

A TESTIMONIAL GENERATING SYSTEM

**A CASE STUDY OF THE DEPARTMENT OF COMPUTER SCIENCE,
KYAMBOGO UNIVERSITY**

BY

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Declaration

I, Rwothoromo Elaijah, do hereby declare that this Project Report is original and has not been published and/or submitted for any other award to any other institution or University before.

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Approval

This Project Report has been submitted with my approval as the supervisor.

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Dedication

The project is dedicated to all who made it all happen; right from the start, and along the way. To Mr. Okecha Jonathan and Mrs. Elizabeth Okecha, my parents, for supporting, correcting and directing me all the way right from birth, till date; and for instilling the fear of The Lord God. Nathan Kisabilaruwa, Rwothber Daniel and Wufoyrwoth Shepherd, my brothers, thank you for standing with me all the way. To all those who love code, my teachers right from Nursery School, through Primary and Secondary School levels; and to my Lecturers for crowning it all. To my Pastors and Watoto Church, where I serve. To God be all The Glory.

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List of Acronyms

TGS: Testimonial Generating System

GUI: Graphical User Interface.

OS: Operating System

UGX: Ugandan Shillings

PDF: Portable Document Format

CSV: Comma Separated Values

GPA: Grade Point Average

CGPA: Cumulative Grade Point Average

RAM: Random Access Memory

GB: Gigabytes

Abstract

Due to the usage of the current manual Testimonial Generation Methods at Faculty of Science, Kyambogo University, and given that the faculty handles results in a centralized way, it was prudent to design and implement a Testimonial Generating System in this project study. This was to address the delay in students getting their Testimonials. All this was achieved by reviewing different state of the art related literature about Testimonial Generation systems. We bring forward the methods and approaches used, Analysis and design of the Testimonial Generation system is also indicated. The implementation, results and finds are also discussed in this project report. We conclude by discussing the “discussions, conclusions and recommendations” as our closing chapter.

Chapter 1

Introduction

In this chapter, we discuss the background of the problems of testimonial generation methods at Universities, however, in this case we focus on Kyambogo University Department of Computer Science. The problem statement, objectives of the study, both the general and specific Research questions are brought forward, significance of the study, and scope of the project are specifically discussed in this part of the project report.

Kyambogo University is located in Kampala, Uganda. It is Uganda's third public University established by the Universities and Other Tertiary Institutions Act 2001, and its instruments were set up in 2003 as a merger between Uganda Polytechnic Kyambogo, Institute of Teacher Education, Kyambogo and Uganda National Institute of Special Education (Kyambogo University Website, 2015).

The Department of Computer Science, in the Faculty of Science at Kyambogo University, offers three courses; Bachelors of Information Technology and Computing, Bachelors of Information Systems and Diploma in Computer Science (2014-2015_Direct_Entry_Application_Guide_and_Advert2, 2013). The Testimonial Generating System is designed for the Department of Computer Science at Kyambogo University.

1.1 Background to the Study

Kyambogo University testimonials provide detailed and accurate student results but are not made available as urgently as the student would expect. Many times students apply for testimonials in a bid to beat urgent deadlines but are let down due to the procedures in processing, even at Faculty level. Furthermore, processing is often done during the Semester breaks, at Faculty level (Office of the Faculty Administrator, Faculty of Science, Kyambogo University, 2014).

Testimonial Generating System is a system independent of a centralized University setting. Each Department handles its own student databases and results for the sake of urgent testimonials' delivery. The system operates in an offline mode and as a stand-alone system.

Testimonials are detailed results of students, for the semesters they have attended. Some Universities refer to them as Transcripts (University of Sheffield, 2015) as they bear semester results. There are universities that issue transcripts online (Cambridge University, 2015).

1.2 Problem Statement

Kyambogo University testimonials take a long time to be processed and tend not to bear the most-recent results, neglecting urgency and bearing incomplete detail, and this is one of the problems faced by graduates while looking for jobs. In this study, we contributed to the solution by designing a Testimonial Generating System for the Department of Computer Science at Kyambogo University.

1.3 General Objective

The main objective of the study is to make a Testimonial Generating System that offers timely delivery of testimonials, at Department level, bearing all the available semesters' results for any given student.

1.4 Specific Objectives

The specific objectives of the study are:

- i) To study the testimonial generation methods at the Faculty of Science in Kyambogo University.
- ii) To design and implement a Testimonial Generating System.
- iii) To test and evaluate the designed system.

1.5 General Research Question

The general research question for the study is how do we design and implement a Testimonial Generating System?

1.6 Specific Research Questions

The specific research questions of the study are:

- i) How do we study the current testimonial generation methods at Kyambogo University?
- ii) How do we design and implement a Testimonial Generating System?
- iii) How do we test and evaluate the designed system?

1.7 Significance of the Study

Due to multiple constraints that keep Faculty administrators from generating testimonials on demand, and the need to give students, parents and employers access to all detailed and available University results of students on demand, as well as, to dissipate the testimonial generation workload over departments at the Faculty of Science, it was significant to carry out the study for the design and implementation of a Testimonial Generating System for the Department of Computer Science at Kyambogo University. The TGS would also help keep track of results and avoid scenarios where marks are missing on transcripts and cannot be traced. This problem has happened before (The Observer, 2012).

1.8 Scope of the Study

The project was centred on the design and implementation of a Testimonial Generating System for the Computer Science Department in the Faculty of Science, Kyambogo University in Kampala, within the study period of January 2015 to June 2015.

