REMOVE BARRIERS, CREATE ACCESS: UNIVERSAL DESIGN OF M-PESA OUTLETS FOR PHYSICALLY CHALLENGED PERSONS IN KIBERA, NAIROBI

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B51 / 69886 / 2011

A Project Submitted In Partial Fulfilment of the Requirement for the Degree of Masters of Art in Design in the University of Nairobi

2017

DECLARATION

This Project is my original work and has not been presented to any other examination body

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DEDICATION

To my family for their love and support as I pursed my academic endeavors.

ACKNOWLEDGEMENTS

My sincere thanks go to my supervisor for the assistance given and their patience in this project.

Many thanks to the Graduate School at the University of Nairobi and my sponsors for supporting me undertake this research. The support enabled me to complete field work efficiently and quickly.

A big thank you to my work colleagues for understanding my academic endeavors. Your support enabled me to complete this work. Many thanks to the Office for Persons with disabilities who assisted me during this research.

Thank you my family and colleagues for the love and support and their unwavering patience with me without which I would not have been able to complete this work.

Above all, to God, the Almighty for his grace, that has been beyond measure.

KEYWORDS

Accessibility

Accessible Design

Activity Theory

Adaptive Technology

Anthropometry / Anthropometrics:

Disability

Ergonomics/Human Factors

M-Pesa Outlets

Universal Design (UD)

ABSTRACT

Universal Design (UD) is a concept, approach, or goal to make products and the built environment universally usable by all people everywhere. UD proposes a collaborative systems approach that benefits from the synergies of cross-functionalism by approaching the diverse challenges facing society through socially responsible design. This research addresses the universal design access challenges, associated with M-Pesa Outlets in the city of Nairobi, Kenya. The research was based in Nairobi, Kenya and was limited to the physically disabled at Kibera Locality M-Pesa Outlets. A case study approach adopted in this research allowed for gathering of qualitative data which was used to develop context-sensitive design outcomes. The case used was of select Safaricom(K) M-pesa outlets in Kibera and its environs in Nairobi county, Kenya.. Twenty participants were interviewed during the fieldwork. These included two key informants from the Kibera locality, five interior designers and contractors, seven agents of the M-Pesa outlets and five persons with disabilities. An interview with the head interior designer of the Safaricom(K) M-pesa shops also provided contextual background on designing for the physically challenged. Semi-structured interviews were undertaken through a qualitative approach and the guiding questions for the interviews were divided into two sections. The first section focused on the access challenges encountered by persons with disabilities (PWDs) in these M-Pesa Outlets, while the second section of the questions focused on the role of universal design and access in integrating the disabled in Points of Sales (POS) spaces. This research sought to propose methods that ensure Universal Design Principles are incorporated in the design of M-Pesa Outlet facilities in Kenya to contribute towards the reduction of stigma and discrimination associated with needs of PWDs. From the findings the researcher was able to propose a framework that would be used as a guide when designing small retail outlets accessible to all guided by Universal Design Principles.

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LIST OF ABBREVIATIONS

KNSPD: Kenya National Survey for Persons with Disabilities

KNBS: Kenya National Bureau of Statistics

KNCHR: Kenya National Commission on Human Rights

PWDs – Persons with disabilities

UD: Universal Design

UNCRPD: United Nations Convention on the Rights of Persons with Disability

WHO: World Health Organisation

WPDA: World Programme of Action concerning Disabled Persons

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DEFINITION OF TERMS

Accessibility: the extent to which a product, system or environment can be used by a variety of people, especially those with disabilities.

Accessible Design: design focused on the principles of extending standard design to people with some form of performance limitation to maximize the number of potential customers who can readily use a product, building or service (ISO, 2001).

Disability: a physical or mental impairment that substantially limits one or more of the major life activities of such individual, a record of such an impairment, or being regarded as having such an impairment (WHO; Americans with Disabilities Act of 1990).

Ergonomics/Human Factors: the science of work: of the people who do it and the ways in which it is done; the tools and equipment they use, the places they work in, and the psychosocial aspects of the working situation (Pheasant, 1996:4).

Person with disability' means a person registered with the Council as a person with disability and includes those who have long term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.

Universal Design (UD): addresses design in the context of needs for all people - of all ages and abilities; associated with Design for All, Design for the Broader Average, Design for Disability, Inclusive Design, Kyoyo-Hin, and Transgenerational Design (Coleman, 1999).

CHAPTER ONE

INTRODUCTION

1.0 Introduction

In a business set-up especially retail businesses, the interior design is very important. A well-designed interior environment of a business strengthens the relationship between the user and the available space. When the interior environment of a retail business is well designed, it provides a harmonious atmosphere hence ensuring safety of both the customer and the staffs are safe. It also makes both the staff and customers feel comfortable since they can interact freely. In addition, a well-designed interior environment of a retail business ensures that the goods or services being sold are well displayed hence could easily see them. This could be achieved by ensuring that there is a good relationship between the staff or business owner's eye level, shelf-height and visibility and that of the customer.

In a retail business, ergonomics plays an important role especially during the process from when goods are received from the suppliers, sold and delivered to the customers' destination/home. Therefore it is important for designers to know the physical capabilities and dimensions of people in order to effectively adjust the design and selection of the equipments used in a retail interior environment. Marketers consider the point of sale very important for products and services in a retail market because consumers tend to make purchasing decisions on very high-margin products or services at these strategic locations. A point of sale may either be a physical location (a booth, store, or other retail outlet) or electronic sales (a website or telephone-based ordering service).

Most retail outlets in Kenya do not consider people with special needs despite Article 54 of the Constitution of Kenya recognizing and giving details on the rights of people with disabilities especially emphasizing on, among others, the right to reasonable access to all places. For example, most of the Safaricom M-pesa outlets in Kenya do don't cater for people with disabilities in terms of their structuring and planning of the interior built environment. When you look at most of the Safaricom M-pesa outlets are not properly planned in terms of providing for easy access by customers or users with physical disabilities. One characteristics of the access spaces that are provided is that they are narrow and not ergonomically planned hence making it difficult for people with disabilities to access the outlets including access using crutches, a wheel chair among other devices that assist people with disabilities with movement.

1.1 Background of the Study

Previous studies have shown that there are ninety thousand (90,000) Safaricom Agents in Kenya that operate M-pesa and the number is increasing daily. Despite the high number, people with disabilities have not been able to venture into the Safaricom M-pesa businesses especially in operating M-pesa outlets because the environment has not been conducive to them. This calls for creation of an harmonious environment within the Safaricom M-pesa outlets that would accommodate the disadvantaged people hence economically empowering them by creating job opportunities for them. In order to create a friendly environment for people with disabilities within the Safaricom M-pesa outlets across Kenya, applicability of the principles of Universal Design during the design and structuring of the outlets is required. This is because Universal Design plays a major role of facilitating and ensuring that numerous facilities all over the world

provide equal mobility and usage to all people.

Architect Ronald L. Mace came up with the term ‘Universal Design’ (UD) when he was describing the concept of designing all facilities in the built environment in a manner that they are friendly and could be widely used by everyone, regardless of their ability, age, or status in life. However, the concept of free access of all facilities by people with disabilities was really initiated by the work of Selwyn Goldsmith, author of Designing for the Disabled (1963), who called it ‘Inclusive Design’ which means design-for-all, lifespan design or human-centered design. Both Architect Ronald L. Mace and Selwyn Goldsmith had similar message that if a designed facility can be used by all people across the spectrum of functional ability, then it means that the facility works better for everyone.

According to the World Report on Disability of 2011, building an accessible barrier-free Point of Sale (POS) facility is usually better achieved when approached incrementally and could put more emphasis on building a culture of accessibility and elimination basic environmental barriers. It has therefore become easier to increase standards and achieve higher levels of mainstream disability inclusion with the concept of accessibility becoming widely accepted and more resources being available. This implies Universal Design Principles should be adopted in designing, structuring and re-structuring of Safaricom M-pesa outlets in order to ensure that they are set in a secure and accessible environment within and between buildings and in outdoor environments. By so doing, the designers ensure that both the users and the customers are comfortable in conducting their daily business with the M-pesa outlets since there would be an harmonious environment for them due to increased mobility for all people including people with disabilities. As a result, the disadvantaged will be interested in venturing into the Safaricom

M-pesa retail business hence ensuring social and economic empowerment for them.

1.2 Research Problem Statement

According to previous studies, the number of Safaricom M-pesa Agents operating M-pesa outlets in Kenya is over ninety thousand (90,000) countrywide. The outlets are designed and build based on branding and merchandising standards provided by Safaricom Ltd. In most cases, Safaricom Ltd provide M-pesa Agents with minimum requirements that they should adhere to when branding the M-pesa outlets. The branding requirements should be met on commencement of M-pesa transactions at any outlet. Further studies have shown that branding is a key feature and requirement by M-pesa outlets since it ensures that the visibility of the M-pesa brand hence attracting more customers. Based on this previous studies, it is appropriate to conclude that the Safaricom(K) Limited has neither adopted nor set out clear standards for the interior design of the M-Pesa outlets. As a result, most of the Safaricom M-pesa outlets do not meet the required set standards for a well-designed retail business both interiorly and exteriorly that enhances accessibility by all including the disadvantaged. This has to led to social exclusion, economic marginalisation and stigmatisation of people with physical disabilities. This implies therefore that Safaricom M-pesa Agents are left to use or misuse the available interior spaces freely without being advised on how they should optimize the available space in ensuring that their outlets are visible and accessible by all people including people with disabilities as one way of promoting growth of their retail business.

1.3 Objectives of the Study

1.3.1 Main Objective

To use Universal Design principles to develop a design framework that will guide the construction of a Safaricom M-pesa outlet that is used and accessed by all people including people with physical disabilities.

1.3.2 Specific Objectives

i. To assess challenges faced by people with physical disabilities in using and accessing Safaricom M-pesa Outlets in Kenya.

ii. To establish minimum set interior design standards for Safaricom M-pesa outlets in Kenya in comparison with Universal Design principles

iii. To develop a framework guided by Universal Design principles that will be used in designing retail outlets in Kenya that are accessible by persons with physical disabilities

1.4 Research Questions

i. What are the challenges facing people with physical disabilities in using and accessing Safaricom M-pesa Outlets in Kenya?

ii. What are the minimum set interior design standards for Safaricom M-pesa outlets in Kenya in comparison with Universal Design principles?

iii. What type of a framework that could be used in designing retail outlets in Kenya that are accessible by persons with physical disabilities?

1.5 Purpose of the Study

The purpose of this study was to use to develop a design framework using Universal Design principles that would guide the construction of a Safaricom M-pesa outlet that would be used and accessed by all people including people with

physical disabilities. The outlet should enhance accessibility and interactions of the interior and exterior available space

1.6 Scope of the Study

The study focused on Safaricom (K) Limited especially Safaricom M-pesa Outlets based in Kibra Sub-County, Nairobi County. The study focused on Kibra Sub-County because of its strategic geographical location and high population density. The study limited itself to seven selected Safaricom M-pesa Outlets due to limited time and resources available to conduct the study. Specifically, the study concentrated on the interior profession design of the M-pesa outlets in comparison with the set principles of Universal Design and Access. This was with the main of mainstreaming the physically challenged in M-Pesa outlets in Kenya and enhancing accessibility and interactions in those spaces.

1.7 Rationale of the Study

According to the World Health Organization (2011), the disadvantaged groups in the society are the world's largest minority accounting for 10 to 12.5 percent of the total population in the world. The Constitution of Kenya (2010) give people with disabilities the right to access to all places efficiently, conveniently and independently without restrictions or barriers. Worthy to note also is that people who are physically challenged possess valuable experiential knowledge like other physically fit individuals in the society. However, in most cases the knowledge that physically challenged people have is underrated by design professionals when designing retail outlets like for the case of Safaricom M-Pesa outlets hence leading to marginalization of the physically challenged people. This calls for the need for standardized assessments of the success of the design that is adopted by the Safaricom M-Pesa outlets which do not exist currently. There is limited number of

studies that had focused on the how to accommodate the physically disabled people into small retail outlets in Kenya. Safaricom M-pesa outlets in would serve as a feasible case study. The researcher's basis of argument is that physically challenged people in the society can be dynamic customers of Safaricom M-pesa outlets in Kenya provided they are socially and economically empowered by being considered and included in the design and build of M-pesa outlet facilities. This is possible through the use the principles of universal design that ensure that the facilities designed in the built environment are usable and accessible by all people including the physically challenged.

1.8 Significance of the Study

Safaricom (K) Limited is one of the largest companies that are listed in the East Africa Stock Exchange. M-pesa is a mobile money transfer and is one of the products of Safaricom (K) that is widely used nationally, regionally and internally. Therefore, Safaricom M-pesa outlets are very common retail business models operated across the country and are mostly operated by people with sound-mind and physically fit. It therefore implies that the use and accessibility of Safaricom M-pesa outlets is of key to social and economic growth of not only individuals who operate them and Safaricom as a company but also to the country at large, hence their significance.

