



Web Application for Conducting and Managing Online Examinations

Vikrant Chole¹, Siddhant Ramteke², Krishna Kant³, Shubham Singh⁴, Vaishnavi Gupta⁵,
Yash Kalode⁶, Vedant Bhambere⁷

Asst. Professor, Department of Computer Science & Engineering, G. H. Rasoni Institute of Engineering and
Technology, Nagpur, India¹

Student, Department of Computer Science & Engineering, G. H. Rasoni Institute of Engineering and Technology,
Nagpur, India²⁻⁷

Abstract: This paper describes the development of a Web application for conducting and managing of online examinations for IT-NetworkZ Infosystems, an IT consulting firm's platform ex-am.com. The purpose of creating such platform is to facilitate organizations and educational institutions in conducting online examinations with control to various useful features. It would help them to manage candidates' profiles and get accurate statistics on dashboard. It would help the organizations to manage payment of subscription packages for students. It will also be a platform with an easy interface for students for taking exams in a smooth manner.

Keywords: Examination system, Online examination, Computer Based Test, Web based examination.

I. INTRODUCTION

The advent of internet has benefited users with many "online" alternatives of manual operations which were initially very difficult to manage and implement. It has led to automate various processes which ultimately improved efficiency and reduced the time to execute. Especially large organizations have got a great deal of profit by using online solutions to their problems.

The use of internet by organizations for conducting online examinations will serve to accomplish various objectives in a single platform. These objectives include conducting live exams, automate the submission of the answers in time with high accuracy, evaluation of the responses and validating the scores, publishing the results instantly and automate certificate creation for passing candidates. Furthermore, using online examination system will help the organizations to easily include demo or training modules in the subscription package, manage data on exams and candidates, make the whole system paperless, reducing distribution and transportation, thereby lowering costs.

This type of system has been proved to be very useful in scenarios like the COVID-19 lockdown where offline and in-classroom examinations were completely halted adhering to the COVID protocols. The Online Examination System will be a good option for the educational institutions for conducting their university examinations without breaking any COVID protocols.

The Online Examination System has been developed to resolve the issues commonly observed in implementing the traditional system of examination. This Web Application is designed to reduce and, in some cases, eliminate the problems faced by using existing system. The user does not require any expertise to use this system, thus, by all means it is designed to be user-friendly. The website is responsive, therefore, could be operated on Desktop or mobile phones for easy usage. Moreover, this system is developed for the particular requirements of a company to manage the various operations in an effortless and effective manner. This will result in accurate, reliable, secure and easy management of the examinations. The website will be useful to educational institutions, companies and individuals to smoothly conduct and manage examinations and candidates to take examinations easily.

II. LITERATURE REVIEW

Research and Development of Online Examination System describes the architecture of web-based examination system which is based on Java. It also describes the various functions of online examination system like Question Management, Paper generating and online tests which provides good benefits to teachers to organize examination as well as the students to study the course. It briefly discusses the structure of Client side and Server-side code for Examination system implementation [1].



A study on Web based Online Examination System explains the advantages of online examination systems over manual system. According to the current demand Online examination system is crucial to the educational institutions to conduct the examinations. It saves the time and effort that is required to evaluate the examination papers and prepare the reports of the results. It can be used to conduct various type of test like aptitude tests, assessment test, personality test, psychometric test, campus and entrance examinations. The progress of the student could also be easily monitored by the Organizations through the score that they obtain in the examinations. Therefore, the result is calculated in shorter duration [2].

Web based online examination system gives the basic idea of subdividing the system to three modules: 1. admin, 2. instructor and 3. student. Each subsystem could be handled separately without influence on other system; thus, it is easy and flexible to implement. It also describes techniques related to assessment of responses: answers submission, automated grading, and submission of feedback [3].

Online Examination System – A Web-Based Application The article discusses the technological implementation of an examination system using PHP script and MySQL. It describes the features of the system for login and logout of the user, answer checking system, dashboard, profile updating and an admin panel. It also illustrates the system architecture of examination system showing different modules and functions of the modules [4].

Application Research of Web Examination System Based on College compares the general aspects of college web examination systems and the performance of using different technologies for implementing it. The different aspects discussed are Models of web examination system, developing language, background database, web server platform and data storage in client [5].