Chapter 2

Literature Review

Here, we review the current related literature on testimonial generation systems and how they work in relation to the Department of Computer Science at Kyambogo University. We focus on testimonial generation methods in general, factors that influence testimonial generation methods, things needed to set up a Testimonial Generating System and a brief overview on the Testimonial Generating System.

2.1 Testimonial Generation Methods in General

Testimonial generation methods vary for any given University or even Faculty. Depending on the available technology, a testimonial may be manually typed and printed out or automatically generated using a computer system bearing a frontend user interface and a backend database management system. Kyambogo University manually types the testimonials (Office of the Faculty Administrator, Faculty of Science, Kyambogo University, 2014). There are universities that issue testimonials/transcripts online using computerised testimonial generating systems, for example, the University of Cambridge (Cambridge University, 2015).

2.2 Factors That Influence Testimonial Generation Methods

The need for detailed academic results by students, parents and employers is the main factor that leads to the generation of testimonials, otherwise, students wait for their results in a class list that is pinned on a notice board or posted to the University website (Kyambogo University, 2014) in the case of Kyambogo University. Many students who do not seek testimonials only receive transcripts, with all other students, during or after graduation. These transcripts also tend to delay in processing, which runs for some months after graduation (Kyambogo University, 2014). The academic transcripts contain all the student's results in detail.

The cost of obtaining a testimonial is another factor. A student visits an online payment portal (Kyambogo University Portal, 2014) processes a payment of UGX 3,000 for a

testimonial, receives a token or receipt number, then goes ahead to pay the money plus bank charges of about UGX 2,500, having indicated the token number then takes the receipt or bank-slip (University copy) and an application letter for a detailed or partial testimonial to the Faculty Administrator. From there on, availability of the testimonial is dependent on the time the Administrator will find viable for looking into students' results, usually and unfortunately, during the semester break (Office of the Faculty Administrator, Faculty of Science, Kyambogo University, 2014). The cost is quite high (UGX 5,500 give or take) but the length of time it takes to get the testimonial is far worse, warding off many who would have dared to initiate the process.

The available technology is also another factor. Kyambogo University does not have an automated computer system for generation of testimonials hence the testimonials are manually typed out (Office of the Faculty Administrator, Faculty of Science, Kyambogo University, 2014). Some institutions implement automated computer systems to generate results, testimonials or transcripts for example the University of Cambridge (Cambridge University, 2015) and the University of Sheffield (University of Sheffield, 2015).

2.3 Things Needed To Set Up a Testimonial Generating System

To set up a TGS, there have to be students' details and credentials, academic results for various semesters, computers, student databases, administrator databases, authorization from the University, proof on the part of the student that they are part of the University (Usually the Admission Letter and University ID), proof of payment for the testimonial by the student, printers and printing paper.

2.3.1 Getting Started

University records or databases that are needed to prove existence or validity of students have to be in place. Also, records or databases bearing academic results for every semester studied by any given intake of students have to be available.

2.3.2 Choice of Testimonial Generation Methods

Now, testimonials maybe typed out manually or automatically generated by computers. Manually typing testimonials is very tiresome and error-prone as compared to automated generation of testimonial with input from a database. Kyambogo University uses the manual

method of typing out testimonials (Office of the Faculty Administrator, Faculty of Science, Kyambogo University, 2014). However, an automated system may have errors in the program code, which if left unchecked, may lead to false results. This is the one major item left to the system developers to fix, preferably, ahead of time. Depending on the available technology, facilities or resources, an institution will be able to determine which testimonial generation method best suits them. The University of Sheffield uses an automated system (University of Sheffield, 2015).

2.3.3 Setting up a Testimonial Generating System

Using the available requirements, the records pertaining students' details and credentials are stored in pre-defined databases. A manual system requires the results' administrator to type out the results in a presentable format, basing on data in the databases, then forward the results for printing, signing and stamping. An automated computerized TGS simply requires a computer program to link to the available databases and select results and details for a select student, then return a document for printing, signing and stamping.

2.4 Testimonial Generating System

The University of Sheffield uses a testimonial/transcript generating system, which is a software designed to automatically generate detailed and up to date testimonials at the University. TGS is a software that automatically does the same at department level for Kyambogo University. TGS uses a MySQL database, a Java build-up of a GUI and backend, iText programmable PDF software (iText PDF software, 2015) for formatting the output, and has secure password settings. Databases can be updated as well as backed up anytime. Henceforth, testimonials can be generated on demand. In light of this, we went ahead to design and implement a stand-alone TGS for the Department of Computer Science at Kyambogo University.

Conclusion

We have looked at the current related literature on TGSs, testimonial generation methods and factors that influence them, things needed to set up a TGS and a brief overview on the TGS. We now move to the methodology used to design the TGS in the next chapter.

Chapter 3

Methodology

Here, we describe the steps, methods or approaches used during the study of Testimonial Generating System design and implementation for Department of Computer Science at Kyambogo University. This was achieved by studying the current testimonial generation methods at faculty level, design and implementation of TGS, and testing and evaluation of the developed system.

3.1 Analysis of Current Testimonial Generation Methods

In order to study the current testimonial generation methods and come up with an effective TGS, the following methods were used:

3.1.1 Observation

We observed the current testimonial generation methods at the Faculty of Science in Kyambogo University and discovered that the work is majorly done by the office of the Faculty Administrator during semester breaks. Students had to drop application letters for testimonials with proof of payment thereof at the same office. We also noted that each testimonial was worked on individually, for any given course at the faculty. We noted that the testimonials were worked on during semester breaks (Office of the Faculty Administrator, Faculty of Science, Kyambogo University, 2014).

