Positive Impacts of Online Examination with Answer–Correction Feedback in Nigeria

L. O. Akazua, K. S. Nwizege, F.O Philip-Kpae, J. Danamina, B.G Akoba, P.G Irimiagha

Abstract: Online examination can be referred to as a means of taking examinations in a digital form, either through a secured or an unsecured network. In this paper we propose an online examination system capable of returning answer corrections as feedbacks to its end users/ candidates. The proposed system is to allow students take examinations from home at their own comforts and time, but must be during the institution's end or mid semester examination period. The proposed system is to allow the creation of course, which comes with the creation of examinations and its components, and does not allow the retaking of examination after the semester's examination season. The proposed system is designed to work with "time countdown" during the examination and return the students marks and corrections of wrongly answered questions upon the completion of the examination. The time countdown auto-starts and auto-disables the take examination page when the examination duration elapses.

Keywords: online examination; yii framework; traditional examination; e-learning; php interpreter; apache server.

I. INTRODUCTION

Education is the bedrock of an individual or a nation; hence it is advised that everyone acquires basic education to keep them mentally, intellectually, socially fit. Over the years, nations have tried to improve their educational sectors by upgrading its standard to the 21st century educational system, which involves the use of digital techniques & internet materials such as notebooks, e-books, online journal articles etc., instead of the traditional techniques that involves the use of paper, pen, black/white board for teaching, learning & taking examination.

"The increase in population of students getting into the university has increased the credibility challenges in the traditional/manual examination system which involves paper, pen and pencil method for both taking the examination and the mark assessment, as this method is prone to a lot of mistakes such as missing scripts, biased marking towards students, possibility of unfair grading, and above all cheating may be at its maximum since the examination hall is said to be crowded,

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Hence the introduction of an online examination system will help raise the credibility of our examination and mark assessment" (Kaburu, K. 2008). With the educational system steadily trending towards the digital form, a lot of institutions/ places of higher learning are re-evaluating the use of the traditional method "conduct form" of examinations, thereby contributing in small measures to the actualization of the 21st century goal of making everything easy and accessible round the clock no matter the user's location.

So far, the digital system is designed to cover and eradicate the use of other tedious means of learning.

Examination is an act designed to use in monitoring the skill progress, knowledge or qualification of an individual on a certain area. Examination can be defined as a measure used to judge the learning ability of an individual (Oxford Dictionary, 2010). E.g. students use it to show the lecturer that he or she is qualified to move to the next level. Internet is defined as "the availability of a material in a digital forms and is accessible using the computer or other telecommunication devices (Oxford Dictionary, 2010). It is an electronic media hooked to the World wide web (www). On this premise we can define online examination as the means of testing the knowledge and progress of an individual digitally through the World Wide Web (internet).

Online examination is said to be the best way to eradicate the tedious and hazards processes, lecturers and faculty heads face in other to test the learning ability of their students. This is because the currently existing examination method known as the traditional examination method is seen to be time consuming, tedious, expensive and not one hundred percent reliable in terms of grading the students as marking of the scripts are done manually by the course lecturer or instructor. Research has shown that the introduction of the online examinations into the educational system will not only ease the workloads for the course lecturers but will also facilitate results and erase the lack of trust in the current system, as a lot of system tend to believe that course lecturers are most times biased during the marking and compilation of the students mid or end of semester results or test. So far, research has shown that "the important scopes of application of web technology are the design/building of a web-based test and assessment application" (Iyilade, et .al, 2005).

According to (Jay, et. al, 2001) "online based test and assessment systems are seen to be more flexible than the manual approach, because the online based process allows the students to take the examinations at their own time in a suitable location for them during the institution examination period using the institution examination schedule frames

The rest of this research work is organized as follows: section 2 is related works, section 3 explains the proposed system design, and finally section 4concludes the paper.

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II. RELATED WORKS

Researchers are working tirelessly to make sure that the traditional examination system is eradicated from our institutions due to its level of incompetency, some of the works already in existence includes;

The national online examination system (NOES) a government project designed by kumar and his colleagues in 2010. The system was designed to handle large population of students, during their end of semester online examination. "The system was designed to handle large amounts of data, error free and highly secured using the spring Flex and the Hibernate framework. Designed to meet its user's basic needs hence an error free, zero faults tolerance, robust and adaptive, round the clock ready to use system" (Kumar, P., et al 2010) with both functional and nonfunctional system requirements fully implemented, though examination using this system can only be successful under a supervised (human) condition. Another reviewed work here is the "Quasi online examination system" (QOES), is a multilingual online examination system that supports languages such as Hindi, Marathi and English language, focused on testing learners' skills and understanding. Its main aim was to test and ascertain the computer proficiency level of employees. It has the ability to return results at the end of the examination, can also be configured to fit its user's desired objective. Finally a secure E-exam Management System; "this system focused on getting the right security mechanism implemented in all the stages of an online examination process in other to preserve the dignity of online examination" (Castella-Roca, J. et al, 2006,). This system focused more on how to overcome the threats online examination systems may pose. In order to achieve integrity, authenticity, non-repudiation and confidentiality, the primary key infrastructure technology was used for the system (Castella-Roca, J. et al, 2006). Cryptographic protocols were used for the design and implementation of the system, though the system focused more on the setting up & assessment of examination papers. The papers reviewed above has one thing in common, and that is the fact that examinations can only be conducted under a supervised location, using human beings as supervisors overcome the threats online examination systems may pose. In order to achieve integrity, authenticity, non-repudiation and confidentiality, the primary key infrastructure technology was used for the system (Castella-Roca, J. et al, 2006). Cryptographic protocols were used for the design and implementation of the system, though the system focused more on the setting up & assessment of examination papers. The papers reviewed above has one thing in common, and that is the fact that examinations can only be conducted under a supervised location, using human beings as supervisors

III. PROPOSED SYSTEM DESIGN

We propose to develop an online examination system with marks and answer corrections feedback after the examinee submits examination question solutions. This system is aimed at overcoming the drawbacks of the currently used system, "the traditional paper and pen examination system. Upon the implementation of this system, it is going to reduce the cost, effort and time taken to conduct examinations over a period of time.

The proposed system is going to be designed to handle examination conducting related tasks such as students' registration, mark grading and results, correction feedback of the examination questions, printing question papers and answer sheets, preparing students examination identity numbers, examination venues and hall arrangements, it will also take care of irregularities and delay of students marks/results as the system is designed to generate students marks at the end of the examination. The proposed system is to be implemented using PHP interpreter, and MYSQL database, with an Apache serve. The Yii framework for php will be used to design some of the functions of the system. This system upon completion will allow the school authority to conduct examinations, test such as aptitude test and entrance examinations for both new students and existing students of the university. The web-based online examination system will use a login window, that will need thorough authentication before it can allow user access, the authentication can only be done after student or lecturer have registered with the system, with its password and user details saved in the system database, the proposed system is going to use the MD 5 encryption algorithm to store user's password in the database, because it is not advisable to store access codes on plain text. The proposed system is going to be divided into two main module, the administration staff module and the lecturer/teacher and student module. The administration staff model is granted access to the system automatically using the admin password whereas the lecturer and student model can only allow them access after they have registered and saved their access details in the system database.

The proposed system is to use the three tier display structure which includes the model, the view and the controller (MVC). The model interacts directly with the database and the controller, and the controller interacts directly with the view. Both the controller and the view are segments of the three tier presentation (MVC), fully based on the CRUD (create, read, update and delete) features of the Yii framework. Below is a brief illustration depicting typical MVC model interaction as used in the proposed system.

