STUDENT ID CARD APPLICATION WITH SMS VERIFICATION MESSAGE SYSTEM: A CASE STUDY OF GRETSA UNIVERSITY

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ICT-G-4-0183-16

A SYSTEM PROJECT PRESENTED IN SCHOOL OF COMPUTING AND INFORMATIC IN PARTIAL FULFILMENT FOR THE REQUIREMENT FOR THE AWARD OF DEGREE IN BACHELOR OF SCIENCE COMPUTER SCIENCE OF GRETSA UNIVERSITY

NOVEMBER 2020

DECLARATION

This System Project is my original work and has not been presented for a Degree or Diploma in any other University.

Signature: .... Date: 16/12/2020.

Mokaya Lameck

ICT-G-4-0183-16

This project has been submitted for review with my approval as a University supervisor:

Signature: .... Date: 16/12/2020

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TABLE OF CONTENTS

Table of figures

ABBREVIATIONS AND ACRONYMS

ID-Identification Card

SMS-Short Message Service

RAM-Random Access Memory

ABSTRACT

An increase in poor service provision during university entrance in Kenya; due to a person not being able to be physically present we will not receive an ID due to manual running of these processes. With a large array of uses of these applications, used in universities its necessary to come up with a better system that is fast and can maintain many students. Main purpose was to design and develop an ID app that enable registration through your phone. The development of this application was developed using java and Android studio. Considering as a factor, ids systems need to be revolutionized to fit in the current dynamic world. Smartphone's have a key and universal tool in personal assistance and taking that advantage. With this idea, real time intrusion detection can be also implanted to safeguard personal security and this will make sure that every Kenyan student receive ids faster and safer and their registration will run smoothly.

CHAPTER ONE

INTRODUCTION

The student identity card application with SMS verification provides a wait and take processed student identity card with a stipulated time for pickup unlike the other system which could not notify a student whether their student identity card is processed and ready for pickup. The student identity card application with SMS verification shall also keep track of the number of times a student has applied for renewal of student identity card. Also, it reduces the workload of the administration hence no need for taking picture of every student manually, this shall be replaced by a feature of uploading passport picture through your phone which contains restrictions that include background color style, lighting.

1.1 Background of the study.

The increasing number of intake of students in the university gives the administration a huge task of processing student identity cards. The continuing students who have lost their identity cards and want replacement of the id during the beginning of the semester find it a very hard task. The student identification application with SMS verification is to reduce the workload of processing student identity cards in terms of time taken.

The student identity card application with SMS verification is connected to a login user authentication database. The student has to enter their details which consists of registration number, student full names and a passport photo which shall be uploaded by the student. This also includes response feature that shall consist of short text messages system that notifies students when to collect their processed identification cards if their details are correct if not so then they are also notified to come and correct their details.

The student identity card application with SMS verification provides a wait and take processed student identity card with a stipulated time for pickup unlike the other system which could not notify a student whether their student identity card is processed and ready for pickup. The student identity card application with SMS verification shall also keep track of the number of times a student has applied for renewal of student identity card. Also, it reduces the workload of the administration hence no need for taking picture of every student manually, this shall be replaced by a feature of uploading passport picture through your phone which contains restrictions that include background color style, lighting.

The disadvantages of manual system are long queues during applying and pickup of the identification card. The students had to queue in long lines to get processing of student identity cards this may waste a lot of time hence students are queuing to access their identification card and also for the case of replacement of student identification card it might be inconvenient to go to the office and discuss issues of replacing your identification card for purpose of wasting personal time that one can use to read or go to class. The increased number of intake during the semester may august manual system is bound to make a mistake be it simple or a larger one for example simple mistake as writing down the wrong detail or misplacing ones' passport picture.

1.2 Problem statement.

In examination of the main processing techniques used in student identification card processing system with SMS verification from the stage of data processing system to end stage of the processed ID-Card. It has been noted that for students to collect their identification card inGretsa University and many other institutions, they queue up for several hours from one unit of the processing center to the another with the manual processing involve in handling the students' identification card process, most of them waste the whole day in the processing center without

2

getting their ID-cards. The student identification card with SMS verification shall solve the above through fast processing of student identity card with minimal time taken and SMS verification after filling in one's details using a mobile phone hence solving the issue of long queues and time wasting.

1.3 Objectives.

1.3.1 Main Objective.

To develop student identity card application with SMSverification to solve the issue of queuing in long lines.

1.3.2 *Specific Objective.*

I. To establish the existing problem a student identification card application with SMS verification that ensures timely processing.

II. To design a system with the capability of providing a wait-and-take processed ID-card.

III. To implement a student identification card application with SMS verification employed in universities with regards to ID-card processing.

IV. To develop a system by designing a successful, secured privacy and reliable student identity card with SMS verification that shall help in providing complementary help to student identification card processing personnel.

1.4. Significance of study

They queue up for several hours from one unit of the processing center to the another with the manual processing involve in handling the student's identification card process, most of them waste the whole day in the processing center without getting their ID-cards. The student

identification card with SMS verification shall solve the above through fast processing of student identity card with minimal time taken and SMS verification after filling in one's details using a mobile phone hence solving the issue of long queues and time wasting.

1.5. Justification.

The system enables one to make prior request for student identity card. We envision a way to give a reliable means of replacing student identity cards and worn-out identity cards hence reducing long queues in administration offices, convenience students by giving them an opportunity for self-service and reducing congestions of students in administration block.

1.6. Scope.

1.6.1 Time Scope.

The user can access the application any time.

1.6.2 *Geographical Scope.*

The application can be accessed anywhere in the country within a network coverage.

