

AN INVESTIGATION INTO THE USE OF WEB BASED APPLICATION AND
ADMISSION SYSTEMS IN PUBLIC AND PRIVATE UNIVERSITIES IN LUSAKA
PROVINCE

BY

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I Mvula Lois declare that this dissertation is my own work and that it has not been submitted previously for a degree at this or any other university. All sources have used or quoted have been acknowledged.

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CERTIFICATE OF APPROVAL

This dissertation by Mvula Lois is approved as a partial fulfilment of the academic requirements for the award of the Degree of Masters of Information and Communication Technology in the School of Engineering of the University of Zambia.

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ABSTRACT

The study aimed at investigating the use of Web Based Application and Admission Systems in Public and Private Universities of Lusaka Province. The study objectives were to explore types of Application and Admissions processes systems used in public and private universities in Lusaka Province, examine challenges faced on the adoption of Web Based Application and Admissions systems and establish measures put in place by universities to drive the adoption of Web Based Application and Admissions systems in public and private universities.

A mixed methods approach was used and an exploratory design was used for the study. The population for this study comprised of 80 students, 4 Dean of Student Affairs, 4 Assistant Registrars, and 12 Admission officers making a total of 100 participants in the 2 private and 2 public universities in Lusaka province in Zambia. Semi-structured questionnaire was used to collect data from the respondents, the questionnaires contained both open ended and close ended questions. Thematic analysis was used to analyse qualitative data while quantitative data was analysed using Microsoft excel (Spread sheet) to generate tables of frequencies and percentages which were used in describing distributions of the variables.

Findings of the study revealed that manual paper based application and admission systems were still used hence low enrolment in some public universities. Few universities used web based application as acceptance letters are still printed and physically collected by applicants, this because web based application and admission system services were not known by applicants and the stakeholders at large. As a result, the universities prefer manual paper based application and admission system.

The study further revealed that it was difficult for some Public Universities to generate resources usually this is because of insufficient government funding and most of the funds were consumed by university operating costs (Internet user fees, electricity and water bills etc.). This lead to the shortage of qualified IT personnel in the universities hence creating a backlog of the admissions and application processes of the universities. If these challenges can be looked into, the universities can flourish and compete with the international private and public Universities where admission is concerned.

Therefore, universities are required to invest in Internet and sever based infrastructure that can provide an Online web based application and admission to the possible applicants located geographically.

Key words: web based, application and admission system, private and public universities, Lusaka

DEDICATION

My efforts on this research are dedicated to my mother Jessie, and my children Jessy, Mercy and Tionenji Daka. Without you to inspire me, this just wouldn't be possible.

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Abbreviations

WBS	- Web Bases Services	-
WBAS	- Web Based Application system	
WBAS	- Web Based Admission System	
DBMS	- Database Management Systems	
IMS	- Information Management System	
FTP	- File Transfer Protocol	
HTML	- Hypertext Mark-up Language	
HTTP	- Hypertext Transfer Protocol	
ISP	- Internet Service Provider	
URL	- Uniform Resource Locator	
WWW	- World Wide Web	
JSP	- Java Server Pages	

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter presents the background to this study on the Web Based Application and Admission System in Public and private Universities of Zambia. The chapter begins by looking at a brief introduction to the research, statement of the problem, objectives, research questions, and significance of the study, definition of terms, related literature and a chapter summary.

1.2 Background of the study

Applying for admission to universities has evolved from a relatively straightforward process to some complex technological ways that causes anxiety for many applicants. Increased media attention about university admissions facilitates the growth of a booming university admissions industry. The admissions process is based on the submission of written application forms and supporting credentials (Mulrennan (2011). Studies indicate that in the late 1990's, many universities began offering the option of online applications available through university websites or through commercial third party (Fujo, 2019).

Many universities have strict admission deadlines to which applicants must adhere. Deadlines for submitting applications and supporting credentials in most cases reflected in the media adverts which are circulated by the universities. These messages are a planned activity schedule which are detailed for the purpose of informing the would be students in the university (Eduventures, 2007).

The study considered online Web based application and admission system. Application is a process by which a person seeks to be enrolled into a programme or courses in a university, whereas admission is the act of admitting an applicant into a programme or courses of the university following submission and assessment of an application. Web based services are offered by an electronic device to another electronic devices communicating with each other via the World Wide Web over Internet. In a web based

service, a web technology is used with various programming languages that run on different platforms. These are Python, HTTP, Java, JavaScript, PHP, C and C+ are among the mostly used for transferring machine-readable file formats on computer networks (Anderson, 2007).

Organizations have selected various ranges of web based systems and Information databases ranging from online student admissions, course registration, online advertising and selling goods. Other web based services include e-commerce, e-library, E-Banking, e-Learning system and web based application forms and admission systems, (Elliott, 2004).

Throughout the world, millions of prospective students apply for admission to colleges and universities. Normally, the admission approaches differ from University to university. The most commonly used types of application and admission system are manual paper based and web based application and admission systems (Elliott, 2004). Manual paper based application and admission systems involve the prospective students applying to universities by filling out printed applications forms, physically hand them to the admission office or place them in suitable envelopes and send through the local postal agency (Fujo, 2019). He adds that a smooth and simpler admission procedure allows more students to follow the steps and apply thereby increasing enrolment for the university.

However, the number of students applying in different universities is increasing diverse. Additionally, the student's admission process is getting increasingly complex with interested learners applying from different geographical locations, applying for a myriad combination of subjects and courses. In this scenario, it is becoming increasingly difficult to handle such a large volume of student's admission needs using the traditional methods. Therefore, there is an increased demand for the use of technology and adapting to an online web based application and admission system and Zambian and other parts of the world (Fujo. 2019).

Most Zambian universities have now adopted the web based online application and admission systems looking at the advantages which have outweighed the disadvantages. An Online web based application and admissions system seamlessly connects all the various departments (or modules) of an institution from application and admission, administration, marketing, accounts, students' courses and many more modules. The use of an online application and admission system ensures that existing traditional paper-based complex admission system is transformed into an applicant friendly, efficient, time-saving, accurate, and transparent system at affordable cost with greater speed and wider accessibility (Sankaranarayanan, 2013). In view of this, it was not clear on how the use of Web Based Application and Admission Systems in Public and Private Universities of Lusaka Province was being utilized.

1.3 Statement of the Problem

Currently, the number of students applying in different universities is increasing and admission processes are getting increasingly complex with interested applicants applying from different geographical locations. Every year, students in thousands stand in queues to collect application forms and later submit the filled in forms to the institution. Other scholars have argued that the admission process is not transparent, leading to possibility for application forms being misplaced and widespread malpractice of enrolling under qualified applicants (Chetan, 2013). A joint research in development Information Systems study conducted concluded that the university administration should provide more information on their e-learning portal and expand the usefulness of their portals to support core academic activities (Meela, Bota and Mumba, 2016)

Studies conducted have provided evidence on how to register returning students into the universities using the created university online student record system (Meela, Bota and Mumba, 2016). Meanwhile, Temba and Silungwe (2020) developed and implemented an online examination system that would allow students to write examinations in the Zambian universities used the larvae framework, JavaScript and relational database technologies. With these web based application available in the Zambian universities, the knowledge gap was the lack of literature on the use of Web Based Application and

Admission Systems in Public and Private Universities of Lusaka Province. Therefore, this study investigated the use of Web Based Application and Admission Systems in Public and Private Universities of Lusaka Province

1.4 Purpose of the Study

The purpose of the study was to investigate the use of Web Based Application and Admission Systems in Public and Private Universities of Lusaka Province.

1.5 Specific objective

The objectives of the study were:

- i. To investigate types of systems commonly used for Application and Admissions processes in public and private universities in Lusaka Province.
- ii. To examine the challenges on the adoption of Web Based Application and Admissions systems in public and private universities in Lusaka Province.
- iii. To establish measures universities have put in place to drive the adoption of Web Based Application and Admissions systems in public and private universities.

1.6 Research questions

- i. What types of systems are commonly used for Application and Admissions processes in public and private universities in Lusaka Province?
- ii. What challenges do universities face in adopting the use of Web Based Application and Admissions systems in public and private universities?
- iii. What measures have universities put in place to drive the adoption of Web Based Application and Admissions systems in public and private universities?

1.7 Scope of the Study

This study is limited to ethical issues that arise in the use of online web based application and admission system in public and private universities, that were fully utilizing web based services, in this case Lusaka province in particular.

1.8 Operational definitions

Private University	Institutions of higher learning funded and controlled by private individuals or partners who may not be part of the government.
Public University	institutions of higher learning funded and controlled by state the governments.
Applicant	A prospective student who creates a profile on the PT admission website to apply for the admission to the PT Doctoral Program.
Application	The collection of all required materials for an applicant to be considered for admission.

1.9 Related Work

As mentioned earlier in this chapter, online admissions differ from one institution to another; therefore, this section tries to pick some of the scientific studies that are close or plays some role in the subject of online application and admissions. The following is a brief overview of these studies:

Pandey (2019) conducted a study which identified various factors governing the online admission process and its effect on the satisfaction of the students of higher educational institutions in the state of Chhattisgarh. The researcher defined admission process as one among the processes of higher educational institutions in which by the help of ICT is automated unlike in the traditional manual system of admission where almost all of the work was done through human resource and with the help of physical documentation. The adoption of online admission system the process has more or less gone virtual with the elimination of the physical documentation process. Moreover, the medium and means of communication has become fast so that it can be quickly completed.

Adam (2017) conducted a study which demonstrated that Universities which were utilising online web based application and admission gained more popularity and resulted in large numbers of enrollments as the services became accessible from any place in the world by potential applicants.

Hien (2008) conducted a study whose objective was to design and develop an online admission for Physical Therapy Graduate Program system. He confirmed that web-based

applications were no doubt replacing paper-based processes in most of higher education activities. He further stated that Web-based applications can help to improve the reliability and reduce the processing time and cost. In graduate admissions, the applicants are able to apply and retrieve the application status online. All of the application forms, resumes, transcripts, and letters of recommendation are submitted electronically.

Mohammed (2014) conducted a study which provided an online based solution that aimed at facilitating automated online admission processes and eliminating the paper work needed by system users. The developed solution was given the abbreviation OASIS which stands for (Online Admission System for Iraqi Students).

Faraj (2009) designed and developed a Web based Postgraduate Application System (WPAS) for university Utara Malaysia. The WPAS provided a real-time application system which was free from traditional document processing procedures. It provided a convenient graphical user interface (GUI) for both student and admission department staff. The WPA system allowed students to create their application online, apply for degree programs, view application status, and update application information from time-to-time. The design also allowed administrators to manage student accounts and admission information. All of the services were possible anywhere at any time.

Dominic, (2017) admission policies need to be better linked to both what students and labour markets want. To ensure that both student and labour market demand are balanced stakeholders from both sides need to be included in the development of national admission policies. In specific fields of study with strong student demand, private HEIs can play an important role in helping to expand the supply of places, as they are able to operate more flexibly than many public HEIs in responding to changes in student demand.

This has led to problems in managing applications, handling of queries, distribution and collection of application forms, and then short-listing the applicants resulting in overly slow response time annoyed and students alike. In addition to this, the admission process is not transparent, leading to possibility for application forms being misplaced and widespread malpractice of enrolling under qualified applicants.

1.11 Summary

This chapter has focused on the background and motivation to the study. The study has presented the statement of the problem, purpose of the study, research objectives, research questions, scope of the study, definition of terms, related works and a chapter summary. The next chapter will focus on the literature related to this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents literature review on what other researchers have written about application and admission systems used in universities. It embraces literature from sources such as books, journals, magazine, articles, dissertations or newspaper reports on which application and admissions systems have been reported and opinions expressed on this matter under investigation. The chapter discusses the strength and weaknesses of the studies reviewed by various researchers.

2.2 Web based Application and Admission

Noel-Levitz (2007) indicated that web based Application and Admission systems help university administrators to run the entire student enrollment and admissions process, from processing applications forms to handling of admission letters. Universities use web based application and admissions system to manage the entire admissions process and take applicants from prospects to tuition-paying members of the university.

The above researcher showed that universities utilising online web based application and admission gained more popularity and resulted in large numbers of enrolments as the services became accessible from any place in the world by potential students with internet access

As the world is moving towards digital age, students check for information about the admissions at any University from the internet as institutions are now utilizing websites. In addition, websites act as a marketing tool on which universities break through the geographical barriers and become accessible, virtually, from any country in the world by potential clients, students and prospective students that have internet access.

Mwapashua (2019) argues that most real world activities show numerous benefits of using web based university application and admissions. The most apparent to this system is the unification of the entire process. He further indicates that the other benefit of a software is the use of a central database. This database is the basis for all actions in the system and

can be trivially updated and used to aid in all of the systems' processes, meaning that all of the required information is stored in one central location and thus easily accessible.

The methodology employed in this research was system development with the aim of computerizing university admission process for higher education and its basic objective is to reach geographically scattered students and provide a solution for prospective students searching for best colleges in the United Kingdom. (Kumar, 2013)

This study so far showed that web based application and admission provides a more reasonable storage method than a paper-based file system, where the time of traveling to and physically searching the records for the required information could be a burden. In addition, human error could also be a factor in that mistakes could be made in the filing process which would not occur in a well written database system and mistakes or changes on physical records can be messy to correct. Software systems are also much faster at performing certain tasks than humans, meaning that time can be saved performing processes such as sending communication e-mails, creating recommendations and the comparison of applications.

This also means that the tasks can be done solely by the system, freeing up those involved to perform more important tasks, this feature saves students the hassle of running around and waiting in queues to submit documents as this can be done from the comfort of the home. If the students happen to miss or forget any documents, the student can simply upload the missing document instead of visiting the school, thus saving time and effort. The most apparent is that data access is centralized making it very easy to reports and retrieve applicants list for planning purposes, (Wakode Rushlau, 2014).

2.3 Application in to University

An applicant is a person applying for permission to study for a programme into the university. Millions of prospective students apply for admission into undergraduate or postgraduate in universities. Application and admission approaches differ from university to university. The most commonly used types of application and admission systems are paper based and web based systems. (Chetan, 2013).

2.3.1 Paper Based application system

Normally the work at the time of applying is done manually by ink and paper. After filing in, applications are physically submitted to admissions office or placed in suitable envelopes and sent through the local postal agency to the University (Kadam, 2017).

Paper based application and admission is less complex than online web based online application systems, which can make it easier for untrained people to access and manipulate data. Anyone can look through alphabetized filing cabinets to find a file. Locating and manipulating an online web based application database information may require technical training, and user error can result in unintended alterations or data loss. (Elzarka, 2012).

Paper based applications allow for a more diverse pool of applicants as online web based applications favor young, educated and computer-literate individuals. The traditional paper application process also creates a more personal connection between admissions office and applicant.

2.3.2. Strengths on the use of Paper Based application system

Research done by Kadam revealed that paper based application system provides security over web based application system as information is stored on paper and locked in file cabinets. As such, someone would need to physically have access to the papers to steal information. (Kadam, 2017)

This can be realized from the fact that paper based application system files are manually stored and filed in cabinets and this may not be that easy to search for an applicant when all their records are piled up in their respective cabinets even though they are arranged properly.

