MODEL OF MOBILE INFORMATION SYSTEM FOR BUGEMA UNIVERSITY DEAN OF STUDENTS' OFFICE IN UGANDA

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MASTERS OF SCIENCE IN INFORMATION TECHNOLOGY
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MODEL OF MOBILE INFORMATION SYSTEM FOR BUGEMA UNIVERSITY DEAN OF STUDENTS' OFFICE IN UGANDA

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ACCEPTANCE SHEET

DECLARATION

I, NIYOMUGABA SAMUEL SONNY declare that, to the best of my knowledge, this thesis entitled "**MODEL OF MOBILE INFORMATION SYSTEM FOR BUGEMA UNIVERSITY DEAN OF STUDENTS' OFFICE IN UGANDA"** is my own original work and has never been presented to Bugema University or any other institution of higher learning for any award. Relevant information to my study has been made and acknowledged.

Signature …….

NIYOMUGABA SAMUEL SONNY

Date Signed…… …… ……..

DEDICATION

I dedicate this work to our Almighty God for blessings and protection and my father GAHUTU Daniel, my mother NZABONIMPA Esther and BUGEMA UNIVERSITY who supported me financially and NIYONIZEYE LEONCIE for being quite understanding to me and encourage me, and all my lectures who has enabled me accomplish this work it amidst various challenges and life's trials. It is mercy that kept me going on and ensures that I fulfill all the requirements for this work.

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Above all, I thank the Almighty God for His guidance and strength He gave me throughout the period of my studies.

BIOGRAPHICAL SKETCH

The author of this thesis is NIYOMUGABA SAMUEL SONNY**,** who was born on 1st January 1987 in Burera District in Northern Province of Rwanda. He is born of Mr. GAHUTU DANIEL and NZABONIMPA ESTHER.

In August 2015, the author joined Bugema University, School of Graduate Studies in Kampala Campus, Uganda, to pursue a Master's of science in Information technology-information system.

From 2012-2013, the author attended "Bugema University main campus" and obtained bachelor's degree of Science in Computer Network and System Administration. The author also attended secondary school education at E.T.Karuganda secondary school in Burera District, Rwanda from 2005-2008 with award of Certificate of Construction A2 and Ordinary Level at E.T.Karuganda school in Burera District, Rwanda after completing primary education.

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LIST OF ACRONYMS

HTML:	Hypertext Markup Language.
CSS:	Cascading Style Sheets
PHP:	Hypertext Preprocessor
Java Me:	Java Platform, Micro Edition
C/C++:	C and C++ programming language.
APIs:	Application Program Interface
QA:	Quality Assurance
SDK:	Software Development Kit
App:	Application

ABSTRACT

NIYOMUGABA SAMUEL SONNY, School of Graduate Studies, Bugema University, Kampala Uganda, September 2018. **MODEL OF MOBILE INFORMATION SYSTEM FOR BUGEMA UNIVERSITY DEAN OF STUDENT'S OFFICE IN UGANDA**,

Supervisor: SAMALI MLAY, Ph.D.

Mobile phone plays a very important role in student life today; its functionality has been extended from voice communication devices to internet surfing and data transfer. Bugema University dean of student office, hold and organize numerous events throughout the academic year and it relies on email communications for notifying its students. Using the email notification for communication to the staff for different issues is suffering from two main problems which are: most of the students rarely check their email periodically, which make them miss access to the communications or notification. Similarly, sometimes internet service is not available or students are at some place where they cannot access internet which may them miss communication. This study designed and developed a notification system in order to be used to send the notifications direct to the students mobile phones via SMS and thus helps to make sure that the message is delivered to all interested. Successfully implementing this model of mobile information system which may provide the announcement to the student at Bugema University was finished and tested by the students to the level of 85% of the a reliable and convenient inter communication channel.

CHAPTER ONE

INTRODUCTION

Background to the Study

Model of mobile information system is a new model which can be used in telecommunication aspect of Information Communication Technologies (ICT) that is systematically transforming human communication the world more than prefect by using information system. The high access to mobile phones by distance learning students opens up the opportunity of higher communications when they are within or outside of campuses communications need to reach students anytime and anywhere (Facemire, 2013).

Model: is structural design of something needed to be work on, or is representation of something. Information systems that include end-user terminals that are easily movable in space are operable independent of location and have wireless access to information resources and services.

Mobile information systems are systems that rely on wireless communications and support mobile applications that typically run on wireless devices such as smartphones and mobile phones (Mohd, 2011).

Bugema University is an Adventist University which was established in 1948. The university students' affairs desk (Dean of students' office) is responsible for coordinating activities that take place between the students' body and the university administration. The Dean of students' office usually disseminates information to the entire university students through notice boards, email, university website and other channels that suit the audience at hand. This include also printing out notices, and distributing them to respective audience.

Applications that are not preinstalled are usually available through distribution platforms called app stores. They began appearing in 2008 and are typically operated by the owner of the mobile operating system, such as the Apple App Store, Google Play, Windows Phone Store, and BlackBerry App World (AL, 2016).

Mobile application is a computer program designed to run on a mobile device such as a phone/tablet or watch. Mobile applications often stand in contrast to desktop applications which run on desktop computers, and with web applications which run in mobile web browsers rather than directly on the mobile device. In 2009, technology columnist David Pogue said: "that newer smartphones could be nicknamed application phones to distinguish them from earlier less sophisticated smartphones". The term "app", which is short for "software application", has since become very popular: In 2010, it was listed as "Word of the Year" by the American Dialect Society (AL, 2016).

Usage of mobile apps has become increasingly prevalent across mobile phone users. A May2012ComScore marketers and media companies study reported that during the previous quarter, more mobile subscribers used apps than browsed the web on their devices: 51.1% vs. 49.8% respectively. In 2014 government regulatory agencies began trying to regulate and curate apps, particularly medical apps. Some companies offer apps as an alternative method to deliver content with certain advantages over an official website (AL, 2016).

This study particularly addressed the Dean of students' office which entails students' status at Bugema University to effectively improve communication with students that is to move from analog system to digital system. For any student it is important to have up to date information about current announcements, events, activities, upcoming appointments and other daily activities.

The study focused on designing a new model of mobile information system for providing relevant information to students on a mobile platform. The research followed a standard design, including surveys, the significance of the system and evaluation of different versions of the system using a mobile system acceptance model. Findings it was found that the intention to use such services is high, in university and colleges particular relative to services providing information based on university localization and schedule events in campus and interests of the student (Krogstie, 2013).

The role of information systems is to provide information management which may enable the decision making that may ensure that the organization is controlled (Kelton, 2015). The dean's office needs a system of its own aimed at prompting communication among students. Information systems that include end-user terminals that are easily movable in space, and possible regardless of the location and wireless internet access. Mobile information systems that depend on wireless communications and support mobile applications that typically run on wireless devices such as smartphones and mobile phones (Kelton, 2015).

In Bugema for instance, many students do not read notice boards; some student read but they do not respond to them. Some students tend to be busy all the time that they do not get time to read announcement on the notice board; this makes them miss essential information or communication (office, 2018). The current system contains a lot of manual work; announcements are circulated all over university manually and displayed on notice boards; and using printed papers with announcement. Therefore, in order to improve the mode of communication there was a need to design a system that could promote easy access of the message on the individual end user from the sender (office, 2018).

Since the mode of communication in Bugema is manual, there was a need to bridge the gap by ensuring that a more electronic mode of communication is designed and implemented to make communication friendlier. The system should involve distribution of announcement through android mobile phone using text messaging to all students staying within campus hostels and even to those staying out of campus (Moe, 2016).

One of the modes of easy communication today is the WhatsApp. This platform being used by many people by direct messaging application that allows iPhone, BlackBerry, Android, Windows Phone and Nokia smart phone users to exchange text, messages.

However, it has been noted that when using What Sapp to send one announcement which was not specifically for that but still have a challenge one you are in whatsapp group it means you are free to post any announcement you need and once you finish to post announcement goes direct to the members but for this new model of mobile information system before announcement it reached to the students dean of student need first to authorized which whatsap group did not supposed (Johnston, 2015).

WhatsApp web does not support internet explorer, Mozilla; if one does not have WhatsApp application, he cannot access the information even with the accounts with WhatsApp but for this new model of mobile information system as long as one activates the account, he can use the devices with internet and access information. In addition to this, WhatsApp has a limited space for uploading documents but the new model of mobile information system solves all this limitation (Johnston, 2015).

Based on the foregoing mobile information system technology is thought to improve communication between deans of student's office and students at campus in a

comprehensive manner to solve the problems of communication in the Deans of student's office and students at campus.

Statement of the Problem

Bugema University students' affairs desk communicates via email, telephone calls, and printed notices and adverts. In most cases, this mode of communication is analog due to changes in information systems which offer many more plat forms that are students friendly. It has been noted that the mode of communication from the student's affairs desk has limitations in their communication and many of the students rarely responds to the different communication sent out to them. There was therefore a need to ensure that the office has a mode of communication that is students friendly and can be accessed at any time once the communication has been send.

Another challenge is that students' views on such events and activities are not received timely by the dean of student's office. Consequently, dean of student's office spends a lot of time in sending announcements but still few students get the message. In addition, dean of student's office they do not get feedback from student concerning the message they received. This means no way adequate approach which is provides efficient communication.

Research Questions

1. Which requirements are needed to analyses the model of mobile information requirements to be used for producing a good model of mobile information system?
2. What function requirement of a new model of mobile information system would be used to coordinate members?

3. What types of software is going to be utilized to design a new model mobile information system to establish as solution of communication between dean of student's office and all students at campus?
4. How can the model of mobile information system be tested and validated and can it reduce time spent and resource material used by dean of student's office in sending announcements?

General Objective

To develop a Bugema university Model of mobile information system for the dean of students' office that would be used to register members, share information, coordinate and communicate the university activities and events to the students and other members.

Specific objectives

1. To gather the necessary requirements for analysis of the existing system from dean of students for developing a new model information systems.
2. To determine and analyze the functional requirements of the new model of information system.
3. To design a new model of mobile information system that can be viewed through mobile phones by students and for the dean of students' office at Bugema University.
4. To test and validate the new of model of mobile information system which is going to be developed for student and the dean of students 'office.

Scope of the Study

The information system is a mobile based system having mainly three users, the administrator stands for dean of students and the public user stand for students and system administrator. The system administrator can update the system, dean of students manages the system by authorizing announcements information to be accessed on public such as events, adverts and other news that he wants to communicate to members. The public members can then view information which had been posted and can add their personal opinions by giving responses passing in their person log in account.

For the members to be able to comment they must register and be approved by the system automatically. The system uses the student identification number, full names and password to create account as a member.

However, the system does not allow public users to send any information apart from passing in the account they have created only. The system also does not allow public users to edit their personal details once captured. It is only the administrator who can edit user details from the database.

Justification

This information system will provide opportunity for members of the university to interact with the dean of student.

The information system is likely to benefit the Bugema community members by providing them with updates on events and activities that take place at the university.

The research will enable the researcher to meet the requirement for a master's degree in information systems of Bugema University.

Operations Definition of Terms

Mobile: An electronic telecommunications device, often referred to as a cellular phone or cellphone.

Mobile phones connect to a wireless communications network through radio wave or satellite transmissions.

Information: is any entity or form that provides the answer to a question of some kind or resolves uncertainty.

System: A collection of components that work together to achieve a common goal.

Web based Information system: a system that receives input and transforms them into outputs. It uses a web browser to access information that is sent from a web server over the internet.