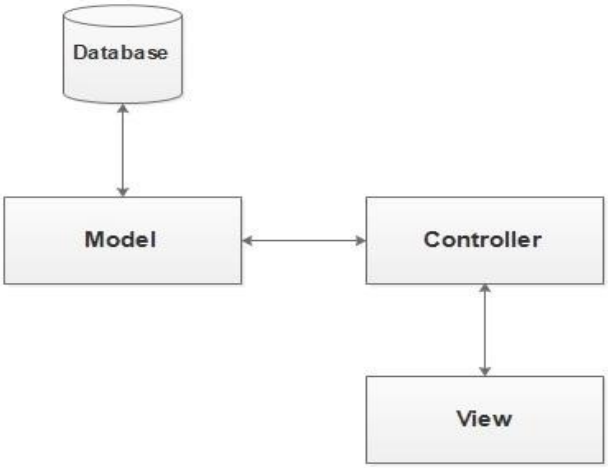

Fig.1: Model view controller for the proposed system (online examination with marks & answer correction feedback).

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A. Proposed system features

The proposed system is made up of the following components: the login, registration, manage course, user profile, enroll courses, manage question & answer, take examination & view grades, examination timer, etc.

B. System & user interaction model

The interaction between the user and the system is illustrated using uml diagram (Use case). See interaction model in figure 3.

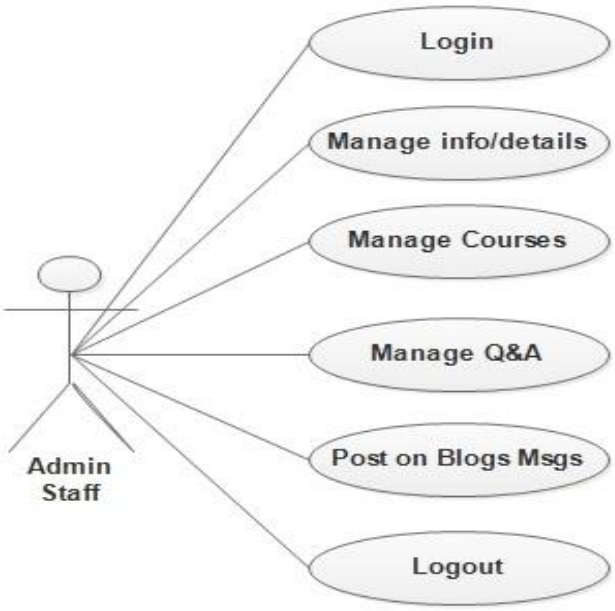

Fig. 2 User Interaction model 1. (Adim. Staff).

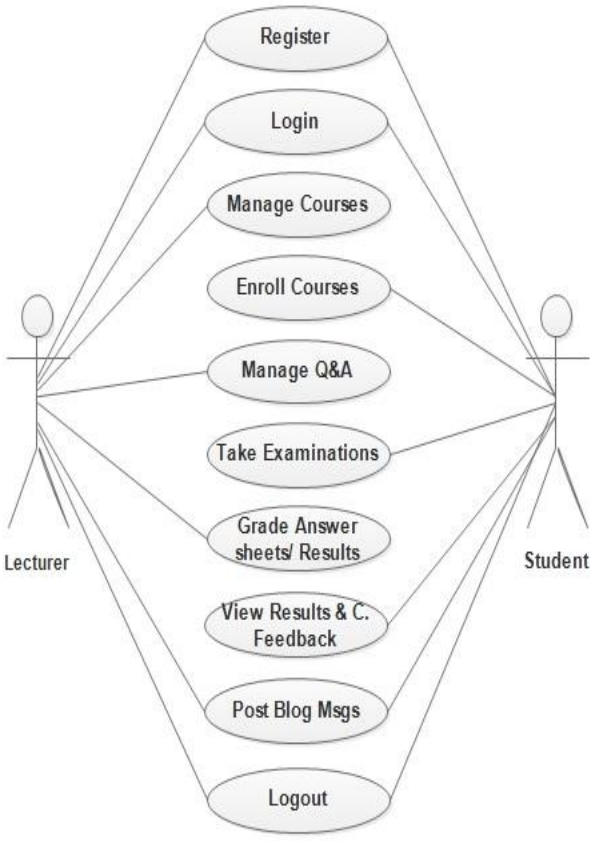

Fig.3 User Interaction model 2. (Lecturer & student).

C. Logical designs/model

A sequence diagram is used to illustrate the basic functional flow of the entire system. See components functional flow below;

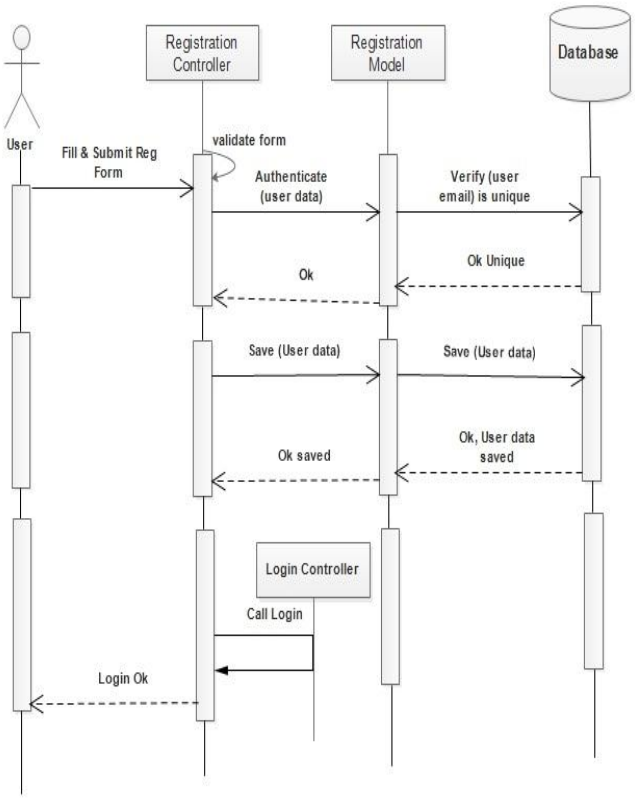

Fig. 4 Functional model 1, (lecturers/students Registration).

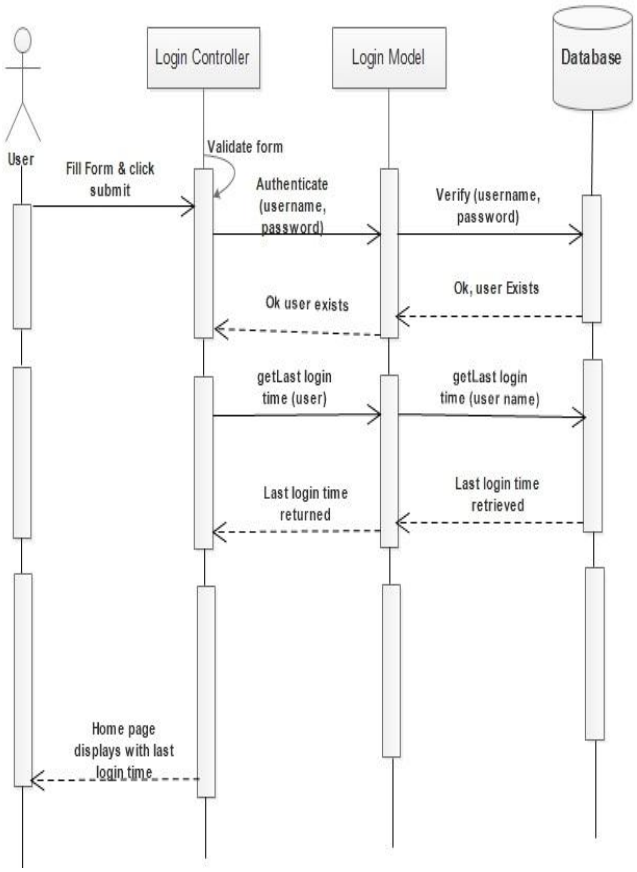

Fig. 5 Functional Model 2, (login).