A Sample Application of Web Based Examination System for Distance and Formal Education raises issues with manual conduction of examinations ranging from transferring of scores, human errors, inefficiency in data acquisition and in its analysis, low response rates, and difficulty in receiving inputs from multiple evaluators and how it could be solved by using web-based examination system. It also raises concerns on preventing malpractices among the students in a web-based examination which could be done, for instance, by doing a comparative analysis between results of the groups of students who have their examinations with paper based as well as web based testing systems [6].

Online Exam System to Improve Student Learning Quality in State Vocational School 5 Tangerang City suggests the advantages of using online test system: improvement in the quality of learning of students, reducing costs of the school administration, preventing the leakage of questions and flexibility in scheduling the examination. A survey on a vocational school and reviews supports the argument [7].

A web-based online examination system for computer science education lists the challenges faced during manual conduction of examinations like delays that occurs in processing of results, filing and filtering of records, loss of records and searching the records. The paper describes the advantages of online based examination system and its functionalities, it also describes the ways to examine students and identifying their weaknesses to improve pedagogical design for students [8].

Development And Implementation Of An Online Examination System: A Case Study At Information And Communications University-Zambia The paper discusses in detail about the development and implementation of an online examination system in Zambia during COVID-19 pandemic. A top-down approach was adopted to implement the application. It discusses the data sources and data collection methods used for the application, the ways to solve the problems associated with the existing system and the methodology to design such systems [9].

DEVELOPMENT OF WEB-BASED EXAMINATION SYSTEM USING OPEN SOURCE PROGRAMMING MODEL The conventional method of assessment is prone to question leakages, human errors during marking and recording of scores. Web based examination drastically reduces the problem associated with the traditional method and enhance the integrity of the result by doing authentication, real-time and instant result checking. This paper discusses the development languages used to implement frontend and backend of the examination system and gives recommendations to prevent the malpractices during examination [10].

III. IMPLEMENTATION

There are three roles for a user in the platform:

1) **Admin:** Admin is usually the instructor or teacher in the organization, admins have privileges like adding or removing candidates, creating and conducting exams and surveys, add and editing questions, managing and having access to certificates, view exam payments by the candidates. Admin has a dashboard where it can get the statistics regarding exams and candidates.

2) **Superadmin:** Superadmin is the usually the owner of the organization, having superuser privileges. Superadmin can add/remove admins and candidates, can manage different departments and categories of examination subjects, can manage and edit exams, can view and manage questions and survey, can create and edit certificates. Superadmin has a dashboard showing visualization of admins, candidates and examinations



3) **Candidate:** Candidate is usually the student or the candidate taking exam. Candidate can take demo exams and live exams, can check its exam history, view exam results, view notice and surveys, pay for an examination by buying packages.