2.3.3 Weaknesses of Paper based application systems

Another research done by (Chetan, 2013) revealed that paper based Application system has for many years been very effective. However, with the increase in the number of applicants, the paper based system has its own challenges. Manual filing of application

forms means placing faith in the people handling the forms. Application forms may get damaged, lost, or misplaced. When records are lost or damaged, the office is exposed to several significant risks such as losing prospective students, thereby causing inability to meet operational goals and objectives.

Furthermore, universities incur expenditure on printing of application forms and in the absence of any reliable forecasting system on how much applications are going to be sold or distributed, the institution may overspend by printing excessive application forms or may fall in crisis if there is excess demand of application forms. Once application forms are printed, changes are not only difficult to make, but also come with additional costs (Eduventures, 2007)

Studies show that using paper based application, universities waste a lot of resources as same information has to be imparted on applicants. For example, to collect and submit application forms. Additionally, short listing of eligible candidates is time consuming and often leads to duplication of work for the University, and the applicants as they have to visit again and again to check for latest admission list and collect admission letters. The figure below depicts paper based application processes

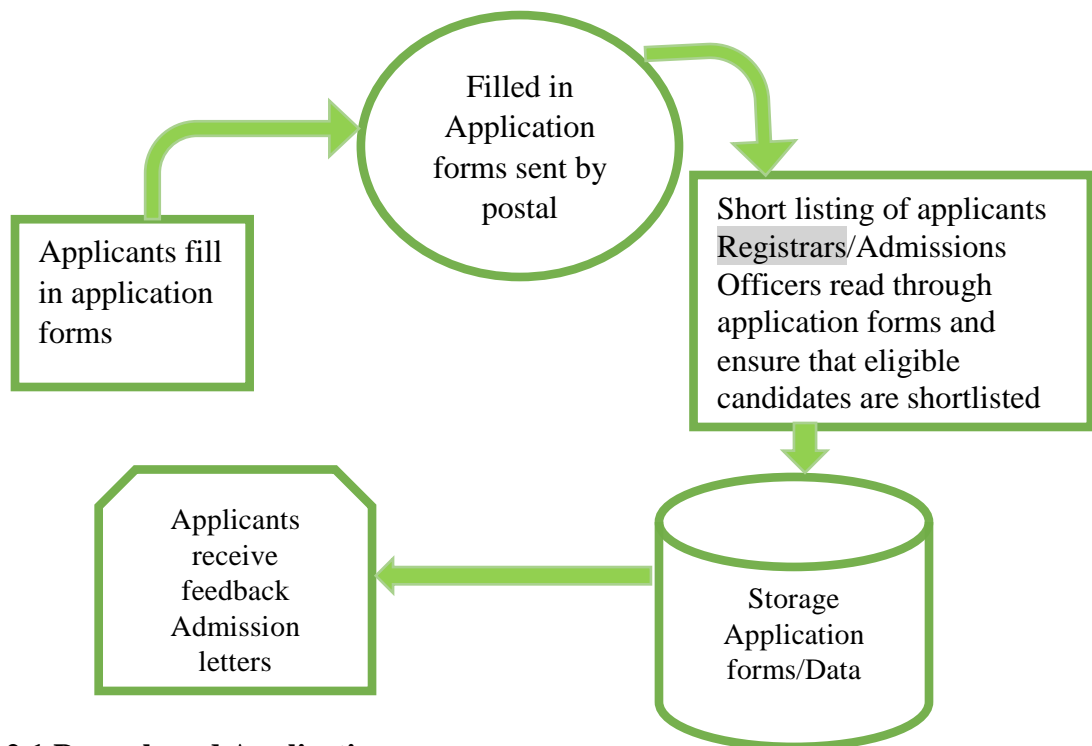


Figure 2.1 Paper based Application

The paper based application system is associated with high cost processes. The number of personnel involved as well as the printing, distributing, scanning, rekeying, filing and archiving is very costly. When institutions move to an online system these significant costs are often reduced.

2.3.4 Web Based Application

Managing admissions can be a huge task for a university. The web based Application system is a software that supports administrators to automate the entire student enrollment process, from processing application forms to handling of admission letters. (Brussel, 2017)

A study conducted by Fujo (2019) looked at various challenges facing admission procedures for advanced level (A-Level) private schools of Kilimanjaro region in Tanzania. Questionnaires were distributed to gather data from potential users of a new proposed admission system; namely: parents, A-Level students and school staffs. The analysis of the survey results confirmed and quantify that 93.5% of admissions into A Level private schools are performed manually by ink and paper. The study helped to develop an online admission system to solve the challenges which the schools were going through in the country. The study also come to confirm that the enrolment was increased in the university because more students were able to access the online platform and enrol in the institutions.

Web based online application systems make it very easy to upload the academic and professional qualifications. This feature saves students the hassle of running around and waiting in queues to submit documents as this can be done from the comfort of their homes. If the students happen to miss or forget any documents, the student can simply upload the missing document instead of physically visiting the university, thus saving time and effort (Noel-Levitz., 2007).

The study by Allison (2002) revealed that web based application systems provide a marketing platform to attract and communicate with prospective students. The system integrates with student information systems and other modules such as e-library, course

registration resource management software to streamline the sharing of student data gathered during the application process (Kadam, 2017).

Kadam (2017) discovered that online web based application provides a centralised database system as the details of applicants are saved directly on the web server and the records can be accessed from anywhere at any time from several campuses and departments for various specific purposes in an organized way in less time. This includes important information such as contact details or residential addresses and financials (tuition fee status). Additionally, web application saves the hassle of storing paper documents by creating a paper and hassle-free digital application process. He added that another important feature of online application system is that applicants can apply at their convenience and the application process can be initiated anywhere at any time. All that is needed is access to a device and internet connectivity and they can submit their application forms at the click of a mouse, from the comfort of their homes (Jones, 2011).

2.3.5 Admission into University

University admission is the process through which students enter tertiary education at universities and colleges. Admission systems vary widely from institution to institution. The most commonly used systems are Paper based and Web based admission systems. (Mwapashua, 2019).

2.4.0 Manual Paper Admission

Admission letters are typed and printed by admissions office and applicants physically visit the university and collect their admission letters or else the admission office places the admission letters in suitable envelopes and sends them through the postal agency to the applicants. (Kadam, R. &.2017). Paper based admission has security advantages over web based admission as they are accessible on a network, which means it is possible for an unauthorized person to gain access over it by hacking methods. universities are legally bound to adhere to their publicized admission standards and honor their admission requirements.

Alikira (2010), states that the paper based admission system allows the admission office to meet the standard admissions requirement set by the university and ensures that admitted applicants meet the required minimum academic requirements, as applicants visit the university to collect admission letters, admission officers are able to check and verify original copies of certificates and confirm that only eligible applicants receive admission letters and are enrolled for a particular programme. Therefore, providing control of forgery over entry qualifications during the admission process.

A study by Mwapashua (2019) confirmed that many problems militated against manual paper admission system putting pressure on both applicants and admission officers. Such admissions were characterized by multiple problems such as delayed feedback, costly, inconsistency, inaccuracy, and difficulties in following admission procedures. He added that potential students suffer from inadequate information and delayed feedback from management on the status of admission. This takes a large amount of time, causing strain on admission offers in short-listing the candidates and then providing admission letters. In Addition, mismanaging of admission information has the potential of admission data being misplaced and getting into wrong hands and potential students may not be considered resulted in losing them.

There is high fatigue and monotony involved in the paperwork admission process and this can be a catalyst for errors. Not only can these errors be expensive to the institution but they also risk the reputation of all involved. Furthermore, the paper admission system had complications in locating appropriate applicant details, programmes or courses/subjects applied for (Hanover, 2014). In addition, George (2015) noted that paper-based admission systems are associated with extra costs on office supplies. Stationery and other related materials such as paper, toner and so on are needed. These costs add up and can become a significant expense, hence lowering university productivity.

When working with paper based admission, sharing of admission information and collaboration is extremely difficult. If several departments need to plan based on the number of admitted applicants at a particular time, they must have a list of admitted applicants printed and make all the necessary amendments and updates and then share

with other departments for planning. With the increase in the number of applicants, an administrator wastes a lot of time in processing and sending feedback to the prospective students (Kadam, 2017). It should be noted that students are a vital part of university source of income and are what keeps the university alive. Admission process is one of the most important activities within a university as one cannot survive without students. It is quite very difficult to achieve efficiency and reliability using manual admission systems.

2.4.1. Web Based Admissions

Web Based Admission System is aimed at computerizing university admission processes and extending the university reach geographically scattered student at the appropriate time. Web Based Admission reduces admission processing time and provides a centralized data handling and paperless admission system (Chetan, 2013). Web based admission systems are also much faster at performing certain tasks than humans, meaning that time can be saved when processing web based admission and sending feedback communication such as e-mails, bulk SMS, creating admission letters, recommendations and programme or course exemptions. (Chetan, 2013)

Kumar (2013) conducted a research project on the comprehensive solution provided by Web Based Admission System with the aim of automating university courses and admission procedures for admission seekers and program/course registration for returning students. The study found that with most real world activities, there are numerous benefits to using the web based admission system for universities. The most apparent to this research project is the unification of the entire admission process and the use of web server as a central database storage. This database is the basis for all actions in the system and can be trivially updated and used to aid in all of the system processes. This means that all of the required information is stored in one central location and thus is easily accessible. In his research project, Kumar developed an admission software system which was computed and was also tested successfully by taking test cases.

According to George (2015), a test case is a set of conditions and variables under which a tester is used to determine whether a system under test satisfies users requirement. In this research project, the web based admission provided user friendly, and had required options, which were utilized by the user to perform the desired operations. However, the

development of a web based admission was a far more reasonable service and storage method than a paper based admission system, where the time of covering long distances to collect admission letters and physically searching for records or required information could be a burden. In addition, human error could also be a factor in that mistakes could be made in the way admission letters are generated which would not occur in a well written database system and mistakes or changes on physical records can be messy to correct (Kadam, 2017).

2.4.2 Web based systems development technologies

According to (Brussel, 2017) who stated that World Wide Web (WWW) is a system of linking documents by way of hypertext and hypermedia. Hypertext provides the means to move from link to link, or item to item. A link might be a document, an image, or site through specially marked documents. The applicant normally would click on the link or use the arrow key to move around the web. Moving round the World Wide Web, or browsing, requires a suitable Web program or an Internet browser e.g. Netscape Explorer or Microsoft Internet Explorer. The Internet, therefore, emphasizes the network of computers while the 'Web' refers to the linkage between the vast resources being held by the Internet. This is in line with (Grimus, 2000) study who said that the vast amount of materials on the World Wide Web are a combination of sound, pictures, animations, and videos design for interactive responses.

According to (Peter Laurie, 2000) World Wide Web became the first web server software to surpass the 100 million website milestone, the main function of the web server is to store, process and deliver web pages to the users using Hypertext Transfer Protocol (HTTP). All websites on the Internet have a unique identifier in terms of an IP address. This Internet Protocol address is used to communicate between different servers across the Internet and Apache server is the most common web server available in the market. The Internet and web based systems have become an excellent foundation for the development of centralized data access services.

Earlier, universities relied on traditional marketing ideas to increase admission, these old-admission ideas for attracting applicants towards enrollment mainly involved public

campaigns, direct post mails, newspapers, magazines, TV and radio advertisements, and billboard announcements. (Eduventures, 2007)

Like any other services, university website should be advertised to the outside world to enable prospective applicants access the services online. The first step is to advertised the uniform resource locator (URL) to the target audience for them to access web based application and admission system online, or share the URL of the university website with stakeholders on social media platform. This URL should be easily accessible in that it should give potential applicants the opportunity to read the admission requirements, fill in the application form and then easily submit or upload them on the web based system.

This process should be seamlessly easy for the applicants. The university can also set up an online course registration and payment that will allow the applicants to make a payment and complete the course registration process. The schematic representation below (figure 1.1) gives an overview of the application and admission system framework for universities, depicting the three key concepts which form the basis for this study.

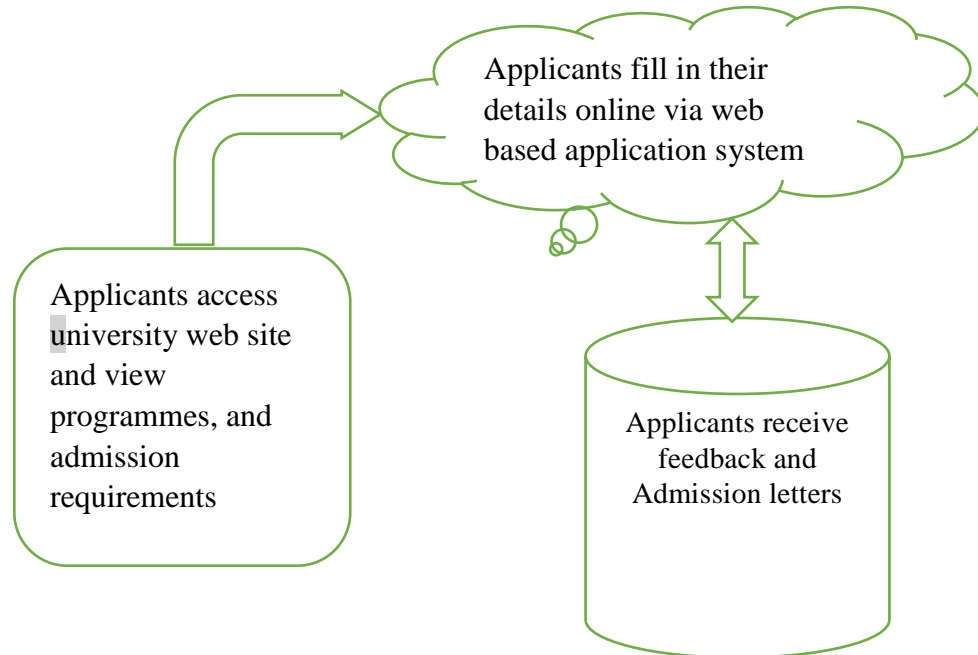


Figure 2.2 A framework of web based application and admission

To facilitate data exchange from the web based online application, scripting languages are used such as JSP Java Server Pages (JSP), the technology that allows HTML or XML

codes dynamically generated in response to web client requests and JSPX JSP document, which are XML representation of a JSP page. (Hadjerrouit, 2010)

A clear advantage of MySQL is that it is obtained for free of charge for most Unix-based systems. Codes can be easily downloaded from the MySQL web site, and supporting materials are freely available online. MySQL also has many Application Programming Interfaces (APIs) to give the developer access and shape the database via programs in various languages (Douglas Kunda & Chama, 2016).

MySQL furthermore, enables cost effective of data management, high-performance and scalable web-based services which provides round the clock web server uptime (Kadam, 2017). The figure 2.3 below shows Web based server for online web based application and admission how data is accessed.