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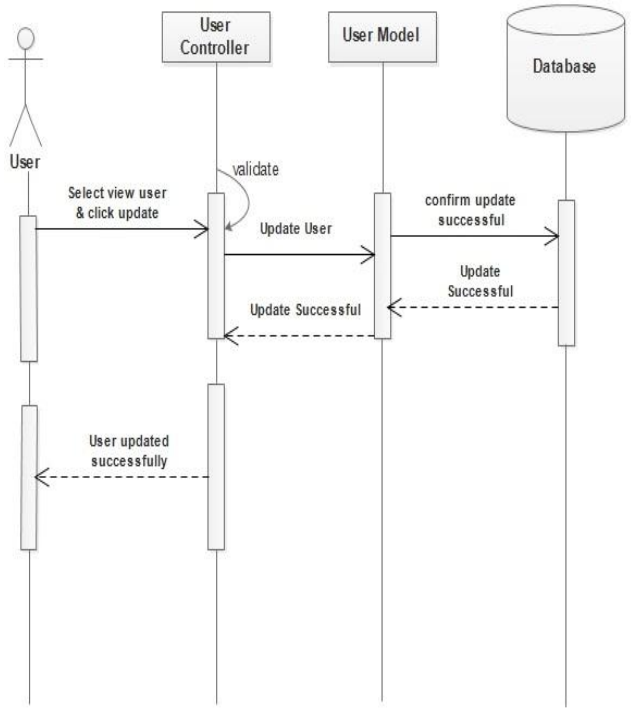

Fig. 6 Functional Model 3, Manage User- update user (create, update & delete, CRUD).

The update user functional flow of the manage user component, can also be applied to the create user and delete user.

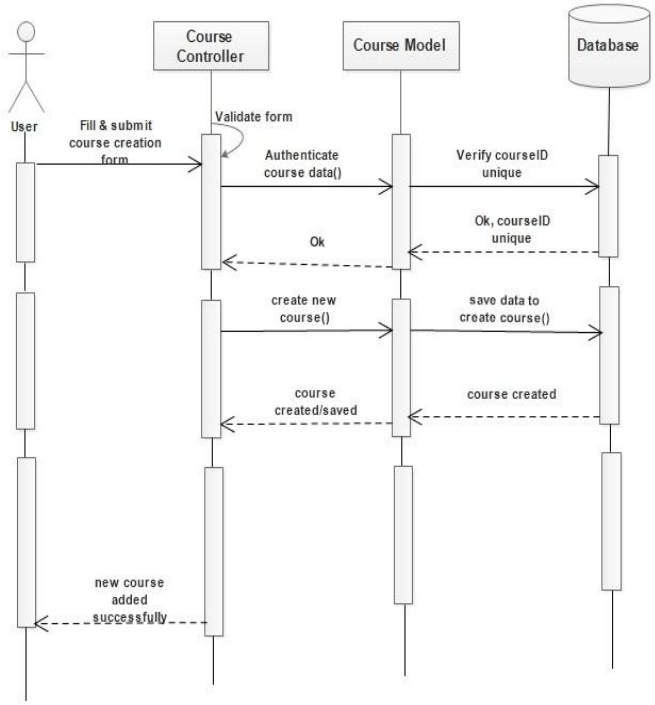

Fig.7 Functional Model 4. Manage Course-create course user (create, update & delete, CRUD).

The create course functional flow of the manage course component, can also be applied to the update and delete courses.

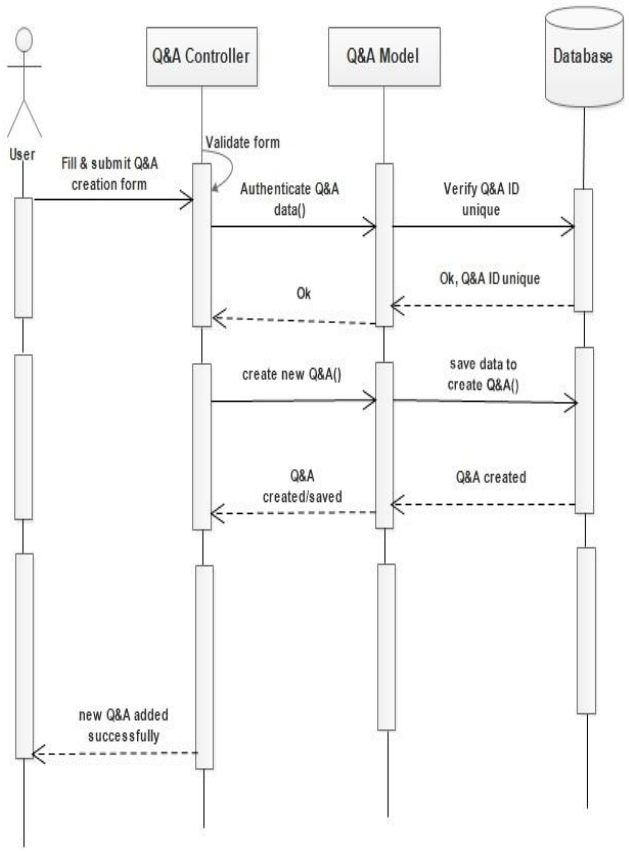

Fig.8 Functional Model 5, Manage Questions & Answers-create Q&A.

The create Q&A functional flow of the manage questions & Answers component, can also be applied to the update and delete Q&A.