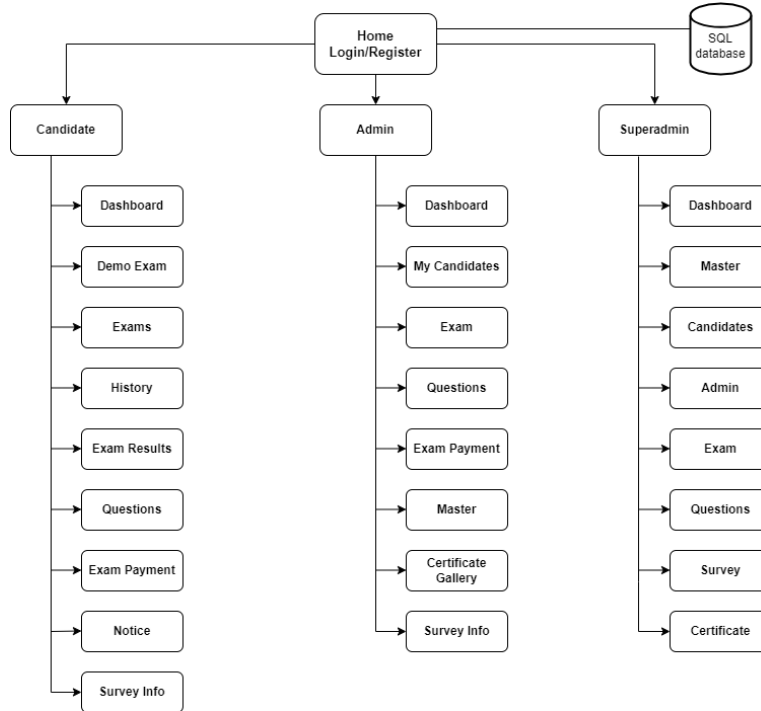


Fig 1. Block Diagram of three panels on the website

A. Login and Registration

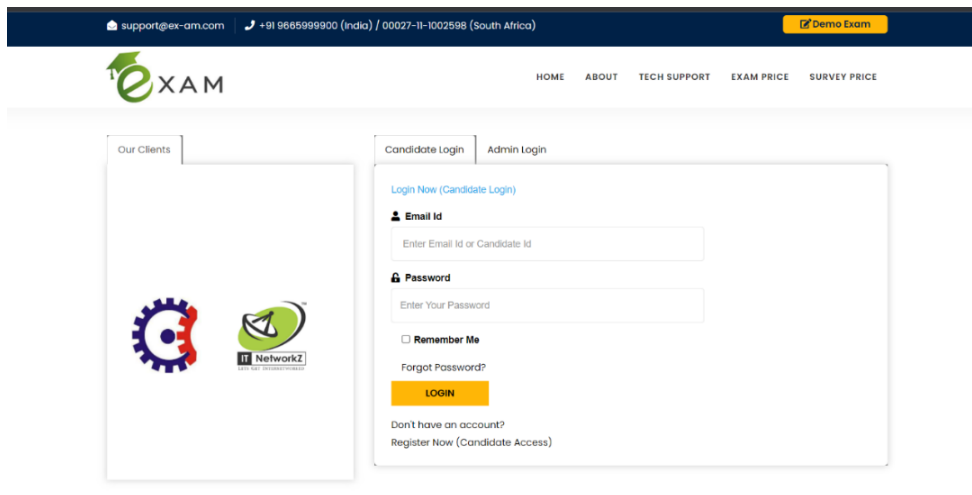


Fig 2. User Login

While registering on the website the user is required to fill a form to collect its Name, Email address, select the password and other details to create a profile. Email is validated to check if the user has already created an account with the same Email address.

If an account has already been created by the user, they can login to the website using the link given at the bottom. The user (Candidate or Admin) will use their credentials i.e., Email address and Password to login to the website by selecting appropriate tab for their role.

Superadmin can access the website from a different page by using their credentials issued by their organizations.

