Web portal for skillset assesment

Software Requirements Specification

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Group E

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Revision History

Date	Description	Author	Comments

Document Approval

The following Software Requirements Specification has been accepted and approved by the following:

Signature	Printed Name	Title	Date

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1. Introduction

1.1 Purpose

The aim of this document is to specify the complete description of the project on Development of a dynamic web based platform for assessment of various skillets. This document describes the functionalities, external interfaces, attributes and the design constraints of the system which will be developed as part of this project. It is intended to be used by members of the project team that will implement and verify the correct functioning of the system. The client can also use this document to verify the fulfillment of his/her/their requirement.

1.2 Scope

- The skill assessment system is a dynamic web-based desktop and/or android application for the assessment of various human skills, designed for Parasmani skills.
- The desktop application and/or android application will be used for conducting various examinations and for providing detailed analysis of the results.
- The website will provide an extensive analysis of the results and also provide relative performance for the user over many criteria.
- The existing system uses pen-paper based examinations which is an unreliable mode of examination. The web portal makes it easier, reliable and much more cost efficient.
- The admin will create the examination on the web portal and then the questions will be added by the question adders.
- The users will log-in to the Web-portal to check the results. In the desktop application the user will give the examination which will then be submitted and assessed through the assessment server and the detailed analysis will be provided to the users.
- The users will not be able to switch windows during the examination to avoid usage of unfair means. Also, the video recordings will be made wherever possible and provided to the assessor for its analysis.
- The analytics server also generates the overall report of the examination subject to various assessment criteria.

1.3 Definitions, Acronyms, and Abbreviations

JavaScript : often abbreviated as **JS**, is a high-level, dynamic, weakly typed, prototype-based, multi-paradigm, and interpreted programming language.

React Js : it is a JavaScript library for building user interfaces. It is built and maintained by facebook.

Node Js: It is an open-source, cross-platform JavaScript run-time environment for executing JavaScript code server-side. Historically, JavaScript was used primarily for client-side scripting. Node JS enables JavaScript to be used for server-side scripting, and runs scripts server-side to produce dynamic web page content before the page is sent to the user's web browser.

MySQL : It is an open-source relational database management system.

1.4 References

IEEE Software Engineering Standards Committee, “IEEE Std. 830-1998, IEEE Recommended Practice for Software Requirements Specifications”, October 20, 1998.

2. General Description

2.1 Product Perspective

This project will be built using a couple of javascript based technologies. The server side application will be written using Node JS. The client side web application for accessing the result analytics will be developed using React JS. The Desktop application will be developed using Electron JS, and React JS will be used to render the GUI. MySQL will be used as the database engine. Node JS will be used to query the database and perform all heavy processes and then the processed data will be rendered in the client side.

2.2 Product Functions

The Product can be divided into 3 sections :-

- Desktop application : The desktop application will be used by the students to submit the answers. Once the exam has started, the student will not be allowed to switch applications. Also if by any means the application is closed the students account will be deactivated and only the coordinator can activate it again. If web cams are available in the systems, the video of the student will be recorded and sent to the server. After the exam has completed, the data along with the video will be submitted to the server.

- Website : The website provides analytics and a portal to create exams, upload questions and to manage accounts. The students will be given their result analytics, and the admin will be provided with analytics based the aggregate data for each exam.

- Server : The server basically does all the heavy tasks. All the data storage and analytics will be done in the server side. The processed data will be given to the client.

2.3 User Characteristics

Users can be broadly classified into four types. Each type having certain authorizations and access to different levels of the database system.

- Students : The student can answer questions and see their result analytics. The student has to login into the desktop application to give the exam. The results and analytics will be provided via the website.
- Coordinator : The coordinator gets access to modify the user details, and to start and end the exam.
- Question Adder : The question adder has access to add/modify questions to a question paper.
- Admin : The admin has access to everything. The admin creates accounts for coordinator and question adder. The admin creates exams and assigns question adder to each exam. The admin gets the over all performance analysis of the students, also they get a exportable document that contains all the analytics which can be submitted to the authorities.