1.9 Limitations of the Study

The study was focused only on Safaricom (K) Limited and specifically to the M-pesa retail outlets. Therefore the outcome might not reflect all retail businesses in Kenya. As a result, the researcher recommended further research on other retail outlets in Kenya in order to generalize the findings.

The study was conducted only seven Safaricom M-pesa outlets in Kibra Sub-county, Nairobi County. The study area being an urban set-up, the findings might not reflect the same situation in a rural set-up. The researcher overcame this by interviewing key informants who provided information based on their nationwide knowledge on the design of M-pesa outlets including in rural setups.

The design approach that was adopted by this study implied that keen observation by the researcher, who is also a designer, was key in the collection of data exercise which later informed the process of designing a framework that would be used by retail outlets. This therefore means that collected data was limited to only to circumstances that the researcher was able to observe through transect walks, sketching, photography and taking of notes. Due to the limited observed data, the researcher triangulated the findings by interviewing key informants.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter provides related literature with regard to designing a framework that would be used in building retail outlets nationally and internationally that are used and accessed by all including the physically disabled people. Mobile penetration in Kenya is at 83.9% whereby 67.0% is penetrated by Safaricom (K) users. In Kenya, Safaricom (K) Limited is the largest mobile service provider and it managed a customer base of 25.1 million people most of which are the adult. Majority of the customers of Safaricom (K) use mobile M-pesa sevices which is a money transfer service. According to Safaricom(K) Limited (2016), a total of 15.7 million people are active users of the M-pesa service and they are served by approximately 91,249 M-pesa Agents distributed across the Kenya. In Kenya, the services of M-pesa started in 2007 as a microfinance project which was funded jointly by British Government and Vodafone. According to Ericsson Business Review (2012) and Mutuku (2012), M-pesa has dramatically grown since 2007, receiving recognition as the world's best mobile-money transfer service.

According Ericsson Business Review (2012), there are factors have contributed to the success of M-pesa services. They include: full commitment of Safaricom (K) in developing its network by customer agents through the nationwide franchising model; availability ready market for mobile banking due to the limited banking services in Kenya; Central Bank of Kenya being open to the mobile money innovation from its initial stages without restricting it based on unavailability of regulatory framework which was set up afterwards, allowing M-pesa to develop outside the traditional financial-services industry; lastly is the high emphasize

Safaricom (K) Limited has on put on the user relationship in developing the M-pesa model – customers are constantly requested to provide feedback on the M-pesa services that they receive and Safaricom(K) has used those feedbacks to constantly improve M-pesa.

Eijkman, Kendall and Mas (2010), argued that M-pesa's main benefit is that it de-materializes cash into e-floats which minimizes theft or loss risks hence providing safer money transfer as compared to handling cash. In addition, e-floats are more convenient to users handle since it reduces bulk of carrying cash money, makes it easier to send and receive money remotely hence minimizing transportation costs. With M-pesa services, users are able to buy airtime directly from M-pesa, pay bills, make bank transactions especially withdrawing and deposting without necessary visiting banks or ATMs.

2.1 Branding of M-Pesa Outlets in Kenya

M-pesa's success is contributed by various factors like its unique operating model of growing the M-pesa's agent network and the customer base of Safaricom (K) Limited. Electronic money transfer by registered M-pesa users is made possible through M-pesa agents. The agents are retailers authorized by Safaricom (K) Limited to offer M-pesa services to Safaricom customers but they are not employees of Safaricom (K). However, Safaricom(K) plays the role of monitoring the M-pesa agents through site visits once every two weeks at each branch (Havard Business School, open knowledge 2015).

According to Mas, Ngweno, Bill and Melinda Gates Foundation (2012), M-pesa outlets put branding at the forefront in their operations. At the initial stages,

Safaricom (K) Limited embarked on creating awareness through awareness campaigns and build trust with its customers and agents through branding M-pesa outlets whose returns have made Safaricom grow rapidly. paid off. Service brand for M-pesa has been strongly build to an extent that some market research has shown is even stronger than Safaricom(K)'s own corporate brand (Mas, Ngweno, Bill & Melinda Gates Foundation 2012).

Up to date, an M-Pesa agent is obliged by Safaricom (K) to adhere to its branding and merchandising standards. Safaricom usually provides the M-pesa Agents with the minimum branding requirements on commencement of the M-pesa outlet business. By making branding as a requirement when opening an M-pesa outlet, Safaricom (K) has managed to make its corporate brand visible. With Safaricom (K) having its branding requirements, it is logical to argue that there are no professional requirements or guidelines adopted when designing the physical layout of the M-pesa outlets. This implies that M-pesa agents are left with the freedom to use the physical space of the M-pesa outlets without being obliged to make the outlets usable and accessible by all people including the physically challenged.

2.2 Disability

A person's capability for unbiased operative classifies his incapacity. Historically, the definition of the term incapacity emerged from biomedical or social wellbeing's need to enable the person's necessity for independence. The clinical model categorizes incapacity into vast groups: bodily: locomotors (ambulatory impairment); listening to (deafness, hardness of listening to); visual (bad sightedness, cataracts, macular degeneration,) speech (language problems and

other speech issues); and mental/intellectual (cerebral palsy and down syndrome autism dementia) (Oliver, 1990; 1996; Jönsson & Certec, 2006; Fitzgerald, 2010; UNCRPD, 2015).

The approach to incapacity has been constrained to three ideas of: disability, impairment, and disadvantage, which talk to a clinical context, has now been changed by means of the new definition given by way of the World Health Organization (WHO) and adopted in 2001 by way of the international type of Functioning, Incapacity and Fitness (CIF). This definition, developed on a scientific basis, makes it clear that the incapacity stems on the one hand from the individual component, and then again from the contextual issue, that could restrict the participation of the character in an activity.

According to this definition, three factors contribute to the development of disabilities:

i. The society's organization,
ii. The scenario of individual characters;
iii. The format of the environment surrounding that person;

According to the Constitution of Kenya, disability refers to any sensory, intellectual, physical, mental or different impairment, situation or infection that has, or is perceived by good sized sectors of the community to have, a full-size or long term impact on an man or woman's capability to perform normal day-to-day activities (charter of Kenya, 2010). The Disabilities Act (2003) defines incapacity as mental, sensory, physical, or other impairments, which includes any visual, listening to, studying or bodily inability, which affects unpleasantly on social,

financial or environmental contribution. On the other hand, the Employment Act of Kenya of 2009, defines disability as a mental, physical, sensory, or different impairment, along with any visual, listening to, gaining knowledge of or bodily lack of ability, which affects adversely on a person's social and financial participation.

According to the World Health Organization (2011), close to 15% of the world's total population are physically challenged and they are the minority group in the world's population. Due to high population growth rate, there is an increase in the number of people who are physically challenged, growth of medical improvements and the natural system of growing older. However, there's massive disparity between the Kenyan government's information on disabilities and the worldwide data which needs to be harmonized so that people read from the same script. On one hand, WHO (2011) states that the share of individuals with disabilities currently stands at 15% of the whole world population while on the hand the Kenya Countrywide Survey for men and women with Disabilities places the populace of persons with disabilities at 4.6% which translates to 1.6 million. The 2009 Kenya Population Census indicated that the adult males with disabilities were 647,689 (3.4%) and adult female were with disabilities were 682,623 (3.5%) of the total population in Kenya. According to the National Council for Population and Development (NCAPD) and Kenya National Bureau of Standards (2009), the prevalence of visible physical disability is anticipated to be 25% of all disabilities which is a large minority to the inclusion of the mainstream society for economic growth and improvement.

2.2.1 Kenya Legislation and Disability

The concept of reasonable accommodation through informing people with disability that they are entitled to access of public locations is acknowledged in Article 54 of the constitution of Kenya (2010). Further, segment 15(5) of Article 54 of the Constitution of Kenya stipulates that an organization shall offer such facilities and impact such changes reasonably required to accommodate the physically challenged persons. Moreover, segment 16(2) of Article 54 provides incentives to a non-public business enterprise that improves or modifies physical facilities or avails special services with a purpose to offer reasonable accommodation for employees and persons with disabilities. Section 21 of Article provides for the rights of humans with incapacity to accessibility and mobility and presents that humans with disabilities are entitled to a barrier-loose and disability-pleasant environment to allow them to have access to homes, roads and other social amenities, and assistive devices and other gadget to sell their mobility. Section 22(1) calls for proprietors of homes to alter and adapt their buildings accordingly. Phase 24 mandates the National Council for Persons with Disabilities (NCPWD) to serve Adjustment Order upon the owner of the premises or the company of the services, or facilities concerned if it considers that any premises, offerings or amenities are inaccessible to people with disabilities.

Currently, designers and other stakeholders in the construction industry in Kenya are bound by *The Local Government (Adoptive By-laws – Building) order of 1968*. This order does not specifically mention anything to do with designing and constructing for the disabled in public built environments such as M-pesa outlets. However, the *Sixth Schedule – Public Buildings* of that order highlights the

requirements for public built environments some of which may be construed to apply to designing for the challenged. Sections 8, 9, 10, 11 and 12 of the Sixth Schedule outlines the minimum design requirements for stairways, steps, ramps and handrails together with non – slipping surface finishes which when proactively done, can accommodate various challenged minorities such as those with physical and visual challenges. Section 25 of the Sixth Schedule further highlights matters to do with soft furnishings especially floor finishing which can aid in guiding the visually impaired when properly installed (Adoptive Building By-laws, 1968). There has been no revision to these by-laws since 1968.

In addition, Volume 1-5 of the *National Planning and Building Authority Kenya Planning and Building Regulations of 2009* suggested replacing the existing Adoptive Building By – laws which are seen as being too outdated. Specifically Sections BB87 up to BB98 of the newly proposed regulations incorporated designing of facilities that accommodate the disabled with particular focus on access at the main entrances and doors, vertical access (lifts), ramps, dropped kerbs, corridors and lobbies, water closets cubicles, handrails and wheel chair spaces. However, the researcher has noted that the proposed regulations have not been effectively done as regards the M-pesa outlets when it comes to their accessibility.

2.3 Designing Facilities for the Disabled

Interior Design is a physical process manifested in the interior finishes of buildings and their environments in possessing different functions. It has emotions and ideas for improving quality of life by ensuring that the needs of human beings met for their well-being through providing living spaces, security and comfort. This is

evident in the similar construction patterns created by different societies over the centuries. How an individual understands space leads to human perception on the interior design process in terms of space, volume, surface and so on. This is influenced by an individual's interaction with interior design environment. For the disabled people, they lack any of the conventional senses required to understand space and architecture hence they require spaces which are different from those that are provided to physically fit people. This means that the disabled's physical conditions need to be considered in order to prevent them from developing a sense of exclusion and marginalized from society, especially from points of sale whose aim is to provide services to all people. Therefore, when designing a point of sale space designers should be able to consider it usable and accessible by the disabled. This will change their perception of the interior design and consequently presenting an accurate pattern of the space which takes into account this perception. This could be achieved by accurately observing professional specified criteria, regulations and standards of designing physical facilities including social amenities that cater for the physically challenged people. The disabled need to be provided with the desired conditions, in addition to guaranteeing them tranquility and safety in using and accessing public spaces within and around the designed facilities that provide services to them.

Kenya as a country has no classification of people with disabilities in terms of design. Other developing countries like Singapore through their Board of Construction Authority classify people with different abilities. Singapore's classification of people with disabilities depends on those who could be taken care of through the design interventions such as application of Accessible Design, Ergonomics / Human Factors, Anthropometry / Anthropometrics, Inclusive Design

and Universal Design. Using those design interventions, the disabled in Singapore are classified into the following categories:

i) **Expectant Mothers:** Expectant mothers require special needs which require priority in accessibility and the use of physical facilities.

ii) **Infants and Children:** This category of people in society has special needs which require special attention in the designing of public amenities and settings. Therefore public amenities and settings should be user friendly giving special consideration to those with special needs. In the micro design, the material and the design detail need to be non-hazardous.

iii) **Persons that are Physically Injured:** Physical injuries suffered result into unstable and slow movement of people and could be either temporary or permanent in one's life. Therefore the affected persons need special needs like crutches or other aids.

iv) **Elderly: The elderly people in the society need special needs due to** their limited strength, reduced mobility, poor eyesight and hearing, range of reach among others.

v) **Hearing Impaired Persons (The deaf):** They need special needs because they are not able to receive audio information, all information should be transmitted through other means.

vi) **Partial or full Sighted Persons:** People with vision impairment need special attention when designing public facilities and spaces since they depend on of any kind vision they possess and other aids to navigate. Therefore there is need for provision of physical and other sensory cues to enable them to move independently.

vii) **Wheelchair Users:** There are two categories of wheel chair users namely those that are able to ride the wheelchairs by themselves and those who need assistance in moving the wheelchairs. In both cases, the designer should put into consideration the accessibility of wheel chairs to all accessible public spaces when designing public spaces and facilities.