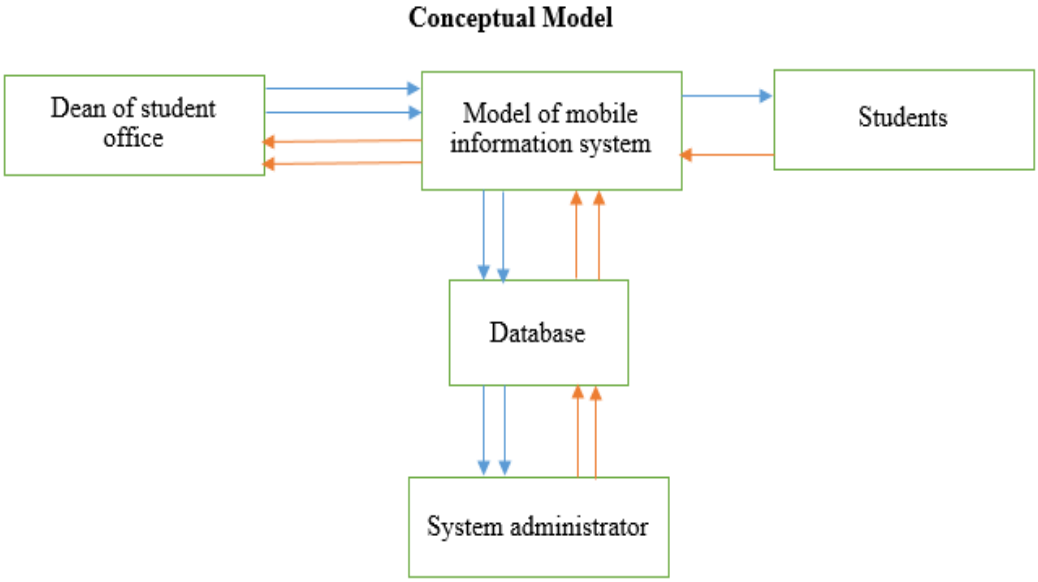

Figure 1: Conceptual Model

- System administrator may do all update and manage the system

- Student may receive information from new model of mobile application and send feedback to the dean of students' office.
- Dean of students' office the administrator of the system for managing the system by authorizing information to be accessed by the public and send them to students also receiving and replay the feedback from students from the new model of mobile information system.
- All data should be stored in database.

CHAPTER TWO

LITERATURE REVIEW

This chapter discusses new model of mobile information system current information system, its challenges, relevant technology, related works and a summary of gaps identified in regards to new model of mobile information system which would be used by dean of student's office Bugema University main campus.

Requirements and Analysis of the Existing System

Efficiency and quality of model of mobile information system based on service; the Information System provide a reliable information and service to the students and staff within that university school based on a central, powerful relational database with data updated frequently by another systems university have.

There are billions of people using mobile devices around the world. By the year 2018 it has been estimated that over seven billion mobile devices will be in use with constant access to the internet. Accessing the internet is a significant feature of mobile devices today, with mobile phones no longer being just a phone but a portable multimedia device. Social media, internet services, multimedia and other applications are in constant demand by users which has therefore led the rapid improvement of mobile phones and tablets (Mockus, 2018).

Andresen, (2016) defines Mobile information systems as information systems in which access to information resources and services is gained through end-user terminals that are easily movable in space, operable no matter what the location and typically, provided with wireless connection. Mobile devices allow users to access information resources and services over many different distribution channels anywhere, anytime, anyhow. Technical and usage characteristics of mobile systems are highly

variable with respect to user capabilities and context characteristics; therefore, an immense level of flexibility is required.

MIT Mobile Web (2011) is providing a similar solution. This solution provides the services such as news events, shuttle track service, campus map, people directory, and mobile access to MIT course management system. This solution utilizes mobile web technology to provide these services. The solution is provided for iPhone especially, but also available for other smart phones (Chang, 2011).

The benefit of mobile information systems is to provide new value-added services owing to their mobility and flexibility with respect to the context of use. Mobile information systems render complex features: user access to the services of the information system is provided through many devices and channels; users of multichannel information systems share data and are able to perform collaborative work, either synchronously and asynchronously.

In mobile information systems, the information, services, and user interfaces available may vary depending on the context of the utilization of the system (Galbus, 2014).Harvard Mobile (2010) is another solution developed by Harvard University. This solution is based on web technology and provides services such as news, events, course updates, map and a directory of people (Harvard, 2010).

Today Student Integrated Information System is service which universities and colleges are using to communicate with the students and to manage their records. The convenience of accessing the communication online makes the programs ideal for working professionals and students like it. Communication using different types of mobile information system has made the life easier to the student at colleges and universities, using different types of online information systems has become a primary business (Feghali, 2011).

Gransaether (2013) says: “Semantic web environment for context-aware mobile services aimed at enhancing everyday campus life at Carnegie Mellon University (CMU). My Campus utilize semantic web technology to provide services to its users, by accessing and processing contextual information such as location and personal preferences. A central element of the Campus architecture is its use of Semantic e Wallets that support the automated discovery and access of contextual resources".

Mobile Information system is an important product in the modern, universities and colleges. To support the internal flow of information, in universities organizations. Therefore, designing the mobile information system becomes an important task when they are sending and receiving communications among them. However, most systems development method today are prescriptive and do not include predictive measurements. Without a predictive measurement, it is difficult to know in advance if a planned information system is likely to be efficient (Kelton, 2015).

The features are not easily managed by the system developer therefore this aspect is a kind of background feature that the developer should be aware of when developing a mobile information systems. For example, a mandatory use and an application not aligned with information work processes may be an obstacle if no alternative tracks are available. This is making the environment an aspect to deal with for a developer (Phusavat, 2012).

Mobile information system user can be accessed anywhere at any time. Anywhere describes the opportunity to access the mobile information system without restrictions to a certain location. Anytime refers to access whenever the user needs a certain service or information. And as the mobile user works at different places on the field the lack of supporting technologies for communication is a situation to consider (Phusavat, 2012).

Chinese college students in 2013, developed a new design prototype of mobile application which was helping them in internal communication among staffs and faculties they application developed was not able to update every time after send communication. The next step is to prepare to receive the next communication. As it was not limited to same specific group of people it was just send to all peoples it would just send to all people (Beechler, 2014).

Usage of smart phones and tablets is increasing rapid. In 2013, and 2014 one billion, 1.3 billion phones were sold. Respectively Smartphone shipments grew up to 29.6% in year 2014 compared to the previous year. In 2014, Android- based smart phones had 81.2% market share globally while, Apple's iPhone had 15.0% global market share. Windows Phone smart phones had 3.0% market share while Other Smartphone operating systems had 0.7% market share (Davis, 2016).

Android mobile applications is a software application developed specifically for use on small devices, wireless computing devices, such as smart phones and tablets, rather than desktop or laptop computers. Android mobile applications are designed with consideration for the demands and constraints of the devices and also to take advantage of any specialized capabilities the University have (Shilpi, 2015).

Mobile Application Information System

In this system, the student has access to both the android application as well as web portal. New model of Mobile information system will provides a way to maintain records. It provides easy way for interaction between students and dean of student office. Student will improve their interaction skills by using mobile information system; it may also help the dean of student office to manage resource which has been used before. All the users get the information without interruption because of mobile information system (Rebne D.S., 2015).

Mobile information systems that use information technology to support and coordinate university schools, organizational in different activities including: effective utilization of mobile information technologies in organizational context; interdependencies of mobile information technologies and organizational structure, relationships and interaction; evaluation and management of mobile information systems; analysis, design, construction, modification and implementation of computer-based mobile information systems for organizations; usage of mobile information systems applications in organizations and relevant research and practice from associated fields (Anderson, 2012).

Testing and Validation of Model

Use various measures of statistical validity to determine whether there are problems in the data or in the model. Separate the data into training and testing sets to test the accuracy of predictions. Ask business experts to review the results of the data mining model to determine whether the discovered patterns have meaning in the targeted business scenario. All of these methods are useful in data mining methodology and are used iteratively as you create, test, and refine models to answer a specific problem. No single comprehensive rule can tell you when a model is good enough, or when you have enough data.

All of these methods are useful in data mining methodology and are used iteratively as you create, test, and refine models to answer a specific problem. These data sets should be selected at random and should be a good representation of the actual population. Similar data should be used for both the training and test datasets. Normally the training data set is significantly larger than the test dataset. Using the test data set helps you avoid errors such as over fitting.

Summary of Gaps

Deans of student office of Bugema university main campus they do communication to the student based the tradition system whereby they use email, printing announcements and post them on noticeboard in other to create awareness among students and deans of student office but there is no electronic notice board which can replaces that tradition existing communication.

The researcher emphasis was to design a model of mobile information system which can be used by the dean of student to send announcement to the student wherever they are staying this put on the awareness between students and the dean of student's office. However little had been done on the execution of the tasks that are involved model of mobile information system after being aware of the services is creating email groups for communication, model of mobile information system which can be used for sending Bulk messaging, live chart, Facebook, messenger chart using mobile application. Therefore, this research focused on posting announcement on public to the student who were in campus under the control and authorization form dean of student office using electronic notice board by using mobile based application.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter discusses the research design that this research followed, the area of study, the scope of study, sample size and sampling techniques, requirement collection methods and requirement instruments, system experimentation and evaluation approaches. Research visualized and perceived as particular methodical efforts to examine, investigate as well as restructure the realities, theories and applications. Research methods reflect the approach is tackling the research problem. By adopting qualitative methodology, the researcher fine-tunes the pre-conceived notions as well as extrapolate the thought process, analyzing and estimating the issues from an in-depth perspective. This was carried out by one-to-one interviews or as issue-directed discussions. Observational methods were, sometimes, supplemental means for corroborating research findings (Corbin J, 2013).

Research Design

The study made used of qualitative approach which involved gathering requirements for the system. It made use of the design science approach for producing and presenting information system research (JW., 2012). The purpose was to contribute design knowledge in the area of communication between dean of students and students at to the existing system. Later it involved designing, implementation, testing and evaluation of the model of mobile information system of the deans of student's office.

Gathering Requirement Information

Interview Technique

The semi-structured interview format encourages two-way communication; both the interviewer and the candidate asked questions, which allowed for a comprehensive discussion of pertinent topics. Because of the conversational tone, the candidate felt more comfortable expanding on techniques and experiences that highlighted the traits that made them a good fit for the position. (JW., 2012).

This Semi-structured interview helped the researcher to gather focused group which were students and all workers form dean of student's office. This method offered a balance between the flexibility of an open-ended interview and the focus of a structured ethnographic study (Bernard, 2015).

Information gathered during semi-structured interviews helped the researcher to move the innovation process from general topics to more specific insights by the factors and variables. It helped the researcher to develop a preliminary hypothesis, and explain relationships and create a foundation for further research. The researcher used open-ended questions to get lengthy and descriptive answers rather than close-ended questions, those that can be answered with "yes" or "no" (Compte, 2015).

The researcher conducted one-on-one interviews as a technique to get individual responses and opinions about the underlying reasons and motivations for people's attitudes, preferences and performance regarding the use of new model of mobile information system. He used terms that participants understood, and questions were in English. The researcher was mindful of the social and cultural contexts of questions as advised by Zorn, (2010). The researcher kept the questions as short and specific as

possible. He avoided asking two-in-one questions. The researcher avoided phrasing questions as negatives (e.g., How don't you get announcements?

Immediately after the interview, the researcher checked if the recording device was functioning properly throughout, and reviewed the notes fill in any gaps or add comments.

