**Software Requirements Specification**

**For**

**STUDENTS EMPOWERMENT SYSTEM**

**Prepared by**

**Mousuf C A 174792**

**Alwin Crasta 174737**

**Muhammed Junain 174791**

**St Aloysius College (Autonomous)**

**Mangalore**

**18/12/2019**

**1. INTRODUCTION**

This section gives the scope, description and overview of everything in the SRS document. All the abbreviations and definitions are provided in this document.

**1.1. PURPOSE**

The purpose of the system is to have an organized way of having information about the student empowerment system. It gives an overall knowledge about the student’s empowerment system websites and sub websites under the system. It provides a better platform for students to share their knowledge and a better personalized content websites to the normal users.

**1.2. INTENDED AUDIENCE AND READING SUGGESTIONS**

The proposed viewers of this software requirement specification document can be the developers, administrators, students and technical support team members.

**1.2.1. DEVELOPERS**

The developers related to this project can use this SRS document to understand the system and implement it without any problems. Developers are expected to have a basic knowledge about SRS to use this document.

**1.2.2. ADMINISTRATORS**

The administrator of the system can refer this document to get better understanding about system and its working. Administrators are expected to have some basic knowledge about technical items and SRS to understand this document.

**1.2.3. STUDENTS**

The students who are going to use this system can refer this document to understand the system and its working. Student will understand the benefits of this system and give suggestions to improve our system using this document.

**1.2.4. TECHNICAL SUPPORT TEAM**

Technical support team can refer this document to setup the required environment to deploy the system. Using this document technical team members can ensure that all the security and safety requirement are satisfied to run this system in the operating environment.

**1.3. PRODUCT SCOPE**

The “Student Empowerment System” is a combination of web and mobile application to give an opportunity for students to share their knowledge and give rich quality personalized content to the normal users. In internet world there is no platform which allows students to collaborate with other students and share their knowledge for those who need it. That’s why we came with an idea to build a website which will help students those who want to share their knowledge to internet in different ways. Our system will be having multiple websites running under it and the best part is that the students can manage all the websites which they want to work, in one single dashboard.

In normal blogs and forum there is no data analytics metrics to serve the articles which the user might be interested. That’s why we planned to implement different data analytics tools in our websites to study user and serve personalized content to them.

**1.4. REFERENCES**

References that we used to create this SRS document is noted below:

1. Software Engineering Textbook by Aggarwal K.K and Singh Yogesh.
2. Object Oriented Modelling and Design with UML by James Rumbaugh

**2. OVERALL DESCRIPTION**

**2.1. PRODUCT PERSPECTIVE**

The “Student Empowerment System” is a combination of web and mobile application to give an opportunity for students to share their knowledge and give rich quality personalized content to the normal users. In internet world there is no platform which allows students to collaborate with other students and share their knowledge for those who need it. That’s why we came with an idea to build a website which will help students those who want to share their knowledge to internet in different ways. Our system will be having multiple websites running under it and the best part is that the students can manage all the websites which they want to work, in one single dashboard.

In normal blogs and forum there is no data analytics metrics to serve the articles which the user might be interested. That’s why we planned to implement different data analytics tools in our websites to study user and serve personalized content to them.

**2.2. PRODUCT FUNCTIONS**

“Student Empowerment System” consists of various goals and functions such as Student ID verification, dynamic dashboard generation, user data visualization, personalized content serving etc...

1. All students are verified with their ID card provided by college. Data in the ID card will be fetched using ORC.
2. Admin will get provision to manage all data and users in the system within one dashboard.
3. Students will get an option to join any websites under the system and access to all sites will be provided within one single site.
4. All normal people can use the websites under the system. Google login is required for get more access to the sites. All user activity in the websites will be used to train our machine to understand the user and serve personalized content for them.
5. AI chat system will help users to get answers for frequently asked questions in the sites.
6. Based on the user’s activity in the sites, data visualization will be provided for administrators as well as students to study users and identify current trend in internet.
7. Notification system will be enabled in the system to keep users in touch with sites.

**2.3. USER CLASSES AND CHARECTERISTICS**

End users of “Student Empowerment System” include administrator, technical support team, students and normal users.