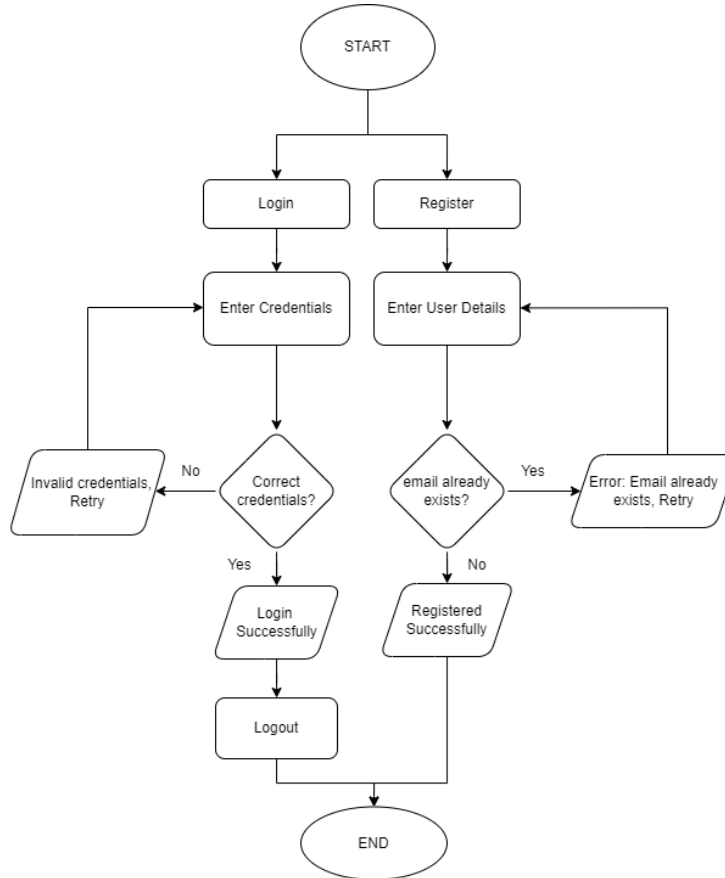


Fig 3. Flowchart for User Login and Register

B. Examination

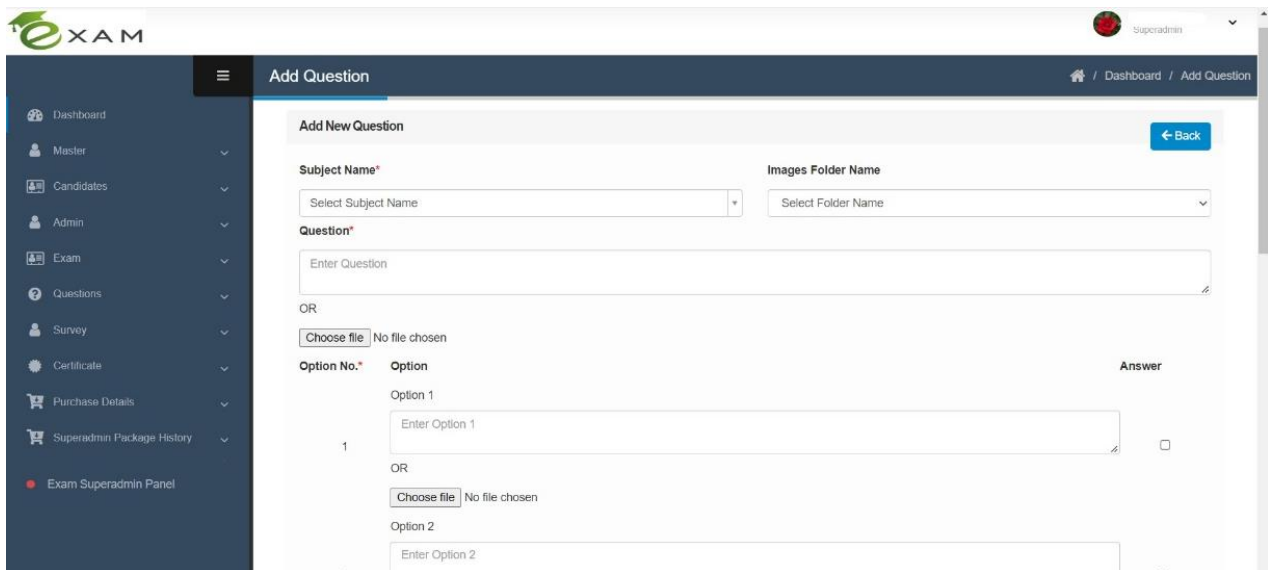
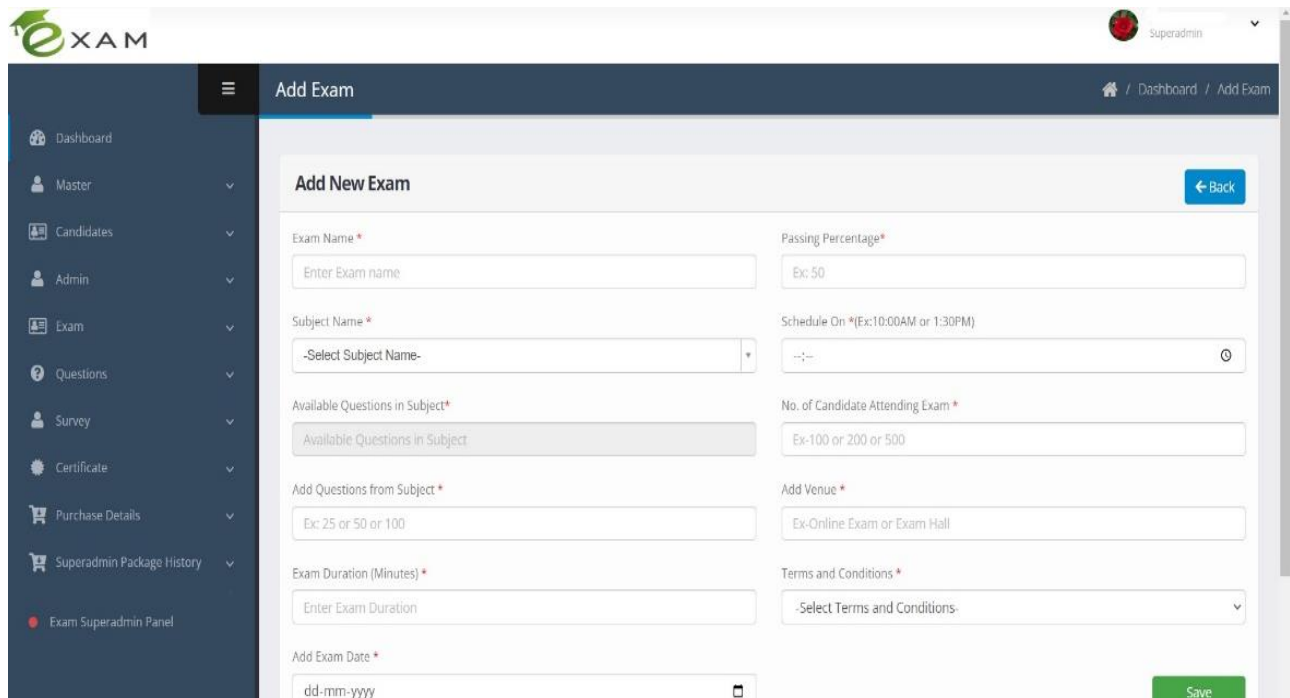


