

A PROPOSED EXAMINATION RESULT PROCESSING SYSTEM FOR UMARU ALI SHINKAFI POLYTECHNIC, SOKOTO WITH REFERENCE TO WORKFLOW AND APPROACHES USED IN USMAN DANFODIYO UNIVERSITY, SOKOTO

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ABSTRACT

The need for an improved result processing system for Umaru Ali Shinkafi polytechnic to overcome the problems of delays in releasing the results, missing grades, insecurity and misrepresentation of information among others is of serious demand due to its greater benefit to the institution. The study, therefore, proposed a solution by designing a graphical representation of the proposed model for effective, reliable, consistent, flexible and timely result processing system. The research employed the use of questionnaire which was distributed to 50 respondents of each of the two tertiary institutions in Sokoto state – Nigeria coupled with the literature of the existing result processing systems helped in obtaining the required information for coming up with the proposed design. The information got using the above methods helped in designing the Flowchart, Activity diagrams and Use Cases of an improved model using Microsoft Visio. Conclusively, the research proposed the use of MIS (central database design) and web-based interfaces as a means of addressing the aforementioned problems when implemented.

Keywords: *Result-processing, workflow, Uml-diagram, SITs (e-vision), MIS, Requirements specification*

INTRODUCTION

This study was geared towards proposing the examination result processing system for the Umaru Ali Shinkafi Polytechnic, Sokoto - Nigeria. The present system of result processing used by the institution is with its lots of challenges, such as misplacement of students' grades, difficulties in addressing students' problems on time due to inadequate and improper channels, likely misrepresentation of information due to manual operations, Inadequate of security and safe keeping of data as a result of which exams files are lost, inconsistency, redundancy and inflexibility of the whole process. The mentioned problems, therefore, is the reason behind this research study. The research focused on the process, workflow, formats, errors, weaknesses and regulations of result processing in the said institution with a view to comparing the procedures and method used by the like of Usmanu Danfodiyo University. Hence, this helped toward coming up with the proposed model for Umaru Ali Shinkafi Polytechnic, Sokoto to use for their students' result processing. Thus, this is done through questionnaire and UML (Use Case and Activity Diagrams) to model the improved and proposed model of result processing system for Umaru Ali Shinkafi Polytechnic. The achievement of the above aim will no doubt helps in minimizing the errors in students' results during the transition, provides a quick method of addressing students complains when something went wrong, instant access to students information, an instant update of students records, consistency, and flexibility of system etc. The research employed the use of questionnaire and observation to obtain the required and relevant information. Also, Unified Modeling Language technique is used to simulate these different examination processing systems and the proposed improved system.

Background to the study

Academic institutions such as Primary schools, Secondary schools, and Tertiary educational institutions are committed to education and research, where at the end of the day awards certificate or degrees to the successful candidates (Obasi, Nwachukwu, and Ugwu, 2013). The Sokoto state established the Umaru Ali Shinkafi Polytechnic, Sokoto (formerly the Polytechnic of Sokoto State) as one of the higher institutions in Nigeria Government vide Law No.2 of 2002. At present, the school consists of eight colleges namely: College of Science and Technology, College of Engineering, College of Administrative and Business Studies, College of Arts and Humanities, College of Basic and Preliminary Studies, College of Environmental Studies, College of Agriculture and Centre for Strategic and Environmental Studies.

At the moment, the Umaru Ali Shinkafi Polytechnic, Sokoto like some institutions in Nigeria is still using Excel-based result processing system. The method employed is not efficient enough due to the involvement of lots of paperwork in the process; thereby taking lots of time. However, the enrolment of students in all the colleges in the school is increasing every year. Hence, the computation of students CGPA has been onerous task and errors prone. Given this, Eyo, Ukem, and Ofoegbu (2012) rightly revealed that the end of the course grades assigned by lecturers is purposely meant to determine the level of success of each student in the class. Thus, a more accurate and efficient method is required for the grading system to avoid misinformation and wrong decision making. Therefore, the proposed model to overcome the situation is of paramount importance. It is in connection with the fact that, the factor that determines the management and administration performance of any given tertiary institution is the quality of

examination result processing and time taken to release that result to students (Oyeyinka and Oladipo, 2015). The grading system presently used in Nigerian tertiary institution is five point grading system Eyo and Francis (2012) and Ogala and Agware (2014). But with some slight differences for the polytechnic system as established by National Board for Technical Education (NBTE)

The below tables (Table 1.1 and Table 1.2) indicated the grading systems for NUC and NBTE respectively.

Score (%)	Grade	Grade value	Remarks
70 – 100	A	5	Excellent
60 – 69	B	4	Very good
50 – 59	C	3	Good
45 – 49	D	2	Average
40 – 44	E	1	Pass
00 – 39	F	0	Fail

Table 1.1 Five-points grading system for Universities by NUC (Eyo and Francis, 2012)

Mark (%)	Letter Grade	Grade Point	FINAL CGPA	Class of Degrees
100 – 75	A	4.00	3.50 – 4.00	Distinction
74 – 70	AB	3.75	3.00 – 3.49	Upper Credit
69 – 65	B	3.50	2.50 – 2.99	Lower Credit
64 – 60	BC	3.25	2.00 – 2.49	Pass
59 – 55	C	3.00	0.00 – 1.99	Fail
54 – 50	CD	2.75		
54 – 45	D	2.50		
44 – 40	E	2.00		

39 – 00	F	0.00		
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Table 1.2 represents the polytechnic grading system according to NBTE (Ogala and Agware, 2014).

The NUC and NBTE examination regulation provided a format on how credits hours are allocated to every course; this varies from one course to another. The variations are identified on the needs and scope of a particular course. The difference in scope leads into how much credit hour is allocated to the course (Ogala and Agware, 2014). The grade points obtained showcase the student's performance in a particular course. Thus, it is determined by the multiplication of grade (numeric grade) by the number of credit hours of that course. While the total grade points of all the courses are obtainable from adding up of all the courses s/he has undertaken. The Grade point average is got by dividing the total GP by the total of credit hours of all the courses s/he took in that period (Adeyemi, & Osunde, 2005). Given that, Eyo and Francis (2012) indicated how the GPA and CGPA are computed using the formula shown below

$$\text{GPA} = \frac{\text{Total Grade-Points of the courses offered in the year}}{\text{Summation of the credit hours of the courses in that year}}$$

The Cumulative Grade-Point Average (CGPA) in a given year is obtainable from the below formula. Computation of CGPA is the division of the summing up of the GP throughout the program and summing up the credit hours over the same period. Thus,

$$\text{CGPA} = \frac{\text{Cumulative sum of Total Grade-Points of the courses from Year One to the Present Year}}{\text{Cumulative sum of the Credit Hours of the courses from Year One to the Present Year}}$$

Aim and Objectives

The research aimed at proposing an improved model of examination result processing system for Umaru Ali Shinkafi Polytechnic's with a focus on what is obtainable in UDUS and other developed international institutions.