2.4 Accessible Design

Design researchers have identified and highlighted accessibility in designed surroundings as major challenge worldwide. Numerous studies put more emphasis on the vulnerability of disabled individuals in in accessing surroundings hence highlighting the importance of barrier-free surroundings in today's world (Antonak & Livneh, 2000; Chapireau & Colvez, 1998; Zola, 1993; Carr, Francis, Rixlin & Stone, 1992; Haq, 2003; Putnam, Greenen, Powers, Saxton, Finney & Dautel, 2003; Metts, 2004). The foundation of this study is that space designers do not priotize accessibility especially to disabled persons due to, for example, incapacity or demographic cohort. According to Valdes (2004) accessibility refers to provision of 'flexibility' to accommodate all users' desires and preferences.

WPDA (1982 further stated that realizing its aims of complete involvement and parity was fundamentally determined by environmental reasons such as "if someone is disabled once, he or she is deprived of the chances usually attainable within the public that is necessary for the basic components of living."

2.5 Anthropometry / Anthropometrics

According to Thorpe (2003), there are various building blocks of particular dimensions provided by anthropometrics that elaborate on individuals with diverse impairment in a society. Vendebelt (2001) argued that specific functioning

dimensions for people with disabilities have not been entirely measured and looked into despite the fact that measuring dimensions are not really different when compared to those of the traditional population. Vendebelt further argued that there exists variations exist between the functional dimensions of people with disabilities and those dimensions for physically fit people. The variations that exist are attributed to the coordination of the eye and the hand, the coordination of the and hand body movement, the coordination between the movement of the two hands, movement of fingers, functional operation of the body posture and body movements. The differences in the dimensions undoubtedly demonstrate that there is need for designers to design special plans in the society that accommodate the physically challenged individuals hence perform their duties and activities with efficiency and performance. Useful measuring includes measure of reaching talents, maneuvering and alternative aspects of house and instrumentality.

Boussenna, Horton and Davies (1983) noted that the disabled people have special needs to enable them access and use public facilities with ease bearing in mind that their measurement dimensions do not fit and are not incorporated within the retail sector that dominates the customers as well as the staff. According to Whateley (2013), developing countries have not embraced the principles outlined by the Universal Design styles as required. This has attributed to the fact that most developing countries have not come up with specific policies that capture various design styles for varied public buildings. These building blocks vary ominously from one country to another. For example, the specification for the attention level of persons sitting on a chair ranges from 1000mm in Spain to 1330mm in Lebanon which is quite a huge variation.

2.6 Ergonomics

Ergonomics are also referred to as human factors or human engineering or biotechnology. According to the International Ergonomics Association, ergonomics is a discipline in science that deals with the relationship between humans and the elements of a system based on their interactions. It is a profession which applies theory, principles, data and methods to design in order to improve human well-being and overall system performance. Therefore, ergonomics is an applied science dealing with designing and organizing things for human beings to use in order for the two (things and people) to interact freely, efficiently and safely.

According to Baris and Uslu (2009), the main goal of Ergonomics is to align the task, tools, and atmosphere with human capacities and limitations. Therefore it aims at forming a work environment that is harmonious hence acceptable and comfortable for all. This finally leads to an increase in the user's comfort, which is seen as the main focus of ergonomics. However, it is actually a result of improving the ergonomics through a more intuitive design that supports natural body mechanics.

Despite Ergonomics widely thought of in terms of products, it could be equally useful in the design of services or processes in many complex ways. However, the users' most concern is how they could use the product or service to meet their needs, and whether they like the product/service or not. Ergonomics therefore helps define how it is used, how it meets your needs and most importantly if you like it. It makes things comfortable and efficient.

2.7 Universal Design

2.7.1 Definition of Universal Design

Mace (1988) defines universal design as a way of developing a product and its surrounding environment in a manner that it is usable by all people to the largest extent without necessarily being subjected to adaptation. Moreover, Stroff (2001) argues that the concept of universal design has advanced from the 1980s to the awake of the 21st century. Stroff further argued that universal style aims at taking care of the special needs. The definition which is widely accepted by most people is the one by UN which refers universal design as an approach used by designers in planning products, services, environments, and programs that are used usable and accessible by all people at the highest level including the disadvantaged in the society, which are the minority, without the need for modifications. CRPD (2008) further asserted that universal design ensures that devices that can be useful for special people in the society like disabled people are not eliminated hence should be available whenever needed.

Universal Design has seven principles that provide guidance in the design of facilities and environments. Here after in are the seven principles together with examples of their application:

i. **Flexibility in use:** acceptance of a wide range of personal preferences and capabilities. A design of a museum which allows visitors to select the content of a display case that want to listen or read is a good example of the flexibility in use principle.
ii. **Perceptible information: Effective c**ommunication of necessary information to the consumers without putting into consideration the ambient conditions or the

sensory capabilities of the user. A captioned television programming projected in a restaurant that is very noisy is a good example of this principle of perceptible information. noisy restaurants.

iii. **Equitable use:** A principle that is well applied for people with multiple abilities. A good example is designed website that is accessed by all people including the physically challenged.

iv. **Simple and intuitive:** This principle is effectively used to embrace understanding regardless of the experienced, knowledge, language skills or concentration levels of the user. This principle is best applied in making science laboratory equipment comprising of buttons that are clear and intuitive.

v. **Size and space for approach and use:** This ensures that there suitable space and size provided that enhances style, influence, manipulation and use regardless of the user's posture, the size of his or her body, or movement. The best example where this principle is applied is a flexible work area designed for use by employees with diverse physical features and capabilities.

vi. **Tolerance for error:** Use of this principle limits hazards and hostile consequences of accidental actions. A good example of where this principle has been used is a software application which provides guidance when the user makes a selection that is invalid or inappropriate.

vii. **Low physical effort**: This principle ensures that there is minimum fatigue when using a product hence efficiency and comfortability is experienced. A good example where this principle has been employed is automatic doors whereby they automatically open for all people especially those that are physically challenged.

2.7.2 Cost of Universal Design

The cost of applying universal design standards and guidelines has a subject of discussion by some design researchers and implementers of the designs. The discussion has been looked at from two perspectives: the cost the cost when universal design is incorporated and the cost when universal design is not incorporated. The cost is grounded on lack of experience or knowledge and estimates of the actual cost of construction that are inaccurate. The assumptions that are made about universal design costs usually exaggerate the really cost and neglect long-term savings. The cost to retrofit numerous structures to accommodate specific needs especially needs of the disabled is the major cost incurred in incorporating universal design. However, if appropriately managed, this retrofitting cost can be reduced to manageable and affordable costs.

There are two good practices of cost-effective universal design. They include the early incorporation of universal design and local stakeholder participation in it. Previous research has proven that providing full access facilities from the outset has additional costs of approximately one percent of the normal costs. However, the returns are far greater than the one percent extra cost that is incurred and they can rise up to five percent or more of total cost depending on the modification of the architectural features of the building. In order to achieve effective application of universal design, it is very important to take into consideration the local stakeholders' participation. Involvement of local stakeholders helps in identifying products and construction techniques that are locally available. These locally available resources if well-utilized by the project designers would help in minimizing significant cost, an important consideration to ensure that such

facilities are maintained by local communities afterwards (Snider & Takeda, 2008).

2.8 Design Considerations for the Physically Disabled

2.8.1 Entrances and Horizontal Circulation

The designers of new buildings should ensure that the entrance is accessible to all individuals regardless of their age, capability or gender. Restructuring an existing building should involve attempts to make the main entrance accessible by all people. Reasonable realignments should be considered in the same way as for other buildings if the building is listed.

2.8.1.1 Accessible Entrances

The following are the guidelines and standards for accessible entrances:

- Have a minimum of 1500mm by1500mm clear of any door swings immediately in front of the entrance and be of a material that does not hamper wheels.
- Be clearly signposted and include the international symbol of access and the principal entrance provided that it is not the accessible entrance.
- Principal entrance to a building is inclusive and should consider the prominence of the entrance, the ease of operation of the door, the type of the threshold to allow convenient access, and an overhead canopy if the door need to be kept locked.
- Be accessible to deaf and hard of hearing and people who cannot speak: 1400mm should be the upper limit in terms of height.
- Should not be a threat to visually impaired people.

Figure 2. 1: Antrance with accessible stairs and ramps at KICC building Nairobi, Kenya

Source: BuildDesign Magazine (2016)

2.8.1.2 DOORS TO ACCESSIBLE ENTRANCES

Entrance doors can be automatically or manually operated. There are a number of principles that should guide on how doors should be designed in order to ensure usable and accessibility by all people. The principles that the designer of doors should put in mind when designing accessible doors for various buildings include, but not limited to:

- Double buggies are wider than wheelchairs
- Vision panels which enable people to see other people on the other side of doors. Minimum zone of visibility should be 500mm and 1500mm from floor level and 800mm and 1150mm from floor level to accommodate a horizontal grab-rail.

2.8.1.3 POWERED ENTRANCE DOORS

For powered entrance doors, all users regardless in a wheelchair, carrying items, limited strength or pushing a buggy benefit in their attempts to leave or enter a building. The principles that guide in designing powered entrance doors include:

- A clearly difference between manual control for powered entrance doors and the background, should be located between 750mm and 1000mm from the ground level and the location of the control should be accessible.
- Under circumstances where the doors swing towards approaching people, provision of visual and audible warnings is recommended. Safety stop also should be if a person is passing through and revert to manual control or stay open in a power failure.

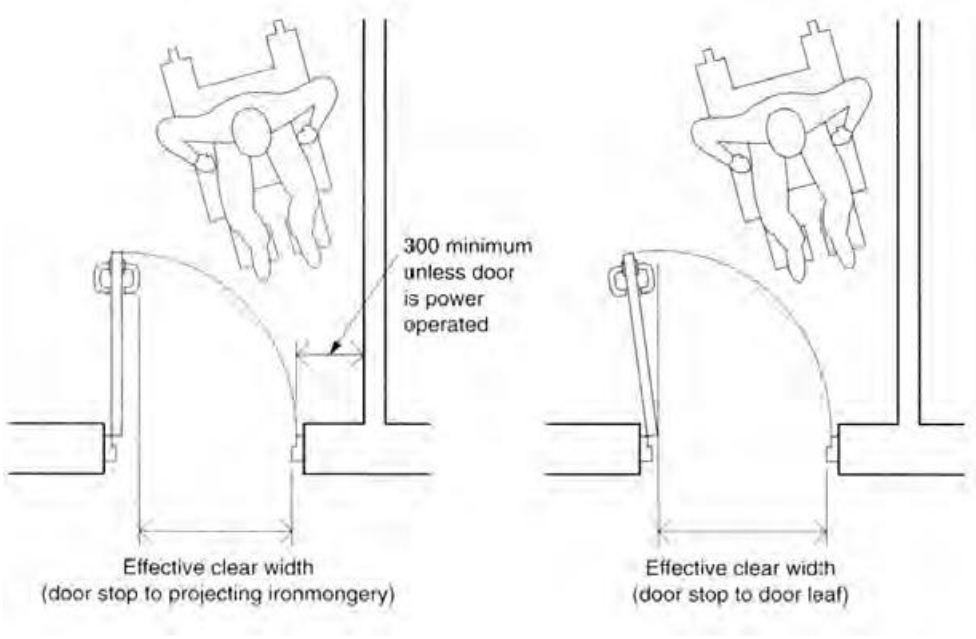

Figure 2. 2: Space requirements for an access control door for a person on a wheelchair

Source: Baris and Uslu (2009)

2.8.2 Vertical Circulation

A good example of designs of designed facility that employs vertical circulation is a lift. Lifts apply vertical transport and are an important part of the accessible path of public building (Baris & Uslu, 2009). This requires extraordinary consideration to the plan in determination to accommodate the special needs of people with exceptional needs. Applying universal design guidelines, it is advisable to design elevators adjacent to staircases, the same way as signage for elevators must be definitely legible, posted, and observe federal and laid out strategies. People who are physically challenged encounter problems in appreciating navigation of physical infrastructure (Lederman & Metzger, 1985). As shown in Figure 2.3, there is a huge clearance area for the users of the lift.

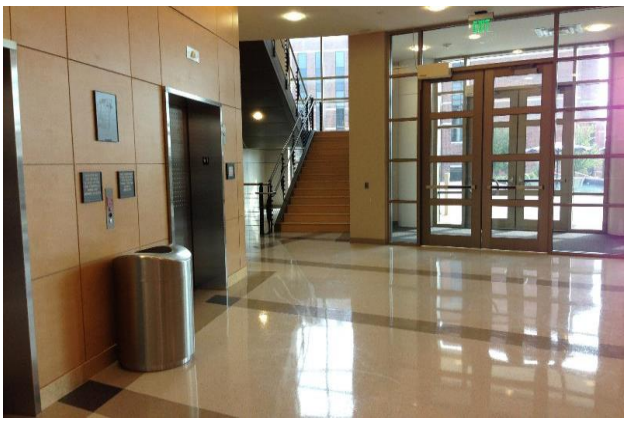

Figure 2. 3: A large lift door with color contrast

Source: Baris and Uslu (2009)

Vinod and Victor (2012) noted that unless a building has been in reality constructed considering universal design principles, a user who is physically challenged encounter problems in getting his or her access to a biding or space at

which the point of sale is located.