Fig 4. Question creation by Admin

An admin (or Superadmin) can view, edit or add question to a specific exam by selecting the subject and entering the question and options in case of multiple-choice questions. The admin could also add images in the question or in each option according to the requirement of a particular question.



EXAM Superadmin

Dashboard / Add Exam

Add New Exam

Exam Name *

Passing Percentage*

Subject Name *

Schedule On *(Ex:10:00AM or 1:30PM)

Available Questions in Subject*

No. of Candidate Attending Exam *

Add Questions from Subject *

Add Venue *

Exam Duration (Minutes) *

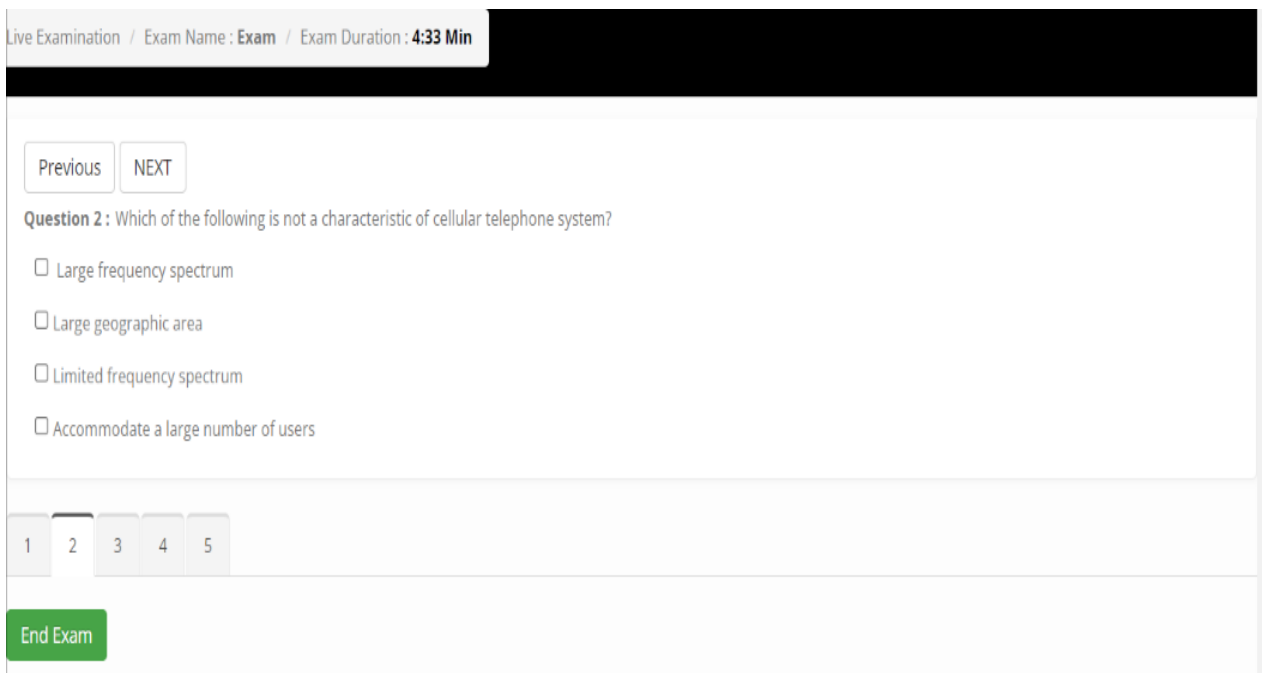
Terms and Conditions *

Add Exam Date *

[Back](#) [Save](#)

Fig 5. Adding new examination

An admin (or Superadmin) can create or edit new examination by entering the name of the test and adding questions either from the question sets already available on the website or using their own question set. Other fields to specify for an exam is the passing percentage, exam duration, exam venue and date, and number of candidates attending the exam.