The objectives of this research are as follows;

- To analyze examination result processing systems by using a questionnaire to get different methods, models and approaches employed in examination' result processing.
- To use Unified Modelling Language (UML) to model the different methods and approaches highlighted.
- To replace existing activities with more enhanced features.

Significance of the study

The proposed model when design and implemented, it will help in addressing all the lingering problems experienced in the current system of result processing in Umaru Ali Shinkafi Polytechnic, Sokoto - Nigeria. The benefits of this study are not only in minimizing the errors in students' results during the transition, providing a quick method of addressing students complains when something went wrong, instant access to students information, an immediate update of students' records but also makes the entire process consistent and flexible.

Overview of the existing students' record keeping systems

The modes of record keeping systems in a tertiary institution in Nigeria are manual and Computer-based records systems respectively. But Osagie and Mallam (2013) in Earl and Katz (2002) are of the view that it is the responsibility of any tertiary institution to provide a proper way of managing and preserving the students'

data in an efficient manner. However, Akimosin (2014) in Vecchioli (1999) categorically stated that it is nearly impossible to organize and managed students' data into a cohesive and efficient system. Never the less, the general information of students such as name, ID, DOB, Sex, Nationality, Religion, etc. and examination results for each semester are expected to be properly computed and kept correctly (Osagie and Mallam, 2013). The information generated by the institution are organized and preserved in a file for use by various departments/units within the system. Thus, there is the need for proper definition of such file to avoid data duplication and inconsistency of the students' records in the registry/department (Eludire, 2011)

However, the solution to the conventional filing system is the database concept (Eludire, 2011). Given this, Akinmosin (2014) revealed that there are many ways of managing students' data. These methods include Student Information Systems (SIS), Student Management Information Systems (SMIS), Student Data Systems (SDS), and Student Data Warehouse (SDW) among others. Barrett (1999) summarizes the importance of a student information system as a collection of a software package that keeps up-to-date, supports, and provides investigation, inquiry, and channel of communication that change students' data into information to enhance the educational process. Also, managing of students' result is as well part of Student Information System (SIS package). According to U.S. Department of Education (2008) the students' data systems consist of both hardware and software capable of storing both present and archive data, consistent and frequent data organization and analysis, and coming up with the proper presentation formats or reporting interfaces. Also, information system helps in improving the quality and accuracy of admission,

registration and result processing activities (Clinton, 2012). The student information systems mostly in use today are server-based; with the program existing in a host computer and being retrieved by client applications at many places within and outside the institution (Hassan et al, 2011). From the above, therefore, many programs have been developed for use in a various tertiary institutions in Nigeria for keeping students' records and their examination result computations. Osagie and Mallam (2013) highlighted some of the programs such as Intelligent Knowledge-Based system using Microsoft Excel programming capabilities to capture the student data in cells. Another one is using the combination of MySQL Server, Adobe Dreamweaver, and PHP. MySQL for tables and data creation, Dreamweaver for codes and GUI while PHP for communication and manipulation of database respectively. Other contributors include Presentation of the Design and Implementation of a Client-Server Distributed Database for Student Results Processing by Lopez (2008). In this case, the relational database is used in such a way that each department in the university has its database, including the Central Record Processing Unit (CRPU), Exams and Record Unit, Student Affair Division, Dean's Offices, and Senate/academic board unit. Microsoft Visual Basic 6.0 and Structured Query Language (SQL) were used to design a prototype of a client-server distributed database for processing students' records.

Bamigbola, Olugbara, and Daramola (2003) presented an Object-Oriented Software Model for Students' Registration and Examination Result Processing in Nigerian Tertiary Institutions. The application was an instance of a well-modelled software system to testify to the beauty, power and supremacy of Object-Oriented paradigm. Hence, the use of predictor software metrics indicates that the software developed is reliable and elegant.

A software application for university students' results processing was presented by (Ukem and Ofoegbu, 2012). The system was designed to facilitate the automated processing of the results. The software was developed using Java programming language and MYSQL Relational Database Management System. The software can compute Grade Point Average and Cumulative Grade Point Average for each student based on examination scores entered.

All the reviewed researchers tried to develop an examination result processing to solve one problem or the other involved in current exam result processing systems. None of the research reviewed attempts to analyze and evaluates these examinations results systems. Even though the student information systems have been moving to the web and that development is moving rapidly to replace the older systems in various tertiary institutions. As such, this study is undertaken to analyze and propose an improved exams system for Umaru Ali Shinkafi Polytechnic sokoto - Nigeria.

Students' record keeping system with a focus on SITS:vision

SITS: Vision or E-vision is a student information system used by most of the universities and colleges in the UK and other developed countries. These institutions chose Tribal's SITS: Vision in order to stay ahead in the competitive global marketplaces. The SITS provided an easy way to the selected schools to record and track their student's full journey through the institution from the time they apply to study all the way through to Graduation. With E-vision, the universities and colleges can quickly recruit the best students, retain dedicated students, create the best students experience, analyze students' performance and produce world class graduates. The tribal group improves the way information is collected, collated, analyzed

and shared, providing rich functionality through an intuitive and engaging user interface. With SITS: Vision there will be support for data security, storage and implementation. The benefits of implementing SITS: Vision is of significant importance. It changed paper application forms to a paperless admission and also allows students to submit their assignments electronically and tutors to mark and send the feedback to the individual students via Vision web portal.

If E: Vision is introduced in the Umaru Ali Shinkafi Polytechnic sokoto; the students will have access to information related to their application and perform many other things such as:

- ✓ Flowing step by step on the situation of their application
- ✓ Getting additional information needed for the processing of their application
- ✓ Access copies of the letters and emails sent to them
- ✓ Access information related to finances
- ✓ Get the current news related to chosen the polytechnic and their courses
- ✓ Contact the Admissions Unit on the Applicant Helpdesk
- ✓ Apply for accommodation in our halls of residence
- ✓ See the induction and Welcome Week information
- ✓ Enrol on the courses etc.

Process and Workflow of the existing result processing system in Umaru Ali Shinkafi Polytechnic, Sokoto.

The process and workflow of the results processing and generation for students' appraisal involve the following steps:

- At the end of each semester, the lecturers will fill-in the "Score Sheet" with the information of each student in the class such

as Student ID, Name, Continuous Assessment (CA), examination scores, Total, and Grades respectively.