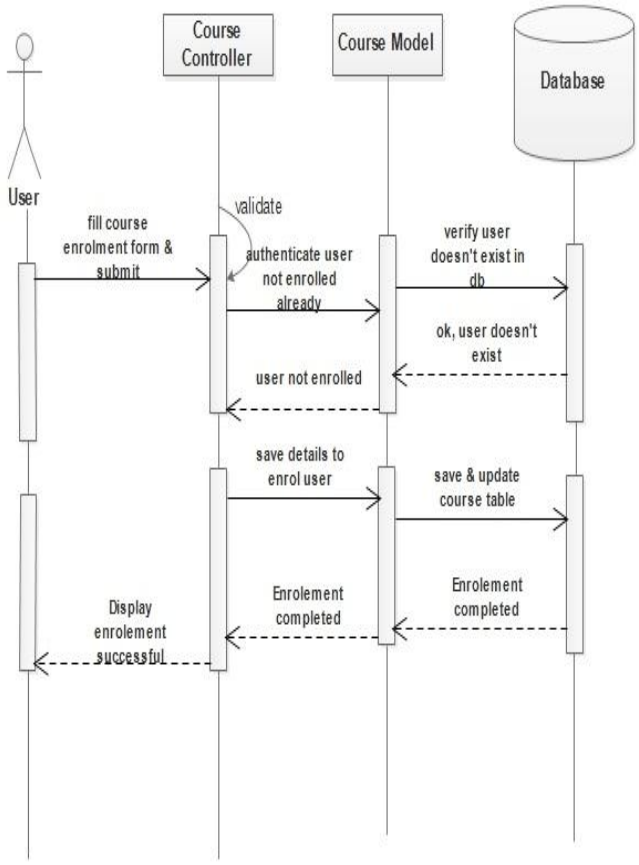

Fig.9 Functional Model 6, Course Enrolment

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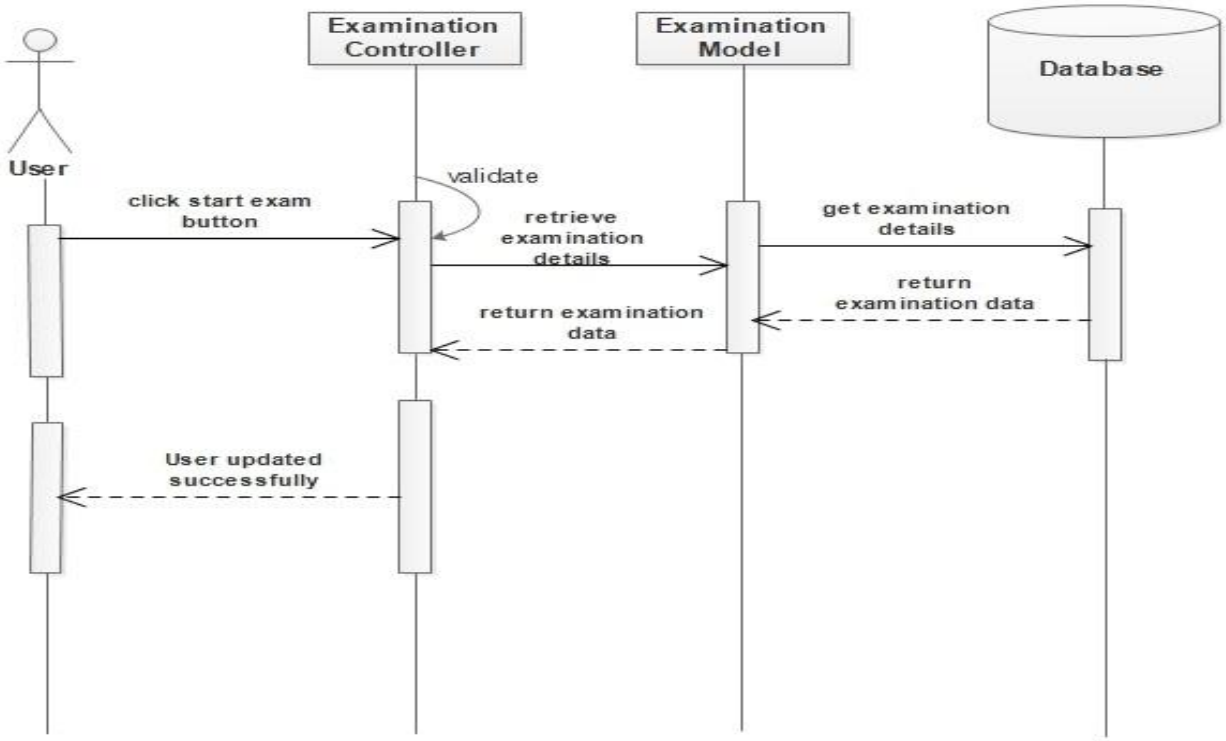

Fig.10 Functional Model 7, Take Examination.

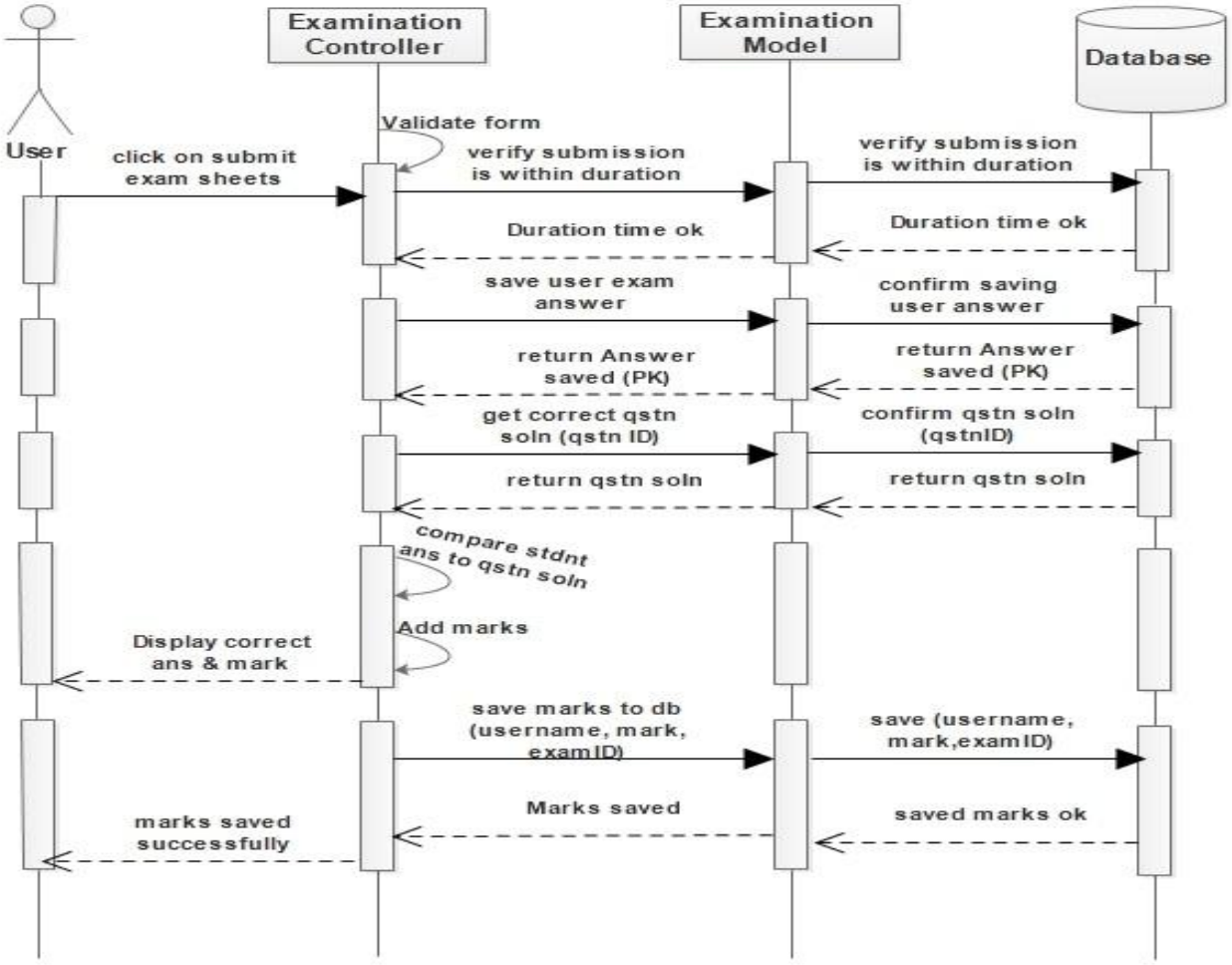

Fig.11 Functional Model 8, Grade Answer Sheets.

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Please note: (Stdnt = student, qstn = question, ans = answers, soln = solution.)

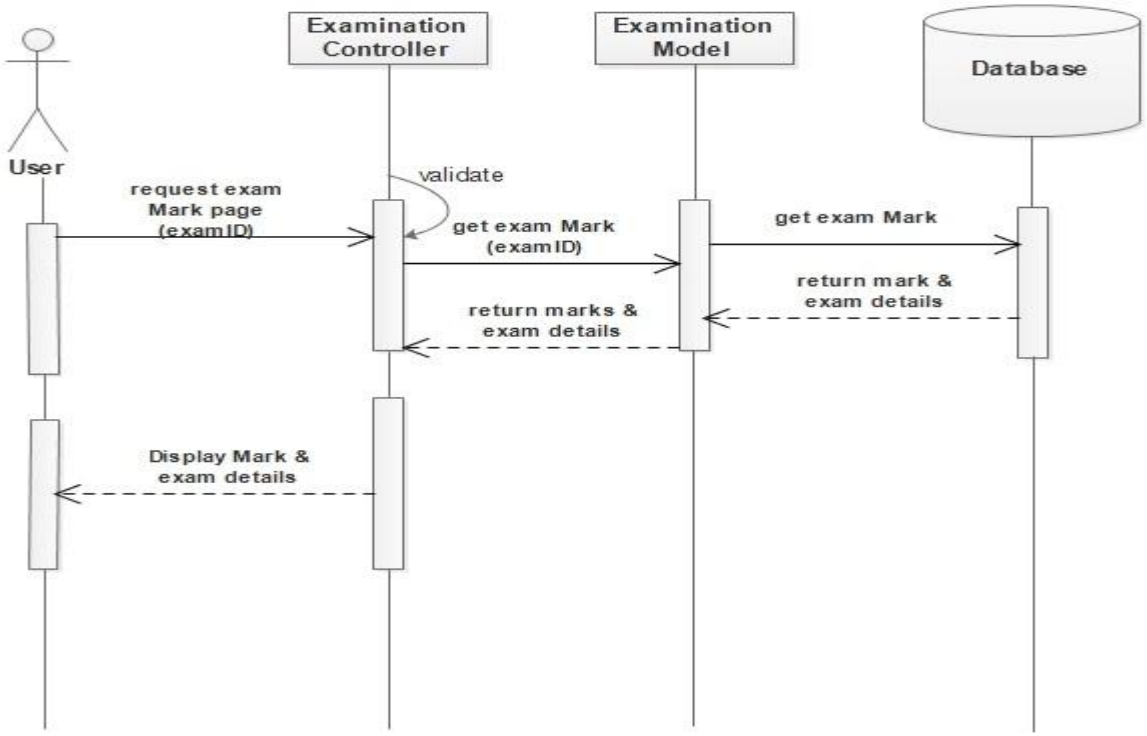

Fig. 12 Functional Model 9, View Marks.