**2.3.1 ADMINISTARTORS**

Administrator is the main controller of the system.He will be provided with full provision to the system. Admin must have basic knowledge about data visualization to study users. Admin will have the responsibility to manager users and verify the contents in all other sites under the system.

**2.3.2 TECHNICAL SUPPORT TEAM**

Technical support team will be responsible for managing the entire server the database resources of the system. All members of the team must know about AWS and its infrastructure, because entire system will deployed in AWS platform.

**2.3.3 STUDENTS**

Students are the main users of the system. Students must have ID card in order to register in our system. Students are expected to have a better knowledge about SEO to ensure the quality of the content

**2.3.4 NORMAL USERS**

Normal users are expected to have a good internet connection and basic knowledge about internet to use our websites. All users are expected to have Google account to get personalized content.

**2.4. OPERATING ENVIROMENT**

The system will be deployed in AWS which is the largest cloud computing service in the world. EC2 server will used to deploy our sites and API’s with Nginx server. For Database AWS RDS Database will be used where a dedicated system will be running only for database with auto backup and CDN functionality. For all static files storing AWS S3 will used with SSD storage with unlimited bandwidth.

The system can be used with the help of smartphone as well as computers by the end users.

**2.5. DESIGN AND IMPLEMENTATION CONSTRAINS**

The “Student Empowerment System”” is designed for English language only. It must consist of attractive and user friendly user interface to make experience with system smooth and enjoyable. Proper validation of the user data with grammar checking and SEO analysis has to done in order prevent the user from submitting low quality content to the site. All the error and warning messages should be shown to user for rectification of errors.

Lazy load must be enabled in all sites to reduce the initial load of the system. Developers have to be very careful when naming tables, since all websites are using same database. All data storing related API must be created using PHP Laravel framework to manage data relations must easier. All data fetching related API must be created using JavaScript NodeJs framework to get better response time for the system. All data analysis’s API must be created using Python Django framework to make use of various python libraries.

**2.6. USER DOCUMENTATION**

**2.6.1. FAQ**

Users will be having an FAQ option in all sites to get answers for frequently asked questions.

**2.6.2. CONTACT PAGE**

There will be separate contact page to users to contact the admin of the system.

**2.6.3. AI CHAT SYSTEM**

AI chat will help automatically process user’s questions and give a best answer for that.

**2.6.4. VIDEO TUTORIALS**

All the students will be provided with videos tutorials to understand the system working and its benefits.

**2.6.1 USER MANUAL**

User manual will be provided to the administrator to understand all his roles in the system.

**2.7. ASSUMPTIONS AND DEPENDANCIES**

The user should have basic knowledge of computers and they must be trained well to handle the features provided by the system. The administrator of the system is expected to spend daily at least 10 hours to manage the system.

All the students who want to join the system are expected to have an ID card issued by their college or university for verification.

It is assumed that all the sites under system are regularly indexed by search to keep a good ranking in SEO. All users are expected to have the latest version of internet browsers to support latest technologies used in the system. All students are expected to understand data visualization models to get a better idea about latest trends in the internet.

All server and database running expenses must be less than 100$ per month to ensure that the system is running in profit.

Various PHP, Python and JavaScript Packages are used to develop the system.

**3. EXTERNAL INTERFACE REQUIRMENTS**

This section provides a detailed description of all input and outputs of the system. It also gives description of the hardware, software and communication interfaces and provides basic prototype of the user interfaces.

**3.1. USER INTERFACES**

The “Student Empowerment System” provides an easy to use graphical user interface. Each user role has a separate login for their dashboard to provide maximum security. For all heavy components lazy loading is enabled to ensure that, user is getting smooth user interface in the system. A single admin dashboard is created to manage the full system.

Students have only one dashboard where they can access all the sites under the system. End user sites are built using single page application model to give the best user experience.

**3.2. HARDWARE INTERFACES**

**3.2.1. SERVER**

* + - 1. **AWS EC2**

Amazon Elastic Compute Cloud (Amazon **EC2**) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers. In this system, the websites and API will be deployed in ec2 to ensure maximum performance.

Server must have minimum configuration of 4CPU, 8GB RAM, 100MB Network, 100GB SSD Storage

* + - 1. **AWS RDS**

Amazon Relational Database Service is a distributed relational database service by Amazon Web Services. It is a web service running "in the cloud" designed to simplify the setup, operation, and scaling of a relational database for use in applications. The system will run on one single database on RDS which be used by all sub websites.