- Each lecturer/tutor sends the result to the head of the department (H.O.D) who is in charge of collecting and compiling the complete result of the respective department.
- The H.O.D will send the compiled result to the departmental exams officer for computation of semester Grade Point (GP) and CGPA using MS Excel-based system.
- After that, the result will be sent to the Vetter/college board examiners who will checkmate errors in the computed result for further correction by the exam officer.
- When this is done, the result will be finally sent to the academic board for consideration and approval. If there is any issue, the result will be directed to the department/faculty for further correction, but if there is no issue, the result will be approved.
- The approved result will be sent back to the department for students to see their performance.
- Finally, the approved copy of the result will be directed to the exams & record unit in the registry for subsequent transcript generation for the students.

The above result processing procedure is tiresome and easy to make a mistake in the process, thus, to change the above process and workflow of result processing into using SITS: Vision in our tertiary institutions in Nigeria is not only desirable but Paramount.

Role of Management Information System(MIS) in Tertiary Institution in Decision Making

Management information system (MIS) is computer-based information systems used in decision making within an organization (Samuel, 2013). But many institutions in Nigeria are yet to migrate

to the recent development of informatics. MIS is primarily employed in the tertiary institution to analyze other systems and sub-system dealing with operational activities. MIS handles activities such as admission process, Record Management, Exam results processing, and preparation of graduation list among others. With MIS in any given institution there will be right information to the right people at the right time; thereby enhancing the communication between staff/students, IT systems and the procedures it uses (Samuel (2013). Additionally, with MIS there is an instant movement of information between departments and colleges. And also reduce the need for face to face interaction among staff and students; thus, increasing the responsiveness of the institution by providing the instant result to students, quick addressing of result error when occurred, and keeping a consistent and reliable record of the whole organization(Clinton, 2012).

Research Methodology

The study made use of questionnaire and observation to collect information needed. This research targeted three tertiary institutions including Umaru Ali Shinkafi Polytechnic, Usmanu Danfodiyo University and Shehu Shagari College of Education. And the participants are lecturers, examination officers, H.O.Ds, the staff of MIS and members of academic board. In undertaking this research, a sample of fifty (50) questionnaires was distributed in each of the selected tertiary institutions. However, non-probability or convenience sampling was used because questionnaires were distributed to the participants. After data has been collected, it is analyzed using percentages in a tabular form. Also, some examination's result flowchart from the case study was equally used to help in this analysis.

Data analysis, interpretation and new approach proposal

The analysis of the questionnaire was discussed and information deducted was used to represent the proposed system adequately. The functional requirement/specifications of the proposed system of result processing were highlighted. The flowcharts, Use Cases and Activity diagrams were designed using the Microsoft Visio to represent the proposed system graphically. Research findings are presented in tables supplemented with some discussions.

Analysis and Interpretation

The study found out that Usman Danfodiyo University has a functional unit of MIS where the overall results are computed and managed. The Umaru Ali shinkafi Polytechnic generate their results at the departmental level before it undergoes final assessment and approval at the general academic board committee. The result of questionnaires distributed to the two institutions is interpreted in the sub-sections below.

Examination Result Regulations

The Survey of examination's result regulations in Usmanu Danfodiyo University Sokoto shows that only courses registered by students are included in result processing because majority of the participants about 90 (90%) chooses this option as shown in Table 1.1. But in Umaru ali Polytechnic the survey indicated that out of the 50 respondents, 95% (45) select that all the available courses in a semester are included in the computation of the result, whether the student registered the course or not.

Table 1.1: Courses included in result processing in the three tertiary institutions

Question	Institution	Option	No	%
Which courses results are included in result processing	UDUS	Only Registered courses	90	90.00
		All courses available	10	10.00
		Total	100	100.00
	UASPoly	Only Registered courses	0	0.00
		All courses available	45	90.00
		Total	45	90.00

This survey seeks to find out who are responsible for marking the examination. It is discovered that lecturers are responsible in all the tertiary institution under study with 150 participants as shown in the table below. In compilation and production of the result, ten (10) MIS staff indicated that MIS unit is used in Usmanu Danfodiyo University Sokoto whereas departmental exams officers/committee is responsible for computation of result in UASPoly with 50 participants.

Table 1.2: shows the responsibility for marking, compiling and production of results grades.

Question	Lecturers	Exams officer/ Depart. Comm.	MIS Staff	Student Advisers	Others	TOTAL
Who are responsible for marking the examination?	150	0	0	0	0	150
Who are responsible for compiling and production of the result?	0	50	10	0	0	60

According to the survey, the Usmanu Danfodiyo University Sokoto is using the degree classification ranging from first class – pass while in the Umaru Ali shinkafi Polytechnic is from distinction – pass. The computation of CGPA in Usmanu Danfodiyo University Sokoto is done per session; CGPA is computed as $(1\text{st Year GP} + 2\text{nd Year GP} + \dots + n\text{th Year GP})/n$ total units and the grade point used are (A – 5.00) – (F – 0.00). But in the Umaru Ali shinkafi Polytechnic, the computation of CGPA is done per semester; CGPA is computed as $(1\text{st Semester} + 2\text{nd Semester})/2$, and the grade point used is (A – 4.00) – (F – 0.00).

Examination Result processing workflow

Survey of examination's result processing workflow indicates that courses grade sheets are collected by departmental examination officers in both the tertiary institutions under study. The overall result is computed by MIS using the computer-based system in Usmanu Danfodiyo Sokoto but the Umaru Ali shinkafi Polytechnic compute their results at departmental level using excel-based system. And examination's result consideration has three stages in

both UDUS and UASPoly such as department, college/faculty, and academic board/Senate.

Examination’s Result abnormalities handling

The error usually occurs during examination's result processing. The causes of the irregularities, who handle the irregularities and the procedure for handling the abnormalities, are discussed in this subsection. The miscomputation by lecturers, wrong computation in the exam office is found to be the major examination's result abnormalities in the both tertiary institutions whereas wrong compilation by MIS is found only in UDUS. In the both tertiary institutions, 78 (52%) of the participants choose miscomputation by lecturers, 45 (30%) of the participants chooses wrong computation in the exam office and 27 (18%) of the participant chooses wrong compilation by MIS as shown in Table 1.3.

Table 1.3: How does result processing problem occurs in the both tertiary institutions

Question	Option	No	%
How does result processing problem occurs?	Wrong computation in exam office	45	30.00
	Miscomputation by Lecturer	78	52.00
	Wrong compilation and overall result computation by MIS	27	18.00
Total		150	100.00

Also, the major causes of error in result processing in all the two tertiary institutions are Missing grades having 74% (37) followed by error in GPAs having 20% (10) and none adherence to result

computational format by Stakeholders having just 6% (3) as shown by Table 1.4

Table 1.4: What are the major causes of error in result processing?