2.8.3 Lighting

Lederman and Metzger (1985) sated that correct lighting importance for all people. It lets people to move sufficiently and self-reliantly within a building and its environs. Impeccable lighting supports the concept of texture, space, coloration, and enables identity and study signs and directives; and makes visual dialogue less complex. Unsuitable lights may also make a building or its surroundings unreachable to some people (Rogerson et al., 2005). When levels of lights are too low, some people may not be able to distinguish various parts of a building or along an outside route, and therefore can be not capable to move around freely. Properly lighting is of specific concern for humans with visual problems. Use of mild enhance or minimize visual assessment between surfaces henceforth the design and selection of surface appearances and lights have to regularly be reflected together. Figure 2.3 suggests the coloration and luminous contrast used for differentiating an object with its background and detecting level distinction. Lighting is very important in bringing out the contrast distinction between the ground of a building and the walls.

Figure 2. 4: Lighting walkways and the placement positions of light fittings to avoid barriers

Source: Lederman and Metzger (1985)

Wylde, Baron-Robbins and Clark (1994), asserts that natural light sources within a built environment have to be keenly considered on the earliest design levels. Rogerson Namara, winters and Marsh (2005) argued that in public spaces, digital tracking of lighting fixtures levels outside and inside need to be considered during the design process.

2.8.4 Workstations and storage

Working stations should be very friendly as one way of satisfying the needs of the physically challenged in the working environment as noted by Lederman and Metzger (1985). They range from the arrangement of the office furniture, desks that are height adjustable and the presence of assistive equipment. In an office scenario, L-shaped desks are the best since one can be able to reach both ends easily. Office seats should be modifiable in height, the headrests, armrest should also be removable. Storage rooms are ought to be firm, robust, and devoid of sharp ends. Rogerson et al. (2005) noted that storage areas should be different from the

neighboring surfaces and fully illuminated. This enables the users to engage with the computer systems in a smooth manner.

The main reception area of any building may be the first area that the public visit therefore it is important to be inclusive. Design guidelines and standards for main reception areas include:

Being easily identifiable right from the entrance doors or lobby, have a direct approach, be free from obstructions, have accessible reception desk or service point to cater for the majority of users whether seated or standing.
A sloping edge to the desk helps individuals when picking up paper, coins etc.

For standing users, accessible counters should be within a range of 950mm and 1100mm high and a surface of 700mm above floor level for seated users with a knee recess of at least 500mm deep.

It is recommended for waiting areas to provide space for buggies, wheelchairs and assistance dogs.

If seating is to be provided within a waiting area it is good practice to provide seats at differing heights with or without arms and also that they contrast in colour with the adjoining surfaces.

A clear manoeuvring space of 1200mm in front is desirable for wheelchair users or individual pushing buggies

A clear signage plays an important part in way finding and good clear accessible signage with the incorporation of symbols will aid most visitors to a building

where for example English is not their first language or they have a learning disability.

Hearing enhancement system should be provided at the reception area. Regular testing of hearing enhancement systems at the reception should be carried out to cater for some security systems which interfere with the frequency of certain loop systems.

Effective lighting is required at the reception areas to enable people with hearing impairment to lipread.

It is highly recommended that information available for visitors is placed at different heights, however, there not provision in alternative formats and languages.

Figure 2. 5: Multilevel Service desk accessible to wheelchair users

Source: Lederman and Metzger (1985)

2.8.5 Floor Finishes

Despite adding aesthetic value to a building a floor finish depicts on the safety, legibility and usability of the built environment Baris and Uslu (2009). Rogerson, et la., (2005) argues safety is the primary goal for all clients. The ground should have high slip resistance which provides a firm foothold and strong wheel grip. Whether the floor is wet or dry the resistance should remain high for slippage. The floor finishes should be firm and even for ease of movement for those using wheelchair, stick or those having difficulty in lifting their feet fully (Lederman & Metzger, 1985).

2.8.6 Corridors and Passageways

Corridors should have ample space so that they can accommodate those with or without physical challenges. Figure 2.6 explains how to direct people around columns;

- A door opening towards the corridor should be modified so that it doesn't get into the corridor when opened fully to avoid being a barrier to flow of people passing through the corridor.
- Fire horses, radiators should not project into the passageway and where it is fully unavoidable there should be contrast application by use of a guardrail.
- A rest area of at least 1500mm long and a rise of less than 500mm should be fitted into corridors with a gradient of 1:20 to1:60.
- The floor should not be slippery.
- Glass items should be easily seen.
- Excluding objects protruding into the corridor, the barrier free width should be at minimum 1200mm.
- If the corridor is 1:20 or steeper, refer to ramp details.

- On a major access or escape route the wider leaf of a series of double doors with leaves of unequal widths should be on the same side along the length of the corridor.
- Passage ways should be 18800mm long and 1800mm wide to allow ease of movement for wheelchair users where a barrier free width of a passage way is less than 1800mm

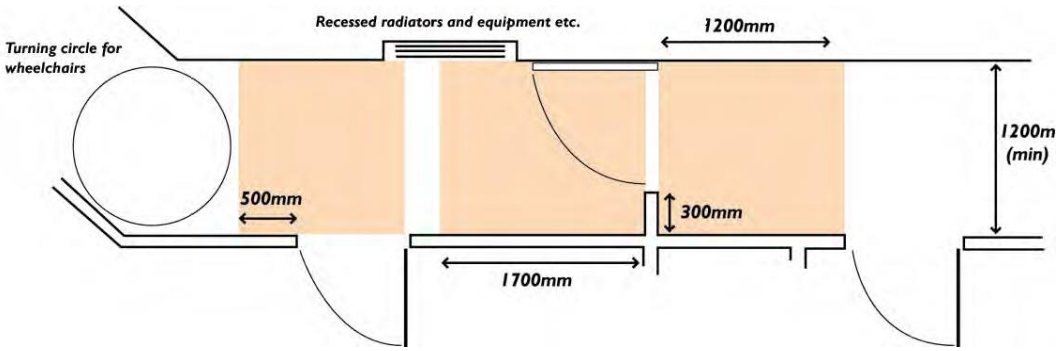

Figure 2. 6: Minimum working dimensions for wheelchair users in walkways

Source: *Lederman and Metzger (1985).*

2.8.6.1 Internal Doors

The weight and design of doors in a built environment also determine the accessibility of the setting. Heavy doors are difficult to close, open and also to pass through them. Pulling a door is difficult to a person using a wheelchair compared when he pushing the door. Therefore the doors should be;

- Opened or closed by switch which is operated by hands.
- Made active by a fire alarm
- Pull handles of the doors should be fully distinguishable from the door itself.
- The door should be fitted with a horizontal rail between 800mm and 1150mm.

- Since fire doors are heavier than the standard doors mostly located along the corridors they should be fitted with an electromagnetic device.
- A swing free device should be mounted on fire doors that lead to individual rooms and close in case of power failure, fire and smoke.
- Incorporate low-level protection from wheelchairs at least 400mm high. Thresholds should be level with adjacent floor finishes.
- The leading doors should be made fully visible by use of different colour.
- Lever handles are preferable to knob sets and still suit most individuals with manual dexterity issues or carrying items.
- The force to manually open a door for the first 30 degrees should be less than 30N .

2.8.6.2 Switches, Outlets and Controls

- To ease access of switches and controls to a user, they should be fitted between 750mm and 1000mm above the surface of the floor.
- Controls that require reading for modification should be 1200mm and 1400mm from the floor.so that the user can read while seated or standing.
- The distance of room corners and the switches should be around 350mm
- For permanently wired machines, their switches should be located between 750mm and 1200mm from the floor.
- Contract of the front plates of sockets should be conspicuous from the background and a clear signal that they are ON or OFF.
- Light switches should be between 1000mmmm to 1200mm above the floor if not applicable pull cord be put in place around the same height

- Television sockets, telephone points and wall fitted socket outlets should be positioned 400mm to 1000mm from the floor.

2.9 Adopting of Design Guidelines: Accessibility in Retail shop design

The Americans with Disabilities Act (ADA) stipulates that unless a building is impossible to be modified to accommodate the needs of the physically disabled all retail stores opened on or after 26,January,1993 should be user friendly to all people especially to those with special needs (Rose 2013).

When designing access for a building those who use wheelchairs should be fully put into consideration. Many physically challenged persons appreciate accessibility and ease of access to the attendants when they shop at the retail outlet. Some of the prerequisite for enhancing accessibility of a store are as follows;.

i) Reduction of noise levels from music and equipment for those with trauma disorders, proper labeling of products, visual guidance system guides should be provide, removal of smells and regular arrangement of furniture
ii) Step free entrance for clients with mobility challenges, parking spaces near to the outlet entrance, easily reachable shelves and seats provision for them in front or inside the stores.
iii) The store should also be equipped with a sign language attendant for the clients who have a hearing problem.
iv) Low or easily adjustable shelves for the clients who have dwarfism.
v) Braille labelling of products for those the blind clients.

Lormis (2016) argued that to achieve accessibility in all retail stores it demands training of employees, showing concern and putting into consideration of diversity of the customers.

2.10 Conceptual Framework

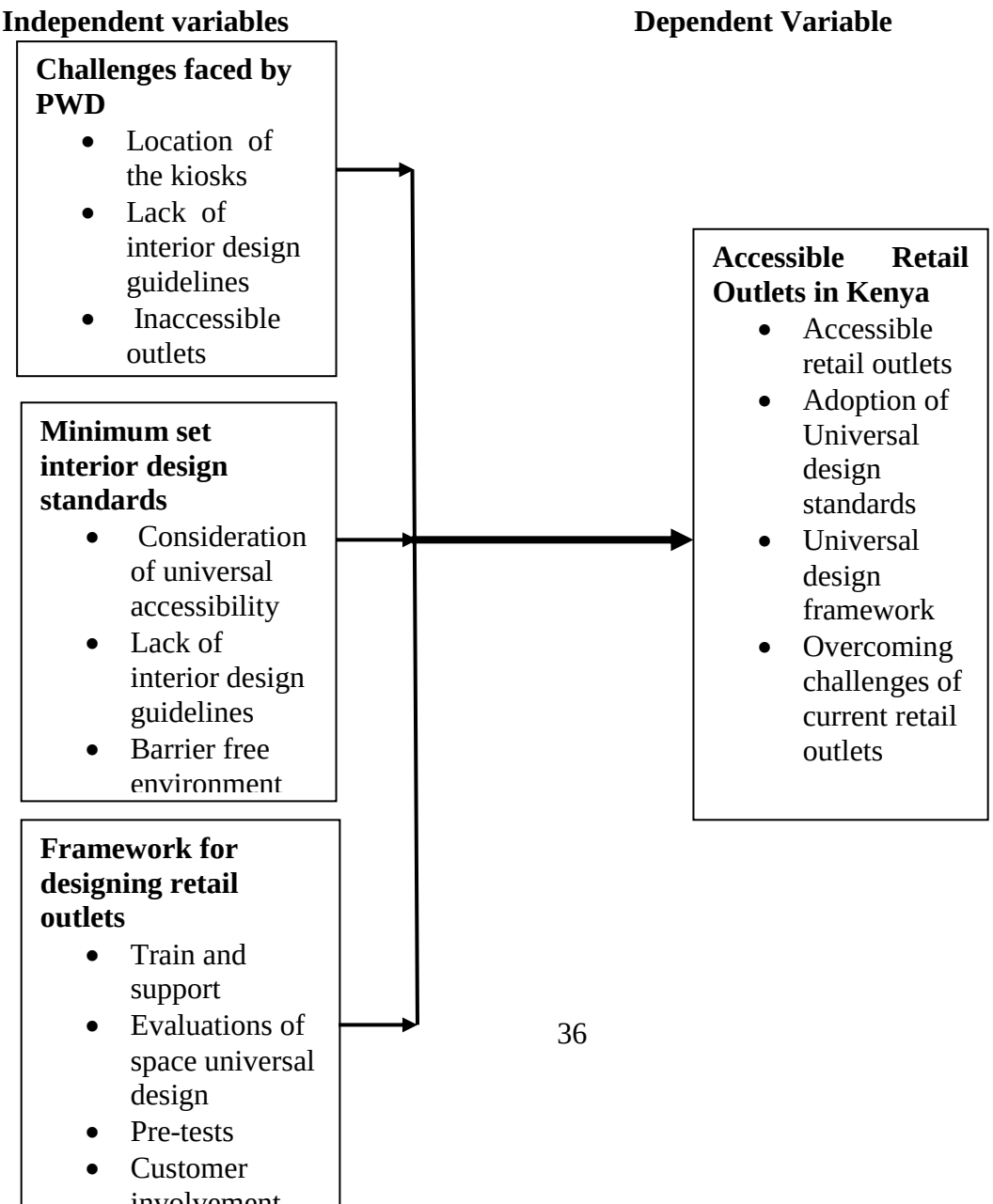

Figure 2.7: The Conceptual Framework

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter consists of design of the study and methodology adopted which includes sampling of population, data collection, methods used in analysis of data and ethical considerations.