3.2 Design and Implementation

The design and implementation of the Testimonial Generating System was achieved through the following:

3.2.1 Design

Mock ups and sketches of proposed databases, table structures and GUIs were drawn on paper. Communication modules between the database and the program code were also sketched out and suggested working code noted down.

3.2.2 Implementation

The need for a timely testimonial generation method by students at the Department of Computer Science, Kyambogo University, led to the implementation of the TGS using the designs that were drafted.

3.3 Test and Evaluation

Having designed and implemented the Testimonial Generating System, it had to be tested and evaluated. Tests and evaluations resulted into the following:

3.3.1 Testing

The solution was tested on development devices, that is, laptops and desktops, for functionality, bugs, appearance, responsiveness, output and running time. Sample inputs and databases were used as shown in Appendix A. After a series of tests, results were positive.

3.3.2 Evaluation

We observed the costs involved in the current testimonial generation methods as compared to the Testimonial Generating System and found that the TGS yielded faster results, was less tiring and offered a smaller workload than what is handled by the manual testimonial generation methods currently used by the Faculty of Science at Kyambogo University.

Conclusion

We reviewed methods used in analysis of the current testimonial generation methods, design and implementation a new TGS, and testing and evaluation of the TGS. The methods showed that the new TGS was found fitting for the goals for which it was designed. We now move to the analysis and design of the TGS in the next chapter.

Chapter 4

System Analysis and Design

Here, we basically focussed on converting the whole design and procedures into an executable program built on code, bearing GUIs and backend databases. The system was designed in Java, iText for output and MySQL, using XAMPP-server to link the TGS to the databases. Front end GUI was in Java, backend code in Java, output was generated using iText and databases were in MySQL. We focused on system analysis and system design.

4.1 System Analysis

Here, we reviewed the current testimonial generation methods used at the Faculty of Science, Kyambogo University which proved to be manual. The testimonials were typed out manually. This led to system design and development of the Testimonial Generating System that met the expected requirements. We studied the detailed requirements of the TGS under design and what it was expected to do.

4.1.1 Requirements Specification

In this section, we translated the information gathered during analysis into documentation that defines, to greater depth and detail, the requirements in two sets; user requirements and system requirements. Details were as follows:

User Requirements

After testing the TGS, it was documented thus: a user manual for the TGS users and super-users or administrators, and a technical manual for the people who will maintain the TGS. User requirements were broken down into functional and non-functional requirements:

Functional Requirements:

The statements here describe the functionality of the TGS. The TGS performs generation of testimonials, updating of databases, uploading of CSV documents containing values to be placed in results' databases, querying results by the results administrator or TGS user, user management and database monitoring by the super-user. The TGS GUI also allows for navigation from one interface to another.

Non-Functional Requirements:

The statements here describe the priorities, rights or permissions in the TGS as well as the appearance and behaviour of the TGS. The users have limited rights and these vary between the super-user and regular user. The two types of users are distinguished at login through authentication by use of passwords and login names. User limitations include viewing and editing permissions on databases; the super-user can edit the ordinary user database. The TGS is designed with error handling and alerts, and a user-friendly GUI.

System Requirements

The system is built on Java hence it should run on most OSs. The database management software XAMMP, will run on Windows 97 OS and higher, with alternatives; LAMP for Linux, MAMP for Mac and WAMP for Windows. The system is updatable to changing requirements and growing number of users or simply put; highly scalable. Start-up time and response time are both very small, that is, less than 5 seconds. System requirements were broken into hardware and software requirements:

Hardware Requirements:

These are the physical technical devices on which the system will run. A mouse or touchpad and keyboard used for input, a system unit for processing, a monitor for display and a printer for printing out the results. Minimum 512MB of RAM and 50 GB hard disk space.

Software Requirements:

The TGS was coded in Java, a programming language that is used to write programs that run on almost every OS, hence the host system should have the Java Runtime Environment installed. The databases were in MySQL and the server may be XAMMP, MAMP, LAMP or WAMP, installed on the host system. The output testimonial is a PDF document hence a PDF reader must be installed; preferably Adobe or Foxit.

4.2 System Design

In this section, we look at the GUI, databases, authentication security feature, processes in the TGS and the output of the TGS. We look at the operation of the TGS, the different functionalities and the output format. The TGS sub-systems include;

4.2.1 GUI's

The TGS interfaces were designed using the Java programming language. The TGS login GUI allows both the super-user and other TGS users to login on the same login form but using separate submit buttons. The TGS has an interface for adding or deleting users by the super-user, an interface for changing passwords, one for adding or deleting results databases, and another for processing testimonials. An error message is displayed, in case of invalid input, and further action denied save for a retry mechanism.

4.2.2 Authentication

The users of the TGS login with Identification numbers (IDNO's) and passwords. Ordinary TGS users are assigned a password and credentials by the super-user and can change the password when next they login. No un-identified user can login. The super-user logs in with ultimate control of the TGS.

4.2.3 Processes

The TGS has a number of processes namely; login authentication for each user, change of each user's passwords, generation of testimonials, uploading or deleting of results databases, and adding or deleting users by the super user.

4.2.4 Output

The TGS output is a PDF document with tabulated results, a header for the Office of the Dean, Faculty of Science in Kyambogo University. The PDF results document is ready for printing, signing and stamping by the same Dean. The PDF is generated by iText PDF software which is included in the distributable.