The research reviewed interview responses and observational data for insights and patterns. The researcher either end at this point with a report on the data analysis, it can be used to build out an ethnographic survey (Compte, 2015).

Observation Technique

Observation was another method the researcher used for data collection in which was observed within a specific research field. Observation was a type of qualitative research method which not only included participant's observation, but also covered the ethnography and research work in the field.

Analysis

In this section, the researcher fragmented the responses of how student receive announcements and give out feedback also the method they use.

Design

The design phase comes after a good understanding of customer's requirements; this phase defined the elements of a system, the components, the security level, modules, architecture and the different interfaces and type of data that goes through the system. The system design was done with a pen and a piece of paper to determine how the system looked like and how it was to function, and then a detailed and expanded system design was produced, and it met all functional and technical requirements, logically and physically.

Implementation and Deployment

This phase came after a complete understanding of system requirements and specifications, the actual construction process after having a complete and illustrated design for the requested system. The actual code was written here; then the implementation phase was containing configuration and fine tuning for the hardware to meet certain requirements and functions. In this phase, the system was ready to be deployed and installed in customer's premises ready to become running, live and productive, training was required for end users to make sure they know how to use the system and to get familiar with it.

Testing and Integration

Different inputs to obtain output was analyzed it is, outputs and behavior and the way it functions was tested. Testing is more and more important to ensure that dean of student's office and student customer's satisfaction, and hardware configuration to new model of mobile information system.

Testing was performed by real users, and by a team of specialized personnel, it was systematic and automated to ensure that the actual outcomes are compared and equal to the predicted and desired outcomes.

The Best of the Bug Capturing Tools

Continuous improvement and fixing of the system is essential, to provide robust bug capturing in the application. In doing so, it was notifying the researcher you with bugs instantly, and allows him to easily review them, tie the bug to an individual piece of code, and trace the cause back to recent changes.

Airbrake enabled the researcher to categorize, search, and prioritize errors so that when bugs occur, your team can quickly determine the root cause. The time and effort you save by capturing your errors with Airbrake is invaluable!

Ethical Consideration

Ethical Considerations was specified as one of the most important parts of this research.

Voluntary participation of respondents in this research was considered as important. Moreover, participants had rights to withdraw from the study at any stage if they wish to do so. Respondents participated on the basis of informed consent. (L., 2013)

The principle of informed consent was involved researcher by providing sufficient information and assurances about taking part to allowed individuals to understand the implications of participation and to reach a fully informed, considered and freely given decision about whether or not to do so, without the exercise of any pressure or coercion. (J., 2011).

The use of offensive, discriminatory, or other unacceptable language was avoided in the formulation of Interview/Focus group questions. Privacy and anonymity or respondents were paramount importance. There was maintenance of the highest level of objectivity in discussions and analyses throughout the research.

CHAPTER FOUR

REQUIREMENT ANALYSIS AND MOBILE APPLICATION MODEL DESIGN

This chapter discusses how the requirements for Model of mobile information system for the dean of student office Bugema university where generated, how system requirements where analyzed and later shows how the parameters from the analysis where used to design the Model of mobile information system. It also shows explains the functional and non-functional requirements for the model using illustrations such as use case diagrams and entity relationship diagrams.

System Requirement Generation

To fulfil objective one, functional and non-functional requirements where gathered from respondents using the interviews conducted at Bugema university main campus students' affairs desk, students community at main campus, dean of students office found in central Uganda, Luwero district.

From the interview, it was noted that in order to get information on such places, for the first time he has to contact the dean of student at Bugema university main campus via telephone to request him to allow me to go and see him and ask permission to allow me to conduct interview in his area is standing for and also to interview student which a pick it randomly to the size of 150 student and staff who worked with dean of student at Bugema university main campus in all category regular students, in-service students, day scholars, boarders student, married and singles, nationals and internationals.

Still from the interviews it was noted that most students also need this Model of mobile information system which can help them to receive and send announcement on time and in easy way without losing to much time to know what announcement the dean

of student office need to communicate and also other student who can communicate to fellow student.

In addition, it was also noted that in case a student needs to send announcement in campus must write what want to be announced and go to look for the dean of student wherever he is in other to be accepted to go and distribute that announcements using printed copies and put on different location with in campus but to these who did not came in campus that day and same time that announcement belong to them they do not respond to that announcement unwillingly.

It was also noted during the interviews that most of the students usually get announcement information about the campus events activities are not many and they are not sure if the announcement posted on different WhatsApp group, emails and different sites of social media used at Bugema university main campus such as face book and twitter, messenger if it can be trusted finally they end up remaining in confusion.

It was also noted from the interviews that mobile devices provide convenience access information online during their communication. Mobile devices also make it more convenient to capture, send and receive the information to make information sharing easy especially via social media with friends. In addition most, it was noted that most of the students, spend much time on their mobile devices sending communication but deans of students office does not have access to them as one unique point which can put them to gather all at the same time which can be used to share announcement

The reports from the interview shows that 85% of the student of Bugema University can get a solution of problem communication of announcement which are coming from dean of student's office by using model of mobile information system, and this will help also the dean of students to know direct responses from the student

and this will help them to plan about that feedback they have deceived before it take place or announce if they was changes they were made from the dean of student's office.

After interview it was well-known that this model of mobile information system, movement of students in campus to check what announcement were posted on notice board 65% never they will happen again and the student thy can access this announcement information using they smart phone wherever they as long as they have internet connection. On the sides of dean of student also they can save all 90% of resources they have been using by taking all announcement so they can use computer or smart phone deliver that service to the student easily.

Requirements analysis "also called requirements engineering, is the process of determining user expectations for a new or modified product. According to the current situation model of mobile information system and user demands, there was need to model it and implemented if the university can support this new idea of using this model of mobile information system the new functions added and improved to the existing one. In order to ascertain the need for the problem the respondents profile was surveyed in terms of age, use of smart phones and whether the smart phones had android system.

Table 1: Respondents' Profile

Age	Frequency	Percent
18-25 years	85	85.0
26 and above years	15	15.0
Students using Smart phone		
Yes	75	75.0
No	25	25.0
Smart phones with Android		
Yes	55	55.0
No	45	45.0

The responses reveal at 85% of the respondents represent the age group of 18-25 years. Furthermore, 75% of the students have smart phones and 55% have smart phones with android. This shows that if the mobile communication information system is applied the majority of the students will be in position to get the information since they have smart phones.

Through the survey the respondents were inquired from to whether there is any model of mobile information system Bugema university dean of student's office has. The respondents noted that the system being used by the dean of students is manual in nature as the messages are posted on notice boards as well as on manila papers. Therefore, they opined that online communication and service delivery can be used. As the Internet penetration gets higher and higher, student's life style at campus has changed a lot. Literature also points out this aspect by stating that "Since the Internet has made things simpler", there is no reason to continue using manually communication by posting message to the noticeboard in campuses in other to announce, events activities, and meeting which is always taking a place at university by touching a few keys no keyboard of computers and even the ones use the smart phone they can send and receives announcements messages easily using model of mobile information system.

Requirement Analysis and Model of Mobile Information System Design

The use of this model of mobile information system is based on the connection, communication, and the interactivity between Dean of student office Bugema University and all students who are registered to study at university.

The dean of students' office administrator at the main campus are to be granted permission to send SMS to the entire registered students' single group of messages to

the students, individually without seeing other people who received the same message and even neither seeing other people who send, reply to each other but on side of dean of student can see and reply each and every message from the students.

The new model proposes that the communication system should have login function with valid email address and password should be provided and secured information for each user, and a strong confidential system in sending and receiving messages. Furthermore, the system should be able to add and publish new announcements information to each student who have an account and account must be updated every semester when a student finishes registration. The types of massages the system must support includes texts, audios and photos, and graphic and all those types of messages needs to be displayed properly on the mobiles as long as that phone can support the blouse and it can access internet connection. The information should not be modified by students only a person who has authorization can do it. This means that only the dean of student's office and system administrator has such rights. The system must be maintained by system administrator, updating system and daily information publishes every day, maintaining accounts, by add new users, delete accounts, rest new passwords, manages database, which includes user login information, online communication information. The students should be able to give feedback and post their own suggested trip itinerary on model of mobile information system.

This type of model allows the use of mobile phones in terms of saving time and money, reduces cost, aids clear feedback, and guarantees confidentiality.

Functional requirements:

1. It mainly emphasizes creation and implementation of a Computer web-based Model of mobile information system.
2. It should publish announcement posted by system administrator to the students wherever they are as long as they have access to the system and internet connection.
3. It relieved and speed up the communication to electronic notice board by updates all the students at the same time wherever they are as long as they have access to the system and they have account on this Model of mobile information system.
4. It should be able to synchronize Model of mobile information system data with a current information system.
5. Documentation requirements, user guide and training manuals of the system will be provided to assist users on working with the system.

Non-functional requirements:

Accessibility

In order to have access to this system first one needs to be a member of Bugema university student body and registered with a valid registration card. Once in the system, the individual cannot have or create a second account since it is based on the registration number. The student should long in using password in order to be allowed to send the request to the dean of students. The announcement it can be viewable after it has been approved by the dean of student office or a person in charge called system administrator with administrator password.

Availability

The system should available every time as long as the network is available:

1. Browser testing and support for Internet Explorer, chrome, Mozilla & Firefox;
2. Reliability requirement: system cannot be replicated;
3. Execution qualities like such as testability, maintainability and scalability;

Requirement Analysis

In this analysis, to fulfil objectives analysis of the requirement are done in order to identify the different actors that were used to design a model of model of mobile information system there is three different actors where recognized as follow:

1. First, Dean of students' office
2. Second, System Administrator
3. Third, Student

Dean of Students' Office

Dean of student's office: is recognized as an actor who is in charge of providing all kinds of announcement which supposed to be uploaded on system, adds new user and authorize them for accessing the system or delete expired account. Dean of student's office is described as an actor who has responsibility to read, respond to messages from different users and make decisions to publish, not publish, advise or adjust the nature of message accordingly. Dean of student's office is described as actor who can do editing of announcement before it get uploaded on system even before it get put on public and being accessed by different student.

System Administrator

System Administrator: is described as actor who is in charge of all kind of update the system and set security protocol of who is supposed to access the system and

who are not supposed to access the system, and also set the security merger in terms of providing authorization to the side of student.

System administrator: is described as actor who endlessly controls and keeps all records of the system on both sides, on student side and even to the dean's side as long as the records have passed in the system.

The Student

The student: is described as actor who has an access to all announcement posted on account read only and replay if necessary as well as send announcement to the dean's office.

System Model of Model of Mobile Information System

Deans of student office': is person who work in dean of students' office; one of his responsibilities is being in charge of preparing all announcements supposed to be delivered to the students, send them to the secretary to type before it become on notice boards

Dean of students' secretary: is person who work in dean of student office and one of the responsibilities has is being in charge of typing announcement and check if the content of the message they want to send to the students is well organized and send it back to the dean of student for to approval. Then secretary must put announcements to different notice board after being sign and stamped by the dean of students' office.

Student: are the main customers who are recipients of announcement and they can attend that announcement.

