

Towards Smart Cities: Digital Content and Urban Governance in the City of Masvingo, Zimbabwe

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Abstract

The urban society of today has grown to be a more sophisticated society because of the various sub-systems that exist in the city. This has made the management of urban areas that uses traditional ways to become more daunting. It has been further complicated by the rapid urbanization that has also been experienced in many of the cities today. These problems can be tackled effectively by adopting the smart city concept of urban management where technology is integrated into the way cities do their businesses. The research aimed to examine how technology has been adopted in urban planning and management in the City of Masvingo and how these technologies, or lack of them, have been affecting the governance of the city. The research used a mixed-methods approach to inquiry, where both qualitative and quantitative methods were used to gather data. A questionnaire survey was used as the quantitative tool of data collection and in-depth interviews and field observations were the qualitative methods used to collect qualitative data. The questionnaire was administered to collect information on the use of information and communication technologies (ICTs) in the city and how it was aiding the governance of the city. In-depth interviews were done with the leaders of planning organizations in the city and they provided information on the use of ICTs, and how they are helping in the planning and governance of the city. The research found out that, the city has not yet made any significant progress in the adoption of ICTs in urban planning. It is therefore, recommended that planners should be trained to use ICTs and the private sector should be involved in financing the development of infrastructure and networks for digital and e-planning in the city. On top of that, the government needs to play a leading role in promoting the digitization of the planning process.

Keywords: Urban planning, participatory planning, inclusive, information technology

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1.0 INTRODUCTION

The history of information technology (IT) can be traced back to around 3000 BC in Asia when the abacus was developed (Talvitie, 2002). The next step in IT advancement was in 1642 with the invention of calculator, which was advanced in 1833 to an automatic calculating machine. It was invented by Charles Babbage, which later culminated it into invention of the computer (Talvitie, 2002). Soon after the World War 2, information technology development has been very fast such that ENIAC - the first high-speed electronic computer was serviced in 1946 and in 1947 there was invention of the transistor, then the integrated circuit came twelve years later (Talvitie, 2002). A step of high magnitude in the history and development of IT took place in 1971 when the micro-processor was invented which in practice was a computer on a silicon chip (Talvitie, 2002). At this point, computers were used by large and rich companies only. Personal computers came in 1975, and only 5 years later came the laptops (Cocchia, 2014). The DVD and CD technologies came and provided better data handling possibilities. Separate data, voice, text, and picture information are now integrated into this multimedia product (Talvitie, 2002). New software also emerged along with the rapid development of information technologies. Talvitie (2002) further posited that computers will start to understand and even translate the spoken to different other languages. The globe has now come at a stage of artificial intelligence and other new ways to use computers are being developed (Talvitie, 2002). The development of information and communication technologies (ICTs) has been a very important in the advancement and management of business (Allam, 2020; Allam & Dhunny, 2019). These information and communication technology (ICT) developments have also been very critical in the drive towards smart city concept (Jiang et al., 2020). There has been adoption of computing systems in every aspect of human life but however, the pace has been significantly slow in the area of planning in Africa (Leon & Rosen, 2020; Odendaal, 2003). This research was done in the city of Masvingo, which is the oldest city in Zimbabwe. This city is hugely endowed with the scenic areas that are utilized for tourism. Sites like the Greta Zimbabwe ruins, with its magnificent architecture, the Gonarezhou game park and its wide range of wildlife, the Mutirikwi dam and its environments also offer a lot of outdoor activities. This research will unveil the ICT situations in the city and will help to see how the city can take of these ICTs for better business. In many cities of the Global South, issues of ICTs have not been fully utilized for business development, so this research will show opportunities that are available through the adoption of these ICTs. The major objective

of this research is to investigate the ICTs content in the city of Masvingo and examine how they have been utilized for effective governance of the city so that the city can be a smart city, which is the way to go for contemporary cities. The research, therefore, provides a range of opportunities that are available in adoption of ICTs in the city and these include the ability to boost the business in this tourist-rich city. ICTs are enablers of smart cities, so when the city of Masvingo adopts these ICTs, it will enhance its business landscape.

