objectives of the study (see Chapter Two for a detailed literature review):

- The policy and legislative framework for web archiving
- Strategies for web archiving
- Issues or challenges related to web archiving
- Process of harvesting municipalities' websites into the e-records repository
- The long-term digital preservation of websites
- Storage of content published on websites

1.9 RESEARCH METHODOLOGY

The methodology had a significant role in illuminating the larger field of discussion on various methods, as well as the link between methods and theories used in this study (Alasuutari, Bickman & Brannen 2008:82). When conducting research, scientific study employs a variety of methodologies, including the quantitative approach, the qualitative approach, and mixed-method research (MMR), in which more than one approach is mixed or integrated (Creswell 1994:176; Fidel 2008:265; Johnson & Christensen 2008:280; Ngulube 2013:5-7). According

to Howell (2013:7), methodology is "the systematic, theoretical analysis of the methods applied to a field of study." Multiple case studies of various sorts of municipalities in KZN were used in this qualitative study. Gustafsson (2017) expounds that when a researcher chooses to do a multiple case study, he or she can analyse the data within each situation as well as across different situations, as opposed to when a single case study is chosen. Using several case studies provides insight into how municipalities manage and preserve their web content for posterity. Purposive sampling was performed to identify municipalities in KZN that have functioning websites. Interviews and questionnaires were used to acquire qualitative data from purposively selected participants who are in charge of municipal websites. Data from interviews were augmented through exploration of municipal websites. This is discussed in detail in Chapter 3.

1.10 SCOPE AND DELIMITATION

This study only focused on municipalities in KZN province. In addition, only municipalities with websites were targeted. The study excludes KZN government departments, parastatals, and private organisations. The study concentrated on web archiving concepts pertaining to content published on websites, as well as web content harvesting (strategies for long-term digital preservation, policies, risks, storage, harvesting, access). It delved deeper into the web archive's policies and challenges. The formations are explored in light of the study's relevance to web content and cybercrime related to website disruption, which results in information loss.

1.11 ETHICAL CONSIDERATIONS

During data collecting in the field, the researcher experienced the same research challenges as any other researcher would face, including report dissemination (Creswell 2007:174). Various researchers and institutions of higher learning regard ethical considerations as the universal standard for adhering to research ethics (Cozby 2001; Kemoni 2009; Ngulube 2003). The researcher followed the UNISA-approved 2016 research ethics policy (more details in Chapter 3). The study was committed to preserving participants' privacy and not violating their privacy. Participants in the study provided informed consent. When interviewing participants, general protocols and procedures were observed. The study complied with and sufficiently addressed the UNISA policy's ethical considerations, such as obtaining an ethical clearance certificate. As a result, a study permit was issued to the selected municipalities, as well as the KZN local government (APPENDIX 3). The researcher informed the participants that the information

gathered from them would be utilised solely for academic purposes. Furthermore, the researcher informed the participants that they would not be forced to provide confidential information, but that they should opt to participate because the outcome could benefit the entire country.

1.12 STRUCTURE OF THE THESIS/DISSERTATION

The thesis is divided into six chapters, which are as follows:

- **Chapter One: Introduction: understanding of websites or web content**
  This is an introductory chapter that discusses the study's background, the definition of key terms, the problem statement, the purpose of the study, the research objectives, as well as the significance and contribution of the study, the study's originality, the scope and delimitation of the study, and a brief research methodology.
- **Chapter Two: Literature review and theoretical framework**
  The chapter presents a detailed literature review, contending theories, and models relevant to the current study.
- **Chapter Three: Research design and methodology**
  The chapter describes the study's research methodology and focuses on the research procedures used, the study population and justification, the data collection instruments, the instruments' validity and reliability, the data collection procedures, data analysis, and ethical considerations.
- **Chapter Four: Presentation of the findings**
  In accordance with the study's objectives, the chapter presents data collected from the field through interviews as well as document analysis.
- **Chapter Five: Discussion of the findings**
  The chapter interprets the research results and presents the evidence relevant to the research questions. Thus, the chapter conveys the meaning of the findings and provides links to other sections, such as the research questions, theoretical framework, and existing literature.
- **Chapter Six: Summary, conclusions, and recommendations**
  The chapter summarises the study's findings, conclusions and recommendations. The recommendations are based on the study's research questions. The chapter also suggests areas for future research.

1.13 SUMMARY

Chapter Two provided an introduction and background on web archiving and digital website preservation. Background information and definitions of key terminology are required to guide readers through the subject of the thesis and how various terms were employed. The theoretical framework, problem statement, study purpose, research objectives, research questions, the significance of the study, originality of the study, scope and limitations, and ethical considerations were all highlighted. Furthermore, the definition of key terms, as well as the organisation of the dissertation and chapter sequence, were outlined. The next chapter discusses the literature review as guided by the objectives of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter presented an introduction and background, conceptual and contextual setting, theoretical framework, objectives, and problem statement, originality of the study, research designs and methodology, ethical considerations, key terms used to define study conceptions, and risk factors for web content archiving. This chapter starts by mapping out the literature review layout. Websites are being considered by various organisations as a means of communicating with their stakeholders or service clients. Therefore, because websites form a significant amount of communication, they must be guided or treated as a record. Municipalities are required to have effective record management systems in place.

A literature review is defined as an overview of what others have written about a particular subject. The review of literature is regarded as the heart of research and should be carried out thoroughly in relation to the specific topic being investigated (Leedy & Ormrod 2010:66). According to Leedy and Ormrod (2010), a literature review can help avoid the repetition of similar studies being conducted by sparking new ideas, illustrating methodology tactics, disclosing data sources, and resolving design disputes. It also provides a clear indication of how other scholars may have expanded on issues related to that specific area of study. Figure 2.1 depicts the constructs from the web archive life cycle that guided the literature review, which include the policy and legislative framework for web archiving, strategies for web archiving, long-term digitisation, website harvesting, and the status of cyber-crime in South Africa.

2.2 PURPOSE OF THE LITERATURE REVIEW

A literature review enables the researcher to interrogate the subject under study by conducting a critical evaluation of existing knowledge in that field of study (Leedy & Ormrod 2010:66). It provides a researcher with the advantage of being able to see what other scholars have studied on that specific topic, what revelations have been made about that specific topic, as well as the easily identifiable gaps. Randolph (2009:2) states that conducting a review of literature is a

way of illustrating the knowledge of an author in that particular field of study using theories, vocabulary, and other phenomena, which will later inform the researcher about the dominant researchers in the field. A framework can be developed using new information informed by the literature deliberated by other scholars through a literature review (Randolph 2009). According to Babbie and Mouton (2001:103), the literature review provides answers to the following study-related questions:

- What have other scholars written about the topic under study?
- What previous research has been conducted?
- Are there consistent findings, or do previous studies contradict each other?
- What theories deal with it, and what do they say?

The following themes are covered by the study as they relate to the objectives of the study:

- The importance of web archiving
- Policy and legislative framework for web archiving
- Web archiving strategies
- Threats (dangers) related to web archiving
- The long-term digital preservations of municipalities
- Storage of content published on municipalities' websites
- The process of harvesting municipalities
- ISO16175 / 3: principles and requirements for electronic database
- Analysis of risks associated with web archiving
- Status of cyber-crime in South Africa

A review of the literature informs the researcher about the research instruments, approaches, and methods used in related studies. In this regard, the study reviewed the literature on web archiving and digitisation of records via websites, intending to gain a thorough understanding of municipal archiving websites. According to Kumar (2005:32), the researcher can identify gaps and unanswered questions through literature. Figure 2.1 depicts the layout of the reviewed web archiving literature.

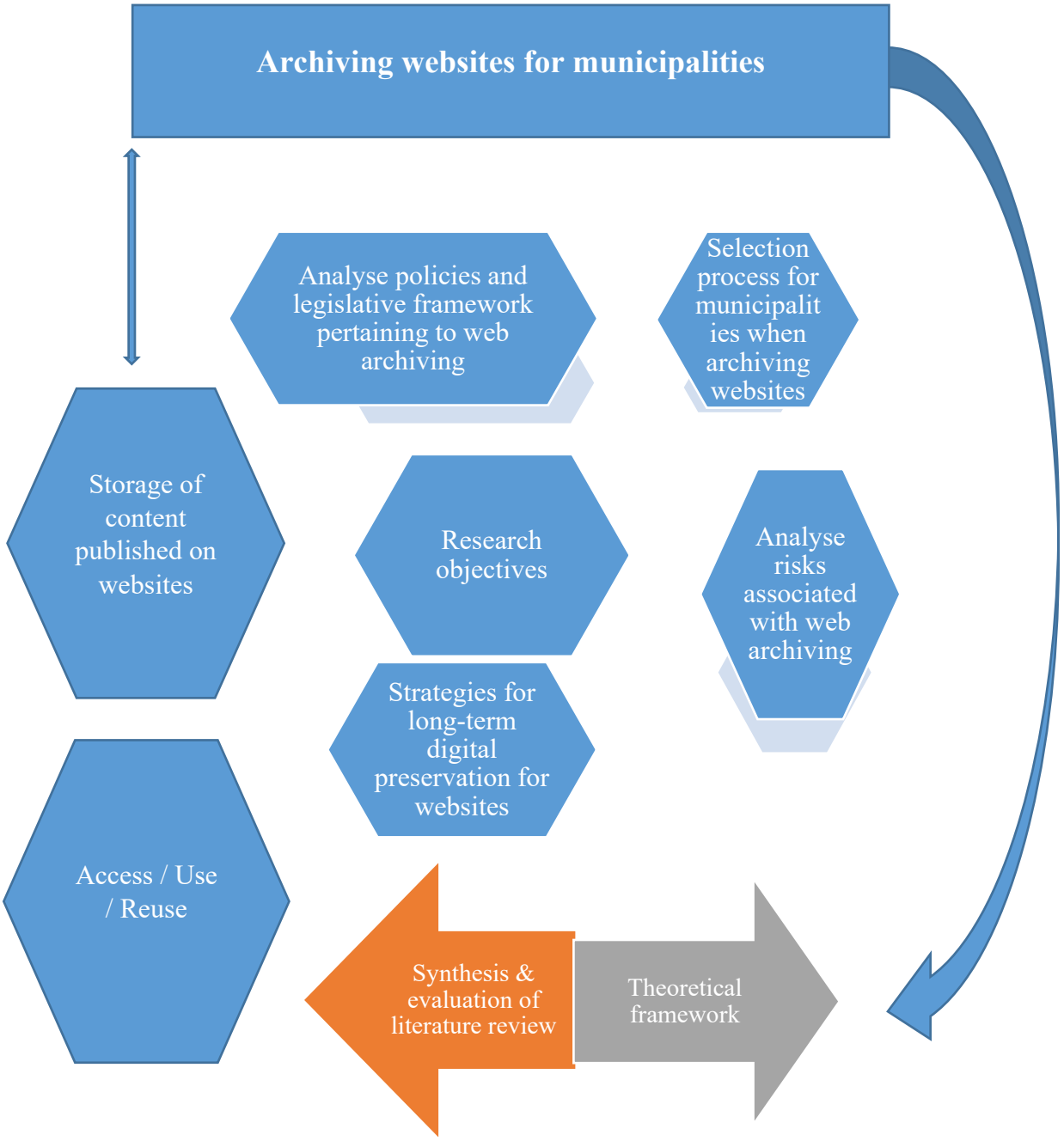

Figure 2.1 Literature review layout (Researcher 2021)

2.3 POLICY AND LEGISLATIVE FRAMEWORK FOR WEB ARCHIVING

One of the objectives of the research was to analyse the legal and policy environment surrounding web archiving. According to the web lifecycle model, the policy addresses the high-level decisions that an institution must make when establishing and managing its web archiving programme. According to a web life cycle model, for each government sector to practise good governance, it must adhere to a specific model in order to be effective and trustworthy (Bragg & Kristine 2013). As part of a formal records management policy,

governmental agencies must pay special attention to the preservation of electronic records. It encompasses digital record management (ISO 15489 – 1: 2016:8; Bantin 2008:233; Okello-Obura 2011:6; The National Archives of the United Kingdom 2010). When it comes to records management, policies and legislative frameworks are crucial. The web life cycle framework has been proven to be a tool that can be adopted by organisations that create or preserve new information on websites on a daily basis, and they require policies that can facilitate uniformity in order to sustain working conditions in an organisation (Bragg & Kristine 2013). NARSSA (2006) mandates that all governmental bodies establish the necessary infrastructure, policies, strategies, procedures, and systems to ensure that records in all formats, including websites, are managed in an integrated manner. This is also consistent with records management standards that guide how records should be managed, such as (ISO) 15489 Records Management Standard, SANS (ISO) 23081 Metadata for Records, and SANS (ISO) 15801 Trustworthiness and Reliability of Electronically Stored Records. According to NARSSA (2006), governmental bodies should implement and maintain integrated document and records management systems that provide, at the very least, the following records management functionalities for digital records:

- Managing a functional subject file plan according to which records filed
- Managing e-mails as records
- Managing websites as records
- Maintaining the relationships between records and files, and between file series and the file plan
- Identifying records that are due for disposal and managing the disposal process
- Associating the contextual and structural data within a document
- Constructing and managing audit trails
- Managing record version control
- Managing the integrity and reliability of records once they have been declared as such
- Managing records in all formats in an integrated manner

To ensure consistency, institutions are required by law to capture and archive web content. When it comes to records management, the United Kingdom (UK) government, like South Africa (SA), is required to follow national archives principles (The National Archives of the United Kingdom 2010). Furthermore, the government is increasingly publishing its records

online, and the UK Government Web Archive has a very high rate of use, with more than 100 million hits a day. In light of this, the need for a policy and legislative framework is a must for web archiving functions. Other legislation mandates record retention in a variety of commercial and private sectors. It was observed that the most significant non-technical issue confronting web archives is frequently legislative. When it comes to web archiving, some countries, such as the United Kingdom and South Africa, do not yet have a legislative framework in place. It was noted that no single collecting institution in the UK could currently harvest the entire UK domain without risking infringement of copyright (The National Archive of the United Kingdom 2016). When the legal deposit legislation is passed, UK legal deposit libraries will be be granted the right to gather and provide access to copies of all websites published in the UK domain (The National Archive of the United Kingdom 2016).

Mutula (2014) conducted a study on the status of digital heritage preservation management in eastern Africa. The study revealed that several challenges, such as weak policy and regulatory frameworks, limited capacity, inadequate government support, and limited connectivity and bandwidth, were hampering digital heritage preservation management in Africa. This, however, gives us an accurate depiction of the African context, of the struggle that African countries face when it comes to preserving digital materials. Ngoepe (2017) points out that having a policy in place might help the organisation to create solutions for how to preserve their transitory records. Going forward, policy assists the organisation in preserving its records and regulatory framework. This also affects how these records are managed by various stakeholders, including municipalities. Mnjama and Wamukoya (2007) note that having regulations that guide record management functionality will facilitate the monitoring and evaluation process in the long run. With that being said, severe measures are required to emphasise record management policies from their creation to be able to retrace their provenance. Ajibade and Khayundi (2017) confirm that they were not aware of the existence of any policy or the meaning of being a records manager and its compliance involvement in the Raymond Mhlaba Local Municipality in South Africa on small, micro, and medium enterprises (SMMEs). In one of the studies of higher institutions in South Africa, Garaba (2018) found that the institution still lacks strategies to address electronic RM policy.

The legislation associated with preserving electronic information and harvesting also presents continuous obstacles. When archiving web content, this process emanates from different types of electronic content being archived and the type of website that needs to be included, such as, a page or a link. The snapshots are taken live as they facilitate the dynamic link between the

material being archived and other scripts of the sites. On the other hand, Duranti and Thibodeau (2006) note that archival theory gives rise to a reformulation of the notion of digital records as they are considered to be different from electronic formats and electronic records that are being stored. Web pages and websites are not only short-lived; they are often also interactive and include scripts that are eventually embedded in dynamic link instructions that may use different materials (Duranti & Thibodeau 2006). These processes guide how archivalisation functions in the ordeal of archiving websites and all the processes involving archiving web content. With proper guidelines being in place, it will speed up the process of archiving web content and understanding the content being archived.

Most developed countries have social media or web archiving policies for government, such as the United States, where the National Archives and Records Administration has NARA Bulletins on Guidance on Managing Records on Web 2.0/Social Media Platforms (2016), the New South Wales Archives has Government Social Media Policy and Guidelines (2016), and, at a lower level, the United Kingdom has Government Social Media Policy and Guidelines (2016). In 2018 Mosweu, proposed a new framework for liquid communication to add to web management. Furthermore, Bologun (2020), also suggested a framework for Web Archiving of Indigenous Knowledge Systems in Academic Institutional Repositories in South Africa. This all adds to the scars of literature in Africa. His focus was more on digital preservation and assessing the digital preservation policies of the institutions. This, however, shows the gap when it comes to web archiving policies in Africa, more specifically in South Africa.

2.4 STRATEGIES FOR WEB ARCHIVING

The Web Archiving Life Cycle Model incorporates the technological and programmatic arms of web archiving into a framework for it to be relevant to any organisation seeking ways or strategies for archiving web content. In its vision for its digital preservation approach, the web archiving life-cycle model mentions capturing born-digital data as one of its strategies. According to the National Archive of the United Kingdom (2016), the majority of current government records are created solely in electronic format, and the lack of a long term strategy for archiving and preserving this content will certainly lead to the disappearance of important information in the future.

The National Archives of the United Kingdom (2014) notes that they used metadata as one of the strategies as it keeps all information contained within that particular document. It is further considered to be more effective in giving out detailed information about the file, like the quality of the file, its location, ownership, and its condition. Cloud computing is also considered the other format that can be used to preserve information in the cloud. Several scholars have suggested that cloud computing is becoming the most used system for storing information. Scholars like Prince (2011) agree that archives can benefit by using the cloud to store their information. Cloud computing can be used as a tool that facilitates proper record management (Mosweu et al. 2019). Migration is also one of the strategies that deal with static digital objects like images and text (Heslop, Davis & Wilson 2002; Kirchoff 2008). It was noted that migration could facilitate the process of accessing data through a cloud computing system (Harvey 1997; IRMT 2009). The collaboration of agencies dealing with web archiving was noted to be more effective when dealing with web content. Multidisciplinary skills are seen as the way to go in the digital era in all aspects of archivalisation (IT, records managers, archivists, librarians, and researchers).

The National Archives and Records Administration (NARA) of the United States of America (US) (2019) employs various strategies for dealing with digital preservation. The goal behind the implementation of these strategies was to reduce risk and achieve best practices to preserve and maintain access to digital content.

The **first strategy** is "documentation of standards and procedures", which focuses on providing guidance on minimum metadata and preferred file formats for electronic records to be transferred to NARA. It also promotes the use of open standards-based formats and accepted voluntary, community-based standards to help facilitate future access and preservation; and "provides guidance to Federal agencies for the management of Federal records and transfer to NARA to support a digital record preservation lifecycle".

The **second strategy** is "prioritisation", which looks at the risk that comes with digital preservation and prioritises the required activities involved in the digitisation process. NARA also conducts regular assessments of formats if they need a complex technical approach. Strategic planning has grown in popularity in the public sector around the world, and it is commonly understood to signify "a systematic process of strategy formulation during which an organisation’s environment is analysed and strategic goals are defined" (George 2017:527).

The **third strategy** is "file management", which deals with the storing of digital content in a trusted digital object repository. It further grants the ongoing process of the management of and access to content throughout its lifecycle. They see a trusted digital repository as a process that facilitates long-term access and a reliable source that can be used for future access to managed digital resources. It further enables them to manage the number of files being accessed.

The **last strategy** is “organisational relationships” in which NARA is actively engaged with the local, national, and international digital preservation communities to share information and experiences, seek guidance, and collaborate to address digital preservation challenges. This engagement will help NARA identify emerging risks, practices, and standards to continually improve the programme. It engages the information technology (IT) industry to ensure that it has an understanding of the needs of digital preservation as it develops new technical tools and systems.

2.4.1 Strategies developed by the National Archives of South Africa

Infrastructure is taken into account by the South African National Archives as one of the things that are considered to facilitate proper records management e-regardless of its form. A preservation strategy employs a proactive approach rather than a passive one. According to Rounds and Horton (2004:10), based on the Minnesota Historical Society, the legal framework strategy was created that must conform to legal mandates in such areas as the following:

- Providing public accountability
- Distinguishing public from non-public records
- Creating records retention schedules and carrying out disposal actions
- Developing and sustaining a trustworthy process for electronic records management
- Digital media. Review digital media storage options (e.g. magnetic tape, optical disk) for your electronic records.
- Electronic document management systems. Introduce yourself to electronic records issues that may arise as you seek to integrate and manage the records management process with an electronic document management system.

- Digital imaging. Introduce yourself to digital imaging, its uses, and legal considerations. Review recommendations for implementing digital imaging projects.
- E-mail management. Consider the issues involved in extending your electronic records management strategy to your e-mail messages.
- Web content management. Learn how to develop a policy for managing your web content that meshes with your electronic records management strategy.
- Electronic and digital signatures. Learn about the distinction between electronic and digital signatures, and the legal considerations surrounding their use.

2.5 LONG-TERM DIGITAL PRESERVATION FOR WEBSITES

The web life cycle model states that, for the long term, digital is essential to ensure future access. Therefore, websites or content on websites must be preserved. Web preservation must be a start-to-finish activity, and it should encompass the entire lifecycle of the web resource (A guide to web preservation 2010). Furthermore, digital preservation is defined as "the set of processes and activities that ensures long-term, sustained storage of, access to, and interpretation of digital information. Government agencies play a vital role in making sure that information is available online or on the web to facilitate service delivery" (A Guide to Web Preservation 2010).

Accuracy is the key to delivering relevant information to the public. Jamain et al. (2018) claim that the content posted on websites may change daily and some may be permanently removed, if not managed properly, which could lead to the loss of important information that might be valuable for future research purposes. Joe and Lala (2006) state that "in the twenty-first century, information is being produced at vast rates, not only through traditional forms or formats but also increasingly in electronic or digital formats." A study by Khumalo and Nkala (2015) focused on web archives in an academic institution in Zimbabwe, and the findings revealed that there was a lack of awareness of the concept of web archiving.

When it comes to web archiving, there is the challenge from various stakeholders of not being certain about the need for the preservation of websites. Nonetheless, web archiving is one of the initiatives to preserve information and data on websites (Jamain et al. 2018). The National Archives of the UK (2011) and NARSSA (2006) agree that "web archiving is a vital process

to ensure that people and organisations can access and re-use knowledge in the long term, and comply with the needs of retrieving their information." Furthermore, websites are considered records by many national archival institutions, including the NARSSA (2007), that report under the category of records other than the correspondence system. Many organisations, municipalities included, are struggling to manage websites throughout their entire life cycle as they are still dominated by physical records. As a result, information published on their websites disappears when websites become dormant. Hence, Mosweu and Ngoepe (2019) argue that one moment these types of records are accessible, and the next moment they disappear without a trace. Therefore, regulations need to be built to capture and preserve such records as websites, social media, and e-mails, which are termed liquid communications (Mosweu & Ngoepe 2020).

The United Nations Educational, Scientific and Cultural Organization (UNESCO) started to realise the importance of digital preservation in early 2003, when they indicated the issue of the disappearance of information posted online and their emphasis was on the disappearance of the heritage of all nations (Hüfner 2010). In 2010, UNESCO underpinned the Universal Declaration on Archives institutions with the view that archives need to play a huge role when it comes to the development of society at large and safeguarding the contributions made by everyone involved in communities (Hüfner 2010). The preservation of data is not only for educational purposes and historical use, but it involves technological support that leads to the evaluation of trustworthiness detection, retrieval of information, and webspam. Long-term digital preservation is required by all institutions to be in control of the information that is digitised, employing web archiving as it facilitates future access (Costa, Silva & Gomes 2016). This is no different from web archiving. It also requires contributions to be made to non-digital records that were later digitised and published online via "The Times Archive" with news since 1785 (Costa et al. 2016).

2.6 SCOPING AND DATA CAPTURE PHASES INVOLVEMENT IN ACTIVITIES AND DECISIONS OF MUNICIPALITY WEBSITES

Capturing websites is a process that consists of taking a snapshot of websites for the preservation process. Many organisations are practising web arching in European countries for the posterity of their websites. "Websites are mostly used as a snapshot process when capturing or doing web archiving processes. In the process of documenting the entire website as a record,

consider taking website snapshots, using a software programme to enable you to reconstruct your entire website "(Rounds & Horton 2004). For example, an agency set up a short-term extranet website for a legislative initiative that included a bulletin board for key people to discuss the initiative. Public records agencies, whose purpose is to take website snapshots to reconstruct the sites completely as they existed at a given point in time (Rounds & Horton 2004:111).

In various aspects of born-digital records and digitisation platforms, the web has posed various challenges to digital preservation (Brügger & Laursen 2018). According to SalahEldeen and Nelson (2012), approximately 11% of resources circulated on social media will be lost after a one-year estimate based on a decay rate of about 0.02% per day. This, however, gives the vivid idea that issues that emanate from web archiving are not something new but have been experienced for some time now. Heritrix Crawler initiated the particular system when dealing with the archiving of web content in which they introduced a snapshot system (Brugger 2013; Brugger & Laursen 2018). The system by the Internet Archive harvests information on the web in its process, and it is mostly adopted by various institutions.

It takes time to deal with the web archiving process, and it needs to be done right as it is considered to be costly (Brügger 2013; Brügger & Laursen 2018). The new systems have been developed and are used to archive web content, including all forms of social media. Due to various challenges in clouding web archiving processes, some of them are faced with challenges such as being expensive and having ethical, privacy, copyright, and technical complexity problems throughout the system (Ben-David & Huurdeman 2014; Littman et al. 2018; Ben-David 2019). Different organisations choose different web archiving processes based on their different needs.

According to Milligan et al. (2016), the selection process is described as the "gatekeepers" and it requires a strategic approach. Ben-David (2019) further notes that the use of URLs when archiving the web has manifested effectively because when they were traced, it was found that most of them were still active in most organisations. However, it still poses a challenge because changing the institutional web causes problems with tracing the information being archived using a URL. He further notes that this poses a challenge for future researchers to bring together the rich metadata collected, together with the URLs, and that would also include Tweets, YouTube videos, and comments. However, this indicates that challenges are still there when it

comes to web archiving as it highlights the gaps brought about by archiving YouTube videos and comments in the digital era. Nowadays, organisations make more use of social media and websites when communicating with various stakeholders. Therefore, there should be ways to archive work that emanates from those platforms without exposing them to harm done by malware.

2.7 RISKS ASSOCIATED WITH WEB ARCHIVING

There are risks associated with web archiving. However, the web life cycle model notes that institutions require a certain approach to avoid risk when creating web archiving programs, and some of the issues they come across are copyright permission and access. The web life cycle model confirms that reservation is an evolving issue for institutions that archive the web, which goes hand in hand with the evolving nature of digital preservation and the development of digital repositories (Bragg & Kristine 2013). Duranti (2014) notes the following threats when it comes to records posted on the web: hackers, unauthorised access, documents that can be stored anywhere and can be moved at any time (without the knowledge of the record creator). Encryption might be breached, and shared servers could associate information.

The following three main challenges in web archiving work in Pustaka were noted by Jamain et al. (2018:10):

a) **Insufficient data harvested:** the majority of these websites cannot be viewed because insufficient data were harvested. The web archiving system is unable to capture the full details of the websites.
b) **Technology:** The rapid development of the latest technology requires urgency in actions to be taken in archiving websites. Electronic content is constantly changed, erased, or lost permanently and cannot be recovered when the website is being updated. In such instances, web content becomes inaccessible.
c) **Data storage and backup recovery:** One of the crucial problems is the storage capacity of archived websites. A server with a huge space capacity must be provided to ensure that the web archiving activity runs smoothly. Another issue is the inconsistency of the work done on backup recovery on the web archiving server. Previously, backup recovery for web archiving was done using CDs, but now the harvested websites are saved directly on the server.

Other challenges that were identified when archiving web content include staffing; developing criteria for evaluation of web archiving; awareness of the resource, especially among website administrators; and strategies for assessing the success and sustainability of the initiative for institutions (Antracoli, Duckworth, Silva & Yarmey 2014). This, however, shows that most scholars seem to identify the same challenges when it comes to the web (Hamooya & Njobvu 2009; Bayissa, Ketema & Birhanu 2010; Sigauke & Nengomasha 2011).

2.7.1 The hacking of websites

It was discovered through website harvesting that some people use these sites in an unseemly manner that harms society and poses a risk in the process. According to the web life cycle model, institutions decide which types of data or material are worthy of being preserved in their web archive through preservation. For many years, government agencies have been the target of cybercrime and website hacking. Concerns about cybersecurity have been raised all over the world (Fearn 2017). There is a growing trend of attacks in which websites are hacked and critical information is obtained. However, if the websites had been archived, the information deemed sensible and important could have been safeguarded. In 2014, approximately R50 billion was lost due to cyber incidents, and in 2015, over half a billion online personal records were lost and illegally accessed in South Africa (SABC News 2017). Again, in 2011, the country experienced a tremendous loss of about R3.7 billion to R6.5 billion through cybercrime (Norton South Africa 2012). Song (2017) states that more threats will spread as the country progresses. South African internet users will be affected. Van Niekerk (2017:117) notes that "the South African Police Service suffered a hack in 2013 that resulted in the release of approximately 16,000 details of whistle-blowers and victims".

Venkatesh (2016) notes that at the eThekwini Municipality (Durban), customer information went viral when the URL was being edited. Subsequently, the websites were taken down to correct the error. MyBroadband (2013) also explains the cyberattack on the City of Johannesburg in 2013. There is evidence that the cyber-attack against the City of Johannesburg was foreseen, and the relevant stakeholders were alerted of the vulnerability and risk to the personal information of the municipality's customers. It appears that they tried to rectify the issue by taking down the websites, which later appeared to be operational. In 2019, the City of

Johannesburg's website was hacked again, and the hackers obtained access to customers' personal information, compromising the security of customers. According to MyBroadband (2016), MTN (illegal access to bills of other customers) also suffered the same effect when customer information was mistakenly distributed, and, for ratification, the website was taken down to try to correct the error. The E-toll at Absa Bank lost approximately R500 000. Cell C, Postbank, and the South African Post Office's financial institutions had R42 million stolen in January 2012. The Department of Minerals and Energy and cinema chain Ster Kinekor were also hacked (Cave 2017).

However, this portrayed the un-trustworthiness of non-government and government institutional websites. Looking at instances such as hacking of Eskom's payroll, the Gautrain Management Agency (which resulted in a loss of up to R800 million), the Road Traffic Management Corporation (who lost up to R8.5 million), Standard Bank (who lost up to R300 000) by using Japanese ATMs (Patrick 2015; Speckman 2015; Mkhwanazi 2015; Van Zyl 2016; BBC News 1999; Porter 2003; ITNewsAfrica 2013; SANews 2012; Thiel 2004). Five universities in South Africa were also hacked, including the University of the Witwatersrand, the University of Cape Town and the University of Stellenbosch. All these websites were hacked by different people through the trace of authorities. Van Niekerk (2017) states that cybersecurity in South Africa is not effective enough since crime is soaring each day. Even Stats SA's website was targeted in 1999 by hackers who replaced data with negative comments about Telkom (BBC News 1999).

The above instances of cybersecurity threats prove that digital preservation has continued to be the preferred way of harvesting web content for web archiving. Concerning web archiving of digital content, institutions need to consider the level of risk relating to copyright and how they move towards it. A risk management policy gives authority regarding which material should be archived by institutions when archiving websites. The web life cycle model notes that "the appraisal and selection phase of web archiving involves choosing specific websites for capture". Again, it also gives preferable choices in terms of the URL that should be considered by organisations when selecting material on the web.