D. Structural & work flow models/designs

Uml class and activity diagrams were used to model the work flow and structural design of the proposed system. Class diagram was used to state the class, its attributes & possible operations and relationship. Activity diagram was used to the stage by stage work flow of the proposed system. See the activity diagram models below and the class diagram in appendix of this journal articles.

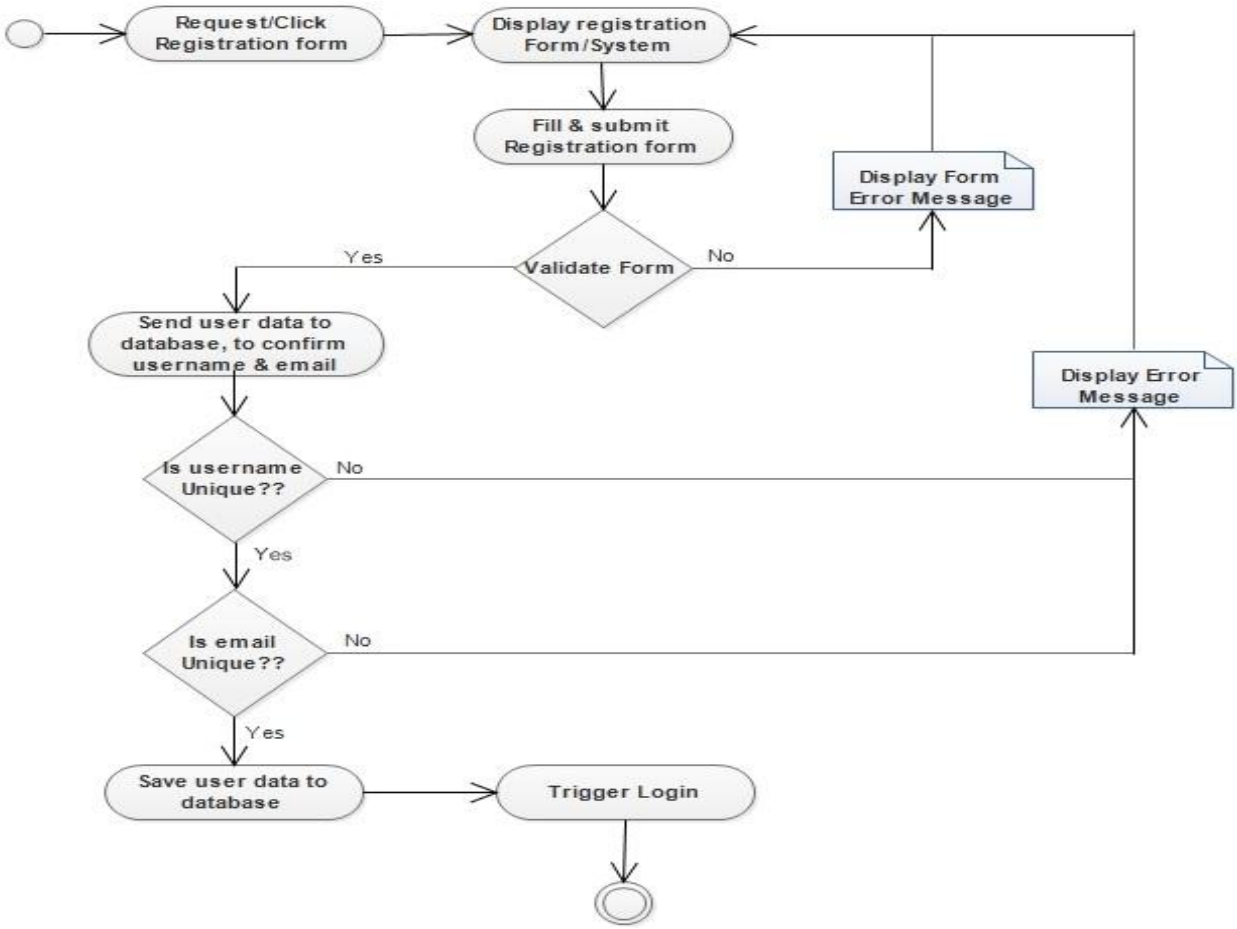

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Fig.14 Work Flow Model 1; User Registration.

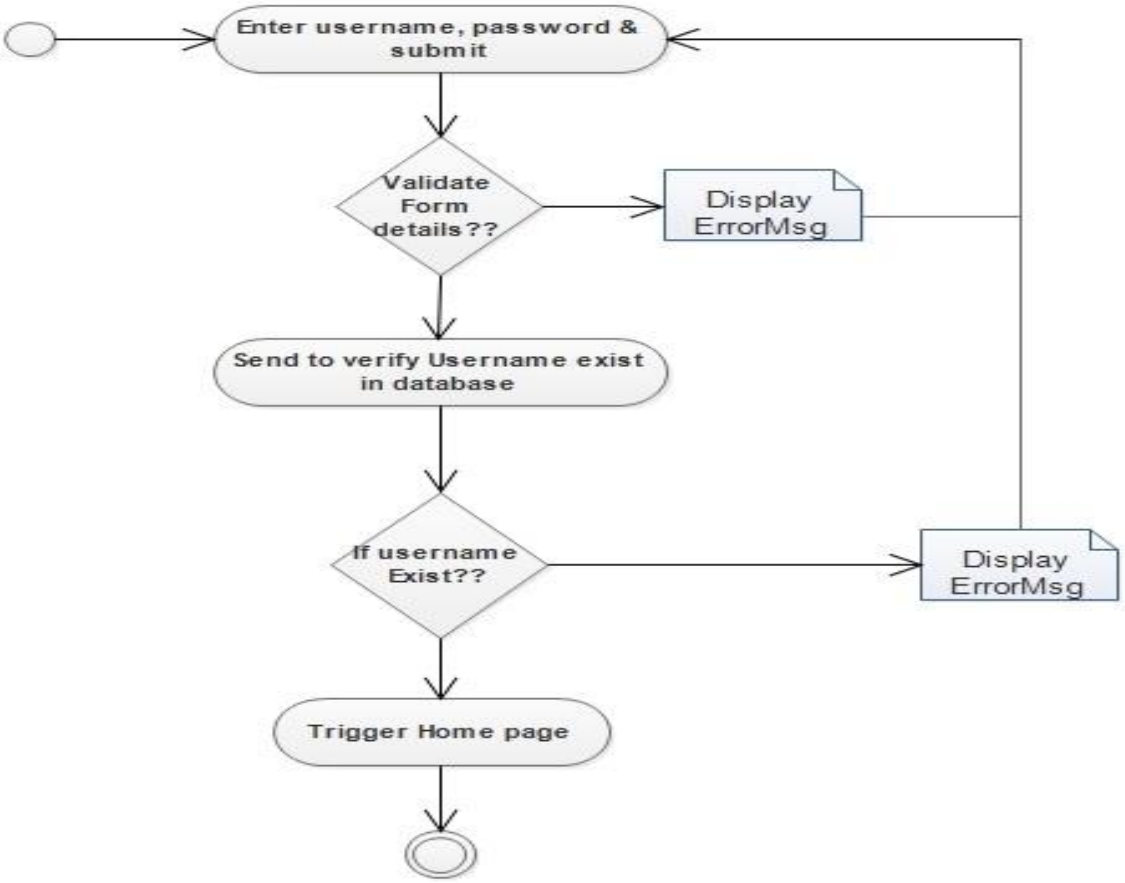

Fig. 15 Work Flow Model 2; Login.