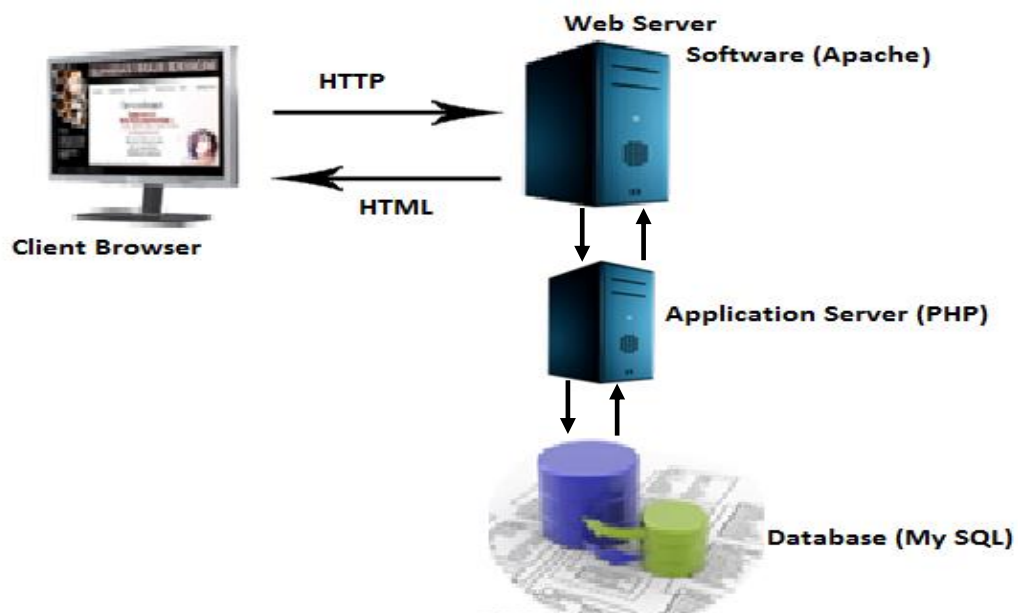


Figure 2.3 Web based system; Picture Source: Lewis (2000)

George and Michael (2006: p.359) states that Dynamic websites use server programming capabilities to generate Interactive pages to the applicant. Database integration refers to combining a database with the web site so that web visitors can add, remove and update information in the database using a web based services.

User Interface (Frontend) Design Usability is the ease with which a user can learn to operate, prepare inputs for, and interpret outputs of system or component. This usability of a system is made less more or less stressful by the usability and complexity of the user interface (Grossnickle, 2004). The user interface of a system is therefore the part of the system that the end user interacts with. User interface design is concerned with how users access or add information from the system and how the system presents information back to the user (Henry, 2006).

The online Web Based Application and Admission Systems is supported by the mostly wide used Web Browsers: opera mini, Microsoft Internet Explorer version, Mozilla Firefox and many more browsers.

2.4.3 World's Perception on Web Based Application and Admissions

In developed countries, for instance, the United Kingdom, France to mention a few, the admission into tertiary institutions, universities and colleges is centralized. Fujo and Mussa (2018) developed a web based admission system for University College Admission System. The admission systems were adopted as a means of saving resources, time and money for both applicants and colleges and harmonizing the turnaround time during the admission process. He added that such admission systems included common application in the United States of America, Joint University Programmed Admission System in Hong Kong (JUPAS), University College Admission System in China (CUCAS), and the Universities and Colleges Admission Service (UCAS) in the United Kingdom.

Admission into tertiary institutions, universities, colleges, and schools were centralized in the sense that, colleges or schools received applications forms through a web portal, and applicants were not required to collect and fill the physical forms; rather they visited the admission website of a particular school or college, and all eligibility criteria were mentioned on the site.

In China, like in most developed countries, there were government boards and agencies which harmonized the admission process by offering admission exams to applicants. This caused students to invest a lot of time and effort to prepare for such exams. However, candidates perform differently on these exams, which do not necessarily reflect their real abilities. As a result, the colleges ended up enrolling unqualified candidates. Therefore,

this made the application procedure very tiresome, being costly, less fair and even less considerate (Sankaranarayanan, 2013).

Dida (2018) indicated that the admission procedures in A Level private schools were totally decentralized. These admission approaches, left school with the mandate to process the admissions requests on their own. In this case, it was further realized that most of A-Level private schools in Kilimanjaro region had taken more than a month to process the applications, and to send feedback of acceptance or rejection back to the applicants. Therefore, these admission procedures caused further delay in commencing new academic years and made it harder for applicants to make decisions about where, when and which subjects they can fit in. Therefore, there is need for each university to develop their own admission in-order to manage their students and data effectively

Karasavvidis (2014) states that the advent of the high speed internet and the web has given the opportunity to educators to distribute the digital learning materials and support new forms of web based learning. The development of e-Learning systems, which support sharing of digital learning material and facilitating communication between learners and educators, has become a vital issue in education platforms. The 1994 era saw Norwegian Universities and Colleges being the early pioneers of Online Educational Admission Systems (OEAS). This system however needed some improvement due to the huge workload on administrators. So, researchers and software developers improved the system so that between 1999 and 2008 online application and admission was done via the Internet Adams and Sankaranarayanan, 2013).

Tanzanian Commission for Universities as education regulatory boards jointly established a Centralized Admission System that become operational in 2010. The Tanzania Commission for Universities admission systems was to assist applicants to deploy and retrieve their applications through a web-mobile application. (Rajnish Kumar et al, 2013). Further, Mwela et al, (2017) pointed out that student portals have become a common feature in most, if not all, institutions of higher learning. Most universities are implementing the student portal because it enables them to streamline information and services, improve service to students and staff, offer personalized, customized or targeted

services and improved administration at the same time ensuring efficiency and effectiveness.

According to Mwela, Zambia defines a portal as a University one-stop client-oriented web site that personalizes the information to the specific needs and characteristics of the person visiting the site using information from the university database. The main goal for the university portal was to make it easy for students to find university information and services targeted specifically at them. Information on the portal can be accessed quickly and easily on any device such as a desktop, laptop or mobile device tablet or smartphone. Additionally, web portal provides institution personalised information such as programmes, courses offered, academic calendar, job opportunities adverts or sponsorships.

Many studies conducted in the area of web based services have highlighted the importance of Adoption of web based portal in higher learning institutions as it fosters efficiency and effectiveness to both students and the university administration and can be accessed from a person's place of convenience and provides all necessary information saving on time and finances that has to be spent if one had to physically travel from their location to the location of the university.

Mwela Et.al conducted a research study to assess the usage of students portal at the University of Lusaka. A case study was employed and the quantitative method was used to collect data from the undergraduate students. The sample size consisted only 60 students and the findings were that university of Lusaka students were satisfied with the university portal because it helped them to achieve more and improve their study productivity and performance.

Mulauzi and Mundia (2019) pointed at the potential benefits of ICTs in education. For instance, that pupils can have an online collaborative platform where they can share information and ideas and work on the project simultaneously across space and time. The research was an investigation on the effects of implementing ICT in education and looked at ICT infrastructure, facilities and skills to facilitate teaching and learning. The study,

however, revealed that the usage of ICTs for such activities was very low as very few teachers and pupils were utilizing ICT facilities. Surprisingly, little work has been done on the use of online web based application and admission in Zambia.

A study by Kunda and Chama (2016) confirms that learning institutions such as universities and colleges use student information systems for the management of student records. With the constant development of countrywide higher education, in order to resolve the trouble of "Information Island", the teaching branch of many universities established correspondingly a series of information system to manage teaching and administration better, and so on. They went on to add on the issues related to student academic record managing including improper course registration, delayed publication of students' exam results, inaccuracy due to manual and tedious computation of fees and retrieval of information problems and inefficiencies. The researcher went on to add that there was a wide collection of existing information systems that was developed to address these problems though varying in implementation, target group, level of integration and customizations capabilities. However, the research restricted itself to student records management systems providing services such as registering courses, assessment monitoring and storing examination results. Web based application and admission system was not mentioned in his study.

Nyanja and Musonda (2019) assert that the rapid development of ICTs and related technology during the last few decades has had a significant impact on education in terms of improved motivation, innovation and higher retention levels. Even though access to ICT's is a challenge for most institutions and schools globally, the desire to have ICT's and use them is quite high.

A study by Samer (2012) revealed that student admissions play a very important role in major activities of any university as the basic requirement of the university is students and without students, the university cannot survive. An inefficient admission application system may reduce the number of admitted students in the esteemed university because if the admission system is slow and has many delays in the process, this can mean the difference between success and failure because of the large sums of money each brings to the university's economy.

The research aimed to design and develop the under-graduate local admission process at the university of Al-Quds in order to develop an easy to use system that significantly quickens and simplifies the admission process. The interviews were conducted for the data collection, after that, the design was made in Unified Markup Language (UML) in order to meet the requirement of admission system. This admission system was developed by using JSP and MySQL. Once the application and admission system has been developed, the address and location should be known by the end users

The first and most pivotal step of an online application and admission system is to share the Uniform Resource Location (URL) within the university and to other stake holders using deferent social media plat forms such as Facebook, or WhatsApp. This URL should be easily accessible to the students and should give the applicants the opportunity to read the guidelines related to admission procedures and filling the online forms in a simple format and then easily submit them online. This process should be seamlessly easy for the students without any complications or complex procedures (Krishnan, 2019).

2.4.4 Challenges on the adoption of web based application and admission

Phiri (2015) examined main challenges faced in the implementation of the ICT in public schools. Exildah used qualitative and quantitative research methods which involved on site observation, analysis of documents and interviewing of relevant stakeholders involved in the implementation of the ICT Curriculum. The study further identified several main problems which embodies in the very limited number of computers and having very poor IT infrastructure. As a result, ICT services offered in class were not effective. The merit of this study was that, the researcher used both qualitative and quantitative research methods to collect information about respondent's opinions on the challenges of implementing ICT's in public schools which included policy makers and pupils (users).

A research study conducted by Mussa (2019) established that the introduction of web based admission system comes with its own challenges. It was revealed that Rajasthan University faced a number of problems when it first introduced online admissions to its clients. The university reported technical malfunction on the web based application system. Hundreds of parents and candidates flocked to Rajasthan University over

technical snags that marred the application filling and admission process of Universities, causing unnecessary distress to applicants, who went seeking clarity about possible solution on the system failure. On the other hand, applicants needed clarity on the subject combinations, eligibility, and cut-off marks due to a lack of from admission offices.

2.5.0 Web based Application and Admission Security concerns

One of the limitations of the online web based application and admission system is that all the data are transmitted over the Internet in plain text. That would cause the system vulnerable to eavesdropping attack. To overcome this threat, we can use SSL (secure socket layer) protocol to encrypt the transmitted data. (Hien, 2008)

A survey by Vacca (2009) examined university admission requirements, in order to be admitted in any of the university programmes applicants are required to meet the minimum academic and professional admission requirements These are standards by which an applicant is eligible to enroll for a particular programme. All qualifications are to be certified and signed by the examination Council of Zambia and applicants shall be assessed as individuals and given fair and equal opportunity to demonstrate relevant skills and provide supporting information where necessary (Quality Assurance System for Higher Education in Zambia, 2015). Applicants are encouraged not to omit any requested or relevant information, make any misrepresentation (for example, through plagiarism) or give false or misleading information at any point of the application process including after an offer is made. Should this occur the university reserves the right to dismiss an application, withdraw an offer of a place and/or revoke registration.

Yuanxiang (2017) established that security should be one of the first considerations when setting up a website and developing of web site. If a website is not secure, it can become a low-hanging fruit for cybercriminals and this has been a major concern for the use of online web based Application and admission system. Since web based application and admission is entirely online and applicants can access it at any time and on any device connected to the Internet, it is easier for the system to be breached and fraudsters can manipulate the application process and the eligibility requirements of the applicants.

The fear that hackers may target universities and educational institutions web based application and admission is a grave one. Unintentional system failures or server crashes may disrupt the entire admission process. Website security is important because nobody wants to have a hacked website. Not having a secure website can be as bad as not having a website at all or even worse, if a website is hacked and blacklisted it may lose its traffic (Symantec, 2015)

Like many African countries, Zambia's Internet connectivity has hampered progress owing to frequent electricity outages and the exorbitant cost of bandwidth. Conversely, the use of online web based systems are still constrained by irregular electricity supply, inadequate ICT equipment leading to overcrowding of computer labs, insufficient server based software systems and the highly prohibitive costs of software licenses, slow speed of technological development including unaffordable access to connectivity with adequate bandwidth (Mambwe, 2015).

Mambwe Further, stated that most public universities government funding was insufficient to meet university high operational costs (such as Internet user fees, electricity and water bills etc and this makes it difficult for public universities to generate resources and invest in ICT infrastructure. (Habibu, 2012)

The fact that Internet connection is a shared bandwidth and is split among a number of Universities in Zambia, the greater the amount of bandwidth, the more data can be transmitted through it at a given time, it has been overly expensive to have a high speed internet connection (Kasch, 2015).

Universities using a dedicated bandwidth have access to more reliable Internet connection services, having stable download and upload speeds, at a high speed rate having no limit on the amount of data that can be transmitted at any particular time (Wong, 2012). Universities send colossal amount of money to pay for a dedicated internet connection in order to provide online web based services to their clients (students and Prospective students). Having a dedicated bandwidth eliminates the problems such as slow upload or download and video buffering leading to having satisfied clients.

There are constraints on the potential impact of web based services in many developing countries. These constraints include inadequate technical infrastructure, limited human

skills and the relatively high cost of communications equipment, and poor policy and regulatory environments. These factors reduce the scope for institutions to realise the potential of web based services. Qualified Technical personnel such as Software engineers, System analyst, Web Developer or IT Technicians are often seen as a catalyst in the development and effective use of web based systems (Hennessy et al, 2010).

2.5.1 Application and Admission Policies

Darwin, (2003) revealed that university admission policies aims to attract, select and retain a diverse range of students who are academically capable. To achieve this, the University has established the minimum admission requirements that seek to ensure that all commencing students have satisfied academic requirement and standards that demonstrate the potential for success in their course of study. Additional course specific admission requirements ensure that commencing students have the appropriate academic knowledge required for success in a particular course of study. Further, the selection processes ensure admission decisions are transparent, consistent and merit-based, with equity considerations taken into account, where appropriate.

The cornerstone of education policy in the Netherlands is that Admission to higher education is open to all those who have successfully completed secondary education and passed one of three kinds of final examination (Josephine and Mulrennan 2011).

Before the introduction of the higher education in Zambia, through act of parliament higher education act of 2010, universities could do what they wanted. Compromising the quality to increase shareholder value was common place, especially in private universities and quite rare in public universities. Even when the university administration new the best technologies to use the pressure from the institutional shareholders could make the management compromise government policies and regulations (Zulu, 2018).

With reference to the act of the Ministry of higher education in Zambia, the admission requirements for any university are five (5) 'O' levels and only eligible candidates are to be admitted in any college or university. The admission process is authenticated by the verification of GCE results by submitting certified copies from Examination Council of

Zambia at the time of accepting applicants, ensuring that only genuine candidates are admitted. Therefore, leaving no room for fraudsters to manipulate the application process and eligibility requirements (Higher Education. Act No. 4 of 2013 93).

2.5.2 Measures put in place to drive the adoption of Web Based Application and Admissions

Beforehand universities used to rely on school visits, open days, bulky paper prospectuses, public campaigns, direct post mails, newspapers, magazines, TV or Radio advertisements, and billboard announcements (Alikira, 2010).

As time passed and technology developed especially the invention of the Internet, pretty easy, cost-efficient and creative ways to reach and discover people came to see the daylight. Online web based service strategies which are inexpensive and affordable are now gaining viability. Universities are using web based marketing to successfully recruit more students onto campus. Business organization including educational establishments (Universities, Colleges and Schools) have implemented online web based system to reach and attract potential candidates (Johnson, 2007).