Database server must have minimum configuration of 2CPU, 4GB RAM, 100MB Network, 100GB SSD Storage.

* + - 1. **AWS S3**

Amazon S3 or Amazon Simple Storage Service is a service offered by Amazon Web Services that provides object storage through a web service interface. Amazon S3 uses the same scalable storage infrastructure that Amazon.com uses to run its global e-commerce network. For all static file in this system will be stored in s3 to get maximum retrieval speed.

**3.2.1. END USER**

Computer or a smartphone device which has a latest version of web browser installed.

**3.3. SOFTWARE INTERFACES**

**3.3.1. VUEJS**

Vuejs is an open-source Model–view–view model JavaScript framework for building user interfaces and single-page applications. It was created by Evan You, and is maintained by him and the rest of the active core team members coming from various companies such as Netlify and Net guru. In this system, all the frontend sites will be created using Vuejs**.**

**3.3.2. LARAVEL**

Laravel is a free, open-source PHP web framework, created by Taylor Otwell and intended for the development of web applications following the model–view–controller architectural pattern and based on Symfony. In this system all the data storing related API will build using Laravel framework.

**3.3.3. NODEJS**

Node.js is an open-source, cross-platform, JavaScript runtime environment that executes JavaScript code outside of a browser. In this system all data fetching API will be build using this superfast JavaScript framework.

**3.3.4NODEJS**Django is a Python-based free and open-source web framework, which follows the model-template-view architectural pattern. In this system all site image processing API will be built with Python framework.

**3.3.5. TENSORFLOW**

TensorFlow is a free and open-source software library for dataflow and differentiable programming across a range of tasks. It is a symbolic math library, and is also used for machine learning applications such as neural networks. In this system all the data analytics and machine learning models will be developed using this software.

**3.4. COMMUNICATION INTERFACES**

**3.4.1. HTTPS**

Hypertext Transfer Protocol Secure is an extension of the Hypertext Transfer Protocol. It is used for secure communication over a computer network, and is widely used on the Internet. In HTTPS, the communication protocol is encrypted using Transport Layer Security or, formerly, its predecessor, Secure Sockets Layer. In this system all the sites will served using https protocol.

**3.4.2. TLS 1.3**

Transport Layer Security, and its now-deprecated predecessor, Secure Sockets Layer, are cryptographic protocols designed to provide communications security over a computer network. Our system will be using this encryption method while sending data from client browser to server.

**3.4.2. REST API**

Representational state transfer is a software architectural style that defines a set of constraints to be used for creating Web services. Web services that conform to the REST architectural style, called Restful Web services, provide interoperability between computer systems on the Internet. All the API of this system will under REST API model.

**3.4.2. FTP**

The File Transfer Protocol is a standard network protocol used for the transfer of computer files between a client and server on a computer network. Filezilla software used to establish a FTP connection to the server.

**4. SYSTEM FEATURES**

**4.1. ADMINISTRATOR**

**4.1.1. STUDENT VERIFICATION**

Admin will get the list of registered students with their details. The data fetched from their provided ID card also display there. Admin has to verify whether the student data is accurate or not.

**4.1.2. STUDENT MANAGMENT**

Admin have full control over student’s data. He can perform All CRUD operations in students.

**4.1.3 END USER MANAGEMENT**

Admin can manage all end users and their data

**4.1.4 COLLEGE MANAGMENT**

Admin can add college list to the database. This college list will be shown for students when they are doing registration in the system

**4.1.5 BLOG REVIEW AND MANAGMENT**

Blog content added by students will send to admin for review. Admin must check for mistakes and authenticity before approving the article. Admin will get full control over articles.

**4.1.6 PHOTOS MANAGMENT**

Admin has to verify the images uploaded by students before publishing it into the site. He can reject the image if any issues found.

**4.1.7 QNA MANAGMNET**

Admin can review all the questions and answers in forum and performance any action if some policy violations are found.

**4.1.8 PROMOTIONS**

Admin will have an option to send Email or SMS promotions to the selected users.

**4.1.9 DATA VISUALISATION**

Admin will be provided with multiple data visualization graphs to understand the statistics of the system.