Live Examination / Exam Name : Exam / Exam Duration : 4:33 Min

Previous NEXT

Question 2 : Which of the following is not a characteristic of cellular telephone system?

Large frequency spectrum

Large geographic area

Limited frequency spectrum

Accommodate a large number of users

1 2 3 4 5

End Exam

Fig 6. Examination page

At the commencement of an examination the examination page automatically goes to Fullscreen to prevent changing of tabs by the candidates. A countdown at the top of the page shows the time left to end the exam. The candidate has to select among the given options and can navigate the questions using the Next or Previous button given at every page along with the question. Candidate can submit the responses using the Submit button provided at the last page of the test.

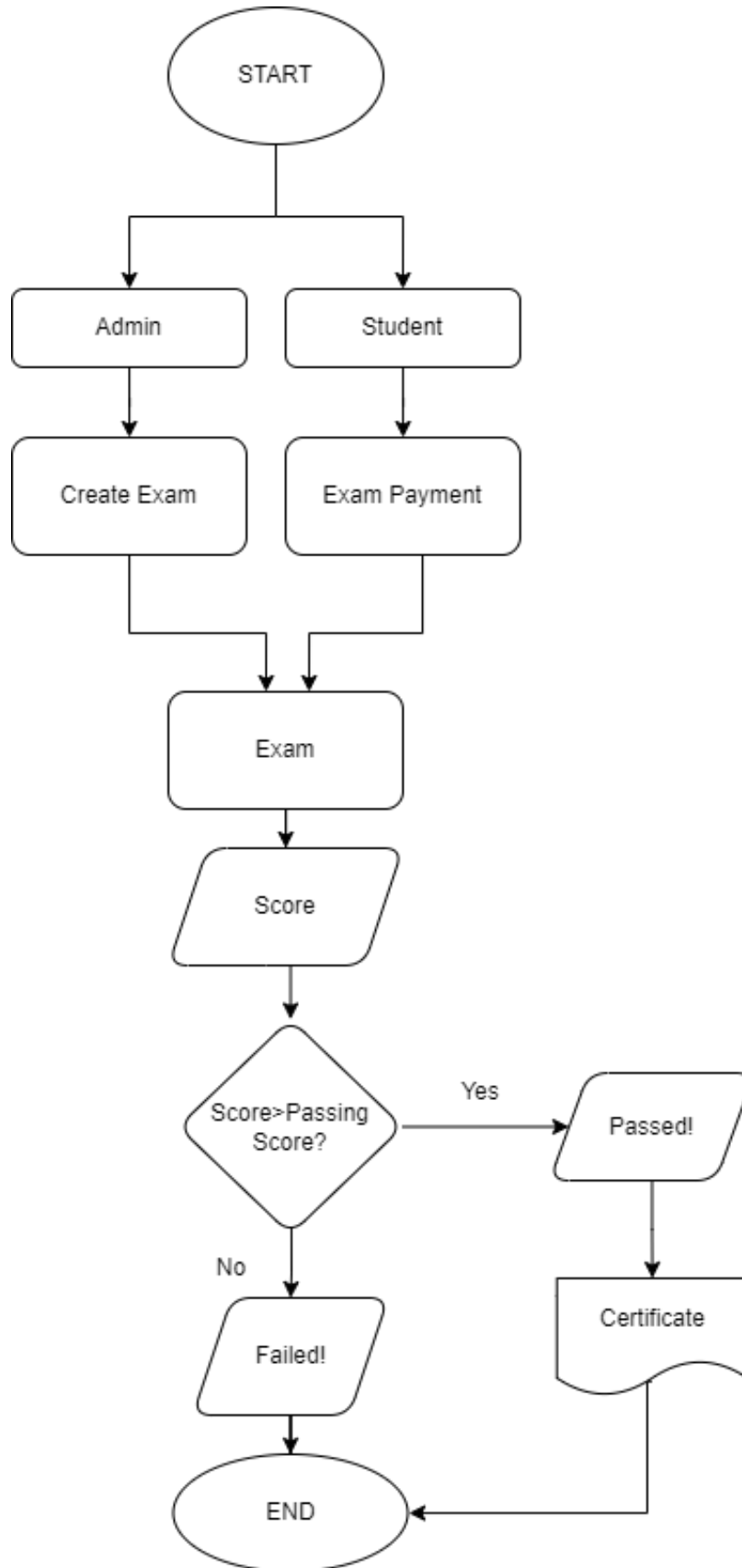


Fig 7. Flowchart for test and result creation

C. Results

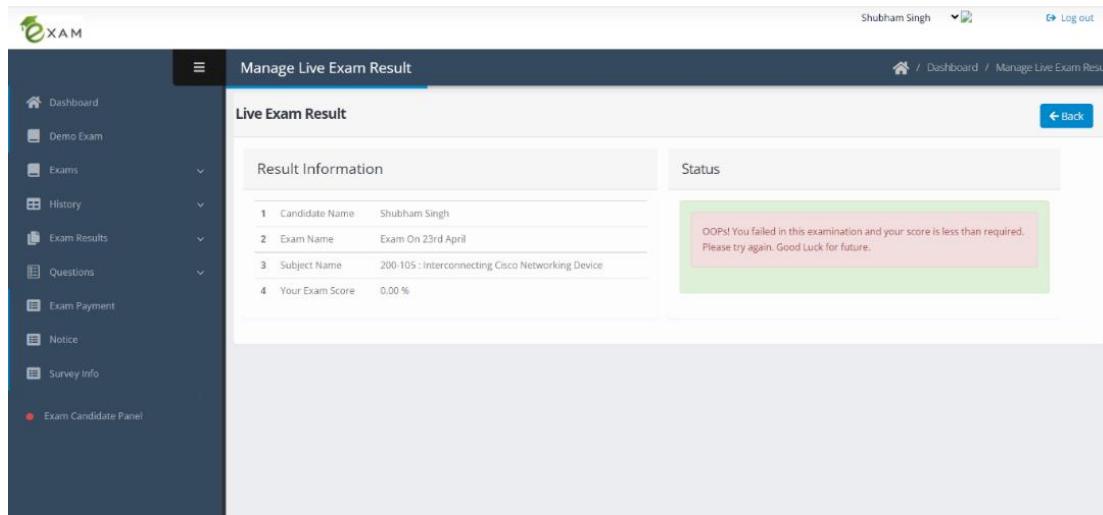


Fig 8. Result with failing score

After submission by the candidate the responses are stored at the server and is evaluated immediately to display the result according to the passing score defined by the Admin.

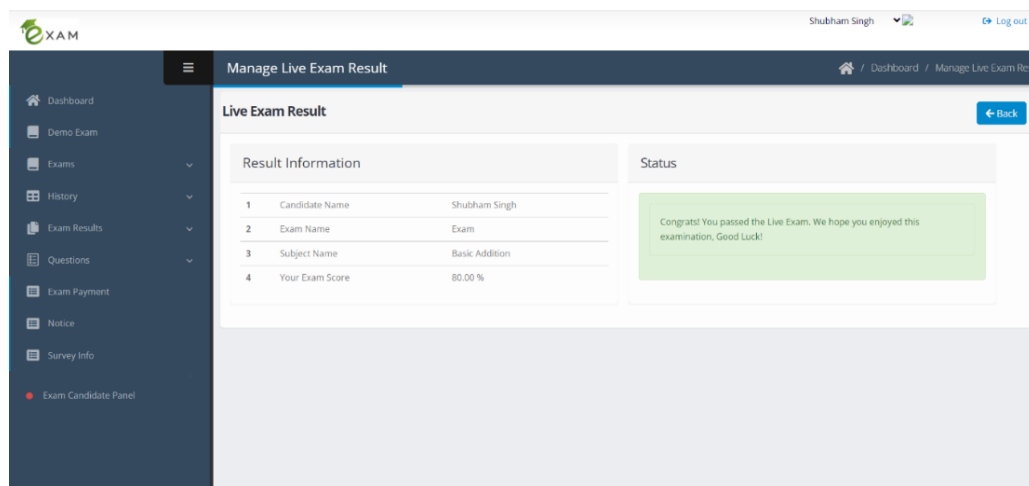


Fig 9. Result with passing score

If the candidate has received a passing score on a test, the candidate can go to Exam Results section to view and download the certificate immediately after the display of results.