2.5.3 Creating Conditions for prospective students

To make it easy for prospective students to raise their hands first, universities must ensure that their online presence is both visible and is of high quality. This means ensuring that their website achieves page-one Google rankings for relevant keywords and social media posts are engaging enough to be loved, shared and allow students to picture themselves on the campus. Smart universities are not shy about revealing and celebrating their culture thought-leadership and outcomes (Mwapashua, 2019)

2.5.4 Ensuring that Right Marketing Techniques are used

A combination of university visits, alumni outreach, and Admitted Student Days will improve admission yield. Students remember a university that reaches out to them in a way that is thorough, personal and compassionate. Universities are working hard to ensure each point of contact is curated and orchestrated perfectly so it is unforgettable (Allison, 2002).

2.5.5 Increase Face-to-Face Contact

One of the most important things to remember during the process of website development is to create a clean, appealing design. A quality design is attractive and easy to read with intuitive navigation. (George, 2015) Most importantly, a clean design helps viewers focus on the Creating appealing web based system, Facebook these enable potential applicants create friendships and bonds with their peers before they come to commerce their studies and during student orientation. These communities ease the anxieties that students may feel in their decision and make this often-daunting next step in their journey seem more comfortable and accessible.

Between prospective students and current students; between prospective students and faculty; and between prospective students and alumni a community reaching out to welcome new students creates a sense of belonging before the students even set foot on campus. Some universities will send t-shirts, hats, pens, calendars, to cite a few, as part of the acceptance package, though, this only works if it is done in good taste and not as a high-pressure tactic (Sankaranarayanan, 2013).

2.5.6 Respond to Applicants Right Away

Universities are required to provide feedback to the applicants as soon as possible to avoid losing of students. Once prospective students have been accepted, admission officers have to notify the student and their parents. Anxiety can be high, from prospective students spending time on checking their email inbox hoping for the congratulation response from the university. What makes each strategy unique is its personalization: the most successful universities personalize their processes to meet the needs of each student and parent that the university serves. That is why the best university chooses their students so carefully. An excellent admissions strategy has to go beyond simply picking the students with the highest scores. The university may also pick the ones whose scores will increase the most as a result of university's particular brand of education (Supekar, 2014). In addition, administrators have further adopted the use of inbound marketing. Inbound marketing is a marketing technique intended to draw visitors and potential applicants in the university,

utilizing a mix of marketing channels such as website Content Marketing, or Social Media approaches to pull in individuals' attention (Allison, 2002).

The entire application and admission process is carried out in a paperless manner. It is not just about eliminating the paperwork from the whole process, it is about automating and shortening it. The technology of today's has reached leaps and bounds, and has given the world ample pieces of code to optimize many manual admission processes (Kadam, 2017). Eduventures (2007) states that effective communication is the key to the smooth functioning of any admissions office. This helps in sending admissions responses and resolve admission queries in real-time. Mediums like SMS, WhatsApp, Email and so on can be used for this purpose. This is a practical and efficient way to communicate notices, updates alerts and any other critical attention to applicants and all students. Further studies have revealed that there have been numerous cases, where many students miss out an opportunity of their dream just because of lack of communication. It is of vital importance for both the applicants and universities to keep up with the updates regarding the admission process (Kadam, 2017).

2.5.7 Summary

The studies reviewed in this chapter have demonstrated that web based application and admission positively affects university achievement. It is clear, that Student admissions are a vital part of any academic institution's running because students are what keep the institutions alive as no university can survive without students and a poor application and admissions system can mean fewer students being admitted into a university. While there are numerous systems on the market that help universities manage the admissions process, surprisingly little work has been done to develop software that would go beyond streamlining admissions processes and organizing data. This study will endeavor to fill this gap. The next chapter discusses the methodology used in this study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The aim of this chapter is to describe the research design that was employed. This relates to the Study population, Sample size, Sampling Technique, Research Instruments, Data collection instrument, Data collection Tools as well as Data Analysis and Ethical issues that were considered.

3.2 Research design

Exploratory research design was used when conducting this research. Since the research sought to collect information about the respondents' opinions on the use of Web Based Application and Admission Systems in public and private Universities, the descriptive research design was ideal. The study used both quantitative and qualitative research methods of data collection. (Kombo, 2006). The strategy of triangulation was used as a way of cross validation of research findings, figure 3.1 below shows mixed methods research design.

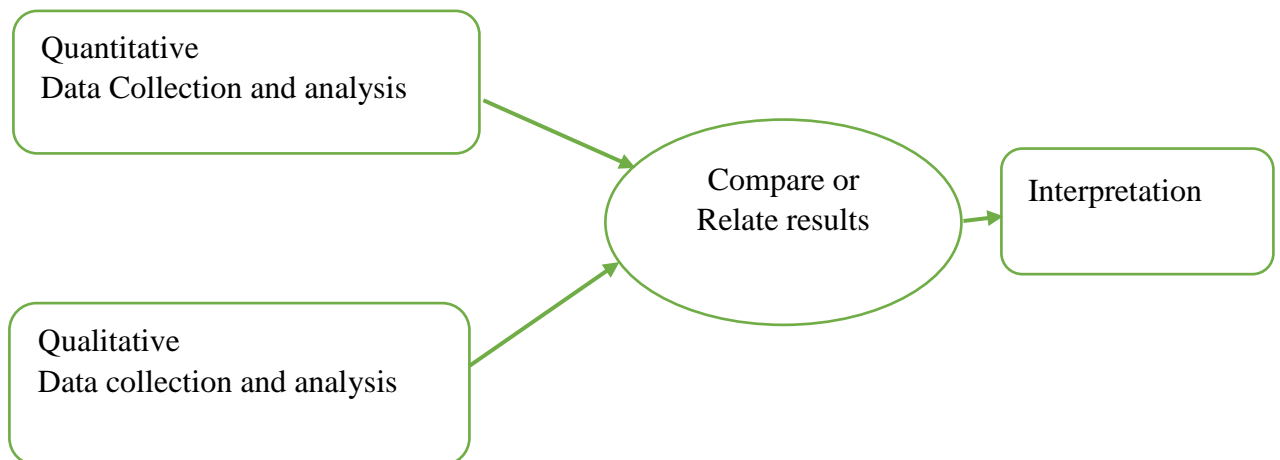


Figure 3.1 Mixed Methods Research Design

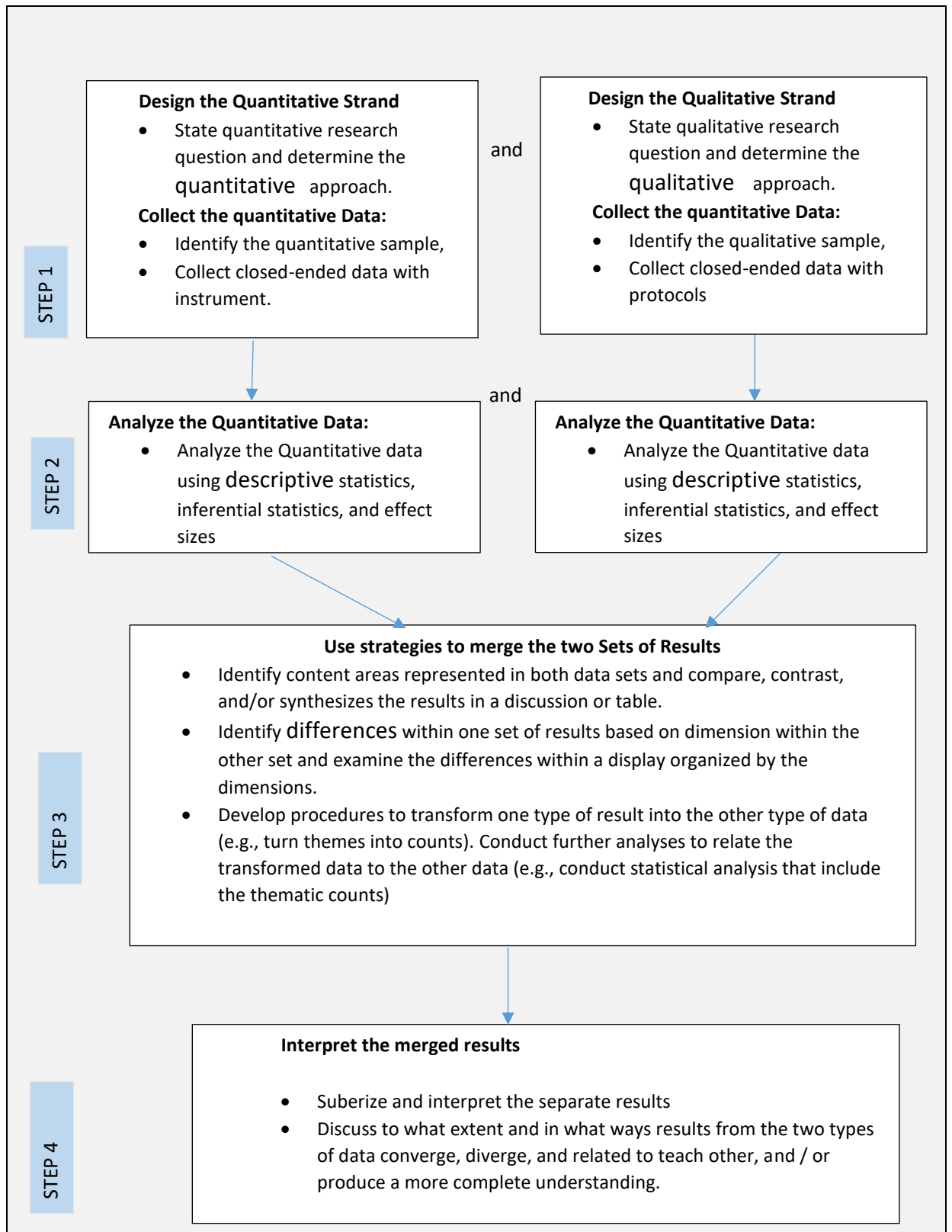


Figure 3.2 implementing a mixed research methods design.

3.2.0 Justification for Mixed Research Methods Design

The purpose of the mixed methods design is to “obtain different but complementary data” on the of Web Based Application and Admissions systems in public and private universities of Lusaka Province. (Kumar, 2011). Since no single method ever, adequately solves the problem of rival causal factors, multiple methods of observation were employed; triangulation was a methodological rule that was used for investigation.

3.2.1 Types of Systems used for application and admission

For this part, the method used was to review relevant literature on the types of systems commonly used for Application and Admissions processes in public and private universities. This has already been collected and documented in the literature review. According to Chetan, (2013), application and admission approaches differ from university to university. The most commonly used types of application and admission system are paper based and web based application and admission.

3.2.2 Challenges on the adoption of web-based application and admission

The qualitative approach was chosen because it would enable the researcher to recognize different types of challenges faced on the adoption of Web Based Application and Admissions systems in public and private universities in Lusaka Province. More details are outlined in the discussion of findings chapter.

3.2.3 Establish measures universities put in place to drive the adoption of Web Based Systems

To Synthesize the outcomes in 3.2.1 and 3.2.2; the results are documented in the discussion of findings and analysis on the measures universities have put in place to drive the adoption of Web Based Application and Admissions systems in public and private universities.

3.2.4 Study Population

The population for this study comprised all students, Dean of Student Affairs, Assistant Registrars, and Admission officers in private and public universities in Lusaka province

in Zambia. A research population is generally a large collection of individuals or objects that are the main focus of scientific inquiry. However due to large sizes of population researchers often cannot test every individual in the population because it is too expensive and time consuming. This is the reason why researcher rely on sampling (Dawson (2013).

3.2.5 Sample size

The sample consisted of 100 respondents, 80 were first year students, 4 Assistant registrar’s office, 4 Dean of Student Affairs office and 12 Admissions office. Sample was drawn from the following universities: Chalimbana University (CHAU) University of Lusaka (UNILUS), University of Zambia (UNZA), and Zambia Open University (ZAOU) and their names were changed to ABCD respectively. The sample sizes of all respondents were 100 and only 84 out of 100 participants responded.

TABLE 3.1: Shows the total Number of Participants by Designation and Institution

	A	B	C	D	TOTAL	Percent
Students	19	16	17	18	70	88%
Administrators	6	3	3	2	14	12%

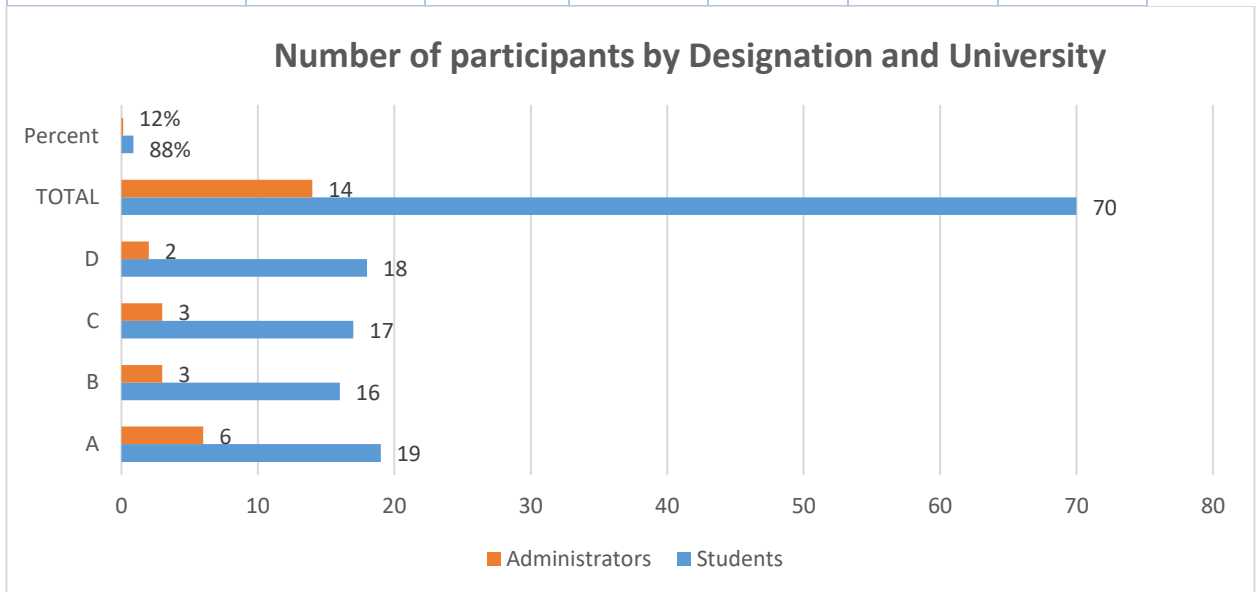


Figure 3.3: Shows the total Number of participants by Designation and Institution

Table 3.2: Shows the total number of participants by Gender

Gender	Total	Percentage
Female	46	54%
Male	38	46%
Total	84	100%

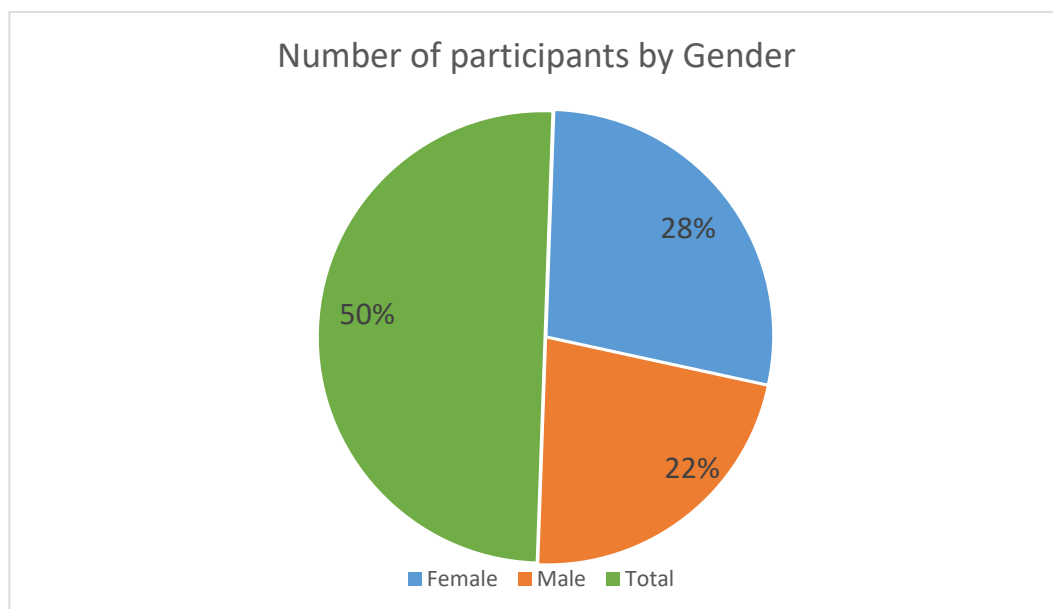


Figure 3.4: Shows the total number of participants by Gender

The sample that was drawn was representative, in that those included in the sample display the same characteristics as that of a target population.