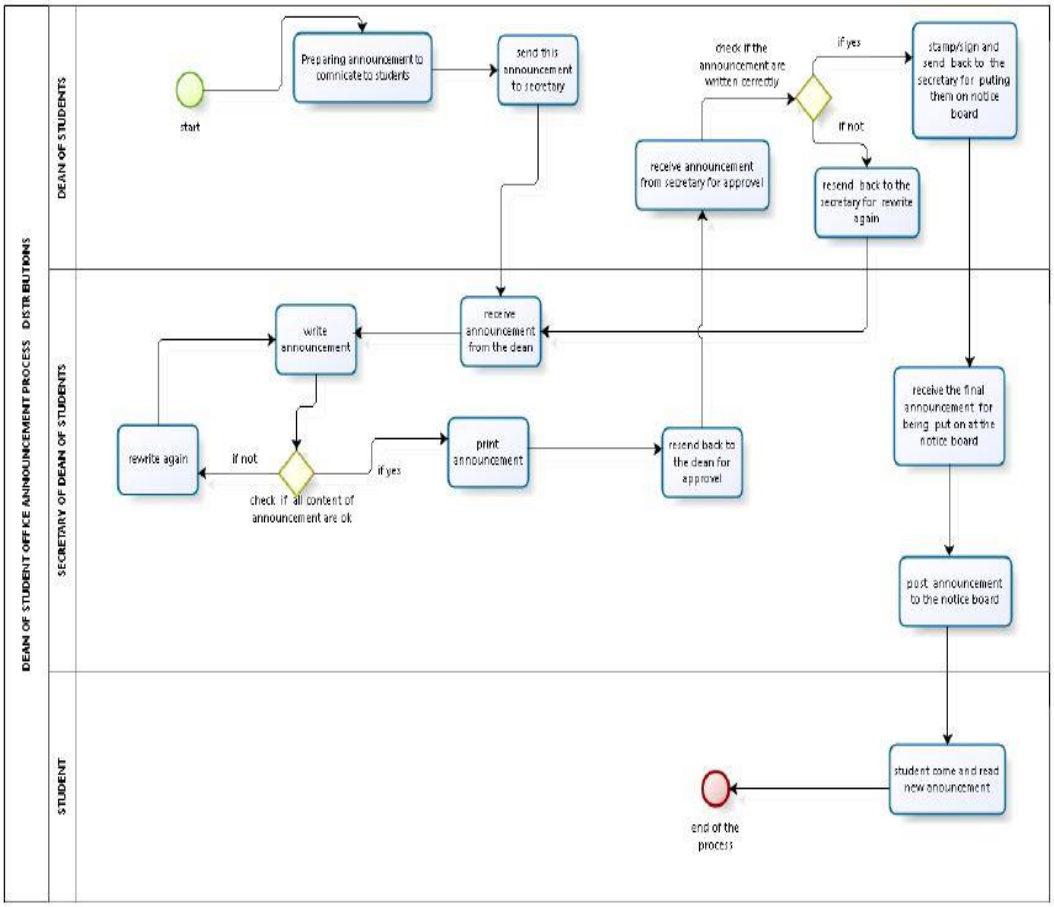

Figure 2: Existing Model: Called as Is

In this system model of model of mobile information system is to fulfil the objectives of this research and show illustration of how this system works.

System Model of Model of Mobile Information System to Be

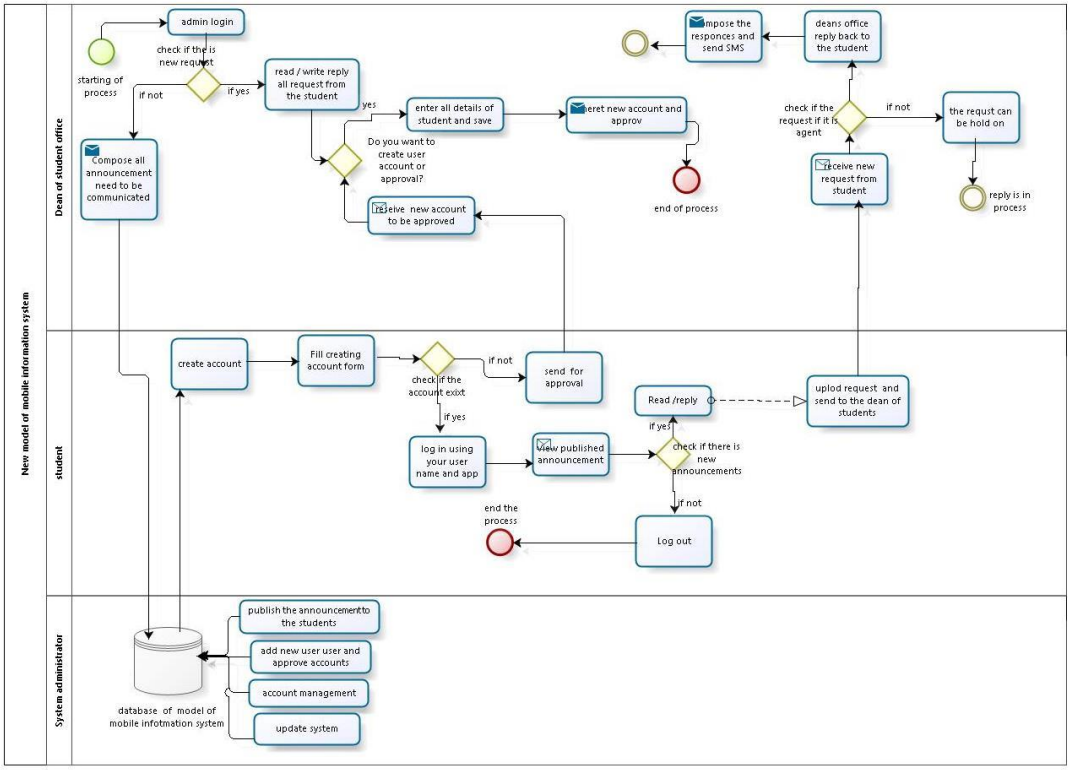

Figure 3: New Model: Called to Be

This model is comprised of three actors who are: deans of student office, system administrators and student and all their roles as follows:

Deans of student office: are person who work in dean of student office and being in charge of preparing all announcements supposed to be delivered to the students and read all responses from the students, edit announcement and upload to the system.

System administrator: is who is in charge of reserving all records from both side and store and their management and deliver all announcement by posting and publishes them to the student.

The student: is a person who is recipient of announcement read them only and reply them if necessary also and who can make any enquirers to the dean of student office and give them new announcement she/he need to be announced.

Use Case Diagrams for Model of Mobile Information System

User case diagram of Model of mobile information system, has the important aspect to capture the dynamic behavior of the system when it is running or operating. Internal or external factors that cause the interaction are known as actors. The use case diagram consists of actors, use cases and their relationships. Use case diagrams are used to gather the requirements of a system including internal and external influences. To gather Model of mobile information system functionalities user case are prepared and actors are identified. Requirement analysis classified as functional requirements and nonfunctional requirements. The user case for the Model of mobile information system has the following requirements:

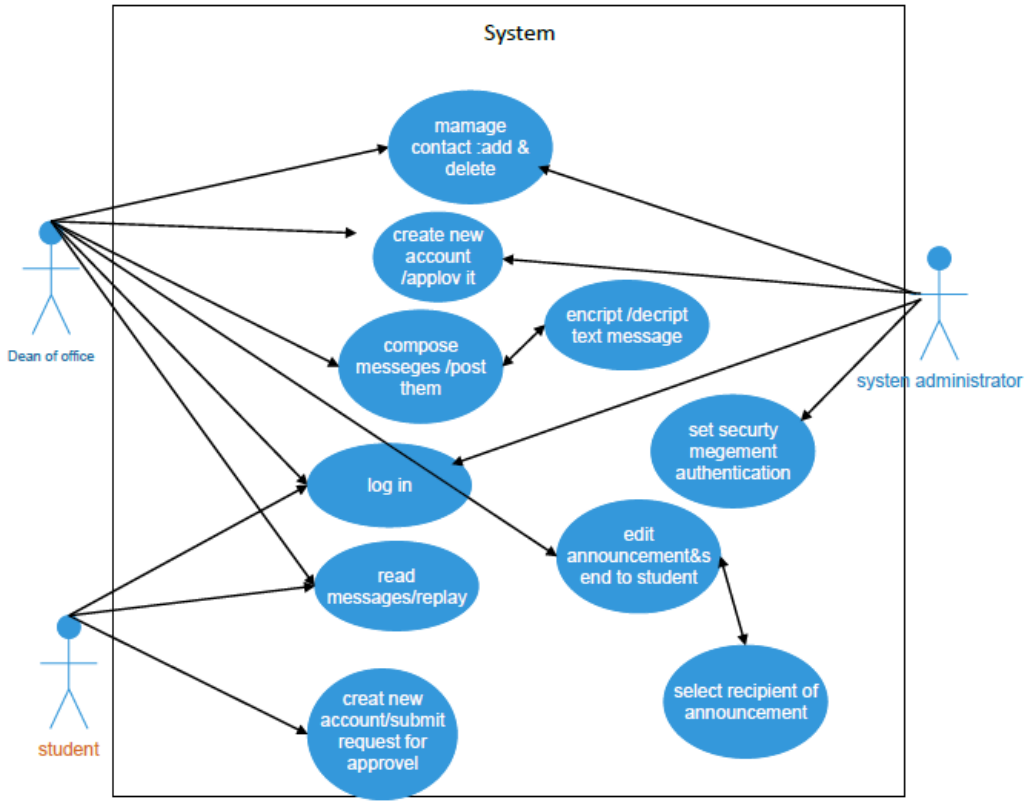

Figure 4: User Case Diagram of Model

User Case Description

The system has only three main users who are: Dean of student's office, system administrator, and student.

Deans of student office is a user who is in charge and manages contact persons means such as student and can add or delete user and approve accounts of student in other to make them active.

Dean of student office: can compose the announcement and poste them on system, encrypt and decrypt the announcements, manages log-in to the system, and read reply's messages and also replies the necessary communications.

System administrator: is a person who is in charges of updating the system, and manage database of the system and set permissions of access to the system, approval on new account which has been created by new user, publishes on public the announcement posted by the dean of students office and makes them to be viewed by students, can also add new user manage log in by set and reset new password to the uses and set security protocol and manages authentication messages from un authorized users who can access the system when they are not authorized.

Student is another user among the three users who can do creating account and send for approval to the deans of student or to the system administrator for approval and after student can do log in into the system also is in charge of receiving announcement from the deans of student office and read them and can reply if necessary as well as send new communications.

Database Design Model

This shows the various objects and their consistent attributes. This is demonstrated using an entity relationship diagram which shows below.

Model of mobile information system Entity Relationship Model First Normal Form (NF1)

This demonstrate how the entity relationship for a model of mobile information system works.

First Normal Form

In this entity relationship dean of student office can send many announcements to the students, the many announcements can be received by many students.