3.2 Research Design

Case study approach to research enables adequate exploration and better understanding of complex scenarios. This design is considered to be robust especially when in-depth and holistic investigations are required in a research study (Gulsecen & Kubat, 2006). The case study method allows a researcher to examine in a closer manner data that is within a specific context (Yin, 2009). Case

study enables researchers to go past the results that are quantitative in nature in order to understand conditions of behaviour or existence of phenomena from a different perspective (Tellis, 2007).

This case study provides the researcher a chance to study occurrences in context through application of diverse perspectives (Baxter & Jack, 2008).By application of a case, the learner aims to comprehend various factors within one or more cases therefore engaging in a contextual or intensive rather than exensive. To ensure that the empirical material is fully comprehended contextual depth is applied to achieve holistic and integrative understanding (Angrosino, 2007; Saldaña, 2013).However, it is cumbersome to generalize findings of a study despite the fact that a case study provides a profound understanding (Thomas, 2011).Yin, (2009) states that case findings can be generalized through theoretical triangulation. The primary goal for this method is to fully understand rather than quantification of the findings (Baškarada, 2014).

The case study design is based upon the assumption that the case being studied is atypical of cases of a certain type and therefore a single case can provide insight into the events and situations prevalent in a group from where the case has been drawn (Ranjit Kumar 2008). The case study approach adopted in this research allowed for gathering of qualitative data which was used to develop context-sensitive design outcomes. The case used was of select Safaricom(K) M-pesa outlets in Kibera and its environs in Nairobi county, Kenya.

For the purposes of this research and sampling, Safaricom (K) M-pesa outlets were classified as follows:

- Safaricom(K) Owned M-pesa outlets

- Shop-in-shop M-pesa outlets
- Kiosk type M-pesa outlets

3.3 Research Population

According to Cohen (2007), research population refers to a group of items or individuals that have common characteristics and which are of interest to a researcher. The population therefore may include the total number of individuals that have a particular common attribute or a part of a group that is more restricted. Pandey et.all (2016) opines population to be the total number of members of a class of objects, people or events that is well defined. Population represents a complete enumeration method or a census under which all units included therein can be reached.

The population is therefore the entire group of people the researcher wishes to obtain knowledge from. A selection of these individuals is taken from this population and is known as the 'sample' (Gerrish & Lacey 2006). According to Creswell (2014), sampling entails the process of taking a section or part or a population to represent the rest of the population or universe. Cohen (2007) stated that sampling is a process of taking out a sample from a population. The sample provides the information and data for the study. According to Parahoo (2006) non-probability samples can be useful with qualitative research as "the purpose of qualitative research is to contribute to an understanding of phenomena" and the sample can be 'chosen' to best provide the required data for the study.

M-pesa outlets were selected out of logic convenience for observation while the key respondents were selected on the criteria that they were willing to be

interviewed for a realistic amount of timeb (Poulis, Poulis & Plakoyiannaki, 2013). In this regard, the selected outlets were identified during a transect walk with two key informants who were Safaricom(K) employees.

3.3.1 Characteristics of the sample

The sample which participated in the study were selected on condition that they were formally registered as agents of M-pesa by Safaricom Limited found in Kibera area providing Point of Sales Sevice to the public. Purposive sampling was used to select the sample size. Purposive sampling allows in depth information to be derived from a carefully selected group that is small in number (Mason, 2002). Purposive sampling ensured the informants give necessary and relevant information for this study(Parahoo,2006).Purposive sampling therefore helped the researcher to select individuals that would be most appropriate for the study(Burns and Grove 2011).This research was fully funded with time limits the sample size allowed for easy access as it was cost friendly.

The researcher approached a 'gatekeeper'; an individual who enabled the researcher access to the setting and research participants (Gerrish & Lacey 2006) for example, the head of M-Pesa within Safaricom(K). Permission was sought to conduct the study and further ethical approval was sought from the owners of M-Pesa Outlets. A semi structured interview guide was sent to potential respondents from the target population.

3.3.2 Characteristics of the sample

The sampling criteria for this study included participants that were fully and formally registered as agents of M-Pesa by Safaricom(K) and were located within

Kibera locality offering Point of Sales service to the publicand thus the choice of using purposive sampling, as the sample was chosen deliberately, “on the basis that those selected can provide the necessary data” for the study (Parahoo 2006). This allowed the researcher pick a selected group of individuals most appropriate to answer the questions and select the specific information sources required to gain insight into the research study (Burns & Grove 2011). As this research was self-funded with limited time available for the study, this sample technique and size allowed for easy access as it was cost effective.

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3.4 Data Collection

3.4.1 Semi-structured and Unstructured interviews

The semi-structured interview had a protocol that contained a clear set of instructions to provide reliable, comparable qualitative data. These semi-structured interviews were preceded by observation, unstructured interviewing and literature review in order to develop a keen understanding of the topic. The open-ended questions provided the opportunity for identifying new ways of seeing and understanding the topic (Cohen and Crabtree, 2006).

Interviews are appropriate when a researcher wants to access the experiences of

people and their personal feelings, attitudes and feelings. Structured interviews have predefined questions which are asked in the same order to all respondents for the study (Fontana & Frey, 2005). Unstructured interviews offer a natural extension of observations from participants because oftenly they occur as part of observations made by participants in fieldwork (Patton, 2002). In unstructured interviews that are more ideal, interviewers follows interviewees/ narrations and comes up with spontaneous questions purely base on personal reflections of the narration (McCann & Clark, 2005).

3.4.2 Transect walk

The transect is a tool to help the researcher learn more details about the environmental, economic and social resources in a community. The purpose of a transect is to organize and refine spatial information and to summarize local conditions in the area. The information is gathered from direct observation while walking a straight line through the community. While on the transect, questions about each zone are discussed. Everything noted is written down as the transect proceeds. During the transect walk time is taken for brief and informal interviews with women and men met along the way. During these interviews, the critical issues are discussed. After the transect walk was finished, the researcher sat down in a suitable place with the local analysts to discuss and record the information and data collected.

Transect walks aim at capturing diversity instead of averaged (Zeeuw & Wilbers, 2004). According to Lee and Braae (2013), transect line aim at twist and turns with

a main goal of revealing continuously qualities of sites. Diedrich et al.(2014), view site thinking to be on-site thinking therefore suggesting a need to develop methods that enable identification and building of situated knowledge. To achieve this, experimental transect walking is emphasized.

3.4.3 Observation

Observation entails watching attentively in a systematic or scientific manner. Usually it consists of keen and detailed notation of events, behaviours and the surrounding context in which they occur (Powel & Connaway, 2004). Observations may take the setting of the physical environment, activities and interactions. Many researchers prefer this method of data collection because it allows the researcher to observe and record participant's behaviour directly instead of relying on reports (Best and Khan, 2003).

Naturalistic observation (i.e. unstructured observation) involves studying the spontaneous behaviour of participants in natural surroundings. The researcher simply records what they see in whatever way they can (McLeod, 2015). By being able to observe the flow of behaviour in its own setting studies have greater ecological validity. Like case studies naturalistic observation is often used to generate new ideas. Because it gave the researcher the opportunity to study the total situation, this method suggested avenues of enquiry and solutions previously not thought of by the researcher.

3.4.4 Sketching and note-taking

Recording notes is a quick way to capture general observations and ideas. Mind maps can then be used to connect ideas in a diagrammatical, non-linear form. The

mind maps enable one to see a large amount of information on one page; the central idea is clearly stated in the middle of the page; connections between key concepts are clarified; and additional information can be added easily (Different models of note-taking, 2015). The researcher used this method to record an in turn propose new design options for the M-pesa outlets guided by UD principles.

3.5 Thematic Data Analysis

Thematic analysis is a qualitative analytic method for identifying, analysing and reporting patterns (themes) within data. It minimally organises and describes data set in (rich) detail. Its aim is to unveil contextual meanings by relating varied forms of data (Braun and Clarke, 2006). The researcher used this to transcribe and analyse the interviews held with interviewees.

3.6 Data Presentation Methods

For this study, the following research instruments will be used to present data; Narrative, Photography, and Tables.

3.6.1 Narratives and Tables

Data collected from the interviews was presented in tables for comparison as in the case of the categories of the M-pesa outlets. The tabulated data was complemented with narrations to explain their relevance to the research. Field notes were transcribed and clustered accordingly under various headings according to the research objectives.

3.6.2 Photography

Photographs were presented and complemented by descriptions to explain the circumstances and their relevance to the research.

3.6.3 Logical Framework

Objective 3: To develop a framework that can be used in designing small scale retail outlets accessible by persons with physical disabilities	
Data Needs:	UD Principles; Needs of PWDs
Data Sources:	Literature; PWDs
Data Collection Tools:	Note taking; Unstructured Questionnaires
Data Analysis Method:	Systematic Review of Literature; Meta Analysis; Thematic Analysis
Output:	Customized set of interior design guidelines, applicable in any small scale retail outlet, accessible to all persons

Objective 2: To investigate the minimum interior design set standards of M-pesa outlets by Safaricom (K) in line with UD	
Data Needs:	Set Bylaws governing building for PWDs in the built environment
Data Sources:	Literature Review; County Bylaws; NCA regulations; Lead Designer(s) of the Mpesa Outlets
Data Collection Tools:	Note taking; Unstructured Questionnaire
Data Analysis Method:	Systematic Review of Literature; Meta Analysis; Thematic Analysis
Output:	In depth understanding of design standards and UD principles

Table 3.1: *Logical Framework illustrating a summary of the Objectives, Methodology and Findings from this research*

3.7 Ethical Considerations

Written ethical approval was obtained from the School of the Arts and Design prior to the commencement of the study for the protection of the participants and their rights. Informed verbal consent was obtained from each participant before the study and this was after they had received adequate information, briefing and understanding of what participation in the study entailed as informed by Bowling (2002). Participants were informed of their right to voluntary participation and the right to withdraw from the study at any time without incurring a penalty, which protected their right to self-determination of participation as advocated by Burns & Grove (2011). All information obtained within the study was treated as confidential and stored securely as proposed by Parahoo (2006).

The individuals were given an opportunity to adopt a pseudonym in order to maintain anonymity for the duration of the rest of the process in order to protect subjects and records (Zanotti & Cowman 2008). Confidentiality was maintained at all times by not disclosing the information shared to any other parties, without consent and by avoiding attributing information in the findings which would identify the participants (Parahoo 2006). Justice and fairness were upheld through equal opportunity for all eligible participants regardless of tribe, language and education levels.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.0 General Information

The name Kibera originated from the Nubian Language meaning "Forest" (Affordable housing institute.org, 2005). Kibera is located 5Km from the city centre of Nairobi, Kenya. According to International Medical Corps.27 March 2006 Kibera which is the largest slum, has a population of 1.2 Million and covers 2.5Km^2.In Africa Kibera is the largest slum. However there has been conflicting results in its populations as (Mutisya and Yarime, 2011) suggest that the population varies depending on which slum population is included. Kibera has 13 villages which includes Laini Saba, Soweto Kisumu Ndogo, Kianda, East, Gatwekera, Makina Lindi, Siranga, and Mashimoni. The 2009 Kenya Population and Housing Census reports Kibera's population as 170,070 (Muchiri (3 September 2010).

Nevertheless, the economy is very vibrant. There is the small economy inside of the slum as they trade with each other, but more importantly there is a huge daily flow of cash through mobile phones. Many transactions are carried out through mobile money transfer with Mpesa being the leading mobile money transfer service provider. Numerous Mpesa transactions outlets can be found in many areas within Kibera. Many of the inhabitants are casual labourers and are paid

through M-pesa. However a marginalized people (PWDs) live within this setting and the researcher saw a gap that needed to be addressed in this kind of informal settlement(s) in proposing the design and construction of accessible retail outlets/kiosks for them, to integrate them in society.

4.1 Purpose

The objective of this study was to find out ways in which the physically challenged can be mainstreamed, therefore improving ease of use and interactions in those points of sale in M-Pesa outlets in Kenya. The main aim of this study was to draw on the field experience, interior design expertise, and the vision of key "experts" to provide assistance to define the best way of mitigating challenges experienced by the physically challenged in point of sale spaces. The researcher also aimed at identifying the needs and gaps, with a view of making recommendations for further development in the implementation of universally designed and accessible M-Pesa Outlets.

4.2 Methodology / Approach

During the study, the researcher analysed the following three themes: extent to which M-Pesa outlets are accessible to the physically challenged; limitations and challenges encountered by the physically disabled in M-Pesa Outlets; and model that can be incorporated in the design process of M-Pesa Outlets to enhance access of the physically challenged into those spaces. In order to investigate the area under study, the researcher selected Kibera Area for in-depth study. The tools of collecting data employed were desk review of secondary data sources, observations, transect walks, semi-structured interviews for the key informant,

unstructured interviews questionnaires, and interviewing of group. The procedure was: preliminary desk based study; data collection regarding M-Pesa outlets including interviews at Safaricom(K) Group Level, structured interview at designer level and a questionnaire administration with agents. Thematic coding and data compilation for each objective and for the general research setting were employed in the data analysis phase.

