

# **Software Requirement Specification for BUP ICT Alumni Website**

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# 1 Introduction

## 1.1 Purpose

This document is intended to describe accurately the capabilities that the software product “ICT Alumni Website” should provide to its end-users and also specify all the functional & non-functional requirements that the application should implement, regarding subjects like performance, availability, reliability, security, etc.

## 1.2 Document Conventions

IEEE format is used in the document. Bold words are for highlighting the topic of the software that is being described. Italic font is used for the descriptions.

## 1.3 Intended Audience and Reading Suggestions

This document is intended for our supervisors, developers, project managers, marketing staff, users, testers, and documentation writers. The rest of this SRS contains a detailed description of the product, hardware, software and communication interfaces, system features, other non-functional requirements, and how it is organized. A sequence for reading the document could be beginning with the overview sections and proceed through interface requirements, non-functional requirements and system features.

## 1.4 Product Scope

The software product is intended to offer remote access to the Alumni Database of the graduates of the Department of Information and Communication Engineering. So, the stored information will remain accurate and it will be visible both to the students and alumni.

The software product is designed to run as a web app. It will receive incoming requests from servers, it will process them, and, finally, will query the underlying Alumni database and obtain the desired results/information, which will be passed to the web server. Users would access the product by using their web browser, so an Internet connection is necessary to access the system. This software product is supposed to satisfy both the alumni's wish for sharing access to the database storing their information and the students and other alumni in need of information regarding the graduates.

## 1.5 References

- [IEEE] The applicable IEEE standards are published in “IEEE Standards Collection,” 2001 edition.
- [Bruade] The principal source of textbook material is “Software Engineering: An Object-Oriented Perspective” by Eric J. Bruade (Wiley 2001).
- [Reaves SPMP] “Software Project Management Plan Jacksonville State University
- Computing and Information Sciences Web Accessible Alumni Database.”
- Jacksonville State University, 2003.

## 2. Overall Description

### 2.1 Project perspective

The project is going to be built in the perspective of alumni and present student as a requirement for a platform that gives out the opportunity to connect with people with similar interests. Such a platform would be able to provide valuable data such as skills, stack expertise, blood group, job history, present job, etc to interested students so that they can query and find the right person for them. Taking mentorship would be easy due to the implementation of this project. As to keep the development and progress sustainable we require to preserve our talents and records in such platforms.

### 2.2 Product function

This product will give out features like job searching, blood group, searching, alumni directory etc.

#### **Administrators:**

1. The Admin has full-fledge control of the website.
2. The Admin should be able to insert, delete and modify any data.
3. The Admin should be able to see all the activities of the users.
4. The Admin should be able to manage all the financial transactions related to donations.
5. The Admin should be able to get information about the users.
6. The Admin should be able to send any notices or launch any events.
7. The Admin should be able to approve any post made by the users.

#### **Users:**

1. The Users should be able to create a profile.
2. The Users should be able to insert any information or remove any information from their profile.
3. The Users should be able to go through other user's profile.
4. The Users should be able to search users by providing a criteria.
5. The Users should be able to contact the admin directly.
6. The Users should be able to make fund raiser events.
7. The Users should be able to post any notices, news, events or any help post.
8. The Users should be able to upload any photos in the photo gallery.
9. The Users should be able to see the CVs' of other users

### 2.3 User Characteristics

The website's users are graduates from a certain university, department, or organization, and its administrators will look after its upkeep.

The Users should be familiar with the fundamentals of using computers and the internet. Administrators need to have a basic understanding of the website and be able to troubleshoot issues when they arise.

## 2.4 User documentation, assumptions & dependencies

It will provide links of various job opportunities. Assumptions that has been made during the start of the project and list of any dependencies that has any impact in the success or outcome.

The website known as the ICT Alumni Association Website must be able to function with JavaScript and Flash Player on widely used browsers like Google Chrome, Mozilla Firefox, and Microsoft Edge.

## 2.5 System context & general constraints

It describes resulting context within the business that has strategic issues in which the system is involved. It must contain a clear context for the system in particular who may have no knowledge about the system.