2.8 STORAGE OF CONTENT PUBLISHED ON WEBSITES

For decades, storage has been one of the issues in record management systems, especially physical records. The web lifecycle model states that web archiving consists of websites and their contents to be preserved for future use, and it ensures that the contents of these websites are not completely deleted over time. Electronic or digital records come as a lifeline to many organisations as they save space and time. Web archiving is not an easy process, as it requires big data and technology for it to function efficiently. When archiving websites, many factors require attention; for instance, the storage format as well as the storage capacity and selection of the website that needs to be archived (Jamain et al. 2018). Pennock (2013) indicates that "capturing large and complex sites regularly, whilst maintaining and clearly identifying the relationship between different versions of a site, and simultaneously managing the artificial boundaries that inevitably occur in an 'extracted' collection, requires a more complicated solution". Various forms need to be taken into consideration when archiving websites, like the inclusion of still images, sound recordings, motion pictures, and other multimedia formats available on websites. It was noted that entering cloud-based storage is one of the things that has been used for some time now.

Cloud computing services are being used increasingly regularly by organisations around the world, and South Africa is no exception. Literature reveals that organisations adopt these services as they offer efficient and cost-effective computerised services. Enterprise-wide systems and ECM implementations often rely on cloud computing. Although cloud computing offers good tools for organisations to conduct business efficiently and improve records management, there are threats and issues related to record storage, jurisdiction, privacy, and security. Records in the clouds need to be managed properly from creation to disposal, just like other conventional paper records, as they all provide evidence of business transactions.

The use of cloud computing services by businesses has grown exponentially over the years (InterPARES: 2016). For example, Google claims that 5 million businesses are subscribed to Google Apps. The cloud industry continues to expand. Forrester Research (2019) predicted that the cloud market would grow from $146 billion in 2017 to $236 billion in 2020. Cloud computing, dominated by global US-based companies, is still in the early stages of growth in Africa (Gillwald & Moyo 2012). Governments in most African countries have been playing a

key role in the cloud services market by promoting public cloud services as a delivery model for their e-government services (Gillwald & Moyo 2012:1). Information stored in information systems should be accessible for operational use as long as needed. According to the State of Kentucky (2012), organisations should still have access to information even if systems become obsolete and data is migrated to newer software applications.

Rounds and Horton (2004) state that citizens have the right to information at all times, as governments need to account for their citizens. Some government entities create records and some are considered confidential or sensitive. For instance, child protection records and adoption records. Information should be available for decision-making, but it is required to be preserved. Web content management makes it a must for the government to give an account and websites are considered to have all the activities of the government. Therefore, government entities must manage their web content with a carefully developed and implemented policy. Legality is considered when it comes to trustworthiness, accessibility, completeness, and is legally binding in a court of law. If the above aspects are honoured, it means the government has conformed to its citizens' requirements. They further state that website records should be managed as part of overall records management and should include the record life cycle as the strategy that can be used to manage records (Rounds & Horton 2004).

For some time, there have been arguments about whether content published online is good enough for it to be archived, looking at the quality of it. The printing world's publishers have also raised concerns when it comes to selecting quality material that needs to be archived digitally. Masanes (2014) notes that not knowing the methods involved when doing web archiving also causes chaos for those that deal with a selection of material. Furthermore, the dramatic rise of content creators archiving the web using URLs has been seen as one of the issues when it comes to retracing that particular work in the last two years, making pages untraceable (Masanes 2014). This again raises concerns as to whether methods being used are effective enough to hold the information for decades if the very same information becomes untraceable later in the years. Berners-Lee (1998) seems to have another view, stating that if people stop altering URLs, nothing will happen; and if people change people who work on a particular web server technology project while the project is ongoing, problems will be experienced when dealing with web archiving in organisations. This can even result in the loss

of information altogether. The ARC (archives) and WARC (web archives) are considered to be predominantly in data format and are used to store archived content. However, over the last few years, there has been a shift from the use of ARC to WARC when introducing a new format that can detect duplications of information and record contextual metadata (Costa et al. 2016). "NutchWAX" or "Solr" is used to support full-text search. The "Wayback Machine" was introduced to support URL searching and display of archived content, and the "Heritrix" is used to crawl web content (Costa et al. 2016). This gives us a clear indication of the content stored on websites that needs to be archived for posterity, and organisations (including municipalities) need to take precautionary measures when it comes to web content.

2.8.1 The digital repositories

The WWW was established in the late 1980s to try and keep up with the sharing of information to be more efficient and effective. Web archiving is defined as "the process of capturing content that has been made available via the World Wide Web, preserving this content in a web archive, and making it accessible to users" (National Records of Scotland 2017:1). The National Library of Australia was one of the first organisations to archive web content in 1996, and the web archiving sector has now spread across the globe. A digital repository is considered the instrument for managing and storing digital content on the web. Digital repositories are one of the systems that offer a wide range of services that are considered to be trustworthy core values. Trusted digital repositories are trustworthy digital repositories that go beyond what is expected, which is to understand the threats and risks within their systems. Constant monitoring, planning, and maintenance, as well as conscious actions and strategy implementation, are required from repositories to be able to carry out their mission of digital preservation and beyond. It further notes that all trusted digital repositories must accept responsibility for the long-term maintenance of digital resources on behalf of their information depositors and for the benefit of current and future users of information. InterPARES (2018) further states that policy guidelines are a requirement for all organisations to be able to function efficiently and to have good, running and trusted repositories.

2.9 THE LIBRARY OF CONGRESS INITIATIVES ON WEB ARCHIVING

The Library of Congress has taken it upon itself to initiate various programmes for archiving web content so that the study can take a pattern from what they are doing when developing a framework. Some of the programs collect or archive websites all over the world, including Africa. These initiatives were established to get first-hand material that is considered to be born-digital records. The Library of Congress states that "The Library of Congress is making its Web Archives Collection available for educational and research purposes. The Library has obtained permission for the use of many materials in the collection, and presents additional materials for educational and research purposes following fair use under the United States copyright law". The United States law grants the Library of Congress the right to access information on various websites around the world, and they also rely on international law concerning other countries. This is necessary for them to be able to archive websites for future access and for preservation purposes for valuable information that could be useful in the future, not forgetting research purposes and educational purposes. The archiving process by the Library of Congress still uses URLs, and information is differentiated by the subjects of that particular content. They further state that websites are at risk all the time because if the content changes, websites change and that leads to a loss of information throughout and cannot be traced back. Full-text search is not provided by the Library of Congress thus far; for now, they only make provision for URLs.

Some of the observations include the fact that not all of the information published on the Library of Congress websites is accessible to the public and is not published on the websites. The Library of Congress conforms to the following restrictions:

- **Content embargos**: The library has a one-year embargo period for all content in the archive. Content outside of the embargo period is updated and made available regularly.
- **Permissions:** Some archived content may not be accessible offsite if the owners have not granted the library explicit permission to display their archived content offsite. In these cases, the library may identify a site as part of a collection, but only display a catalogue record and a thumbnail image of the site to offsite researchers.

- **Processing requirements/workflow:** There may be additional captures of websites available through URL searches that have not yet been fully processed by library staff for access.

The system being used by the Library of Congress when archiving is called "archival-quality harvesting software", which crawls the web. This process includes HTML, images, PDF documents, audio files, and video files. The web crawler has its own technical limitations, which are "typically unable to capture streaming media, deep web or database content requiring user input". Advanced content that necessitates plug-ins is difficult to capture using the current web archiving tool. "Scoping" is used in this process to facilitate the direct order of the required information throughout their domains and to identify sources. Having said that, it is essential for those involved in web archiving to follow the proper procedures when dealing with content published on websites. It is important to obtain permission first before accessing the information.

2.10 HARVESTING WEBSITES INTO THE DIGITAL REPOSITORY

The web life cycle model notes that websites should be harvested for specific information and all web domains should be archived for easy access (crawler or scoping). Web harvesting is known as web scraping through a search engine (Davis 2010). Ngoepe (2017) notes that when transferring digital records from records into the archive repository, they should be harvested into a trusted digital repository. Therefore, it is required to endorse a policy that will allow government entities to develop a provisional infrastructure to be able to preserve digital records. This, however, means that electronic records to be valued require proper identification that will enable them to be identified in the digital repositories upon their formulation. According to Ngoepe (2017:5), "NARSSA is unconsciously following a post-custodial approach as far as the preservation of digital records is concerned." He further notes that NARSSA needs to emphasise governmental bodies to migrate e-records, together with hardware and software changes, to ensure they remain accessible at all times. This means that the flow of information is important when dealing with governmental entities in the process of digital records.

Digital repositories are used by organisations as a channelling tool for clients when searching for websites (Davis 2010). A web harvesting tool is considered to be specific when storing

information. Because the harvesting process provides a link to clients when they search for websites, municipalities can benefit from this form as well if they provide reliable information with a trace of who published that specific information to facilitate accountability. (Davis 2010). The information can be indexed through popular search engines (Google, Yahoo) for easy access to information when doing additional searches. Over the years, the harvesting process has been used to facilitate business processes through online businesses as it usually provides links to potential client factors in increasing online business revenue. According to Davis (2011), "'web harvesting' and 'web scraping' are similar, but 'web harvesting' is often used to mean crawling multiple sites and extracting a specialised set of data. It can be thought of as "directed web crawling".

Harvesting and preservation of websites are considered not a new thing, but as having originated in libraries in Europe. They often harvest websites using robots to crawl and copy content and metadata using resources encountered by that particular dominion. Through the life cycle model, websites are harvested and collected but it differs from organisation to organisation as to what content they require (Bragg 2013). Based on the archiving team, after institutions have done their capture of the websites they wanted, they re-visit what they have acquired intending to do quality assurance and completeness. Bragg (2013) notes that this process can be facilitated through reports that are generated by crawlers. He further states that the Wayback software is one of the systems that make it easy to revisit archived material by clicking on the links.

According to Srivastav and Nath (2016:52), a web content management strategy could look like this:

- Identifying content requirement
- Creating consistent structure content for reuse
- Managing content in a definitive source
- Ensuring content complies with corporate and government standards and guidelines
- Assembling content on demand to meet your customers' needs

For governments to be effective, they are required to take the content management strategy into play by first understanding the importance of the content and being able to link it with the policies.

Web archiving initiatives emanate from historical value and information that is being archived, from printed formats and born-digital records (Liu & Kong 2013). The lack of knowledge about the global issues of web archiving initiatives hinders the improvement and collaboration that might take place in dealing with a problem that emanates from web archiving. The Chinese have been very successful when it comes to web archiving. In 2003, they decided to link all government agencies with the China National Library to preserve their work. What they do is collect all born-digital content from government websites and archive them (Liu & Kong 2013). This process includes the news media and major events using the Chinese language (Liu & Kong 2013). These authors further state that the United States also joins in on these initiatives, and so does most of the rest of the world. It was noted that three universities started with archiving initiatives where they collaborated for strong resilience. The angle for archiving at George Washington University, Georgetown University, and Johns Hopkins University consisted of archiving of social media in China's anti-corruption campaign (Ye et al. 2018). The programme of the University of California in San Diego consisted of collecting information on selected websites of current news and bulletin board sites in China. Again, in other parts of the world, the collaboration of the University of Heidelberg and the University of Leiden was based on the Digital Archive for Chinese Studies (DACHS), which emanated from social and political discourse for Chinese studies (Xue, Yang & Long 2019). This process triggered the burning desire to archive NGO-related information in China now (Xue et al. 2019). This urgent need was due to policies that were adopted concerning access to information that restricted NGOs from accessing any information online. The online records are censored, which makes it difficult for NGOs to access this information on an online platform (Xue et al. 2019). This clearly indicates that collaboration is the way to go when dealing with web archives, as it makes it easy for organisations to overcome challenges involved in the web archive. Again, the link between libraries and the national archive plays quite a big role in the archiving of websites. In these collaborations, challenges were noted that entail funding to sustain the projects at hand and staffing to work overtime. With this being said, it further emphasises that collaboration between librarians, researchers, IT experts, archivists, and records managers is urgently needed to run a successful project of harvesting websites or the web.

2.11 ACCESS TO ARCHIVED WEB CONTENT

The web lifecycle model states that access pertains to making decisions about whether and how to provide access to their collections and monitoring how patrons use the content (Bragg 2013). In turn, preservation helps organisations to make decisions on which collections are worth archiving, as the process includes both data files and metadata (Bragg 2013). When dealing with critical information, the policy should guide which information is considered accessible to the public. Through web archiving processes, archivists have a choice regarding which material should be made available to the public. Furthermore, archiving of material puts organisations in control of their collection. When crawling the web, the type of information that is required is much needed to harvest relevant information (Bragg 2013).

The Government of Canada Web Archive has made it a point to archive websites because it allows them to easily access information (Cantello & Stegenga 2008). Grouping the information allows users to quickly access it and leaves it up to the users to become familiar with the websites for easy navigation. Documents were created as a guideline for the processes that were being developed during the process of archiving websites. Some of the documents created during the process included "Digital collection development policy" and "Selection and acquisition guidelines" which were used when archiving web content. It was also noted that the harvesting strategy was required to guide the process of harvesting digital content, and they realised that it would provide them with proper direction (Cantello & Stegenga 2008). This archiving process, known as "deep archiving" is typically performed on an annual basis. During that process, the websites are completely shut down and then reopened to the public once the entire process is completed. They also include blogs, Facebook, Wikipedia, and YouTube in their archiving process (Cantello & Stegenga 2008). However, this clearly indicates that having structured systems in place makes navigation easier. Accessibility is very important to society as a whole, and accountability and transparency are essential when dealing with the public.

Many people regard websites as valuable tools that are necessary for communicating with the rest of the world. As a result, all governmental stakeholders, including municipalities, must be accessible. According to Khademizadeh and Mohammadian (2019), when dealing with websites, it is critical to consider the type of links that are added to the homepages of institutions' websites for easy navigation.. They added that evaluation and review of web pages are critical for effective use and accessibility. Nagi et al. (2011) envision a new system

comprised of links to frequently visited webpages that are regularly searched by users. The links will make it easier for site visitors to get around and will increase their satisfaction. As a result, municipal websites can benefit from the experience of archiving websites.

2.12 SUMMARY

The chapter reviewed existing literature on relevant issues related to web archiving and web content harvesting. The study linked multiple case studies because it is thought to be more robust and detailed in dealing with the issues. The reviewed literature identified gaps in the literature and alluded to policies used by various types of organisations when archiving web content. The study also reviewed literature in accordance with the study's objectives, which included: analysing web archiving policies and legislative frameworks in municipalities in KZN; determining strategies for web archiving in municipalities in KZN; assessing the plans for long-term digital preservation of websites in municipalities in KZN; determining the storage of content published on the websites of municipalities in KZN; the risk involved in web archiving; accessibility of web archiving; determining the process of harvesting municipalities' websites into the e-records repository in KZN; and designing a framework for web archiving that will assist with proper management of websites in municipalities in KZN. This chapter also discussed the current state of cybercrime as it affects various types of organisations, as well as the role of the web life cycle model in the public sector. The following chapter discusses methodological perspectives as well as the research design used to carry out this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter reviewed literature on the study of website archiving. The review of literature was guided by the study's objectives, with a focus on the narrative policy and legislative framework for web archiving; long-term digital preservation strategies; the risk associated with web archiving; and website harvesting for long-term digital preservation. The purpose of this chapter is to present the research methodology used in this study. According to Ngulube (2015), it is necessary to elaborate on the research design and methodology. This means that during the planning and execution stages of a research project, the research methodology addresses decisions made by a researcher about the cases to investigate, the research methodologies to employ, and the appropriate data gathering and analysis tools to employ. The methodology and research design guide the researcher in constructing a relevant framework to be used in data collection and allow the researcher to draw conclusions between variables (Bless & Higson-Smith 2000). On the other hand, Creswell (2014:34) claims that the research approach or methodology stems from a specific plan chosen to conduct research, in which the researcher presents the intersection of the research philosophy, research designs, and specific methods employed by it. It was stated that "knowledge that is produced in any scientific field primarily depends on the methodology that is used" (Ngulube 2015:125). This chapter describes the study's research methodology.

The ontology, epistemology, approach, methods, and instruments used to conduct this study are all discussed in detail in Figure 3.1. Following that, the chapter focuses on the research methods used, the study population and justification, and the data collection instruments. Sarantakos (2013:28) defines social science research in terms of three fundamental components: ontology (nature of reality), epistemology (nature of knowledge), and methodology (approaches and methods).

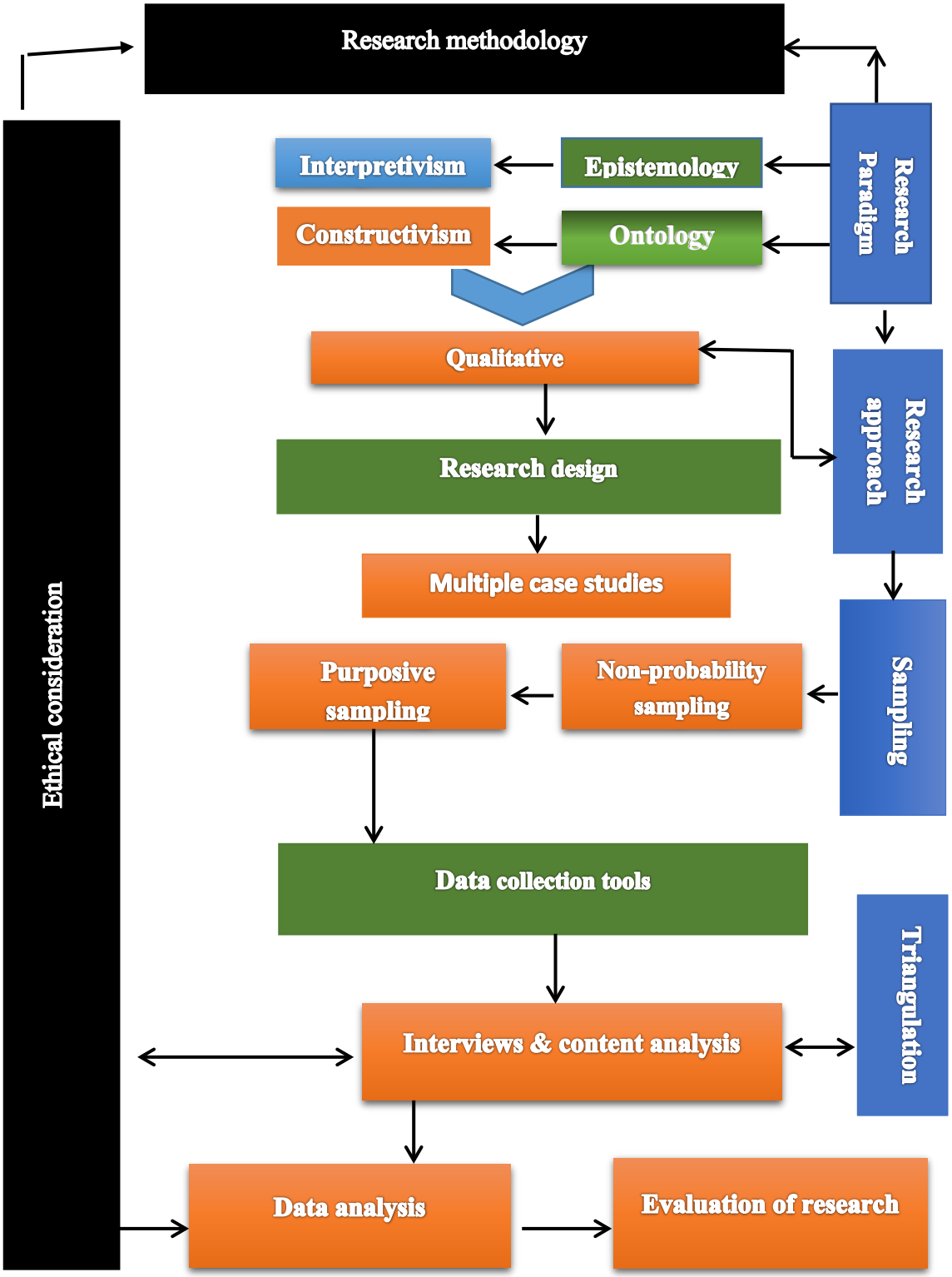

Figure 3.1 Research methodology road map for the current study (Researcher 2019)

3.2 RESEARCH PARADIGM

A paradigm is a set of assumptions or beliefs about fundamental aspects of reality that give rise to a specific worldview; it addresses fundamental assumptions taken on faith, such as beliefs about the nature of reality (ontology), the relationship between the knower and the known (epistemology), and assumptions about methodologies (Maree 2016). The term 'research paradigm' is understood to mean "patterns of beliefs and practices that regulate inquiry within a discipline, doing so by providing the lenses, frames, and processes through which investigation is accomplished" (McGregor 2018).

According to Punch (2014), "methods of inquiry are based on assumptions about the nature of the reality being studied, assumptions about what constitutes knowledge of this reality, and assumptions about what therefore are appropriate methods of building knowledge of this reality" However, this raises the question of why understanding the philosophical approach and having a clear understanding of it is so important. Understanding the philosophical assumptions gives the researcher power in terms of understanding the choices to be made during the research (Neuman 2011, Kivunja & Kuyini 2017 & Schwandt 2001). They added that research methodology is dependent on the formation of ontology and epistemological assumptions. Ontology is concerned with the nature of reality, whereas epistemology is concerned with how we know and perceive the world around us. Neuman (2011:92) defines ontology as a branch of philosophy concerned with what is and what the essential categories of reality are, whereas epistemology is a branch of philosophy concerned with the creation of knowledge. On the other hand, Ngulube (2019:27) states that "researchers should measure all the variables in their theory to avoid theory dropping". Ngulube (2019) adds that having too many theories may imply that the study's objectives and research questions are not aligned. According to Punch (2014), assumptions establish the primary essential impression of what is meant by the term paradigm. The interpretative paradigm was used to conduct this study, which sees research as a means of better understanding within the context of the web archive. Furthermore, in an interpretative research paradigm, the researchers generate or inductively develop a theory at the end of the study rather than beginning with a theory at the beginning (Creswell 2008).

This, on the other hand, goes into detail about the two basic positions in ontology, which are realism and nominalism or constructionism (Bryman 2012; Neuman 2011; Sarantakos 2013). Realists believe that the real world exists apart from humans and their interpretations of it

(Neuman 2011). The same author adds that realists believe that what you see is what you get. Constructivists, on the other hand, believe that humans never directly experience reality. According to Creswell (2014), constructivists believe that people construct their understanding and knowledge of the world by experiencing things and developing a subjective meaning of those experiences.

Constructing reality, according to Sarantakos (2013), entails making accounts of the world around us and gaining impersonations based on archiving web content and historically situated interpretations and personal experiences when dealing with websites. These ontologies guide methodologies for determining what the researcher or research is supposed to look into. Epistemologies inform methodologies about the type of understanding or knowledge required, and methodologies prepare methods for researchers to use that further instruct them on what to focus on in the inquiry and how to recognise and extract knowledge (Sarantakos 2013:29). In the research methodology literature, these assumptions constitute the core concept of what is meant by the term paradigm (Punch 2014).

An epistemology is a comprehensive belief system and the underlying philosophy and assumptions that guide research and practice in the field (Villiers 2005; Willis 2007; Phothongsunan (2010). The current researcher's epistemological orientation was largely influenced by the nature of the research problem, the theoretical lens adopted in the study, and the degree of uncertainty surrounding the phenomenon under study, as guided by Rowlands (2005). The study used interpretivism to come up with new interpretations and underlying meanings, paying attention to the ontological assumption of multiple realities, which are time and context-dependent (Villiers 2005; Leitch, Hill, & Harrison 2010; Scotland 2012; Levers 2013; Thanh & Thanh 2015).

Interpretivism epistemology is naturalistic, as it is done in a natural setting and not in a laboratory (Cohen, Manion & Morrison 2000). Interpretive researchers do not seek answers to their studies in rigid ways (Thanh & Thanh 2015). In the current study, the researcher was able to comprehend the sentiments of the wider populace, web users, and information management practitioners about web archiving in municipalities. For this study, interpretivism emerges as a suitable epistemological belief. In this regard, this study was founded on operational systems for qualitative methodology in discussing matters. According to Raddon (n.d.), data collection

in an interpretive study can be complex, difficult, and time-consuming, but it facilitates understanding of how and why situations are the way they are.

Table 3.1: Research paradigm, approach, and methods (Kinyanjui 2017)

Paradigm	Approach	Key features
Interpretivism	Qualitative	Contextual understanding Detailed descriptions Theory embryonic (purposive according to the theoretical fruitfulness depending on the case) Unstructured or open Produces rich deep data Natural settings Trustworthiness and authenticity Interpretative Empiricism Covers multiple issues
Positivism	Quantitative	Measurements or statistical Generalisation or explore Replication Theory testing Structured Produces hard reliable data Artificial settings Validity and reliability Ideally random sampling
Pragmatism	Mixed methods research	Numbers versus words Artificial versus natural

3.3 RESEARCH APPROACH

This section discusses the various types of research approaches. Creswell (2014:158) distinguishes three types of research approaches: qualitative, quantitative, and mixed methods research. Quantitative research is a systematic and objective process that uses numerical data from only a subset of a universe (or population) and generalises the findings to the universe being studied (Maree 2016). Quantitative research can be defined as a research method that emphasises quantification in data collection and analysis; it entails a deductive approach to the relationship between theory and research, with an emphasis on theory testing. Quantitative research, in particular, has incorporated the practices and norms of the natural scientific model and positivism, and it embodies a view of social reality as an external, objective reality (Bryman 2012).

3.3.1 Quantitative approach

A quantitative research design focuses on numbers that can be statistically analysed, as well as other numerical analysis (Flick 2011:11). Quantitative research is positivist, logical, systematic, and reductionist. Quantitative methods are deductive and are determined by prior theories (Creswell 2009; Kitchel1 & Ball 2014). It should be noted that quantitative research does not generate theories, but rather tests and validates them (Ngulube 2019:31). In a quantitative study, hypotheses for an empirical study must be used ahead of time to test theories. In most cases, the theoretical concept is tested or measured right away (Flick 2011). It was also stated that quantitative research is interested in causalities, such as demonstrating that stress before an exam is unquestionably caused by the exam (Flick 2011:10). According to Creswell (2009), when researchers use the quantitative tradition, they begin with a theory and then collect data to confirm or refute that theory. Again, according to Ngulube 2019, the variables or constructs are based on the theory itself. He goes on to say that because the quantitative approach is specific and to the point, it is less theory-dropping (Ngulube 2019).

Flick (2011:13) adds that the advantage of quantitative research is that it allows the study of a large population or many cases to be completed in such a short period and with a high degree of generalisation. He added that one disadvantage is that the aspect being studied is not relevant to the participants, and the context of the meanings is not sufficiently taken into account. In quantitative research, data collection procedures include surveys (questionnaires), structured interviews, structured observations, content analysis (which attempts to quantify content in terms of predetermined categories), and experiments. According to Neuman (2011), data analysis is accomplished through the use of statistics, tables, or charts. Qualitative research is more precise and detailed, and participants have more freedom to choose what is relevant to them (Flick 2011:14). Furthermore, it can be found in contexts (Flick 2011:14). Hence, researchers prefer qualitative research because it is more detailed and deals with a variety of cases.

3.3.2 Qualitative approach

As previously stated, Bryman (2012) defines qualitative research as a research approach that typically emphasises words rather than quantification in data collection and analysis, and that primarily emphasises an inductive approach to the relationship between theory and research; the emphasis is on theory generation. The qualitative approach is used to answer questions about experience, meaning, and perspective, usually from the participant's point of view. According to Maree (2016), all qualitative research is naturalistic in nature, focusing on the natural settings where the interaction takes place. In other words, rather than being viewed in static terms, social life is viewed in terms of processes that occur.

Qualitative researchers are primarily interested in how humans arrange themselves and their settings, as well as how the inhabitants of these settings make sense of their surroundings through the use of symbols, rituals, social structures, social roles, and so on. Fieldwork is typically used in qualitative research, where the researcher goes to the people's setting, or site, to observe behaviour in its natural setting. Rather than testing existing theories, it constructs abstractions, concepts, hypotheses, or theories (Mohajan 2018). The study employed qualitative research methods..

According to Flick (2011:12), qualitative researchers purposefully select participants and integrate a small number of cases based on their relevance. Because there are multiple case studies to explore, investigate, and collect data related to websites or web archiving, using a qualitative research approach is critical for the study. Furthermore, the study purposively used the qualitative approach in selecting those who deal with web content in municipalities in KZN. To explore more of people's perceptions and experiences through the use of municipal websites by synthesising data from studies conducted in a variety of settings. Furthermore, because the study involves hands-on personnel and website operation, this allows the researcher to be more detailed. The study employed a qualitative approach.

3.2.1.1 Justification for the use of a qualitative approach

According to Cibangu (2012), qualitative research methods include logic, ethnography, discourse analysis, case study, open-ended interview, participant observation, counselling, therapy, grounded theory, biography, comparative method, introspection, casuistry, focus group, literary criticism, meditation practice, historical research, and others. To qualify as a

qualitative study, the current study incorporates the case study research design, as it served the purpose of the study by allowing the study to comprehend.

The study employed qualitative research to evaluate the digital content of archival interest suitable for public consumption in municipalities, the harvesting systems used to harvest websites, and the risks associated with web archiving. According to Pajo (2018:28), qualitative research aims to gain insight and depth into whatever topic is being articulated. He adds that it allows the researcher to be creative, connect issues, and interpret the topic's details (Pajo 2018). A good qualitative study is one that examines a variety of issues in depth in order to devise solutions and provides a detailed, deeper understanding of people and events. With that said, it discusses the study at hand, which dealt with various cases in municipalities.

A qualitative design is also considered inductive reasoning because it starts with a specific observation and progresses to a broader understanding of a specific topic (Pajo 2018). According to Zohrabi (2013), the qualitative approach employs a variety of forms to comprehend social settings, including interviews, diaries, journals, classroom observations and immersions, and open-ended questionnaires to obtain, analyse, and interpret data content analysis of visual and textual materials, as well as oral history. The study used some of these forms when collecting data in municipalities, and it was well-suited for providing insight into municipal web archiving. Open-ended questions, observation, and interviews are common methods used by qualitative researchers. The qualitative study is considered exploratory because it seeks to explain 'how' and 'why' a specific social phenomenon or programme functions as it does in a specific context (Haradhan 2018:2). The study's qualitative research served its purpose, and it is recommended for studies involving multiple case studies. The open-ended questionnaires provide flexibility and allow the researcher to ask follow-up questions to gain a better understanding of the study. The qualitative research process is largely inductive; the inquirer generates meaning from the data gathered in the field.

According to Leedy and Ormrod (2013:159), qualitative data is very complex and may require the use of software such as Atlas.ti, Ethnography, SuperHyperRESEARCH, Kwalitan, MAXQDA, and NVivo for deep analysis, which includes storing, segmenting, and organising the data. Babbie and Mouton (2001:411), on the other hand, list the various types of data analysis software, such as Statview, Survey Mate, SURVTAB, SYSTAT, and TEGPACS, to name a few. Despite the existence of these data analysis systems, word processing software

such as Microsoft Word ® is commonly used to analyse qualitative data, which includes organising and interpreting the data (Leedy & Ormrod 2013:159-160). Leedy and Ormrod (2013:334-347) go on to explain how the Excel spreadsheet can be used to keep track of literature resources, record and recode data, reorganise data, perform simple statistical analysis, create data sets, compute descriptive statistics and inferential statistics.