4.3 Study Procedure

The researcher followed the following process in collection of data and its analysis:

i **Preliminary desk-based study:**

Prior to the field visit the researcher did a thorough desk-based research, analyzation of the secondary sources, and mapping of the stakeholder. General contextual and policy documents on the physically challenged and universal accessibility, disability reports, review articles and building accessibility evaluation reports were drawn from the internet sources though a collaboration with the relevant institutions. Appropriate text from the secondary sources were coded according to the research questions. The exercise of mapping key stakeholders formed a list of the vital informants for the study which was reviewed and added during the study process.

ii **Collection of data from the Mpesa-outlets:**

This phase of study entailed collection of more secondary sources which included mainstreaming data associated with the visually challenged, interviews from the

key informants who comprised of interior designers, and non-electronic sources which had not been accessed. The first month in the research included preliminary meetings with Safaricom(K) managers in charge of M-Pesa Service where interviews and visits to the relevant design firms were conducted. The second month involved the interviews at M-Pesa Agents, stakeholder's interviews at design expert level, and the final visits to the M-Pesa Outlets in Kibera.Individual interviews were conducted thereafter where the interviewers were free to ask follow up questions to gain clarity. The questions were lifted from standardized schedule.

iii **Initial data analysis:** This process commenced whilst in the field. Analysis involved coding of the interview transcripts for the data was qualitative. To smoothen the comparative analysis process the coding scheme adopted a shared core component.

iv **Integrated analysis:** To achieve a narrative analysis data was compiled for each activity selected including that of commercial bank. Wherever possible triangulation of data was adopted in order to maximize the strength of points drawn analytically, interpretations of evidence are clearly indicated since they are more speculative.

4.4 Coverage

The findings of this study were collected from twenty participants. These included two key informants from the Kibera locality, five interior designers and contractors, seven agents of the M-Pesa outlets and five persons with disabilities. An interview with the head interior designer of the Safaricom (K) M-pesa shops also provided contextual background on designing for the physically

challenged.80% of the key informants of the study were primarily contractors who mostly handle the design of the Mpesa outlets. The rest of the respondents provided relevant information on the challenges experienced directly and indirectly by the physically challenged in points of sale. Strict ethical guidelines all through the study process were adhered to; no informant was forced to participate in the interviews it was fully voluntary. Anonymity of the informants was fully respected during the process and in this report.

The researcher adhered strictly to ethical guidelines whilst doing the study, which included gaining informed consent from all participants in the research prior to interviews. The research was conducted on the basis of anonymity, and therefore in this report we do not disclose the identity of those making statements that are reported.

4.6 Analysis of response

In this section, the researcher sought to establish the response rate as compared to the research design in the previous chapter. The figure below shows the researcher managed to interview seventy five percent of the targeted population sample, making the survey a success:

No	Description	Targeted	Responded	Response Rate
1	Safaricom Employees	2	2	100 %
3	M-Pesa Agents	7	6	86 %
4	Physically Challenged	9	5	56 %
5	Interior Designers	2	2	100 %
Total		**20**	**15**	**75%**

Table 4.1: *Table showing the sample population response rate*

4.7 Analysis of the Findings

This exploratory study set out to explore the challenges faced by the physically challenged in M-Pesa Outlets in terms of physical accessibility and the impact of various interior design interventions.

4.7.1 Safaricom Employees

The study selected a group of individuals most appropriate to answer the research questions and select specific information sources (Burns & Grove 2011). This allowed the researcher to select two key informants, who are supervisors on the ground in charge of Kibera area. The two individuals are in charge of enforcing design and branding guidelines and operational set of standards.

From the interviews carried out, the study was able to get these findings:

4.7.1.1Design Guidelines

Safaricom Kenya does not have any accessibility design guidelines for retail M-pesa outlets. This has resulted in shops not being accessible to disabled persons. The outlets have narrow door entrances which do not allow person with disability to easily access the Mpesa outlet. These narrow doors ensure disabled people; especially those on wheel chair do not have access into the Mpesa Shop. They are therefore forced to carry out their business transactions from outside the shop. Kimani one of the respondents living with disability said;

"*When I want to carry out an Mpesa Transaction, I have to shout while*

seated on my wheel chair. I am no able to get inside an Mpesa shop when I want to. The attendant has to come and serve me outside. If I find a line of other customers waiting to be served, I have to wait for a longer period of time before I am served".

This presents the serious challenge that Mpesa outlets pose to people living with disabilities in Kibera. The respondents reported getting frustrated and sometimes opting to go somewhere else or avoiding carrying out the transaction all together.

Other outlets have high counters that are completely unreachable. Customers trying to get services over the counter cannot do so. They are forced to shout from their wheelchairs if the Mpesa agent fails to notice they need service. The high counters make it impossible for persons living with disabilities to access Mpesa services because they are unable to reach the high counters. Mary, one of the respondents living with disability gave her account of this challenge;

"*The service counters in some Mpesa outlets is too high for me to reach. I am totally unable to converse with the agent so that I can get the service that I want. I have to request the Mpesa agent to come outside and serve me form outside the shop. Most of them agree and come out, however in some outlets you can totally get ignored because the agent say they are too busy serving other customers".*

The lack of a guideline on how to design Mpesa outlets has left business agents to design the outlets as they wish. High counters inaccessible to persons with disabilities are the result of this. The location of some of the Mpesa outlets raises security concerns. In a bid to prevent and reduce access to the outlets, high

counters have been the result, making them inaccessible to persons with disabilities. Mutua an Mpesa operator who was one of the respondents claimed,

"Insecurity can get really bad here. You have to be careful because you cannot tell who is coming to your shop; you have to limit accessibility by having a high counter to keep unwanted persons out. Short people have a difficult time reaching the counter, but we also have to factor in our own security".

Security concerns were given as one of the reasons for restricting access to the shops by Mpesa attendants. While designing their outlets, the need to have universal designs that accommodate persons with disability to access the shops is shelved and instead security and need for restriction takes precedence. This has resulted in persons living with disabilities being unable to access the Mpesa shop outlets.

4.7.1.2 Demand for Company Branding

All M-pesa outlets have to abide by the branding standards set by Safaricom Kenya and the ground supervisors enforce this on the ground. For an Mpesa agent to open shop and carry out transactions, they must strictly adhere to guidelines set out by Safaricom. Such guidelines demand proper branding of the outlets with officers on the ground enforcing such measures. Mpesa outlets that have not been properly branded risk been closed down.

Anthony, an Mpesa operator gave his account of the branding guidelines.

"The shop has to 'appear' to be an Mpesa agency shop failure to which, enforcement officers from Safaricom serve you notices of shutdown of your agency

code. This means you have to invest in painting and branding materials to avoid closure of business".

Safaricom enforces the branding guidelines with great intensity. Agents are strictly required to adhere to branding guidelines. The Safaricom Company has laid so much emphasis on branding at the expense of ensuring accessibility of Mpesa outlets to persons with disability. Enforcing similar measures on their outlets that allow easy access of facilities to persons with disabilities will see all the Mpesa agents strictly adhering to Universal Designs that allow access to persons with disability.

Currently, no such guidelines exist therefore implementing them is not feasible. The company has focused more on its energy on branding and brand positioning while ignoring designs that allow access of facilities to persons with disabilities.

4.7.1.3 Plans to improve accessibility

The area supervisors did not have any information on plans by Safaricom Kenya to make M-pesa outlets accessible to all. This failure in policy by the company serves to ensure that Mpesa outlets continue to be inaccessible to persons living with disabilities. The area supervisors cannot enforce something that is lacking. Eric, an area supervisor and who was one of the respondents said,

" *I am yet to see official plans and communication form the company on improving accessibility of outlets to everyone. Currently, no such plans exist and Mpesa agents are not required by the company to ensure that their outlets are accessible to persons with disabilities. Enforcing such a guideline is therefore not realizable currently because I will only be doing it at my own discretion instead of*

it coming as an official guideline from the company".

The company is not developing policy guidelines to ensure that Mpesa outlets become accessible to everybody. Agents are left to ensure accessibility of their facilities at their own discretion. Area supervisors cannot demand that an outlet ensures it is accessible to persons with disabilities.

James, who is an Mpesa operator said,

"No such requirement exists that my outlet must be accessible to persons with disabilities. In designing my outlet, I am not required by the company to ensure accessibility of the Mpesa outlet to persons with disabilities. Why should I implement something that I am not required to implement? Besides, it may turn out to be expensive for me to implement such a guideline, if any existed".

The lack of policy to ensure accessibility of facilities to persons with disabilities serves to ensure that more and more Mpesa outlets continue to be inaccessible to persons with disabilities. The company continues to put a blind eye on this issue despite the fact that persons with disabilities contribute to its revenues and profits. The company also seems not to be in a hurry to develop such guidelines and policies to ensure Mpesa agents are accessible to everyone intending to use them. This means that current outlets cannot, without a guideline, implement changes in their outlets aimed at making their Mpesa outlets accessible to everyone.

4.7.2 M-pesa Agents

The study, in this section, sought to get an understanding from the agents on the state of the M-pesa outlets and the challenges faced by PWDs when trying to

access the different services offered in these outlets. Different data collection tools were employed to in a bid to collect relevant and useful data. The research managed to get the following findings:

4.7.2.1 Interior Design Guidelines

Safaricom Kenya does not have any interior design guidelines for the design and construction of M-pesa outlets let alone design guidelines to improve accessibility for PWDs. The failure in policy by Safaricom to have interior design guidelines mean Mpesa agents are left to design their outlets as they wish. This means different outlets have different interior design outlays making each outlet seem 'unique'. This is basically a result that is attributable failures by Safaricom. Presence of an interior design guideline will greatly serve to improve how the outlets are designed. James who is an agent reported,

" *I did not receive any interior design guidelines form the company. I chose to design the interior of my outlet as I saw fit".*

Most Mpesa agents opt to design the interior of their outlets to their own taste and liking striving to make them as appealing as they can to customers. It is then common to find different interior designs for different Mpesa agents yet they all offer the same service.

4.7.2.2 Knowledge of universal design

Findings from the sample population interviewed showed little understanding of universal design thus most of them had experienced challenges serving PWDs but had no understanding of how to mitigate these challenges. Respondents did not

have sufficient knowledge of what universal design is all about. They expressed little understanding of it and the role it plays in ensuring accessible outlets to everyone. Anthony reported,

" I do not understand what universal design is. It sounds too complex for me to comprehend"

This lack of knowledge on universal designs continues to pause as a serious challenge to accessibility of Mpesa agents to persons with disabilities. Most Mpesa outlets do not know how they should apply universal designs in their Mpesa outlets to ensure that everyone including persons with disabilities easily access them.

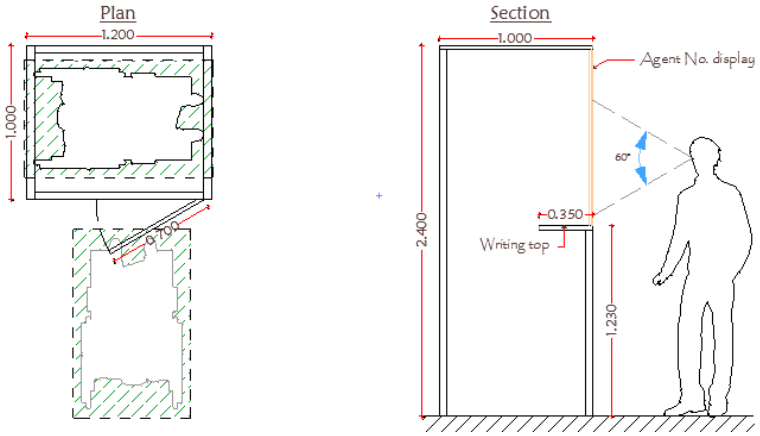
From the unstructured interviews carried out, illiteracy came out as a surprise disability that the agents experienced in the provision of M-pesa money transfer services. Some Mpesa agents attributed lack of sufficient knowledge on how to carry out mobile money transfer survives as an impediment to availability of such services to everyone.

Some of the accessibility challenges were not by design and construction of the M-pesa outlets but by the location of the kiosks. Most kiosks are located on county land and the accessibility of these areas is hindered by the high and continuous kerbs. Respondents living with disability attributed this as an obstacle to them getting Mpesa services. Mary who was a respondent reported,

" I cannot jump over the barbed wire fence in order to get to the Mpesa agency. That is impossible for me. The location of the Mpesa agency is therefore inaccessible to me and I have to go look else for the Mpesa services".