■2.0 BACKGROUND OF THE STUDY

As we entered into new technological-cultural era, the foundations of thinking and conception of urban space is being challenged due to the growing presence of information and communication technologies (ICTs) in everyday life (Mirembe, 2017). In the planning and management of cities, people are spending more time using computer and this means that their space is formed within the computer and virtual planning has become a necessity (Talvitie, 2004). Architecture and urbanism have therefore changed due to adaption of ICTs and new activities have been enabled due to provision of internet access. Technology therefore, makes everything possible that a person can travel simultaneously in both the real and the virtual space (Chen, 2016; Odendaal, 2003). For example, tool that is equipped with wireless internet and geographical positioning systems (GPS) technology can provide space-related technical data and visual that the user can understand beyond the established scope of their physical space. This has allowed efficient management and functioning of cities (Odendaal, 2003). New technology therefore penetrates thoughts of the user as medium of knowledge and experience in living space (Lombard & Ditton, 1997). The internet also has transformed the way we see and understand space. Lombard and Ditton (1997) further argued that different technologies, cause different experiences of space. For example, digital sensors and control system allow for monitoring and management of operations in the city and fixed and wireless networks have allowed for connection of enhanced information diffusion (Yigitcanlar et al., 2019; 2020). Space is viewed as a metaphor in our mind, and will change whether it could be in the realm of non-digital world. Information technology together with a new attitude and a new life therefore creates a new city. It has also created possibilities of urban planning and improved infrastructure for current and future cities. In recent decades, information technology under titles such as (Digital City), has enabled the creation of the virtual equivalent city (Parallel City), which is transition to a modern city (Cocchia, 2014; Jiang et al., 2020; Paskaleva, 2014). Paskaleva (2014) further argued that the digital city creates intelligent cities which makes them smart cities.

The emergence of ICTs has greatly influenced the way planners conduct their duties because planning can now be done in the virtual space and in real time (Bandauko et al., 2016; Bowora & Chazovachii, 2010; Yigitcanlar et al., 2020). Information and communication technologies ensure public safety and good governance because they permit participation of stakeholder in decision making. However, in most cities of the Global South, these technologies have been adopted in various ways and their impact on urban planning and management is still scantily enjoyed. In the Global North, the rate development of ICTs has greatly accelerated economic globalization (Bandauko et al., 2016). The 21st century is a century of global urbanization and cities will play an increasingly important role in the achievement of this through the adoption of ICTs. The on-going ICT evolution reshapes and regroups traditional cities and transforms their morphology, social and economic bases enormously (Leon & Rosen, 2020). Leon and Rosen (2020) further argued that ICTs have transformed traditional cities into smart cities due to their digital content that emphasizes on infrastructure and solutions driven by the digital content. The same effects that industrial revolution has caused on spatial structure of the agricultural society are the same effects that progress in ICTs is likely to cause on modern cities. Information and communication technologies are therefore the choice of a future city as it holds the promises of a better life (Kim et al., 2009). However, Allam and Dhunny (2019) argued that technology needs to be approached with a lot of caution as it has different impacts on different cultures. Some groups in the city have cultures that do embrace ICTs, hence, there is a need to reconstruct the way ICTs are adopted in the city so that all cultures remain included in the city. This was supported by Pereira et al. (2018), who argued that ICTs should be nonlinear so that they allow all citizens to collaborate in decision making.

In Europe, nearly 80% of the population live in town and cities and globally, 54% of the world's population lives in cities, a figure predicted to rise to 66% by 2050 (Bandauko et al., 2016). Such rapid development requires the adoption of IT so that the management of these cities is manageable and effective because ICTs allows for efficient performance of cities and they have supported economic development (Allam, 2020). Europe and other developed worlds have reached great milestones in technological advancement as compared to Africa and this has helped them to manage their cities properly. The e-planning platforms in the form of GIS software, Google earth, satellite imaging and other design softwares are very effective planning platform that can allow better planning of cities. Yigitcanlar et al. (2020) added that platforms such as autonomous driving technology have been very efficient in ensuring smart mobility as it has allowed even the disadvantaged groups of the city to be mobile in the city. It is obvious that emerging new e-technologies have brought in a set of new emotions, experiences and perceptions to the urban space. According to Talvitie (2004), technology has become a strong determinant of urban space network; it actually triggers the emergence of new patterns and formations of urban planning. Talvitie (2004) further argued that technology is indeed one of the many tools that can be used to solve planning problems. It has also allowed delivering of high quality urban services to the urban public (Lopez-Quiles & Bolivar, 2018). The application of technology increasingly improves and directs the functionalities of the network structure of cities.

Kim et al. (2009) illustrated that the early cities prior to the use of mechanics and e-technologies, were characterized by the movement of people who shared information by word of mouth, hence, the reference to the “word of mouth city”. In such, a city governance of the city was very difficult because it was very difficult to reach each and every citizen and also for each and every citizen to reach the city authorities. The twentieth century revolution and through the adoption of ICTs has allowed the use of automated machine, freeways, high-speed motorways and all these improvements stated influencing and shaping the city networks and urban space into something much improved aesthetically. This new city is now called the “Machine Mechanical Metabolic City”. By the end of twentieth century, this city had improved due to further improvement in technology into a “Conduit Free City” known as the Information City, which is characterized by unseen borderless and timeless infrastructural networks that co-existed with the visible urban space networks (Kim et al., 2009). ICTs