Creswell (2014:160) backs up the preceding statement by pointing out that quantitative data can be entered into a spreadsheet or database for analysis. The researchers used Microsoft Office software in this study, including Microsoft Word®, Google Forms, and Microsoft Excel®. To collect data from participants and code some of the data, Google Forms were used. According to Junio (2018:1), "Google Forms are widely used to create surveys easily and quickly since they allow you to plan events, ask questions of your employees or clients, and collect diverse types of information simply and efficiently." Google Forms allow us to include different types of questions, such as short answers, paragraphs, multiple selections, verification boxes, pull-down, linear scale, and a grid of several options, among others. That being said, Google Forms are versatile, and the nature of the study allows for their use because they are digital and more interactive with participants. The Google Form enforces the anonymity rule as well, as viewing it requires a password, it is linked to the researcher's email, and the data will be protected and accessible in the future (preserved). Questions were automatically added to Google Forms and classified according to their objectives (automatically analysed according to their objectives). This was done to clearly capture the date being collected. Because percentages "provide an explicitly comparative framework for interpreting the distribution" of data, the data was eventually displayed in the form of percentages based on the total sample or number of responses (feedback/returned questionnaire) (Singleton & Straits (2010:511). Notable findings from the data analysis "In general, the intent is to make sense out of text and image data. It consists of segmenting and initiating the data (like peeling back the layer of an onion) as well as putting it back together" (Creswell 2014:194-195).

3.3.3 Mixed methods research

According to Sarantakos (2013), the foundations of social science include ontology, epistemology, methodology, design, and finally data collection instruments. In this context, mixed-methods research (MMR) is defined as a research design that employs more than one approach, with more than one approach being mixed or integrated (Creswell 1994:176; Fidel

2008:265; Johnson & Christensen 2008:280; Ngulube 2013:5-7). The term "mixed methods" is a simple shorthand for research that combines quantitative and qualitative methods within a single research project. However, these instances of combining research methods are linked to a single research strategy (Bryman 2012). The two approaches can be used sequentially (first a quantitative study, then a qualitative study, or vice versa), with the first assisting in the design of the second; they can also be used concurrently as different approaches to the same question (Hammarberg, Kirkman & De Lacey 2016). Accordingly, it entails gathering quantitative (closed-ended) data in response to research questions or hypotheses, as well as qualitative data in response to open-ended questions. The mixed-methods approach employs rigorous methods for data collection, data analysis, and data interpretation in response to research questions or hypotheses (Creswell & Creswell 2018). Mixed-methods research, according to Creswell and Plano-Clark (2007:5), is both a method and a "methodology for conducting research that involves collecting, analysing, and integrating quantitative and qualitative research into a single study or longitudinal programme of inquiry." According to Punch (2014), the MMR is a pragmatic inquiry method that includes data collection and analysis in collaboration with quantitative and qualitative data.

Thus, Ngulube (2010:254) attempts to provide a consolidated definition that is applicable to this study:

> MMR involves collecting, analysing, integrating and interpreting qualitative and quantitative data concurrently or sequentially in a single study or a series of studies investigating the same problem, irrespective of which research methodology is dominant, to exploit the benefits of combining them and to enhance the validity of the findings.

Therefore, it can be seen that the best-suited research methodology that can be used to carry out the investigation, other than researchers attempting to find an appropriate methodology, is dependent on the type of research study being conducted (Moahi 2002). Since the study consists of multiple cases and is more interpretive, MMR was not used in this study. As a result, the study employed a qualitative approach to comprehend the use of websites in municipalities in KZN, as well as the good services provided by municipalities through the use of websites.

3.4 RESEARCH DESIGN

The theoretical foundation or strategy for organising the conditions for data collection and analysis to combine relevance to the purpose with technique efficiency is known as research design (Cooper & Schindler 2008:140). Furthermore, study design functions as an inquiry structure, outline for data collection, data measurement, and analysis, all of which contribute to the smooth flow of research operations (Kothari 2004:31; Kumar 2011: 94). A case study, according to Yin (2003), is a study that allows the researcher to investigate individuals, organisations, communities, relationships, and programmes. The author also shows how it supports deconstruction and subsequent reconstruction of various phenomena. Having said that, research design enables researchers to conduct in-depth analyses of the functionality of the prospect organisations they have chosen. The structure of research is referred to as research design; it is the glue that holds all of the elements of a research project together. In a nutshell, it has bee a strategy for this research (Akhtar 2016). According to Ngulube (2015), research designs are methods of planning and carrying out research. The study used a qualitative research design and a multiple case study because it included more than one case in each of the 53 municipalities in KZN. More information about the case study's adoption is provided below.

3.4.1 Multiple case study

According to Creswell (2009) and Hancock, Ockleford and Windridge (2009), "qualitative inquiry" is a catch-all term for theoretical perspectives and designs such as narrative, phenomenology, grounded theory, action research, case studies, ethnography, historical research, and content analysis. Since this study focuses on case studies, the research design and deliberations are also entwined with it.

The qualitative design includes case study (situated knowledge), historical research (knowledge of history), grounded theory (knowledge of process and outcome), ethnography (knowledge of culture), content analysis (knowledge of content), phenomenology (knowledge of lived experience), action research (knowledge of process, outcome, and change), hermeneutics (knowledge of scriptures or texts), and discourse analysis (knowledge of discourse). Experimentation, surveys, and case studies are the most common qualitative designs (Ngulube 2015). The case study research design was chosen for this study because it appears to be appropriate for exploratory qualitative research.

A case study is an empirical investigation that investigates a contemporary phenomenon in depth and within its real-life context, particularly when the boundaries between a phenomenon and its context are unclear (Yin 2009). The case study method is not intended for case analysis, but it is a good way to define cases and explore a setting in order to understand them (Gustafsson 2017). The study employs a number of case studies involving various types of municipalities in KZN. According to Gustafsson (2017), when a researcher chooses to conduct a multiple case study, he or she can analyse the data within each situation as well as across different situations, as opposed to when a single case study is chosen. This provided insight into how municipalities manage and preserve their web content for posterity.

According to Ngulube (2019:96), case study research can refer to a single or multiple case studies. The use of multiple case studies lends "lot of validity and credibility" to case study research. The case study method is defined by Hagan (2006) as a "in-depth, qualitative study of one or a few illustrative cases" This indicates that more than one case was used. Moreover, various scholars observe that the use of case studies is becoming more common in information science (Ngulube 2019; Ngulube & Ukwoma 2019; Ullaha & Ameen 2018; Harrison et al. 2017; Herreid 2006). Ngulube (2019) adds that case studies are popular because of their robustness, which is why many researchers opt to use them. There are four types of case study research, according to Yin (2014:57): "single case (holistic) designs, single case (embedded) designs, multiple case (holistic) designs and multiple case (embedded) designs" A multiple case study was used in this study. Each case, according to Ngulube (2019), should be associated with a specific theory. Ngulube (2019:101) goes on to say that "ontology, epistemology, and methodology" are at the heart of single case study research ideologies. The multiple case study allows for more data to be collected and illustrated, making generalisation easier than when data is collected from a single case (Ngulube 2019). He further states that a multiple case study allows for the use of a "replication strategy" He adds that in the qualitative research approach, using either of the cases (single cases or multiple cases) is appropriate. Since the researcher was dealing with 53 municipalities in KZN, he used a multiple case study.

3.5 POPULATION AND SAMPLING

A sample, according to Hernon and Schwartz (2009:23), is a subset of the population being studied. Purposive sampling is used in the study to gather detailed information on those who work with websites or web content in municipalities. Purposive sampling was considered appropriate for this study because it allowed the researchers to select the appropriate

population: those who interact with municipal websites. The study's population was made up of municipalities in the KwaZulu-Natal Province. The province is divided into 53 municipalities and 10 districts. The municipalities were purposefully selected to look at those that have websites. Only records managers, information managers, web administrators, communication managers, and website managers or designers from municipalities with websites were targeted. The researchers chose these participants because they are relevant to the study and have a high level of understanding because they are hands-on and deal with websites in some way. According to South Africa's yearbook 2018/19, the country has 278 municipalities, including eight metropolitan municipalities, 44 district municipalities, and 226 local municipalities. Most organisations, including municipalities, now have websites, and websites serve as a means for organisations to stay in touch with their service clientele. Regular monitoring and evaluation processes are required for effective service clientele. Municipalities work with communities and provide efficient service delivery. Most municipal websites are used to highlight the services that the municipality provides, and various reports can be found on the website. All of the documentation on websites is about municipal functionality and how municipalities are attempting to bridge the transparency gap between the community and municipalities. The study concentrated on municipalities in South Africa's KwaZulu-Natal Province. The following section discusses the sampling procedures used in this study while keeping the target population in mind.

According to Bhattacherjee (2012:65), sampling is "the statistical process of selecting a subset (called a "sample") of a population of interest for making observations and statistical inferences about that population" According to Neuman (2007:2019), sampling is the process of selecting a small number of units from a large population in order for the researcher to study a smaller group and make an accurate generalisation about the larger group. To identify meanings, the qualitative research method is used to interpret and understand social life. Qualitative researchers capture real occurrences by recording what individuals say, observing specific behaviours, evaluating written records, and studying visual imagery, according to Neuman (2011:175). Neuman (2006) also notes that researchers normally do sampling to save time and money, and to give an accurate verdict. In the social and behavioural sciences, sampling can be divided into three categories: probability sampling, nonprobability sampling, and systematic sampling design (Barreiro & Albandoz 2001:4; Kothari 2004:59-60; Teddlie & Yu 2007:77; Kumar 2011:181-190). In probability sampling, each element in the population is expected to

have an equal and independent chance of being selected like all others (Kumar 2011:181). Simple random sampling, stratified random sampling, and cluster sampling are some examples.

Furthermore, Kumar (2011:187) confirms that non-probability sampling does not adhere to probability theory in the selection of the study sample because it employs elements of the population that are unknown or difficult to identify as individuals. Quota sampling, accidental sampling, judgemental sampling (purposive), expert sampling, and snowball sampling are all examples of non-probability sampling designs (Kumar 2011:188; Singleton & Straits 2010:155-157). Purposive sampling is associated with qualitative research (Gentles, Charles, Ploeg & McKibbon 2015:1775; Padilla-Daz 2015:104). They examined 54 municipalities in KZN, and those that deal with websites were purposefully selected (records managers, information managers, web administrators, communication managers, and website managers or designers). Purposive sampling, according to Kombo and Tromp (2006:82), allows the researcher to select participants based on their ability to deliver or provide rich cases for in-depth analysis related to the issue at hand. The study sampled 57 participants based on your purposive sampling, and other municipality participants were identified as respondent one (1) to respondent five (5). That was done to clarify some of the points raised during data collection. The interviews were conducted in IsiZulu and English to clarify some of the terminologies and concepts associated with web archiving.

Table 3.2: A representation of the participants

List of municipalities with websites in KZN	Participant job designation	No of participants that were reviewed	Research instrument
eThekwini Metropolitan	3 - Communication	***Responded 1*** ***Responded 2*** ***Responded 3***	Interviews
Amajuba District	1 – IT personnel		Interviews
Dannhauser Local	1 – IT manager		Interviews
eMadlangeni Local	1 – IT manager		Interviews
Newcastle Local	1 – IT & 1 communication		Interviews
Ugu District	1 – IT & communication		Interviews
Ray Nkonyeni Local	1 – IT & communication		Interviews
Umdoni Local	1 – IT personnel		Interviews
Umuziwabantu Local	1 – IT personnel	***Responded 11***	Interviews
Umzumbe Local	1 - Website and digital media officer		Interviews
Harry Gwala District			
Greater Kokstad Local	1 – IT & Communication	***Responded 12***	Interviews
Dr Nkosazana Dlamini Zuma Local	1 – IT Department	***Responded 4***	Interviews

iLembe District	1 - Communication department		Interviews
KwaDukuza Local	1 - Communication department	***Responded 5***	Interviews
Mandeni Local	1 - IT manager	***Responded 9***	Interviews
Maphumulo Local	1 - IT manager		Interviews
Ndwedwe Local	1 - IT manager		Interviews
King Cetshwayo District	1 - Communication department		Interviews
City of uMhlathuze Local	1 – communication department		Interviews
Mthonjaneni Local	1 - IT Manager		Interviews
Nkandla Local	1 – IT Manager		Interviews
uMfolozi Local	1 – IT Manager		Interviews
uMlalazi Local	1 - Communication manager	***Responded 6***	Interviews
uMgungundlovu District	1 – IT Manager		Interviews
Impendle Local	1 – IT Manager		Interviews
Mkhambathini Local	1 – IT Manager		Interviews
Mpofana Local	1 – IT Manager		Interviews
Msunduzi Local	1 - Communications manager		Interviews
Richmond Local	1 – IT manager		Interviews
uMshwathi Local	4 – Communication Staff	***Responded 10***	Interviews
uMkhanyakude District	1 – IT manager		Interviews
Big 5 Hlabisa Local	1 – IT Manager		Interviews
Jozini Local	1 – IT Manager, 1 communication manager	***Responded 7***	Interviews
Mtubatuba Local	1 – IT Department		Interviews
uMzinyathi District	1 – IT Manager		Interviews
Endumeni Local	1 communication manager, 1 IT Manager		Interviews
uMsinga Local	NO WEBSITE		Interviews
Umvoti Local	1 – IT Personnel		Interviews
uThukela District	1 – IT Manager		Interviews
Alfred Duma Local	1 – IT personnel		Interviews
Okhahlamba Local	1 – IT personnel		Interviews
Zululand District	1 – IT department		Interviews
eDumbe Local	1 – IT Manager	***Responded 8***	Interviews
Nongoma Local	1 – IT support		Interviews
Ulundi Local	1 – IT Department		Interviews
uPhongolo Local	1 – IT personnel		Interviews
Zululand District	1 – IT personnel		Interviews

3.6 DATA COLLECTION INSTRUMENTS

Data for this study were gathered through interviews, questionnaires, and document analysis. Data analysis is defined as the process of identifying patterns and themes in data after the researcher has reached a conclusion about the findings of the study in question (Bernard 2013:394; Mouton 2002:111). The researcher searches for data patterns and philosophies about

the reality and state of data collected during the data analysis process (Bernard 2013:394). At this point, it is the researcher's responsibility to ensure that the data being analysed makes sense to the reader. According to Singleton and Straits (2010:498), after being edited, summarised, captured, and error-checked to eliminate or correct irregularities and other weaknesses, data analysis assists the researcher in determining the relevant terminologies to be aligned with the data collected from participants (Johnson & Christensen 2008:37). Furthermore, the researcher must be able to convert the collected data into answers to the study questions (Creswell 2009:4; Terre Blanche, Durrheim & Painter 2006:52). The researcher made certain that the data was categorised according to its objective in order to facilitate the transition into meaningful information. The researcher also searched municipal websites to determine the types of websites and document assessments.

McGregor (2018) defines data collection tools as methods for gathering information for a study, a component of research that is heavily influenced by methodology. According to Ngulube (2015), we use the term "research methods" to refer to data collection techniques. Neuman (2014), on the other hand, defines tools as a set of specific techniques used in a study to select cases, measure and observe social life, collect and refine data, analyse data, and report the results. Methods are the tools used by researchers to collect data; these tools allow us to collect data about social reality from individuals, groups, artefacts, texts, or any other medium. It is important to remember that the research questions, ontological position, and/or conceptual framework, as well as the study's aim, all influenced the methods used (Maree 2016). Purposive sampling was used to identify municipalities in KZN that have functional websites.

Questionnaires, observations, individual interviews, document or artefact analysis, multiple data collection methods, and a strategy to strengthen data triangulation are all examples of qualitative data collection methods. Experiments, clinical trials, and computer simulations are examples of quantitative data collection methods, as are observing, counting, and recording well-defined events, obtaining data from information management systems, and administering surveys with closed-ended and open-ended questions (McGregor 2018). Since this was a multiple case study, the qualitative method was used; the study used observations and interviews to collect data from those who work with websites. The study employs questionnaires, document analysis, and interviews to comprehend the systems in place for web archiving and to provide insight into the methods used for web archiving.

3.6.1.1 Interviews

Interviews are the most commonly used qualitative research tool because they allow the researcher to ask follow-up questions while interacting with the participants. According to Babbie and Mouton (2010:292), interviews should be conducted in a comfortable setting. The interview is defined as a process in which the interviewer or researcher arranges direct contact with the interviewee or participants in the expectation that the interviewee will answer questions directed at them during the data collection process (Bless & Higson-Smith 1995:106). It is noted that having assistance during an interview is seen as the most appropriate thing to do for effective and proactive engagement, especially when dealing with a large population. Babbie (2007:264) observes that interviews appear to attract more participants than questionnaires, with the response rate ranging from 80% to 85% at most.

In KZN municipalities, interviews were conducted with heads of departments or sections (communication/corporate department, ICT department, and website and digital media officer). The purpose of this was to determine the types (static or dynamic) of websites being used and whether they serve the intended purpose of providing information to the community and the municipality for effective service delivery. Leedy and Ormrod (2013:194-195) identified the guideline when they stated that researchers must develop a proper plan for restructuring the interview guide into an effective and well-articulated tool. They also state that interview guides must be identified early and participants must be informed in advance to avoid contradictions and to ensure that participants are not coached when responding.

Furthermore, participants must be balanced in terms of population representation; reports must be well-managed; questions must be asked that can reveal qualitative data; each question must emanate from a single idea and must clarify some responses, where necessary; and categories must be initiated in accordance with objectives for easy interpretation (Leedy & Ormrod 2013:194-195). The semi-structured interview schedule, on the other hand, was used to ask open-ended questions to allow for more deliberation by the participants. This was done on purpose to prevent participants from avoiding answering some of the questions in terms of providing clear discussion. Brewerton and Millward (2001:70) also state that if the interview guide is not restricted, the relevant results will not be obtained; thus, more information from

the participants is required. Since the municipal heads of department (communication managers, records managers, and website managers or designers) have a busy schedule, interviews were conducted when they were available. According to various scholars, the advantage of using interview tools is that participants can seek clarification on the spot on any question posed to them, allowing them to answer questions clearly (Babbie 2007:265; Bless & Higson-Smith 1995:107; Bless & Higson-Smith 2000:108). Due to the immediate demand for answers, there is no time for participants to plan or justify incorrect answers, or to conceal correct or true answers during an interview. It also allows participants to elaborate on their responses, and it encourages researchers to be on top of their game during the interviewing process. Brewerton and Millward (2001:73-74) emphasise that "rich data" or ironic interactions are amalgamated during the interview. The true meaning is extracted. In addition, methods involving other techniques, such as observation and related practices, are introduced into the process (Brewerton & Millward 2001:73-74). Various scholars, including Creswell (2009:179), Bless and Higgson-Smith (2000:108), and Leedy and Ormrod (2013:190), note the following disadvantages when dealing with interviews in qualitative research:

- Biasness during the interview
- The participants may not equally express their insights
- Participants may give false information according to their views
- Anonymity or privacy might not be anticipated during the interview process
- Time-, energy and money consuming due to geographical area for an interview, which might be easily overcome by using telephonic interviews to cut the cost
- Participants may claim to be busy for an interview
- Interviews are considered to be very expensive since interviewers need to be trained

3.6.1.2 Content analysis

According to Ritchie and Lewis (2003:35), document analysis entails studying an organisation's documents to gain insight into that organisation. Bernard (2013:385) defines content analysis as "archival research in which archived records are articulated but collection data methods are not active." Creswell (2009:181), on the other hand, suggests that content analysis be used when evaluating information policies, reports, procedures, standards, regulatory frameworks, and other related documents.

He also believes that this method of data collection is not reactive. Document analysis techniques were used to evaluate the information contained in policies, procedures, standards, reports, and other pertinent documents (Creswell 2009:181). The document analysis procedure was used in the study to evaluate policies used to guide the web archiving process in municipalities in KZN. One disadvantage frequently encountered when it comes to document analysis is being denied access, sometimes due to the documents' confidentiality. The study also looked at the website documentation that was available on their websites. First, the website's type was evaluated to determine whether it was static or dynamic. Second, most municipalities have documentation on their websites, such as policy documents, reports, and day-to-day government initiatives. The researchers had the opportunity to deliberate on each of the policy documents that were available on the websites. However, those that did not have active websites were also given the opportunity to submit their policy documents. More verification was also done to see if they had any other documents besides the ones posted online. These documents enabled the researchers to comprehend the state of municipalities in KZN.

3.7 DATA QUALITY

The trustworthiness and authenticity of qualitative studies can be used to assess their value or quality. According to Bryman (2012:389), reliability and validity are most common in "establishing and assessing the quality of quantitative" research because measurements are used, and measurements are not a fixation on qualitative studies.

3.7.1 Trustworthiness

Bryman (2012:390) defines trustworthiness as having four sections, each of which is equivalent in quantitative research:

- Credibility – parallels internal validity and is about ensuring that the research is carried out correctly and the results are confirmed by the population to show that the investigator understood their social world. After collecting data from all the districts in KZN and analysing it, the researcher went back to some of the respondents and checked with them to see if the correct information was captured. The research went on to confirm with municipalities whether everything that was being said telephonically and through Google Forms was true.

- Transferability – parallels external validity and is about producing detailed accounts of the social world rather than focusing on coverage.
- Dependability – parallels reliability and is about keeping a record of all phases of the research to establish how well proper procedures are being followed, and the study took all precautions related to dependency.
- Confirmability – parallels objectivity, which is about ensuring that the researcher is objective enough and has not allowed personal feelings, values, or perceptions to sway the conduct of the research and the findings thereof. The responses were recorded as they are, and to check that the investigator listened to the tapes confirming that what was said is actually what was presented in this document. It was easy to extract from Google Form the exact words of participants.

To ensure trustworthiness, the researcher gathered information from credible sources dealing with municipal websites and those who are part of the support team to ensure that they work. During the interview, voice recording was used to capture every discussion so that the researcher could refer back to it at any time or point for clarification. The assistant was present during the interview to ensure that the researcher correctly captured and interpreted all of the information. During data collection, the researcher was able to connect and network with people, while also building relationships for future use. During data collection, the researcher was able to triangulate the entire process using content analysis, triangulating what was discovered through interviews. Another method of ensuring credibility in a qualitative study is triangulation, which involves using multiple sources of data (Shenton 2004:64). As a result, in this study, data collection instruments such as documentary review and interviews were triangulated to complement each other and possibly cover up their flaws.

3.7.2 Authenticity

According to Bryman (2012:393), authenticity in qualitative research includes the following issues:

- Fairness – the research should fairly represent different viewpoints of the population.
- Ontological authenticity – the research should help the population to understand their social world better.

- Educative authenticity – The study should teach participants to value the perspectives of others in their social world.
- Catalytic authenticity – the research should have an influence on members to the possibility of changing their circumstances.
- Tactical authenticity – the research should empower members to take action in their social world.

This process allowed the researcher to return to municipalities and validate the information provided by participants. That was added to the data gathered, and clarity was ensured throughout the process. Long-term digital preservation is inextricably linked to websites, and when dealing with digital content, it is critical to understand the types of records that are declared into the public domain and the perception that those who receive them may have.

3.7.3 Data analysis and presentation

Data analysis is defined as the process of identifying patterns and themes in data after each researcher has reached a specific conclusion about the study findings (Bernard 2013:394; Mouton 2002:111). According to Neuman (2011:507), data is gathered in qualitative research to deliberate in depth about people, their actions, and events in their lives. Text from questionnaires, document analysis, interview transcripts, and audio recordings obtained during interviews were used to collect data for this study. Data analysis entails organising and integrating data in a systematic manner while looking for patterns or themes between specific details (Neuman 2011). Data were analysed thematically (Braun & Clarke 2012:2). The thematic analysis comprises classifying, analysing, and reporting the patterns (themes) emerging from data (Braun & Clarke 2006:79; Alhojailan 2013:40). It is usually the most widely used method of data analysis in qualitative research (Jugder 2016:2).
According to Braun and Clarke (2006:16-23), the process of thematic data analysis largely goes through the following phases:

- Familiarisation with data collected
- Generating initial codes
- Searching for themes
- Reviewing themes
- Defining and naming themes

- Producing a report

Those who were unable to attend a face-to-face interview were interviewed over the phone (communication managers, heads, and website managers or designers). Due to the pandemic, Google Forms was also used to collect data from support staff (records managers, information managers, web administrators). Google Forms were organised into categories based on the objectives, and sub-questions were created. Data from document analysis, interviews, and questionnaires were combined to create a more complete picture that could be used to answer research questions. The interviews were organised into themes derived from the research objectives.

3.8 ETHICAL CONSIDERATIONS

According to Partington (2003:22), "ethics is a philosophical term derived from the Greek word ethos, meaning character or custom, and connotes a social code that conveys moral integrity and consistent values." Bwalya (2011:233) says it is essential to conduct proper and precise research in empirical research. Bryman (2012:135), on the other hand, identifies four main areas of ethical principles that must be considered when conducting research:

- whether there is harm to participants
- whether there is a lack of informed consent
- whether there is an invasion of privacy
- whether deception is involved

The researcher observed the following in accordance with the UNISA Policy on Research Ethics (UNISA 2016):

- Obtained ethics clearance from UNISA's Department of Information Science in the School of Arts, College of Human Sciences (see APPENDIX 5).
- Received clearance to conduct the study from all 54 municipalities in KZN, and the various municipalities were consulted to obtain permits (see APPENDIX 5). To some municipalities, the verbal agreements were obtained due to the global pandemic.
- Used the UNISA's Policy on Research Ethics to guide the interaction between the researcher and research participants.

The general ethics principles were taken into account when data were collected and this study was conducted (UNISA 2016):

- Existing literature related to the study was consulted to ensure that the study adds to the existing knowledge and creates more of an African perspective of web archiving.
- The study was conducted transparently, fairly, and honestly by way of acknowledging the information sources consulted.
- The research was undertaken as its results could have potential benefits for all municipalities in South Africa, more especially KZN municipalities. Other than that, the study findings will be reported through publication in a journal(s) once the study is completed.
- Respect for and protection of the rights of study participants such as their right to preserve their dignity, privacy, and confidentiality, including their institutions.
- Participation of study respondents was based on informed and non-coerced consent.

The participants were informed that their participation was entirely voluntary and that they could withdraw at any time if they felt uncomfortable during the interview. Participants were also assured that they would remain anonymous and that their confidentiality would be maintained at all times. To protect the participants even more, none of them were quoted, and none of their responses were singled out. The websites were used to determine which municipalities' websites are active and should be reviewed. The content analysis comprised municipal websites in order to identify the type of websites they present and the information that is published on their websites. As a result, ethical clearance was granted from the Department of Information Science Ethics Review Committee for this study (see APPENDIX 5). Turnitin was also used to calculate the similarity index.

3.9 EVALUATION OF RESEARCH METHODOLOGY

The research methodology applied to a study cannot be perfect, as indicated by Leedy and Ormrod (2010: 285) and Ngulube (2005: 48). Hence, Ngoepe (2012:115) notes that it is necessary to evaluate the procedures that led to data collection and analysis as all research methods have imperfections that may cast a hint of doubt on the study findings. The research permit for this study was granted without any issues encountered and the data collection started immediately. All electronic messages are considered to be equivalent to writing under the

Electronic Communications and Transactions Act (ECTA) 25 of 2002. The researcher collected data primarily through semi-structured qualitative interviews, telephonic interviews, Zoom interviews, and Microsoft Teams interviews.

During data collection, the study encountered some difficulties. For example, because of the COVID-19 lockdown, most of the identified participants were unavailable, making it difficult to contact some of them as they took turns reporting to work. The data collection was supposed to begin in 2020, immediately following the President of South Africa, Cyril Ramaphosa's (2020 current) announcement of a lockdown due to the COVID-19 pandemic. As a result of strict lockdown regulations and people becoming accustomed to working on online platforms such as Zoom, Blue Jeans, Microsoft Teams, and others, the researcher was only able to collect data from late 2020 to 2021. As a precaution, the researcher must take all necessary measures to safeguard both the participants and oneself from the pandemic. To prepare the participants, the researcher had to send the interview schedule via email. As a result, some interviews were conducted over the phone to adhere to social distancing rules, while others were conducted through Microsoft Teams. Corporate departments are also known as communication departments in some municipalities, and if they have a corporate department, they do not have a communication department. It was also pointed out that records managers and archivists were not involved in website management.

During the interviews, it became clear that the majority of the participants were unfamiliar with web archiving. As a result, only twelve (12) of the 56 purposively selected participants from the municipalities provided the required information in relation to the current study. This, however, did not mean that the other participants did not add value. Although others were interviewed, they had no idea how their municipalities' websites functioned. Even when they referred the researcher to other colleagues, they were unable to obtain relevant information. As a result, only information provided by the 12 participants was found to be useful during data analysis. As a result, the researcher provided only verbatim quotes from these 12 participants. Document analysis, including content analysis of websites from municipalities that did not provide interview data, was used to triangulate the interview data. The question of whether the correct participants were identified arose as a result of this. The researcher dug deeper and even asked the participants to refer to the appropriate people. As it was clear that the responsibilities of web archiving in municipalities were unclear, the researcher had to continue with the participants who met the identified criteria. This was due to the fact that records management

functions in most municipalities fell under the corporate services or IT section as a sub-section handled by lower-level employees. Websites or web content were observed and identified as not being an important thing that is done in the municipalities of KZN. This shows the importance of educating the participants and introducing the concept of web archiving because they deal with municipalities' websites. It was also discovered that the majority of municipalities in KwaZulu-Natal do not consider websites to be records.

3.10 SUMMARY

The chapter discussed the research methodologies used in this study to examine the archiving of municipal websites in KZN. The research paradigm, research approach, and research design adopted in this study were discussed in detail. The study's population was defined, and interviews were discussed as the most useful data collection tool for municipalities in KZN. The methods used to ensure the reliability, validity, and trustworthiness of data instruments were also discussed in this chapter. The chapter further discussed the data analysis used in this study, as well as ethical considerations and the evaluation of research methodologies. The next chapter interprets the data collected for the study.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 INTRODUCTION

The research methodology used in this study was described in the previous chapter. This chapter presents the study's findings as informed by research objectives in an effort to address the study's research problem with the goal of developing a framework for website archiving. Data presentation and analysis are considered critical because they help the researcher reduce data to a comprehensible and interpretable form so that they can become acquainted with the research at hand. According to Creswell (2012:10), data analysis and presentation of findings are important because they help the researcher make sense of the information provided by the research participants in the study. Interviews and content analysis were used to collect data for this study. In order to comply with the ethical clearance, which requires participant anonymity, the researchers considered ethical considerations for the study. This study's findings are presented thematically in the form of narratives, figures, and tables, which Yin (2009:233) considers to be the appropriate way of presenting qualitative data in tables, hierarchies, matrices, and other diagrams. He adds that thematic analysis can be used in both deductive and exploratory interviews. The main purpose of this study was to develop a framework for the archiving of websites of municipalities in the KwaZulu-Natal Province. So, this chapter explains the study results in a way that makes sense, based on the data that the researchers got from the field (Blum 2006:2).

The researcher devised an interview schedule that included questions that were organised in accordance with the study's objectives. Since the questions were never asked in the same order and, in most cases, not all of them were asked, they were primarily used as a guideline for the interview. So that there were no interruptions, the flow of discussions determined which questions were asked and which were left out. Since content analysis was one of the major instruments, some of the questions were asked to confirm information found on websites. Due to the COVID-19 pandemic, interviews were scheduled in a variety of formats, including Microsoft Teams, Zoom meetings, and telephonic interviews, in order to protect participants and researchers from contracting the virus. With the participants' consent, the semi-structured interviews were tape-recorded. To comply with UNISA ethical consideration rules, participants

were not asked to reveal their identities during the interview schedule (see Appendix 5). Some participants were asked to identify themselves by using the name of their organisation. Due to the current state of the lockdown, some organisations reached a verbal agreement, and the UNISA ethical clearance included COVID-19 regulations as one of the things that must be followed when collecting data. To accommodate the participants, the interview was conducted in both IsiZulu and English.