Question	Option	No	%
What are the major causes of error in result processing?	Missing Grades	37	74.00
	Error in CGPAs	10	20.00
	None adherence to result computational format by Stakeholders	3	06.00
	Misreading of handwritten results	0	00.00
	Confusion of similar names	0	00.00
Total		50	100.00

Furthermore, the majority of abnormalities in result processing at all the three tertiary institutions are handled by the lecturer concerned, departmental examination officer or departmental committee except in UDUS where the MIS staffs are involved.

UML activity diagrams showing examination's result processing workflow

Based on the above result's interpretation in UDUS, the lecturers mark the examination, compile and produce the students' grades. These result grades are compiled and computed by the exam officer. After compilation, the results are considered by the departmental board. That is, the result is moderated for corrections. If the results are found to have any problem(s) they will then be taken back to the

lecturer for corrections and back again for consideration by the departmental board. But, if the results considered are devoid of any problem they will then be taking to the faculty board for further review.

Also, if there are corrections at faculty board level, the results concerned will be taken back to the examination officer for corrections. The results then proceeds to MIS unit for overall computation and production of copies in the Senate/academic board format result for presentation. However, if there are errors with the results like missing grades and errors in computation of GPAs, the results will be sent back to the examination officer for corrections.

At the Umaru Ali Shinkafi Polytechnic, the model used is the same where only examination officers/committee works the same as departmental committee and computes the result grades and compiled for all courses available. After compilation, the results are considered by departmental committee. If the results have problem, they will be taking back to the examination officers to make correction and back again for consideration by the departmental committee or examination committee. But, if the results considered are not having any problem the departmental exam officers compute the overall results.

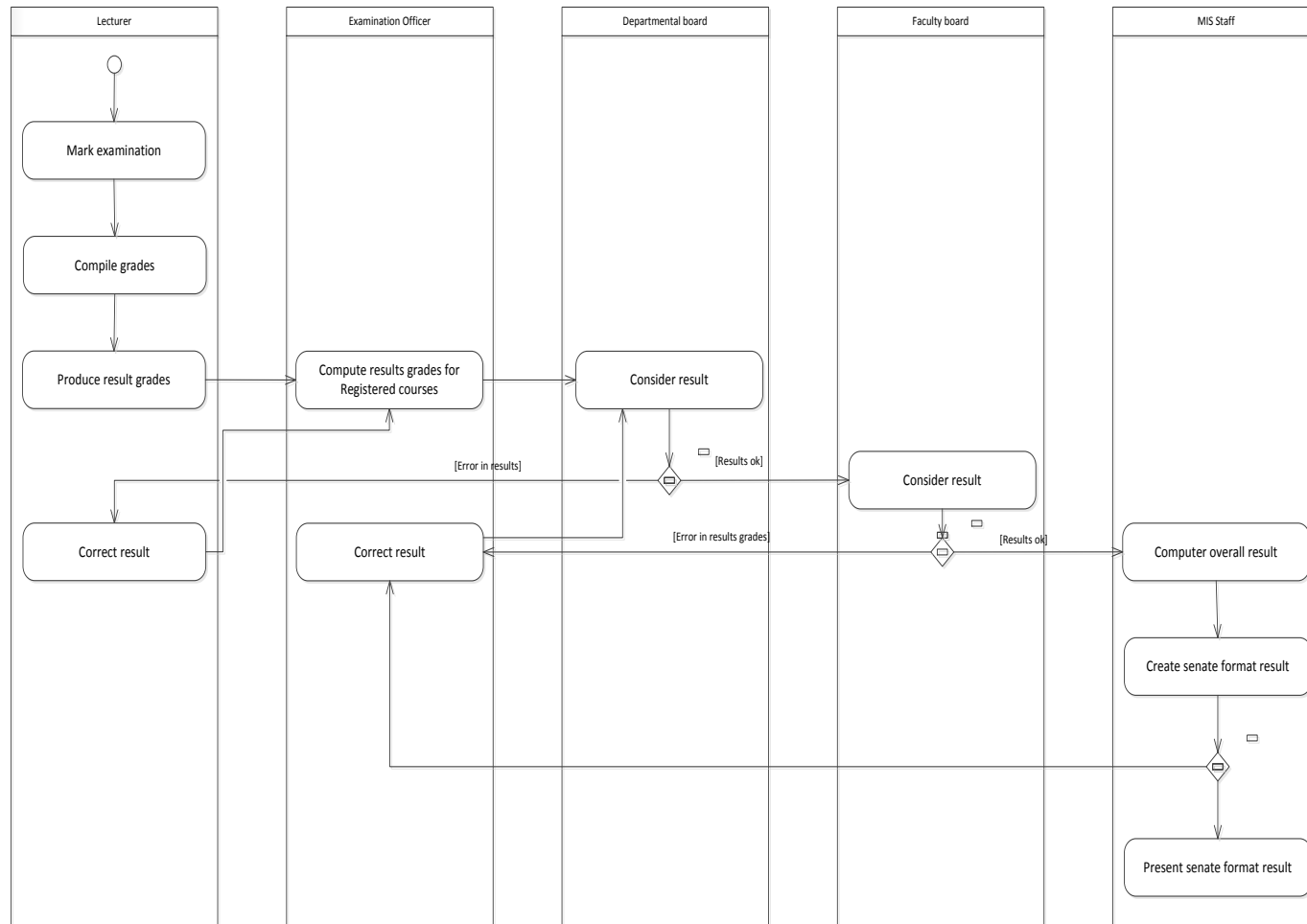


Figure 1.1: UML activity diagram of Usmanu Danfodiyo University Sokoto Examination Processing processes and Workflow