4.2.5 Database Design

The TGS databases store user data, students' data, as well as students' results submitted by the users. The TGS databases were designed in MySQL, are manipulated in Java and are connected-to via a local server offline. The server maybe WAMP or XAMPP for Windows OS, LAMP for Linux OS or MAMP for Mac OS. The TGS was designed to operate offline and so

were the databases. This section describes the designing of the databases to be used by the TGS. We look at the conceptual, logical and physical designs of the TGS databases.

Conceptual Design:

The conceptual design of the TGS databases involved setting up a model of entities and their corresponding attributes and relationships in accordance to the TGS sections in which they were to be applied.

Logical Design:

The logical design of the TGS databases involved setting up a data model of information used in the TGS. Databases were normalized and rules of data integrity were observed. TGS database tables were constructed with clear relationships as dictated by the conceptual design.

Physical Design:

The physical design of the TGS databases involved programming the databases using Java and MySQL and ensuring that the TGS connects to the databases. The relational data model was implemented, with data and relationships tabulated.

4.2.6 Tables

Tables were used to store different datasets that the TGS uses to manipulate its databases. Tables consist of rows, also known as records and columns, also known as fields. The tables used in the TGS are as follows:

Super-user Table:

The super-user table was designed to handle details of the Faculty Administrator as the ultimate authority in the TGS. It contains a number of fields namely; IDNO as the user identification, FName as the first name, LName as the last name, Position as the title, job or role of the TGS user in the Faculty of Science, and the Password as shown in Appendix A down below.

User table:

The user table was designed to handle details of the ordinary TGS users. It is not so different in design from the super-user table and contains fields namely; IDNO, FName, OName as the other names, Position and the Password as shown in Appendix A.

Computer Science Department Table:

This table contains the course codes and the full titles of the courses offered at the Department of Computer Science, Kyambogo University; the two are represented by fields CourseCode and CourseName respectively as tabulated in Appendix A.

Students table:

This table was designed to hold details of students for a given course and year of entry for example, bitc2012 for students pursuing a Bachelors of Information Technology and Computing with year of entry 2012. The multiple fields are shown in Appendix A.

Results Table:

This table is a sample format for students' results that are submitted to the Head of Department and to the Faculty Administrator as drafted in Appendix A.

Chapter 5

TGS Implementation

This section covers the implementation of the design discussed above and the working protocols of the TGS in action. The TGS was developed using the Java programming language based on the designs above. We specifically look at the interfaces and explain the functions they perform.

Login Page:

This is the first GUI once the TGS is launched. It functions if the server is running Apache and MySQL. It is a platform for both the super-user and ordinary TGS user to login, by capturing the IDNO and password and cross-checking with the TGS user databases as shown in Appendix B. An invalid input will trigger an error message and deny login but will leave room for retrying.

Super-user Page:

This is the page on which the Super-user performs administrative roles and has access to multiple functions as shown in Appendix B. the super-user may add or delete a results database, add or delete an ordinary TGS user, generate testimonials, change password, log out or exit the system.

Logged in User Page:

This is the page on which the ordinary TGS user performs availed roles and has access to multiple functions as shown in Appendix B. the user may generate testimonials, change password, log out or exit the system.

Change Password Page:

This is the page from which a user can change their password. It is accessed by clicking the Change Password button on the Logged in user page or on the Super-user form for the Administrator. The user enters both old and new passwords and the old password is first confirmed by comparing it with the one in the database and the one entered. The image of the page is shown in Appendix B.

Add User Page:

This page is accessed by the super-user on clicking the delete user button. The credentials and password for the new user are entered and submitted. The password is however cross-checked for consistency so that the super-user can be sure of the password they assigned and take note. The image of the page is shown in Appendix B.

Delete User Page:

This page is accessed by the super-user on clicking the delete user button. (See Appendix B). The IDNO and names of the user are entered then submitted. The super-user ought to know the name of the user they are to delete as well as the IDNO.

Generate a Testimonial Page:

This is accessed by the user of the TGS by on clicking the Process a testimonial button. (See Appendix B). The registration number, CourseCode, year of entry, current year and semester of study are input and submitted. If the details are correct or the database exist, a PDF containing results (testimonial) is displayed in the default PDF reader; preferably Adobe or Foxit. The testimonial is ready for printing, signing and stamping. Otherwise, an error is displayed and the user has to retry.

Upload a Database Page:

This page is accessed by clicking the Upload a file button. The course code, year of entry, current year and semester constitute the name of the file to be uploaded to database, for example bitc2012_1_2 database is named after course code BITC, year of entry 2012, current year 1 and semester 2. (See Appendix B).

Delete a Database Page:

This page is accessed by clicking the Delete a file button. (See Appendix B). The operation is not so different from that of uploading a database save for the fact that the delete file button will trigger a command to empty the table in the database bearing the file name.

Add Student Details Page:

This page is accessed by clicking the Add Student Details button. The course code and year of entry constitute the name of the file to be uploaded to database, for example bis2012 database is named after course code BIS and year of entry 2012. (See Appendix B).

Chapter 6

Results and Findings

This chapter describes the results and findings that we came across during the study that was carried out at the Department of Computer Science, Kyambogo University in Kampala, Uganda. The findings are about the current testimonial generation methods used and related items whereas the results after implementing the Testimonial Generating System.