4.2 PARTICIPANTS' PROFILE

Since this is a qualitative study, issues such as response rate and representativeness are not addressed. In contrast to quantitative studies, qualitative data provides a more detailed analysis. Maluleka (2017:95) and Mosweu (2018:107) did not report on the response rate in their studies because their studies were qualitative and the findings could not be generalised, as in the current study. Maluleka (2017:95) added that qualitative studies are known for producing rich data rather than the statistical data that quantitative studies produce. Table 4.1 presents participants' work designations and their place of work. The researcher gathered information from ten district municipalities in KZN as well as 44 local municipalities. There were 61 municipalities before they merged, but now there are 54. This followed the resolution from the MEC's Local Government meeting on 13 May 2016 (MinMEC and Portfolio Committees), where MECs were responsible for local government in KZN. They made the decision to amalgamate all of the municipalities that had failed to produce. It was also discovered that only three of the 54 municipalities did not have websites. As a result, the study focused on all municipalities with websites. The COVID-19 regulations were observed, which resulted in the usability of technological resources (Zoom, Microsoft Teams, and telephone). Furthermore, the researcher visited some of the municipalities to confirm some of the findings from the interviews, and website evaluation was also performed to attest to what the participants were saying in order to validate some of the research issues at hand. To gain a better understanding of the study's problems, a systematic review was conducted to identify the various types of municipal websites. It was determined that the majority of municipal websites are considered dynamic because they now have a chat function, also known as the message box in some municipalities. This function allows users or communities to interact directly with the municipality, or they can leave contact information so that they can get back to them. It was also discovered that the websites for municipalities are linked to various social media platforms through links or icons. Although 56 participants were interviewed, only data from 12 of them were coded and

analysed, as explained in Section 3.9 and shown in Table 4.1. Only the 12 participants' information was found to be useful. As a result, the researcher provided only verbatim quotes from these 12 participants. Document analysis, including content analysis of websites from municipalities that did not provide interview data, was used to triangulate the interview data.

Table 4.1: A representation of the participants and municipalities

List of municipalities with websites in KZN	Participant job designation	Codes	Research instrument
eThekwini Metropolitan	3 - Communication	**Participant 1 Participant 2 Participant 3**	Interviews
Amajuba District	1 –personnel		Interviews
Dannhauser Local	1 –manager		Interviews
eMadlangeni Local	1 –manager		Interviews
Newcastle Local	2 –		Interviews
Harry Gwala District			
Dr Nkosazana Dlamini-Zuma Local	1 – IT Department	**Participant 4**	Interviews
Greater Kokstad Local	1 – IT & Communication	**Responde 12**	Interviews
uMzimkhulu Local			
Ugu District			Interviews
Ray Nkonyeni Local			Interviews
Umdoni Local			Interviews
Umuziwabantu Local	1 – IT personnel	**Participant 11**	Interviews
Umzumbe Local			Interviews
iLembe District			Interviews
KwaDukuza Local	1 - Communication department	**Participant 5**	Interviews
Mandeni Local	1 - IT manager	**Participant 9**	Interviews
Maphumulo Local			Interviews
Ndwedwe Local			Interviews
King Cetshwayo District			Interviews
City of uMhlathuze Local			Interviews
Mthonjaneni Local			Interviews
Nkandla Local			Interviews
uMfolozi Local			Interviews
uMlalazi Local	1 - Communication manager	**Participant 6**	Interviews

uMgungundlovu District			Interviews
Impendle Local			Interviews
uMngeni Local			
Mkhambathini Local			Interviews
Mpofana Local			Interviews
Msunduzi Local			Interviews
Richmond Local			Interviews
uMshwathi Local	4 – Communication Staff	**Participant 10**	Interviews
uMkhanyakude District	No respondents		-
Big 5 Hlabisa Local			Interviews
Jozini Local	1 – IT Manager, 1 communication manager	**Participant 7**	Interviews
Mtubatuba Local			Interviews
uMzinyathi District			Interviews
Nquthu Local	NO website		-
Endumeni Local			Interviews
uMsinga Local	NO website		Interviews
Umvoti Local			Interviews
uThukela District			Interviews
Inkosi Langalibalele Local	No website		-
Alfred Duma Local			Interviews
Okhahlamba Local			Interviews
Zululand District			Interviews
AbaQulusi Local	No respondents		-
eDumbe Local	1 – IT Manager	**Participant 8**	Interviews
Nongoma Local			Interviews
Ulundi Local			Interviews
uPhongolo Local			Interviews

Interviews were conducted with the municipality officials who were responsible for the municipalities' websites. These included the following employees from the communication department (which is also known to some municipalities as the corporate department) and the information technology department (IT): website and digital media officers, IT technicians or managers, and communication personnel (Table 4.1). The municipalities employ records managers, but they perform completely separate functions. They were not among those who managed websites. Only members of the IT/ICT department and the communication department were involved; these are referred to as the corporate department by some municipalities.

The researcher categorised interviews based on district, municipalities with active websites, and anonymity; those who highlighted important points were assigned codes ranging from 1 to 12 (see Table 4.1) in column three. According to Table 4.1, only three of the municipalities did not have a website, and two did not respond. The researcher made certain to follow up on these municipalities to avoid making unsubstantiated assumptions that could lead to technical issues. When the investigator began the review process, some of the municipalities' websites had not yet been created, while others displayed "due to technical error". To avoid repeat encounters with municipalities that exhibit the same behaviour, the researcher conducted a follow-up check-in on the status of these municipalities. The municipalities without websites stated that the website is still under construction, while the other two municipalities cited a lack of funds and skills to develop and maintain a website as the reason for their lack of a website.

4.3 DATA PRESENTATION

To begin, a semi-structured interview was used to collect data from municipalities in the KwaZulu-Natal Province. The researcher devised an interview schedule that included questions arranged in accordance with the study's objectives. The interviews were taped with the participants' permission. As previously stated, interviews were conducted in IsiZulu and English to accommodate the participants' level of comprehension and to provide more clarity in the language they understand. Zulu-speaking people predominate in KwaZulu-Natal, and they prefer to be addressed in their native tongue. The data from content analysis and interviews were integrated to obtain a more holistic picture to provide answers to research questions. Interviews were grouped into themes that emanated from the research objectives.

The results are presented according to themes emanating from research objectives as follows:

- The policy and legislative framework for web archiving;
- The scoping and data capture phases involvement in activities and decisions of municipality websites;
- Strategies for long-term digital preservation for websites;
- Risk related to web archiving;
- Appraisal and selection for archiving municipal websites for legal and professional use;
- Archiving of municipal websites for legal and professional use;
- Storage of content published on the websites of municipalities;

- Harvesting of websites into a digital repository;
- Access of web content in municipalities; and
- A framework for web archiving.

4.3.1 Policy, legislative framework and standards for web archiving

Policies and legislative frameworks are critical to records management, regardless of the type of record created (Bragg & Kristine 2013). The analysis was conducted in response to Ngoepe and Saurombe (2016)'s interpretation of a definition of a record, which stated that pieces of legislation in the Eastern and Southern Africa Regional Branch of the International Council on Archives (ESARBICA) include websites in a broader definition of a record. According to ISO 15489-16, best practice in most organisations entails ensuring adequate compliance with the regulatory environment in their activity records. This section presents data on the legislative and policy framework, as well as web archiving standards. Data for these objectives were primarily gathered through an examination of legislation, policies, and standards. It was also supplemented with interviews. It was also noted that for the majority of municipalities in KwaZulu-Natal, the issue of policy in relation to web archiving was foreign or unknown to them.

4.3.1.1 Legislative framework

Participants were first asked about pieces of legislation that affect web archiving. The Municipal Demarcation Act was one of the pieces of legislation identified by the participants and examined by the researcher:

- Municipal Demarcation Act, 1998
- Local Government Municipal Systems Act, 2000
- Promotion of Access to Information Act (Act No 2 of 2002)
- National Archives and Records Service of South Africa Act (Act No. 43 of 1996)
- KZN Archives and Records Service Act (Act No. 8 of 2011)
- Electronic Communications and Transactions Act (Act No. 25 of 2002)

a) Municipal Demarcation Act, 1998

The researcher examined this Act after it was identified by some participants. The Municipal Demarcation Board is required by the Municipal Demarcation Act of 1998 to notify the public of its intention to accept municipal boundary determinations through public meetings. Such notices must be published in local newspapers, broadcast on the radio, or distributed through other acceptable means of communication in the affected area. This information is made more widely available and accessible by posting it on the internet. This was the only entry that was relevant to the website's information.

b) The Local Government Municipal Systems Act, 2000

The participant also mentioned the Local Government Municipal Systems Act of 2000 as being relevant to web archiving. This Act allows for community involvement in local government as well as access to local government information. For example, "section (a) state that the system of financial management and internal control established for the municipality is diligently carried out; (b) that the municipality's financial and other resources are used effectively, efficiently, economically, and transparently; and (c) that any unauthorised, irregular, fruitless, and wasteful expenditure, as well as any other losses, are prevented." As a result, municipalities must establish and inform local communities about the participation and information mechanisms that are available to them. The Website is one of the platforms that municipalities can use to communicate with the general public. Furthermore, Section 21B of the Act requires all municipalities to address the issue of transparency by posting all information on their websites for accountability. Section 21B also stated that information should be updated on a regular basis. The Integrated Development Plan (IDP) and annual report, among other public records, must also be available on the municipality's official website.

The act details that the municipalities need to:

- give public notice of each ordinary and special meeting of the municipal council;
- publish municipal by-laws in the municipal code; and
- publish service fees and resolutions on tariff and tariff policies for at least 30 days.

c) Promotion of Access to Information Act (Act No 2 of 2000)

The Promotion of Access to Information Act was another act mentioned by participants, particularly records management officials. Section 14 of the act, according to the municipality, requires all public bodies to compile a manual that specifies which records are automatically available to the public. The following is the manual directive:

- Describes the structure and functions of the public body;
- Provides an index of the records held by public body;
- Details the process to be followed when requesting information;
- Provides the details of contact persons; and
- Details relevant costs, if any.

The manual should be published in three official languages within six months of the entity's establishment. To make this information easily accessible to the public, it should be updated annually and published on the web. According to Nkwe (2020), while provincial departments in KZN fared better, as all departments had published their PAIA manuals on their websites, municipalities did not fare as well. As a result, using the degree of comparison, Ngoepe (2012) and Nkwe and Ngoepe (2021) concluded that compliance is better in national departments, worse in provincial departments, and worse in municipalities. To put it another way, while the national government struggles for resources, the provinces struggle even more, and municipalities, which are at the front lines of service delivery, struggle the most because the local government in South Africa is in a deep crisis, and municipal record-keeping is equally bad, according to Dominy (2017).

d) National Archives and Records Service of South Africa Act (Act No. 43 of 1996)

The NARSSA Act was identified as the primary Act for web archiving in South Africa by participants from records management. According to Ngoepe and Saurombe (2016), this legislation includes provisions for the management of electronic records. Based on an examination of the legislation, it was discovered that it contains two provisions for the management of electronic records. For example, in terms of Section 13(2)(b)(ii) and Section 13(2)(b)(iii), the National Archivist shall determine the conditions subject to which electronic records systems shall be managed and records may be reproduced electronically. According to Ngoepe (2017), while the first provision relates to the management of born-digital records

through systems such as electronic content management, the second provision relates to the conversion of paper-based records to digital through imaging to create surrogates. However, the Act is silent on the preservation of electronic records. Based on the interpretation by Ngoepe and Saurombe (2016), with the definition of a 'record' including those that are created electronically by means of computer technology, archiving of websites can be covered under preservation of records.

e) KwaZulu-Natal Archives and Records Service Act (Act No. 8 of 2011)

The other Act identified by participants was provincial archival legislation. The Act emanates from Schedule Five of the Constitution of the Republic of South Africa, which states that archives other than national archives are a provincial competence. According to Ngoepe (2016), each province has to enact their legislation based on this provision. As a result, the government of KZN promulgated the KwaZulu-Natal Provincial Archives and Records Service in 2011. As Ngoepe (2016; 2019) rightly observed, provincial archival legislation is a replica of national archival legislation. For example, in terms of the KZN Archives and Records Service Act, the Act defines a record as "recorded information regardless of form or medium, and includes electronic and digital information." The only difference with national legislation is that it includes electronic and digital information." Like the national legislation and other provincial legislation, this Act gives power to the Provincial Archivist to determine (a) the conditions subject to which records may be microfilmed or electronically reproduced; as well as the conditions subject to which records systems must be managed." As the Act was enacted in 2011 unlike the national legislation that was promulgated in 1996, an opportunity was missed to modernise this piece of legislation. Irrespective of form or medium, a record must reflect the final business decision concerning the transaction. It is therefore critical for organisations to ensure that proper control and processes exist about records maturity levels. For example, electronic records management systems must be able to declare a document as a record.

f) The Electronic Communications and Transactions Act (Act No. 25 of 2002)

The Electronic Communications and Transactions Act was identified by participants, particularly IT officials, as being more relevant to digital records. The majority of municipal websites, it was stated during the interview, are managed by communication departments in collaboration with IT departments. It was also revealed that the municipality's communication department is in charge of conflict resolution and collision reporting. It was discovered that

there is no monitoring of websites or information on digital platforms. The Act's aim is to legalise electronic communications and transactions while also increasing trust in electronic records. Communication regards some of the legislation as the core function of various legislation that lends credibility to the existence and operation of municipal communication.

To give effect to electronic commerce, the Electronic and Communication Transaction Act (ECTA) was enacted in 2002. A record must be created regardless of how a commercial transaction was carried out. Section 1 of the Act defines a data message, which is equivalent to a "record," as data generated, sent, received, or stored electronically. Voice, when used in an automated transaction, and a stored record are examples of such data. As a result, ECTA was designed to meet the evidentiary requirements of a digital commercial environment.

Based on the preceding context, documentary evidence refers to evidence presented in the form of a document, regardless of form or medium, as defined by Section 1 of the Act. Such evidence can be either primary or secondary. While primary evidence is the most reliable, secondary evidence can be used in its place if primary evidence is unavailable. The ease with which documents can be created, duplicated, and amended on computers creates significant challenges in determining the originality and authenticity of the document, making auditing difficult.

4.3.1.2 Policy for web archiving

Participants were also asked if there were any requirements or guidelines in place to assist municipalities in developing online archiving and harvesting systems (Bragg & Kristine 2013). The NARS Act also states in the policy that the NARSSA has the authority to consider and evaluate the work done by the municipality in terms of record functionality. According to National Archives documentation, their organisational mandate is to provide services to the public sector. In addition, several additional legislative instruments were identified to aid in the management of digital information (Katuu & Ngoepe 2015). The Electronic Communications and Transactions (ECT) Act, enacted in 2002, facilitates electronic communications and transactions by promoting legal certainty in situations involving public administration and private business activities (South Africa, 2002a:16-18). The Regulation of Interception of Communications Act (RICA) became law in 2002 and governs the interception

of certain telephone and internet communications (South Africa 2002b). These ACT are viewed as an addition to digital content management (Katuu & Ngoepe 2015).

In discussions with participants, it was revealed that from section 16.10 web content policy to 16.11.1, it was revealed that:

- The municipal systems are managed by the IT/ICT department and the communication department, and their duty is to manage all content posted on websites through the programmed software. On the other hand, the Information Security Policy governs how the IT/ICT manager and related stakeholders function. The following parts existed and were in operation:
- Electronic records management policy;
- E-mail policy;
- Document imaging; and
- Web content management policy.

The contents of municipal website documents were analysed, and it was discovered that the policies are used by municipalities to work in the ICT and communication departments, which are in charge of the municipalities' websites. The researcher then inquired about the relationship between these three departments (communication, records, and IT), and it was discovered that no such working relationship existed in any of the municipalities in KZN. According to interviews, there is no specific policy that governs web archiving in municipalities. It was also discovered that municipalities rely on IT and communication to manage websites and that they use their policies in the day-to-day operation of the municipality. Another issue was that the majority of municipalities relied on a service provider to handle everything in their municipalities.

The discipline of GEIT is supported by several reference frameworks to guide its implementation. The most prominent are COBIT, ISO/IEC 38500 on ICT Governance, the IT Infrastructure Library (ITIL), and lS027001 (previously lSOl779) on information security.

As reflected in Figure 4.1 from Dr NDZ Municipality, it was discovered that the policies such as the ICT Governance Policy and Charter, ICT change management policy are used for information and communication technologies.

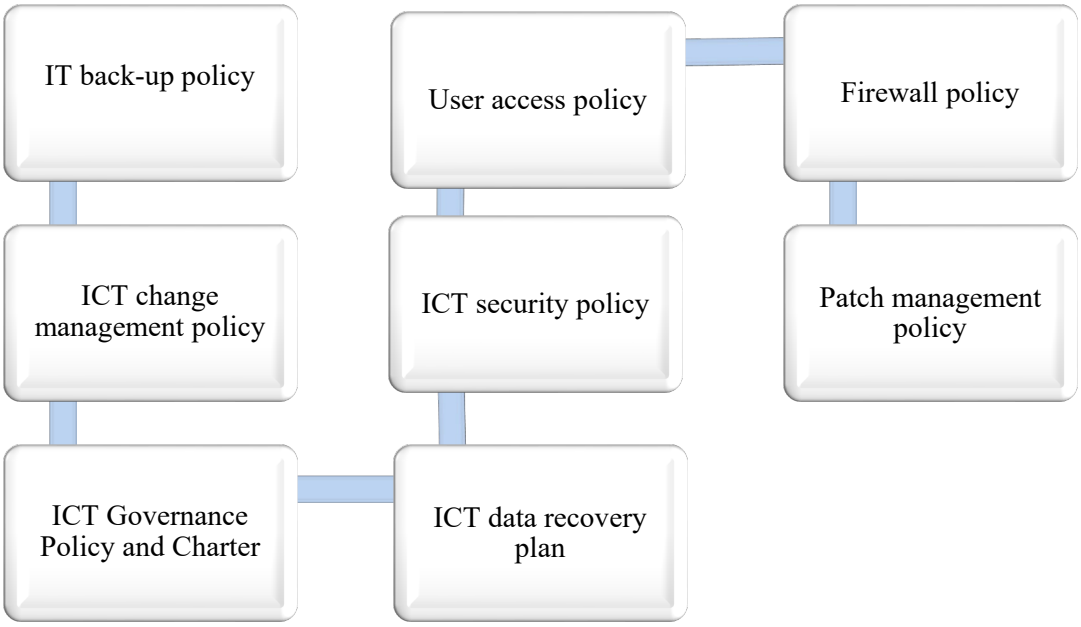

Figure 4.1: ICT/IT municipality policies (Dr NDZ Municipality 2017)

It was also discovered that some municipal policies are not only applicable to ICT/IT functionality, but also to all other functions, including those of the municipal manager, rather than ICT or IT roles, including website functionality. The purpose of the communication policy has been revealed to be to provide an integrated and coordinated communication platform within the municipal area directed by the communications strategy for the disclosure of internal and external information and communication. Figure 4.1 shows a reference to ICT Policy on the website of one of the municipalities (Dr NDZ Municipality). When asked about web archiving policies, the following responses emanated: information and communication technology usage, as well as security policy. The municipality created this policy to comply with South Africa's Minimum Information Systems Security Standards and to protect the municipality's ICT assets and data. This policy also serves as a guideline to be followed when utilising the ICT infrastructure in order to reduce the risk of errors, fraud, and data loss. The confidentiality, integrity, and availability of an organisation's information is a critical aspect of information security. The participants were also asked why the term "ICT POLICY" was used. The interview revealed that the people in charge of the websites are mostly those in the IT department, which led to the use of their IT policy.

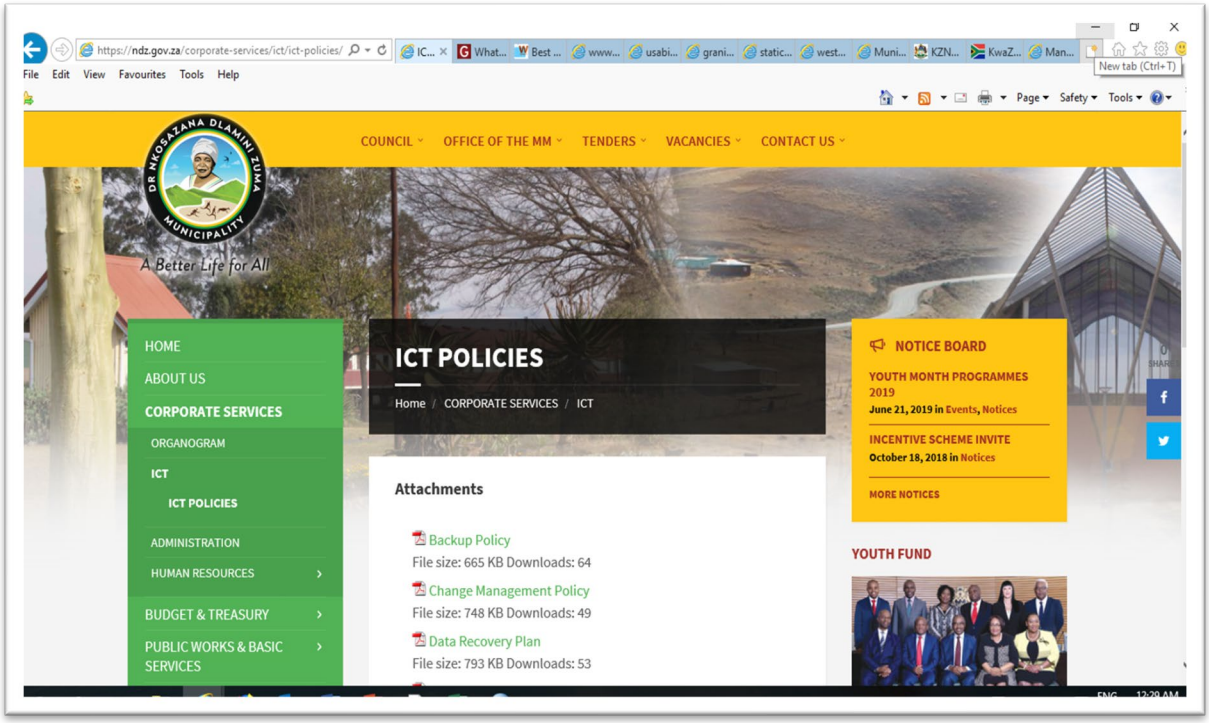

Figure: 4.2 ICT Operations policy (Dr NDZ Municipality) 2020

This policy was also scrutinised. However, it was determined that there is no specific reference to web archiving in the policy. A sample of records management policies from a few municipalities was also requested. It was also discovered that the majority of municipalities are still unfamiliar with the term "web archiving." As a result of the responses, it is clear that municipalities do not have digital preservation policies that are specific to the preservation of content posted on websites.

4.3.1.3 Policies used by the municipality to crawled web

Policy decisions, according to the life cycle model, include developing a new policy specific to web archiving and adapting an existing policy to new collecting practices. Participants stated during the interviews that "Our municipality has a user access policy, and we also have a legal team that represents the municipality in all legal matters. We believe that sharing information online or on our websites is more beneficial to users than creating potentially dangerous situations."

The communication and IT departments in all of the municipalities under study are in charge of publishing information on websites. Having said that, it was discovered that the ICT/IT

policy and the communication policy are applied to the majority of the functionalities of the municipal websites. According to the eThekwini municipality, "URL, keywords, date, themes, and departments are the most used to crawl websites and this can date back as far as 2013 and beyond." Although the records management policies of Mlalazi, uMhlathuze, Ethekwini, Nkandla, Ilembe district, and Dr Nkosazana Dlamini-Zuma Local municipalities recognise the website as a record, these municipalities have no control over uploading records to the websites or decisions on where such records should reside, that is, on the internal server, cloud, or website database itself.

4.3.1.4 Standards for web archiving

Participants were also asked if there were any standards or guidelines in place for web archiving. Among the other things mentioned were Minimum Information Security Standards (MISS) and ISO 27002 2005 to support the classification of information and appropriately manage its security. The policy also prohibits controlling access to information among its users, as well as hacking and spoofing. Among the standards identified are:

- ISO/IEC: International Standards Organisation (ISO) and the International Electro Technical Commission (IEC).
- ISO 38500: Corporate governance of information technology standard. Provides a framework for effective governance of IT to assist those at the highest level of organisations to understand and fulfill their legal, regulatory, and ethical obligations in respect of their organisations' use of IT.
- Website specialism: The management of projects, typically (but not exclusively) involving the development and implementation of business processes to meet identified business needs, acquiring and utilising the necessary resources and skills, within agreed parameters of cost, timescales and quality.

Other issues identified by the participants include "municipality ICT, service components (SC) and configuration items (CIs)". These include but are not be limited to:

- documentation including policies, procedures, service catalogues, and system documentation.

The Content Manager's role is to give direction and support. In the area of direction, to:

- Create and update the Municipal website Content Management Guidelines.
- Monitor implementation of the Guidelines.

- Strategise the content to go onto the portal, including language variants.
- Point departments to gaps in their online content.
- Do quality control of content.
- Ensure accountability for content approved.

In the area of support, to:

- To assist departments decide what to put online.
- Train users about their roles and responsibilities, how to write for the Web, and how to use the content management system.
- Help users understand the implications of these content management guidelines.

4.3.2 The scoping and data capture phases involvement in activities and decisions of municipality websites

According to the web archiving life cycle model, "the scoping and data capture phases of the life cycle frequently overlap because they involve similar activities and decisions" (Bragg & Kristine 2013:2). The researcher was interested in this topic because he wanted to understand the municipality's intentions in creating the website. The participants' responses varied, but there was general agreement on 'communication with stakeholders.' For example, participant 5 stated that "the website is the pride of the municipality, where activities pertaining to the municipality are showcased using it, as it is also linked to various forms of social media." The participants also stated that the municipality advertises "job opportunities, tenders, and notices." on its website.

It was also discovered through systematic analysis that municipalities use the website to share reports for user access, national government budget allocations, recent activities where they interact with the public, and policies related to the municipalities' functionality. Participants also stated that this method allows communities to have access to all of the municipality's activities.

A systematic review revealed that some municipalities (Umzumbe Local Municipality, Umuziwabantu Local Municipality, Richmond Local Municipality) have not updated their websites in three to four years (Umzumbe Local Municipality, Umshwathi Local Municipality, Umuziwabantu Local Municipality, Richmond Local Municipality), while others do.

Participants in the interviews also mentioned a lack of ICT skills as a barrier to updating municipal websites.

Following the interview, participants were questioned about the material used on the websites as well as the source of such information. According to Participant 2:

> "*The content that we post on the site comes from various departments. There is one that feeds us with information and we then choose which one to post*". Participants from the metro municipality responded that because they work with various departments, they rely solely on them to feed them with their activities and pictures.

Participant 4 further elaborated:

> "*We are categorised into different forms as per our functionality. We have people who deal with audio-visual, text or content.*"

Municipalities such as KwaDukuza Local Municipality, Umshwathi Local Municipality, and Ethekwini Metropolitan Municipality were discovered to own their content, from creation to management. It was also discovered that the vast majority of municipalities outsource their services to service providers. The service providers are in responsible for developing websites from the ground up, publishing information (via email), and preserving information (via web archiving), and they rely solely on service providers to post information on their behalf via email. They also revealed that the service provider controls some of the services and that the email system is the most commonly used mode of instruction or communication between service providers and municipalities in KZN for giving instructions. Contracts with service providers, for example, lapsed in some cases, and websites were no longer updated. This is exacerbated by the fact that such service providers failed to transfer skills to municipal employees.

4.3.2.1 Legal requirements for archiving municipal websites

The study investigated the factors that influence the use of municipal websites as well as the legal requirements for archiving websites for day-to-day operation. Municipalities must learn how to archive various types of websites, including social media platforms like Twitter, blog posts, podcasts, Facebook, YouTube, and others that originate from their municipal portal.

During the interviews, participants were asked whether or not the municipalities have web archiving policies and how the municipalities' websites are managed.
Participant 4 stated:

"*I have never heard of such a policy in my life and this sounds interesting.*"

The sentiments were echoed by Participant 5 that:

"*For us websites, we only use them to share information and we do not think we should have a specific policy for them*".

The investigation also inquired whether there were any working relationships with the KZN Provincial Archives, as well as the National Archives and Records Service of South Africa, in terms of records management in general and web archiving in particular. The participants agreed that there is no relationship with either the national or provincial archives repositories. However, Participant 4 stated that the National Archives of South Africa website is frequently consulted to download directives and policies that are used as a benchmark for records management activities.

Participant 6 further mentioned:

"*We do not have any working relationships and we are not aware of the role that they play in the municipality as a whole."*

According to Ngoepe and Keakopa (2011), archivists and record managers are still marginalised by the state administration in most countries. According to the current study, the majority of municipalities do not have a working relationship between records managers and website and digital media officers or content managers. "The Constitution of the Republic of South Africa Act No. 108 of 1996 designates archives other than national archives as a functional area of exclusive provincial legislative competence. Ngoe"e (2016) states that in implementation of Schedule five of the Constitution, it is clear that "provincial archives legislation is to a large extent modeled on national archives legislation, with provisions being made for provincial application and relevance." Indeed, several features of national and provincial legislation are shared. It was discovered that the following archives and records management policy will inform, so Ngoepe (2016) believes that provincial legislation is simply a replicator of national archival legislation. This is due to the fact that the shortcomings of national archival legislation continue to be replicated in provincial ones.

4.3.3 Strategies for web archiving

The web life cycle model encourages organisations to define their goals for web archiving. According to the life cycle model, institutions decide how they want to maintain the data gathered in their site archiving operations. This includes both data files and metadata. As shown in chapter two, ISO 16175-3:2010 identifies the specific requirements for long-term digital preservation by allowing the export of records to a system capable of long-term preservation activities. Participants identified the following interventions: training, long-term digital preservation, and full ownership of municipal websites, which should not rely on service providers.

The content managers, website and digital media officers, IT technicians, and communication specialists/managers (also known as corporates in some municipalities) were questioned about the strategies in place for the long-term digital preservation of the municipality's websites. They revealed that they would like to one day have full ownership of the municipal websites and be provided with training that will enable them to develop websites on their own rather than relying on service providers (Umzumbe municipality, Nongoma Municipality, Impendle Local and Mpendle municipality). Municipalities that already manage their own websites stated that they hope to keep their websites up to date despite the software they use. Participant 4 stated, for example:

> "*Frequent training to brush up our skills will help us from time to time, since some of the things we are learning ourselves on the job through YouTube.*"

The study also discovered, through content analysis, that one of the strategies stated by the communication policy act No 21 (P21) ("P" being part of policy) of those municipalities in charge of websites is to "ensure accessibility of municipal websites to stakeholders at all times." (on 12.2,7:7).

Participant 5 further suggested:

> "*For the municipality to grow, we compare ourselves with other municipality websites to learn when we need to improve or not*". In addition, they also said, "*We also archive websites from previous years so that we are able to reflect on them, see where the KwaDukuza municipality comes from*". Some participants continued to say, "*If you look at the website from five years back, you will be able to tell that we have made some changes and developed some new tools, like the chat function, a covid-19 platform that directs users to an information need*".

4.3.3.1 Control of the content on the site or website

It was also inquired as to who controls the municipal material in KZN. Participants received a variety of responses, but the general consensus focused on contracted IT service providers. Previous research by Ngoepe (2008; 2012) revealed that records management practitioners always take a back seat when it comes to IT issues relating to records management. Participant 7, for example, stated:

> "*The content on municipalities' websites is controlled by service providers, depending on the contract that is given to them by the municipality.*"

Since it is not under municipal authority, anyone can simply tamper with the data or take ownership of information on the website. It happens to the African National Congress (ANC), South Africa's ruling party. According to media reports, the ANC has lost its web domain after the South African Institute of Intellectual Property Law ruled against it in a dispute with Unwembi Communications.