have allowed cities to be functional in complex city systems that are characterized by diversity because of ICT products such as the big data, which has allowed internet of things (IoT) and the easy management of cities (Allam & Dhunny, 2019). ICTs have therefore played a role in shaping cities space from the physical to virtual space and this has allowed easy management and functioning of the city. The evolution of computers and the informational revolution that necessitated the discovery of new software such as ILWIS, GIS, AutoCAD and applications that are usable in urban planning have been very critical in shaping the new city into smart and globalized cities (Jiang et al., 2020; Leon & Rosen, 2020; van Vuuren Coetzee, 2005). Van Vuuren Coetzee (2005) further argued that ICTs have allowed the production of information at a much higher speed (van Vuuren Coetzee, 2005). In addition, technological advancement resulted in circulation of information at a very fast rate and hence, the evolution of our cities taking place at a fast rate as well. ICTs have influenced the movement of information in the virtual world and this has a major impact on the evolution of cities.

Chinese cities have taken advantage of this advancement in information and communication technologies in urban design, where it is being used to optimize natural solar energy and lighting and also to accommodate renewable energy use. These strategies combined reduced fossil fuel energy consumption (Chen, 2016). China has therefore made strides up in building a city that serves energy, which is a critical component of a smart city. New smart or intelligent buildings are constructed using ICTs to help orient buildings and building features to take “passive” advantage of natural conditions, including sunlight for lighting and heating and wind for cooling, which are all components of smart city. In addition, when these structures are completed and occupied, ICTs is also used to support the maintenance of smart buildings with features such as sensors and controls designed to improve efficiency and tailor energy use to actual demand (Chen, 2016). Besides saving energy and operational costs, ICT-integrated building systems can increase personal comfort and productivity, through optimization of light (including natural lighting), cooling, heating and fresh air.

ICTs have not only had impact on spatial planning but on regional and development planning also, as observed by Lee et al. (2014) who analyzed the economy of Qatar and established that it was driven by investment in ICTs. These investments greatly contributed to improved gross domestic product (GDP) of the country. This has also allowed it to have the highest per capita in the region of \$102,100. They also analyzed Los Angeles Metropolitan area from the period 1970 to 1990 and observed how the new technologies have improved economic prosperity. ICTs in urban planning have shown that, it is complex, unpredictable and mysterious in nature. In addition, ICT is also powerful and useful in controlling spatial planning and also other economic activities like business and industrial activities. It can be argued that ICT is so powerful to the extent that it controls and powers the whole economy. Lee et al. (2014) in their studies on the impact of technology on the urban form of metropolitan cities in the United States of America (USA), observed that cities became edge-less and polycentric in terms of their networks and spatial footprint. These transformations and impacts began to show that there are various “prima facie” indications that an ICT technology has influenced urban dynamic and urban space.

■ 3.0 RESEARCH METHODOLOGY

The research used a mixed-methods approach to data gathering, where the qualitative and the quantitative methodologies were mixed. This enabled the research to gather data that is reliable and authentic because the weakness of one methodology was compensated by the strengths of the other methodology. The questionnaire was the quantitative tool that was used and it was administered to 100 randomly selected city inhabitants in the City of Masvingo’s different residential areas. These were clustered according to the residential areas of the city. 25 respondents were selected from each of these clusters, which included the city center, low density residential area, medium density residential area and the high density residential areas. Questions asked in the questionnaire included questions on the ICTs used in the planning, how they are helping in the governance of the city and delivery of city services. Semi-structured interviews and field observations were the qualitative methods that complimented the questionnaire. Semi-structured interviews were done with purposively selected key informants in various planning institutions such as the department of physical planning, the City of Masvingo, land developers and other private planning institutions in the city. A total of 8 interviews were done with head of planning division in the City of Masvingo, head of department of physical planning, 3 land developers and 3 private planning companies. Data collected from these sources included data on availability of ICTs, how ICTs have been helping in their planning and how it is helping in the governance of the city. The research targeted leaders in these institutions for in-depth interviews. Field observations were concurrently done during the interviews to find out information and communication technologies that were available at various centers. Qualitative data was analyzed qualitatively and quantitative data was analyzed using computer software called SPSS.