Some Mpesa outlets were located in areas in which they were completely inaccessible for everyone. Persons living with disability like Mary would therefore find it very difficult to get services due to the location of the Mpesa agency. Some agencies are located on storey buildings with no lifts. People with disabilities are not able to use the stairs to access the Mpesa facilities and instead opt to go elsewhere to get Mpesa services. This possess as a challenge to persons living with disabilities as accessing such facilities is impossible for them because of their location.

- As figure illustrate, no accessibility considerations were made in the design and construction of the M-pesa outlets.



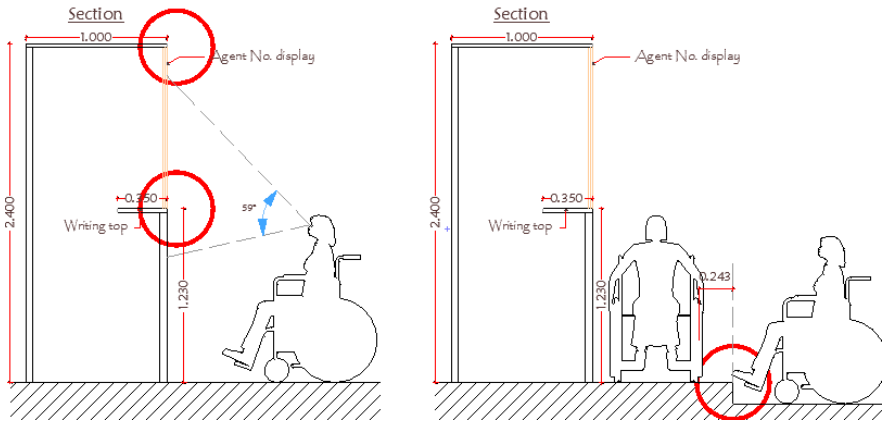


Figure 4.7: *Technical drawings illustrating barriers faced by persons with disabilities in accessing Kiosk type M-pesa outlets*

4.7.3 Persons With Disabilities

The whole purpose of his study was to integrate the physically disabled in the M-pesa retail market both as customers and as agents. This sample population thus formed an integral part of this study. Unstructured interviews and informal discussions were the most appropriate data collection tools used and the following were the findings:

4.7.3.1 Terrain of Location

The locations of most M-pesa outlets in the Kibera area were not accessible because of the terrain. The terrain of the landscape is not conducive to promote easy movement and access to Mpesa outlets by persons with disabilities. This means persons living with disability in Kibera face a difficult time in their bid to access Mpesa retail outlets. Persons with disabilities require a smooth terrain that allows them to move around more easily. In their bid to access Mpesa services, the terrain in Kibera has paused as a serious challenge making Mpesa Kiosks inaccessible to persons with disability. Gerald reported,

" I cannot cycle my wheel chair because I am unable to maneuver through the rough terrain in this locality. Moving around can be hectic at times and when it rains, things get worse".

The findings show the importance that a good and smooth terrain plays in obtaining Mpesa services by persons living with disabilities. Lack of accessible doors, high counters accompanied by rough terrains complicate the whole process further of access to Mpesa services by persons with disabilities.

4.7.3.3 Design of Kiosks

The design of the kiosks did not offer accessibility and thus agents have to get out of the kiosks to serve them. Mpesa agents reported having had to get out and serve clients outside their Mpesa Kiosks. There exists no established design for an Mpesa kiosk. This means that Mpesa owners and agents choose to design their Kiosks as they wish. This then results in Mpesa Kiosks that are inaccessible to persons living with disabilities.

The Safaricom owned shops did not have universal design solutions to mitigate the barriers they faced. For most of the PWDs, they have formed rapports with specific agents who are aware of their challenges and thus go out of their ways to serve them. James, a respondent living with disability reported,

"I do not go to any Mpesa agent. I have specific agents where I do my Mpesa transactions. They serve me well and if I get a waiting line, they serve me first. This has made access to Mpesa services easier for me".

The findings reveal that indeed some Mpesa agents go out of their way to make the Mpesa services as accessible as possible to persons with disabilities. This has improved the access to mobile money services as 'customized service' is given in some Mpesa retail outlets to disabled people with whom a rapport and business understanding has been struck.

4.7.4 Interior Designers

Purposive sampling was used, as the sample is chosen deliberately, “on the basis that those selected can provide the necessary data” for the study (Parahoo 2006). With this in mind, the study specifically interviewed two designers who have had the privilege of being involved in the design and construction process of the Safaricom owned shops. The research was able to establish that:

a) Over the years, Safaricom owned shops have been designed and constructed with zero consideration of universal accessibility for both employees and customers.
b) Safaricom Kenya has no interior design guidelines for the Kiosk type shops.
c) In the last quarter of the year 2015, Safaricom Kenya together with the design team developed a list of interior design solutions with the aim of accommodating PWDs

- Breakout area couches installed to make it more comfortable
- Main entrance door made bigger-1100mm minimum
- One counter made lower-800mm high from 1200mm normal height
- The queuing and ticketing system
- Seats provided for customers

This interventions have however not made Safaricom owned shops completely a barrier free environment as budgets and turnaround times would not allow for a more comprehensive design solution.

d) After a series of deliberations, Safaricom Kenya has no clear road map of improving accessibility in other M-pesa outlets which they do not own and run mostly because of the logistical nightmare.

4.7.5 Anthropometrics

This section of study sought to understand the actual physical capabilities of the physically challenged which would in turn inform the challenges they faced and in turn inform the recommendations. To have a clearer understanding, the study sought available information from literature and crosschecked this with observation.

Captioned technical drawings were found appropriate in the presentation of these findings which is as follows:

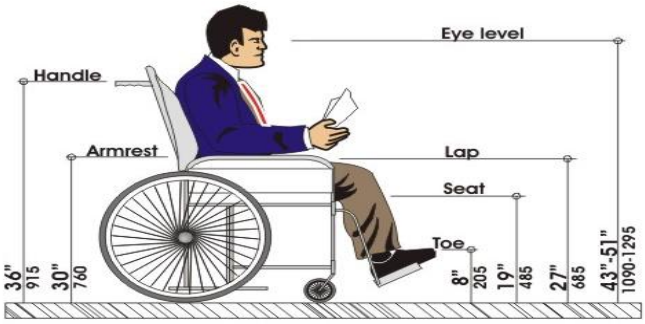


Figure 4.8: *Illustration showing the average wheelchair dimensions of an average adult*

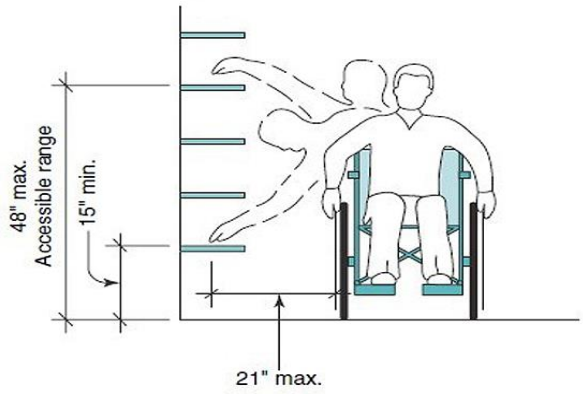


Figure 4.9: *Illustration showing accessible range of a wheelchair user*

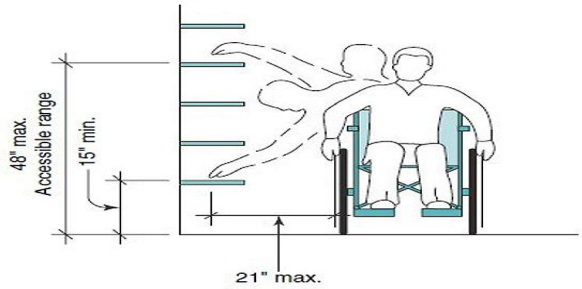


Figure 4.10: *Illustration showing accessible range of a wheelchair user*

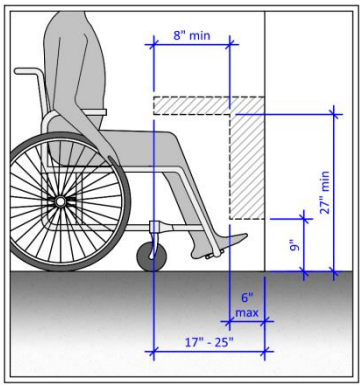


Figure 4.11: *Illustration showing minimum dimensions of a service desk for a wheelchair user*

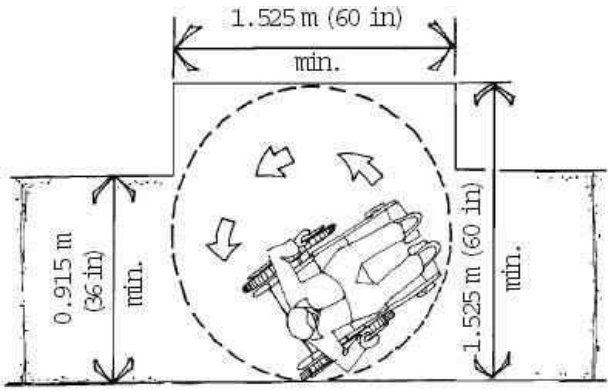


Figure 4.12: *Illustration showing the minimum turning radius for a wheelchair user*

4.8 Synthesis of findings

Data and all information collected in this study were cross-checked against the Universal Design principles to analyse the merits and demerits of the M-pesa outlets in the two classifications being studied.

4.8.1 Safaricom (K) Owned M-pesa outlets

1. **Equitable use:** the design is convenient and marketable to individuals with different capabilities.

Merits	Demerits
	• **High service counters:** The high service counters provide a barrier to the physically challenged and are not useful to both able • Bodied and the physically challenged. Wheelchair users require counters that are 850mm high and the available counters are 1200mm high. • **Narrow Aisles:** The UD principle 'Equitable use' directs that the environment or product should be beneficial to individuals with various abilities;this is not the case with the design of the aisles as they are too narrow to accommodate persons on wheelchairs or those using walking supports. At an average of 1000mm in width, the aisles fall short of the recommended 1200mm wide aisle width.

2. **Flexibility in use:** the design should be user friendly to a wide range of individuals and their abilities.

Merits	Demerits
	• **Access controlled doors:** In the Safaricom(K) owned shops, these doors offer access to the back offices, breakout areas and restrooms for all the employees. The design of these doors does not offer enough flexibility for usage by all. • **Service counters:** In addition to the service counters not providing equitable usage to all, they also do not provide enough flexibility to accommodate different persons preferences and capabilities

3. Simple and intuitive: understanding of the design should be easy for the end user.

Merits	Demerits
Layout: The design layout and signage of the outlets makes it easy for people with varied abilities to understand and manoeuvre around easily **Queuing:** The queuing and ticketing system makes it easy to understand for everyone.	

4.Zero or no tolerance of error: the design should have little or no hazards and the hostile results of accidental actions

Merits	Demerits

	• **Slippery floor**: The floor finishes do not provide enough traction that would minimise any error that would lead to an individual to slipping and sustaining an injury.

5.Little physical strength: the design should be comfortable, efficient and low physical energy.

Merits	**Demerits**
	• **Access controlled:** The lack of enough turning radius next to the doors, the positioning of the control switches and the reaction times of the timers make it hard for the physically disabled to operate the doors comfortably.

6. Size and space for approach and use: suitable space and size is offered for use

Merits	**Demerits**

	• **Access Controlled doors:** The approach area for the access controlled doors does not provide enough turning radius for wheelchair users.

4.8.2 Kiosk Type M-pesa outlets

1. **Equitable use:** the design is convenient and marketable to individuals with different capabilities

Merits	Demerits
	• **High service counters:** The high service counters provide a barrier to the physically challenged and are not useful to both able bodied and the physically challenged. Wheelchair users require counters that are 850mm high and the available counters are 1200mm high. • **Narrow Entrances:** The UD principle 'Equitable use' directs that the environment or product should be beneficial to individuals with various abilities; this is not the case with the design of the entrances as they are too narrow to accommodate persons on wheelchairs or those using walking supports. At an average of 1000mm in width, the entrances fall short of the recommended 1200mm wide aisle width.

2. **Flexible to use:** the design should be user friendly to a wide range of individuals and their abilities.

Merits	Demerits
	• **Service counters:** In addition to the service counters not providing equitable usage to all, they also do not provide enough flexibility to accommodate individual preferences and abilities

3. **Simple and intuitive:** understanding of the design should be easy for the end user.

Merits	Demerits
• **Branding:** The branding standards and guidelines make it easy to identify all M-pesa outlets.	

4. **Zero or no tolerance of error:** the design should have little or no hazards and the hostile results of accidental actions.

Merits	Demerits

	• **Exposed sharp edges:** The primary material used i the construction of the Kiosk-type M-pesa outlets is steel. All too often the finesse in the finishing is overlooked and sharp edges are left exposed which is hazardous and dangerous for the occupants

5. **Little physical strength:** the design should be comfortable, efficient and low physical energy demanding

Merits	**Demerits**
	• **Continous Kerbs:** Kerbs on road sides with a height of 150mm act as barriers to wheelchair users and other persons with walking aids.