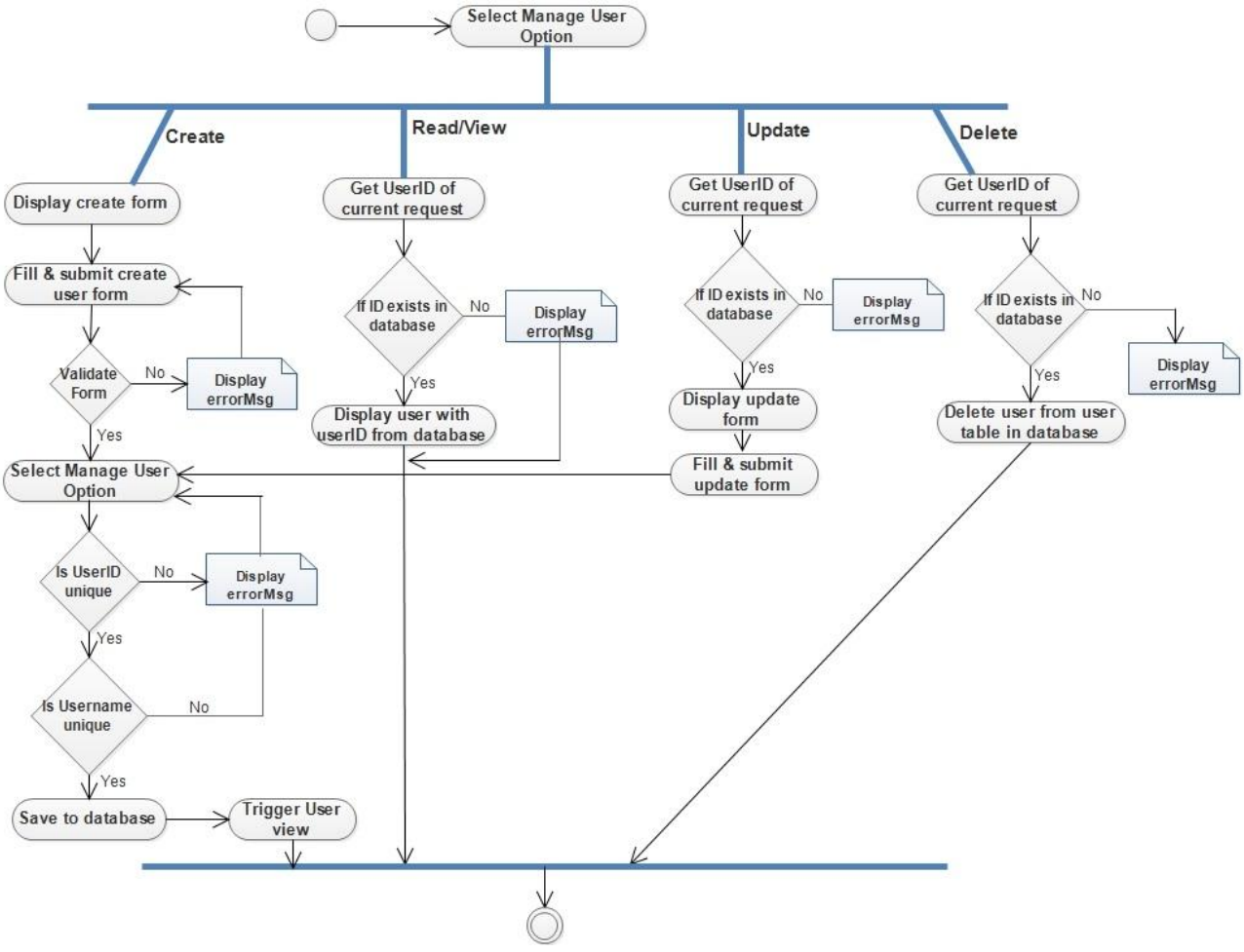

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Fig.16 Work Flow 3; Manage Users (CRUD).

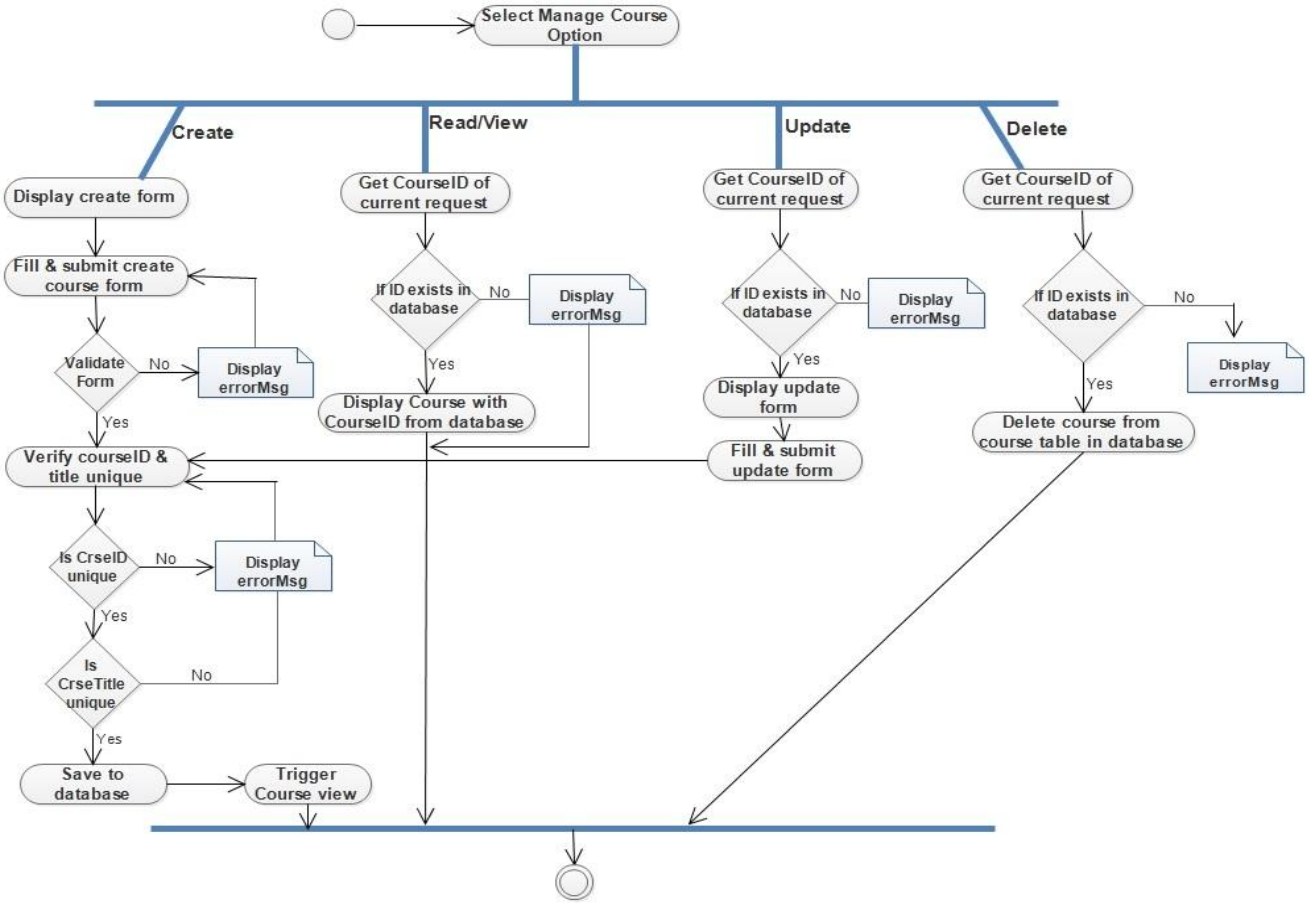

Fig.17 Work Flow Model 4; Manage Courses (CRUD).