3.2.6 Sampling Technique

Lusaka province was purposively selected as it represents a large number of universities. Being the capital city of Zambia, Lusaka Province comprises a total of sixty-three (63) registered private universities and two (2) public universities giving a total of 65

universities. (<https://www.hez.org.zm/index.php/registered-private-heis2> retrieved on 06-03-2020). (Kumar, 2011).

The purposive sampling technique was appropriate for this study because the selected universities were in the position of providing needed information due to their popularity (Kothari, 2004). Whereas public universities were naturally selected owing to their long term existence, and they are only two (2) public universities within Lusaka Province; University of Zambia and Chalimbana University respectively.

Chalimbana University formerly NISTCOL was pronounced a University by the Zambian government in 2011, but transformation into Chalimbana University was done in 2013 through the statutory instrument Number 111 of 2013. NISTCOL or Chalimbana Teachers Training College was one of the oldest public colleges and has existed since 1950's.

Additionally, Admission officers, Assistant Registrars and Deans of students' affairs were purposely selected. This is because the mentioned officers were directly involved in admission processes of the university and had variable data. Purposive sampling technique ensures that participants with needed information about the topic are selected (Robbins, 2009). Furthermore, the researcher randomly selected the students. The simple random sampling ensured that each member of the population has an equal chance of being selected (Dawson, 2013).

3.2.7 Research Instruments

In this research, structured questionnaires and focus group discussion were used to collect data. A questionnaire is described as a research instrument consisting of a series of questions for the purpose of gathering information from the respondents. The purpose of including focus group discussion in this research was to obtain in-depth information on concepts, perceptions and ideas of the admissions officers, Dean of Student affairs, Assistant Registrar and the students. Focus group interviews are considered purposive discussion of a specific topic or a set of related topics by eight or twelve individuals with similar back grounds and common interest (Catherine, 2013).

3.2.8 Pilot Study

The questionnaires were pilot tested at Chalimbana University, students and administrative officers, Dean of student Affairs and Assistant registrars were randomly drawn from the population considered in the study. The researcher personally administered the questionnaires she had to the participants. The respondents were requested to provide feedback to the researcher on any difficulty they had with items in the questionnaire. The pilot test among other things focused on finding out ambiguous or poorly worded items. After the pilot test, some amendments were made, and participants who participated in the pilot study were not included in the main study.

3.2.9 Data Collection Procedure

Semi-structured questionnaires were used to collect data from the respondents. The questionnaires contained both open ended and close ended questions. Open-ended questions were used in order to get the experiences and feelings from the respondents about the use of web based application and admission. The researcher distributed consent forms and questionnaires to the respondents who were sampled and willing to complete them, enough time was given to respondents so that they could complete the questionnaires, after collecting the questionnaires, the researcher randomly selected 10 students and two admissions officers, so that they could take part in focus group discussion.

3.3.0 Data Analysis

The data for this study was analyzed both quantitatively and qualitatively. Quantitative data was analysed using Microsoft excel (Spread sheet) to generate tables of frequencies and percentages which were used in describing distributions of the variables. Qualitative data was analysed by coding and grouping the emerging themes. Coding is an interpretative technique that both organizes the data and provides a means to introduce the interpretations of into certain quantitative methods. Dawson (2013) describes data analysis as a process that involves organising what you have seen, heard and read, so that you can make sense of what you have learnt.

3.3.1 Ethical Considerations

The proposal for the research, as well as the thesis questionnaire, was submitted for review by the Research Ethics Committee at the university. This is an important part of the research process since this study required personal information in order to access members of the student population. An official letter seeking approval to conduct the research study at the University of Zambia was eventually received (Kothari, 2004). The ethical considerations most pertinent to this study included the right to informed consent, right to privacy and the right to confidentiality. The purpose and aim of the questionnaire and the research study were clearly outlined. The respondents were informed of the anonymity of their responses and were therefore not required to provide their names or any other form of identification (Dawson, 2013). The study took into consideration ethical issues. The information that was collected was kept strictly confidential. Consent was sought from all the respondents and their participation was voluntary.

3.3.2 Summary

This chapter has presented the methodology used in this research in terms of research Design, Study population, Sample size, Sampling procedure, Research instruments, Data collection procedure, Data analysis and the ethical issues considered.

The next chapter; presents the findings of the study.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents the findings of the study. The findings were presented according to the objectives of the study. The objectives of the study were to: Investigate different types of systems commonly used for Application and Admissions processes in public and private universities in Lusaka Province, examine the challenges on the adoption of Web Based Application and Admissions systems in public and private universities in Lusaka Province and establish measures universities have put in place to drive the adoption of Web Based Application and Admissions systems in public and private universities.

4.2. Application and Admissions systems commonly used in public and private universities in Lusaka Province.

Application and Admissions system used in a university

Table 4.2.1 Application systems used in some universities

Application System	Students
Manual Paper Based	64
Online Web Based Application	8
Lack of awareness of web based	13

Table 4.2.1 shows that the 75% of the student respondents indicated that they bought printed application forms and filled in their details, while 10% used online web-based application system, 15% of the student respondents indicated that they lacked awareness on whether the university had a web based application and admission system.

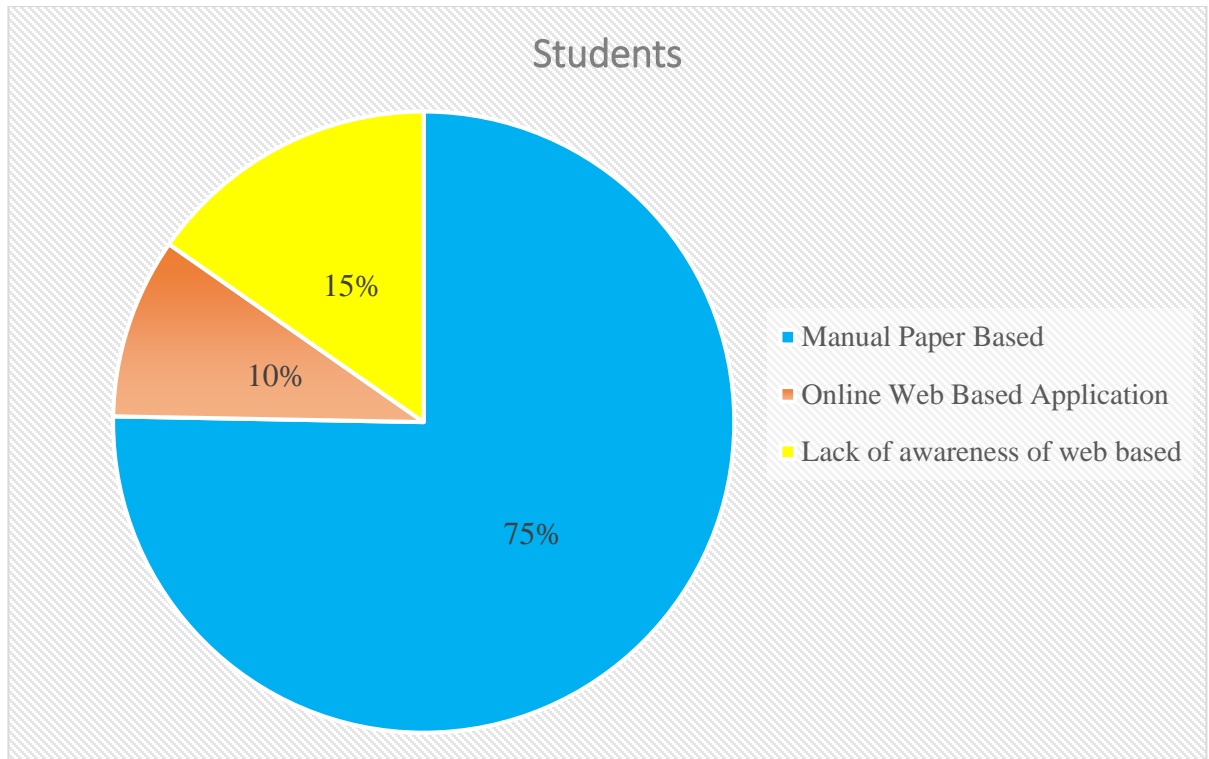


Figure 4.2.1 types of Application systems used in some universities

Administrators were asked to indicate the type of admission system used in their universities.

Table 4.2.2 shows types of admission Systems used in some universities

Admission System	Administrators
Web Based Admission System	5
Printed Admission Letters and Applicants physically collected	9
Admission letters sent through Postal Office services	4

The above table 4.2.2 indicates that 28% of the administrators' response indicated that applicants received admission notification and admission letters direct from the web based admission system, while 50% of the administrators indicated that admission letters were printed and sent via postal office services, on the other hand, 22% of the administrators' response indicated that applicants physically visited the university and collected admission letters

Admission systems used by Administrators in the universities

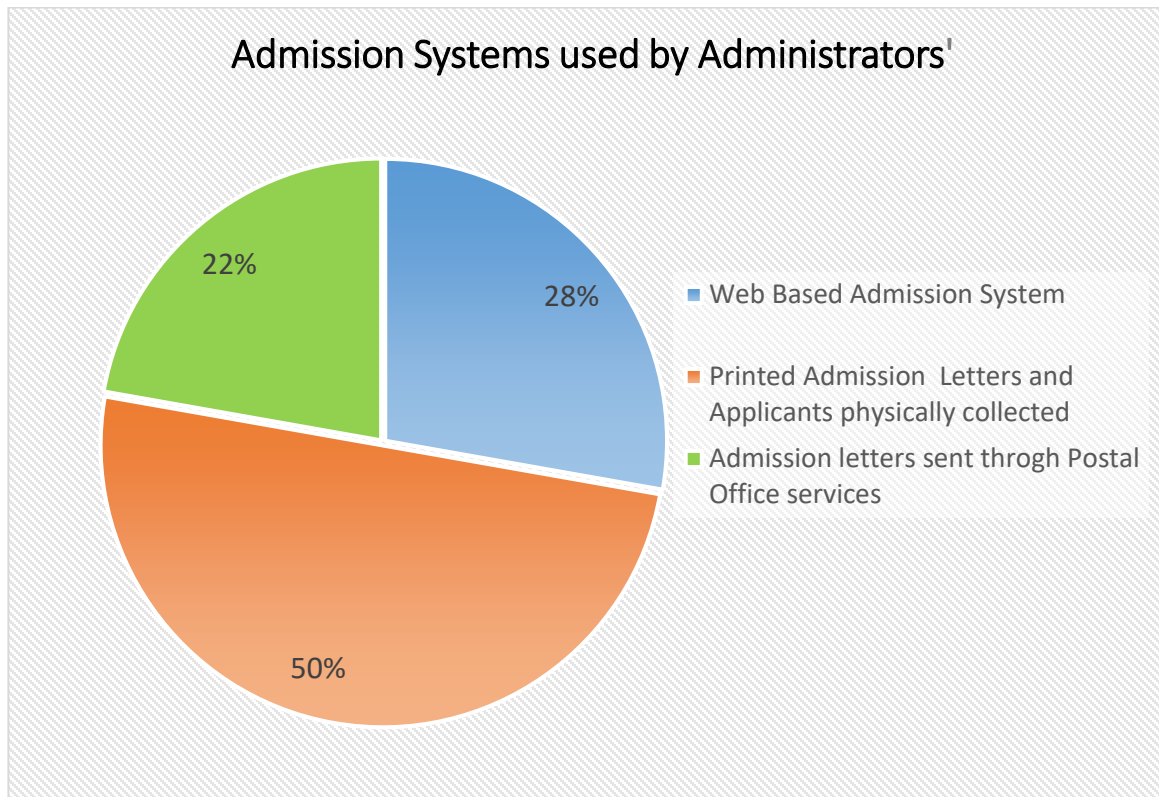


Figure 4.2.2 Admission systems used by Administrators in the universities

Students were asked to indicate how they received admission letters used

Table 4.2.3 indicates that 14% of the students' responses indicated that they received admission notification direct from the web based admission system, while 29% of them said that the admission letters were printed and sent via postal office services. On the other hand, 57% of the students physically visited the University and collected admission letters