1.6.*3 Content Scope*.

A student gives their details which has to contain registration and phone number, passport size photo. The student shall then get a SMS verification for picking up their processed identification card.

1.4 System Requirement.

1.7.1 Hardware Requirement.

     I.   Hard Disk: At Least 500 GB and above.

    II.   Processor: 1.90 GHZ

    III.   RAM: At Least 8 GB.

IV.   Mobile Phone: Android.

1.7.2 Software Requirement.

I.   Database: MySQL.

II.   Operating System: Android version 3.1.

III.   Application Development Tool: Android Studio.

CHAPTER TWO: LITERARURE REVIEW.
2.0 INTRODUCTION.

The present 21st century is a digital era now-a-days the development in various aspects of computer technology has reached beyond our imagination & expectations. Every new day, new software is launched in the market. Software has an attractive user interface & easy maintenance facility which helps us in our working field. In certain University of Tripura students don't have any printed I-card and the card it has not carry so much of information. This fact inspired us to develop software which will aid in computerization of identity card generation system (Rajiv, 2011).

The new Student ID Card introduced at the University of Greifswald for summer semester 2017. To start with, the ID cardhas been handed out in a test phase to newly enrolled students starting in the summer semester. The electronic ID card replaces the previous Semester blatt in paper form. Data Stored on the Student ID Card, the following information is printed on the Student ID Card: Surname, First name, Student id Number, Library barcode, Library user number. The following identification numbers are saved on the chip of the Student ID Card: Student ID Number, Library user number, Personal reference number (user group Student Services). No personal details are saved on the chip like for example name, address, date of birth etc. The ID card currently unites five functions, some of which previously needed separate ID cards: Identification function, Mensa (cafeteria) function, Library function, Printing and copying function, Access control function. (Röhr, 2017)

Before 1994, student registration at Newcastle University involved students being registered in a single place, where they would present a form which had previously been filled in by the student

and their department. After registration this information was then transferred to a computerized format. The University decided that the entire registration process was to be computerized for the Autumn of 1994, with the admission and registration being carried out at the departments of the students. Such a system has a very high availability requirement: admissions tutors and secretaries must be able to access and create student records (particularly at the start of a new academic year when new students arrive).

The Arjuna distributed system has been under development in the Department of Computing Science for many years. Arjuna's design aims are to provide tools to assist in the construction of fault-tolerant, highly available distributed applications using atomic actions (atomic transactions) and replication. Arjuna offers the right set of facilities for this application, and its deployment would enable the University to exploit the existing campus network and workstation clusters, thereby obviating the need for any specialized fault tolerant hardware. (Wheater, Ingham, Whitfield and Shrivastava 1994)

System architecture based upon the experiences of the manual registration process, it was anticipated that 100 front-end machines would be necessary for the purposes of the registration exercise, resulting in a maximum of 100 simultaneous users. These machines (PC-compatible machines and Apple Macintosh systems), would be distributed throughout the University campus. For each of these two types of machine, a user-friendly interface program (front-end) was written, which would display the equivalent of the original paper registration form. The student data would be retrieved from an information store, written using Arjuna.

In the following sections we shall examine this architecture in more detail. It is important that the student information is stored and manipulated in a manner which protects it from machine

crashes. Furthermore, this information should be made accessible from anywhere in the campus, and kept consistent despite concurrent accesses. Therefore, a distributed information store (the registration database) was built using the facilities provided by Arjuna. The database represents each student record as a separate persistent object (approximately 1024 bytes), the Student Record, which is responsible for its own concurrency control, state management, and replication. This enables update operations on different student records (Student Record objects) to occur concurrently, improving the throughput of the system. Each Student Record object was manipulated within the scope of an atomic action, which was begun whenever a front-end system requested access to the student data; this registration action may modify the student record, or simply terminate without modifying the data, depending upon the front-end user's requirements. (Wheatear at. el., 1994)

With the economic condition of public universities worsening, school administrators must rely more and more on automation and the computer in maximizing the quality of education with the amount of resources available. Many manual chores of administration that are already automated in business must receive similar attention in the university sector. It is unfortunate that the staff of universities are burdened with the task of performing the detailed, yet essential, clerical functions, semester after semester, year after year, when their time is urgently needed for instruction of the students, professional counseling, guidance, and the continuous evaluation of the system to shape the policies necessary to move the education process forward.

The purpose of this project was to deal with one of the most persistent and unresolved problems facing university administrators today: how can a computer be used to construct proper university id registration. If resolved, it should be possible to minimize on time used to access ids, available, minimize the number of student course request conflicts which result in the

process, keep multi-section courses balanced in size, and free administrators, teachers and guidance personnel from clerical duties that can be automated. The scheduling system developed in this study has two general phases: First, building a course master schedule, and second, sectioning the student requests. A sub-optimum approach to scheduling was used that is similar to M.I.T.'s Generalized Academic Simulation Program (GASP). This means that the generation of the schedule is derived from successive computer runs with the input of each successive run being revised through human analysis of the previous run. (Fore, 1993)

The current MIT ID Card consists of a double-layered strip of PVC with a magnetic strip and an RFID chip. This card will also be referred to as a ``proximity card'' or ``proxy card'' later in this paper. The front face of the card has the MIT logo and owner's name, MIT ID number, photograph, and an expiration date. The back face of the card has a magnetic strip, a serial number, the status of the owner (explained below), the MIT logo and contact information for the MIT Card Office, and a disclaimer. There are three types of card based on the status of the owner: student, affiliate (including spouse or partner), and alumni.