IV. TOOLS AND TECHNIQUES

Frontend: The front-end of the website is designed with HTML, CSS and JavaScript. JavaScript is used for doing validations on the client side before sending it to server. Bootstrap is used for creating dashboards for different panels for visualization of statistics. The whole website is responsive which means it can be operated using any desktop or mobile devices.

Backend: The backend of the website is created using PHP. The question sets are stored in CSV (Comma Separated Values) format. The database used for storing data is MySQL which is a relational database.



V. CONCLUSION

In this paper, we discussed the development and implementation of a web application for conducting and managing online examinations. This platform could be used by Educational Institutions, Companies, Individuals for secure, reliable and fast conduction of examinations. The organizations can conduct tests, surveys with accurate time limits. The results and certificates could be automatically and instantly generated after the conduction of examination. Furthermore, a user-friendly implementation enables candidates to take tests in this platform without any prior knowledge of the platform.

VI. FUTURE SCOPE

A. MANAGEMENT INFORMATION SYSTEM (MIS): This website could be extended to add MIS into the platform, this would help the educational institutions to manage profile of candidates throughout an academic session. This would include all the scores and other information of the candidates. The candidates can view their score and status on a single platform using their profile.

B. ONLINE PROCTORING: A proctoring feature could be added further in the platform for ensuring academic integrity and preventing any kind of cheating by candidates while taking tests. Webcam could be used for additional security and ensuring the candidate is not performing any malpractices outside the examination protocols.

REFERENCES

- [1]. Zhao Qiao-fang, Li Yong-fei, "Research and Development of Online Examination System", Proceedings of the 2012 2nd International Conference on Computer and Information Application (ICCIA 2012), May 2014, Pages: 936-938, doi: 10.2991/iccia.2012.228
- [2]. Anjali Choubey, Avinash Kumar, Ayush Ranjan Behra, Anil Raj Kisku, Asha Rabidas, Beas Bhadra, "A study on Web based Online Examination System", International conference on Recent Trends in Artificial Intelligence, IOT, Smart Cities & Applications (ICAISC-2020)
- [3]. Siddalingappa V Dhamade, Dr Shubhangi D C, "Web based online examination system", Publication Since 2012 | ISSN: 2321-9939 | ©IJEDR 2020 Year 2020, Volume 8, Issue 3
- [4]. Priya D. Armarkar, Vaishali C. Asole, Samiksha S. Thul, "Online Examination System – A Web-Based Application", International Journal of Computational and Electronics Aspects in Engineering Volume 2, Issue 3, July 2021, pp 46 - 50
- [5]. Lu Changa, Xu Guang Ming, "Application Research of Web Examination System Based on College", 2012 International Conference on Future Electrical Power and Energy Systems
- [6]. Burcu Yılmaz Kaya, Gökhan Kaya, Metin Dağdeviren, "A Sample Application of Web Based Examination System for Distance and Formal Education", 1877-0428 © 2014 The Authors, Published by Elsevier Ltd.
- [7]. Aris Martono, Arsi Yulianjani, Dewi Immaniar Desrianti, "Online Exam System to Improve Student Learning Quality in State Vocational School 5 Tangerang City", ISSN: 1978 -8282, Online ISSN: 2655-4275
- [8]. Rajesh kumar, Neetesh kumar, Sabeen Gul, Shahbaz Wahab, "A web-based online examination system for computer science education", International Journal of Scientific & Engineering Research Volume 9, Issue 7, July-2018, ISSN 2229-5518
- [9]. Temba Saina, "Development and Implementation Of An Online Examination System: A Case Study At Information And Communications University-Zambia", Paper ID: CFP/2144/2020, ISSN: 3471-7102
- [10]. Olalere A. ABASS, Samuel A. OLAJIDE, Babafemi O. SAMUEL, "DEVELOPMENT OF WEB-BASED EXAMINATION SYSTEM USING OPEN-SOURCE PROGRAMMING MODEL", Turkish Online Journal of Distance Education-TOJDE, April 2017, ISSN: 1302-6488, Volume: 18, Number: 2, Article 3