**4.1.10 LIVE SERVER MONITOR**

Admin can monitor the server health and performance

**4.2. STUDENT**

**4.2.1. REGISTRATION AND LOGIN**

Students can register using their ID card provided by their college. Those who don't have an id card will get an option to contact our customer support team to create an account.

**4.2.2. DATA VISUALISATION**

Using data visualization graphs, students can easily find the trends in internet.

**4.2.3. CHAT SYSTEM**

Students can chat with other students if they want to work together.

**4.2.4. POINTS SYSTEM**

Depending on the activities of students, points will be awarded for all students. In every month best student result will be published in main site.

**4.3. NORMAL USERS**

**4.3.1. GOOGLE LOGIN**

In all sites normal users can use their Gmail account to login to our system.

**4.3.2. INTEREST SELECTION**

Users will get an option to choose their interest to get most relevant content for them.

**4.3.3. ACTIVITY TRACKER**

Each and every activity of users in our sites will be tracked to study the user to serve more personalized content.

**4.4. AI CHAT SYSTEM**

This AI chat system will help to users for solving small doubts about the working of the sites

**4.5. BLOG MODULE**

All articles added by students will be added in this blog site.

**4.5.1. COMMENT STSTEM**

Users can comment to any blog post to get a better clarity about the topic.

**4.5.2. LIKE AND FOLLOW OPTION**

Users can like articles and follow the author if they want to

**4.6. FORUM MODULE**

Students will answer to the questions asked by the users of this site.

**4.6.1. ASK QUESTIONS**

Users can ask any questions in our forum. For more clarification they can images and code snippets or files with their questions

**4.6.2. SEND MESSAGE**

Users can send message to students in our system, if they want any help.

**4.6.3. WATCH QUESTIONS**

Users can like add any questions to watch list if they want to get notifications when someone answered to that

**4.7. PHOTOGRAPHY MODULE**

All the photos uploaded by students will be displayed in this site.

**4.7.1. PHOTO DOWNLOAD**

Users can download any photos of they want. Multiple quality option will be provided when they opt for download.

**4.7.1. DONATION**

Users can donate to the author of the photo if they can any financial benefit from the photo

**5. OTHER NON-FUNCTIONAL REQUIRMENTS**

**5.1. PERFORMANCE REQUIRMENTS**

The system should be able to produce accurate data within less amount of time. The load time for User Interface screens may take less than a second. The login authentication process should take few seconds. Server must be able to handle any number users and queries. Auto scaling and Load balancing feature must be implemented.

**5.2. SAFETY REQUIRMENTS**

The user authentication and authorization protocols have to be tight. Username and passwords need to be entered in order to get all features of the system. The system must allow users to change his password at any point of time if he wishes. In case of server fault, crash due to virus, Operating system failure the system should do periodic backup though a live internet connection.

**5.3. SECURITY REQUIRMENTS**

The entire user password will be stored in encrypted format to provide security. All the communication between client and server will be done through TLS 1.3 ensure security. Instead of FTP, SFTP will be used to communicate with server.

**5.4. SOFTWARE QUALITY ATTRIBUTES**

**5.4.1. RELIABLITY**

Good validation for user input will be done and avoid incorrect storage records. Only authorized users will be able to use the system. The data will be maintained in a centralized server and modifications to the data will be only done by the authorized users who are given rights according to their role.

**5.4.2. USEABILITY**

Any users with basic knowledge of working with computers or any smartphones over the internet will be able to use the application with ease.

**5.4.3. INTEGRITY**

Users are given role based on which their operations with the data will be restricted; there by preventing any invalid operations over data, the system maintains integrity of data.

**5.4.4. PORTABILITY**

This system shall run in any operating system without depending on factors like hardware platform etc…

**5.4.5. AVAILABILITY**

System will be available 24x7

**5.4.6. MAINTAINABILITY**

This SRS Document can be referred for validation during maintenance stage.

**5.5. BUISNESS RULES**

Admin can disable any student’s login, if they found any illegal activity in our sites. Our system will be having the copyright over the content which student shared to our sites. The content and data of the users and student won’t be sold to any other third parties. All user registered ion our sites must agree to the terms and conditions in our site.