Furthermore, Participant 8 indicated:

> "*This contract normally lasts three years to five years and that puts the service provider in control of the material as per the contract.*"

When asked if the contractors hand over the material at the end of the contract, the participant stated that they do "*No one has made that follow-up on whether what is happening to that content or material that they hold*". While some municipalities' records management policies state that the policy's scope extends to suppliers contracted by municipalities and that "all records, regardless of format, created by any person or entity in the service of the municipality, are owned by the municipality and subject to its overall control, including employees and independent contractors," other municipalities do not. In this case, because municipalities outsourced website development and maintenance to third-party service providers, they risk losing content when the contracts expire. However, in one municipality, the records management policy stated that "when custody of the municipality records passes to a contracted service provider through outsourcing or any other arrangement, the records will remain the property of the municipality and be subject to approved disposal instructions and storage requirements." This, I assumed, also referred to contracted websites, which are also classified as records. However, participants stated that websites are frequently excluded because they are not considered records within municipalities.

4.3.3.2 The municipality's website serves as a frequently used forum

According to the findings of the study, most municipalities rely on the various departments to provide them with accurate information, and they collaborate with the heads of department from each section. For example, Participant 1 indicated:

> "*We can't know everything that takes place within the municipality, but through colleagues on the ground, they feed us with all the information we require as per their departments*."

The study also revealed that the majority of people in charge of the publication of information on websites are divided into different categories, such as those in charge of content, audiovisuals, live videos, and text. Participants also stated that before anything is finalised, they approach department heads to confirm that the information received from various departments is correct.

The researcher wished to assess the current state of municipal websites. According to the study, most municipal websites are not very active, with some only being updated once a year or once every six months. This was observed in 2019, but as time passed, the researchers repeated the assessment in 2020, with some improvement in some KZN municipalities (Figure 4.3). The pandemic has put pressure on many organisations to keep their distance, and municipalities have had to find a way to communicate with communities in the process. Websites were one of the modes of communication used in awareness campaigns. The majority of municipalities created websites, and posts were visible when they were. The reflection revealed that the majority of municipalities last posted eight months ago. According to the participants, most municipalities use service providers and send requests whenever anything needs to be posted on websites.

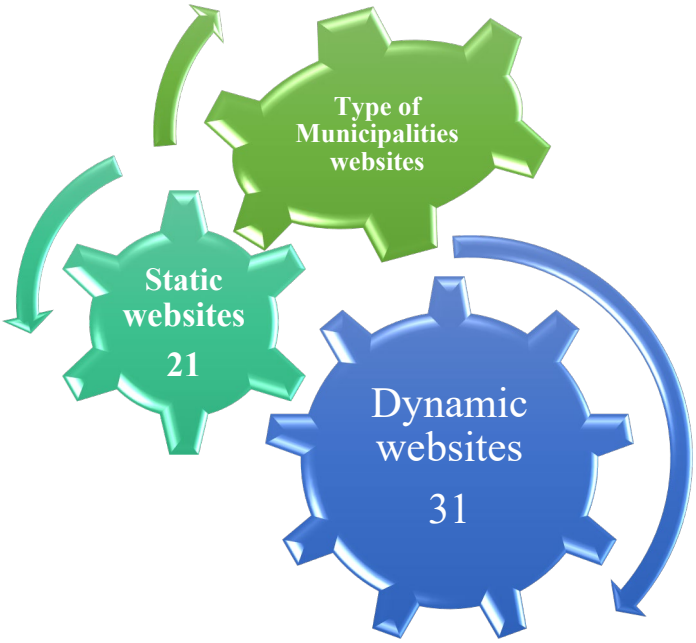

Figure 4.3: The strategies by the municipalities' websites (Researcher 2020)

These are linked to municipal websites that are considered to be dynamic.

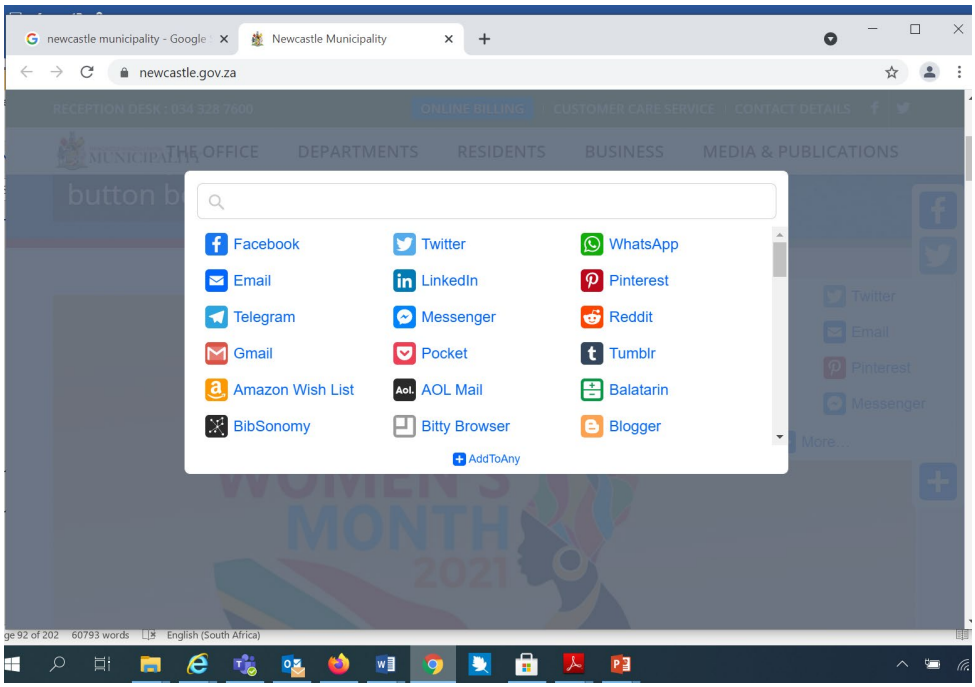

Figure 4.3.1 Dynamic websites (Newcastle municipality 2021)

According to the web archiving life cycle model, organisations use a variety of preservation strategies to provide successful functionality. According to the findings of the study,

municipalities are unable to operate as they would like due to a lack of systems that allow them to create websites from the ground up.

For example, Participant 4 indicated: "*Another issue that we are faced with is accessing the system itself, which is why we always email it to the service provider.*" One of the issues that the municipality has had to deal with is a lack of connections, particularly in rural areas. It was also stated that most municipalities install their servers from other locations and provide easy access to information flow. Due to a lack of understanding of the system, senior management relies on those who manage websites (IT, communication) to improve the standard of their municipalities' websites across the board in KZN, according to the study. The majority of the issues stem from people being hired out of politics or leadership positions without regard for the skills required for the job. The study also revealed that municipal websites play an important role in the dissemination of information about job openings, tender applications, and municipal activities.

4.3.4 Risk related to web archiving

When developing web archiving programmes, institutions must take certain precautions to avoid risk, according to the web life cycle model. These precautions include copyright, permission, and access (Bragg & Kristine 2013). As detailed in Chapter Two, government agencies have been identified as one of the targeted bodies when it comes to hacking, with recent incidents involving the City of Joburg and the Department of Justice in South Africa. Participants were asked to identify the risks associated with web archiving or the operation of the municipality's website. Participants identified the following risks: not having control over the municipality's website, a lack of skills, and a lack of long-term digital preservation.

For example, Particiapnt 9 indicated:

> *"Since we do not manage websites ourselves, we rely on the service provider or consultants."*

Particiant 5 from the stated:

> *"We do not have a policy that is specific to the archiving of websites and before you came here, I was not aware of such terminologies of web archiving and the value that it contained."*

It was also discovered through content analysis that some of the URLs were ineffective because they directed to service providers' websites where they advertised their services. This demonstrates a lack of monitoring and evaluation by municipalities following the development of websites by the service provider. Following up on this issue during the interviews, the participants were astounded that these things occurred. Participant 10 from uMshwathi Local Municipality said, "We need to be in charge as the municipality to avoid such an incident from happening." Participants 5 further mentioned that fake news was seen on social media (Facebook, Twitter, etc.) and that having such a platform "*we can detect them fast and correct them by taking action, These platforms are responsive, notifications come intently and we are able to correct them quickly, unlike the website*." Participant 10 stated that the spread of fake information about vacancies, press releases and confidential documents from the municipality, and fake municipal pages (Facebook, Twitter, blogs, etc.) that "*If we had a policy that spoke to all of this, it could have been better*."

4.3.5 Appraisal and selection of archiving municipal websites

The selection phase of web archiving entails deciding which websites should be archived. This stage of the life cycle involves more granular, specific decision points than the more general "vision and objectives" policy phase (Bragg & Kristine 2013:22). The participants were asked how they handle the decision-making process for which materials to publish on the municipal website and which to archive. Some participants stated that they are the ones who are in charge of sharing information. For example, Participant1 stated:

> "*We only rely on various departments like parks or electrical departments to give us related content, together with pictures that support the story to be published. We then put together a story to be posted online (websites, Facebook, Twitter*). "

The study also revealed that some of the websites' content is out of date because they were created in 2011, 2016, or 2017, and will remain the same in 2021 (uMuziwabantu Local Municipality, Ubuhlebezwe Local Municipality, Maphumulo Local Municipality, and Richmond Local Municipality) as evaluated by in 2019, 2020, and 2021 (see Figure 4.4 and Figure 4.5). In 2019, it was revealed that most municipal websites' information was posted when the websites were created, and then there was no activity. As a result of the pandemic, most municipalities were forced to adapt to change and the digital world by 2020. After six months, there had been no new update relating to Covid-19 awareness or any other recent news.

When participants were asked about the outdated municipal website pages, Participant 11 responded:

> *"The outdated information that exists on websites is caused by the fact that we only wait for the service provider to update information for us".*

It was discovered that the hands-on municipalities update their websites on a regular basis; even their chat function is effective (KwaDukuza Local Municipality, Umshwathi Local Municipality, Umlalazi Municipality, and Ethekwini Metropolitan Municipality).

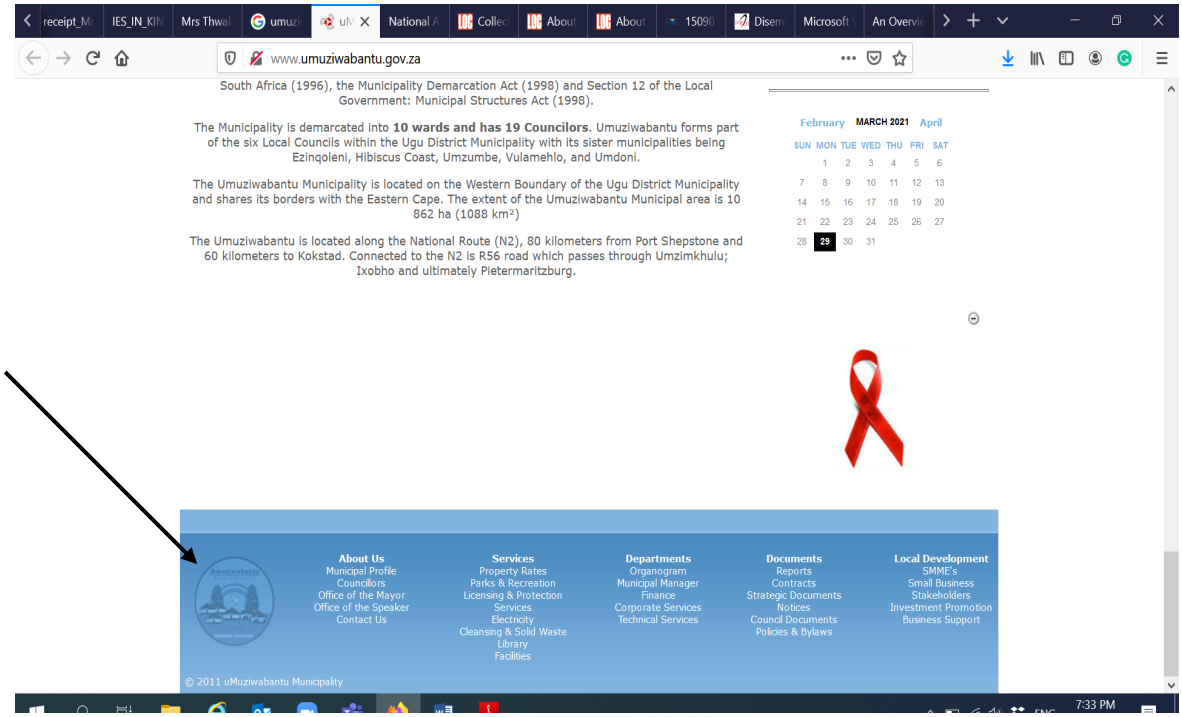

Figure 4.4: Website that dates from 2011 (© 2011 uMuziwabantu Municipality)

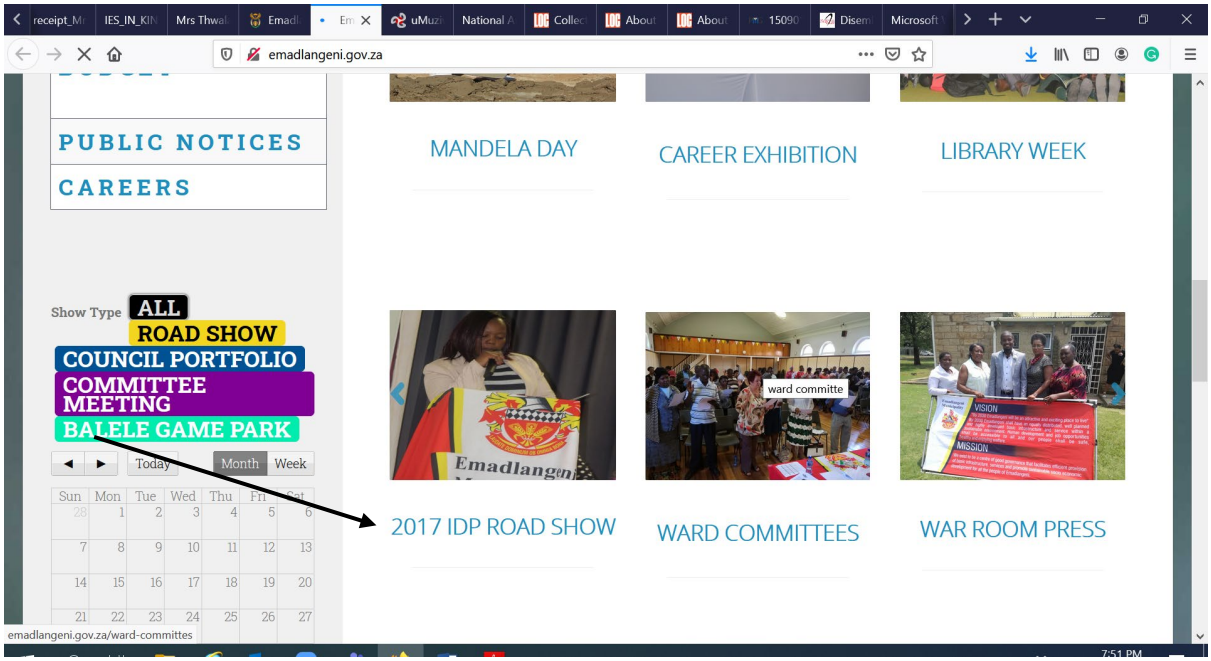

Figure 4.5: Publication that dates from 2017 (Emadlangeni Local Municipality 2020)

4.3.6 Storage of content published on the websites in municipalities

According to the web archiving life cycle model, the life cycle storage and organisation process can also be considered preservation activities for certain organisations. For decades, storage has been a problem in record management systems, particularly for physical records. Since they save space and time, electronic or digital records have proven to be a lifeline for many organisations. The use of cloud computing services by businesses has skyrocketed in recent years (InterPARES 2016). However, data show that cloud storage adoption in South Africa is very low. Perhaps this is due to the fact that the cloud storage policy was only developed in 2021.

When asked how the website's and files' contents are created, stored, and managed, Participant 1 stated that "*information is described as per the various departments of the municipality" (technical services, community services, etc.*). Participants 9 also revealed, "*We always create hardcopy files for each of the information or content being emailed to the service provider, but we do not determine how long we have to keep the files that are being emailed to the service provider*". The following storage mediums were also identified by the participants: cloud, internal server, external server, USB, hard copy files, and automated systems. It was also

discovered that email is the most commonly used system for sharing information to be posted on websites (service providers, colleagues). Participants 10, for example, stated:

> "*As the municipality, we email all the content to the service provider and it never crosses our mind to think about the criteria to be used in the management of the files that we remain with after emailing everything to the service provider.*"

Participants 12 also revealed: "*We are not aware of any tracking system that is in place for the content published on websites.*" Various software were mentioned by the participants (Kokstad Local Municipality, Ethekwini Metropolitan Municipality and KwaDukuza Local Municipality) as being used by the municipality for content management, such as SharePoint and WordPress.

4.3.7 Qualifications and skills that are essential to the development and success of web archiving

According to the web life cycle model, a lack of understanding of the global issues surrounding web archiving initiatives stymies any potential change and collaboration in dealing with a web archiving problem. Eastern and southern Africa, particularly South Africa, are experiencing a skills and competency shortage (Mosweu & Ngoepe 2020). Again, Katuu and Ngoepe (2017) identify challenges related to skill competencies in various African organisations. According to the study, managing digital records necessitates the development of specific qualification, skills and abilities. The participants were asked what skills they needed to be hired for website management. The purpose of the study was to learn about the qualifications that are considered appropriate for archivists and records management professionals. The following qualifications were revealed by the participants as the reasons for their hiring:

- ICT specialists;
- IT skills, some hold a diploma in information technology;
- Communication degree/ diploma;
- Website and digital media officer; and
- Grade 12/ Standard 10.

This, however, indicated that they had no training in archives and records management, as well as no related qualification and skills for web archiving. After being hired, the participants were asked if they received any type of training from the municipality. The majority of participants

stated that they received no training from the municipality regarding website functionality or content management (uMhlathuze Local Municipality, Nkandla Local Municipality, Greater Kokstad Local Municipalities, Harry Gwala District Municipality, and Ilembe District Municipality). Participant 5 disclosed that "*I am using my skills from technical school to perform my duties.*"

4.3.7 Appraisal, retention and disposal of web content

Appraisal leads to the final phase of records management, disposal, which includes either indefinite retention in the office of origin, record destruction, or transfer to an archives repository in the case of the public sector. When asked about content appraisal, selection criteria, and workflow management, participants (KwaDukuza Local Municipality, uMlalazi Local Municipality, Ubuhlebezwe Local Municipality, Richmond Local Municipality, uMhlathuze Local Municipality, Ethekwini Municipality) said they mostly use URLs and keywords when selecting information on websites. Municipalities and other governmental bodies, as Ngoepe and Nkwe (2018) point out, are required to apply for disposal authority from the NARSSA or respective provincial archives. Once a disposal authority has been granted, the municipality will use it to create a retention schedule that will guide either destruction or transfer to an archive repository.

In terms of disposal authority, it was agreed that municipalities had not applied for disposal authority from the provincial archives. Mostly relied on the NARSSA's general disposal authority. It was also discovered that most municipalities in KZN lack the necessary skills to perform the responsibilities of compiling retention schedules once disposal authorities are obtained. Participant 2 indicated, "*With regards to the flow of information, we rely on all the media platforms that are linked to websites, since what is usually posted on websites is also posted on Facebook, Twitter, and Instagram*". Figure 4.7 depicts the retention policies as well as other useful policies that can be applied to web archiving. The NARSSA Act, No. 43 of 1996, states that national archivists "shall be charged with the proper management and care of public records in the custody of government bodies." Figure 4.7 depicts the municipality's policies, and there is no mention of an appraisal and retection policy in relation to records and archives.

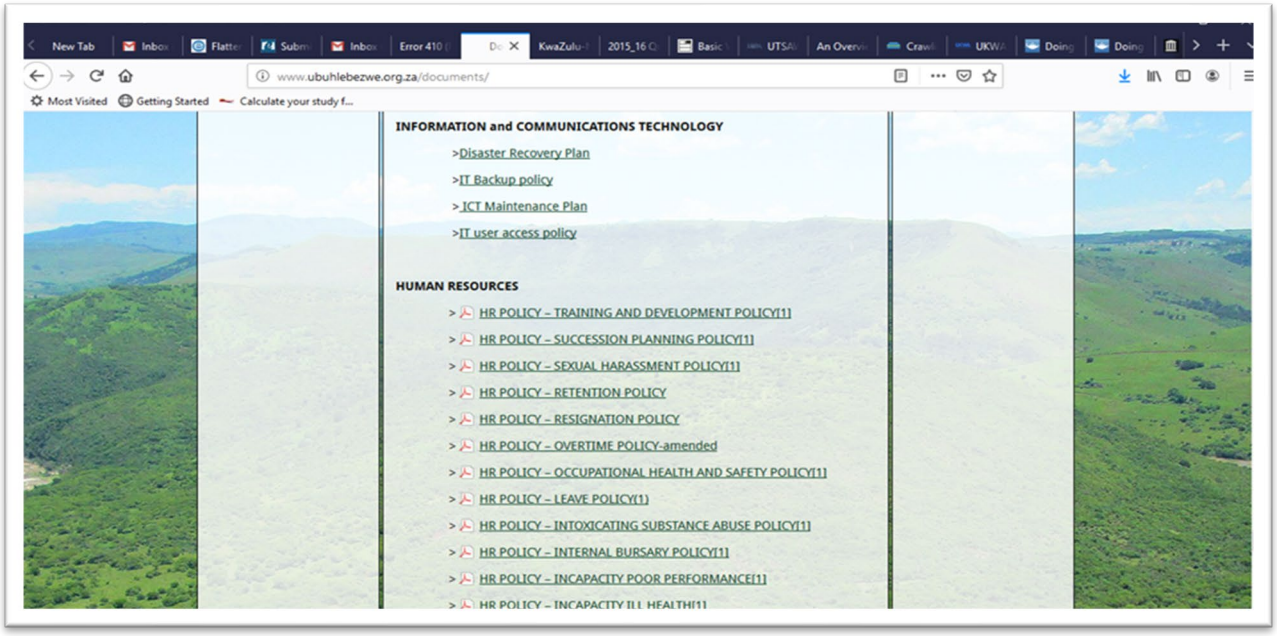

Figure 4.7 Policies published on municipality websites of Ubuhlebezwe (2019)

4.3.8 Access to web content in municipalities

The participants were asked how they determine user accessibility to municipal websites. The systematic review study findings revealed that the majority of municipalities (Richmond Local Municipality, Ugu District Municipality, Umshwathi Municipality, King Cetshwayo District Municipality, uMhlabuyalingana Local Municipality, City of uMhlathuze Local Municipality, Dr Nkosazana Dlamini Zuma Local Municipality) have a statistics account that can detect the number of people who access the municipality's website. This, however, implies that users do follow municipal updates and expect to find relevant information that can help them improve their lives. The statistic count also reflects how important it is for municipalities to archive information posted on their websites for posterity and the benefit of their users.

During an interview to follow up on the findings of the systematic review, Participant 1 stated:

> "*The municipality uses different types of social media platforms for communicating with their users and when sharing information, and the website is linked to various types of social media that belong to the municipality. It was also discovered that one person per municipality is liable to operate social media platforms, and when asked why, they indicated that this helps with accountability*."

During interviews, it was also revealed that only municipal employees had access to archived websites because they were manually archived using the internal server and the cloud. When users attempt to access the old site, they are greeted with a "404" error message (see Figure 4.10). This, however, means that municipalities in KZN must implement a system that allows members of the public to access archived websites.

According to the study's systematic review (Figure 4.8), municipalities' websites are mostly used for posting job openings, bidding for tenders, and distributing yearly reports, as well as budget allocations and government speeches (president, mayor).

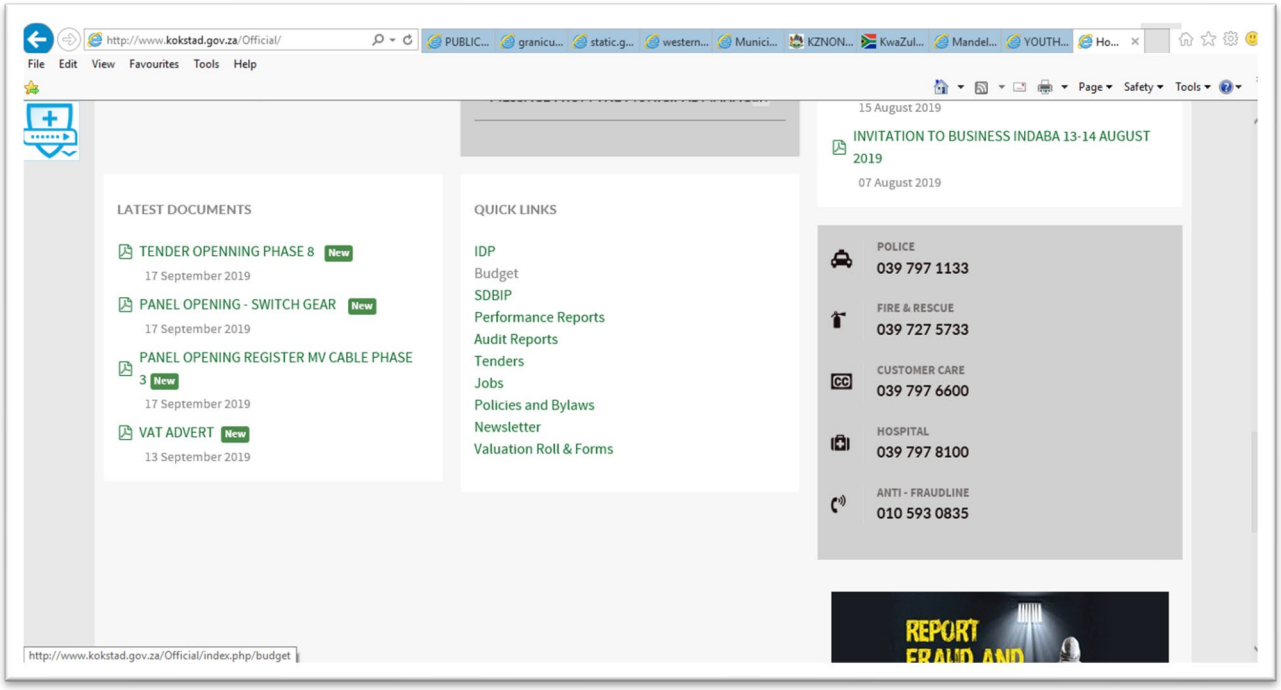

Figure 4.8: Material posted on municipality websites

The participants were asked to indicate how the municipalities' websites are accessed. When looking at the statistics, they discovered that the municipalities' websites continue to be the most relevant platform that is mostly used by communities in KZN. Some participants also stated that the application forms for various municipal services are accessible via websites, and that "*websites are regarded as the most formal platform to share information compared to other platforms like Twitter, Facebook, Instagram, and YouTube, and they are trustworthy.*" Participants also indicated that "*with other platforms, users can just respond any how compared to websites. Even the chat function is more formal as it requires the user's details.*" Figure 4.9 depicts an example of a municipality's website with statistics count, and they continue to be the relevant platform that communities in KZN use.

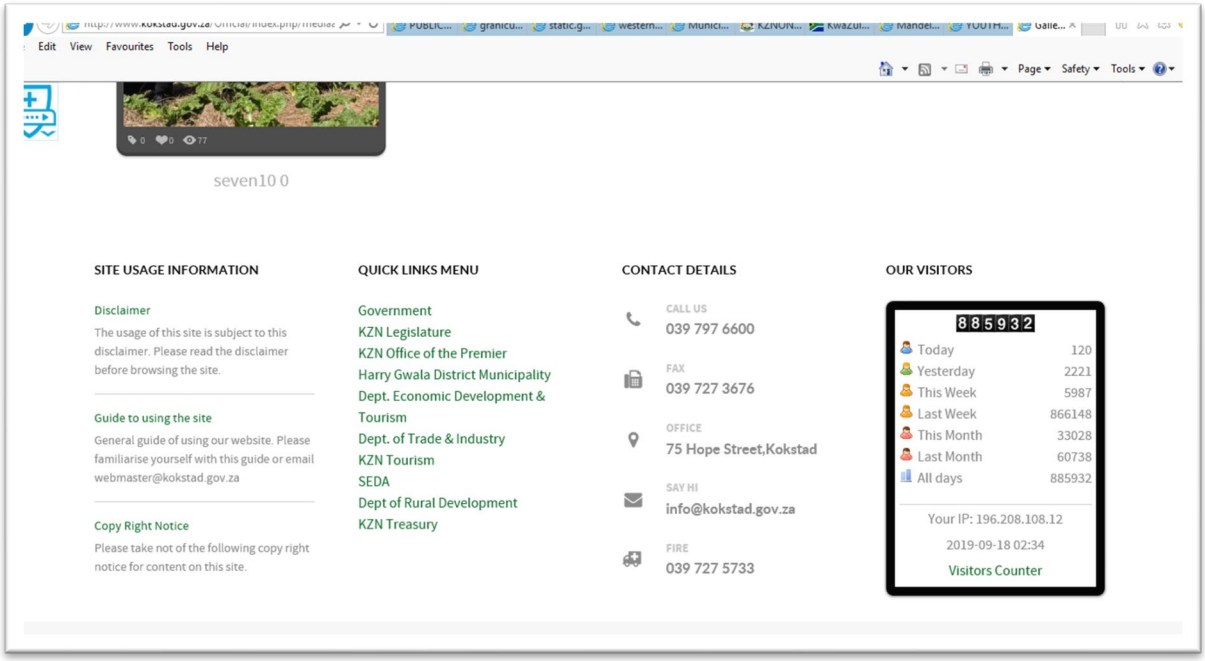

Figure 4.9: Statistic count for municipality website, Greater Kokstad Local Municipality (2020)

4.3.9 Harvesting of websites into a digital repository

According to Ngoepe and Keakopa (2011), there is no infrastructure in South Africa to ingest digital records into archival custody. Furthermore, according to Ngoepe (2017), the only digitised audio-visual records in South Africa are the court proceedings from the famous Rivonia trial, which were originally in Dictabelt format. As a result, it was necessary to investigate how municipal websites are harvested. This was also evident in the literature on harvesting issues in Chapter Two. It was noted that "NARSSA is unconsciously following a post-custodial approach as far as the preservation of digital records is concerned." The question was designed to help the reader understand the municipality's harvesting process for the e-records repository. The participants stated that they were unaware of any harvesting tools used by the municipality. For example, Participant 11 said:

> "*We request the service provider to deal with all those concerns since they are not affiliated with anything that has to do with the website of the municipality*."

Another issue raised by Participant 11 was a lack of technical resources and capacity for designing and maintaining websites, which was heavily emphasised. A follow-up question about harvesting municipal archives at the provincial archives confirmed that there is no infrastructure for web ingestion into archival custody. As a result, the responsibility for

archiving content is delegated to municipalities, according to Ngoepe (2017), who contends that provincial and national archives in South Africa unwittingly employ a non-custodial approach. It should be noted, however, that the Procincial Archives Act allows for the acquisition of records, including websites, because the definition of a "record" was interpreted as such. Surprisingly, the participants stated that they were unaware that a website is a record that should be managed as such. Participant 3, for example, stated that:

> "*We use the website as a communication tool. Therefore, we are not managing it as a record. This is so because the content that is published is managed elsewhere. Here on the website we are just communicating to the external stakeholder*."

Participants were asked which tools were used to harvest content from KZN municipal websites. The KZN provincial archival services indicated that it is still waiting for the NARSSA-implemented open source software, Archivematica and AToM, for record preservation and access. According to the provincial archives, these softwares will be extended to all provinces. According to the study, only eThekwini Metropolitan Municipality and KwaDukuza Local Municipality indicated that they harvest their content into an internal web archiving system. Participant 5, for example, stated that:

> "*We only rely on the software to control the content on websites through WordPress.*"

According to the study, software such as WordPress, Drupal, SharePoint, and TTech can store data for up to five years, depending on how it is programmed. Figure 4.10 depicts the URLs in Ubuhlebezwe Local Municipality that were either inactive or returned an error message.