■ 4.0 RESULTS AND DISCUSSION

4.1 The Digital Infrastructure in the City of Masvingo - Wireless Communication

The majority (76%) institutions involved in urban planning and design such as the department of physical planning, architects, land developers, housing co-operatives and the municipality of Masvingo have access to Wi-Fi services at their workplaces. However, very few (24%) of them still work without any form of ICTs and these are mostly community-based organizations such as co-operative and indigenous property developers. They do not have the infrastructure to adopt ICTs such as simple gadgets like computers and office space. These institutions are however, not directly involved in planning issues but they use products of urban planning. They need planning technologies such as drawing software so that they can produce layout and house plans. The use of Wi-Fi service in most of the planning institutions is mainly to enhance their communication with their clients where most of them use it for social media communication. Very few uses Wi-Fi for Google earth navigation, and Arch GIS because most of them do not have the skills to operate in these platforms. So, wireless communications are used for nothing that is directly related to planning. The majority of people in the planning, however, appreciate that Wi-Fi is a very essential service in communication, hence, can be a very important tool for communicative and

collaborative planning. ICTs are very important tools for collaborative decision making as they can allow participation of stakeholders (Paskaleva, 2014; Pereira et al., 2018; Ryser, 2014). There is a general agreement among stakeholders in the planning fraternity that wireless communication can provide quick and fast communication channel but its utility in planning has been underutilized because players in the planning fraternity rarely use it for planning purposes. Wi-Fi facility can be used to create platforms for communication between the city authorities and the citizens of the city thereby enabling participation of various stakeholders in the governance of the city. This facility however is not ready for such function as it is only available in isolated areas, which does not allow every citizen to participate in decision making processes of the city. Such system asymmetries were experienced in South Africa where disadvantaged group of the society have been excluded in decision making processes that are technology-based (Odendaal, 2003; 2006). The planning stakeholders in the City of Masvingo are mainly using Wi-Fi facility for communication on social media and not for planning purposes. The availability of wireless communication services should be a strong enabler for planners to access information and communication technology that should allow them to use e-planning services, which should afford participatory planning and stakeholders involvement in the planning (Yigitcanlar, 2015). Wi-Fi services should allow planners to interact with their planning environments easily and at very much low cost, however such benefits are not utilized in the City of Masvingo. For example, people in the department of physical planning are still travelling to areas such as Chiredzi and Mwenezi - areas that are 500km from the city to collect planning data. At some time, they have to stay there for 5 working days to assemble the planning data. These travels are usually in the company of not less than three officials from the department. This results in huge costs being incurred by the government in terms of fuel, upkeep of the official and accommodation. These costs could be reduced greatly if they had adopted information and communication technologies such as GIS that could allow them to access data in their offices. Yigitcanlar (2015) argued that information and communication technology in planning is the best way to achieve smart cities because it allows planners to manage resources more efficiently through the use of the digital content. It is the best way to achieve sustainable economic development in the globalized cities. This sustainability is difficult to achieve in the City of Masvingo because planning is becoming too expensive.

The institutions that are still working without Wi-Fi on their workplaces are missing a lot of information and were left behind because of the continued reliance on traditional ways of doing planning, which are limited in terms of participation of various stakeholders (Foth et al., 2009). Foth et al. (2009) further argued that incorporation of information and communication technology in planning redefined urban planning because it has made urban planning an interactive process where it has fused participation and collaboration in the planning fraternity. ICTs, if used together with other softwares such as Google earth and Arch GIS or other internet-based softwares can allow virtual planning that serves a lot on time and distance between places (Drewe, 2005; Keivani et al., 2003; Odendaal, 2003). Odendaal (2003) added that ICTs have allowed local authorities to deal with their matters in the cyber space due to the use of internet, which has allowed interconnectedness in the city. The state of ICTs in the City of Masvingo is such that it will be very impossible for the whole city to allow participatory planning because the service is not available to the public, hence the public is denied the chance to participate in planning and development of the city. In such situations ICTs will allow wide spread exclusion in the city where disadvantaged groups will be excluded from participating in city matters (Leon & Rosen, 2020). Leon and Rosen (2020) further argued that ICTs are mostly used to manage capital accumulation therefore has very little to benefit the generality of the urban population. ICTs have therefore created linear urban planning systems that do not fit in the diversified urban systems of the contemporary city (Pereira et al., 2018). ICTs have also allowed disadvantaged groups of the city to be left out in the development and decision making processes of the city (Odendaal, 2006). There is no public Wi-Fi, in the City of Masvingo since the government, the private sector and local authority have not provided it for public. The service is only available to office bearers. There is a very big theme park at the civic center but Wi-Fi is not covering this area. The park is well-furnished with furniture for people to relax but the unavailability of wireless communication disables them to interact with the city on various platforms. There is a need for public Wi-Fi in parks and public places to enhance social interaction and in the process drive towards the goal to digitize the city. Those will allow for sustainable development in the city because the stakeholders in the city will be participating.