Temporary cards can be issued for residence access, parking access, summer conferences, retirees, athletic center access, and other non-picture cards. Specialty cards can also be issued such as those for the Emergency Response Group, for Campus Police, and for Facilities. Currently, there are over 27,000 card records in the MIT system. The integration of the card into the existing MIT infrastructure was done by MAC Systems of Avon, Massachusetts. (Moore, 1999)

Card Specifications.Indala Corp. of San Jose, California is the vendor who provided the card technology to MIT. It is part of their range of solutions for card systems. The type of card used for the MIT ID Card is the FlexISO Proximity Card.According to the Indala website, the

FlexISO card is a credit card-thin identification card that is ISO 7813 compliant. ISO 7813 is a standard for identification cards that are used as financial transaction cards. The card has a graphics-quality surface on both sides of the card and can contain multiple ID technologies including a magnetic strip, Wiegand code strip, bar code, a multitude of smart chips, and MIFARE. Currently, all MIT ID Cards has a magnetic strip and an RFID chip but some of the newer cards have a bar code also. Information is printed on the card using a dye-sublimation printer. (Drakos, 1996)

This history of the MIT ID is highly indebted to, a draft document maintained by MIT Information Systems. Taking after the document that outlined its creation, the new database that would manage the new MIT ID system was called the ``People Database.'' This represented version 1.0 of the MIT ID storage and lookup system. It was not until version 2.0 in the fall of 1997 that the system received its current name, MIT ID Database. To this day, dormitories and some other places on campus require students to leave their ID card as collateral for items borrowed. Likewise, it is still the stated policy of the MIT Card Office that students should never agree to leave their card as collateral.

DeHon discovered that when a card was reported stolen and a new one reissued to a student, the only difference between the stolen card and the new card was that a counter encoded on the magnetic stripe was incremented by one. Therefore, it would be trivial for someone to steal a card and use it even after the card was reported stolen. To address this, issue the counter was replaced with a randomly generated number.1995 was indeed a focal point in the debate over the MIT Card. It was during this year that most objections to the proposed technology and policies were raised and it was during this year that campus-wide interest reached a noticeable peak. The number of issues raised by member of the MIT community in 1995 are too numerous to be listed

in full here. For an excellent synopsis of this early period in the MIT Card's development. (Zamfirescu, 2004)

The present 21st century is a digital era. Now-a-days the development in various aspects of computer technology has reached beyond our imagination & expectations. Every new day, new software is launched in the market. Software has an attractive user interface & easy maintenance facility which helps us in our working field. In certain University of Tripura students don't have any printed I-card and the card it has not carry so much of information. This fact inspired us to develop software which will aid in computerization of identity card generation system. The system ICGS (I-card generating system) is based on computerization of Student identity card generation system.

To develop this project front-end tool as VISUAL STUDIO 2005 & back-end tool as relational database1 has been used. Using this software user can easily print student identity information along with a unique barcode in a uniform format. Even a user can reprint an identity card instantly if needed from previously stored records. The system enables a good user-interface for the user to maintain the records. It will also provide a permanent database and this will help to store the student identity information in an error free and non-redundant way along with better option for maintaining the records. Problems to consider include probable security breaches due to the ease of copying the code, and the potential for physical damage to the Barcode after repeated swipes.

The major lead of a 2D Barcode is its data encoding competence, with up to 500 bytes per square inch being practical. Some of this data will normally be used for error correction encoding which also makes the 2D Barcode remarkably tolerant of holes, cuts, and dirt marks. With around 500

bytes of data available, a 2D Barcode can be used to store biometric data such as a fingerprint, or even a compressed version of the holder's portrait. Other promise includes detailed personalized data such as name, address, department, employee number, access authorizations, training status, and expiring date. Since swiping is not required, and 2D Barcodes are very tolerant of artefacts, physical wear should not be a problem, but a potential downside is the higher cost of scanners1. Visual Studio 2005 released on February 2002. In the past, Visual Basic has been criticized & maligned as a "toy" language as it did not provide all of the Features of more sophisticated languages such as C++ and JAVA although Visual Basic 1.0 had already then changed the face of windows Programming by removing the complex burden of writing code for the User Interface (UI). VB 1.0 freed the programmers to draw their own UI. Microsoft has removed all the restrictions and made VB.NET as a powerful development tool. (Sagarjit, Sarathi, 2011)

Online Student Registration System. Student Online admissions are a vital part of any university's running because students are what keep a University alive. The Student admission is one of the most important activities within a university as one cannot survive without students. A poor admissions system can mean fever students being admitted into a university because of mistakes or an overly slow response time. Online Student Registration is the software which is helpful for students as well as the department. In this project, the student is facilitated by the online system for registering students, add subjects and fee structure Our Student Management System deals with the various activities related to the students.

In the Software we can register as a user and user has of two types, student and administrator. Administrator has the power to add new user and delete a user. Through this online system we overcome many problems time and money is saved, nothing is done manually, long lines in the department for these issues. The purpose of this SRS document is to allow the registration of

students in particular course. It is intended to be complete specifications of what functionality the admission provides. Online Student Registration 8 records of students, such as their id, name, address DOB, etc. So all the information about a student will be available in a few seconds. Overall, it will make Student Online Registration System an easier job for the administrator and the student of any organization. The main purpose of this SRS document is to illustrate the requirements of the project Online Student Registration System and is intended to help any organization to maintain and manage its student's personal data. Without an Online Student Registration System, managing and maintaining the details of the student is a tedious job for any organization. Student online registration system will store all the details of the students including their background information, educational qualifications, personal details and all the information related to their resume. Login Module: Login module will help in authentication of user accounts. User who have valid login id and password can only login intorespective accounts. Online Student Registration requirements 10 MySQL: is a RDBMS based on SQL which is used for adding, removing, and modifying information in the database. RDBMS: Relational Database Management System HTML: Hypertext Markup Language PHP: Hypertext Preprocessor CSS: Cascading Style Sheet HTTP: Hypertext Transfer Protocol. References.¬Software Requirement Specifications, Online Examination System. IEEE (Institute of Electrical and Electronics Engineers) Guide to Software Requirements Specifications (Agarwal, Lohya, Badlani, 2017).