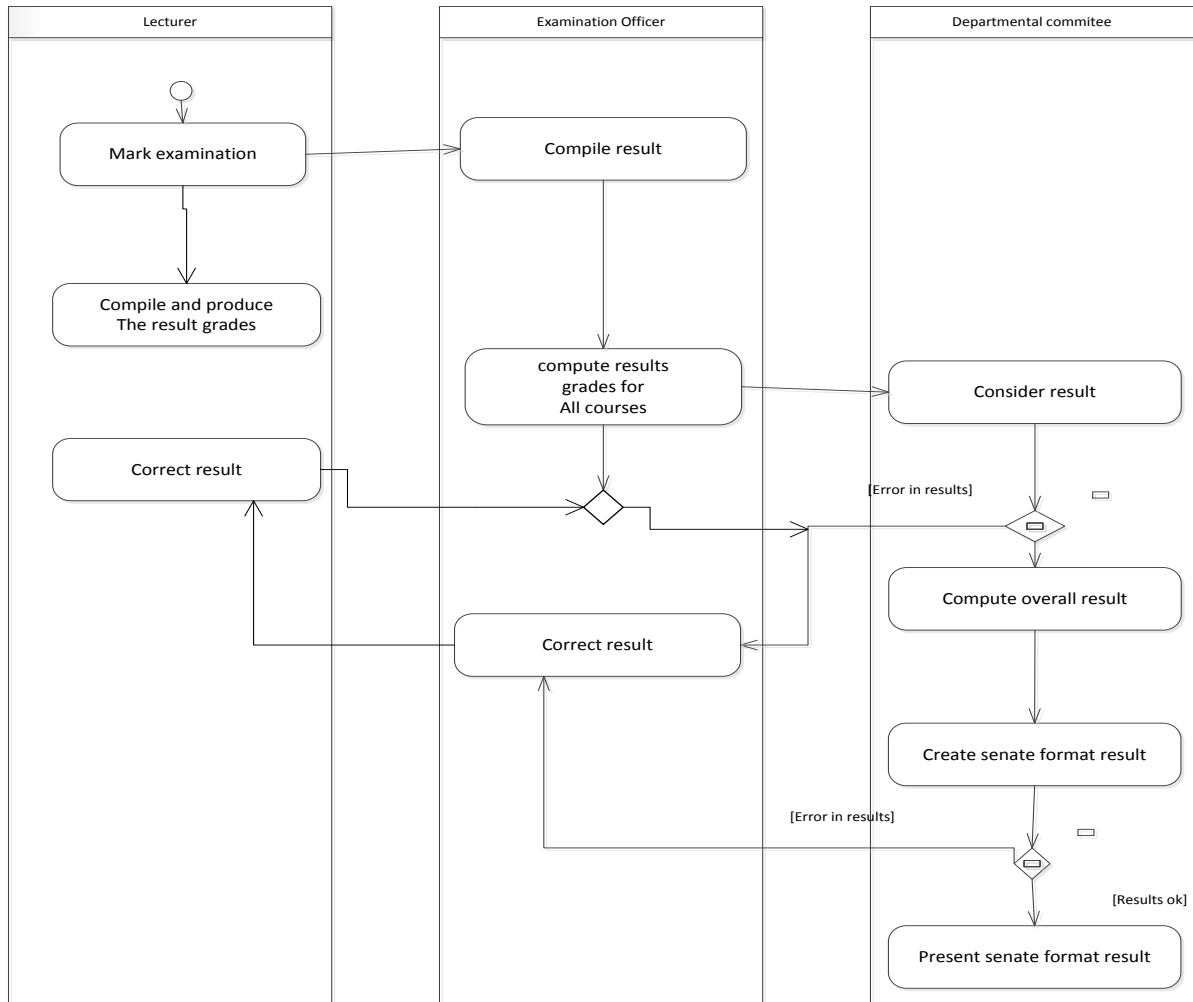


Figure 4.2: UML activity diagram Umaru Ali Shinkafi Polytechnic Examination Processing processes and Workflow

Proposed improvement for Sokoto State Polytechnic Examination’s result processing System

The aim of this proposed system is to enable secure, error-free, efficient, effective, excellent and timely result processing system for Umaru Ali Shinkafi Polytechnic and or any other institution that is still using the manual or Excel-based method. The system will provide the students with a module to which they can have access to

their personal details, course enrolment, coursework submission, view result among others. The system should ensure that all the key actors perform the operations efficiently. It should also store and maintain their details services to reduce much workforce involved in the current system.

Requirement Specification of the Result Processing System

User needs

Need	Priority	Concerns	Current situation	Proposed solution
Effective student enrolment	High	The present process of students' registration in UASPoly is taking much of the students and course advisor's time. It leads to too much of misinformation and making the entire process is inflexible.	The students register online but still print the registration form and go office to office for signing. The student later submits the signed forms to the department, college and registry for record keeping manually.	The proposed system should support full online registration/enrolment of students. The student can simply login to the system via enrolment page and register all the modules/courses s/he supposed to take at that particular academic year. The database should automatically store the record of all the registered students.
Effective and efficient means of result processing system.	High	The present system of result processing in UASPoly is tiresome, time consuming, error-prone, inflexible and inconsistent.	Most of the work is done conventionally.	The user 'self- services' approach is proposed so that lecturers can compute the result on an excel sheet and send the same as provisional result online for both management and students to view. Exams officer upload the sent results by lecturers to compute the result of all the registers courses in a semester to determine the GP of each student. The system allows the student to check their results and forward a complaint where necessary as soon as it is released. The MIS should compute the final class of degree and generate transcript automatically.
Design of	High	Unavailability of	The result is	The proposed system requires the

Database.		database designed for the student results and other related records in UASPoly led to loss of valuable data, improper keeping of records, changes and corruption in the students' result processing among others.	computed using Excel software. The number of students admitted into each programme in the institution is increasing every year; thereby making the computation with the current system very difficult, data delays, unauthenticity, and insecurity etc. The present system used only anti-virus as a means of security.	design of database as a solution to the current situation. The database must have the features of confidentiality, integrity availability, openness, non-repudiation, etc. the system should use firewall, intrusion detection system, powerful anti-virus software, regular back-up and apart from normal username and password for login by end-users.
Accurate Information	High	The incorrect computation and compilation of results lead to wrong grades and inaccurate class of degrees or diplomas. The wrong information results into a serious inconsistency of records and subsequent loss of reputation by the institution.	The registration and computation are largely done manually. There is much participation of human in entering data; resulting into human mistakes.	The proposed system updates Information related to students' results and management records automatically. The signatories of the system (Exams officer, HOD, Lecturers, etc.) are strictly responsible for computation of students' result and alteration where necessary. In case of any changes made, the system will be automatically monitored and restored such changes.
24/7 internet access to the end-users	Medium	Availability of internet is required for flexible access at anytime and anywhere for the end-users	The students accessed their record/results and other files at the exams office, HOD's office and registry.	The proposed system requires end-users to have 24/7 internet access to enable them performing their self service operations accordingly.

Requirement analysis

Requirement analysis is the source for any software/ project design (Maciaszek, 2007). It provides a sense of direction for developers on what to do and how to do it for successful execution of the project (Sommerville, 2016). The users of this system are the students, the exams officer, the lecturers and administrators (H.O.D, MIS staff, etc.).

Requirements elicitations were derived from the interaction (via questionnaire) with the end-users of this proposed system from Usman Danfodio University and Umaru Ali Polytechnic Sokoto.

Functional requirement of the proposed system/Deliverables

The functional specifications state what the planned system is to do (Pfleeger, 2001). It entails the list of services a system should render to the end-users.