Admission systems used to send admission letters to applicants

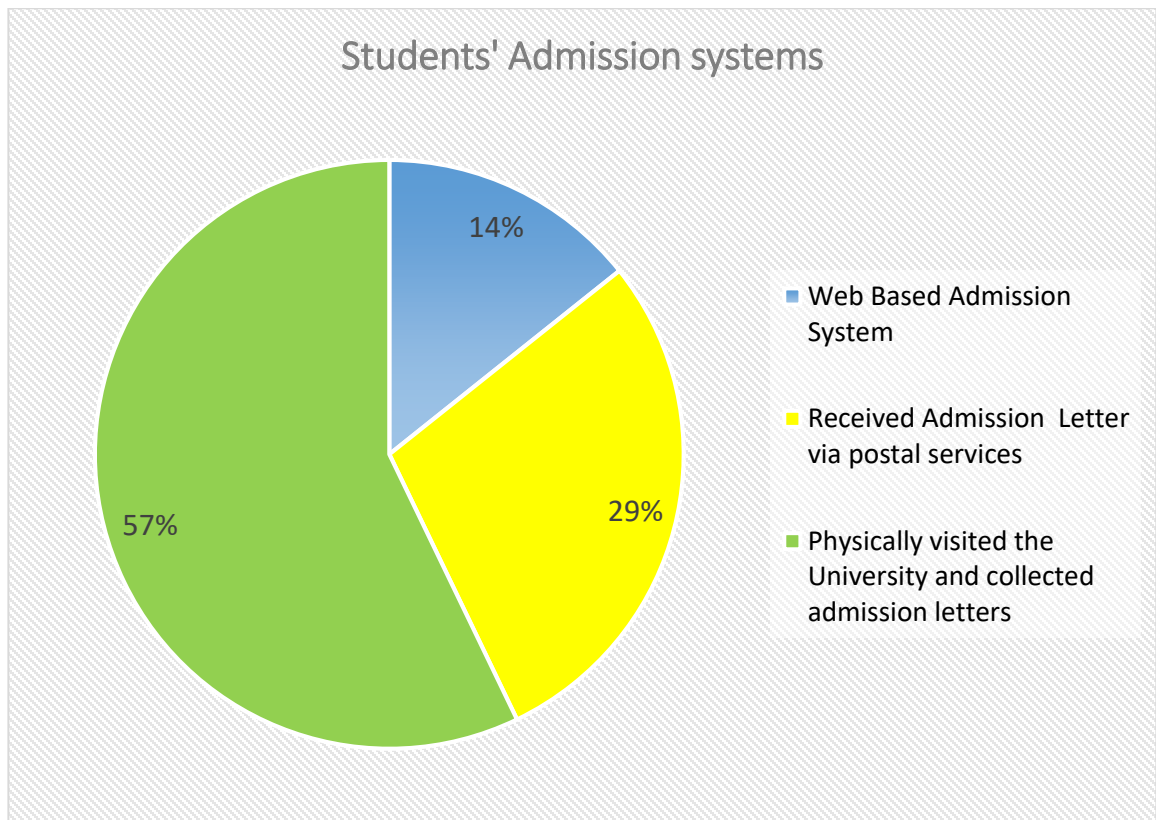


Figure 4.2.3 show Admission systems used to send acceptance letters to applicants

4.2.4 Administrator were asked during the focus group discussion to indicate the type of application and admission system they used in their universities. Shown below were the views of the administrator;

As we inevitably live in an era where time is an essential and scarce resource, using online application and admission enabled the university to reach out to the students at their point of need, ensuring that all the processes required for admission can be done from the comfort of their home or their office. Thus ensuring that the admission process was done at any time convenient to the applicants irrespective of location. This is an invaluable feature that will help benefit applicants and will greatly enhance the admission process for all involved. Gone were the days of long admission queues for applicants and endless paper forms for university. Today, the digital era calls for an admission process that is not only efficient but eliminates unnecessary hassles for all parties involved. An admission management system is the key to the new-age admission processes.

Regarding online application and admission processes which proved to be very quick and efficient for filtering out candidates and processing of applications were possible through the data base, the university got access to student records which was saved in a secure manner and there was a lot of cost-saving that an online application and admission system offered as the costs of processing applications were completely eliminated with the implementation of an online application system.

This technology has impacted and integrated into every aspect of our lives as we move into the digital age. Prospective students get and receive information about the programmes and courses online on the web site and the university kept all information in a central location.

During focus group discussions, students were asked to indicate the type of application and admission system used. Below were the views of the students

As students, we were not well informed about the university web site and the services found on the same web site, and that they did not get enough information for them to utilize the web based services fully.

Students indicated that they used manual paper based where they bought printed application forms from the campus and filled in their details.

They further indicated that they were not sure whether the university had a web based application and admission system. *They further said, "At the time we were applying for admission, we did not know of such services. Some of the universities who claimed to have been providing online web based application and admission did not advertise these services. Most of the adverts we got from TV and Radio such as: The university wishes to invite admission applications for the 2019 academic year from suitably qualified candidates in the schools..... and Application forms can be obtained from Customer Care, Chipwenupwenu Road campus upon payment of a non-refundable application fee of K100.00 Payment for applications forms should be made at NATSAVE Bank, Account Number 0210140373267. However, I would like to say that, the web based application and admission were not fully effected from our university.*

Student's views from another university were as follows:

online application and admission system makes it possible for us applicants from across the country and even abroad to apply to the university without any hassles, eliminating the inconveniences caused by ailments and exigencies, providing deserving applicants a convenience that has never before been available.

They further postulated that there were immediate notifications from the university via SMS and E-mail alert notification. This was easy and convenient for them to apply for a program.

4.2.4 Some of the challenges faced by students when using manual paper based application and admission systems.

Table 4.2.4 Challenges faced by students when using manual paper based application

Manual Paper based Application System	Respondents
Applicants covered long distances to access forms	52
Admissions process become too costly	35
Applicants waited for too long for the admission responses	40

Table 4.2.4 shows that the 41% of the respondents indicated that they covered long distances to access admission letters, while 28% of the applicants showed that the admissions process becomes too costly and while 31% of the respondents indicated that applicants waited for so long to get their admission response.

Admission systems used to send admission letters to applicants

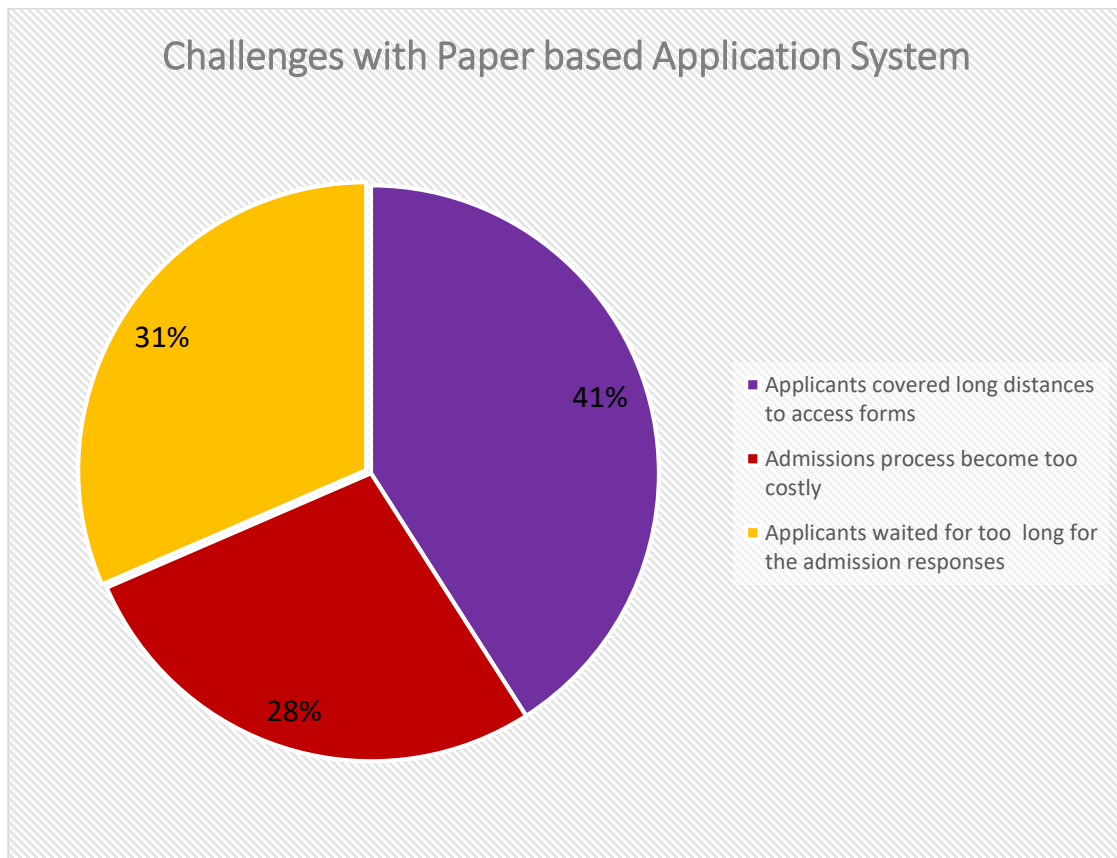


Figure 4.2.4 shows Admission systems used

Students were asked during focus group discussion to indicate the challenges faced with manual paper based application and admission system

Students said that:

We spend a lot of time going through the whole process of application and admission, we have to access the application forms from the assistant registrar's office which we physically visited. After collecting the application form we went to the bank to deposit applications fee, and attached the deposit slip to the application form. Then went to the accounts office for the cash receipt, after that, handed over the application form to the assistant registrar's office. The whole process took the whole day, and later went back home waiting for feedback which took two months from the date of application. After the university published the names of successful applicants, we had to physically visit the university to collect the admission letter. A lot of time and resources were wasted.

Administrators were asked to indicate the challenges faced when using manual paper based application and admission systems.

Table 4.2.5 Challenges faced by administrators when using online web based application

System	Admissions
Fraudsters can easily manipulate the admission process system due to lack of security measures	19
Difficulty to detect genuine applicants on the system	10
Lack of technical experts	8
Website not accessible due to poor Internet Connection	14

Table 4.2.5 shows that 29% of the respondents indicated that fraudsters can easily manipulate the online application system, 17% showed that it was very difficult to detect genuine applicants on the system, 14% of the administrator's responses indicated that there was lack of technical experts to develop and maintain a web based application and admission system while 25% of the respondents said that web based application and admission system were not accessible due to internet connection intermittent.

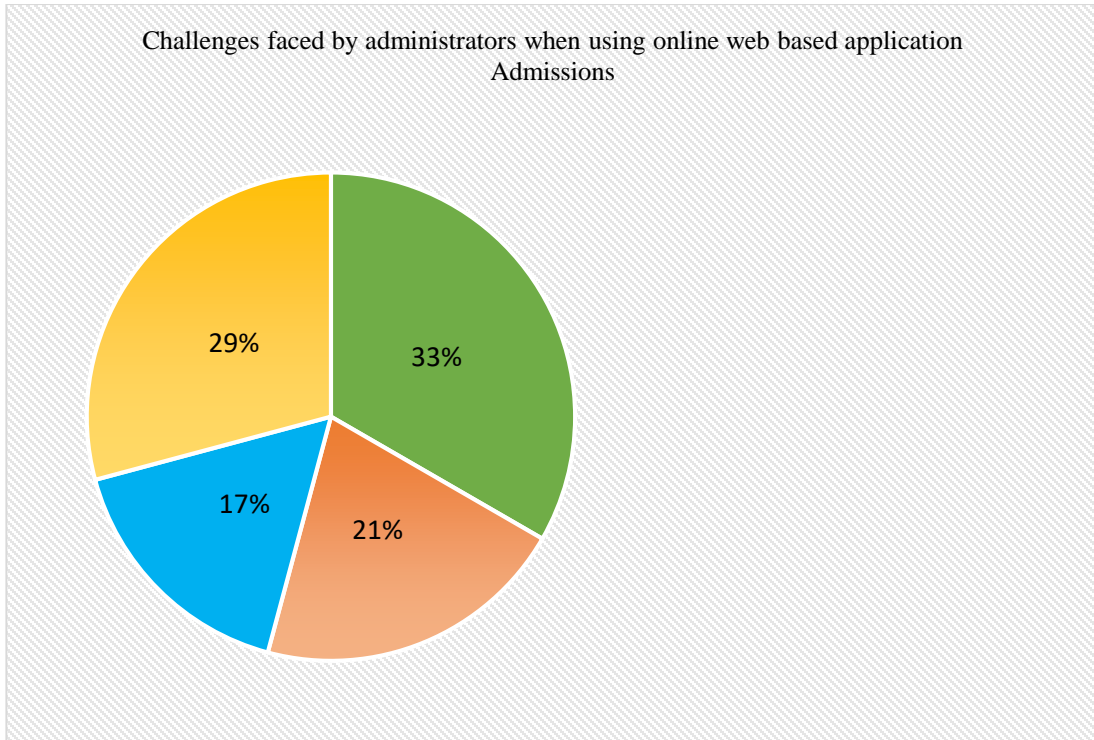


Figure 4.2.5 Challenges faced in adopting the use of Web Based Application and Admissions systems

The administrators were asked during focus group discussion to indicate the challenges they faced in adopting the use of web based application and admission systems. Their responses were as below:

Firstly, they said that the University received inadequate funding from Government, and this resulted in universities soliciting their own funding especially public universities. They also indicated that the problem of none availability of ICT skilled personnel such as Data Base Administrator, Web Developers posed a challenge for them.

Secondly, in the Ministry of Higher Education, there were no positions for personnel such as Data Base Administrator, Network administrator or Web Developers for these universities, except for ICT lecturers. They further stated that ICT lecturers had a big load of work and therefore, had no time to sit in their offices to start coding and develop web based systems for the university. For this reason, the university had to outsource for ICT expertise to develop web based systems which was too expensive for the institution to update and maintain the system.

They pointed out that *public universities had a serious shortage of highly skilled IT personnel, probably because they preferred working for Private Universities where the wages are more attractive than they pay in Public Universities.*

They also indicated Security concerns on the use of online web based application and admission saying, “as we tend not to have control over applicants applying online we, cannot check for genuine of certificates, for this reason it’s easier for applicants to breach admission eligibility requirements as they sit at their own comfort to process their application forms online.”

In addition, they posited that It was very easy for fraudsters to manipulate the application and admission system process especially that applicants were not monitored and guided on what to upload on the online system.

Universities, according to them, were struggling with exorbitant costs of bandwidth for Internet connectivity, Internet service Provider (ISP) and charges were too high for the universities.

4.2.6 Mode of Communication employed by the University to inform Students and prospective students in regard to University website and its services

Table 4.2.6 Shows mode of Communication employed by the University

Mode of Communication	Administrator	Students
Website News portal	10	25
Facebook	7	15
WhatsApp	12	30

Table 4.2.7 above shows that the 49% of the respondents indicated that the university communicated through website news portal to returning and prospective students for announcement and any other changes in programmes, 24% were administrators and 25% were students who received news updates from the university news portal. While 60% indicated that the university communicated through Facebook on the changes in

programmes, 35% were administrators and 25% were students who received notifications through university Facebook. 91% showed that their university communicated through WhatsApp forums for announcements and any other changes in programmes, 41% were administrators and 50% were students who received updates and notifications through University WhatsApp.