2.1 CONCEPTUAL FRAMEWORK.

Login Form

STUDENT

UNIVERSITY SERVER

MOBILE DEVICE

SMS VERIFICATION
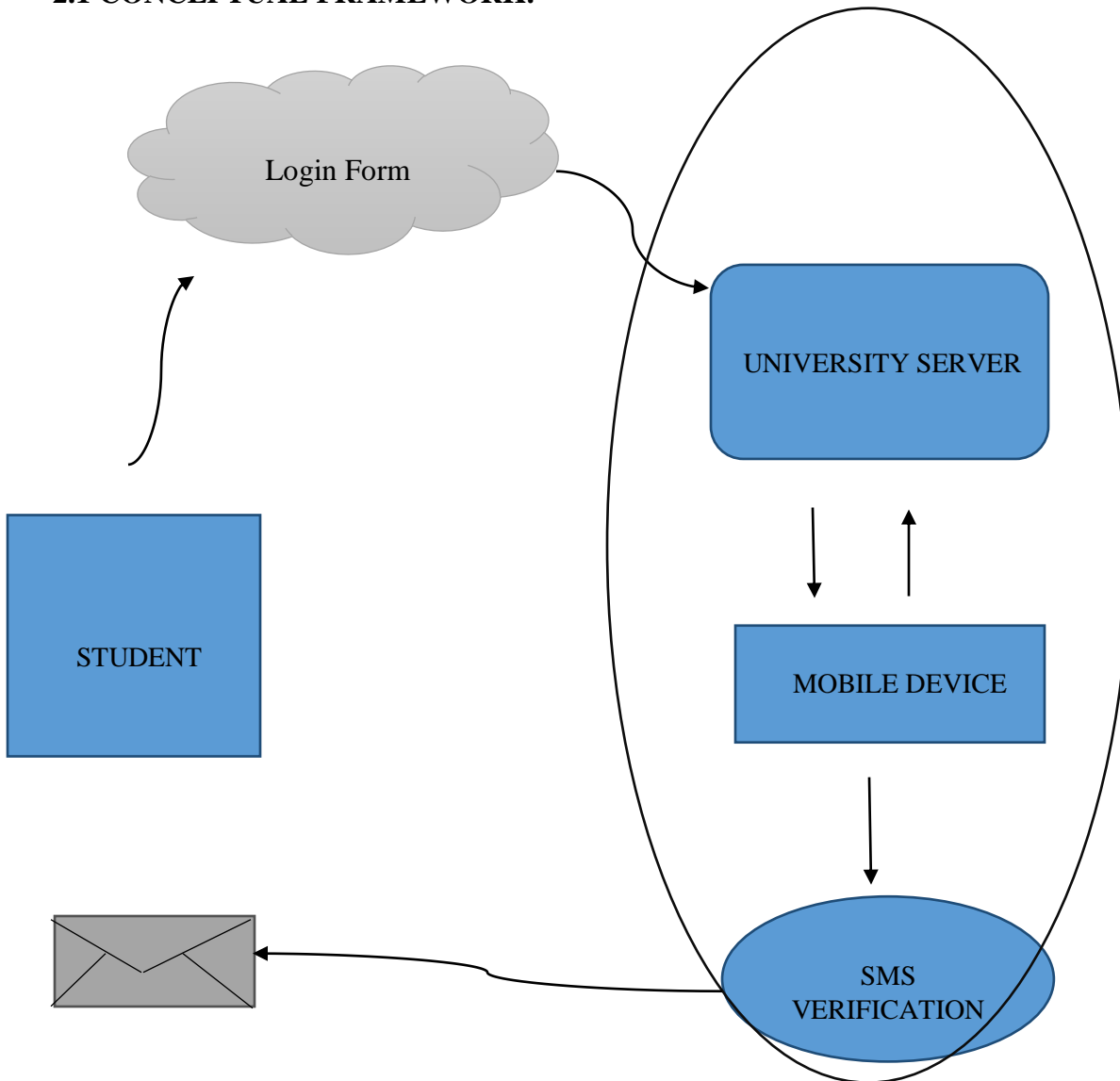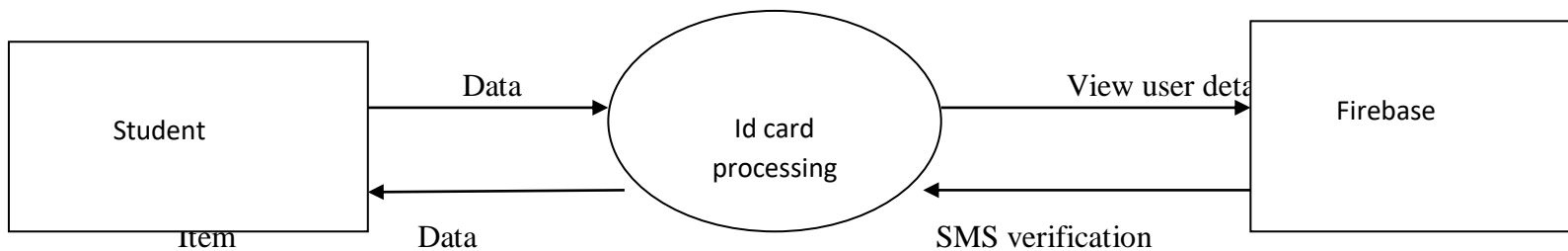
3.0 Introduction

This chapter includes the methodology that were used or followed in designing then application. In order to focus on the processes of ids production and how the application works, the researcher decided on qualitative study that initializes on the trends of the benefits of the current system. Software process model adopted: The study conducted was to analyze the works of the current manual system of id production to be able to come up with a more advanced system, the relationship that the current system has with the user, and the flexibility to changes of the current system. The most suitable methodology I used in developing this system was prototyping.

