

A Web-based Examination Management System

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Abstract

This research aims to develop a web-based system to produce electronic systems capable of assisting university faculty members in preparing exams and keeping them for years to come. It allows the creation and maintenance of a board for different types of questions based on the course learning outcomes. The system also initially supports three types of questions: multiple-choice questions, right and wrong questions, and essay questions. Faculty members can use these questions by creating a test paper by specifying some of the test specifications by specifying the required course and the learning outcomes to be covered from the specified course. After that, the faculty member can print the test and keep a copy on the system. The saved version on the system prevents the test from being duplicated afterward.

Keywords: *Web-based, Exam systems, learning systems, course learning outcomes*

1. Introduction

In today's world, time is a major concern. Any product that can effectively reduce time and power consumption is accepted and appreciated. Each year teachers and faculty members at education institutions across the world are searching for ways to properly evaluate their students' understanding of course content (1-3). A proven method for doing this is to test a student's knowledge using quizzes or exams. We are presenting a web-based System for Exam preparation that can reduce time consumption by replacing the conventional method of exam preparation (4-6).

The web-based system for Exam preparation is an application that has been created to aid faculty members in creating exams. The System will provide the tools for a faculty member to create and categorize questions. Questions created with the system can then be included in exams. Exams can be randomized. This functionality allows faculty members to focus on the content of the exam instead of the layout. Exams can then be shared with other faculty members (7-8).

The traditional way of preparing for exams has many drawbacks such as time-consuming since it is done manually. Generating test paper is challenges, tedious, and time-consuming For faculty members. Usually, the faculty members keep their question pool for test paper in any format to assist them in preparing for future exams(9).

2. Literature review

An Assistive Examination Processing System Based on Course Objectives Using a Binary Approach Algorithm, this research presents a web-based application that has been created to help prepare question papers for examinations depend on binary algorithm to selecting the questions, by defined the total of questions(10).

Online Examination System (OES), a web-based examination system. This Web-based model provides users with both Internet and intranet networks. The paper research developed a system that is going to helps staff to manage exams more effectively. It produces significant results, such as faster access and processing, and more accurate examination results (11).

The OES also focused on handle examinations online. This can be done through the Internet, intranet, or Local Area Network. Some Challenges facing of manual examination systems are The inaccurate results it provides, and difficulty of filtering of documents. The OES is more flexible, sufficiently quick and cuts down the huge amount of material required for manual examinations. The web-based examination system does all the work, including question executive, Questions paper design, and online exam (12).

The issue of examination test papers based on Computer-Based Testing (CBT). The study highlighted the features of computer-based test platforms for the Centre of Entrepreneurship Development and Vocational Studies (CEDVS) at the Federal Polytechnic, Ado-Ekiti, Nigeria. The study has identified freely available open source software (FOSS) for this purpose, called MOODLE. This software was used to develop a system for creating examination test papers (13).

3. Proposed Methodology

The methodology that will be used to develop the system to meet the main goal and to accomplish all the objectives is the waterfall methodology, which is one of the categories of rapid application development⁽¹⁴⁻¹⁶⁾.

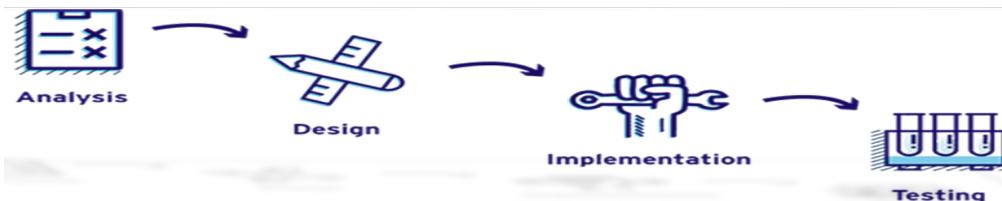


Fig. 1. System Development Methodology

4. Analysis

System Analysis is a process of systematic investigation for the purpose of gathering data, interpreting the facts, diagnosing the problem and using this information to either build a completely new system or to recommend the improvements to the existing system⁽¹⁷⁻¹⁸⁾.

2.1 Objectives Analysis

This project aims to develop an efficient and effective web-based system for automatically preparation of exam sheets. System eliminates wasted time spent on preparing exams sheet and enable faculties to do focus on teaching process and do their research work.

- Shorten the time on the faculty member to complete his other work.
- A fully automated system that not only saves lot of time but also gives fast results.
- Create an exam from existing Questions bank with just a few clicks.
- Saves the exams information in a database, and this make it an easier way to give exam teachers can add their exams rules in a totally automated system.
- Can be used anywhere any time as it is a web-based application.
- All Questions papers are saved for easy retrieval.

2.2 Analysis Diagram

The Analysis of the proposed system is basically achieved through the “Use case Diagram” depicted in figure 2 in order to provide the major services provided though our system as well as the system interaction with the various users.