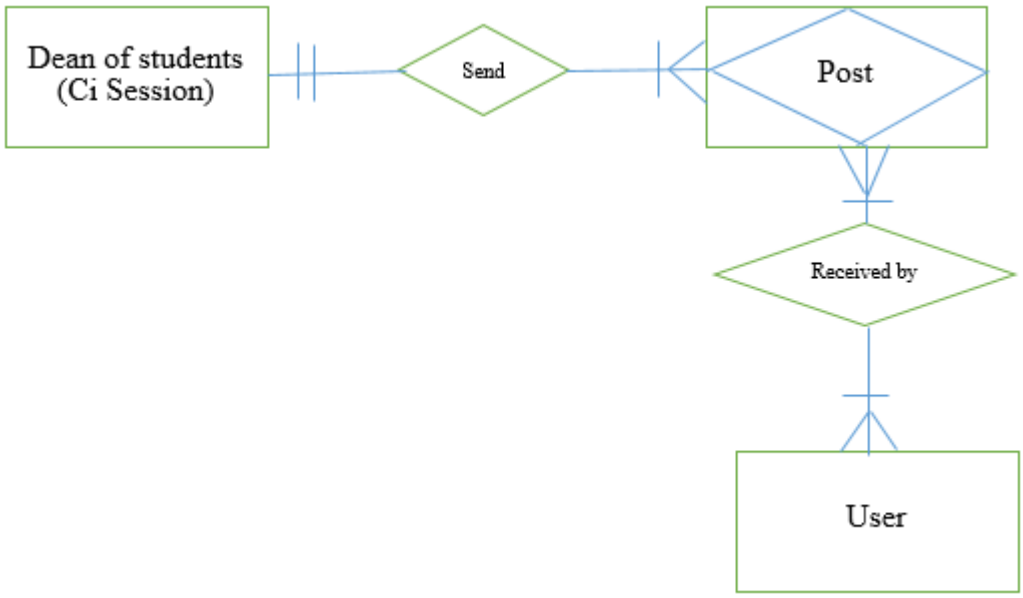

Figure 5: Entity Relationship

Second Normal Form

The second normal form relationships involves the dean sending many communications which involves many SMS to different users or one SMS sent to many students.

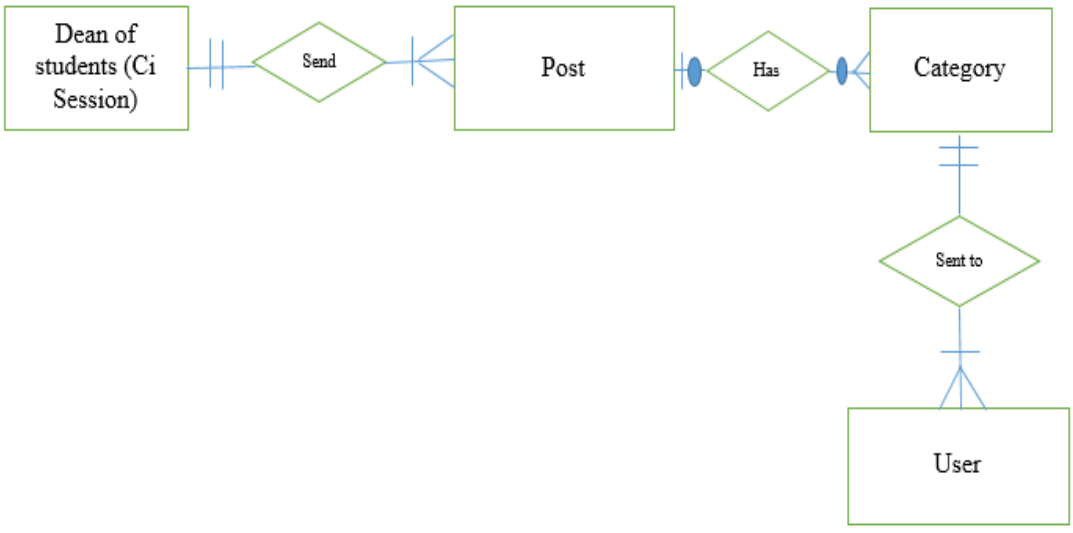

Figure 6: Entity Relationship

Entity Relationship Model

The ambition of this entity relationship model is to show relationship between various entities and their attributes. Represents entity relationship Model of mobile information system and showing all the entities and their attributes as below.

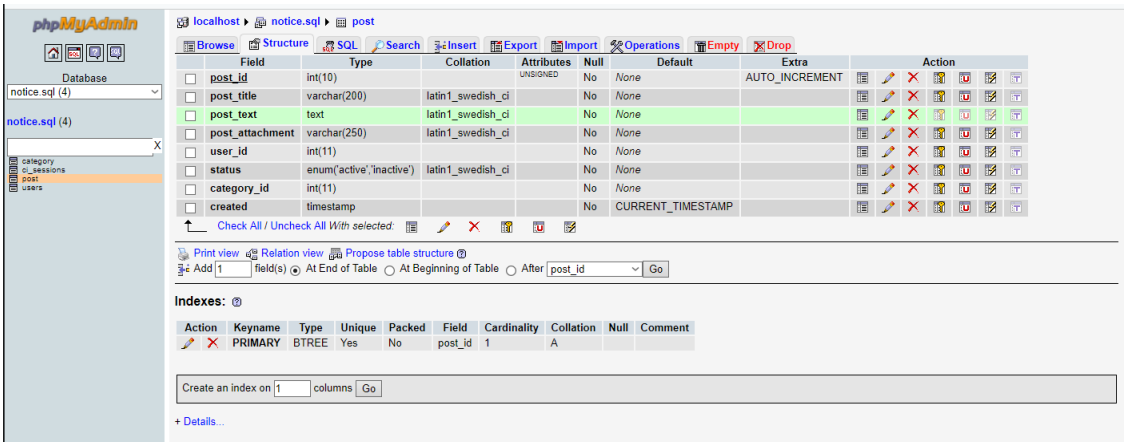

Figure 7: Database Design for Tables

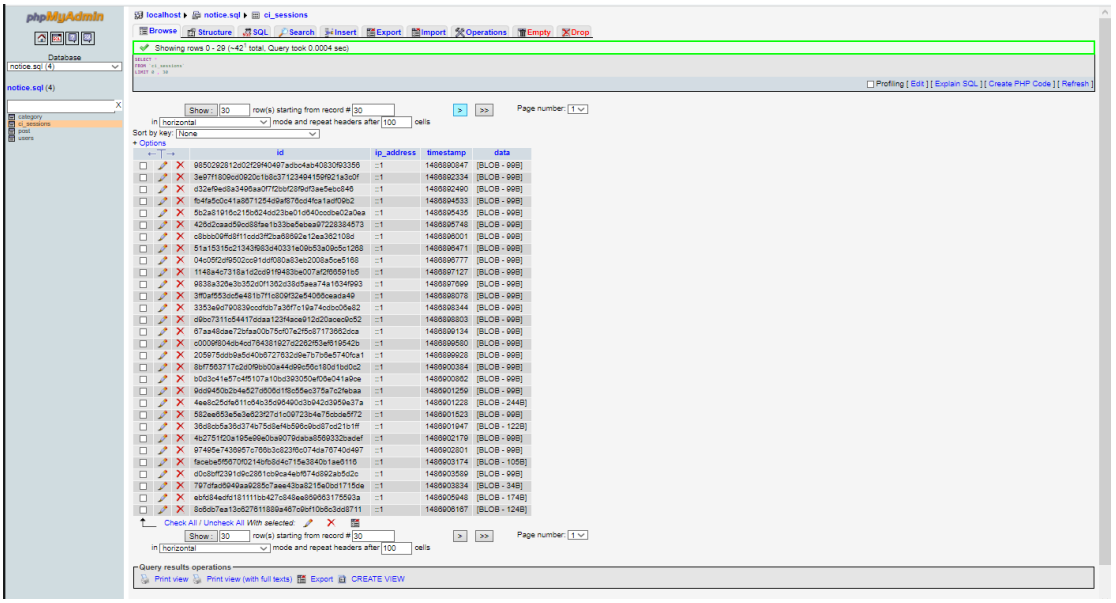

Figure 8: Database Design for Encrypted Password

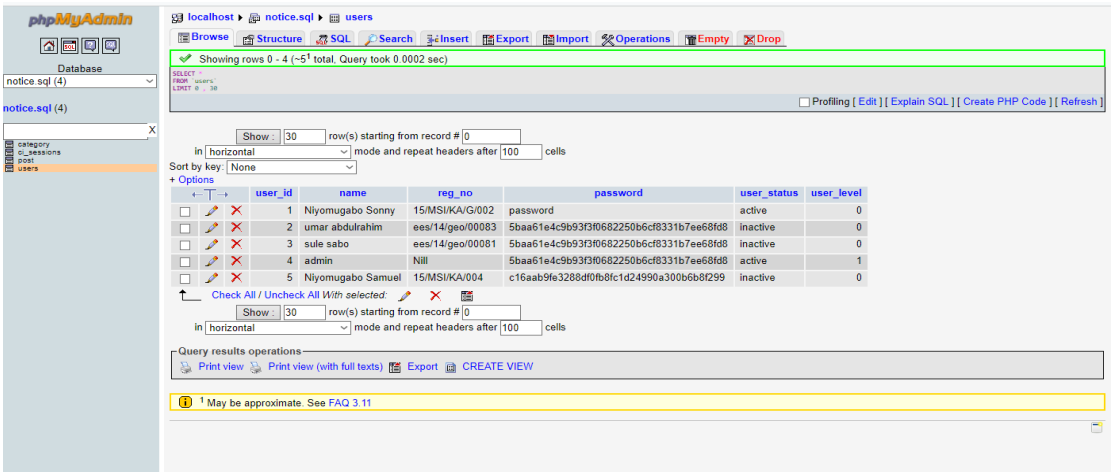

Figure 9: Database Design for Registers Members

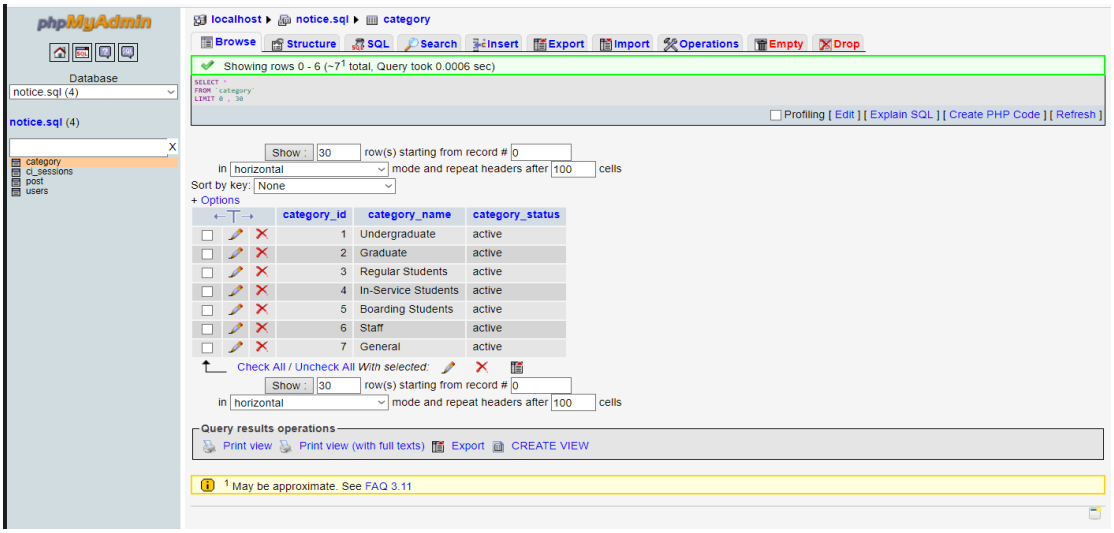

Figure 10: Database Design for Active Categories

CHAPTER FIVE

SYSTEM IMPLEMENTATION TESTING AND EVALUATION

This chapter illustrates the fulfilments of main objectives is this research which explores the details of designing of model of mobile information system which was simulated, tested and evaluated. This system was implemented using web based and it can also run in android form and to other varies types of the smart phones and to different laptops of different student how are with in Bugema and outside of Bugema university.

This chapter also fulfills objective which explored the details of the designed Model of mobile information system developed, simulated, tested and later evaluated by the dean of students' office and student community. The application was implemented using web based and also android platform.