6.1 Findings

We found out that the Faculty of Science handled generation of Testimonials for all of its departments, including the Department of Computer Science (Office of the Faculty Administrator, Faculty of Science, Kyambogo University, 2014). We also noted that the testimonial generation and analysis workload lay entirely on one office; that of the Faculty Administrator. It was also discovered that the testimonials were mostly worked on during semester breaks, when time was found to be more available. We also found out that once testimonials were printed and submitted to the Office of the Dean, Faculty of Science, they were signed and stamped.

We discovered that each testimonial had a header bearing details and contact information of the Office of the Dean, Faculty of Science, Kyambogo University, as well as the University logo. The type of testimonial, that is, partial or full, the date of issuance, the name, registration number, programme, duration of study, years of entry and completion for the select student were beneath the header. The rest of the testimonial was broken down in a table describing the course codes, course units, grade points, grades and grade GPA for each semester. Semesters beyond first year, first semester bore the CGPA for the particular semesters.

We also discovered an application that calculates the GPA or CGPA using Kyambogo University's grading system. The application is GPA/CGPA Calculator (GPA/CGPA Calculator, 2015) designed for Firefox OS, Firefox Browser and Firefox for Android, and would install locally onto the computer if downloaded using the Firefox browser.

6.2 Results

The implementation of the Testimonial Generating System split the workload over various departments at the Faculty of Science, leaving a relatively small workload to the Department of Computer Science, and the role of signing and stamping the testimonials to the Office of the Dean, Faculty of Science. This sped up the process of testimonial generation such that testimonials were available on demand. The Department of Computer Science would use its results databases to generate testimonials using the Testimonial Generating System and submit them to the Office of the Dean, Faculty of Science for signing and stamping.

TGS was found to be effective in beating deadlines, making timely delivery and easing the workload at the office of the Faculty Administrator.

Chapter 7

Discussions, Conclusion and Recommendations

In this chapter, we discuss the work done on the Testimonial Generating System, the evaluation and objectives, the conclusion on the study and the recommendations for the future Testimonial Generating System.

6.1 Discussions

During the evaluation of the TGS, we had to look at the functionalities and objectives of the TGS, thoroughly analyse and compare them to the expectations of the TGS. The TGS was designed to generate testimonials at the Department of Computer Science, Kyambogo University, at a rate faster than that offered by the testimonial generation methods at the Faculty of Science, and bearing more up to date results, which are best found at Department level.

The main objective was to make a Testimonial Generating System that offers timely delivery of testimonials, at Department level, bearing all the available semester results for any given student. The TGS designed offered timely generation of testimonials just a click away, with the latest results as provided by the Department of Computer Science. To this end, the TGS delivered.

The specific objectives of this study were to study the testimonial generation methods at the Faculty of Science in Kyambogo University, to design and implement a Testimonial Generating System and to test and evaluate the designed system. We stayed true to the cause, resulting in efficiency in the study.

We completed the study with well-set objectives and evaluated the TGS basing on well-defined requirements hence the design, development and implementation were successful. The designed GUI allowed users to log in, change their passwords, query results using a registration number for a given student and output a file for printing. The TGS was accurate and used results as provided by the Department databases.

6.1.1 Problems encountered

We faced a number of challenges, among which include high expenditure on software and machinery used to design and test the system and transportation costs were the major strains on finances during the study. A lot of time was also spent on learning to use new software to use in the TGS development; in particular, iText tutorials. The iText programmable PDF software is licenced and charged for if distributed commercially, and we used it in development of the TGS. Buying a license is mandatory as soon as you develop commercial activities distributing the iText software inside your product or deploying it on a network without disclosing the source code of your own applications under the AGPL license. These activities include: offering paid services to customers as an ASP, serving PDFs on the fly in the cloud or in a web application, shipping iText with a closed source product. (iText sales, 2015).

6.2 Conclusion

The TGS met the design objectives and was found to be efficient in its capacity, very usable on the user end, timely in generation of testimonials and was conclusively more effective than the testimonial generation methods that were being used at the Faculty of Science.

The TGS is expected to deliver testimonials on demand, which would allow students, parents and employers quick access to students' results. The TGS is also expected to decentralize the testimonial generation workload to department level, which is expected to boost efficiency.

6.3 Recommendation

We made the following recommendations on improvements to be made in the near future to the Testimonial Generating System:

The TGS will be further developed for more advanced automation features based on feedback from users and any other design features considered suitable by the TGS developers. The output testimonial PDF will be digitally signed and emailed instantly to the student.

The users of the TGS will have to be trained accordingly for full utilization of the system in practice. The roles will have to be clearly defined for each type of user, that is, the super-user and the ordinary TGS user. The actions performed or functionalities of each page will have to be elaborated. The location of the PDF results output will have to be made clear, and how to go about printing the documents clarified.