4.2 ICTs for Urban Planning in the City of Masvingo

ICTs in urban planning have changed the meaning of space, place, distance and time as the determinants of location factors (Drewe, 2005; Keivani et al., 2003). In the modern day, distance is no longer a problem because of the incorporation of the information and communication technologies and this has enabled the transmission of information via telecommunications networks (Yigitcanlar et al., 2020). The same applies to time as virtual planning has reduced the time to get to a place and collect information for planning purposes. It has also enabled other stakeholders to participate with planning information as they can contribute to planning with information that might be needed for planning. All transmissions will take place instantaneously and in real time (Keivani et al., 2003; Yigitcanlar et al., 2020). Keivani et al. (2003) further argued that such technological innovations have reduced space barriers thereby affording real time connectivity for better planning and management of data in planning. Wireless communication is now allowing connections to be made at any time, any place where the service is provided. Space and place are thus not any more affected by distance and time factors in the same way they used to be before technological innovations thus work can be done anywhere. Urban planning technologies such as geographical information system (GIS), geographical positioning system (GPS), Map-info, Auto Cad, and Arch CAD are important technologies that can be employed in urban planning for better planning and design. The adoption of technologies has enabled planning to be more accountable as the e-tools have allowed planning to be more accountable to urban investments (Baud et al., 2016; Katsara, 2008). Figure 1 below shows some of the technologies that were found within the planning offices in the City of Masvingo. It was established that e-planning technologies are more practiced in the private sector than the government and quasi-government organizations. In community-based organizations such as housing co-operatives and local consortium of property developers such technologies are non-existing and they still rely on traditional ways of planning and managing their activities. If they need the use of such technologies, they usually outsource such services. The research found out that the widely available technology in urban planning was the Auto-CAD which is the

drawing technology that is used to produce layout plans and house plans. This technology is also available in government organizations. However, not all government employees are skilled to use the technology hence the technology is not fully utilized. The old-schooled officer in the government and city council are not able to use the technology and it is only the recent planning graduates that are using the technology. The majority are therefore using the old system of drawing pens and drawing boards to produce layout plans and other planning products. One of the officers in the government's department of physical planning said, "It is good to use these upcoming technologies but the way we were schooled did not have this ICT component, we are therefore disadvantaged".

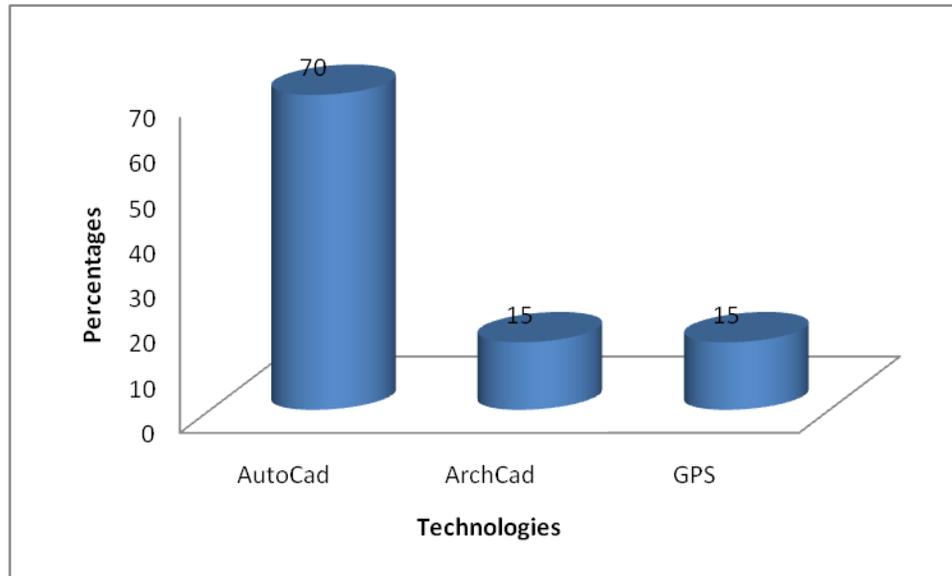


Figure 1 Technologies for urban planning in the City of Masvingo

The local authority argued that it is interested in using the planning technologies but they have no expertise within their workforce who can help in the shift from traditional planning tools into the new regime of e-planning. The department of physical planning is also in the same situation as alluded earlier that most of their employees do not have the expertise to employ new technologies in planning therefore, they are still relying on the traditional planning tools such as drawing pens and hard copies of base maps from the surveyor general. It was also established that some of the e-planning tools that are available are too old and are way behind the technological innovations that has been happening in the planning field. For example, the GPS that is being used is too old and lagging behind the advancements that have been happening in the areas. Technologies such as the Live GPS which enables planning to be done without site visits and give planners a more updated and current spatial information are now in use but in all the government and quasi-government institution such technologies have not been adopted. Arch GIS also allows the assessment of distant development which again can reduce the distance barriers (Drewe, 2005; Keivani et al., 2003).