Graphical User Interface (GUI) of the System

The GUI for this application is built using a collection of activities which are the basic unit of web application and also Android application. All the components of the GUI are defined PHP, THML, CSS, JAVA SCLIPT, and MY SQL and in XML file and this file is loaded during a runtime.

Launch Icon

First the mobile application needs to be first installed on a smart phone that supports android, iOS or blackberry operating systems. On installation the user needs to connectivity to internet so as to access an online server. On access of the server the user accesses the startup icon and first interface which is shown below:

The application was launched by clicking or tapping the icon showed in Bugema university log which is having the white, and blue, red colored is selected intentionally

to signify Bugema University. Launch icon for Model of mobile information system is shown in figure 5.1.

Figure 11: Launch Icon

On clicking the icon on your mobile device, then first interface appears which requires the visitor access any information on places of interest by clicking on any icon. This interface in figure 12, allows a student to access information on all the sites that are being publicized on the mobile application.

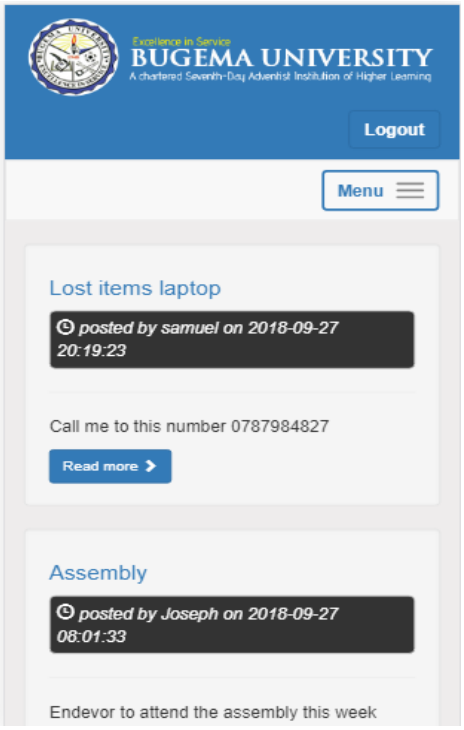

Figure 12: Student Interface

In case a student is interested to log in as a user of the system you need first to register as a new member then after you can log in using your user name and password

and after log in in your account you can have permission to send your announcement to the dean of student office or system administrator who can approves the announcement to be publicized. The site of interest, he needs to register on the Model of mobile information system platform by entering his your full name, registration number and set password as shown down in the Model of mobile information system registration interface in Figure 13.

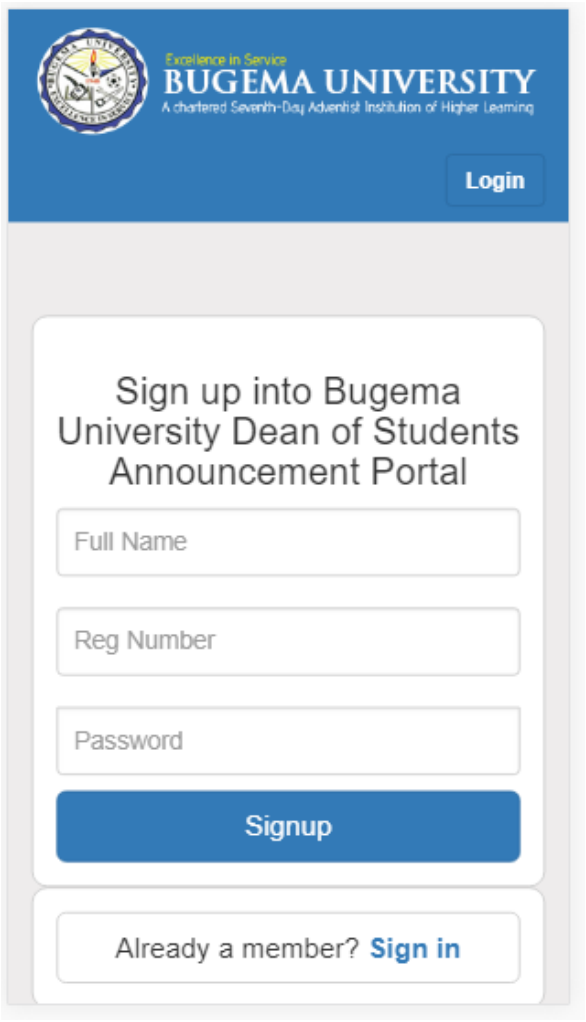

Figure 13: Registration Interface

The user can explore different communicated announcement publicized by the dean of student's office and even search for other related information. But in-order to search information the user's the mobile phone or any other types of devices should be having internet connection and also an active account which enabled the student to have

an access to the applications so that the application can determine the user's account and also to have access to the system.

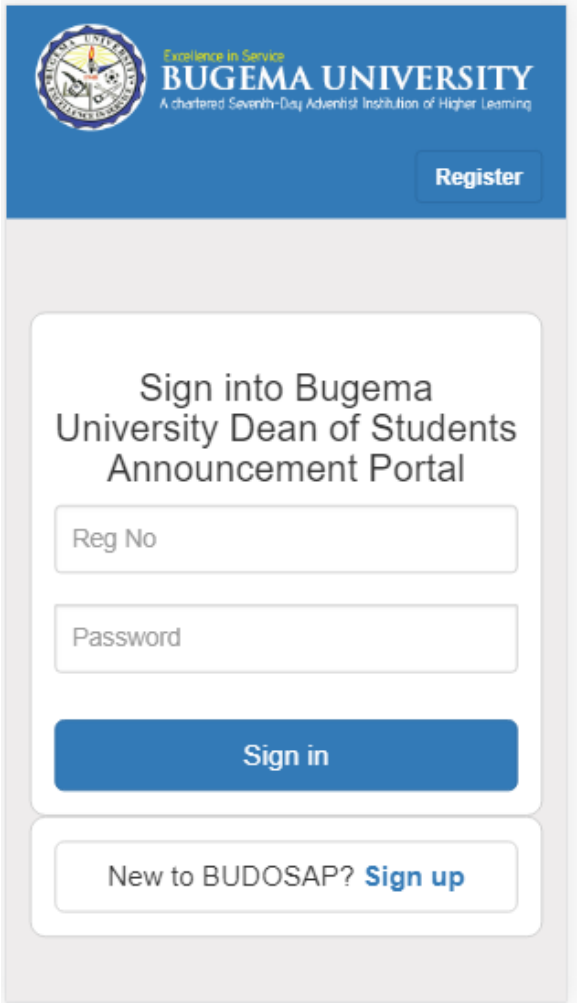

Figure 14: Registration Interface

Once the user has successfully registered, can log in as a member, the creation of his account require a user to have a registration number, they system conforms registration after your password id done automatically encrypted and saved in database the details he provided during registration plus the confirmed password the system store them automatically and allows log in access direct. Then the user can then login and operate from his account. The login interface provide access to specific user privileges such as setting user preferences, sharing of information.

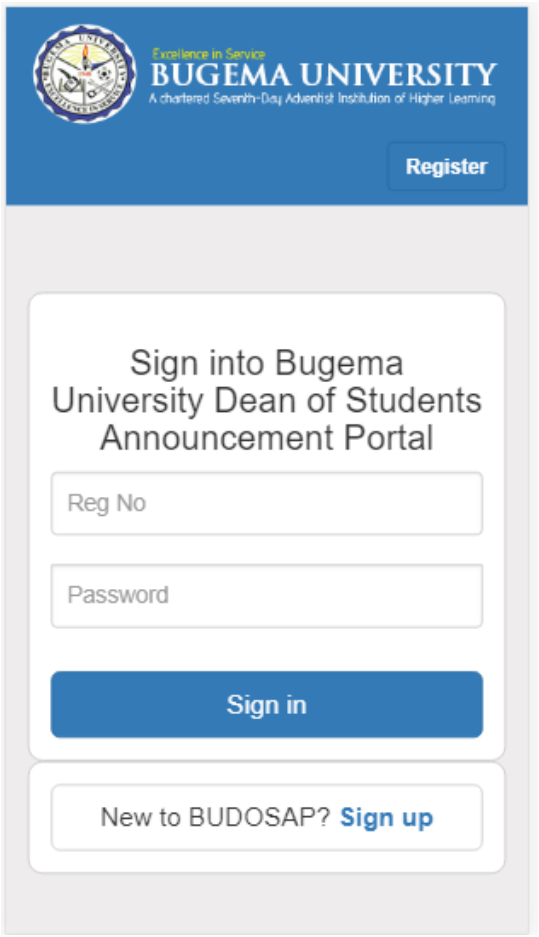

Figure 15. Registration Successfully Registered

The Model of mobile information system list shows the available categories of student Bugema university dean of student give the announcement according to their registration states. When the user selects the category where they want announcement to go after approval from the dean of student and publicized the announcement found automatically where it belongs and even the names of the person who sends that announcement. The page also contains different buttons which make easily functionality and access of the access to the system.

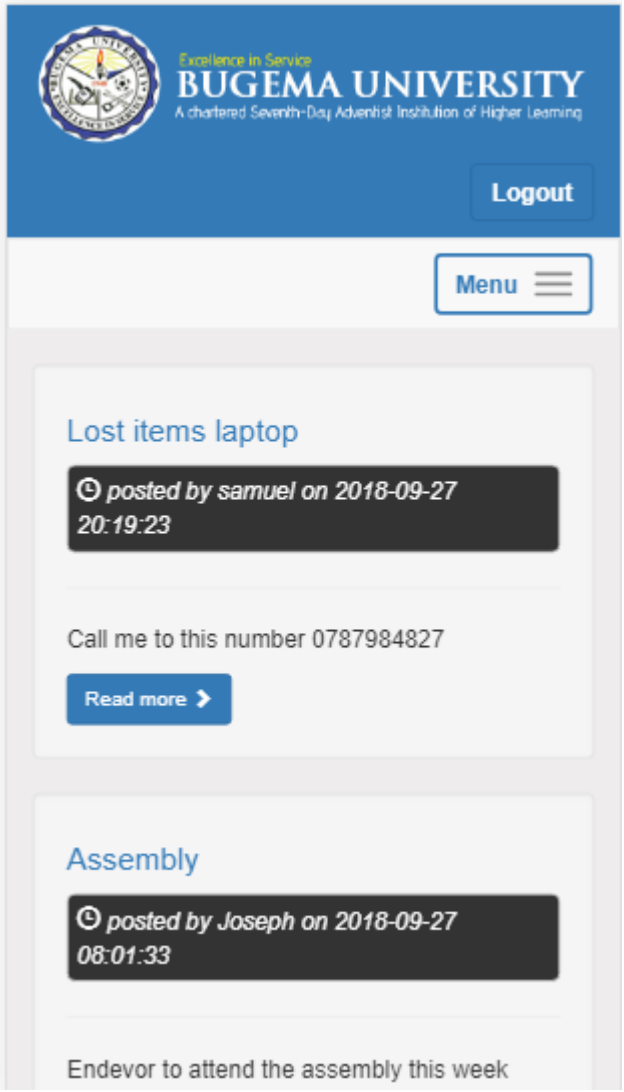

Figure 16.Buttons which Make Easily Functionality

Admin platform is also another interface which show all activity system administrator must do as he is using the mobile application.