The proposed system should be able to:

- ✓ Authenticates/validate the end-users of the proposed system's login credentials
- ✓ Allows the students to enrol/register their courses
- ✓ Allows the students to upload their assignments, assessment work/task online
- ✓ Allows lecturer (s) to send assessment feedback/individual result after marking the scripts
- ✓ Allows the students to view their provisional results
- ✓ Allows students to filled a complain form related to the released provisional result/individual result once a problem occurred
- ✓ Send an alert to H.O.D for any result 's complain raised by the students of the department
- ✓ Allows H.O.D to forward such result cases to the individual lecturers concerned for necessary action

- ✓ Allows exams officer(s) to compute students' GPA and CGPA respectively, in order to know the status of each individual student
- ✓ Provides means of authenticating results by going through vetting, departmental examination board, academic/senate board committees before final approval
- ✓ Generates senate/academic board format result.

Non-functional requirements: *The non-functional requirements of the proposed system should fulfill the following:*

- **Security:** No any unauthorized user should have access to the system. Validation should be done using Password and Username.
- **User Interface:** The proposed system interfaces should be clearly designed in such a way that instructions are given a clear path to the System. In the event of entering wrong data the Warnings and error messages are provided to prompts the end users of the wrongdoing in the system.
- **Scalability:** due to dealings with large number of students the system should be scalable, thereby supporting large volume of data that can be stored and accessed conveniently.

System Scope

The system should cover the services such as student enrollment, viewing personal information, submission of coursework/assignment online, assessment/ exams marking, computation of GPA and CGPA, uploading result online, view students results, filling complain form by the students and generating the Senate/academic board format result. These interactions between end-users and system are best achieved using web-based interfaces.

Flowcharts, Use Cases and Activity Diagrams

Clear pictorial representations of the proposed system are shown below to best define the data flow and activities of the actors involved in the system.