2.4 General Constraints

2.5 Assumptions and Dependencies

- Server-side: The following are the requirements from the server :
  - Linux based system(preferred)
  - Node JS installed
  - MySQL database engine installed
- Client-Side: The desktop application will be Cross-platform hence the client's computer can be Windows, Linux or Mac. The website will work on any system with browser later than IE 7.
- It is assumed that the operating system and other underlying pieces of software on the user side are free from any error which may affect the functioning of this system.

3 Specific requirements

3.1External Interface Requirements

3.1.1 User interfaces

The web-portal will have a login page for a)students, b)Admin, c)Question Adders, and d)Coordinators.

The user will then be redirected to a dashboard which will contain further options unique for each category:

- **STUDENTS** : Inside the web portal, after login the users will have an option to view the result of any previous examination along with a detailed analysis of their performance in each of the examination. On the desktop application in the examination centers, after login, the user will be shown the instructions for a particular exam and a confirmation page before starting the exam. After this, the examination will start. The page will have a question and four options out of which the student has to choose the appropriate option/s. There will always be a button for next question, previous question, viewing the question list and for ending the examination.
- **ADMIN** : In the admin's dashboard, there will be an option to add an examination, add students for a particular examination, add another admin, add a question adder, export analytics and to generate certificates.
- **QUESTION ADDER** : In the question adder's dashboard, first he/she will asked for the examination ID and the will be allowed to add questions and options for that particular examination.

3.1.2 Hardware interface

For the implementation of our model, the organization requires a functional lab with all the machines having Internet access. Also, if the organization wishes to monitor the users, a video recording of the user can be provided if a web-cam is available.

3.1.3 Software interface

This project will be done in mainly three parts. The first one will be a desktop application which will run on the systems and the users will give the examination on the same.
Second will be a website where the admin will login and create the examination. Also, the analytics will be shown on the website.
Third will be a server which will be hosted and the database will be stored in it along with the analytics.

3.1.4 Communication interfaces

All the data (I.e. the question paper, the responses and the analytics) will be stored in the server and will be accessed by the application as and when required.
To upload the responses of the users, an Internet connection is required in the labs where th examination will be conducted.

3.2 Functional Requirements

To add an examination, the admin will create an examination on the website along with its description. Then the question adders for that particular examination will be added who will enter the question for that exam in various languages and categorize them on the basis of difficulty.

Then the server will process the questions added for the examination and select equal number of questions having a particular difficulty to generate different set of question paper of same overall difficulty for the users, also the order of the options for each question will be randomly changed for each user to prevent the use of unfair practices

Then the admin will add the users who are going to take the examination and some coordinators will be made.

The examination is to be given on the desktop application. During the examination, the application will be run in kiosk mode to prevent any other application from running. The video recording of the lab and the student will also be uploaded to the server for analysis.

The application has a login page, followed by instructions of the examination. Once the examination has been started, a timer will show the remaining time.

There will be an option to go to the next question, previous question, question list and to end the exam.

Once the exam is finished, the responses are uploaded to the server which are then analyzed and the final score is computed.

After the examination, overall in depth analysis will be generated and made available to the website. The users can login to the website and download the analysis of their performance and also their certificates.

3.4 Non-Functional Requirements

3.4.1 Performance

Since the system is web based, the server/servers should be capable of handling large number of simultaneous requests(say 100).Thus the Internet bandwidth should be as high as possible (200mbps recommended)to handle the large number of requests. It is recommended that the server hardware have at least 2GHz processing speed and 4GB RAM.

3.4.2 Reliability

The system should be able to process all the information for analytics and store them permanently as any loss of data will render the whole portal useless for the user.

3.4.3 Availability

The system should be up and running during the examination time so that there is no problem during the exams and everything runs smoothly.

3.4.4 Security

The operating system being used on the server should be updated so that it is free of common vulnerabilities. The application should also have security features to protect it from basic vulnerabilities. The administrator shall also be able to timely inspection of database to ensure safety.

3.4.5 Maintainability

The database should be accessible to the administrators so as to carry out maintenance.

3.4.6 Portability

The platforms on which the system runs should be generic enough to allow substantial amount of portability.

3.6 Logical Database Requirements

- The names, contacts, addresses should in a valid standard format to maximize correctness of information.
- At least 10 GB storage is recommended for database storage requirements.