3.4 SYSTEM DESIGN.

To be able to come up with the above application I put my ideas in paper and gathered the necessary requirements from the users. The following models were used: -
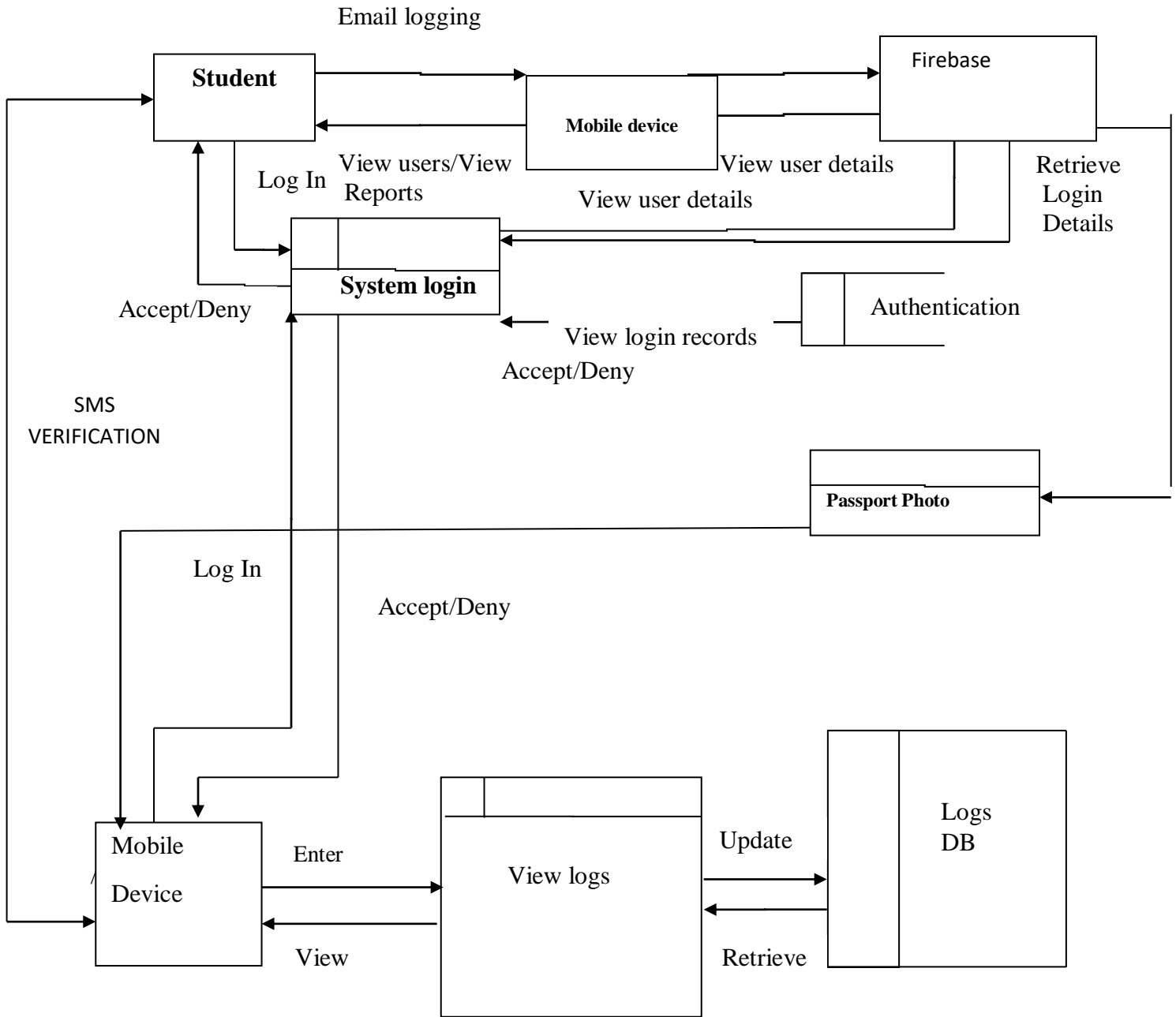
i. Context diagram

ii. Data flow diagram

3.4.1 Context Diagram.

3.4.2 Data Flow Diagram.

The following dataflow diagram shows logiclly how the system is.

Email logging

| Student | | Firebase |

Mobile device

View users/View Reports

Log In

View user details

View user details

Retrieve Login Details

System login

Accept/Deny

Authentication

View login records

Accept/Deny

SMS VERIFICATION

Passport Photo

Log In

Accept/Deny

| Mobile Device | Enter | View logs | Update | Logs DB |

View

Retrieve

3.5 SYSTEM ANALYSIS.

System Analysis is the process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision making. Here we used the data obtained from the questionnaires and internet sources to analyze the data.

3.6. Data analysis and techniques.

Data analysis helped in the interpretation of data and take a decision or answer the research question. Presenting the data included the pictorial representation of the data by using graphs, charts, maps and other methods.