6. **Size and space for approach and use:** suitable space and size is offered for use

Merits	**Demerits**
	• **Interior size of the Kiosks:** The average size of the Kiosk type M-pesa outlet is 1200mm by 1000mm. There is no ample space for the people who use wheelchairs; therefore they cannot work comfortably in the kiosk.

Figure 4.13: *Photo showing high counter heights for Mpesa outlets*

Figure4.14: *Photo showing riser steps at the entrance of an M-pesa*

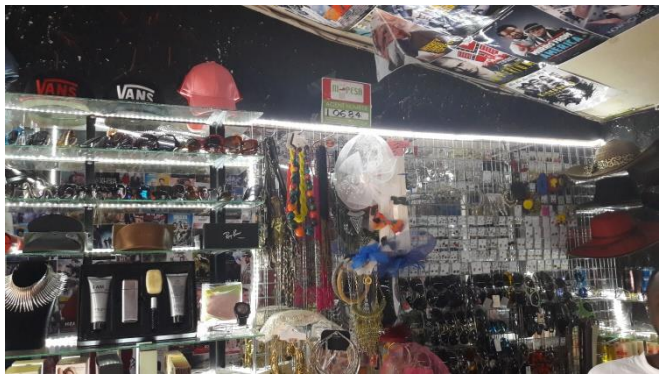


Figure 4.15: *Photo showing positioning of agent number*

Figure 4.16: *Photo showing Safaricom owned shop with narrow aisles*

Figure 4.17: *Photo showing Safaricom customer care employee having to kneel down to serve a customer*

Figure 4.18: *Photo showing narrow entrances and walkways*

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The study has explored different aspects of accessibility to Mpesa outlets by disabled persons. The study focused on abilities of people with disabilities and the limitations they face when trying to get services at Mpesa retail outlets as a result of poor design of Mpesa outlets. The study established the various obstacles that persons with disabilities face when obtaining Mpesa services and the underlying causes that promote such obstacles to service access. The study then established a framework that designers can use to overcome these obstacles.

Designers are aware of physical competences and magnitude of people therefore they can enhance of design, the retail environment and the equipment. Consumers make procurement decisions on products and services at the retail market therefore marketers should give maximum attention to point of sale in the retail market.

This research has shown that the physically challenged persons have a very difficult time accessing services that they would like to access in this case M-pesa Outlets. It has been seen from literature and other studies that imploring Universal Design principles can accommodate them effectively and mainstream them with society in accessing these services.

5.1 Recommendations to Safaricom

Safaricom Kenya limited is the largest limited company in Kenya in terms of revenue collected and its M-pesa money transfer service being the largest retail network in East Africa. The retail distribution of M-pesa has a franchise model of business and thus the design and branding standards should be controlled by the Safaricom Kenya Limited. As a bare minimum, Safaricom Kenya should be able to:

a) Improve accessibility to the Safaricom owned shops for both the customers and employees.

Figure 5.19: Model showing how to improve access to customers and employees

Safaricom shops and outlets should be designed to enable both employees and customers to access them easily. Figure 5.19 above illustrates how Safaricom can improve accessibility. Entrances to Safaricom shops should

have ramps made out of non-slip material that will enable PWDs get into the shop without difficulty. Customers who are on wheel chairs can also directly enter the shop and do not have to leave their wheel chairs outside when they want to enter a Safaricom shop or outlet. Figure 4.17 showed a customer care having to kneel down and serve a client from the floor. Presence of entrance ramp would have assisted the customer to get inside the shop. Signage signs should also be displayed clearly and at an appropriate height to allow everyone to see them. Figure 4.15 showed an Mpesa agent number that was too high for persons with disabilities to see. Figure 5.1 above showed the appropriate height that signs should be placed for convenient access to everyone intending to use them inclosing persons with disabilities.

b) Design a model universally accessible Kiosk which can be replicated across all its Mpesa outlets

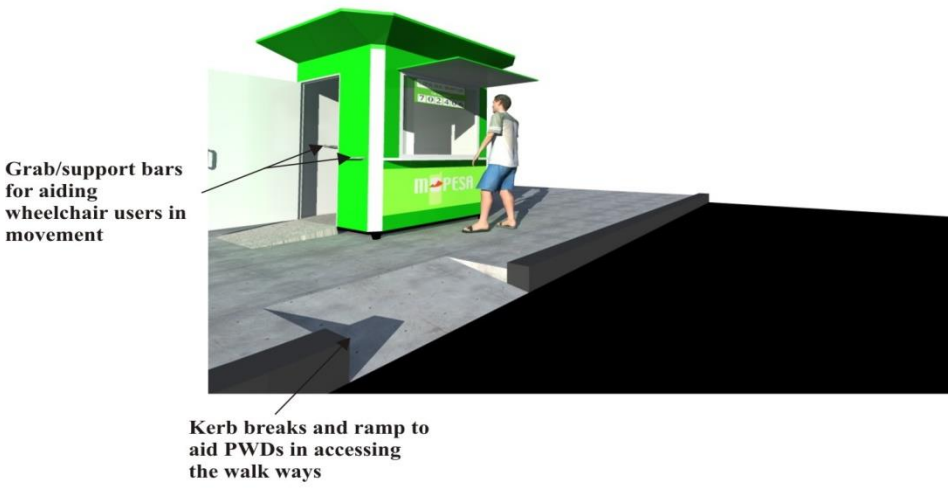


Figure 5.20: Model Design Mpesa outlet

Figure 5.20 above illustrates a model of a Safaricom Mpesa Kiosk that can be replicated in all Mpesa retail outlets. The model has walkways to aid PWDs to access the Mpesa outlets. Current Mpesa retail outlets are not designed with kerbs breaks and ramp to aid PWDs. The model also has support bars that aid wheel chair users to move easily around the Kiosk. The design illustrates a model that addresses the challenges that were identified in the study, where PWDs reported that they were not able to access Mpesa Kiosks because some had stair cases and movement around them was also difficult. Such an Mpesa model design will allow PWDs to access the counters by themselves without having to be served from outside the Mpesa outlet.

c) Adopt Universal design standards, which apply to the M-pesa model of business

Figure 5.21 Application of Universal design standards to Mpesa Model of business

Safaricom should adopt universal design measures in the Mpesa business model. The design should include details like shades that protect customers from weather elements as illustrated in Figure 5.21 above. In addition to kerb breaks and ramps in design, such design can also include panels that allow advertising on the outlets. This will add value to the design of the outlets.

5.2 Recommendations to local authorities

All businesses are licenced by the local authorities and most of the Kiosk type M-pesa outlets operate within land owned by the local authorities. This said, some of the accessibility issues are as a result of lack of regulations from relevant authorities or the lack of enforcement of existing design standards and regulations.

The following actions would mitigate these shortcomings:

a) Periodic review of regulations in a bid to be up to date with user needs

Some licenced businesses fail to implement existing design standards and regulations because local authorities fail to enforce them. Corruption is also a major obstacle in the enforcement process because some businesses use unorthodox ways to get away with faults in design of their business premises. Local authorities need to ensure that design standards are implemented by everybody equally to address the challenge of accessibility. It is also important that local authorities regularly review design guidelines and municipality laws to ensure that they are up to date and that such regulations address the challenges of the day.

b) Design Universally accessible trading areas

Local authorities should design trading areas that can be accessed by everybody including persons with disability. Such designs should be replicated across all the trading areas within the municipality. Persons with disabilities reported that they were unable to access to access services in some localities due to high fences with kerbs. Removal of such barriers through proper universal design will address this problem.

5.3 Recommendations to Designers

Designers have, as a main responsibility, a role to solve design problems with design solutions. Findings from the study have shown that most designers have either shunned Universal design or have little knowledge of it.

The diagram below illustrates a framework the researcher proposes from his findings, when designers are creating and designing retail outlets for use by all persons.

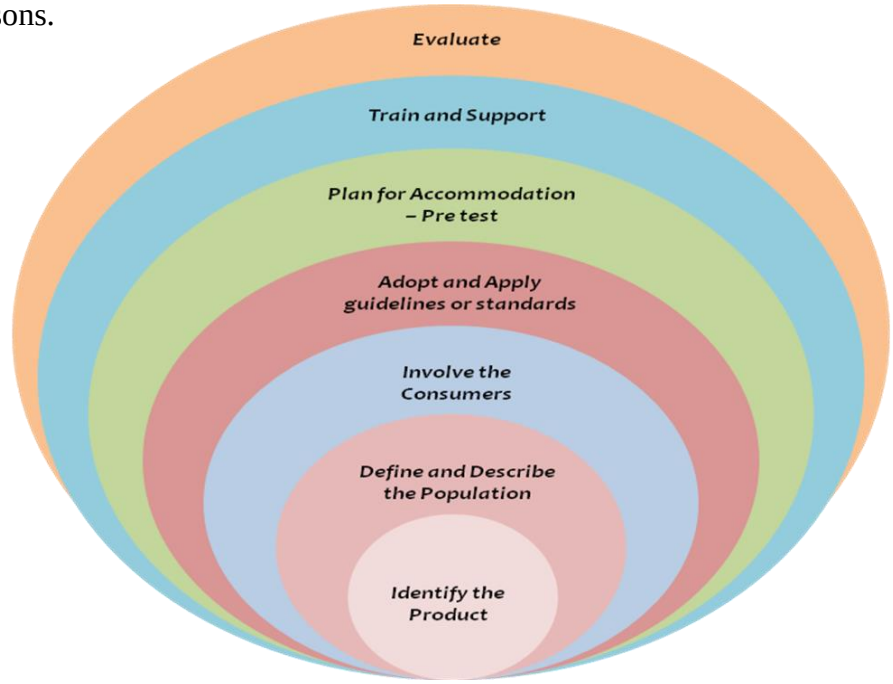


Figure 5.22: *Lighting walkways and the placement positions of light fittings to avoid barriers (Lederman & Metzger, 1985).*

Steps to follow in order to apply universal design in physical spaces;

Identification of the product. The initial step in the process of designing for the disabled should be identifying the product or the environment. A thorough analysis of the product is necessary at this stage: purpose of the product, budget, location and any other analysis necessary.

Define the user. Knowledge of the user and the user needs is the next step and a very critical step when designing for the disabled. In the case where a product has different users with diverse abilities, all information should be collected and all abilities considered.

Involve consumers. Consumer insight can be gained through involving the end users throughout the design process.

Apply guidelines or standards. Exploration and practice review is necessary to identify the paramount and most suitable practices for a product design. In this case, Universal design standards should be adopted and applied for the various products.

Pre-test. At this stage, a prototype or the end product is available and the designer can test the success, or lack of it, of the product.

Train and support. Train and support the end users. To ensure that the integrity of the design is upheld the reasoning behind it should be fully explained

Explain the reasoning behind design decisions so that design integrity is maintained over time.

Evaluate. In periodic evaluations of space universal design measures should be included by using different group of users and alterations put in placed based on the findings.

It is of importance to note, as illustrated by *Figure 5.22* that at any one of the stages the designer can go back to step one and start the process all over again.

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APPENDIX A: INTERVIEW PROTOCOL: EXPERT KEY INFORMANT

Research project title: Improving accessibility of M-Pesa Outlets in Kenya

Interviewee's name and institution:…….

Interviewer's name and institution:……

Date:……

For your information, 1) your identity will be held confidential, 2) the recorded audio will be transcribed then erased, (3) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (4) the information you provide is purely for research purposes. Thank you for agreeing to participate.

Topic: Understanding Accessibility of M-Pesa Agent Outlets

According to the Safaricom(K) website, M-pesa agents are:

- Safaricom(K) authorized dealers, operating one or more outlets around Kenya
- Other retailers with a substantial distribution network like petrol stations, distributors, supermarkets and registered SMEs
- Selected Banks and Micro-Finance Institutions

We have also gathered from other literature that M-Pesa agents/outlets can be categorised as:

- Safaricom(K) owned M-Pesa outlets
- Shop-in-shop M-Pesa outlets
- Kiosk type M-Pesa outlets
- M-Pesa agents (retailers who a few outlets)
- M-Pesa super agents (Banks)
- M-Pesa special agents (remote locations, hospitals, hotels, petrol stations)

Please consider this information and answer the following questions:

Question 1: Please explain your understanding of the above terms?

Probe: Do you think the understanding and use of these different terms have an effect on the way M-pesa products are accessed by customers?

Question 2: What design accessibility requirements (in terms of physical and mental disability) were considered in making M-Pesa outlets more accessible?

Probe: Has Safaricom(K) (or you as expert analyst) considered illiteracy and language barrier as forms of disability?

Question 3: Which type of retail outlet has been designed/re-designed to be accessible? What has been the customer feedback?

Question 4: What are the branding guidelines/standards for M-pesa outlets?

Probe: Branding has been very successful so far in making M-pesa visible as a product. How can this success in visibility translate into accessibility?

Question 5: What future plans does Safaricom(K) have to make M-pesa outlets more accessible?

Do you have any further comments and/or concerns regarding this interview?