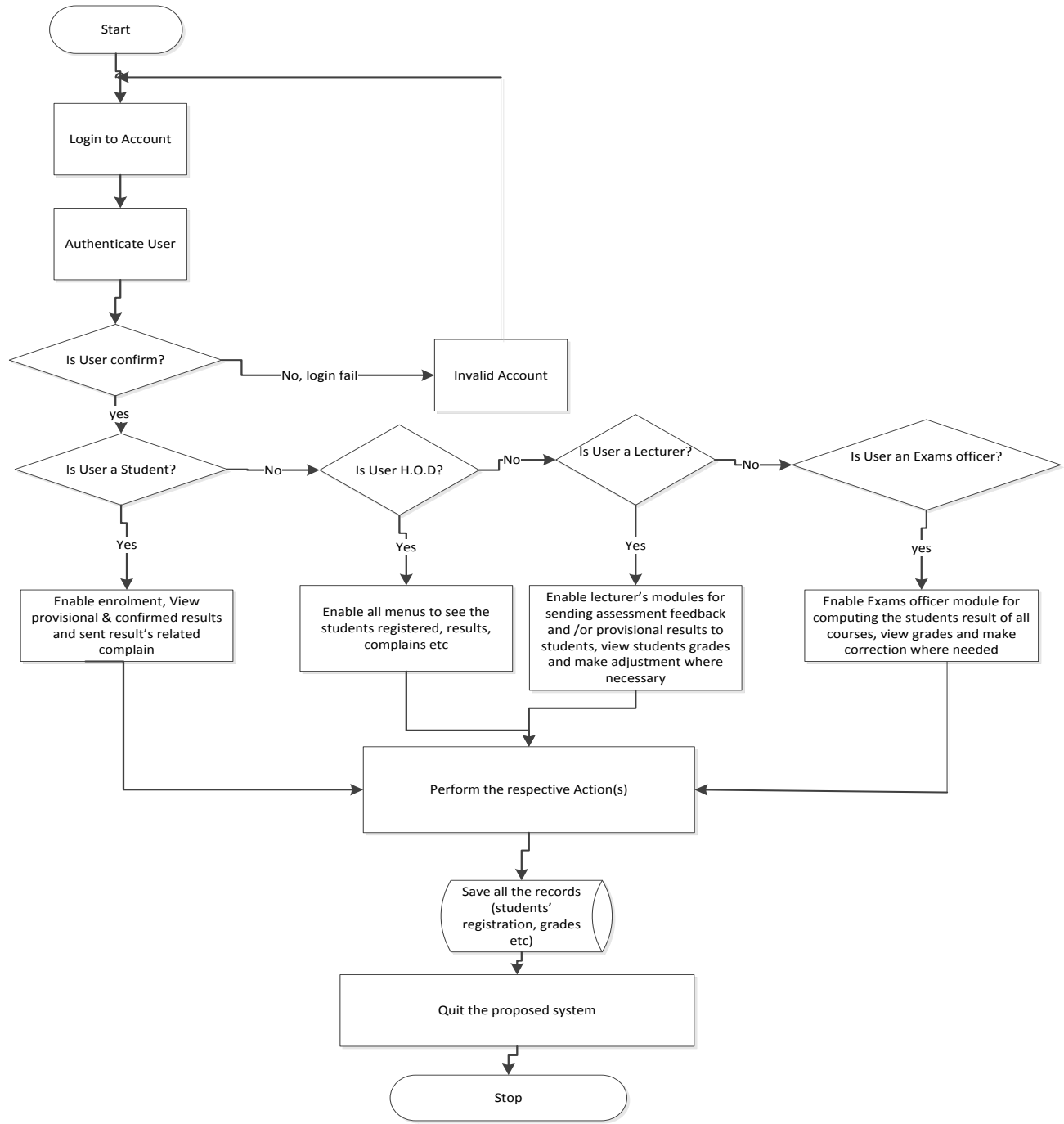


Figure 4.3: Flowchart of the proposed system

Activity Diagram of the proposed Improvement

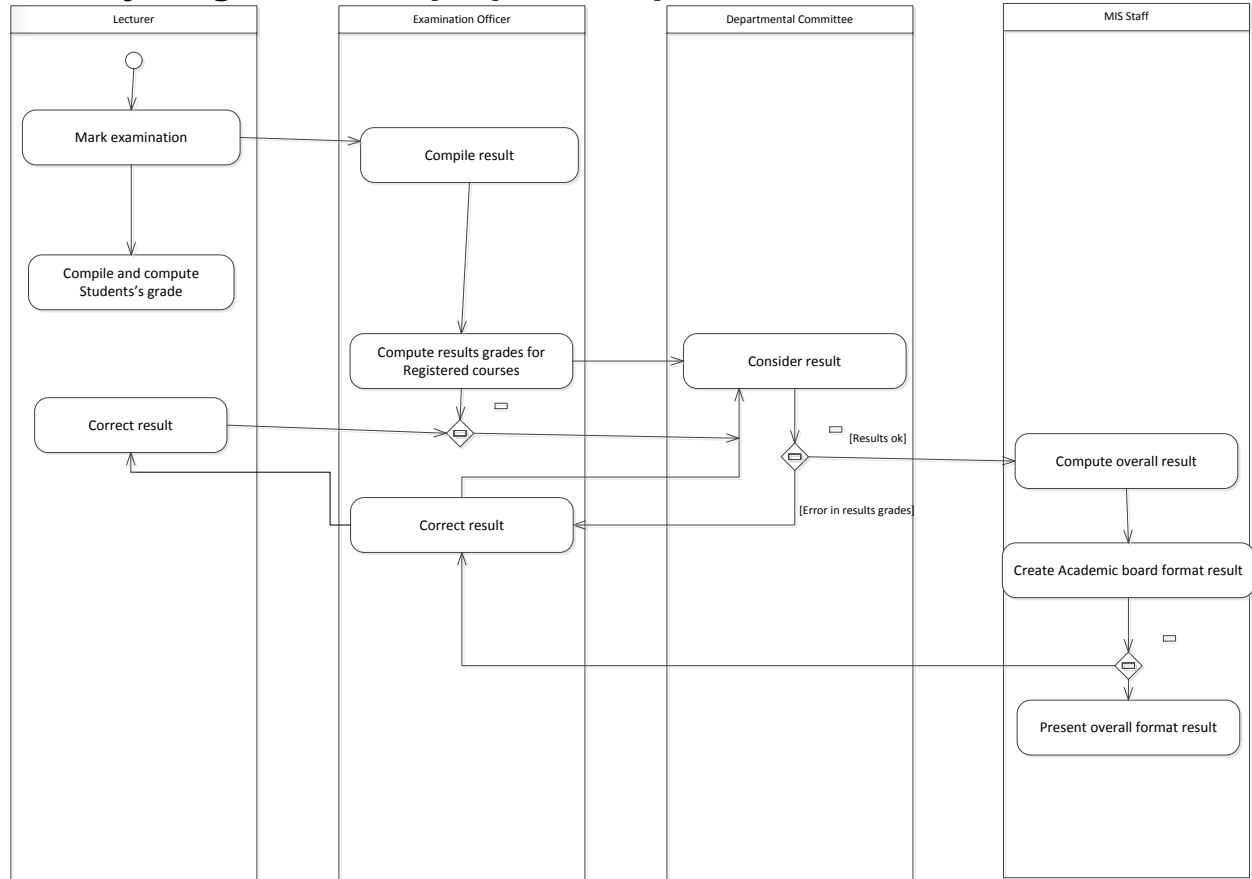


Figure 4.4: UML activity diagram of the proposed improvement of Umaru Ali Shinkafie Polytechnic Examination’s result Processing System

Proposed use cases of the proposed result processing system for Umaru Ali Shinkafi polytechnic

DESCRIPTION OF USECASES DIAGRAM

The below two use cases diagrams in fig 1.6a and fig 1.6b are used to depict the actions each of the users of the proposed system is expected to perform. The proposed system is expected to provide

an interface for student to register their courses/modules in each year, view result and make any complain related to their result. It must also allow the lecturers to upload the result after marking and make correction(s) to the grades where necessary before the final computation of the result. The HOD must see the list of registered students and view results for an appropriate action where necessary. The system has an Exams officer whose responsibility is to compute the result of all courses and make amendment to any result with a problem. The proposed system also employs MIS unit/staff who will oversee the compilation and storage of the entire school's results and generate an academic board format for the final approval.

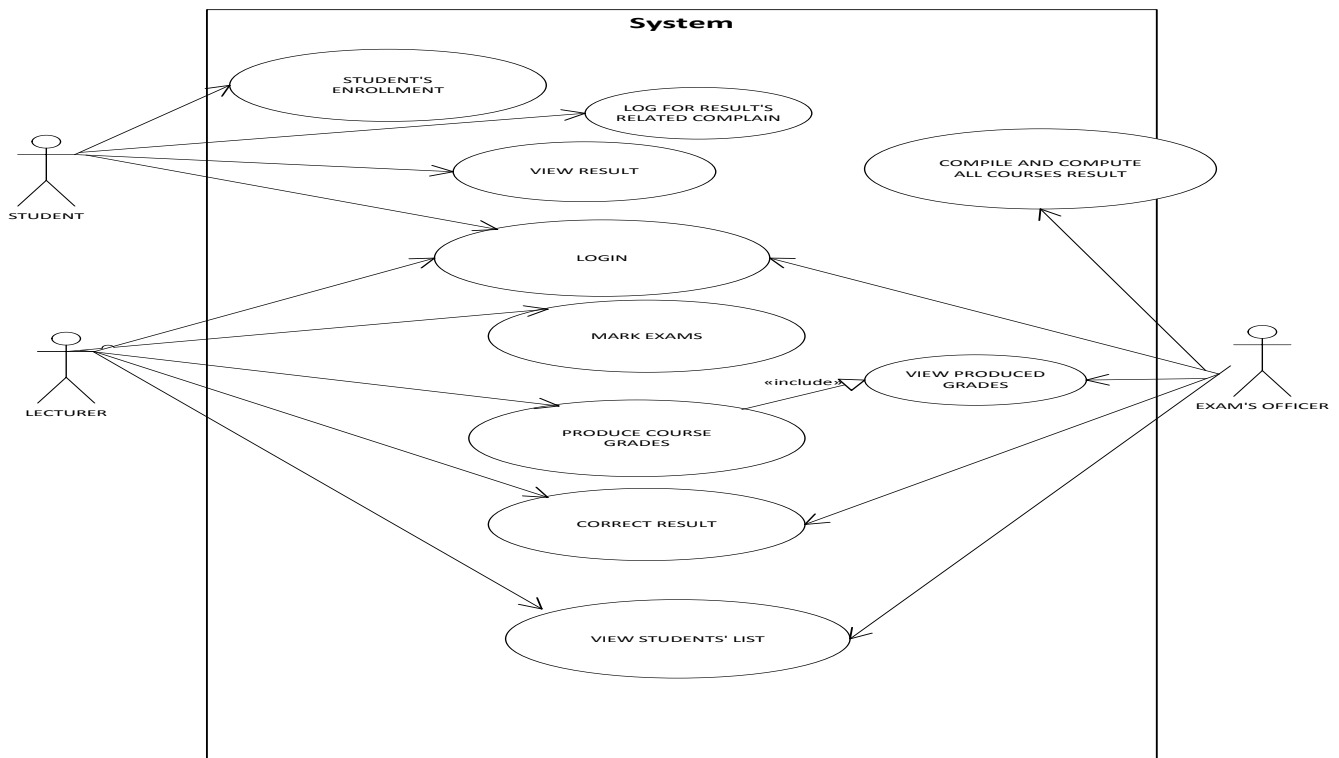


Fig 4.5a: showing the student, lecturer and exams officer interactions related to the result processing system.