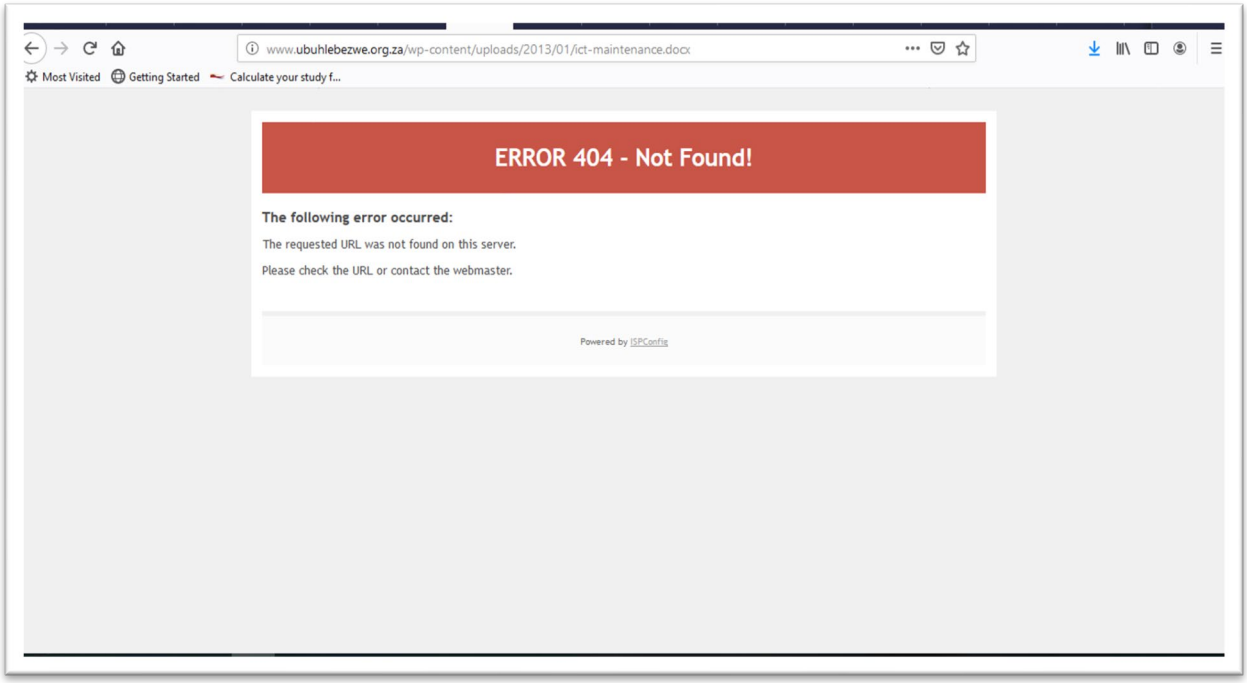

Figure 4.10: No effective URLs in the municipality (Ubuhlebezwe Local Municipality 2019)

4.3.10 A framework for web archiving

The study's final objective was to propose a framework for archiving websites. The life cycle model (see Figure 1.2) was used as a theoretical framework in the study to inform the objectives, literature review, and data collection (Bragg & Kristine 2013). The information is disseminated through notices and precautions that municipalities must take to control the spread of Covid-19. Taking what was said above, this can be accomplished by putting in place a policy that addresses the flow of information on municipal websites. Harvesting information from the web, evaluating it, and selecting it can all be compatible with the implementation of solid policies to guide the functionality of websites. Even if a new employee is hired, they can be given instructions on what to do with regard to the websites if there is a clear policy in place. It was discovered that the majority of municipalities lack the necessary skills and systems to develop websites, a policy that has directive constructs on how to allow the flow of information, appraisal and selection regarding whether websites need to be kept, risk management, preservation of how they will archive their information and files, and work relations (records managers, archivists).

The participants' general request was that:

> "*We hope you will come back and advise us since most researchers come to our institution but never return with the results as to how to improve.*"

It clearly indicates that they are willing to benchmark with various stakeholders in order to guide them in how to operate. Participants stated that they need to develop working relationships with institutions because they are also for the community. The participants acknowledged that managing websites and all social media platforms is a difficult task. Participant 11 stated:

> "*In some instances, those handling social media need to put feelings aside, since some of the users (communities) when they get frustrated, they just react anyhow on this platform, which becomes a challenge.*"

It was also discovered that no digital preservation policies exist in KZN municipalities, particularly for long-term digital preservation for web archiving.

4.4 SUMMARY

The chapter presented data collected through interviews, observations, system reviews, and document analysis following the study's research objectives. The main focus was to learn how the municipalities investigated evaluated website archiving to create a framework for archiving municipal websites in KZN. The primary goal was to determine whether municipalities have a policy in place that governs the archiving of their web content. Many concerns were raised about municipalities losing control of their data, and it was further elaborated that the majority of municipalities use a service provider to manage their website (managing and maintaining it). During the interviews, follow-up questions were asked to gain clarity. The study's findings revealed that participants from municipalities are eager to implement web archiving systems. Municipal websites, it was discovered through observation, play an important role for the public in that they must be maintained because they connect municipalities with the general public or communities. However, it has been established that websites are not considered records. Furthermore, no collaboration existed between ICT, communication, records managers, and archivists. The findings indicate that archivists and records managers have a long way to go before being taken seriously and forming relationships with the IT and communications departments. The next chapter deliberates on data interpretation and discussion.

CHAPTER FIVE

INTERPRETATION AND DISCUSSION OF RESEARCH FINDINGS

5.1 INTRODUCTION

The previous chapter analysed and presented the results of data obtained from interviews and document review. This chapter provides the interpretation and discussion of the results. According to Creswell (2009:152), an interpretation of the results necessitates the researcher interpreting insinuations from the results for the research questions, hypotheses, and the broader meaning of the obtained results. Neuman (2006:159), on the other hand, emphasises that interpretation of results entails abandoning the meaning of the results. The following themes emerge from the research objectives in the interpretation of the study findings:

- Policy and legislative framework for web archiving;
- The scoping and data capture phases involved in activities and decisions of municipality websites;
- Strategies for long-term digital preservation for websites;
- Risk related to web archiving;
- Appraisal and selection for archiving for legal and professional use;
- Storage of content published on the websites in municipalities;
- Access of web content in municipalities;
- Harvesting of websites into a digital repository; and
- A framework for web archiving.

5.2 POLICY AND LEGISLATIVE FRAMEWORK FOR WEB ARCHIVING

The first objective of the study was to evaluate the legislative and policy framework that was informed by the archive life cycle (see Figure 1.2). Records management is considered as the best practice that is required by an organisation to provide adequate evidence of its compliance with the regulatory setting for its rapid functionality. These are usually statutes, mandatory standards of practice, codes of best practice, and codes of conduct and ethics. The nature of an organisation and sector determines the regulatory elements (ISO 15489-1: Section 5). According to the International Council on Archives (1997:19), "The legislation governing many aspects of information creation, management, use, and preservation has not kept pace

with the rapid change in technology and archive legislation is no exception". This states that as technology evolves, government entities must adapt in order to remain competitive. Policies that are more sustainable in order to keep up with the changes in the digital world are developed during this process. According to the ICA (1997:19), when rapid changes occur in the digital world (technologies), archival legislation frequently remains "weak," "outdated," "old and inconsistent".

The discussions for this objective was informed by the following themes:

- Policy and legislative framework for web archiving;
- The role of a municipality's website;
- The laws and policies anticipated to support web archiving; and
- Requirements for archiving municipal websites for legal and professional use.

Any organisation must have an effective policy framework in place in order to function properly. According to the findings of the study, policies and legislation govern how various departments in various municipalities operate. Despite the fact that the NARS Act is mandated to manage all records created by governmental bodies, it should also ensure good governance in all South African municipalities. KZN municipalities still need to revise their policies because most of them refer to the IT/ICT function, the communication function, and the corporate function. It would have been easier for municipalities to function and maintain control over information posted on municipal websites if they had a specific policy on web archiving.

The study also uncovered legislation governing web archiving, such as the National Archives and Records Services of South Africa Act (Act No. 43 of 1996). The Act mandates that governmental entities, including municipalities, manage electronic records (including websites). It also requires that those with archival value be transferred to archives repositories for long-term preservation. Kalusopa (2011:175) agrees that "the organisational environment should comprise policies, responsibilities, accountabilities, systems, and procedures that need to be in place to enable the organisation to meet good recordkeeping practices". It should be noted from literature that in African countries, records including websites are not managed properly (Ngoepe 2014:1; Asogwa 2012:201-202 Abbott 2007:7;). However, this clearly shows that, over the decades, African countries have encountered issues arising from proper

records management that is in accordance with its regulatory framework and speaks to its functionality. It was discovered that policies in KZN municipalities do not include provisions for websites. Most municipalities use an IT/ICT policy, a communication policy, or a corporate policy to manage their websites. These websites are managed solely as communication platforms, not as records. The municipality is required to inspect all existing systems in order to properly align them with its policies. However, municipalities such as eThekwini Metropolitan Municipality and KwaDukuza Local Municipality have systems in place to manage records, including website archiving. The only thing they need is to connect related departments to provide support in their work functionality and to develop relevant policies that are compatible with web archiving.

The study undertook a systematic review of municipalities' websites in KZN for the years 2019, 2020 and 2021.

The study's findings indicate that there are laws and guidelines in place to provide guidance on the functionality of municipal websites. The Municipal Demarcation Act of 1998, for example, was identified as a piece of legislation. Notices must be published in local newspapers, on the radio, or through any other suitable means of communication in the affected area, according to the Act. Furthermore, the Local Government Municipal Systems Act of 2000 mandates community involvement in local government and access to local government information. Municipalities must create and notify local communities about the participation and information mechanisms that are available to them. Section 21B of this Act mandates that all municipalities create their own official websites. The municipal manager is in charge of updating the official municipal website. If municipalities are unable to do so, they must send information to a well-organised local government and provide all necessary information. The community should be aware of the website address and kept up to date on relevant issues.

The other Act is the Promotion of Access to Information Act of 2002. According to the Act, section 14 of the Act requires all public bodies to compile a manual that stipulates which records are automatically available to the public.

According to Ngoepe (2017), NARSSA should enact a policy requiring government agencies to provide a temporary infrastructure for archiving digital documents. Most laws have record-keeping implications, but the most important ones, such as data protection and privacy laws,

have yet to be enforced, particularly in the context of website archiving. The National Archives and Records Service Act of 1996, which is the recommended law, is intended to hold municipalities accountable for managing records, legal matters, and the body's historical need to keep records of transactions. This means that NARSSA is in charge of all government records management activities, such as authorising record disposal and deciding which classification systems to use. Based on this foundation, NARSSA issued guidelines for issues such as paper and electronic records management. In these papers, NARSSA distributes a code of ethics for public records management to all public bodies.

The other piece of legislation is the KZN Archives and Records Service Act of 2011. This provincial archival legislation also requires that records of lasting value be transferred from governmental bodies to provincial archives repositories. This should occur 20 years after a disposal authority is granted. Ngoepe and Saurombe (2016) posed the question that 20 years is a long time for websites that change on a daily basis. Moshweu and Ngoepe (2019; 2020; 2021) emphasise that liquid communications such as social media and web content are constantly changing. They, therefore, require a faucet to turn them from liquid to solid. Otherwise, by the time 20 years have passed, the content may have been lost forever. As a result, there is a need for an archival system to harvest websites of lasting value as records and place them in archival custody.

The Electronic Communications and Transactions Act of 2002 is the other Act mentioned. The Act's aim is to legalise electronic communications and transactions while also increasing trust in electronic records. Various pieces of legislation that provide credence to the existence and operation of municipal communication consider communication to be the core function.
The others that were considered key are:

- Constitution of the Republic of South Africa Act (Act No. 108 of 1996);
- Local Government: Municipal Structures Act (Act No. 117 of 1998);
- Media Development and Diversity Agency Act (Act No. 14 of 2002);
- Intergovernmental Relations Framework Act (Act No. 13 of 2005);
- The Local Government Municipal Systems Act (Act No. 32 of 2000) (Systems Act); and
- The Local Government Municipal Financial Management Act (Act No. 56 of 2003) (MFMA).

It was discovered through content analysis or review that municipal websites are regarded as a platform for information dissemination, participation, and compliance with various pieces of legislation. Mosweu (2018) discovered that the Botswana government lacked a specific policy in place to accommodate liquid communication. Records and archives laws, according to Okello-Obura (2011:4), are part of a larger legislative platform for transparent and efficient government. However, there are gaps in the above Act regarding the archiving of websites for posterity, and municipalities must still have appropriate legislation that will accommodate web archiving. In Chapter Two, it was also revealed that organisations are required by law to capture and archive web material to ensure accuracy. The findings in Chapter Four show that much work remains to be done in the field of archival legislation. It was also discovered that, even though the Act covers the management of electronic records, it does not cover web archiving.

5.2.1 Web archiving policies

It was discovered that the municipal systems are managed by the IT/ICT department and the communication department, and their responsibility is to manage all content posted on websites using programmed software. The Information Security Policy governs the activities of the IT/ICT manager and other stakeholders. The following components are present and functional:

- Electronic records management policy;
- E-mail policy;
- Document imaging; and
- Web content management policy.

The documents' contents were examined, and it was discovered that the policies were used by municipalities to work in the ICT and communication departments, which are in charge of the municipalities' websites. The researcher then inquired about the relationship between the three departments (communication, records, and IT), and it was discovered that none of them had a working relationship in any of the municipalities in KZN. Through interviews, it was discovered that municipalities had no specific policy regarding web archiving. It was also discovered that municipalities rely on IT and communication to manage websites, and they indicated that they use their own policies in the municipality's day-to-day operations. Another issue was that the majority of municipalities relied on a service provider to handle everything in their municipalities. According to Marutha (2016:28), the scope of records and archival rules covered both the basic model of paper-based record archiving and the archive obligations,

which have proven to be a problem for many archival institutions when it comes to handling electronic records. Despite its emphasis on the public sector, the IRMT (2004:8) e-readiness evaluation tool emphasises that, within the context of national legislation and standards, each entity implementing e-government services should define internal policies and responsibilities for records and information management in a manner that is acceptable to its internal organisational structure, culture, and resources. Again, providing a suitable policy that guides liquid communication appears to be a challenge for the Botswana government. These are some of the policies cited that do not affiliate with web archiving. The discipline of GEIT is supported by several reference frameworks to guide its implementation. The most prominent are COBIT, ISO/IEC 38500 on ICT Governance, the lT Infrastructure Library (ITIL), and lS027001 (previously lSOl779) on information security.

The study looked at the legal requirements for archiving websites for municipal day-to-day operations. As reflected in Chapter Four, the study revealed that municipalities must learn how to archive various types of websites (such as Twitter, blog posts, podcasts, and so on) that originate from their municipal portal. During the interviews, participants were asked whether or not their municipality has web archiving policies in place, as well as how they manage their municipalities' websites. Participant 1 stated: "*I have never heard of such a policy in my life and it sounds interesting*". Participant 2 noted: "*For us, we only use websites to share information and we do not think we should have a specific policy for them*". The study revealed that municipal websites in KZN do not appear to be treated as a valuable source of information worthy of having a web archiving policy. It is critical to have a specific policy that explains how what they do will provide direction.

It was also revealed that service providers are the most preferred method for municipalities to manage and post on websites. According to the study, service providers are in charge of everything related to the website, including its creation, management, and information harvesting. It was also revealed that the municipalities outsourced the service to a service provider due to a lack of people with relevant skills. The study also revealed that no follow-up is done with service providers because this process is tendered, and the information is not handed over to the municipality after the contract expires. It was also revealed that after each contract, they would advertise for and award the next contract to the next company. What happens to sensitive information handled by the service provider is a critical consideration. However, it is concerning that some municipalities do not take record management (creation,

receipt, maintenance, use, and disposal of records) seriously. According to the Public Records Office Victoria (2013), any communication between the government and the public must be kept for accountability and transparency under records management requirements. According to ISO 15489-1 2016, regardless of the type of record (form or structure), it should include the following: value, authenticity, reliability, integrity, and usability to be considered authoritative evidence of business events or transactions and fully meet the business requirements. Having said that, municipalities must seize complete control of their municipal websites for the public to see accountability and dependability.

5.2.2 Standards for web archiving

Participants were also asked about the availability of web archiving standards and guidelines, and some that were discovered included municipal ICT, service components (SC), and configuration items (CIs). This includes, but is not limited to the following:

- host systems, including rebooting of servers;
- environmental components, power systems, fire suppression systems;
- all hardware components;
- software elements, including application and databases systems;
- network components, including physical cabling;
- security devices; and
- documentation, including policies, procedures, service catalogues, and system documentation.

It was also discovered that, as shown above, there is no clear policy or standard in place for archiving websites in all KZN municipalities. It was also revealed that specific departments dealing with municipal websites use an ICT policy and a communication policy to guide their daily operations. The document review revealed that the majority of municipalities in KZN attempted to develop and implement a variety of basic internal policies, standards, and procedures, particularly in the ICT and communication departments, to keep up with the day-to-day operation of the municipalities' websites. Policies on record management must be established, registered, and enforced per the International Records Management Standard ISO 15489, derived from business goals and supported by business rules or procedures for managing records (2016:8). Policy creation should be guided by an understanding of the market context, as well as criteria for documents relevant to the policy's reach (ISO 15489 2016:8). It

is noted that the policies or standards do not address web archiving adequately. The study looked at the legal requirements for archiving websites for them to function daily. In Chapter Four, the study revealed that municipalities must learn how to archive various types of websites (such as Twitter, blog posts, podcasts, and so on) that originate from their municipal portal. During the interviews, participants were asked whether the municipality has web archiving policies and how the municipalities' websites are managed.

To emphasise what was previously stated, one of the participants stated: "*I have never heard of such a policy in my life and this sounds interesting*". Another participant noted that "*for us websites, we only use them to share information and we do not think we should have a specific policy for them*". According to the findings of the study, municipal websites in KZN are not being treated as a valuable source of information worthy of a web archiving policy. It is critical to have a specific policy that explains how what they do will provide direction. It was stated that the Act is the primary piece of legislation governing archives and records management (Parer 2000:1). This is similar to the municipalities in KZN. They must have a policy in place that specifically addresses web archiving. Scholars such as Ngoepe and Keakopa (2011:155) and Ngoepe and Saurombe (2016:30) argue that archive legislation is ineffective in guiding digital record administration, let alone ensuring their accuracy for long-term digital preservation.

5.2.3 Control of the municipality website

The study sought to ascertain who was in charge of the websites of KZN municipalities and to comprehend the municipality's intentions when developing the website. Municipal websites were discovered to be one of the platforms used to share various types of information (job opportunities, tenders, and notices). Through systematic analysis, it was also discovered that municipalities use the municipal website to share reports for user access, national government budget allocations, recent activities where they interact with the public, and policies related to the municipality's functionality. To name a few, uMhlathuze Local Municipality, Ugu District Municipality, Kokstad Local Municipality, uMfolozi Local Municipality, Nkandla Local Municipality, and King Cetshwayo District Municipality do not have control over their websites and rely solely on a service provider to manage and run the municipalities on a daily basis. Municipalities in KZN, on the other hand, must have complete control over their websites and hire skilled personnel to run the municipality on a daily basis, including the development

of an automatic digital harvesting system to crawl the web during the web archiving process. According to Luthuli (2017), governmental bodies must take control of their organisations in order to be reliable and accountable. According to Smallwood (2014:31), organisations must formalise the process of acquiring or developing new systems, which includes all requirements for capturing the metadata required for the system's life-cycle management of records. This clearly demonstrates, however, that if organisations prioritise gaining control over their functionality, they will not incur expenditures from taxpayers' money.

There are also no plans for web archiving, long-term digital preservation, digital records management, or policy formulation that is solely focused on website functionality. In Chapter Two of Luthuli (2017)'s study, it was also stated that for effective record management, the national archive requires constant monitoring and evaluation from the public sector. Katuu and Ngoepe (2015) confirm that the regulatory framework governing public record functionality remains a challenge in the public sector. They added that due to a lack of proper systems in place, it is difficult to trace records dating back more than 20 years. Municipalities in KZN, on the other hand, are demonstrating this by failing to have fully functional systems in place, putting them at risk of losing all valuable data. It was also discovered that no collaboration existed between the IT/ICT and the records and archives departments. Again, there is no link between the communication department and the records and archives department. However, it has been discovered that in some municipalities, the only relationship they have is between the ICT/IT and communication departments. Because these departments have different skills and can avoid outsourcing everything to service providers, many things would be fully operational if they collaborated. The literature supports this, stating that websites are used to assist with customer service, information access, and direct community participation, as well as that interactions between the government and citizens on social media result in liquid communication (Duranti 2014). However, there is evidence that websites should be treated as records, with policies and legislation guiding how municipalities should operate.

5.2.4 Legal standards for archiving of municipal websites

The research looked into the legal requirements for archiving websites for everyday use. Municipalities, according to the report, must learn how to archive various types of websites that originate from their municipal portal (such as Twitter, blog posts, podcasts, and so on). According to the study's findings, there is no specific policy governing how municipal websites

should function, and municipalities rely on ICT policy in general to guide municipal functionality. Municipalities still need to develop a policy for web archiving. The municipality also does not value electronic records or content, as there were no activities centred on electronic content other than its placement on the platform. However, it was discovered that no plans for dealing with digital records were in place. According to the study's findings, most employees were unaware of the term "web archiving" which was mentioned in Chapter Four. Mosweu (2019:122) agreed, stating that 'liquid communication' was new to Botswana and that she needed to elaborate on the importance of having a related policy in place for its daily operation. "Public sector records management is subject to provisions in laws and regulations," she adds. The NARS Act requires government departments tasked with managing all records created by government agencies to also ensure good governance of liquid communications generated through the use of social media." Similar findings were confirmed by Balogun and Kalusopa (2021) in South African institutional repositories where information managers were unfamiliar with the terminology. This is similar to municipal governments in KZN. As detailed in Chapter Two, all governmental bodies must put in place the necessary infrastructure, policies, strategies, procedures, and systems to ensure that records, including websites, in all formats are managed in an integrated manner (NARSSA 2006). Balogun and Kalusopa (2021:1) discovered that Indigenous Knowledge Systems (IKS) in South African institutional repositories "lack a standard policy guiding the digitisation project, and also admit to a lack of knowledge or in-depth understanding of web archiving and its prospects as a digital preservation measure." This is consistent with findings from municipalities in KZN reported by Balogun and Kalusopa (2020), who conducted research in Africa as well. Municipalities do not have a comprehensive understanding of web archiving and long-term digital preservation.

5.2.5 Policies used by the municipality to crawled web

The purpose of the study was to determine whether or not municipalities have a policy that guides them when harvesting websites. As stated in Chapter Four, there is no specific policy resulting from web archiving that details KZN municipalities' crawling process. It was discovered that the ICT/IT policy and the communication policy were being applied to the majority of the functionalities of the municipalities' websites. URLs, keywords, dates, themes, and prospect departments were used to crawl the websites. This, however, poses a challenge for municipalities because they must develop a standardised system that all municipalities will use when crawling the web. Social media posts, according to Franks and Smallwood

(2014:264-254) and Madhava (2011:33), can be used in court. As a result, they must be handled with care, including metadata and hyperlinks to the content being created, and they must be preserved for e-discovery purposes. Kalusopa and Zulu (2009) confirm that policy and digital preservation frameworks are major concerns in African countries when it comes to digital preservation. It suggests that, while municipalities have policies governing how they manage or crawl the web, a policy governing web archiving is lacking and desperately needed.

5.3 Scoping and data capture phases involvement in activities and decisions of municipality websites

According to the reviewed literature, records management is the process of managing records related to aligned activities based on their life cycle (Ismail & Jamaludin 2009:138; Ngoepe 2014:2). That was not the case in KZN municipalities, which operated without adhering to records management procedures. It was also revealed that various municipalities create paper records first before migrating them to digital content, and they use emails to share them with prospective heads of departments and service providers in charge of managing the websites. A follow-up question was posed to better understand the system used for both paper records and digital content. As stated in Chapter Four, KZN has no system in place to control or store information generated by municipalities. SharePoint and WordPress were mentioned by the municipalities of Kokstad Local Municipality, Ethekwini Metropolitan Municipality, and KwaDukuza Local Municipality as software used to manage content published on websites. Since records creation could not be tracked throughout the entire process, it was clear that the records management functional operations were not clear from the first phase of creation and receipt. It also became clear that municipalities have no control over record management. It is clear that municipalities in South Africa are most confident when using paper records or manual systems for records management (Lott 1997: iv; Weeks 2013:140-143). This is no different in municipalities, where paper-based records are created first before digital records are created.

5.4 STRATEGIES FOR WEB ARCHIVING KZN

The web archiving life cycle model examined long-term digital preservation strategies by combining the technological and programmatic arms of online archiving. The study discovered that municipalities in KZN have a long-term digital preservation plan in place, but their websites are only designed to function for five or three years. According to the study's findings, they would like to have full control of municipal websites at some point and to be supplied with training that will allow them to construct a website on their own so that they do not have to rely on service providers to accomplish it. Those municipalities who already manage and create their own websites stated that they hope that their websites would be up to date notwithstanding the software they use. "Frequent training to brush up on our skills will help us from time to time, because some of the things, we are learning ourselves on the job through YouTube," the other municipality even added. As indicated in Chapter Four, content analysis found that one of the strategies outlined by the communication policy (P21) in those municipalities responsible for websites is to "ensure accessibility of municipal websites to stakeholders at all times" (on 12.2.7:7). According to ISO 16175-3:2010, organisations must specify the particular needs for long-term digital preservation by allowing records to be exported to a system capable of long-term preservation activities, as stated in Chapter Two.

The following themes were employed in long-term digital preservation strategies::

- Control of the materials on the website;
- The extent of the accuracy of the work on the municipalities' websites;
- The impact and strategies of municipalities' websites;
- Have full ownership of the municipal websites; and
- Have continuous training for records management.

5.6 STORAGE OF CONTENT PUBLISHED ON THE WEBSITES IN MUNICIPALITIES

For decades, storage has been a problem in record management systems, particularly for physical records. Because they save space and time, electronic or digital records have proven to be a lifeline for many organisations. The use of cloud computing services by businesses has skyrocketed in recent years (InterPARES 2016). According to the study, the majority of municipalities in KZN rely on service providers daily to create, manage, and upload materials.

Participants stated that they do not view municipal websites as records, but rather as a platform for communicating with the public. It is evident in their policies, which exclude website management and control. Communication between government and communities, according to Public Records Office Victoria (2013), should be viewed as a source of accountability and transparency, and should adhere to records management requirements. Mosweu (2019:130) discovered that the Botswana government does not consider social media to be a record. She adds: "Liquid communication generated through the use of social media by the Botswana government is evidence of government business and should be treated as such." According to the literature, countries such as the United Kingdom, the United States of America, Singapore, Canada, and Australia are frontrunners in developing policies and guidelines for other government agencies dealing with web domain information (social media, websites, etc.). Government agencies have taken the initiative to make managing all information posted online a top priority for all government agencies.

However, as revealed in Chapter Four, this was observed in the majority of municipalities where no one was in charge of managing website content for posterity. According to the Public Records Office Victoria (2013), when capturing outlines of web content, the following should be included:

- The original post from the site;
- Responses to the original post, if any;
- Relevant posts identified when monitoring the sites; and
- Content republished by the agency when the content has come from elsewhere.

According to Rogers (2014:8), regardless of the form of the records, they must be maintained and preserved in order for their authenticity and reliability to be protected.

5.6.1 Information posted on municipal website

Records management, according to ISO 15489-1 (2016: v), entails "taking appropriate action to protect their authenticity, reliability, integrity, and usability as their business context and requirements for their management change over time." According to the findings of the study, most municipalities rely on various departments to provide them with accurate information, working hand in hand with the head of each department. For the accuracy of the information,

it was revealed that they rely on various departments to provide them with relevant information based on their perspective functionality. It was also revealed that the pandemic has put pressure on many organisations to keep a safe physical distance between their employees, and as a result, municipalities have had to find a way to communicate with communities. As a result, one of the methods used for raising awareness was the use of websites. According to Rogers (2016:17), record authenticity is an important theory for archival science that has a theoretical foundation that allows ICT professionals to function. This is no different in municipalities, where professionals with specific skills are required to function efficiently. According to Jansen (2014:39), digital records must be kept for the sake of authenticity and sustainability. Furthermore, the most significant barrier to most municipalities gaining control of the content generated daily across multiple platforms was identified as skills (websites, Facebook, Twitter, etc.). The InterPARES Project addressed the concerns raised by the preservation of authentic digital records by developing essential knowledge that can be used to ensure the long-term authenticity of digital records (Rogers 2009:37).

5.6.2 The strategies of municipality websites

According to the study findings, most municipalities rely on various departments to write municipal strategies. Furthermore, because they lack understanding of the system, senior management relies on those who manage websites (IT and communication departments) to improve the standard of their municipalities' websites across KZN. It was also revealed that one of the issues is that most employees are hired out of politics or positions of leadership, and the skills required for the job are not taken into account. The study also revealed that municipal websites play an important role in the dissemination of information such as job openings, tender applications, and municipal activities. According to Wamukoya and Mutula (2005a:73), when managing records in a digital environment, staff members in organisations face a variety of challenges because new technologies require new skills and competencies to operate in such an environment. This confirmed the findings in Chapter Four that various municipalities do not hire skilled employees, prompting municipalities to outsource services to service providers. Employing skilled personeel would help municipalities save costs while also increasing employee creativity as they would share ideas that would help the municipality grow. According to Eastwood (2006), archivists must have a wide range of skills, including the ability to design, implement, and manage record-keeping systems, which is especially important in the digital age. The National Archives of Australia (NAA) (2015) also confirms the need for

records management professionals to possess the competencies and skills required to manage records in the digital age.

5.7 Risk related to web archiving

According to Bragg and Kristine (2013), the web life cycle model requires institutions to take a specific approach when developing web archiving programmes in order to avoid risk. They also mention copyright, permission, and access issues, and government agencies have been identified as one of the targeted bodies when it comes to hacking, as detailed in Chapter Two. According to the findings of the study, municipalities do not face many risks. The other participant stated: "... *since we do not manage websites ourselves, we rely on the service provider or consultants*." It was also revealed that no specific policy governing web archiving exists in all municipalities. Another issue is fake news on social media platforms such as Facebook, Twitter, and email, where people spread inaccurate information about municipalities. Fake news about vacancies, press releases and confidential documents from the municipality, and fake municipal pages (Facebook, Twitter, blogs, etc.) are examples of fake news that end up tarnishing the municipality's name. People begin to distrust the municipality over time as a result of incorrect information being disseminated. Municipalities are required to implement systems to prevent such incidents from occurring. This is no different when dealing with digital records, as they may be altered accidentally or on purpose (Boudrez 2005:1; Xie 2011:577). This is why organisations must always maintain the authenticity of the records they create (Duranti & Blanchette 2004; Mason 2007:32). This also entails hiring skilled individuals and implementing a directive policy based on web archiving, which can reduce the various risks associated with all platforms.

The literature in Chapter Two has revealed that there are growing significant issues where we have seen numerous attacks on websites where websites are hacked to obtain access to critical information, but had websites been archived, they could have protected the information deemed sensible and important. According to Venkatesh (2016), customer information went viral at eThekwini municipality (Durban) when the URL was edited, releasing customer information. To correct the error, the website was taken offline. This raised concerns among the participants that the public is aware of this, prompting them to evaluate the municipalities' websites and categorise them into various departments for the monitoring process to be implemented. It was also seen on the ANC Youth League website when it was defaced, with a fake message

purportedly from Julius Malema, the then-president of the Youth League, stating that he was stepping down (Redelinghuis 2011). Furthermore, three government websites were defaced in 2012 by Moroccan hackers in protest of South Africa's official position on Western Sahara (Saville 2012).