Primary data collected from the field was first edited and cleaned. The responses were then coded for analysis. Coding was done to summarize the responses given by the respondents for analysis. The data was analyzed with the aid of a computer using Statistical Package for Social sciences version 23 (SPSS) as a tool for analysis. Quantitative data was then analyzed using descriptive statistics such as frequencies, percentages while thematic analysis technique was used to analyze qualitative data collected using open ended questions. The analyzed data was then be presented in the form of tables, pie-charts and bar-graphs where applicable.

3.7. Ethical considerations.

I obtained a permit from the university VC in order to be allowed to collect data. A copy of the permit was submitted to the relevant departments, to seek permission to carry out this study in the University. Participants were also assured of their personal identity anonymity to uphold privacy and confidentiality. The use of questionnaires was a good tool for the protection of the privacy of the participants. I also obtained an approval to conduct my research from my project supervisor to show that am a student and seek to do research.

3.8. Coding

The system was developed using java programming language for backend. The developer chose java since it is the most frequently used language for apps development. Been an open source makes the language is being modified by many volunteers making it easy to maintain. There are many communities which help each other in case one is stacked unlike other programming languages.

3.9. Testing

The system was passed through different software testing to test it effectiveness.

3.9.1 Functional testing

The types of functional testing performed were; unit testing, integration testing, system testing, interface testing and acceptance testing.

3.9.1.1 Unit testing

This is a testing performed on each software module to test if it is operating as it was designed to work. Each module of the system was tested to satisfy that it was working as it was designed to work.

3.9.1.2 Integration testing

This is a process of testing the interface between two software modules to measure the correctness of each module. Top-down integration testing was used, this a technique that stimulates the behavior of the lower-level module that are not integrated. The high-level module is tested up to the lower-level module. The advantages of this approach of testing is that one can debug modules separately, it needs fewer resources and lastly it is more stable and accurate while testing.

3.9.1.3 System testing

This is where a complete system is tested to check its compliance with the system requirements in that case specific requirements. The system functionality was tested and found to be satisfying the stake holders.

3.9.1.4 Interface testing

This a testing that is performed to check whether system and its components interacts correctly with each other. Verify that communication between system components is correct. Verify that all the supported hardware and software have been tested. Verify the security requirement of the system.

3.9.1.5 Acceptance testing

This is a form of testing to check whether the developed system compliances with the business requirements of the software and whether is acceptable for delivering a solution.

3.9.2 Non-functional testing

Non-functional testing includes; performance testing, load testing, security testing, usability testing and reliability testing.

3.9.2.1 Performance testing

This is a type of software testing that makes sure that system operates effectively under workload. This is in terms of speed, reliability and stability.

CHAPTER FOUR: SYSTEM PRESENTATION AND ANALYSIS OF DATA

4.0 DATA ANALYSIS

For designing the student ID card production application with SMS verification, we worked on different phases like logging, image uploading, and database and SMS verification. An application for student id production with SMS verification has been developed successfully.

The design phase is the primary phase, which gives a brief idea about the different levels used for developing the application. The application is designed in a user-friendly manner.

The most important phase in the project is the execution phase. For executing the application, we worked on four sections: logging, image uploading. Database and SMSverification.We designed the program using JAVA platform, and used different approaches for testing the application, which helped us to know about the limitations.
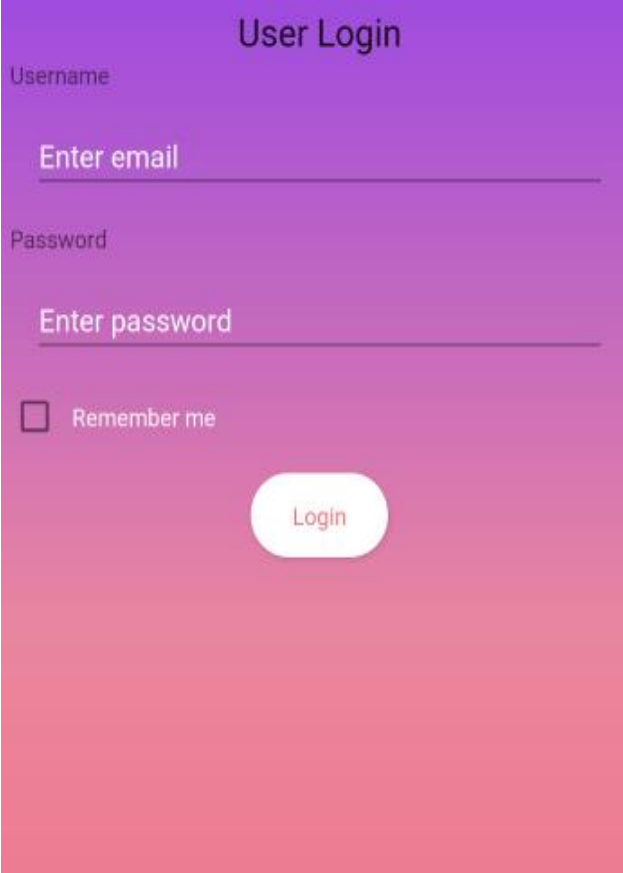
Figure 1:Firebase
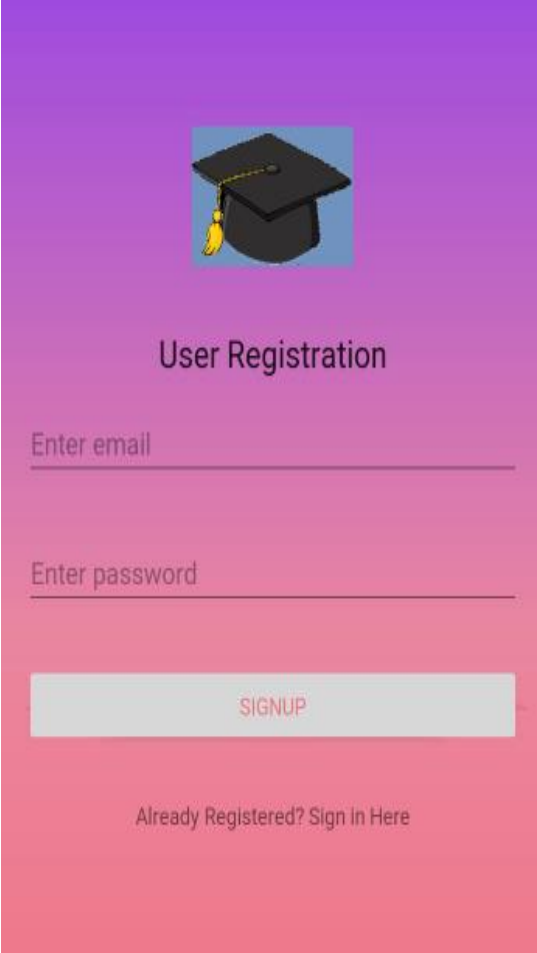
Figure 2:user login page