These urban planning innovations can drastically change how developments are planned, and this will enhance the planning process. Figure 2 below shows the traditional drawing office in government offices and quasi-government organizations. This is an ordinary office desk that is used as a drawing table. This shows how backward some of these government institutions are in terms of technological advancement in planning. They still rely on the costly traditional planning practices that are very outdated in this globalized time. The adoption of urban planning technologies will therefore allow planners to gather available and potential information that will allow them to make informed insights in their planning (Houghton et al., 2014). Houghton et al. (2014) further argued that adoption of technologies will allow planners to interact effectively with the places they are planning for as data can easily be gathered and utilized in the planning process. Technologies such as Live GPS and Arch GIS can allow planners to plan their places with less engagement with places, they are planning (Matimati & Rajah, 2015; Shin & Shin, 2012; Yigitcanlar, 2020). Shin and Shin (2012) further argued that planning that has incorporated planning technologies has also allowed planners to engage even in places that are disadvantaged and as a result planning has allowed involvement of all places to be included therefore enhancing inclusivity of the city. However, in order to effectively allow citizen participation caution needs to be exercised in the adoption of these ICTs because in most cases the use of ICTs has resulted in marginalization and exclusion of other groups of the urban society (Allam & Dhunny, 2019; Jiang et al., 2020; Leon & Rosen, 2020). Incorporation of technologies such as volunteered GIS can allow sharing of spatial information through mobile phones and social media thereby enhancing participation of various stakeholders in the planning of the city.



Figure 2 Drawing office in one of the planning offices
(Source: Author, 2019)

4.3 Data Storage Technologies in the City of Masvingo

ICTs for data storage systems have also not yet been adopted in most planning offices in the City of Masvingo as most of them are still using the old and traditional forms of data storage. Most of the players (80%) still relying on manual systems of data storage such as arch liver files, metal cabinets, and even just the open (see Figures 3-5 below).



Figure 3 Pictures showing some forms of data storage
(Source: Author, 2019)



Figure 4 Another form of data storage in the planning office
(Source: Author, 2019)



Figure 5 Reports just heaped in open
(Source: Author, 2019)

Some of the information is just kept in very old systems of data storage, which call for the need to embrace the modern means of data storages that are more combatable such as PDF or other electronic version of data storage. These new technologies are efficient in the use of space as they are just stored in computers and the internet. One of the government officers commented on the files that were in the open and he said, “[...] *how will I retrieve a file from such a heap of files like this?*”. He was commenting on the files that were in the open shelf. It therefore calls for more efficient and competent ways of managing their resource and this can be done through adoption of ICTs (Baud et al., 2016; Paskaleva, 2014). The fact that most of their operations are still in the traditional systems (i.e. layout plans still being drawn using drawing pens and stored in wooden and metal cabinets), make it very difficult to use the electronic versions of data and information storage. There is need to adopt technologies that will allow planning to be done in real time and this will significantly contribute to development of smart city (Jiang et al., 2020; Leon & Rosen 2020). Town planners in Masvingo, therefore, have limited technologies in planning and this has a great likelihood of slowing down their planning process and attainment of smart city. Information and communication technologies in planning are very essential tools that can produce instantaneous information, because virtual planning has removed barriers of distance (Katsara, 2008; van Vuuren Coetzee, 2005; Yigitcanlar et al., 2020). Katsara (2008) further argued that information and communication technologies have allowed planners to use data in different forms so that they can collect, analyses and, create spatial plans in a more advanced way that allows composite layering of urban issues. In this way planning will become more intelligent as planners have been allowed to organize urban space intelligently. Van Vuuren Coetzee (2005) also argued that information and communication technologies are essential tools that will allow planners to rapidly transform cities because of their capacity to produce information at higher speeds. It also allows planners to reach some of the places that are impossible, thereby allowing these places to be included in the development of the city or regional planning process. Information and communication technologies are, therefore, tools of integration as they allow places to be included and stakeholders to be involved in the planning process (Foth et al., 2009; Sakil, 2018;

Yigitcanlar, 2015). Mandarano et al. (2010) added that ICTs are very important in achieving equal distribution of resources in cities of today. Sakil (2018) emphasized that technologies in planning have allowed some stakeholders such as the youth that have for long been sidelined in the planning process to be included in the planning process and participate in the city-wide activities. This is because the adoption of technologies in planning has created space for youths, who are always in the fore front in the development of information especially in the use of mobile platforms. He further argued that this has increased their engagement with government in urban governance and in this way information and communication technology has allowed the extension of boundaries of democracy in cities. However, some scholars argued that ICTs are tools that are used to marginalize some societies in the city because they are not found everywhere and in these areas where there is no ICTs they are excluded in the development of the city. Proponents of this school of thought argued that ICTs are not meant to benefit the general public but they are used for capital accumulation and in this why they have shifted city governance from democratic practices to support only the market systems (Leon & Rosen, 2020). Mora et al. (2019) also supported the same argument and added that ICTs support top-down approaches to development and are mono dimensional. In this way ICTs alone are not sufficient to produce a smart city (Aina, 2017). Keeping of planning information in files and metal cabinets like what is obtaining in some of the organizations in the City of Masvingo, offers very little chance of the people on Masvingo to access some of the planning products of the city. For example, if one need to see a master plan that has been produced by the City of Masvingo they have to travel to their offices where the plan has been deposited, and this means some clients will need to travel as far as Beitbridge which is close to 400km away. If they were using electronic means they can upload such products on various platforms such as the internet and the website so that people can access them from their offices.