5.8 Appraisal and selection for archiving municipal websites

According to the study, the Ethekwini Metropolitan Municipality, Umshwathi Local Municipality, and KwaDukuza Local Municipality are in charge of sharing information. The participants from the metropolitan municipality further responded (1, 2 & 3) by saying, "*We only rely on various departments like parks or electrical departments to give us related content, together with pictures that support the story to be published. We then put together a story to be posted online (websites, Facebook, Twitter*)". This, however, implies that the municipality must assume responsibility for its operations at all operational levels. According to the findings of the literature review in chapter two, the Government of Canada Web Archive has made it a point to archive websites to facilitate easy access to information (Cantello & Stegenga 2008). This process allows easy access to the website as well as a simple selection process within the agency.

The study also revealed, through a systematic review, that some of the websites' content is out of date because they date back to 2016 or 2017 (uMuziwabantu Local Municipality, Ubuhlebezwe Local Municipality, Maphumulo Local Municipality, and Richmond Local Municipality), as reflected in Chapter Four. This means that municipalities must prioritise maintaining their websites and performing frequent updates to attract users.

The websites from 2019, 2020, and 2021 were also evaluated in the study. In 2019, it was revealed that most municipal websites' information was posted when the websites were created. The change became apparent in 2020 as a result of the situation as it was during the pandemic when most municipalities were forced to adapt to change and the digital world. After six months, there had been no new update relating to awareness of Covid-19 or any other recent news. It was also revealed that some of these issues were caused by the fact that municipalities rely on the service provider to do everything related to websites, including their creation, management, and maintenance. Records can be controlled, created, and implemented in a

variety of ways, according to ISO 15489 (2016:13), depending on the technological and business environment.

The study also revealed that most municipalities use URLs and keywords when selecting information for their websites. It was also discovered that for the appraisal, they rely on software to store all of the information in case it is needed later. These municipalities' websites in KZN are programmed for a specific period, depending on the term of office of the leadership in charge at the time. It was discovered that they rely on all social media platforms to disseminate information shared by the municipality for public consumption. Municipalities used the cloud, as well as internal and external servers, to save content for posterity.

5.9 SKILLS FOR WEB ARCHIVING

The qualification for web archiving sub-objective sought to comprehend the skills and qualifiacation required when hiring personnel to manage websites. According to the findings of the study, the personnel were hired based on the following qualification:

- ICT specialists;
- IT skills, which some hold a diploma in information technology;
- Communication degree/ diploma;
- Website and digital media officer; and
- Grade 12/ Standard 10.

This, however, indicated that they lacked archives and records management training, as well as any related web archiving skills. They also revealed that they received no training from the municipalities regarding website functionality or content management (uMhlathuze Local Municipality, Nkandla Local Municipality, Greater Kokstad Local Municipality, Harry Gwala District Municipality, and Ilembe District Municipality). It was also revealed that those who attended tertiary institutions could put their qualification to use when managing websites (IT or communications). According to Eastwood (2006), archivists must have a variety of qualifications, related skills, including design and implementation, to keep up with the changing times of the digital era. This was also evident in the National Archives of Australia (NAA) (2015), which sees the importance of equipping records management professionals with relevant skills that will enable them to keep up with the digital age.

5.10 ACCESS OF WEB CONTENT IN MUNICIPALITIES

The purpose of the study was to see how easy or difficult it was for users to access municipal websites. The majority of municipalities (Richmond Local Municipality, Ugu District Municipality, Umshwathi Municipality, King Cetshwayo District Municipality, uMhlabuyalingana Local Municipality, City of uMhlathuze Local Municipality, Dr Nkosazana Dlamini-Zuma Local Municipality, etc.) have a statistics account that detects the number of people accessing the municipalities' websites, according to the findings of the systematic review. On a daily and monthly basis, the statistics track the number of people who visit the municipality's website. The study also discovered that municipal websites are linked to various types of social media pages created by the municipality. It was also revealed that municipal websites are mostly used for posting job openings, bidding for tenders, and distributing yearly reports, as well as budget allocations and government speeches (president, mayor). The Government of Canada Web Archive, according to the reviewed literature, has made it a point to archive websites because it allows them to easily access information (Cantello & Stegenga 2008). This is comparable to municipalities. If they use web archiving, their users will have easy access to website information and will be able to determine whether it is still relevant to their provision. The web lifecycle model, according to Bragg (2013), emphasises access in terms of making decisions about whether and how to provide access to their collections, as well as monitoring how patrons use the contents.

5.10.1 Usage of municipalities websites

According to the findings of the study, municipalities perceive a website as a more formal approach that cannot be easily manipulated by the public. Fake news is most prevalent on Facebook, Twitter, Instagram, and other social media platforms, where it circulates fake news about job opportunities and fake notices about the municipality's implementation of something. Websites are also used to download application forms and tender application forms, as well as to confirm some circulated notices, as they are regarded as the most reliable platform. The response demonstrates that municipalities in KZN must consider the systems in place to be more effective, as websites are regarded as more reliable than other platforms for sharing information. According to Shepherd and Yeo (2003:216), municipalities require a records management system that captures records and allows users to use them systematically. As a

result, all records are created for a specific purpose and should be treated accordingly. Rogers (2009:37) also confirms the preservation-related issues. The InterPARES Project has addressed authentic digital records by developing long-term preservation of authentic records created or maintained in digital form, which serves as the foundation for policies, standards, and strategies, including plans for the longevity of the material used for trust in its authenticity.

5.11 HARVESTING OF WEBSITES INTO A DIGITAL REPOSITORY

According to the reviewed literature, websites should be harvested when looking for specific information, and the entire web domain should be archived for easy access using the web life cycle (crawler or scoping). Web harvesting is also known as web scraping through a search engine, according to the literature in Chapter Two (Davis 2010). According to Ngoepe (2017), the digital records that will be transferred from records into the archive repository will also require archival custody. NARSSA must endorse a policy that will allow government entities to develop a provisional infrastructure to preserve digital records. The study sought to establish the municipality's harvesting process in the e-records repository. As shown in Chapter Four, the majority of municipalities revealed that they are unaware of any harvesting tools used by the municipality. Because some people do not have control over the material posted on websites, they are unaware of the tools that are being used to track the information published on the websites. Another finding of the study was that most municipalities were unable to use websites, and some cited technical resources as a factor. It became evident that the few who consider themselves to be harvesting process practitioners use software such as WordPress, Drupal, SharePoint, and TTech. When it comes to the harvesting of information by all KZN municipalities, the municipalities still need to do more. This issue is not unique to South Africa, particularly KZN, but has been seen in the ESARBICA region by scholars such as Wato (2006:74), Kemoni (2009:194), Kamatula (2010); in African countries by Mnjama and Wamukoya (2007:279), Asogwa (2012:202), Abuzawayda, Mohd and Mohd (2013:250), Adu and Ngulube (2017:1131); and around the globe as a whole (also in China, Iceland and Malaysia, just to name a few, by Saman and Haider (2012:8) and Wang (2009:7).
It also included the following sub-objectives:

- Web content appraisal, web content selection, and workflow management
- Access to web content in municipalities

5.12 PROPOSED FRAMEWORK FOR WEB ARCHIVING

Participants in the study were given the opportunity to provide feedback on the development of a web archiving framework for municipalities to aid in the functionality and sustainability of municipalities. Various ideas were expressed during the interviews and were taken into account. Among these suggestions are:

- Training of website handlers
- Clear policy development on web archiving
- Implementation of solid policy to guide the functionality of the websites
- Suitable resources to be used and guidance on managing websites
- Develop a web crawl system that is effective in tracing information
- A policy that has directive constructs on how to allow the flow of information
- Appraisal and selection of whether websites are required to be kept
- Risk management
- Preservation system
- Benchmark with various stakeholders to guide them
- Have control of the municipalities
- Prioritisation of information security
- Dedicated human and technical resources are needed to make sure that instant responses are there all the time
- Guidelines on usability and community standards are also important to have

5.12 SUMMARY

The chapter interpreted and discussed the study's findings. The discussion was founded on the data presented in Chapter Four as well as the literature reviewed in Chapter Two. The reviewed literature was used to either support or refute the findings of this particular study. The results were interpreted and discussed in light of the objectives outlined in Chapter One. It was noted that various policies exist in an attempt to establish some sort of guideline in the municipalities. It was also noted that, while municipalities in KZN have policies in place, very few of them focus on web archiving. The municipalities of KZN relied heavily on ICT and communication policies.

It was clear that technology continues to play a significant role in slowing progress in most municipalities, just as it does in any other developing country where technology is gradually being adopted (e-mail is very slow). The study also revealed that most municipalities continue to rely on service providers to keep their websites functional. The municipalities also revealed that ongoing training would be extremely beneficial in honing their skills.

Communications managers, records managers, general workers, and website and digital media officers must have technical competence, preservation, and web archiving skills to crawl the web for harvesting.

It was discovered that web content was not considered a record, and measures to ensure the integrity and protection of records were a significant issue. The same is true for the storage and disposal of online content. The next chapter provides conclusions, a summary, and recommendations for archiving KZN municipal websites. The chapter also proposes a framework that municipalities can use to help with website archiving.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The previous chapter discussed and interpreted data that were analysed in Chapter Four. This chapter presents the study's overall conclusions and recommendations. The following elements, according to Williamson and Bow (2000), should be considered when yielding conclusions and recommendations:

- The researcher should not over-conclude;
- Meaning that improper conclusions and generalisation should be avoided; and
- All research questions should be answered.

The chapter also presents a framework for mapping the process of preserving websites at the municipal level in the KwaZulu-Natal province. It is hoped that such a framework will improve municipalities' ability to communicate with their constituents as the front lines of service delivery at the local government level. If implemented, the framework may assist various stakeholders and the general public in understanding how knowledge is managed so that it is not lost to future generations. The chapter was structured to include an overview of the findings, conclusions based on the study's objectives, a proposed framework, and recommendations for future studies. This is provided in accordance with the study's aims.

The research aimed to explore the archiving of municipal websites in KZN to develop a framework for archiving websites. The specific objectives were to:

- analyse legislative, standards, and policy framework on web archiving in municipalities in KwaZulu-Natal;
- assess the strategies for long-term digital preservation for websites in the municipalities in KwaZulu-Natal;
- analyse risks associated with web archiving of municipalities websites in KwaZulu-Natal;
- determine the selection process for municipalities when archiving websites in KwaZulu-Natal;

- determine the storage of content published on the websites in municipalities in KwaZulu-Natal;
- assess the process of harvesting municipalities' websites into the trusted e-records digital repositories in KwaZulu-Natal;
- examine the access of archived web content in KwaZulu-Natal municipalities; and
- design a framework for web archiving to assist with proper management of websites in municipalities in KwaZulu-Natal.

6.2 SUMMARY OF THE FINDINGS

This section of the chapter summarises the study's findings based on the aforementioned objectives.

6.3 POLICY AND LEGISLATIVE FRAMEWORK FOR WEB ARCHIVING

The first objective of this research was to look into the legislation that resulted from municipalities in KZN archiving websites. The study examined the existing legislation and policies that are expected to support web archiving. According to the International Records Management Standard ISO 15489 (2016:8), the goal of issuing and implementing records management policies should be the creation, capture, and management of authentic, reliable, and usable records that have integrity and support and enable business activity for as long as they are required.

The following is a synopsis of the findings:

- According to the study, municipalities lack a dedicated web archiving policy or strategy to provide direction on website archiving governance, despite having policies on community participation in local government and access to local government information..
- The Electronic Communications and Transactions Act (Act No. 25 of 2002): The purpose of the Act is to legalise electronic communications and transactions, and to build trust in electronic records. Communication regards some of the legislation as the core function of various legislation that lends credence to the existence and operation of municipal communication.

Other pieces of legislation considered to be key:

- Constitution of the Republic of South Africa Act (Act No. 108 of 1996);
- Local Government: Municipal Structures Act (Act No. 117 of 1998);
- Promotion of Access to Information Act (Act No. 2 of 2000); and
- Media Development and Diversity Agency Act (Act No. 14 of 2002).

The study also discovered that municipalities' systems are managed by the IT/ICT department and the communication department, whose responsibility is to manage all content posted on websites using programmed software. It was noted that the Information Security Policy governs how the IT/ICT manager and other stakeholders function. The following components are present and functional:

- Electronic records management policy;
- E-mail policy;
- Document imaging; and
- Web content management policy.

The documents' contents were analysed, and it was discovered that the policies were used by municipalities to work in the ICT and communication departments, which are in charge of the municipalities' websites. It was also discovered that service providers manage the majority of municipalities in KZN. It is unknown which policies the service providers are employing. It is critical for accountability and transparency that the government's engagement with residents on all media platforms, particularly municipalities, be maintained. According to the literature, other organisations in countries such as the United Kingdom, the United States of America, Canada, and Australia have web archiving policies and plans to guide the management of web content or information posted on websites (The National Archives of the United Kingdom 2010, 2014; Duranti & Thibodeau 2006; Rounds & Horton 2004).

Due to the fact that municipalities are affiliated with government agencies, the South African government's failure to maintain websites will result in legal and records management issues. Despite the fact that municipalities in KZN made a deliberate decision to investigate web archiving, this study discovered that there are risks associated with their website use. More rights are being granted to service providers. Disinformation, a lack of digital record recognition, website maintenance, information security, fake news, and a lack of web archiving policy are among the threats. A solid legal and policy framework is required to aid in the

capture, long-term digital preservation, and access archiving of municipal websites in KZN. In most European countries, governments are in charge of managing and preserving the data and information that they generate. The Government of Ontario, for example, is required to follow the Archives and Recordkeeping Act, and the Archives of Ontario provides a set of rules, retention schedules, and fact sheets to assist government agencies in keeping track of their records (Ontario Ministry of Government Services 2011).

6.3.1.2 SCOPING AND DATA CAPTURE PHASES INVOLVEMENT IN ACTIVITIES AND DECISIONS OF MUNICIPALITY WEBSITES

It was noted that municipalities in KZN manage various platforms of social media pages, but it was later discovered that the majority of these platforms lack an appropriate system for maintaining websites. It was also discovered that websites and Facebook were maintained more than other social media platforms such as Twitter, YouTube, Instagram, and Google+. The study discovered that municipal websites generate a wide range of financial records, including budgeting records (e.g. commitment and expenditure records), payables (e.g. invoice registers, expenditure reports, payment registers, listing reports), and receivables (e.g. auction reports, revenue receipts, advance overpayments, traffic fines) (estimated budgeted against collected revenue, budget actual expenditure, development votes and budget against actual expenditure). Capturing records into the system is done either directly on municipal websites or by uploading them to the system.

6.3.1 STRATEGIES FOR WEB ARCHIVING

For some time now, KwaZulu-Natal municipalities have actively recognised the importance of developing websites as part of their communication process to stay in touch with the various communities that they serve. The study discovered that municipalities use the website to share reports for user access, national government budget allocations, recent activities in which they interact with the public, and policies related to the municipalities' functionality. It was also discovered that this method allows communities to gain access to all of the municipality's activities. The national ICT and communication policy was identified as the primary driver for the government to provide more people with access to municipal websites in KZN in this study. It was discovered that some municipalities do not frequently update their municipal websites

as a result of a lack of ICT skills as a problem associated with the use of municipal websites. It was also discovered that service providers play a significant role in the operation of municipal websites. Once again, the communication department has no ties to the records and archives departments. However, it was discovered that in some towns, the only relationship exists between the departments of ICT/IT and communication. Many things will be fully functional if these departments collaborate because they have diverse skills and can avoid relying on service providers for everything.

The study discovered that municipalities in KZN have a long-term digital preservation plan in place, but that the municipalities' websites are only programmed to run for five or three years. According to the findings of the study, they would like to have full ownership of municipal websites at some point and to be provided with training that will enable them to develop websites on their own so that they do not have to rely on service providers to do so. When combining the technological and programmatic aspects of web archiving into a framework that can be used by any company looking for ways to archive web material, the Web Archiving Life Cycle Model notes that. In its vision for its digital preservation approach, the online archiving life cycle model emphasises capturing born-digital material as one of its tactics. Long-term digital preservation is required by all institutions to maintain control over the information that is digitised, with web archiving being used to facilitate future access (Costa, Silva & Gomes 2016).

6.3.4 RISK RELATED TO WEB ARCHIVING

It was discovered that there is no specific policy governing web archiving in any of the municipalities in KZN. Another problem identified was fake news on Facebook, websites, Twitter, and email, where people spread inaccurate information about municipalities. Fake news about vacancies posted on websites, press releases and confidential documents of the municipality, and fake municipal pages (Facebook, websites, Twitter, blogs, etc.) that end up tarnishing the name of the municipalities are examples of fake news. People begin to distrust the municipality over time as a result of incorrect information being disseminated. Municipalities are required to implement systems to prevent such incidents from occurring. This is no different when dealing with digital records, as they may be altered accidentally or on purpose (Boudrez 2005:1; Xie 2011:577). This is why organisations must always maintain

the authenticity of the records they create (Duranti & Blanchette 2004; Mason 2007:32). Hiring skilled individuals and implementing a directive policy based on web archiving can help to reduce the various risks associated with all platforms. This says a lot about government websites, where altars have occurred on numerous occasions. As a result, the study was unable to determine the strategies in place to protect the information posted on KZN municipalities' websites. It was also discovered that those who manage their own websites have user access for their employees to control the usability and accountability.

6.3.5 APPRAISAL AND SELECTION OF MUNICIPAL WEBSITES

Municipalities in KZN must have control over their municipal websites. Municipalities must assume control of their operations at all levels. According to the findings of the literature review in chapter two, the Government of Canada Web Archive has made it a point to archive websites in order to facilitate easy access to information (Cantello & Stegenga 2008). This process allows for easy access to the website as well as a simple selection process within the agency.

According to the report, the websites were also analysed from 2019 to 2021. It was discovered in 2019 that the majority of municipal websites contained information when they were created. The transformation became apparent in 2020 as a result of a situation similar to that which existed during the pandemic, when most municipalities were forced to adapt to change and the digital world. This study's recommended framework for archiving websites, which advocates for the use of legal and records management regulations to ensure that content posted on websites as communication is appropriately collected and preserved for long-term digital preservation.

6.3.6 ACCESS OF WEB CONTENT IN MUNICIPALITIES

The objective of this study was to determine how simple it was for citizens to obtain municipal websites. The vast majority of municipalities (Richmond Local Municipality, Ugu District Municipality, Umshwathi Municipality, King Cetshwayo District Municipality, uMhlabuyalingana Local Municipality, City of uMhlathuze Local Municipality, Dr Nkosazana Dlamini-Zuma Local Municipality, and others) have a statistics account that can track the number of people who visit the municipality's website. The inquiry also discovered that municipal websites are linked to several social media pages created by the municipality.

It was also demonstrated that municipal websites are primarily used for job postings, tender bidding, and distribution of annual reports, as well as budget allocations and government speeches (president, mayor). According to the research, the Government of Canada Web Archive has made archiving websites a priority because it makes it easier for them to retrieve information (Cantello & Stegenga 2008). According to the Minister of Natural Resources Canada (2013), the usage of a web portal to provide access to records that may be searched using descriptive metadata is common. Users must be able to quickly locate a dataset of interest and learn how the records were created; learn about licences, use rights, and the cost of accessing that information; and place orders. They add that it also means that data delivery must be specified in detail. According to Bragg (2013), the web lifecycle model emphasises access in terms of making decisions about whether and how to allow access to their collections, as well as monitoring how patrons use the contents.

6.3.7 HARVESTING MUNICIPALITIES' WEBSITES INTO TRUSTED ELECTRONIC DIGITAL REPOSITORIES

The investigation sought to determine how the municipality obtained its documents for inclusion in the e-records repository. According to the findings of the study, the majority of municipalities are unaware of any harvesting tools in use by the municipality. Furthermore, because some municipalities have no control over what is posted on their websites, they are unaware of the tools that are used to track what is published on the websites. Another finding of the investigation was that the majority of municipalities are unable to use websites, and others cited technical resources as a barrier. It was discovered that those who consider themselves to be harvesting experts use software such as WordPress, Drupal, SharePoint, and TTech. When it comes to the harvesting of information by all KZN municipalities, the municipality still needs to do more. Managers are responsible for ensuring that the requirements for business process records in their industries are met. Service providers are responsible for ensuring that the records systems under their control run continuously and reliably, as well as that all system records are accurate and up to date. The fundamental problem was identified as a lack of technological resources and capacity in website design and management.

6.4 CONCLUSIONS

This section presents the conclusions based on the findings of the study. The findings of the investigations are categorised based on the study objective. Furthermore, in Section 6.5 of this study, a proposed framework is presented and discussed. According to the University of Southern California (2018), the goal of the conclusion is to help the reader understand why the research is important after they have finished reading it.

6.4.1 POLICY AND LEGISLATIVE FRAMEWORK FOR WEB ARCHIVING

A legal framework is required to guide records, regardless of format or medium (Mosweu 2018). According to the findings, there is still a lot of work to be done in terms of legislation and policy. It was also discovered that many municipalities have a policy in place that addresses digital content management in the context of IT/ICT and communication. It still lacks the web archiving policies required by law and when archiving websites. The study revealed that municipal websites in KZN do not appear to be treated as a valuable source of information worthy of having a web archiving policy. According to the study's findings, municipal websites in KZN do not appear to be regarded as a valuable source of information worthy of archiving. It is critical to have a policy in place that outlines what they can do and provides guidance.

6.4.2 SCOPING AND DATA CAPTURE PHASES INVOLVEMENT IN ACTIVITIES AND DECISIONS OF MUNICIPALITY WEBSITES

According to the report, the websites were also reviewed from 2019 to 2021. It was discovered in 2019 that the majority of municipal websites contained information when they were created. Transformation became apparent in 2020 as a result of circumstances similar to those that existed during the epidemic when most municipalities were forced to adapt to change and the digital world. There was no new information about Covid-19 awareness or any other recent news after six months. Some of these issues were also discovered to be the result of municipalities relying on service providers to handle everything related to websites, including their design, management, and preservation. Following a thorough examination, the study discovered that some of the websites' content was outdated, dating back to 2016 or 2017. It means that municipalities must prioritise website maintenance and frequent updates to attract users.

6.4.3 STRATEGIES FOR WEB ARCHIVING

The statistics count indicates how many people visit the municipality's website on a daily and monthly basis. The study also discovered that municipal websites are linked to a variety of social media pages that the municipality has created. It was also demonstrated that municipal websites are primarily used for job postings, tender bidding, and distribution of annual reports, as well as budget allocations and government speeches (president, mayor). The study discovered that municipalities in KZN have a long-term digital preservation plan in place, but that the municipalities' websites are only programmed to run for five or three years. According to the findings, they would like to have full ownership of municipal websites in the future, as well as training to be able to develop websites on their own rather than relying on service providers. Municipalities that already manage and create their own websites expressed optimism that their sites would be up to date, regardless of the software used. Since it was discovered that the majority of municipalities in KZN rely on pre-programmed software to aid in long-term digital preservation, various municipalities did not hire skilful people. As a result, municipalities began to outsource services to service providers. Employing skilled personnel would help municipalities save money while also increasing employee creativity as they would share ideas that would help the municipality thrive.

6.4.4 RISKS ASSOCIATED WITH WEB ARCHIVING

The study discovered that there was no explicit policy on web archiving in any KZN municipality. As a result, fake news on Facebook, Twitter, websites and email was identified as a problem, with people exchanging inaccurate information about municipalities. Fake news about job openings, as well as press releases and confidential information from the municipality, are posted on websites, as are fake municipal pages (Facebook, Twitter, websites, blogs, and so on) that harm the municipality's brand. According to the study, there are increasingly significant issues where they have seen numerous attacks on websites such as hacking of websites to gain access to critical information. However, if websites had been archived, they could have protected the information deemed sensible and important. Records

are authentic because they are handled by trustworthy, secure, compliant, comprehensive, and methodical record-keeping systems (ISO 15489 2016).

6.4.5 STORAGE OF CONTENT PUBLISHED ON THE WEBSITES

It was discovered that information is shared in the municipality based on the function of each department. It was also revealed that some municipalities establish paper records before migrating them to digital material and that they discuss them via email with department heads and service providers who manage the website. It was found that KZN does not have a mechanism in place for controlling or storing data generated by municipalities. Furthermore, it was established that municipalities have no control over record management. When it comes to records management, it is clear that municipalities in South Africa prefer paper records or manual procedures (Lott 1997:iv; Weeks 2013:140-143). Municipalities are no exception, as they begin with paper-based records before transitioning to digital records. It was also discovered that those who had attended post-secondary institutions were qualified to manage the websites using their expertise (IT or communications). To keep up with the changing times of the digital world, archivists, according to Eastwood (2006), must have a variety of skills, including design and implementation. This was also evident in the National Archives of Australia (NAA) (2015), which believes that records management personnel must be equipped with essential skills to keep up with the digital age.

6.4.6 APPRAISAL AND SELECTION OF MUNICIPAL WEBSITES

According to the website, the municipality uses a variety of social media platforms to communicate with its users and share information, and the website is linked to a variety of social media platforms owned by the municipality. It was also discovered that some municipalities have one person responsible for operating social media sites. When asked why, they stated that it helped with accountability. It was also discovered that municipalities have the ability to limit user access to their municipal websites.

6.4.7 HARVESTING OF MUNICIPALITIES WEBSITES INTO TRUSTED DIGITAL REPOSITORIES

The majority of municipalities claimed to be unaware of any municipal harvesting equipment. Some municipalities are unaware of the tools used to track what is published because they have no control over what is posted on the Internet. According to the study, the majority of municipalities are unable to use websites, and others cited a lack of technical resources as a barrier. It became clear that harvesting experts relied on software such as WordPress, Drupal, SharePoint, and TTech.

6.5 RECOMMENDATIONS

This section contains recommendations for resolving issues discovered during the research. The recommendations address each of the study's research objectives.

6.5.1 POLICY AND LEGISLATIVE FRAMEWORK FOR WEB ARCHIVING

According to the findings of the study, municipalities in KZN have a poor legislative framework that does not provide guidance for the maintenance of digital data published on the site, instead focusing on web archiving. This policy should include a statement about scope, such as which aspects of managing records they cover, applicable standards, and auditing requirements, and should also indicate the business activities to which the policy applies, according to the International Records Management Standard ISO 15489 (2016:8).

The following are recommended:

- The National Archives and Records Services Act should be revised to include specific provisions for the administration of digital records in conjunction with web archiving.
- As its policy says, the National Archives and Records Services should be in charge of training and helping all public entities with record management.
- Municipalities must collaborate with stakeholders such as organisations with digital records preservation skills, ICT experts, legal practitioners, educators, and archivists to develop a digital records plan to support web archiving.

- Since the majority of municipalities in KZN have a records department, the working relationship between records managers, website and digital media officers, or content managers, needs to be strengthened for them to receive support from within the municipalities.

6.5.2 THE SCOPING AND DATA CAPTURE PHASES INVOLVEMENT IN ACTIVITIES AND DECISIONS OF MUNICIPALITY WEBSITES

According to website reviews conducted in 2019, the majority of municipal websites contained information when they were launched. The transformation became visible in the years 2020-2021 as a result of circumstances similar to those that occurred during the pandemic when most municipalities were forced to adapt to change and the digital world. The study recommends that municipalities use the pandemic to educate their employees on relevant skills to facilitate the archiving of websites and access to the system. The selection process should include the development of a long-term digital strategy as well as the maintenance of an accurate and comprehensive record of their business activities.

6.5.3 STRATEGIES FOR WEB ARCHIVING

KwaZulu-Natal municipalities have long recognised the importance of developing websites as part of their communication strategy in order to stay in touch with the many communities they serve. Municipalities have been seen using the website to communicate information on a wide range of topics, including notices. It was also discovered that municipalities in KZN attempted long-term digital preservation by programming their websites to keep information in the system for three to five years.

The study recommends that:

- KZN municipalities need to implement long-term digital strategies for posterity.
- Municipalities need to benchmark with other stakeholders to facilitate long-term digital preservation strategies.

- Municipalities in KZN need to treat websites as records and involve the municipal records managers and archivists who support the IT/ITC and communication departments.
- Municipalities in KZN have adopted various forms of social media to share information, which must be valued for transparency and accountability, as well as for the benefit of citizens.

6.5.4 RISKS ASSOCIATED WITH WEB ARCHIVING

According to the findings of the study, municipalities in KZN lack skilled personnel to manage websites. It was also revealed that there is no specific policy governing web archiving in all of KZN's municipalities. Another problem identified was fake news on Facebook, websites, Twitter, and email, where people spread inaccurate information about municipalities. Municipalities are required to put systems in place to prevent such incidents where data is accessed by unauthorised individuals. As a result, this study recommends that municipalities hire more qualified individuals to manage the day-to-day operations of municipal websites. More strategies are needed to improve the web archiving system in all municipalities to provide effective service delivery. The issue of hacking has been seen all over the world, and some organisations have taken the initiative to put major measures in place to prevent hacking from occurring regularly in public sectors. Moroccan hackers defaced three government websites in 2012 to protest South Africa's official position on Western Sahara (Saville 2012).

6.5.5 STORAGE OF CONTENT PUBLISHED ON THE WEBSITES

Municipalities in KZN were found to be in violation of records management requirements. As previously stated, information is shared in accordance with the functions of each municipality's departments. It was also revealed that several municipalities begin with paper records before transitioning to digital content, and that this information is exchanged via email with department heads and website service providers. The study's findings suggest that when it comes to capturing records into the system, they should consider an automated harvesting system of information directly posted on municipal websites. Long-term strategies are also needed to facilitate preservation and accessibility. Digital records management should be taught to archives and records management professionals on a regular basis. Municipalities in

South Africa are most confident when using paper records or manual record management systems (Lott 1997:iv; Weeks 2013:140-143). It was also discovered in KZN municipalities that before beginning any process involving records management and storage, they manually create records as well as the storage process. To facilitate storage and accessibility, records management functionality must be implemented.

6.5.6 APPRAISAL AND SELECTION OF MUNICIPAL WEBSITES

According to the website, the municipality uses a variety of social media platforms to communicate with their users and share information, and the website is linked to a variety of social media owned by the municipality. It was also discovered that some municipalities have one person in charge of running social media sites, and when asked why, they stated that it helps with accountability. It was also discovered that municipalities can limit user access to their municipal websites. When it comes to information evaluation, municipalities must develop a strategy. Furthermore, after each term of office, they should be held accountable for all content shared with service providers.

According to the findings, municipalities in KZN are managed by IT/ICT technicians and the communication department. According to the study, municipalities see websites as a more formal approach that is difficult for the public to manipulate. It was also demonstrated that municipal websites are primarily used for job postings, tender bidding, and distribution of annual reports, as well as budget allocations and government speeches (president, mayor). The Government of Canada Web Archive has made archiving websites a priority because it makes it easier for them to find information (Cantello & Stegenga 2008). According to the study, municipalities in KZN should implement a web archiving system to ensure access to all information posted on websites. The study recommends that access management be used to provide users with easy access. Long-term digital record preservation necessitates infrastructure. The study also recommends that the provincial archives be held accountable in municipalities across KZN through ongoing training, monitoring, and evaluation.