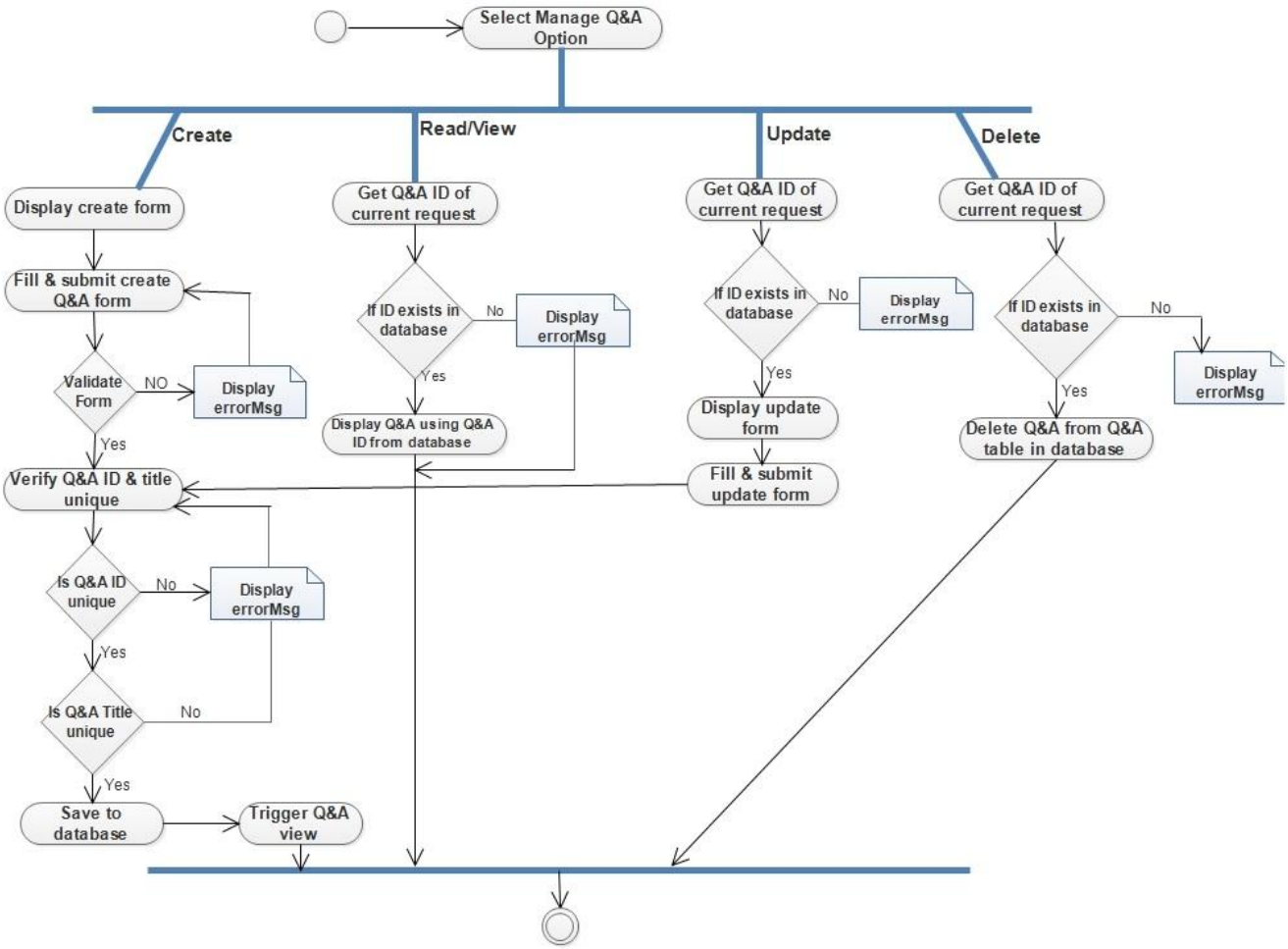

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Fig.18 Work Flow Model 5; Questions & Answer (CRUD).

Where Q&A = Question and Answers.