Figure 3:user sign up page
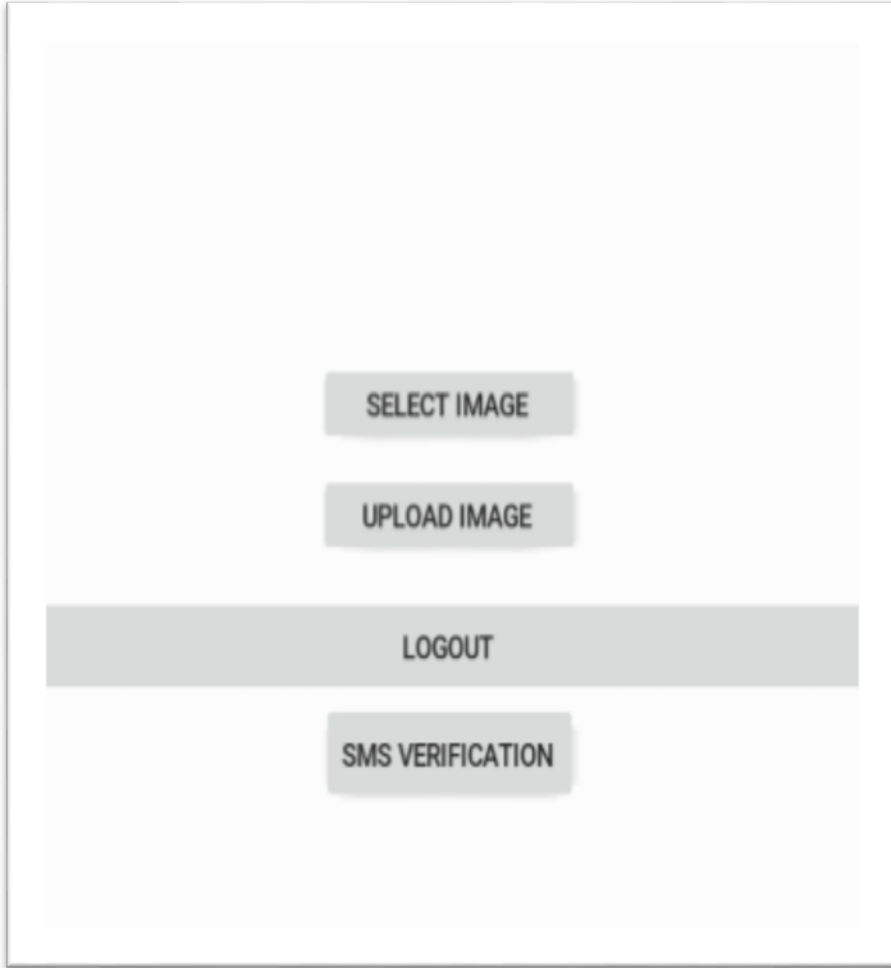
Figure 4: user upload image page
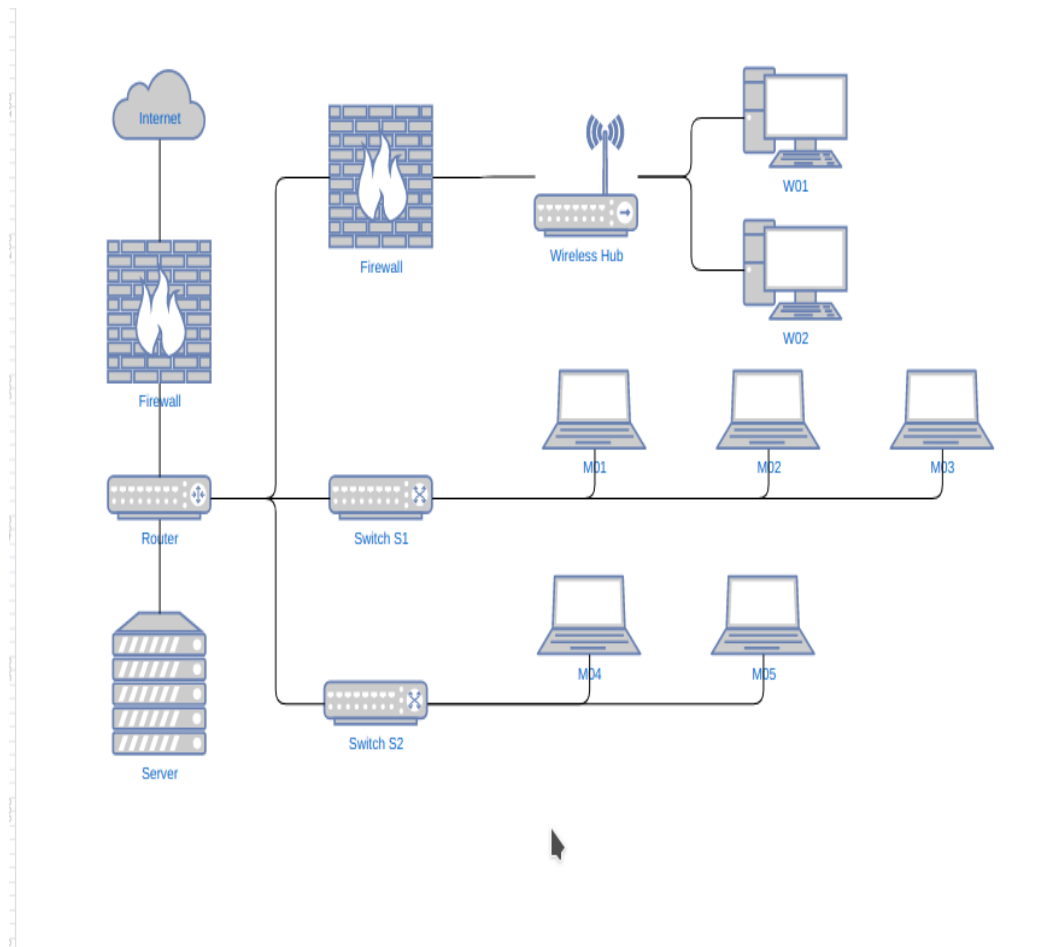
Figure 5:user details