Mode of Communication employed by the University

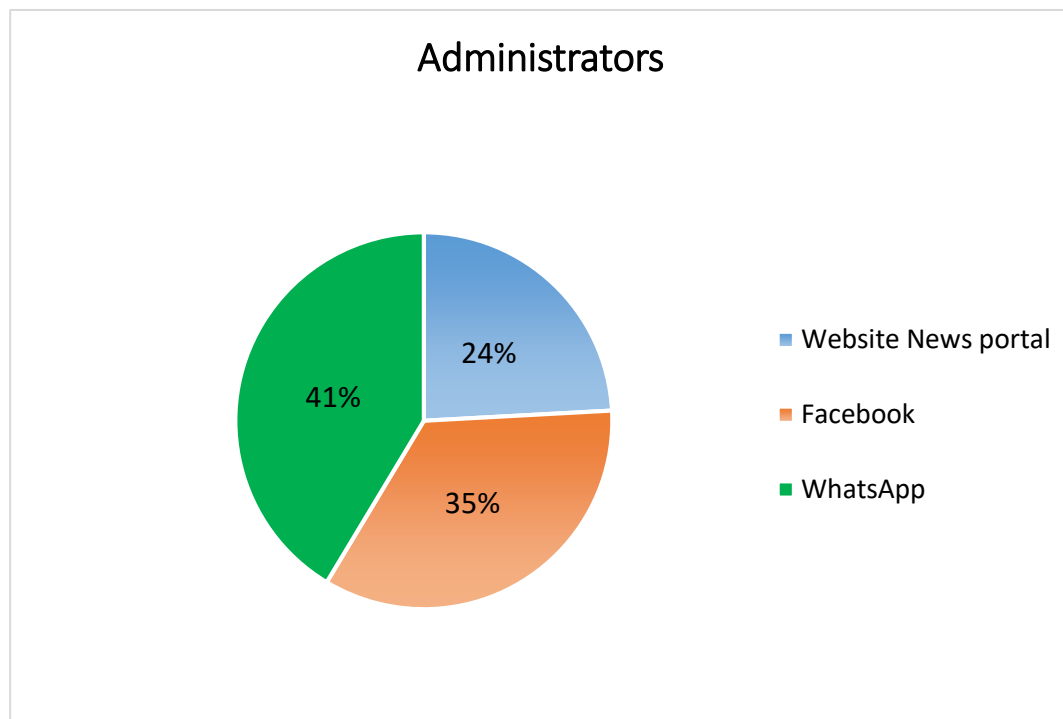


Figure 4.2.6 shows mode of Communication employed by the University

Mode of Communication employed by the university to inform students and prospective students in regard to university website and its services.

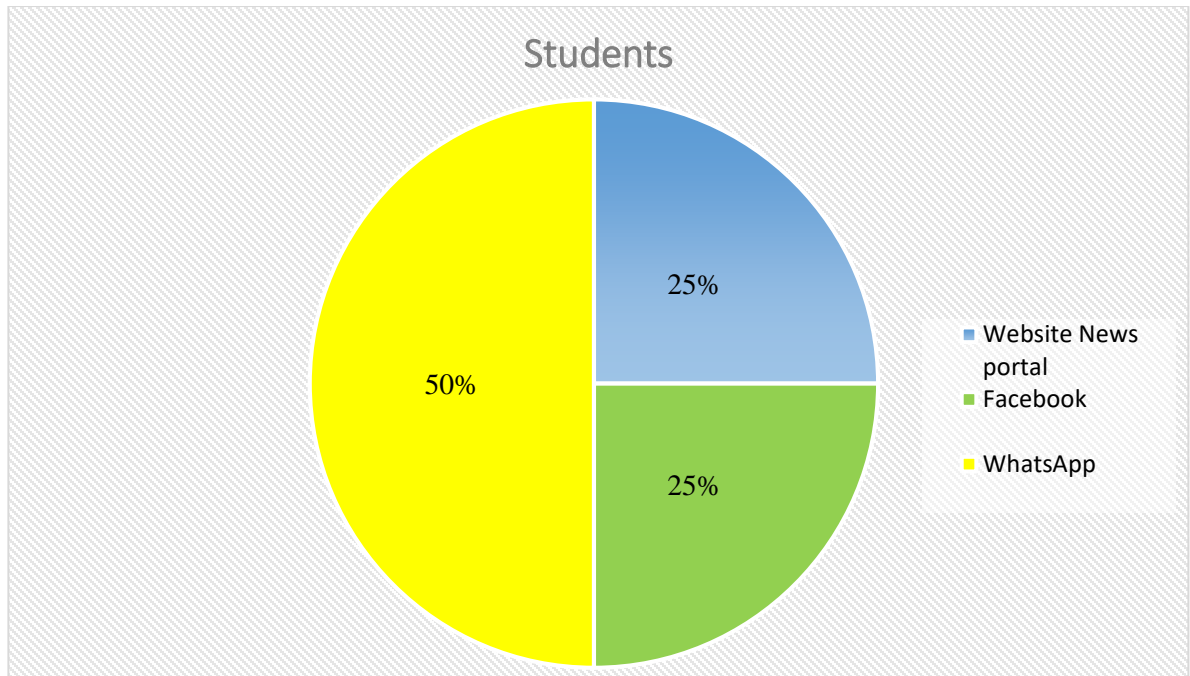


Figure 4.2.7 shows how students receive feedback

Administrators were asked to indicate types of measures put in place to drive the adoption of web based application and admission.

Measures universities have put in place to drive the adoption of Web Based

Table 4.2.7 Measures universities have put in place to drive the adoption of Web Based

Measures put in place	Admissions
Improve customer care services	13
Use of new Technology strategies for marketing	8
Effective communication and responding in real-time to admission queries	6
Employment technical expertise	4

Table 4.2.8 above shows that, 42% of the respondents indicated that they had put measures to improve on customer care services while 26% showed that they had adopted new technology strategies for marketing to reach geographically scatted potential student, stakeholders and customers. 19% on the other hand showed that they provided effective

communication and responded in real-time response to admission queries and 13% indicated that they had put measures to employ technical expertise to manage their web-based application and admission for the university.

Measures put in place by Universities to drive the adoption of Web Based Application and Admissions systems

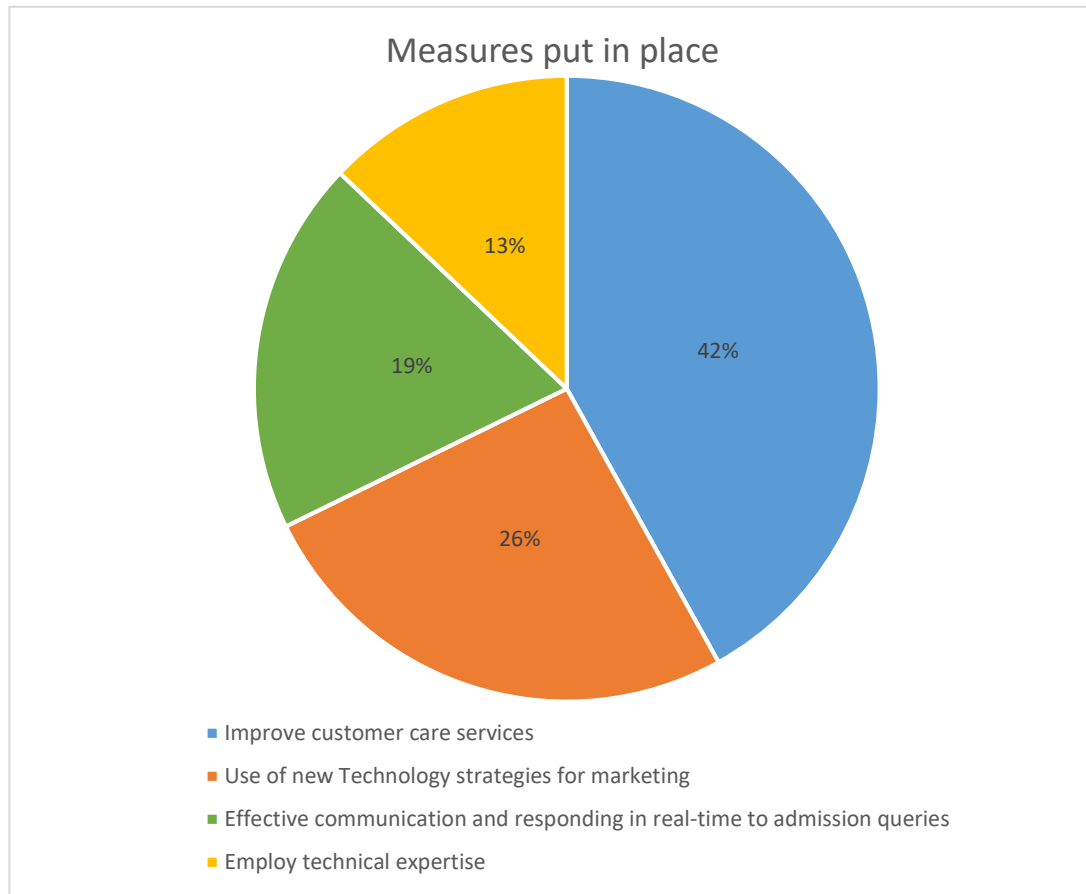


Figure 4.2.8 Measures put in place by Universities

4.2.8 Measures put in place to by universities to drive the adoption of Web Based Application and Admissions systems. Administrators were asked during focus group discussion on the measures put in place by universities to drive the adoption of Web Based Application and Admissions systems. Administrator's Views

They stated that they had put measures to generate extra income to outsource and pay ICT specialized services in order to meet the high demand of web based services.

Advertising the website and online web based application and admission to the current students in the university had been done to ensure that the service and point of contacts are orchestrated perfectly so that returning and alumni students advertise and create a community reaching out to prospective students who have not even set foot on campus in order to improve admission yield on the university.

They indicated that, the response given to the applicants takes a lot of time for them to receive application forms and then do short listing of successful applicants, therefore, losing out on potential students, by failing to respond quickly and processes admissions responses

Many students missed out of study opportunities of their dream just because they did not communicate on time, communication is of vital importance for both the applicants and Universities to keep up with the updates regarding the admission process.

4.3. Summary

This chapter has presented the findings from students, admissions officers, deans of students and assistant registrars on the use of web based application and admission system in Public and Private Universities of Lusaka Province. The next chapter discusses the findings of this study.

CHAPTER FIVE

DISCUSSION OF FINDINGS AND ANALYSIS

5.1 Introduction

This chapter discusses the findings of the study, which sought to investigate the use of web based application and admission systems in Public and Private Universities. The discussion is presented according to objectives of the study.

5.2 Application and admission systems currently in use

The study revealed that manual paper based application and admission systems were used. 75% of the administrator respondents said that they used printed application forms which were distributed and sold to the applicants and 75% of the student respondents indicated that they bought printed application forms from the campus. In addition, administrators confirmed that with Paper based system shortlisting of applicants was the most challenging and time-consuming step in the admission process. These findings were in line with Mwapashua (2019) who said that manual paper based system, data and information are manually stored on filing cabinets making it hard to find for an applicant's records when all the files were piled up in their respective cabinets even though they were arranged properly. With an increase in the number of applicants, administrators wasted a lot of time in processing and sending feedback to the applicants. The study findings are further supported by (Kumar, 2013), By reducing those drawbacks Kumar created a web based application for managing the admissions of the university.

As regards to the use of web based application and admission, the study revealed that students expressed ignorance on the use of web based application and admission about 15% of students said that they did not know whether the university had a web site or a web based application and admission systems. In a focus group discussion, students in this study said that university administrators rarely talked about such services, and the possible explanation for this scenario could be the universities failure to advertise web based application and admission systems to the returning students. These students would advertise the services further as they go back to their communities and interact with

different people including potential applicants. These findings are similar to that of Krishnan (2019) who concluded that online application and admission system Uniform Resource Location (URL) can be shared within the university to students and to other stakeholders using different social media platforms such as Facebook, or WhatsApp. This URL should be easily accessible to the students and should give the applicants the opportunity to read the guidelines related to admission procedures and filling the online forms in a simple format and then easily submit them online. This process should be seamlessly easy for the students without any complications or complex procedures.

The study established that about 31% of the administrators in this study said that online application and admission provided a very quick and efficient way for filtering out candidates and processing of applications through the database. The university accesses student records and databases in a secure manner. It existing traditional paper-based complex admission system into a friendly, accurate, and transparent system at affordable cost with greater speed and wider accessibility.

The study findings were in line with Rajnish Kumar et al, (2013). Who jointly established a Centralized Admission System that became operational in 2010. The online admission systems aimed at assist applicants upload and receive their admission update through a web-mobile application. The research method was A Case Study of A-Level private colleges of Kilimanjaro region in Tanzania.

5.3 Challenges on the adoption of Web Based Application and Admissions

As regards to the use of online web based application and admission, 33% of the administrators showed a negative attitude towards the use of web based application and admission system. This is because there were some security concerns by some of the administrators who said that they could not recommend the use of web based application and admission system to other universities who were still struggling with Manual paper application and admission system, as administrators tend not to have control over applicants applying online and could not check for authenticity of their certificates. These findings were in line with Darwin (2003) who revealed that security and admission policy

measures must be one of the first considerations when setting up an online web based application and admission system. Consequently, cybercriminals and hackers mostly target web based system to disrupt processes of the university. Yuanxiang (2017) also supports that securing of online web based application and admission is vital to university's online presence, a simple neglect could attract cybercriminals who may invade and destroy important information for the university.

The study findings revealed that 7% of the administrators from public universities indicated that they had a serious shortage of highly skilled IT personnel. This was probably because they prefer working for private universities where the wages are more attractive than they pay in Public Universities. The finding is in line with Habibu (2012) whose study revealed that it was difficult for Public Universities to generate resources usually this is because of insufficient government funding and most of the funds were consumed by salaries of members of Staff. This lead to the shortage of qualified IT personnel in the universities hence creating a backlogs of the admission and application processes of the universities. If these challenges can be looked into, the universities can flourish and compete with the international education providers where admission is concerned.

The study further revealed that 17% of the administrators were struggling with exorbitant cost of Internet bandwidth for network connectivity, Internet service Provider (ISP) charges were too high for the Universities, and the daily power interruption also impacted negatively on the use of web based application and admission, as the Internet infrastructure requires constant power supply for the clients to access the services. The long durations of power outage daily significantly affected online web based application and admissions services in the institution.

The findings were similar to Mulozi (2008), who said that poor electricity supply led to high blackouts issues and sharing Internet bandwidth became one of the most common contributory factors for slow access and breaks in Communication in Zambia.

5.4 Measures put in place to adopt Web based application and admission

The analysis of this research revealed that 15% of student respondents showed that they lacked awareness of online web based application and admission. This simply shows that, the extent of effective communication was weak and as such, the services could not reach the community and prospective applicants. This may result in fewer students being enrolled for a particular academic year. This finding is in line with Fujo (2019) whose study revealed that poor admission processes result in fewer students being admitted into universities. The findings are further supported by Eduventures (2007) who revealed that delayed feedback from management exposed several significant risks such as losing prospective students and causing the university inability to meet operational goals and objectives. Hence communication is important for both the applicants and universities in order for both parties to remain updated with regards to the admission process.

As regards to the measures put in place, 42% of the Administrators indicated that they had put measures in place to drive the adoption of web based application and admission by improving on customer care services so that applicants are given responses on time because delayed response may result in losing out of potential students to other universities with relatively quick response.

The study revealed that 13% of the administrators indicated that they had put measures in place to drive the adoption of web based application and admission by generating extra income in order for the university to outsource and employ qualified IT technical experts who would assist in the drive and adoption of online web based application and admission systems.

The findings are further supported by Alikira, (2010) whom confirmed that later universities used to rely on bulky paper prospectuses, public campaigns, direct post mails, newspapers, magazines, TV or Radio advertisements, and billboard announcements, as time passed and technology developed especially the invention of the online web based services, which are pretty easy, cost-efficient and it's a creative way to reach and discover people with similar goals worldwide. Online web based service are straightforward, inexpensive and affordable and are now gaining viability. Universities using web based marketing have successfully recruit more students onto campus. Business organization

including educational establishments (Universities, Colleges and Schools) are now implemented online web based system to reach and attract potential candidates (Johnson, 2007).