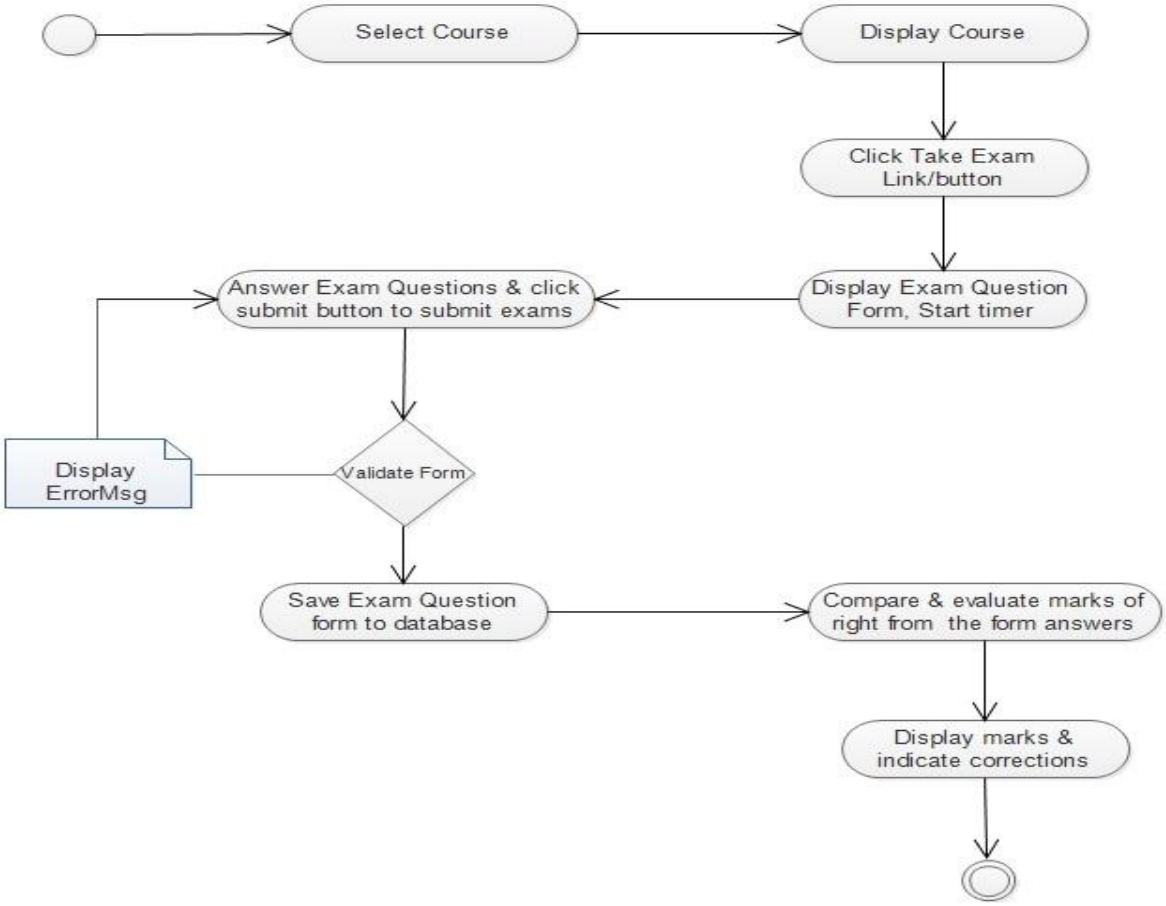

Fig.19 Work Flow Model 6; Take Examination

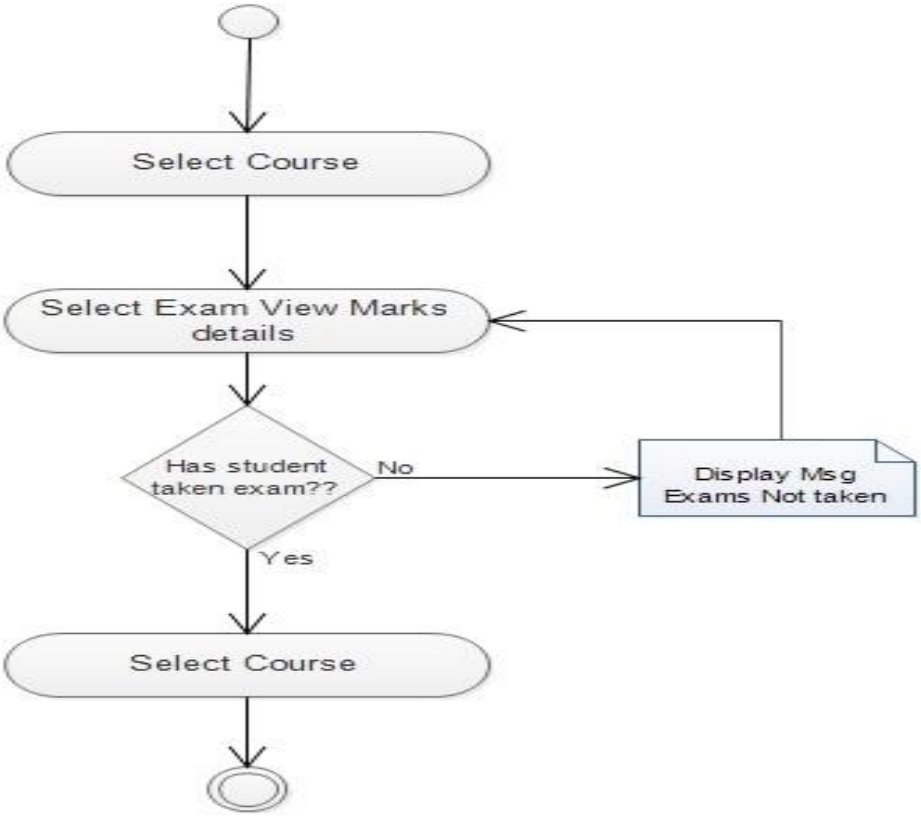

Fig.20 Work Flow Model 7 View Marks.

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E. Positive impacts /benefits

Online examination, just like other projects have their ups and down, though in course of this writing we are going to consider few of its benefits, which includes;

- Online examination system saves cost.
- Simplifies the steps involved in conducting and evaluating examinations.
- Allows the creation of multiple sets of examination questions per subject.
- The instant results function, eradicates any form of alteration, victimization and harassment of students after exams in other to pass them.
- Time management and security; exams taken at the right time, & results saved directly to the database.
- Reduction of cheating, using auto surveillance systems with the ability to take snapshots of the students seating for the examination.

IV. CONCLUSION

In a bit to eradicate and award certificates to hard working and well deserving members of our society, examination been a test of knowledge has to be taken seriously, hence employing every necessary manpower required to make it cheat free. We can state here that the proposed system when implemented, though not 100% efficient as no system is, but will go a long way in solving the stress lecturers/teachers, administration staffs and students of an institution go through to conduct and take their examinations.

However the proposed system in this article is flexible in that it will allow students take tutorials, returns students results immediately after they confirm that they are done with the examination, post comments, allow students enroll on courses of their choice above all students can take examination in their own comfort zone but must be during the semester examination period, and get their results after the examination by clicking the system's submit button, hence there will be no need to go home and wait for your marks to be out as the students already know their marks before leaving their computers or where ever they took examination from.

A. Recommendation

We recommend that the government or other co-operate bodies finance further studies to incorporate some more features into the online examination system with answer-correction feedback. This will help the proposed system combat malpractice and cheating during examination, if the system is to be implemented by any institution in Nigeria and beyond. The recommended systems are;

- To create an encrypted live OS
- To introduce a finger print reader enabled light pen and opting pad.

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APPENDIX

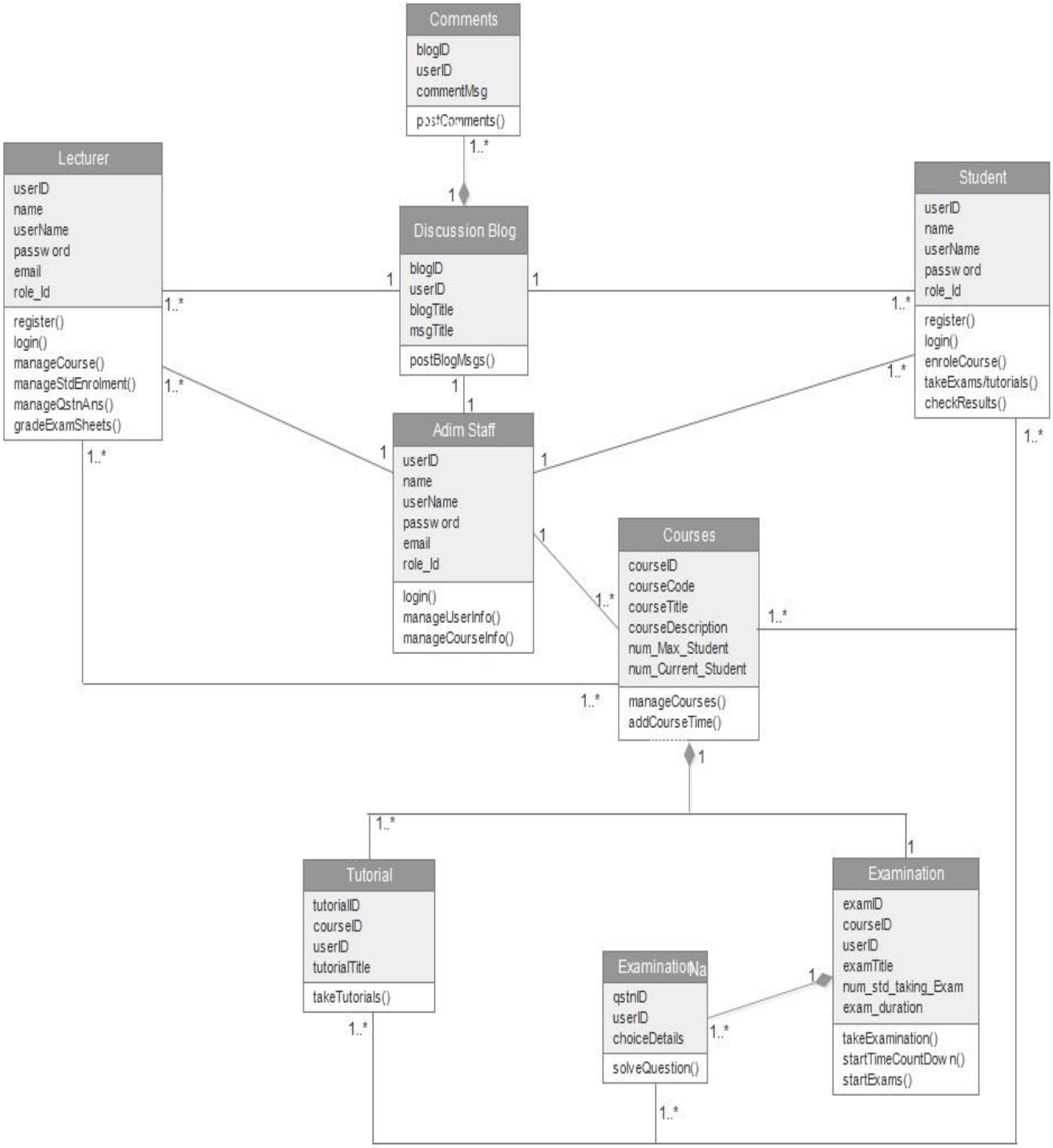

Fig.13 Structural design: Class diagram.

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