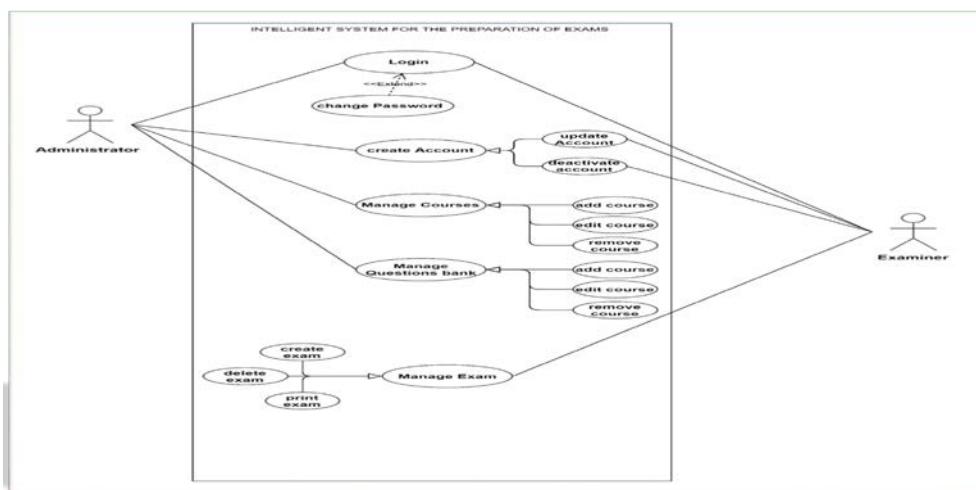


Fig. 2. Use case Diagram

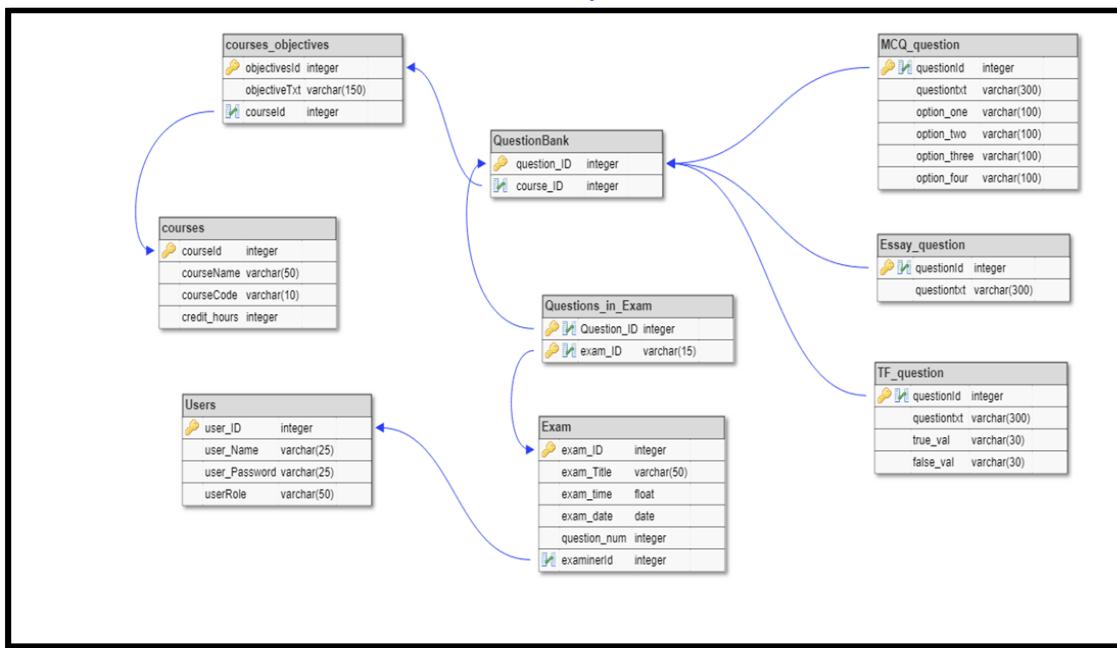


Fig. 3. Relational Model

Relational Model in figure 3 is an approach to managing data using a structure and language consistent with first-order predicate logic, where all data is represented in terms of tuples, grouped into relations[8]. A database organized in terms of the relational model is a relational database.