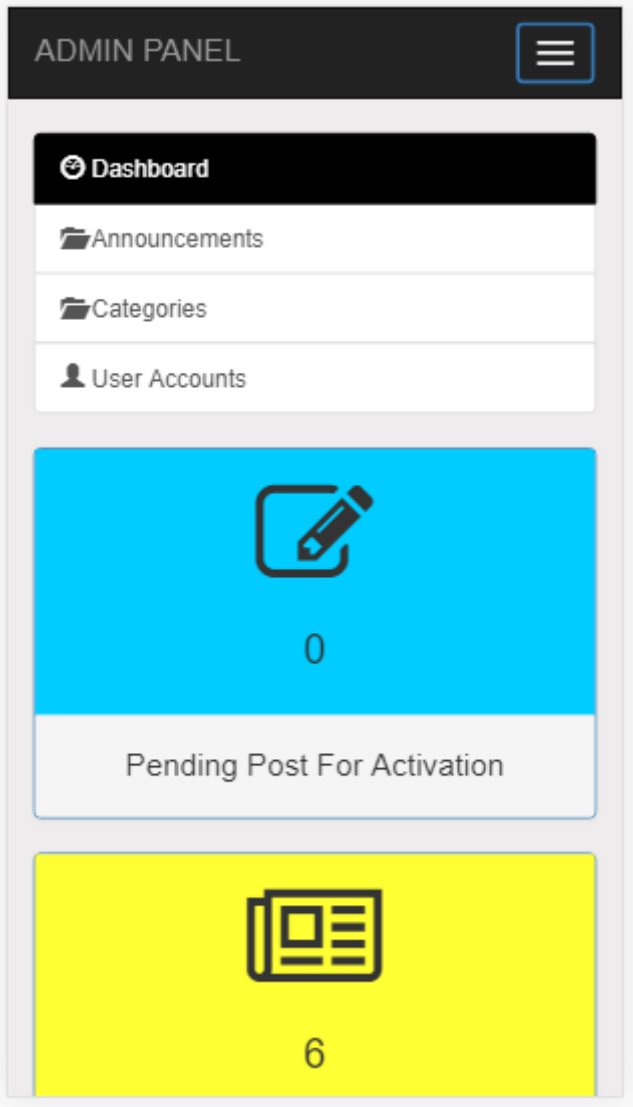

Figure 17: Admin Platform

This allows the admin to view and manage all details about the student who have joined as members and even what they have send to you as request and approve available based on the selected user as the user's preferences.

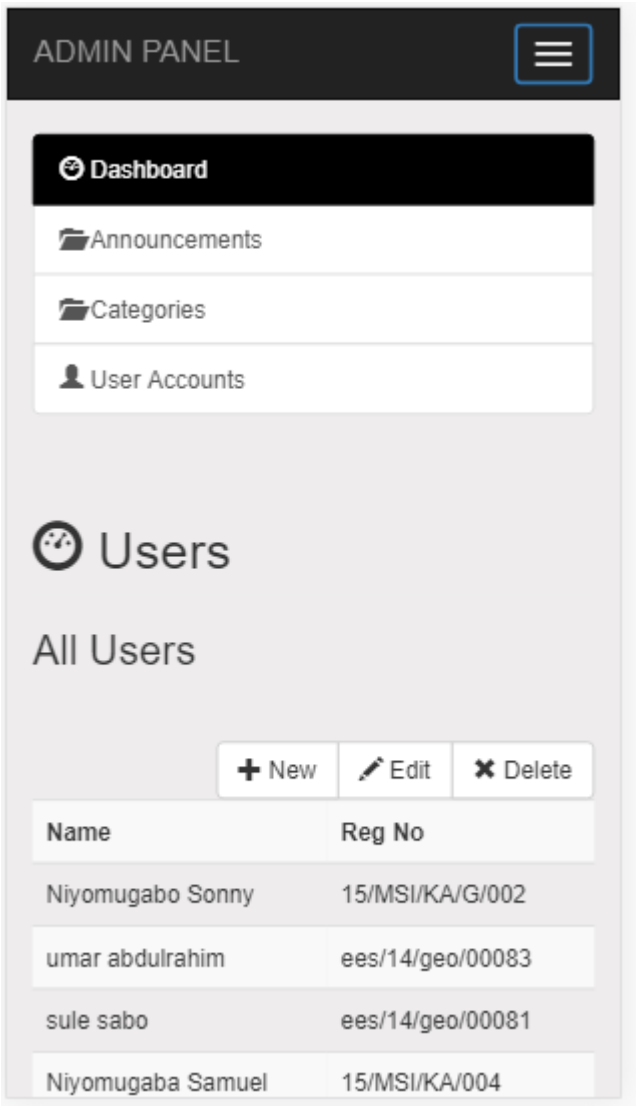

Figure 18: Admin to View and Manages all Details about the Student

Application Testing

To fulfill objective of this research, the Model of mobile information system application was successfully tested in terms of working environment platform such as online modes; the main functional requirements and the non-functional requirements were achieved according to the predefined objectives.

The users can access the announcement posted or any other information the dean of student has authorized to be announced from the mobile student devices

located from different hostels of Bugema University. The amount of information over his mobile is determined by the mobile device storage capacity.

Platform Testing

The application was tested on all category of the smart phones are found at Bugema university main campus and on the current version of android called Android 9.0, Pie: August 6, 2018. It runs perfectly in all android versions which are between jellybean and. The application was also tested on different devices such as blackberry phone and the application also showed expected outcomes.

Requirement Testing

All the functional and nonfunctional requirements are tested. Regarding the functional requirements the model of mobile information system gives enough information and makes it easy to use. The GUI is user friendly and used different images to represent different unique features of the system, this makes user for easy access and documentation of the functionality of the system.

The application also enables a student to also view all the information posted and the people who announces the information and even the time announcement information it has posted.

The application also allows the student to share information during they are at campus even the time they are in they respecting places and also this allows users to stay connected to the university even if they are at their home in holiday.

Evaluation

After testing the system as its working, the system is evaluated through user experience feedbacks. The researcher designed an evaluation procedure which involved

engaging the various users of the mobile application that was developed so as to get an understanding of their user experiences. It comprised of user experience questions that guided the respondents. Greatest percentage of user feedbacks showed that the mobile application model meets the expectations of most of the users. This is illustrated in appendix 1 task C. The system also provides a user interface that engages the registered users to rate the mobile application and also provide comments about the experiences on using the application.

All registered users are able to view announcement that was provided by various users who have accessed the system. The administrator also gets all the user ratings and reviews the areas to improve. This helps on the other had helps the administrator to know whether the system meets the defined user needs. The system is designed in such a way that a user rates and comments on the application.

CHAPTER SIX

RESULTS, CONTRIBUTIONS, LIMITATIONS AND FUTURE WORK

The model developed was found to meet the aim of the study because it enables a dean of student office to and all student to access the announcement direct electronically using portable different types of smart phone and other network devices they are fast and save many things.

The model was developed through interviewing respondents and observation from different members who work with the dean of students' office at Bugema University, main campus. This included respondents from students who are at main campus. A total of 100 respondents were interviewed regarding the necessity of having model of mobile information system.

These interviews also sought opinions from the users about the requirements that the model of mobile information system needed to haven so as to deliver update information that would help a student's plan for their time of studies and how to attend other activity event which take place on campus. Through interviews the researcher also evaluated the designed mobile application model to ensure that the model offers the intended purpose that the deans of student office and the communication expected to be sent to the students at Bugema University.

Majority of the respondents agreed that it was necessary to have model of mobile information system so as to simplify and make work easier dean of students' office in terms of communication and post are receive announcements with in campus. The students who need to send information need to be communicated to by the students to the dean of students' office without coming to see him face to face; this provides quick access to sites information (fugue 19).

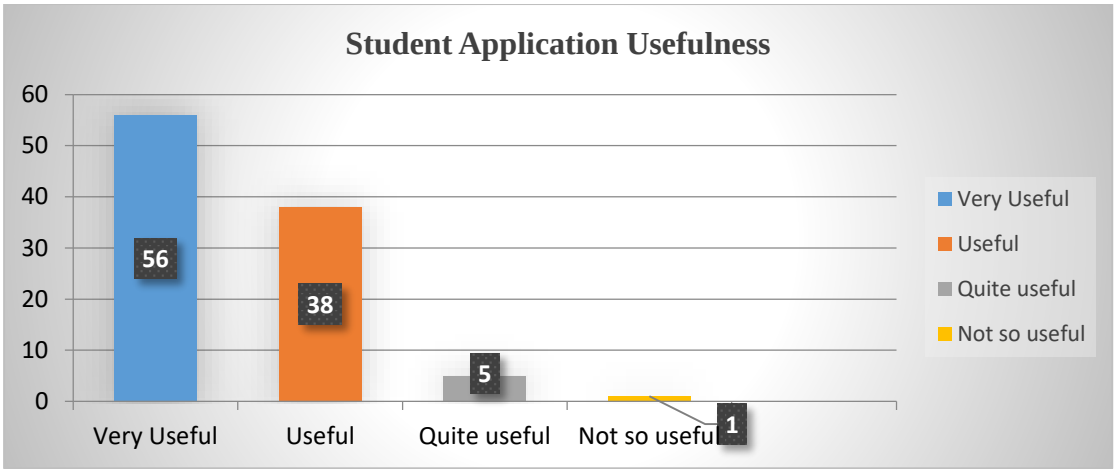

Figure 19: Student Application Usefulness

Requirement Acceptance Rate

After designing model of mobile information system, it was simulated and experimented through engaging users to perform certain tasks using the application. The majority of the respondents accepted most of the tasks that the model of mobile information system was able to perform.

For example users were registering as new members and after registering they can access their account log in and sent their announcements afterward the system admin approved and publicized it can be viewed by all who have been created and count to the system and even others who have an access to the system, to find information regarding the sites that were being advertised on the mobile application and majority where able to perform this task.

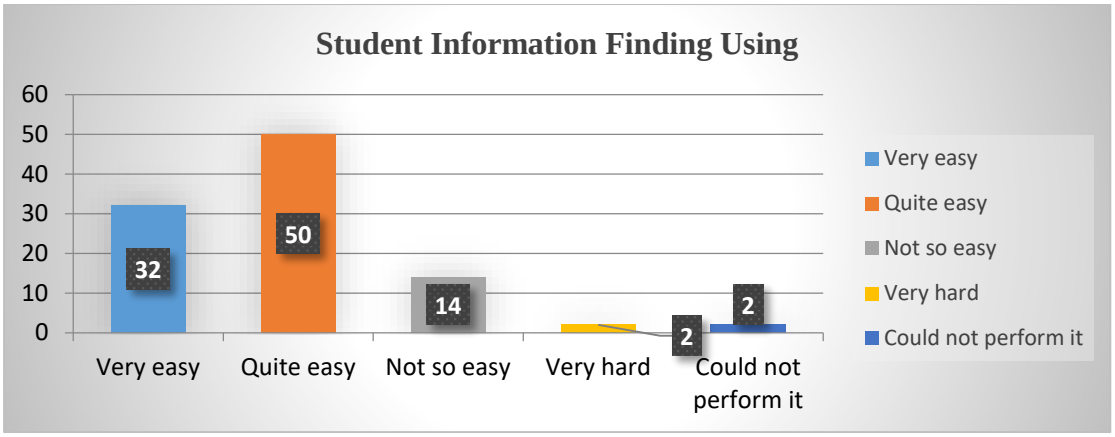

Figure 20: Student Information Finding Using App

Users were also tasked with using model of mobile information system to send inquiries regarding to the announcements they wish to be put on electronic notice board of mobile information system the accessibility. Using of the system, majority were able to perform this task successfully.