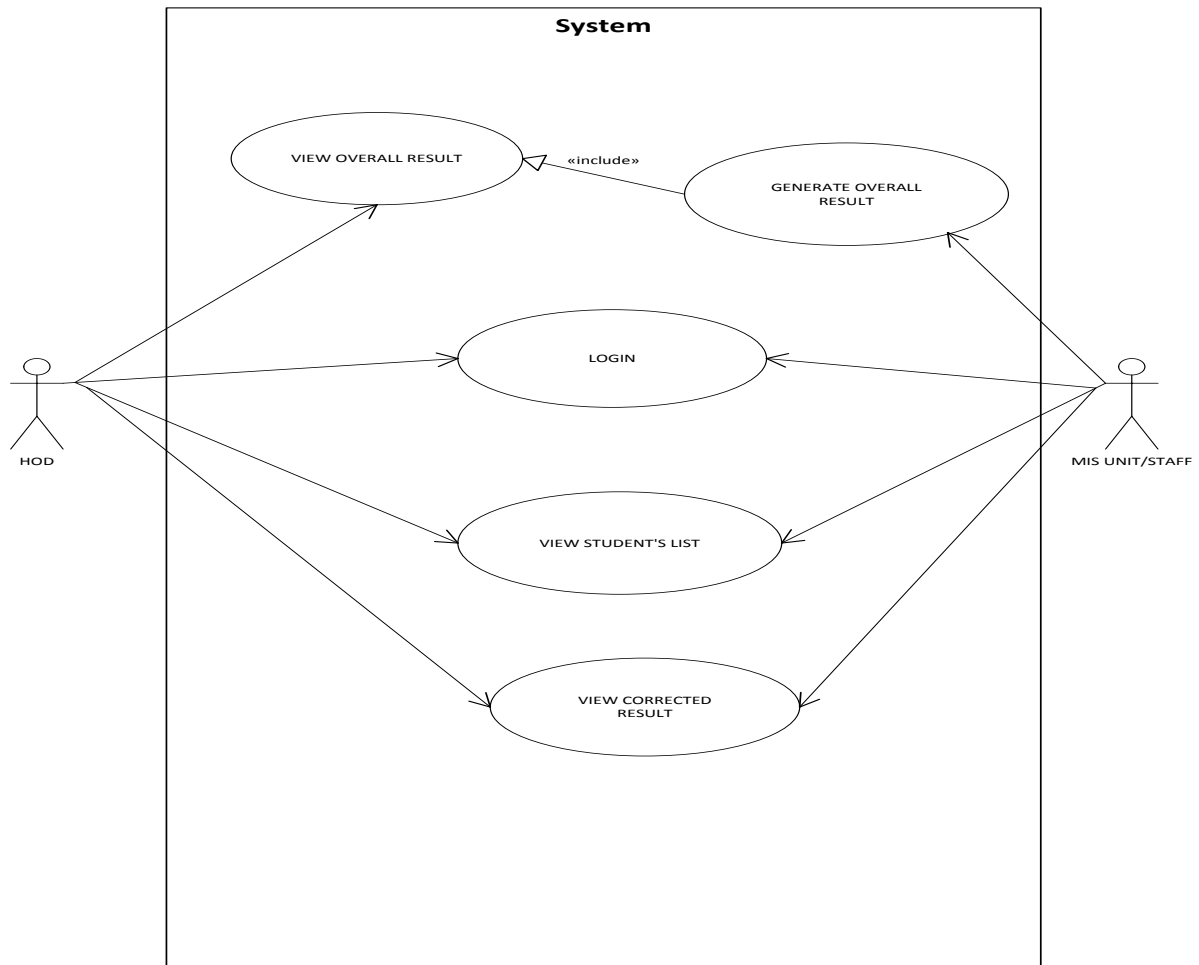


Fig 4.5b: show the relationship between HOD and MIS staff/unit with respect to result processing system

CONCLUSION

This research work proposed the examination's result processing system for Umaru Ali Shinkafi Polytechnic. The proposed system's features were captured and modelled using UML tools that gave a direction for a proper designing of an efficient examination's result

processing system. In the course of this work, the study has revealed that the use of MIS (central database) and web-based interfaces can bring about solution to the problems associated with the existing system employed in Umaru Ali Shinkafi Polytechnic for their result processing.

RECOMMENDATION

In improving the present result processing system in Umaru Ali Shinkafi Polytechnic sokoto – Nigeria, the following are recommended.

Enrolment and Result Compilation and Computation

- ✓ The system should be available for the students to register their respective courses so as to avoid unnecessary delays resulting into stopping students from attending classes on time.
- ✓ The lecturers should upload the provisional result online for students and management concern to view for further computation of GPA and CGPA by exams officers.
- ✓ Higher institutions in Nigeria that are still using the conventional method of result processing should employ automation of registration and result processing for active, reliable, consistent and less time-consuming production.
- ✓ It is suggested that the proposed system should support the feature of automatically alerting the students via e-mail or SMS whenever the result is released.

Database and application

- ✚ The central database must be designed with the features of integrity, confidentiality, authorization, availability, interoperability, scalability, openness, portability, non-

repudiation among others to offer a solution to the problems of redundancy, inconsistency, rigidity of the current record keeping system.

- ✚ The database should be fully secured by enforcing access control so that only authorized/registered users can have access to the system.
- ✚ The system must save all work of the users as a backup with their username, time and date.
- ✚ The system is recommended to automatically alert the users to change their password at every three months interval for security reason. When user failed to do that the system should automatically block the user, and this can only be resolved by login a call to the admin help desk.
- ✚ The study suggested the use of biometric for enforcing further control in accessing the system when adding/deleting a user by admin/module leader/ H.O.D and making some changes to the result by the lecturer, exams officers, and academic board/senate.
- ✚ The training of personnel involved in the proposed system is suggested for efficient and a smooth implementation of the new system

Using SITS as an alternative solution

The research as a matter of urgency recommends that all the tertiary institutions in Nigeria should employ the use of SITS for efficient, reliable, secure and proper records management. With SITS there is no more paperwork, there is maximum security, submission and feedback are done electronically; thereby making the whole process of applying to study up to graduation a memorable and pleasurable one.

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