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Appendix A

Tables

Field	Type
IDNO	Varchar(5)
FName	Varchar(20)
LName	Varchar(20)
Position	Varchar(30)
Password	Varchar(30)

Figure 4.5.1.1 Super-user table

Field	Type
IDNO	Varchar(5)
FName	Varchar(20)
OName	Varchar(20)
Position	Varchar(30)
Password	Varchar(30)

Figure 4.5.2.1 User table

Field	Type
CourseCode	Varchar(5)
CourseName	Varchar(50)

Figure 4.5.3.1 Computer Science Department table

Field	Type
No	Int(3)
FName	Varchar(20)
ONames	Varchar(30)
RegNo	Varchar(20)
StudNo	Varchar(20)
Duration	Int(1)
YrOfEntry	Int(1)
YrOfExit	Int(1)

Figure 4.5.4.1 Students table

Field	Type
No	int(3)
RegNo	varchar(20)
Sex	varchar(1)
HM 111 MK	int(3)
HM 111 GP	Float
HM 111 CU	int(1)
IT 111 MK	int(3)
IT 111 GP	Float
IT 111 CU	int(1)
IT 112 MK	int(3)

IT 112 GP	Float
IT 112 CU	int(1)
IT 113 MK	int(3)
IT 113 GP	Float
IT 113 CU	int(1)
IT 114 MK	int(3)
IT 114 GP	Float
IT 114 CU	int(1)
IT 115 MK	int(3)
IT 115 GP	Float
IT 115 CU	int(1)
TCU	int(2)
TWS	Float
GPA	Float
REMARKS	varchar(50)

Figure 4.5.5.1 Results table

Appendix B

GUI



The screenshot shows a web application window titled "Kyambogo University Testimonial Generating System". The page has a light gray background. On the left side, the text "KYAMBOGO UNIVERSITY" is displayed in large, bold, black capital letters. Below this text is a logo featuring an open book with a gear-like shape above it, containing the word "KYAMBOGO" and "UNIVERSITY". Below the book, the motto "KNOWLEDGE AND SKILLS FOR SERVICE" is written. Underneath the logo, the text "TESTIMONIAL GENERATING SYSTEM" is displayed in bold, black capital letters. On the right side, there is a login section titled "Login" in a bold, italicized font. This section contains two input fields: "IDNO :" and "Password :". Below these fields are two buttons: a red button labeled "Login" and a blue button labeled "Admin Login".