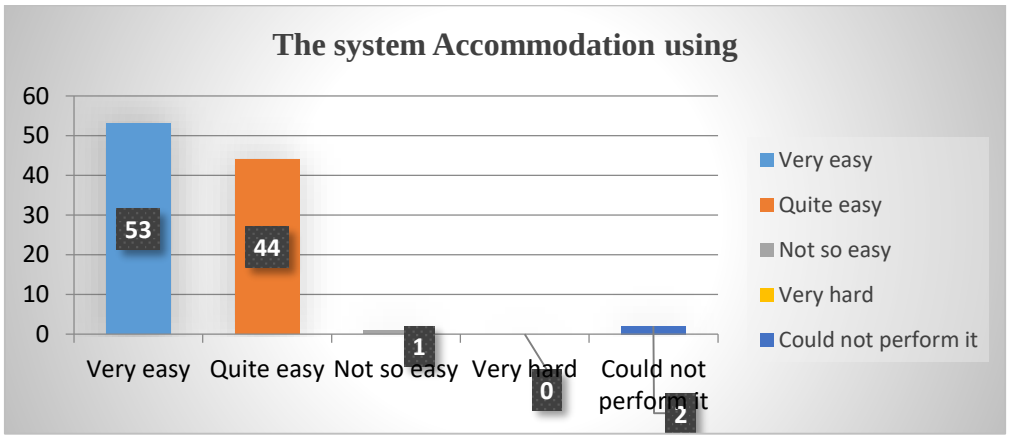

Figure 21: The System Accommodation Using App

Users were also tasked with using this model of mobile information system to get directions access announcement posted by the dean of student office at Bugema University main campus. Majority of the students were successful in performing this task.

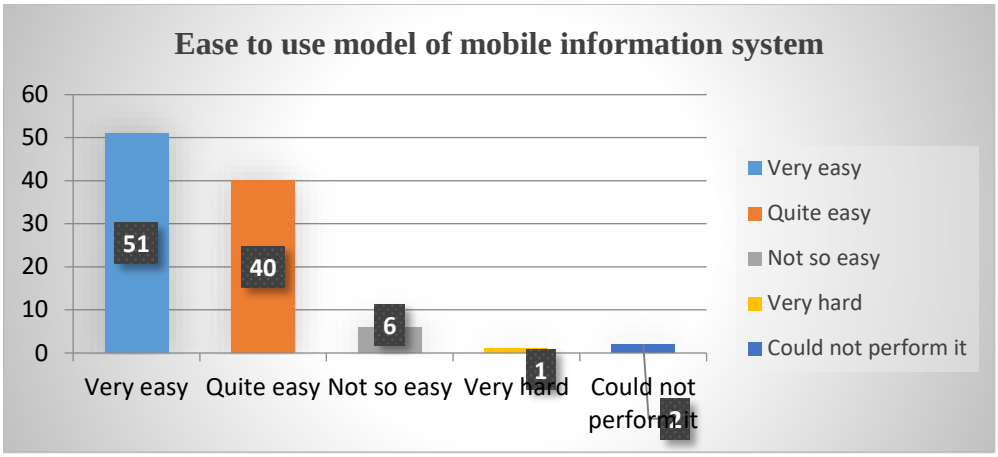

Figure 22: Ease to use Model of Mobile Information System

Majority of the students also found the complete attendance and clarity of model of mobile information system on the mobile application satisfactory.

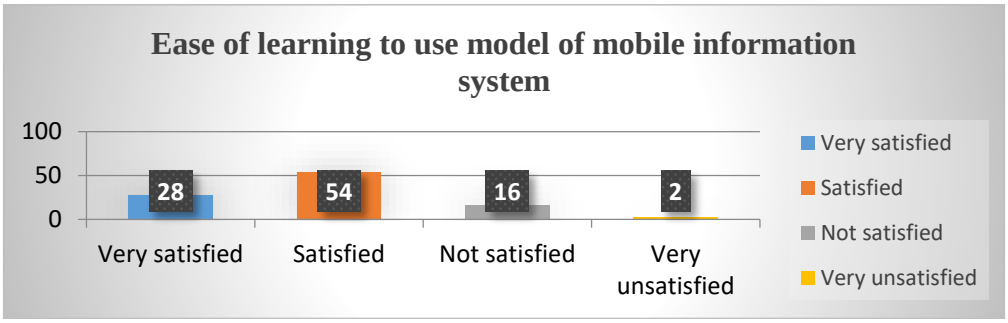

Figure 23: Ease of Learning to use Model of Mobile Information System

Contributions

The researcher's contribution was to address gaps that the researcher highlighted in the existing 'model of mobile information system and later present the design model that addresses the gaps. He achieved the main aim of the study where he presented a design of a model of mobile information system and he addressed the gaps identified. For instance, the model addresses the gap of using the electronic devices to get one unique system which can be used by all students to send and receive direct announcements from the dean of students' office without using much time money and

received correct announcement which has been approved by the person in charge and sharing using new social platforms.

The researcher also addressed the gaps in connecting this model with the existing Bugema university is having therefore the dean of student office can also link all compasses of Bugema university and also put detecting of validations of student systematically and identifications of student identification numbers.

Conclusion

The study developed a model to enable dean of student office and all student to access the announcement direct electronically using portable different types of smart phone and other network devices. The model of mobile information system needed to deliver update information that would help a student's plan for their time of studies and how to attend other activity event which take place in campus. After designing model of mobile information system simulated and experimented through engaging users to perform certain tasks using the application. Users acknowledged that the model of mobile information system to get directions access announcement posted by the dean of student office at Bugema university main campus was successful in performing this task.

Recommendation

After a thorough all this research and developing a new model of mobile information system the researcher recommends Bugema university dean of student office to ask Bugema university administration to accept the final implementation to be added on the other systems they have so that the analog model system they are using to disseminate announcement can be replaced by this new system of model of mobile information system.

Limitations and Future Work

Not all student information and the services of dean of students' office were captured in this model of mobile information system. Therefore, there the researcher only dealt on announcement sent to the students and the requests students send to the dean of student office. This needs to be put on electronic noticeboard in order to pass information about events and activities taking place on campus.

Future work should be done on wither updates and language dictionaries for interpretation of native languages need to be added to model of mobile information system to improve student and deans of student office as they are sending and receiving announcement on campus and outside the campus.

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APPENDICES

Appendix I: Interview Guide

TASKS

A. Requirement Gathering Questions

Which smart phone do you prefer using?

Have you ever used a model of mobile information system to send and receive announcement from deans of student?

What do you use if you want to send announcement to the students?

If there if a mobile information system what functionality do you wish to get from it?

What manner do you wish the model information system can be used by all students in other to get announcement from the dean of student to the student?

Which functionality do you need from this model of information system?

B. Analysis and Design Questions

How do you see the existing system which is used by the dean of student office of Bugema University today?

Is there any other thing that is attractive about new model of mobile information system?

What things do you find challenging in terms of looking for approval from the dean's office?

C. Task 1. Evaluation Procedure

(a) Start model and set the partialities as you desire taking into consideration the time required time to complete this procedure.

I found to this task of Student Application Helpfulness

Status	**Frequency**	**Percentage**
Very useful	56	56%
Quite useful	38	38%
Not so useful	5	5%
Not useful	1	1%

I found this in Information Finding Using Application

Status	Frequency	Percentage
Very useful	32	32%
Quite useful	50	50%
Not so useful	14	14%
Not useful	2	2%
Couldn’t perform it	2	2%

I found this task of ease to use model of mobile information system

Status	Frequency	Percentage
Very useful	51	51%
Quite useful	40	40%
Not so useful	6	6%
Not useful	1	1%
Couldn’t perform it	2	2%

I found this task of the system Accommodation using Application

Status	Frequency	Percentage
Very useful	53	53%
Quite useful	44	44%
Not so useful	1	1%
Not useful	0	0%
Couldn’t perform it	2	2%

I found this task of ease of learning to use model of mobile information system

Status	Frequency	Percentage
Strongly agree	28	28%
Agree	54	54%
Disagree	16	16%
Strongly disagree	2	2%

(a)Select a desired

I found this task

Status	Frequency	Percentage
Very useful	29	29%
Quite useful	38	38%
Not so useful	20	20%
Not useful	9	9%
Couldn’t perform it	4	4%

Task2. User Experience Questions

(a) It was easy to learn to use the system

Status	Frequency	Percentage
Very easy	42	42%
Easy	31	31%
Slightly easy	23	23%
Difficult	4	4%

(b) I was easy to find the information and perform the tasks I needed.

Status	Frequency	Percentage
Very easy	38	38%
Easy	35	35%
Slightly easy	24	24%
Difficult	3	3%

(c) The organization of the information needed to be posted on system.

Status	Frequency	Percentage
Strongly agree	53	53%
Agree	34	34%
Disagree	12	12%
Strongly disagree	1	1%

(d)The interface of the new model of information system

Status	Frequency	Percentage
Strongly agree	58	58%
Agree	41	41%
Disagree	1	1%
Strongly disagree	0	0%

Appendix II: user interface Code

```php
<?php
defined('BASEPATH') OR exit('No direct script access allowed');

class Users extends Admin_Controller {

    public function __construct()
    {
        parent::__construct();

    }

    /*
     * this method displays all users for the admin
     *
     */
    public function index()
    {

        $data['title'] = 'Users | Admin';
        $data['main']  = 'admin/users/users';
        $data['users'] = $this->user_model->get_users_admin();
        $this->load->view('admin/template_admin', $data);
    }



}//end of class
```

This Codes Are for Home Extends

<?php
defined('BASEPATH') OR exit('No direct script access allowed');

class Home extends Frontend_Controller {

public function __construct()
{
parent::__construct();

}

/**
* this index method loads all the announcement to the homepage
* and displays the home page
*
*/
public function index()
{

$data['title'] = 'Bugema University Dean of Students Announcement Portal';

```
$data['main'] = 'public/home';
$data['posts'] = $this->post_model->get_post_with_users();
$data['slide_post'] = $this->post_model->get_featured_post();
$data['navlist'] = $this->category_model->get_category_nav();
$data['sidebar'] = $this->post_model->resently_added_post();
$this->load->view('template', $data);

}

/**
* this post method gets a post by its id
*
*/
public function post($id)
{
$id = $this->uri->segment(3);

$data['title'] = ' Post | Bugema University Dean of Students
Announcement Portal';
$data['main']  = 'public/post';
$data['navlist'] = $this->category_model->get_category_nav();
$data['sidebar'] = $this->post_model->resently_added_post();
$data['posts'] = $this->post_model->get_post_by_id($id);

$this->load->view('template', $data);


}


/*@ this category method get category by its id
*@
**/
public function category($id)
{
//getting the category id from the url
$id = $this->uri->segment(3);

$data['title'] = 'Category | Bugema University Dean of Students
Announcement Portal';
$data['main']  = 'public/category';
$data['navlist'] = $this->category_model->get_category_nav();
$data['sidebar'] = $this->post_model->resently_added_post();
```

```
                $data['category'] = $this->category_model->get_category_by_id($id);
                //dump($data['category']);
                $this->load->view('template', $data);

            }


            /**
     * this search method process the user search query
             * and displays the result
             *
             */
            public function search()
            {

            $term = trim($this->input->post('term'));

                if($term){

                $data['search_result'] = $this->post_model->search($term);
                $data['count'] = $this->post_model->search_count($term);

                }else{
                redirect('home', 'refresh');
                }

        $data['title'] = 'search | Bugema University Dean of Students Announcement Portal';
                $data['search_term'] = $term;
                $data['main'] = 'public/search';
        $data['sidebar'] = $this->post_model->resently_added_post();

    $data['navlist'] = $this->category_model->get_category_nav();
                $this->load->view('template', $data);
```

Appendix III: Data Collection Letter