6.5.7 HARVESTING OF MUNICIPALITIES' WEBSITES INTO TRUSTED DIGITAL REPOSITORIES

According to the findings of the study, the majority of municipalities in KZN were unaware of the use of harvesting equipment. Some municipalities stated that they are unaware of the techniques used to track what is posted on municipal websites because they have little control over what is posted. Furthermore, the majority of municipalities are unable to use websites, and others cited a lack of technological resources as a barrier. It became clear that those who consider themselves harvesting experts rely heavily on software programmes like WordPress, Drupal, SharePoint, and TTech. These programmes enable municipalities to store information for a set period of time, depending on the contract awarded to that specific service provider. It was also revealed that some municipalities rely more on the system's operation. According to the study, the municipality should have a proper strategy in place to facilitate the harvesting system. Every employee is responsible for creating and maintaining a complete and accurate record of their company's operations in accordance with the ISO15483 guidelines. The study also suggests incorporating the creation, use, maintenance, modification, and preservation of digital records in KZN municipalities.

6.6 PROPOSED FRAMEWORK

The study's last objective was to propose a framework for web archiving to aid in the proper management of websites in municipalities throughout KwaZulu-Natal. The proposed framework (see Figure 6.1) is based on the study's findings, which are detailed in Chapters Four and Five, as well as the literature review, which is detailed in Chapter Two. The web archive life cycle model represents common workflows as well as the development of a measurable model to which organisations can refer when developing or improving their web archiving programmes. The Archive-It team developed this model based on their practical experience in web archiving, as well as feedback and lessons learnt from their partnerships with web archiving organisations. In archiving municipal websites in KwaZulu-Natal, the framework was found to be relevant to the South African context. Due to the municipalities in KZN's lack of formalised processes and procedures for archiving websites, the framework for archiving websites was proposed. The government is exposed to legal and regulatory risks due to the lack of a directive.

As a result, this study presents a framework for municipal online archiving. Figure 6.1 depicts a proposed structure to help municipalities ensure web archiving. Websites and their contents are included in the constructs to preserve them for future use. It keeps these websites' contents from being completely erased over time. Web archivists typically use web crawlers for automatic capturing due to the vast size and volume of information on the internet. The information on websites will be archived using a framework for web archiving. According to the findings of this study, archives and records management professionals are lacking in digital records management skills and competencies. Also, there are several issues associated with the preservation of digital documents in municipalities and long-term digital preservation for posterity.

Figure: 6.1 Proposed framework for web archiving of municipalities (Researcher 2021)

Based on the literature and the findings of this web archiving study, a framework for supporting the archiving of websites in municipalities was developed. The proposed framework expands on the existing body of knowledge about municipal website archiving. The web archiving framework first describes the overall structure of archiving websites, which includes legislation and regulatory requirements, digital content harvesting, e-government initiatives, and social media. These components are linked to one another using numbering to illustrate the relationship between them to create a coherent framework. The lack of a framework for web archiving prompted this study to develop a framework that could enable municipalities to function effectively under the proposed constructs. The study discovered that while most municipalities have a records and archives office, the offices do not contribute much in terms of documenting, digitising, harvesting, and posting information on websites. The web archive would contain evidence of the web-based application, source code, the programming language used to create the website, its contents, and other relevant information at the time of the most recent crawl. In the event of technical challenges resulting in the website's closure, hacking or other types of attacks on the website, or even the database via the website, the web archiving framework can assist in restoring the website and its contents (websites that are integrated by databases). Therefore, the proposed framework comprises working relations to assist municipalities in operating in a way that will sustain them for a long time. The following are some of the factors: internal web archiving, digital content harvesting, provincial archives, municipal websites, legislation and regulatory framework, and e-government initiatives.

To sum up the framework, municipalities publish content on their websites. Legislation is the source of both the websites and the content. Municipalities, for example, are required to have a website to communicate with members of the public and to publish information following relevant legislation such as PAIA. Such content can be archived internally within municipalities for the web pages that municipalities require for business continuity. When such content is no longer required for business purposes, it can be destroyed in accordance with disposal authority obtained from provincial archives by municipalities. The provincial archives, on the other hand, can harvest web content of lasting value for permanent preservation. There is no infrastructure in South Africa to ingest digital records into archival custody, as previously stated and supported by Ngoepe (2017). The NARSSA is in the process of implementing Archivematica and AtoM (Access-to-Memory) for digital preservation and access. Municipalities will be able to transfer their websites to the provincial archives repository because provincial archives will be a part of these systems. Alternatively, the

provincial archives repository may be able to harvest municipal websites daily for preservation. This will entail capturing individual municipality websites and storing them in the same repository as digital records, namely Archivematica, where they will be accessible to the public via AToM. The transfer to provincial archives can take place online, and these websites can include associated metadata. Municipalities will use this framework to consciously and proactively adapt to the new reality of digital records.

a) Legislation and regulatory requirements

To support the long-term digital process, appropriate legal and regulatory requirements must underpin a framework for archiving digital records from websites. According to the findings of the study, there is no specific policy governing web archiving in the majority of municipalities. Municipalities' use of websites was encouraged by the national ICT and communication policies, which recognised the importance of government presence online for citizens' quick and easy access to government services. The study discovered that municipalities' use of websites was fraught with challenges, such as a lack of web archiving regulations and strategies. The study also proposes legal and regulatory requirements to support the functionality of archiving websites to facilitate timely and effective service delivery. The International Records Management Trust (IRMT) developed an information management framework in 1999 that emphasises the relevance of policy procedures, structures, and systems, as well as the need for a long-term strategic plan for digital preservation. Various scholars have also noted that a lack of policy is a common problem in Africa (Masenya & Ngulube 2019; Gbaje & Mohammed 2013; Ezema & Ugwu 2013; Mutula 2014; Kalusopa & Zulu 2009). This, however, implies the need for a web archiving-specific digital preservation policy.

b) Internal web archiving

Web archiving, as defined in Chapter Two's literature review, is a relevant system for archiving information posted on the web or online in a variety of ways. According to the study's findings, official government websites are linked to a variety of platforms for information sharing, such as Facebook and Google+, Twitter, blogs, wikis, and YouTube. The interaction between the government and the public results in liquid communication. NARSSA (2006) considers websites to be the infrastructure and public face of governmental agencies. Government agencies must accurately document their websites over time so that they can reliably determine

what content was available at any given time. If websites are not properly managed internally, government entities may lose all information posted online and will be unable to retrieve the information posted on websites. Municipalities will be able to control electronic content posted on websites thanks to internal web archiving. This process will employ specialised software, and websites will be 'harvested' from their current positions on file upload.

c) Municipal websites

The study revealed that, after posting content on websites, it is critical to capture and control all content posted on social media platforms, regardless of its form. Websites are classified as records and should be treated as such. According to the study, websites should be harvested for specific information and the entire web domain should be saved for easy access via the web life cycle (crawler or scoping). According to the literature in Chapter Two, web harvesting is also known as web scraping through a search engine (Davis 2010).

According to Ngoepe (2017), archival custody is required for digital records to be transferred from the records repository to the archives repository. It was also discovered that no municipality in KZN had a formal policy on web archiving. Fake news has also been mentioned as a problem on social media platforms such as Facebook, Twitter, websites, and email, where people exchange inaccurate information about municipalities. False job postings, press releases, and sensitive municipal information are posted on websites, as are fake municipal pages (Facebook, Twitter, websites, blogs, and so on) that tarnish the municipality's reputation. It was revealed that no formal policy on web archiving exists in any of KZN's municipalities. Fake news on social media platforms such as Facebook, Twitter, websites and email was also mentioned as a source of concern, as people exchange inaccurate information about municipalities. On websites, fake job advertisements, press releases, and confidential information from the municipality are posted, as are fake municipal pages (Facebook, websites, Twitter, blogs, and so on) that tarnish the municipality's reputation.

Retention and disposition: Web archiving must be preserved for a reasonable period of time, taking into account legal, regulatory, fiscal, operational, and historical considerations. Municipalities should provide secure and suitable disposal to assist in the archiving of websites that are no longer required to be maintained in accordance with applicable laws and the institution's disposition policy. A company should have a records retention schedule or policy

in place to describe the procedures for transferring or disposing of archived websites to accomplish this. The National Archives and Records Service (NARSSA) should assist municipalities in developing rules for the retention and disposition of archiving websites.

Appraisal: Assessment, or determining the value of records, is an important exercise for any organisation to perform, particularly for information generated in web-based settings. Since there are many ongoing series of multi-media records to evaluate within unstable organisations, appraisal in online settings should focus on the record producer's functions and transactions rather than personal records and their potential applications (Cook 1997). If the information on websites created using the internet has long-term value, it should be preserved. Municipalities must have preservation measures in place to control the activities that ensure the stability and protection of intellectual content posted on various media platforms. Municipalities' information can be shared many times beyond the control of the organisation that created it, harvesting and posing preservation challenges. Mosweu (2018) attested that liquid communication hosted by the Botswana government lacks all of these components, such as appraisal, retention, and disposition because municipalities are linked by various liquid communications. To be effective, the web archiving framework requires that websites and all other media platforms be captured for long-term digital preservation, for posterity in municipalities. When it comes to web archiving, most frameworks are centred on the broader spectrum, with a specific focus that is centred on websites as the most used platform among others that are recognised by municipalities. The framework aimed to guide municipalities in managing their content posted on websites and other related media outlets to have a directive on how to manage all content posted on websites and how to harvest it further.

d) Harvesting digital content

According to the study, the majority of municipalities said they were unaware of any harvesting equipment used by the municipality. Some municipalities are unaware of the methods used to analyse what is written online because they have no control over what is posted on the internet. According to the web life cycle model, websites should be collected when looking for specific information, and all web domains should be preserved for easy access (crawler or scoping). Web harvesting is the term used to describe web scraping with a search engine (Davis 2010). It was also discovered that communication, information technology, and system application controls are critical in ensuring record security in computer-based information systems. According to this study, the general communication department, IT, and system application

controls are used to secure municipal websites in KZN. According to Ngoepe (2017), transferring digital records from records to archive repositories necessitates archival protection or harvesting; thus, the study concluded that NARSSA must endorse a policy that will allow government entities to develop a provisional infrastructure to preserve digital records. This digital content harvesting process links information to the internal web archive.

e) Provincial archives

Since a website is considered a record and should follow the life cycle, the proposed model includes two levels of web archiving: harvesting digital content links information to the internal web archive and harvesting to provincial archives. According to the study findings, there are no working relations between the provincial archives and the municipalities in KZN.

The KwaZulu-Natal Archives' role is to safeguard a treasure trove of documents, oral histories, maps, and photographs that tell the storey of the KwaZulu-Natal Province. The objects and functions of the KZN Archives and Records Service Act No.8 of 2011 are to ensure that public and non-public records of enduring value are preserved for use by the public and the State. That is to facilitate the accessibility of archivalia contemplated in paragraph (a) to the members of public, subject to this Act, the regulations and any other law governing access to the public records; to ensure the proper management and care of all public records by all governmental bodies in the Province; to participate in the National Automated Archival Information Retrieval System in terms of section 3(e) of the National Archives and Records Service of South Africa Act, 1996 (Act No. 43 of 1996); to promote an awareness of archives and records management; to encourage and organise archival and records management activities in the Province; provide training in archival techniques, management and preservation of records. This, however, puts the accountability on the Provincial Archives to work hand in hand with all government stakeholders and provide them with continuous training that will provide them with the required skills. Further, enforce work relations with in-house records managers and archivists to facilitate the process of records management, including web archiving.

f) E-government innitiatives

A website is one of the tools used to communicate information about an organisation to the outside world. While it is classified as a record, many organisations, including municipalities, do not consider it as such. During the interviews and document review, there were numerous revelations. Organisations should declare the aims of their web archiving operations, according to the web life cycle model. According to the life cycle model, institutions decide how to keep

the data collected during site archiving operations. This includes data files as well as metadata. As shown in chapter two, ISO 16175-3:2010 outlines the precise requirements for long-term digital preservation by allowing records to be exported to a system capable of long-term preservation activities. Most municipalities have a records and archives office, but they do not do much in terms of documenting, digitising, harvesting, and posting information on websites. This concerned the researcher because most municipalities handle a large number of records, but any record functionality is taken into account.

The study also revealed that those in charge of websites were hired based on the skills listed below:

- Information and communication technology experts
- IT abilities, with some holding an information technology diploma
- A degree or diploma in communication
- Officer in charge of the website and digital media
- Standard 10 (Grade 12)

This, however, indicated a lack of training in archives and records management, as well as any related web archiving skills. They also claimed that the municipality did not provide them with any website functionality or content management training. As a result, the study proposes that benchmark is the way to go for municipalities, beginning with recognising their records management and archives departments. The study demonstrates that municipalities can collaborate with a variety of academic institutions, NARSSA, the Department of Arts and Culture, and other relevant structures. This will help them understand service delivery. As they are a government agency with a visible role, the National Archives and Records Service's role in integrating all sectors, including municipalities, should be highlighted.

6.6 FURTHER RESEARCH

The study discovered that there have not been many studies focused on archiving websites in Africa and South Africa in particular. Despite efforts, it was discovered that most studies on web archiving focus on institutional repositories, web archiving in general, and liquid communication. The study also revealed that governments in other European countries are in charge of managing and preserving the data and information they generate. Overarching legislation and regulations, it was discovered, may also have an impact on organisations, as

they may specify the administration, preservation, or deposit of some of the documents they create. This also posed a challenge to Africa and South Africa to consider these majors in order to enable swift functionality in government agencies. As the study's participants pointed out, archiving websites was not deemed worthwhile because the media outlet was only used as a marketing tool. According to the study, municipalities used the national communication and ICT policy to strengthen the legal foundation for digital records, but they did not have a policy specifically for managing websites, and thus they were not treated as records.

As it is impossible to explore everything in a research study, the following research proposals are made:

- More in-depth studies on similar areas in Africa and South Africa should be conducted to develop solutions that are more relevant to web archiving.
- Since the study was limited to web archiving, quality assurance should be examined more closely.
- The study also proposed a framework to address some of the challenges that municipalities are experiencing.
- It was also found that municipalities use websites in tandem with Facebook, Twitter, and Google+, and that Facebook is far more interactive and accessible to users. According to the study, municipalities, including blogs, did not use Instagram very much.
- The study also noted that municipal websites are considered more formal because they post tenders, annual reports on expenditures, and so on. As a result, the study recommends that municipalities treat websites as records and implement a record system that is applicable to all media outlets.
- The study found that municipalities lack a policy for archiving websites and the management of records being inter-changed through email.

6.7 FINAL CONCLUSION

The chapter presented the results as well as a summary of the chapters.
It also draws conclusions from the research findings and makes recommendations based on them.
The research was divided into six sections.

The purpose of this research was to investigate the archiving of municipal websites in KZN to develop a framework for website archiving.

The study found that various policies existed in an attempt to have some sort of guideline in the municipalities. It was also discovered that, while municipalities in KZN had policies in place, only few focused on web archiving. The primary policies of the municipality in KZN are ICT and communication policies. It was clear that technology continues to stifle growth in most municipalities, as it does in other developing countries where technology is gradually gaining traction (e-mail and very slow). According to the study, most municipalities continue to rely on service providers to keep their websites up and running. Furthermore, the municipality stated that additional training would be beneficial in improving their competencies. Based on literature and current web archiving research, the study also proposed a framework for supporting the web archiving of municipal websites. The study further discussed its theoretical and practical implications, as well as future research directions.

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APPENDIX 1: INTERVIEW GUIDE

Dear Participant,

I am kindly inviting you to participate in a research project that is aimed at developing a framework for archiving websites of municipalities in KwaZulu-Natal Province in South Africa. I am a Doctor of Literature and Philosophy student in the Department of Information Science with the University of South Africa under the supervision of Professor MS Ngoepe. My research project focuses on the management of websites by municipalities. It also focuses on the documentation of websites, governmental bodies for municipalities not to worry about harvesting websites, as the records can be retrieved.

As web developers, IT specialists, communication personnel, records management, archival management professionals, your responses are critical to the development of a framework that is envisaged to enhance archiving of websites in municipalities in KZN. I wish to inform you that all your responses will be kept confidential, responses will not be attributed to specific respondents and the information supplied shall be used only for the purpose of this research.

Should you have any queries or seek further clarity about the study, please do not hesitate to contact:

The Researcher: Ms L.P Luthuli – lungile.dapresh.luthuli@gmail.com

Promoter: Prof MS Ngoepe – ngoepems@unisa.ac.za

Thank you,

Lungile Luthuli

Research tools: interview guide

1. **Section A: General Information**
   1.1 Name of the municipality? …….
   1.2 Which department under which municipality do you service?
   1.3 What is your qualification? …….
   1.4 For how many years have you been in this profession? ……
   1.5 How did you know about this profession? ……..
   1.6 And what were the requirements when applying for the job?
   1.7 Do you or your organization belong to any of these three groups? Choose all that apply.
      1.7.1 National Archive & Records management of South Africa (NARSA)
      1.7.2 South African Society of Archivist (SASA)
      1.7.3 International Internet Preservation Consortium (IIPC)
      1.7.4 Information Council on Archives (ICA)
      1.7.5 Other……...
2. **Section B: Analyse legislative, standard and policy framework pertaining to web archiving in municipalities in KZN**
   2.1 In your opinion, what is the role of the municipality website?
   2.2 What activities of the Municipality does it address?
   2.3 Is there a directive or instruction from the Municipality management regarding the website – its status, regulations?
   2.4 5. Where does the material for the site come from?
   2.5 Is there a policy that guides how municipality websites should operate?
   2.6 What policies are being used when archiving websites or web content by the municipality?
   2.7 What is the role does the KwaZulu-Natal Provincial Archives Act, 2000 (Act No. 5 of 2000) contributes to the management of records & web archiving?
   2.8 Does the municipality have records management policy in place that guides the municipality on how to manage the municipality?
   2.9 Does your organization have archiving policies specifically related to social media or websites?
   2.10 If you answered yes to question **2.9,** would you be willing to provide a link to or provide a summary of your approach?
   2.11 Why the municipality refer to some of the policies as IT policies and what significant does it play?

3 **Section C: Assessing the strategies for long-term digital preservation for websites in municipality in KZN.**
   3.1 Is there any control of the materials on the site or website?

3.2 To what extent is accuracy important in your work, and who checks your work?

3.3 What are the strategies being used when archiving websites or web content within municipality websites?

3.4 What are challenges faced when initiating these strategies?

3.5 How to provide a strategic overview and senior management briefing, outlining the broad issues and the rationale for funding to be allocated to the tasks involved in preserving digital resources?

3.6 What are the goals of your web archiving activity? Choose all that apply.

- Archive your own or affiliated web content
- Higher an organisation to archive for you or consultant
- Other

Section D: Assess the plans for long-term digital preservation for websites in municipality in KZN.

- What kind(s) of access does your organization itself provide? Choose all that apply.
- URL search
- Full-text search
- Browse list by URL
- Browse list by title
- Finding aids
- Other……...

3.7 Type of staff working with records, web content, communication for the municipality?

3.8 Does the municipality work hand in hand with ICT department when posting material online or websites?

3.9 Who is responsible for long-term digital preservation for municipalities?

3.10 What are the preservation plans?

3.11 What type of system is being used when digitising websites or web content?

3.12 What are the challenges in managing digitized material on websites?

3.13 Who decides what will be appear on the website?

3.14 How do they deal with requests from the public?

3.15 Do you have active researchers utilizing your web archives?

3.16 If you answered yes to question 4.9, could you provide a summary of how researchers are using your web archives?

3.17 What year did your organization begin to archiving web content?

3.18 Have you ever had a request to stop collecting or to take down content that you've crawled or made accessible without explicit permission? Please specify….

3.19 Who is responsible for making sure that URL's are effective?

3.20 Which of the information sharing platform is used the most by municipality?

3.21 And how often is being evaluated (4.14)?

4 Section E: Determine the storage of content published on the websites in municipalities in KZN.

4.1 How are the data described?
4.2 How do municipalities ensure access to the data captured into their websites?
4.3 Which systems is being utilised when storing content?
4.4 Is there anyone responsible for an evaluation of information before being published on municipal websites?
4.5 Did you receive any training based on what you are doing?
4.6 What are the tools linked to the computer that help in the creation of the files?
4.7 Who has access to the files? How does anyone know that the document has not changed over time?
4.8 What happens to the work products, and the work by-products? Where are they saved, and for how long?
4.9 How do is tracking users' requests conducted?
4.10 When content is received from external sources, who has ownership of it?
4.11 Are the files created in the same system? Do the documents have copies in additional places?
4.12 How are the contents of the website, and the files created, managed?
4.13 What are the operating systems and software that are being used?
4.14 What are the tools linked to the computer that help in the creation of the files?

4.15 What are the top employee's skills that are essential to the development and success of web archiving in your organization? Choose three.

- *Appraisal and selection (e.g., determining what web content to collect)*
- *Archiving tools (e.g., configuring or operating web archiving tools)*
- *Collaboration and communication (e.g., advocacy, coordination, marketing, or outreach)*
- *Domain expertise (e.g., knowledge of subjects that are the focus of web archiving)*
- *Metadata (e.g., familiarity with metadata standards, cataloguing experience)*
- *Quality assurance (e.g., analysing and troubleshooting web archive quality issues)*
- *Software development (e.g., able to develop software or web applications)*
- *Web technologies (e.g., familiarity with web architecture, design, formats, or platforms)*

- *Other (please specify)*

5.16 What is your view pertaining the recent event of hacking websites?

6. Section F: Examining how they access their web content through websites in KZN municipalities.

6.1 What web archiving tools are used to harvest content?
6.2 How many of your staff members are involved in this work?
6.3 you use for the following:
6.3.1 Web content appraisal?
6.3.2 Web content selection?
6.3.3 Work flow management?
6.3.4 Do you currently have any collection / selection policies that apply to web content? Subjects / Provide a few examples:
6.3.5 Types of sites (e.g. - government, commercial, institutional, individual, etc.) / Provide a few examples:
6.3.6 Any other criteria that focus the scope of your web archiving activity? Please specify:
6.4 Are there any policies at your organization that determine access rights and permissions required for content crawled? For example, do you have a lawyer or someone with legal and/or copyright expertise on your project team or at least who provides advice as needed?
6.4 How is access for archived web content handled by your organization in terms of the criteria below? Communication /online updates
6.5 Integration with existing digital collections, the municipality website?

System of content management:

7.1 What software is installed?
7.2 Were any specific adaptations made to the software?
7.3 Where is it located?
7.4 Where is the server of this system located?
7.5 What is the connection to the website itself?
7.6 What are the contents managed by the system?
7.7 How are they related/ linked to the different parts of the site?
7.8 What metadata do the documents have?
7.9 What types of files are created?
7.10 Are there standard names for the files? Do they change?
7.11 How and where are they organized? Why did you organize them in that particular form?
7.12 Is the folders directory linked to the content management system for?
7.13 Are the files created in the same system?

8. (Information Communicated Technology - Department):

1.1. Please present a general picture of the website, from the technological aspect –software and hardware.
1.2. Is there general metadata for the site; for a sub-site; for a page on the site?
1.3. How is the website folders directory managed?
1.4. How is a cumulative page managed?
1.5. Where are YouTube clips saved, and how?

1.6. Is it possible to see an optional list of key words?
1.7. Do they conduct tests on materials that are updated (technologically)?
1.8. Are there any statistics on pages preferred by the public?
1.9. Did you harvest the site in the past?
1.10. Is it possible to harvest the site?
1.11. If so, is it possible to reduce the level of website's security on material intended for harvesting?

1.12. How does the state of your organization's web archiving program compare to what it was two years ago? Choose one.

- Significant progress
- Some progress
- About the same
- Slightly worse off
- Much worse off

APPENDIX 2: DOCUMENT ANALYSIS

Document Analysis

Who is considered by the municipality to work with websites or archive websites?

Observation	Analysis comment
Vision and Objectives: institutions clarify the goals of their web archiving program.	
Resources and Workflow: institutions review their available resources including finances, expertise, staff, potential collaborators and others in order to determine how to proceed with developing or changing their web archiving program.	
Access / Use / Reuse: institutions make decisions about whether and how to provide access to their collections and monitor how patrons/community uses the content.	
Preservation: Municipality make decisions about how they want to preserve the data they collect in their web archiving activities. This includes both data files and meta data. Risk Management: Municipality consider their approach to risk in creating a web archiving program, they look at copyright and permissions as well as access.	
Appraisal and Selection: Municipality decides specifically which websites they want to collect.	
Scoping: Municipality may opt to archive portions of a website, whole sites, or even entire web domains.	
Data Capture: institutions fine-tune how they want to capture their data through decisions	

about crawl (capture) frequency and types of files to archive or not archive. The scoping and data capture phases of the life cycle often overlap as they involve similar activities and decisions.	
Storage and Organization: This step includes a temporary or long-term storage plan for the archived data. For some institutions/ Municipality, the storage and organization phase of the life cycle might also constitute their preservation activities.	
Quality Assurance and Analysis: Municipality review what they have archived and how well the resulting collection satisfies the goals they set at the beginning of the life cycle.	
Risk: what are measures in place pertaining the digital content relating to recent instances (hacking of website)	

APPENDIX 3: LETTER OF PERMISSION

GREATER
KOKSTAD
MUNICIPALITY
PROVINCE OF KWAZULU-NATAL

Face Book: The GKM Page

Adam Kok III Building
75 Hope Street
P O Box 8, Kokstad, 4700
Tel. +27 39 797 6601
Fax. + 27 39 727 3676
Email. mm@kokstad.gov.za
www.kokstad.gov.za

OFFICE OF THE MUNICIPAL MANAGER

Enquiries: Dr P N Makoba - ntokozo.makoba@kokstad.gov.za

Ms Lungile Precious Luthuli

By email: lungile.dapresh.luthuli@gmail.com>

Dear Ms Luthuli

GATEKEEPER'S LETTER: PARTICIPATION OF GKM IN THE CASE STUDY RESEARCH

Permission is hereby granted for you to conduct a Case Study Research for your Doctor of Literature and Philosophy in Information Science at the Greater Kokstad Municipality. This permission is based on the information which you provided showing proof of current registration at UNISA as well as the information on your Ethical Clearance. The topic of your study as reflected in your EC is:

A framework for archiving websites of municipalities in KwaZulu-Natal Province in South Africa

You have listed your participants as "...the records managers, information managers, web administrators, communication managers and website manager or designer". Your attention is drawn to the fact that this permission is granted on the understanding that you will send a letter of introduction to the participants in advance and set up appointments with them for a time suitable to them. You also need to obtain informed consent from each participant prior to the interview, failing which this permission will be withdrawn. Kindly note that should the scope of your research or any of this information change, you will have to notify and/or obtain further approval from ntokozo.makoba@kokstad.gov.za.

I wish you well in your studies.

Yours faithfully

L H MAPHOLOBA
MUNICIPAL MANAGER
DATE: 18/06/2021

APPENDIX 4: LETTER OF PERMISSION 2

P.O.B. 7, GROUND FLOOR, INTUTHUKO JUNCTION, 750 MARY THIPHE STREET, UMHLUMBANE, CATO MANOR, DURBAN, 4091
TEL.: 031 322 4513, FAX: 031 261 3405, FAX TO EMAIL: 086 265 7160, EMAIL: MILE@DURBAN.GOV.ZA, WEBSITE: WWW.MILE.ORG.ZA

For attention:
Chair of Research Ethics Review Committee
Department of Information Science
University of South Africa
City of Tshwane
0003

12 August 2020

RE: LETTER OF SUPPORT TO L.P LUTHULI, STUDENT NO. 64063739 - GRANTING PERMISSION TO USE ETHEKWINI MUNICIPALITY AS A STUDY SITE FOR A DOCTORAL RESEARCH

The Information Management Unit (IMU) and Municipal Institute of Learning (MILE) in eThekwini Municipality, have considered a request from Ms Lungile Precious Luthuli to use eThekwini Municipality as a research study site in fulfilment of a Ph.D. in Information Science research study entitled "A framework for archiving websites of municipalities in KwaZulu-Natal Province in South Africa."

We wish to inform you of the acceptance of this request and hereby assure the student of our utmost cooperation towards achieving his/her research goals; the outcome which we believe will help this municipality improve on its services using the research outputs. The student is reminded of the ethical considerations as well as the current COVID-19 related regulations as per the Disaster Management Act (2020) when conducting the research. **In return, we stipulate as conditional that the student presents the preliminary results and recommendations of this important study to the related unit/s via an arrangement with the MILE Office.**

Wishing the student all the best.

Mr Robert Dlamini
Head: Information Management
eThekwini Municipality

Dr. Collin Pillay
Program Manager: MILE
eThekwini Municipality

I Lungile P. Luthuli hereby accept as conditional that I will comply fully as per the conditions stipulated above.

Signed: Date: 25/08/2020

APPENDIX 5: ETHICAL CLEARANCE

UNISA university of south africa

DEPARTMENT OF INFORMATION SCIENCE ETHICS REVIEW COMMITTEE

29 May 2020

Dear Ms Lungile Precious Luthuli

DIS Registration #: Rec-20200529

References #: 2020-DIS-0015

Name: LP Luthuli

Student #: 64063739

Decision:

Ethics Approval from 29 May 2020 to 29 May 2024

Researcher(s): Ms Lungile Precious Luthuli
64063739@mylife.unisa.ac.za
083 870 0116

Supervisor(s): Prof MS Ngoepe
ngoepms@unisa.ac.za
012 429 6792

A framework for archiving websites of municipalities in KwaZulu-Natal Province in South Africa

Qualifications: Doctoral Study

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

The ***low risk application*** was reviewed and expedited by the Department of Information Science Research Ethics Committee on 29 May 2020 in compliance with the Unisa Policy on Research Ethics and the Standards Operating Procedure on Research Ethics Risk Assessment. The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy of Research Ethics.
2. Any adverse circumstances arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the Department of Information Science Ethics Review Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards the protection of participants' privacy and the confidentiality of the data should be reported to the Committee in writing, accompanied by a progress report.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no. 4 of 2013; Children's Act no. 38 of 2005 and the National Health Act, no. 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
7. Research must consider rules for engagement that are in line with observing COVID 19 regulations.
8. No field work activities may continue after the expiry date of **29 May 2024**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

*The reference number **2020-DIS-0015** should be clearly indicated on all forms of communication with the intended research participants, as well as the Committee.*

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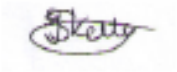
Yours sincerely



Dr Isabel Schellnack-Kelly
Department of Information Science: Ethics Committee

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APPENDIX 6: CONSENT FORM

UNISA university of south africa

CONSENT FORM

CONSENT TO PARTICIPATE IN THIS STUDY

I, _____ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable).

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the recording of the focus group semi-structured interview.

I have received a signed copy of the informed consent agreement.

Participant Name & Surname..... (please print)

Participant Signature.....Date.....

Researcher's Name & Surname.....Lungile P. Luthuli... (please print)

Researcher's signature.....[redacted].....Date...28/05/2020.....

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APPENDIX 7: LANGUAGE EDITING LETTER

information giants

Information Giants (Pty) Ltd
Registration: 2014/090910/07
TAX No.: 9016931249

PHONE: 015 004 1101 / 072 097 3791 | **FAX:** 086 681 7699
EMAIL: info@informationgiants.co.za | **WEBSITE:** www.informationgiants.co.za

TO: WHOM IT MAY CONCERN

SUBJECT: Language Editing

DATE: Monday, 08 November 2021

ACKNOWLEDGMENT OF LANGUAGE EDITING

We hereby confirm the language editing of the following research project using the Windows 'tracking' system to reflect our comments and suggested corrections for the writer to action.

Project Title: *"A framework for web archiving for municipalities in the KwaZulu-Natal Province in South Africa"* submitted to us by **Lungile Precious Luthuli (64063739)** has been duly edited for language by Information Giants (Pty) Ltd. It is hoped that if all the editorial aspects suggested therein were considered, the target readers of the work would find the document decipherable.

For any enquiries relating to the above, please contact the office during working hours at 015 004 1101/072 097 3791 or info@informationgiants.co.za.

Kind Regards,

Moses Moreroa
Language Editor

Disclaimer:
Although we have made comments and suggested corrections, the responsibility for the quality of the final document lies with the writer in the first instance and not with our organisation as the editors.