Figure 6:office network diagram

4.2 Measurement
4.2.1 Software quality measurement

The quality metric is used to measure the complexity or the simplicity of a software. Code

quality, bug free and semantically correct code is essential for a quality software. Qualitative

quality metrics is used when measuring the size of code for a particular software. The bugs per

1000 line of code. Maintainability is also measured in this face. Performance is another metric

for measuring quality, this is used to measure that the system has fulfilled proposed purpose.

4.2.2 Software reliability measurement

This is a probability of failure free software which performs predefined number of input at a given environment assuming the hardware has no error. Software reliability is achieved under conditions that functionality, usability, performance, serviceability, capability, install ability, maintainability and documentation factors are met.

4.4 Performance analysis

The system was given to system users to test it performance, the analysis results showed that the system met the performance expectations of the client. The system helps in achieving optimization of business. In performance the worst-case analysis is carried out and the best-case analysis through which the system performed well as expected.

CHAPTER FIVE: DISCUSSION, RECOMMENDATION AND CONCLUSION.

5.1 INTRODUCTION

This chapter includes recommendation of the study and conclusion as discussed below.

5.2 RECOMMENDATION

Student ID application with SMS verification is one of the new era advanced application which helps in student id production and verifies the user through SMS once the processing is done hence it has to be up-to-date or rather should embrace the new technology fully. It is recommended that more studies to be done and similar study to be conducted in other institutions try and find out if the same results will be received.

5.3 CONCLUSION

The primary goal of this research project was to present a draft understanding of what happens inID registration and efforts made by the management to meet the goals. It's clear that the services provided in the institution are fully satisfying the needs of its security through the student ID application. The system will easily allow easy security monitoring of the users' privacy through Firebase while at home or away from the university. He is notified through a short message for once the processing is done.

REFERENCE

Zamfirescu, (2012).Data mining with SQL injection and interface; Software insight security research, viewed 20/09/2009.*48* (19).

Moris, (2010).Software proposal management (3rd Edition): Delhi. SK Kataria and sons

Mohammad Shoeb Shah; and P. B. Borole (2016).'Surveillance and Rescue Robot using Android' (Vol. 1, pp. 678-681).

SanjaMaravićČisar; Robert Pinter; Viktor Vojnić; VanjaTumbas; and PetarČisar(2016). 'Smartphone Application for Tracking Students'Class Attendance'

ShariqSuhail; ViswanathaReddy; Rambabu; Dharma Savarni C. V.; and V. K. Mittal5 (2016).

'Multi-Functional Secured Smart Home' Volume 2, Issue 4.

L.A. Gama-Moreno; A. Corralejo; A. Ramirez-Molina; J. A. Torres- Rangel; C. Martinez-Hernandez; and M.A. Juarez (2016). 'A Design of a Water Tanks Monitoring System Based on

Rajiv, (2011).Physical ID system.Improving on compound security, East Journal page 3-6

Wheater; Ingham; Whitfield; and Shrivastava, (1994). Physical ID system: Implications for integration and standardization, International Journal of Physical Distribution and Logistics Management, Vol.34, No.2, pp.123-139.

APPENDIX
APPENDIX 1: GANTT CHART WORK SHEDULE

YEAR	2020															
MONTH	MAY				JUNE				JULY				AUGUST			
WEEKS	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Data collection	■	■	■													
Data analyzing				■	■	■	■	■								
Design.								■								
Coding									■	■						
System testing.								■	■	■	■	■				
Documentation.	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Implementation													■	■	■	■

APPENDIX2: BURGET

Item	Amount
4 GB flash disk	1,200
Printing	1,300
Online server	3850
Modem and internet connection	5400
Laptop	46,000
	Total amount 57,750