Figure 1: Login page

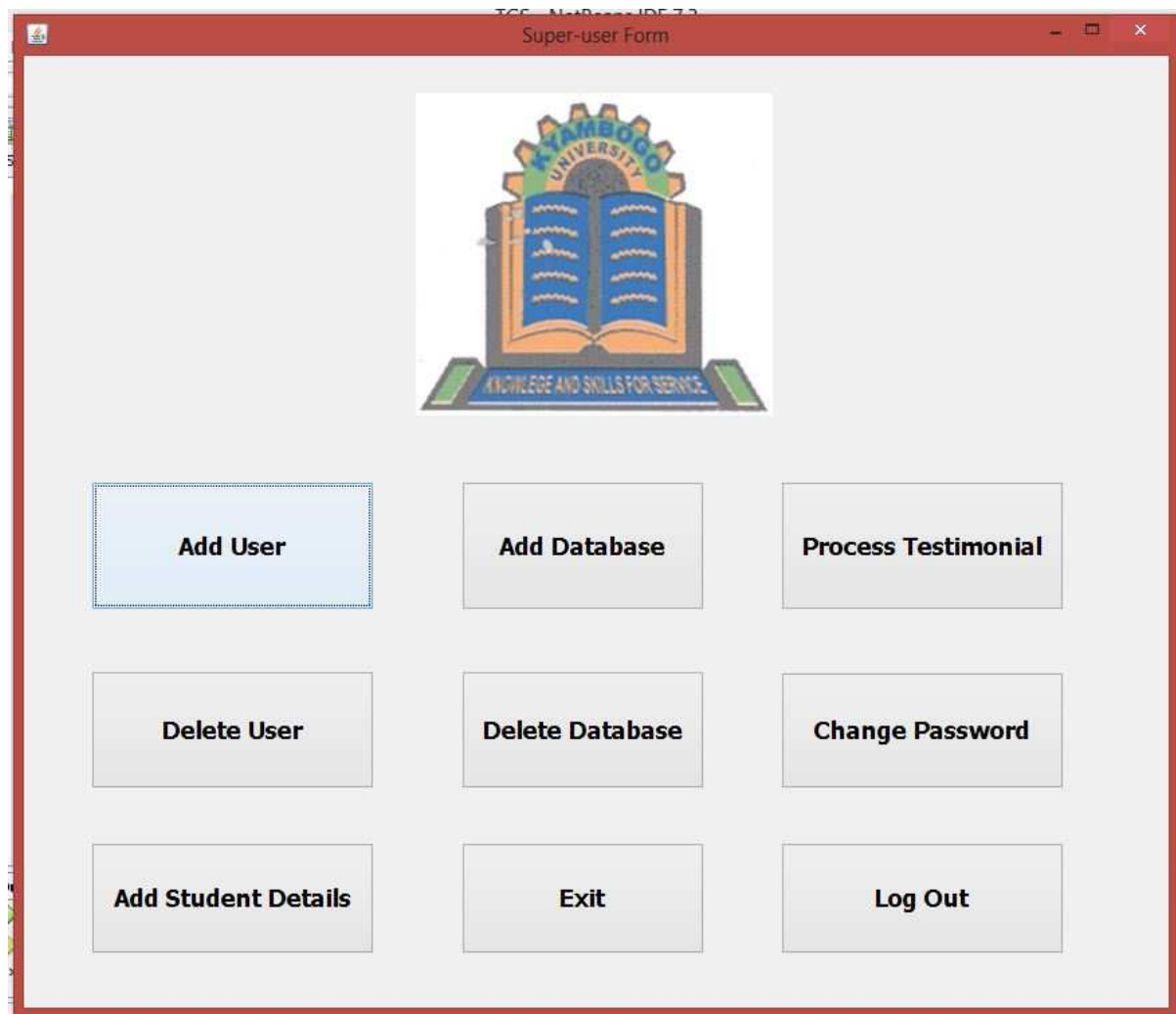


Figure 2: Super-user page

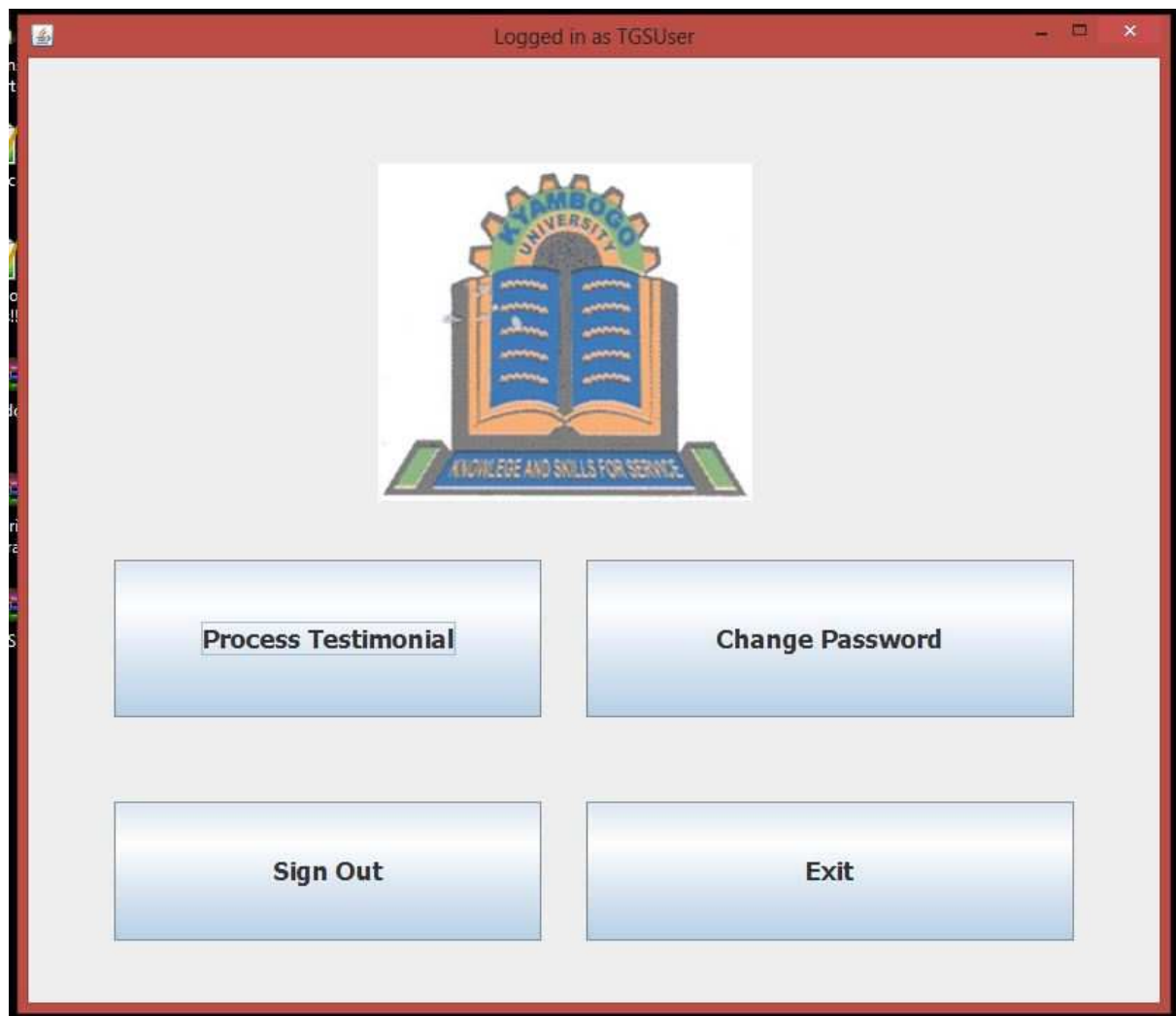


Figure 3: TGS user page



A screenshot of a 'Change Password' window. The window has a red title bar with the text 'Change Password' and standard window control buttons (minimize, maximize, close). The main area is light gray and contains four text input fields, each preceded by a label: 'IDNO :', 'Old Password :', 'New Password :', and 'Confirm Password :'. Below the input fields are two blue buttons with white text: 'Submit' and 'Back'.

IDNO :	<input type="text"/>
Old Password :	<input type="password"/>
New Password :	<input type="password"/>
Confirm Password :	<input type="password"/>
<div>Submit</div> <div>Back</div>	