4.4 ICT and Urban Governance in Masvingo

Urban governance is a critical component of smart city as it allows all stakeholders in the city to participate in city governance. It is a concept that tries to widen and deepen issues of democracy and citizenship. These issues can easily be fulfilled by adoption of ICTs in cities. However, what is obtaining in the City of Masvingo give very little chance of engagement by various stakeholders as the technologies that enabled citizen participation are not available or are not fully developed to allow citizen participation in urban issues. For example, the issues of Wi-Fi are not fully developed so that people can participate in city issues because it is only found on very few spots. The wider part of the city does not have IT and this limits the use of the technology by the general public. Remote areas are therefore disadvantaged as they are not covered by the ICT infrastructure. Disadvantaged groups of the society need to be covered by the ICTs so that they can fully participate in the development of the city (Odendaal, 2006). Most cities in Africa have poor ICT penetration and this therefore exclude other groups from participating in city matters (Njoh, 2012). The poor coverage of ICT infrastructure therefore limits the use of WI-FI by the general public that are located away from the civic center. If there is connectivity everywhere people can fully participate in city matters and this, then widens the democratic boundaries of the city. In this way ICTs can be used to create platforms for citizen participation in city issues (Baud et al., 2016; Foth et al., 2009; Houghton et al., 2014; Odendaal, 2003; Paskaleva, 2014; Watson, 2001; 2015). Watson (2015) further argued that the adoption of ICTs will reduce too much reliance on city experts for city solutions but also allows the public to participate in the decision-making processes of the city and in that way it broadens the democratic boundaries of the city. This will usher in a new planning dispensation where there is collaborative decision making rather than the traditional ways of relying of the planning experts (Odendaal, 2003; Paskaleva, 2014; Pereira et al., 2018). The adoption of technologies such as World –wide web and Geographic Information Systems in planning can essentially assist in achieving this collaborative and inclusive planning. (Allam & Dhunny, 2019; Foth et al., 2009; Saad-Sulonen & Horelli, 2010; Shin & Shin, 2012; Stratigea et al., 2015; Yigitcanlar, 2015). Saad-Sulonen and Horelli (2010) further argued that incorporation of ICTs in planning is very essential as it will allow sharing and distribution of information within the city. In these globalized cities, information technologies are the drivers of city economies as they promote citizen participation and greatly reduce barriers of distance in planning, as people can be allowed to take part in the decision making and problem solving activities of the city (Allam & Dhunny, 2019; Keivani et al., 2003; Mirembe, 2017; Santinha & de Castro, 2010). Technologies such as internet are very important tools that bring about synergies between the city and the public, which is very important as it promotes interaction of citizens and other institution in the city, which again promotes cohesion in the city (Houghton et al., 2014; Santinha & de Castro, 2010; Shin & Shin, 2012).

Lack of ICTs in the City of Masvingo is therefore a very big blow on effective city governance. This has been further compounded by obsolete technologies that are sometimes available. These obsolete technologies are like the simple GIS which are not allowing people to participate in the city issues. More advanced GIS software such as volunteered geographic information system (VGIS) can allow people to share spatial information through mobile phones and social media and this will increase participation. This will also allow planners to access information that might not be available to planner. This can also allow the youth, who are always in the fore front in the use of mobile technologies to participate in urban planning (Sakil, 2018).

4.5 Challenges in the Adoption of ICTs

The challenges highlighted as barriers to adoption of technology in planning in the City of Masvingo included financial constraints, poor resource allocation, lack of skilled manpower and resistance to change among. The major challenge that was raised especially in the government and quasi-government organization was the lack of softwares as the government has invested virtually nothing in the adoption of planning technologies. Most of the softwares used in these government organizations are personal, which are usually obtained through illegal means of cracking into the licensing processes or relying on those softwares that are accessed free on the internet. As a result, the use of e-planning technologies in government organization is limited. Lack of government investment has therefore been seen as the major challenge in the adoption of ICTs in urban planning. The situation has further been compounded by the system of service delivery in the government that has remained centralized. If they had decentralized their operations, some regions are willing to adopt e- planning