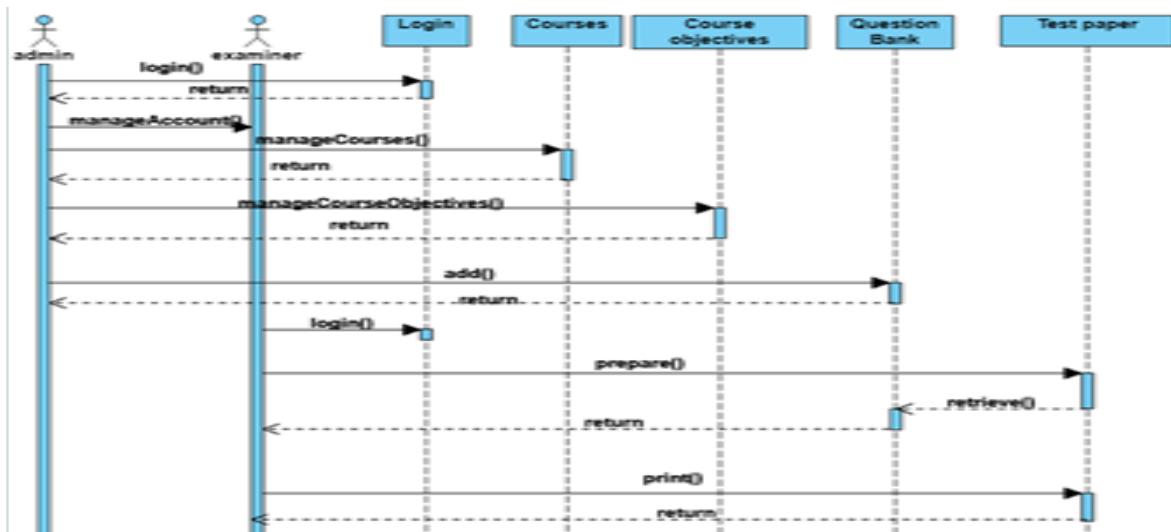


Fig. 4. Activity Diagram

A sequence diagram in figure 4 shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario.