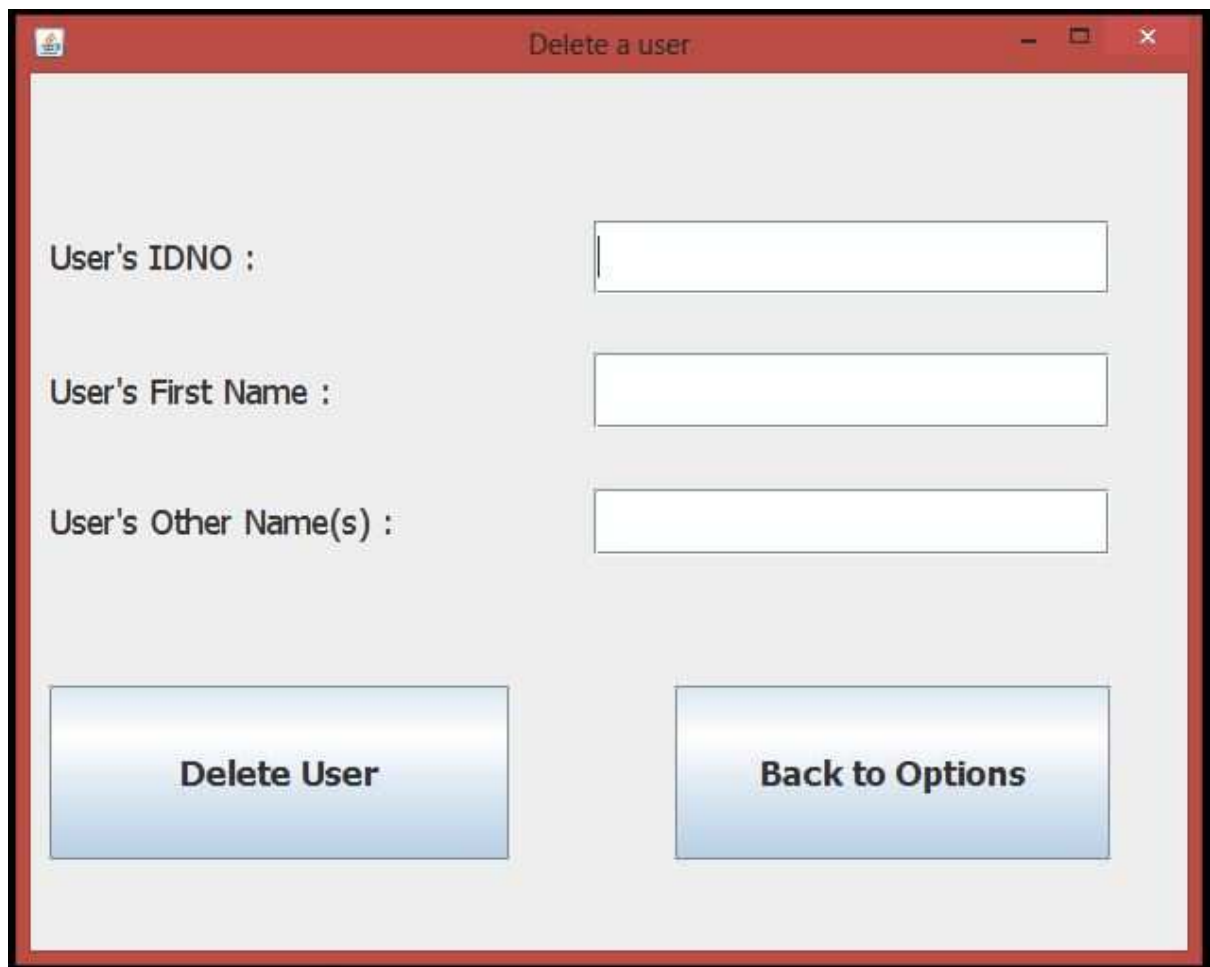
Figure 4: Change Password page

The image shows a software window titled "Add a user" with a red title bar. Inside the window, there are six text input fields arranged vertically, each preceded by a label. The labels are "IDNO :", "First Name :", "Other Name(s) :", "Position :", "Give Password :", and "Confirm Password :". Below these fields are two buttons: "Add user" on the left and "Back" on the right. Both buttons have a blue gradient and a 3D effect.

Field Label	Input Field
IDNO :	<input type="text"/>
First Name :	<input type="text"/>
Other Name(s) :	<input type="text"/>
Position :	<input type="text"/>
Give Password :	<input type="password"/>
Confirm Password :	<input type="password"/>

Add user **Back**

Figure 5: Add user page



The image shows a web browser window with a red title bar that reads "Delete a user". The window contains a form with three input fields and two buttons. The first input field is labeled "User's IDNO :", the second is labeled "User's First Name :", and the third is labeled "User's Other Name(s) :". Below the input fields are two buttons: "Delete User" on the left and "Back to Options" on the right. Both buttons have a blue gradient and a 3D effect.

User's IDNO :

User's First Name :

User's Other Name(s) :

Delete User **Back to Options**

Figure 6: Delete user page



The image shows a web browser window with the title "Generate a Testimonial". The window has a red border and standard window controls (minimize, maximize, close) in the top right corner. The main content area is light gray and contains several input fields and two buttons. The input fields are arranged vertically, each with a label to its left. The labels are "Registration number :", "Course Code :", "Year of Entry :", "Get results up to:", "Year (1, 2 or 3) :", and "Semester (1 or 2) :". The input fields are white with a thin black border. At the bottom of the form, there are two blue buttons with white text: "Generate Testimonial" on the left and "Back" on the right.

Registration number :

Course Code :

Year of Entry :

Get results up to:

Year (1, 2 or 3) :

Semester (1 or 2) :

Figure 7: Generate a Testimonial page

Upload a file

Course Code :

Year of Entry :

Current Year (1, 2 or 3) :

Current Semester (1 or 2) :

Figure 8: Upload a Database page

Delete a file

Course Code :

Year of Entry :

Current Year (1, 2 or 3) :

Current Semester (1 or 2) :

Delete Now!!!

Back

Figure 9: Delete a database page

Add Student Details

Course Code :

Year of Entry :

Upload

Back

Figure 10: Add Student Details page