technologies and they are will to prioritize their acquisition. In the government all requisitions are made in Harare, and all the regional offices can do is to request for whatever they need. It is the head office that prioritizes these requisitions. So far, issues of technological advancement in planning have never been prioritized in the government and as a result they remain stuck in the traditional ways of planning. One of the planners commented that, “[...] we remain stuck in these old drawing techniques because the head office has not prioritized the acquisitions of new drawing equipment”. The situation has also been further compounded by the worsening economic situation that has been characterized by galloping inflation, poor inflows of foreign direct investment. All these factors have combined to cripple the economy and stall any funding for development. The government has decentralized decision making without decentralization of resources and this has further complicated development in regions as their development plans are always supported by financial resources. As a result, efforts by many regional plans to adopt e-planning technologies have suffered and therefore have remained pipe dreams.

Local authorities are also facing a similar daunting task in getting resources to adopt e- planning technologies. The city council argued that their resources are ever dwindling because they have not been spared in the hash-economic environment characterized by ever rising inflation and dwindling government support. As a result of these hard economic conditions, residents are not able to pay their rates to the city in time and in full. The city is therefore owed millions of dollars by the residents and it is not able to provide some of its services such as water and refuse collection. This has been further worsened by lack of government support in capital projects. The government has since stopped issuing of grants they used to give to local authorities for infrastructure development and this has financially crippled them. As a result, the city is left with limited resources to do all the development and the only source of revenue is through payment of rates. The city is therefore in serious financial problems to the extent that it owes it workers several months in salaries arrears, which therefore means that issues of adopting e-planning technologies is a distant problem, they will rather do with what they have rather than engaging in other activities that further strain their financial resources. One of the respondents at the city council said, “[...] how can you talk about Wi-Fi and those expensive gadgets when workers have not been paid for close to a year now?”. It therefore means that the adoption of more powerful technologies that will allow them to do virtual planning are impossible and hence the drive towards smart city will remain a pipe dream because the financial factor will hinder them embracing this smart initiative. Most African cities are facing the same financial predicament in their attempt to adopt ICTs (Muchadenyika, 2015; Murimoga & Misingafi, 2014).

Lack of skilled manpower, i.e. people with formal education in ICT tools in planning, poses a challenge in the adoption of ICTs in the city. There are very few people who can use planning tools such as GIS, Arch Cad and other planning tools. There is no skill in ICTs among the planning work force in the City of Masvingo, as a result they continue to use the traditional ways of planning. Very few (7%) of the work force have acquire the skill in e-planning and most of these are in the private sector who want to use the skills for their business. The situation is very dire in the city council where only one person has the e-planning skills out of more than twenty planners and planning technicians. In the government the situation is the same as only two, one planning officer and a planning technician have the e-planning skills. Coutinho (2010) argued that local authorities are characterized by lack of competent and experienced employees and this has hampered the adoption of information and communication technologies in planning. He further argued that cities of the Global South have not been able to retain such skills as they are easily taken in other sectors that are better paying. The situation in Zimbabwe has been further worsened by the fact that planning institutions do not have skilled development programs which will allow those in services to upgrade their skills in planning. They still offer traditional planning programs, which do not cater for those who are already in service but lacking some critical skills. It is important for these training institutions to be innovative so that they craft training programs for these people so that the adoption of e-planning technologies will be easier for them to be able to adopt new ICTs. The city council has bloated workforce who are far older to be dealing and learning new technologies that are usable in planning. Another challenge cited by 6 other respondents which constitute 35% was the challenge of technology. The municipality does not have sufficient computers and in as much as they have introduced rate payments through the use of Eco Cash residents are not cooperating with this change of effort.

■5.0 CONCLUSION

Technological advancement is the way to go in planning in this globalized world. It will allow a lot of things not only to happen but to happen very faster. It will allow planners to reach and access important information that could otherwise be unreachable. Citizen will fully enjoy their citizenship by participating in the governance of their cities, as a result of adoption in information and communication technologies. Citizen participation in planning is very important as it will bring together all the interested parties in the city to the planning table. It is a movement towards extending the democratic horizons of the city and as a result will bring about collaborative and communicative planning. This will go a long way in creating an inclusive and just city. The traditional ways of planning that are currently obtaining in the City of Masvingo has a serious ramification on the participation of various stakeholders in the city as it does not allow full participation of all the city stakeholders. There is need to adopt information and communication technologies in the planning process so that we allow collaborative planning. To achieve this, there is a need to put up various initiatives such as improving the uptake of information technologies, skills upgrading for the majority of planners that do not have skills in new technologies in planning. The government can also take a lead in acquiring technologies in planning so that when such infrastructure is available the public can use it. Planning should be advanced with the trends that are obtaining in the global world so that effective planning and problem solving can be achieved in the city.

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