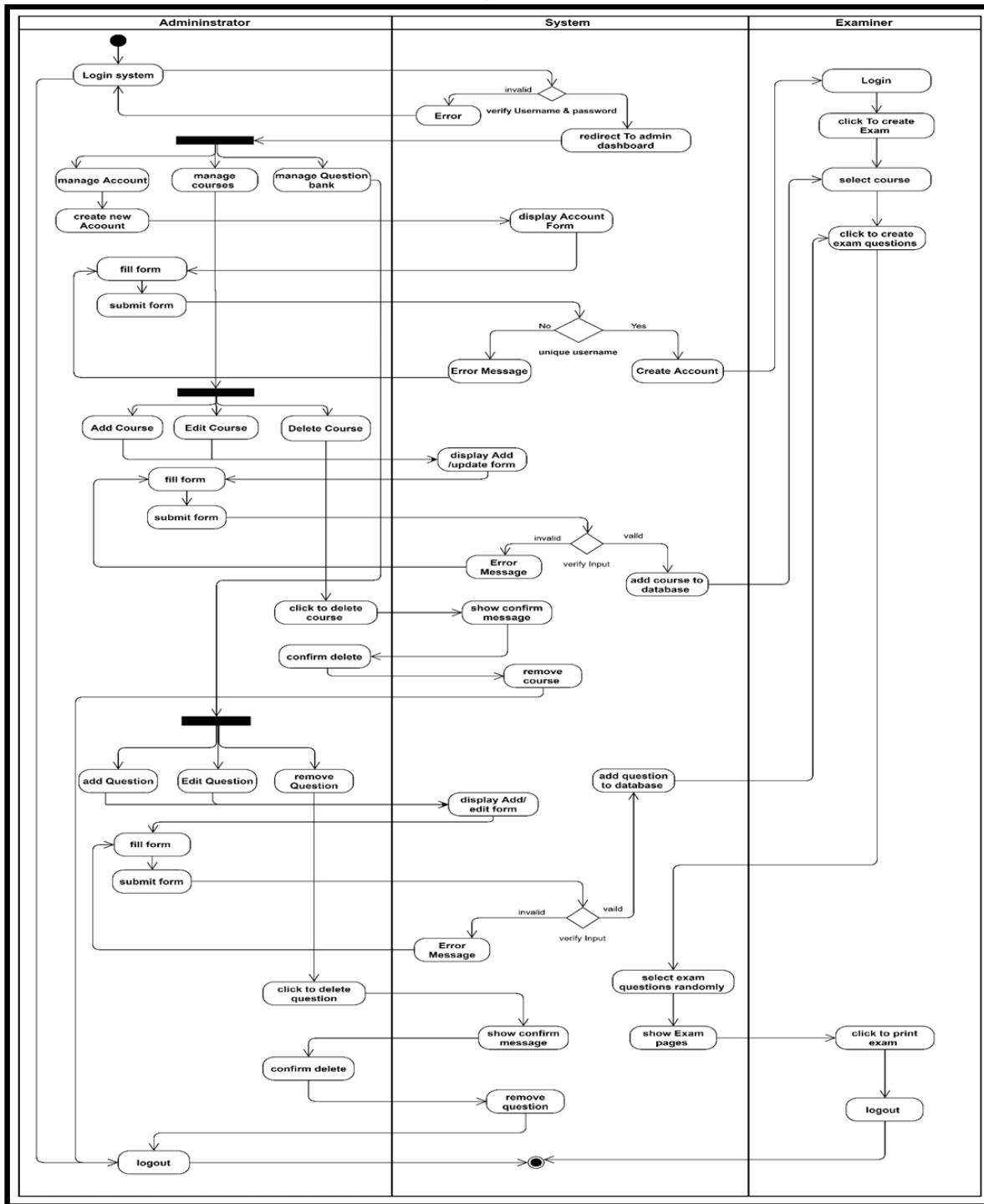


Fig. 5. Activity Diagram

Activity diagram in figure 5 is a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system [6].

5. System Interfaces

The screenshot shows the 'Courses Management' section of the Intelligent Exams System. On the left, a sidebar menu includes 'Account Management', 'Courses' (with 'Course Information' and 'Course Objectives' sub-options), 'Questions Bank' (with 'True / False Question', 'MCQ Question', and 'Essay Question' sub-options), and 'Users Account' (with 'Create Account', 'Deactivate Account', and 'Logout' sub-options). The main area displays a table of courses:

Course Code	Course Name	Credit Hours	Action
101ACCT-3	Principles of Accounting 1(Theoretical)	3	[Edit, Delete]
101PA-3	Fundamentals of Management(Theoretical)	3	[Edit, Delete]
LAW201-3	Commercial Law(Theoretical)	3	[Edit, Delete]
MGMT201-3	Principles of BA(Theoretical)	3	[Edit, Delete]
MIS211-3	Introduction to IT(Theoretical)	3	[Edit, Delete]

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Fig. 6. Manage Courses Page

Figure 6 shows page allows admin to manage courses information including, add of new course, update course information and delete course from database.

The screenshot shows the 'Manage TF Questions' section of the Intelligent Exams System. The sidebar and table structure are identical to Figure 6, displaying the same list of courses with edit and delete actions. The copyright notice at the bottom is identical.

Fig. 7. Manage TF Questions

Figure 7 shows page allow admin to manage T/F Questions including, add of new question, update question and delete question from database.

Question Text	Option1	Option2	Option3	Option4	Action
A computer assisted method for the recording and analyzing of existing or theoretical systems is	Data transmission	Data flow	Data capture	Data processing	
First generation computers were developed during	1940 – 1956	1956 – 1963	1964 – 1971	None Of these	
The brain of any computer system is	ALU	Memory	CPU	Control unit	
The time required for the fetching and execution of one simple machine instruction is	Delay time	CPU cycle	Real time	Seek time	
The tracks on a disk which are accessed without repositioning the R/W heads is	Surface	Cylinder	Cluster	All of the above	
What do you call a single point on a computer screen?	Cell	Element	Pixel	None Of these	
Which of the following languages is more suited to a structured program?	PL/I	FORTRAN	BASIC	PASCAL	

Showing 1 to 7 of 7 entries

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Fig. 8. Manage MCQ Questions

Figure 8 shows page allow admin to manage MCQ Questions including, add of new question, update question and delete question from database.

Question Text	Action
Compare the five generations of computers on the basis of the software technologies used.	
Explain how an output is displayed using a CRT monitor with the help of a neat diagram	
Explain the main functions performed by the system software of a computer system.	
What does Information and Communication Technology (ICT)mean?	
What is the main difference between a mainframe and a super computer?	

Showing 1 to 5 of 5 entries

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Fig. 9. Manage Essay Question

Figure 9 shows page allow admin to manage Essay Questions including, add of new question, update question and delete question from database

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Fig. 9. Setting exam paper

Fig. 10. Create Exam Page

After the exam is created by system, admin can print the exam paper in Figure 10.

6. Results

The result showed that:

- The system consists of two modules, admin modules and examiner module.
- Admin module allow system admin to manage courses information, manage courses objectives, manage exam questions and manage user account.
- Examiner module allow system examiner to manage account and manage exams papers and to create new exam sheets.
- Also, the update or modification of questions will be reflected in the exam paper.
- System will allow admin to print the exams sheets after automatically generate the exam.

7. Conclusion

A web-based exam system for Exam preparation is an application for creating, maintaining, and administering exams. It provides the means of creating easily searchable questions. These questions can then be used to automatically and randomly create exams. Exams sheets can be printed in a format that is clean and easy to understand. In conclusion, the system promises to be a fast, simple, and effective application that many faculty members can use to create and maintain their exams. Its application in practical confirms that the system is highly advanced and functional. The system is expected to be widely applied and promoted in future teaching of the course, to be constantly improved in practice.

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