Further, the study revealed that 26% of the administrators showed that they had put measures to attract applications from a wide demographic and find applicants by running seamless recruitment and admissions processes and this included the adoption of inbound marketing, a marketing technique intended to draw web based customers and potential applicants in the university, thereby utilizing a mix of marketing channels such as online web based application, web based Marketing and Social Media marketing approaches to draw applicant individuals' attention. The above findings are similar to that of Sujatha (2017) who revealed that a number of universities in India have either completely or partially implemented the online application and admission system, about 80% of reputed Indian universities such as IGNOU (Indira Gandhi National Open University) and Manipal University have gone completely online with their admission process.

A university is home to students from different regions and across the globe. This means that applications needed to be processed from all over the country. Processing the volume of applications that are receive can be challenging for a small team, marketing team or the admissions office. Student's admission process is getting increasingly complex with interested applicants applying from different geographical locations and in this scenario, it is fast becoming increasingly difficult to handle such a large volume of students' application and admission in the traditional methods as shown in the circle below.

The increasing numbers of students seeking admission in the academic institutes (school, colleges, and universities) are causing tremendous pressure on the administrative body of the institutes to manage and arrange the admission process manually as shown below;

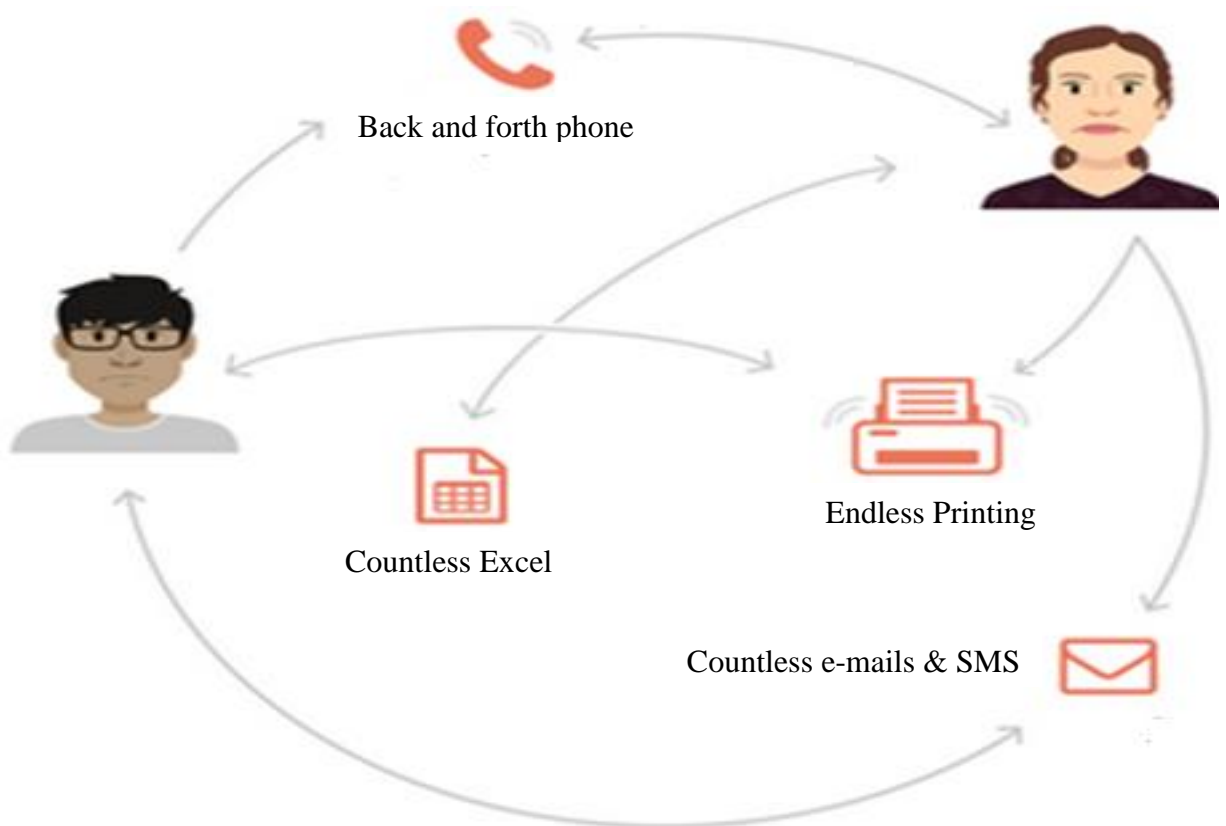


Figure 5.1 Traditional Manual Paper based application and admission methods

Universities need to ensure that the application and admission process is seamless. Adopting the use of an online application and admission system ensures that the existing traditional paper-based complex admission system is transformed into time-saving, accurate, and transparent system at affordable cost with greater speed and wider accessibility.

5.6 Summary

This chapter has demonstrated that most of the universities in Lusaka Province are still using manual paper based application and admission system. It has also shown that student application and admissions processes are a vital part of any university's running because students are what keep a university alive. Student admission is one of the most important activities within a university as one cannot survive without students and poor application admissions system can mean fewer students being admitted into a university.

However, there is need to ensure that the application and admission process supports the administration team and the applicants with the support needed by making the admission process faster, easier and hassle-free experience for all concerned. The study has presented that the web based application and admissions system integrates with student information systems and other modules such as e-library, course registration to streamline centralized data storage and the sharing of student data gathered during the admissions process is the way to go.

The next chapter, concludes the research and makes recommendations of the study.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter concludes the study and also makes recommendations based on the findings of the study.

6.2 Conclusion

In a technology driven world, web based application and admission systems play a very important role in meeting the requirements of sound and effective management of applicant's records and admission processes in universities. Today, the presence of online web based application and admission systems is not only a symbol of modernity in universities but an evolution that has simplified the process of managing application and admission records processes.

The findings from both administrators and students show that the objectives of the study have been realized. They have been realized following what the respondents stated regarding each objective. For instance, for the first objective 75% of the respondents said that printed application forms were distributed and sold to the applicants, even though 31% of the respondents' indicated that they used online web based application and admission, the adopted and implementation of web based application and admission systems is still in its mid-way of growth due some challenges that reflect on the poor state of ICT infrastructural development in some Public Universities. Therefore, investing in having fully fledged modern Online web based services and cloud computing facilities can help to ensure full utilization of the web based application and admission systems. Meanwhile, there is a sign of improvements in Private Universities since the inception of online web based system, as such this study calls for adding value services in the web

based application and admission system to make it all encompassing and to meet the diverse needs of the admission processes.

In the second objective administrators showed a negative attitude towards the use of web based application and admission system. This is because there were some security concerns by some of the administrators who said that they could not recommend the use of web based application and admission system, as administrators tend not to have control over applicants applying online and could not check for authenticity of their certificates. It was reasonably easier for the applicants to be reached for admission requirements as they sit at their own comfort to process their application forms online. It was further revealed that some public Universities had a serious shortage of highly skilled IT personnel, probably because they prefer working for Private Universities where the wages are more attractive than they pay in Public Universities.

They further indicated that they did not get enough information for them to utilize the web based services fully.

In view of this, the researcher went further to ascertain a sustainable measure that universities would institute to promote the Implementation and the use of web based application and admission system. The majority of the respondents recommended the use of web based application and admission system and this would extend the university's reach to geographically scattered students there by reducing time in application and admission processes and provide a centralized data handling and paperless admission with reduced manpower.

The study further revealed that it was difficult for some of the Public Universities to generate resources usually this is because of insufficient government funding and in most cases the same funds were consumed by university high operating costs such as Internet user fees, electricity and water bills and so on This lead to the shortage of skilled human resources in the universities hence creating a backlog of the admissions and application processes of the universities. If these challenges can be looked into, the universities can

flourish and compete with the international private and public Universities where admission is concerned.

6.3 Recommendation

Arising from the findings of the study, the following recommendations are made:

1. The universities to invest in Internet infrastructure and setup Online web based application and admission that is easily accessible and gives applicants the opportunity to read guidelines related to admission requirements, to choose programmes of their choice and fill in the application form, and then easily submit or upload them without any complications
2. Universities to regularly sensitize the students as well as other stakeholders on the importance of online web based application and admission system, web site services and web address
3. Public universities should implementation income-generating projects to seriously address the problem of the shortage skilled human resources in the University

6.4 Future Work

The use of online application and admission system is very effective in a way that it automates the application and admission processes instead of manual. Yet some areas in this study were not explored in detail due to time constraints.

The future work will involve the development and implementation of the proposed web based application and admission system, the to be designed will have the capability to reduce the stress of applicants while filling the application forms and the process of receiving admission letters, below are some of the suggested areas to be taken into consideration:

1. Develop and implement an online web based application and admission system
2. Development of an online admission system that will automate the process of sending offer letters online via web based admission system to the applicants.

3. The application and admission system will be enhanced with security by using captcha.
4. The System can send the confirmation or information by SMS to cell phone of candidates.

KEY INDICATORS

A - Chalimbana University

B - University of Zambia

C - Zambia Open University

D - University of Lusaka

APPENDICES A

APPENDIX A

QUESTIONNAIRE FOR ADMINISTRATORS

THE UNIVERSITY OF ZAMBIA

SCHOOL OF ENGINEERING

DIRECTORATE OF RESEARCH AND GRADUATE STUDIES

I am a postgraduate student at the University of Zambia collecting information on the use of web based application and admission systems in Public and private universities of Lusaka Province.

Be as honest as you can when answering this questionnaire. Your responses will be kept confidentially and will only be used for academic purposes.

You are not required to write your name on this questionnaire.

SECTION A BIOGRAPHICAL INFORMATION

1. What is your gender (sex)?

Male

Female

What position do you have in the institution?

Dean of Students

Registrar

Head of Department

Admissions Office

Tick all those you think are applicable

2. What types of systems commonly used for Application processes in your university?

a. Manual Paper Based application system

b. Online Web Based application system

c. Lack of awareness of web based

Others

(specify)

.....

3. What types of systems commonly used for admission processes in your university?

- a. Web Based admission system []
- b. Admission Letters were sent via email []
- c. Printed letters were sent via Postal services []
- d. Physically visited the University and collected admission letter []

Others (specify)

4. What challenges do you face when using web based Systems in your university?

- a. Fraudsters can easily manipulate the application process []
- b. Inadequate security Measures []
- c. Difficulty to detect genuine applicants []
- d. Website not accessible due to Internet failure and Power outages []
- e. Lack of technical experts to develop application and admission system []

Others (specify)

5. What are the advantages of using Web Based Application and Admissions systems at your universities?

- a. The Universities can easily reach geographically scattered Prospective students []
- b. Reduced time of admission processes for both applicants and administrators []
- c. Provide the Institution with centralized data handling and paperless admission []
- d. Not aware of any benefits []
- e. Communicate via web based application and Admission system emails and SMSs []

Others (specify)

6. What types of measures have university put in place to drive the adoption of Web Based Application and Admissions systems?

- a. Improve customer Care []
- b. Use of New Technology strategies for Marketing []
- c. Effective communication and respond in Real Time to admission queries []
- d. Employ technical expertises []

Others (specify).....

.....
.....

7. Which mode of Communication employed by the University to inform Students and prospective students in regard to University website and its services offered?

- a. Web site news Portal []
- b. Facebook []
- c. WhatsApp []

8. What do you think should be done to overcome these challenges?

Specify.....

Thank you for sparing your valuable time to participate in this research

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APENDIX B

QUESTIONNAIRE FOR STUDENTS

THE UNIVERSITY OF ZAMBIA

SCHOOL OF ENGINEERING; DIRECTORATE OF RESEARCH AND GRADUATE STUDIES

I am a postgraduate student at the University of Zambia collecting information on the use of web based application and admission systems in Public and private universities of Lusaka Province.

Be as honest as you can when answering this questionnaire. Your responses will be kept confidentially and will only be used for academic purposes.

You are not required to write your name on this questionnaire.

SECTION A BIOGRAPHICAL INFORMATION

1. What is your gender (sex)?

Male

Female

2. What is your year of study?

First year of study

3. Do you use the University web site?

a. Yes

b. No

9. What types of systems commonly used for Application processes in your university?

a. Manual Paper Based application system

b. Online Web Based application system

c. Lack of awareness of web based

Others (specify)

10. What types of systems commonly used for admission processes in your university?

- a. Web Based admission system []
- b. Admission Letters were sent via email []
- c. Printed letters were sent via Postal services []
- d. Physically visited the University and collected admission letter []

Others (specify)

11. What challenges do you face when using manual paper based application Systems in your university?

- a) Covered long distance to access application form []
- b) The Process was costly []
- c) Waited too long for response []

Others (specify)

12. What challenges do you face when using manual paper based admission Systems in your university?

- a. Covered long distance to access application form []
- b. Admissions became too costly []
- c. Waited too long for response []

Others (specify)

.....

1. If your response to question 6 is b what type of challenges did you find when filling in the application form at this University?

- d) Covered long distance to access application form []
- e) The Process was costly []
- f) Waited too long for response []
- g) No challenges []

Others (specify)

How did you receive the Admission response from the University at which you are studying?

- a. Web based Admission system []
- b. Admission Letter via Email []
- c. Admission Letter via Postal services []
- Physically Visited the University and collected the Admission Letter []

Any other responses.....

2. If response to question 9 is b, what type of challenges did you face as you were applying to be enrolled at your University?

- a. Could not connect to the internet []
- b. Not able to download admission letter []
- c. Connection time out []

Others (specify)

3. What types of incentives has your university put in place to encourage prospective students apply using web based application and admissions systems at universities?

- a. No application fee []
- b. Immediate response via SMS or Email []
- c. Tuition weaver

Any other responses.....

.....

4. What are your recommendations to overcome these challenges?

Specify

.....

.....

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...

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...

Thank you for sparing your valuable time to participate in this research

APENDIX C

FOCUS GROUP DISCUSSION TOPICS FOR ADMINISTRATOR

THE UNIVERSITY OF ZAMBIA

SCHOOL OF ENGINEERING; DIRECTORATE OF RESEARCH AND GRADUATE STUDIES

I would like to have a discussion about the use of web based application and admission in Universities. There are not right or wrong answers. Please share your true opinion and feelings with me. The discussion will be kept confidentially. Please feel free to participate.

1. Let's start by talking about website services
2. What types of systems commonly used for Application processes in your university?
3. What types of systems commonly used for admission processes in your university?
4. Discuss the challenges you face when using web based Systems in your university?
5. What are the advantages of using Web Based Application and Admissions systems at your universities?
6. Let talk about measures have university put in place to drive the adoption of Web Based?
7. Which mode of Communication employed by the University to inform Students and prospective students in regard to University website and its services offered?

APENDIX D

FOCUS GROUP DISCUSSION TOPICS FOR STUDENTS

THE UNIVERSITY OF ZAMBIA

SCHOOL OF ENGINEERING; DIRECTORATE OF RESEARCH AND GRADUATE STUDIES

I would like to have a discussion about the use of web based application and admission in Universities. There are not right or wrong answers. Please share your true opinion and feelings with me. The discussion will be kept confidentially. Please feel free to participate.

1. Let's start by talking about web site and its services, what do you understand?
2. What types of systems commonly used for Application processes in your university?
3. What types of systems commonly used for admission processes in your university?
4. Discuss the challenges you face when applying using manual paper based application Systems in your university?
5. What challenges do you face when using manual paper based admission Systems in your university?
6. Could you tell me the importance of using web based online application and admission system?