It also identifies any system constraints that is:

- Specified
- Designed
- Implemented
- Tested

# 3. External Interface Requirements

## 3.1 User Interfaces

The alumni website in construction will be used by multiple stakeholders. Ensuring an error-free interface that allows the users to grab the required information from this website is discussed later on. The UI will include- Login Page, Public Portfolio Page for Each user, Forms to submit information, a private dashboard for each user, a communication chat option (IRC), and an interactive search option. These features will be connected with cloud databases.

## 3.2 Hardware Interfaces

This will be a web app. So the hardware requirements for hosting this project are bypassed by using PaaS solutions of cloud computing technology. Here virtual computing resources will be used for the deployment and development of the web app project.

## 3.3 Software Interfaces

The login panel will be connected to a cloud authentication module. It will generate user id & password hashes and save that in an elastic cache. Every time a user authenticates, the hash will be fetched from the cache resulting in a faster authentication. After authentication, a user will get connected to the specific dashboard and profile. The user data will be stored in a blob database and the web app will be containerized using Docker. This will ensure high availability of data and faster response times. An interactive script will be working in the background to collect data from the user end and update it to the database. There will be redundancy features in the database for data loss

prevention. The search bar will have a connection with an elastic cache which will index the database contents to find the desired results in the shortest possible time.

### 3.4 Communications Interfaces

As this will be a web app, it will be containerized using Docker and be hosted in Microsoft Azure in a separate virtual network. This network will be combined with a firewall to control access to the alumni website only by authenticated BUP students using Single Sign On (SSO) feature. The visible web portion of the app will be secured by SSL certificates and HTTPS protocol. TLS encryption will be used for security. As the database end will be serving mostly read-only contents so data protection will be used to ensure that only validated data can be written or updated in the database.

## 4. System Features

### 4.1 Professional Profile

#### 4.1.1 Description and Priority

In this feature, we have provided the profile details of our clients. Anyone, with just a click, now will be able to know detailed information about the alumni of Bangladesh University of Professionals. It will maintain a highly engaged community where alumni from all over the world will be able to communicate with each other and the other students and friends. This section will maintain a relevant highlight on the skills and qualifications that students from the university hold.

This feature holds high priority as the alumni website would not work with no information about the alumni. The benefit of having this section is that anyone in search of a particular person who is alumni can find them over here and check the information to see if they would be useful for the intended work.

#### 4.1.2 Stimulus/Response Sequences

- The users who will work or interact with the website can now easily get to know the information and relevant data on the alumni.
- Get to know the blood group of each person in case of an emergency.
- Get to know alumni activities.
- Users or clients can easily register.

#### 4.1.3 Functional Requirements

REQ-1: Taking the user's username and login information.

REQ-2: Taking the user's password.

REQ-3: Providing information on required items.

### 4.2 Job Opportunities

#### 4.2.1 Description and Priority

This section will provide opportunities for students to get more jobs and intermingle more into their adult surroundings. It is one centralized area to post, or view, job opportunities and internships. It will help them get ready for jobs. It will also help the respected alumni search for appropriate employees who will be perfect for a job. It will help them look for the right person. Job opportunities helps both the users and the alumnis discover not only more jobs available, but also which job will help them advance more, which job will help in which sector and what kinds of job provides the best opportunity to move forward, This might be different for different people and everyone gets to judge which is best for themselves, and apply for the job. The almunis in search for an employee can also search up what kind of specificaliosn they want in the person fit for the job, whether the job is pefect for an accounting student or a student from ICT department. They will be able to search up the requirement



and then approach as well. This feature holds high priority as job opportunities is one of the most important sector of any graduating student's life.

#### 4.2.2 Stimulus/Response Sequences

- Search for appropriate person for a job.
- Look up for job opportunities when in need of a job.
- Get to know the requirements needed in a particular job.
- Get to know if the job is meant for them.

#### 4.2.3 Functional Requirements

REQ-1: Registration

REQ-2: Taking the user's username and login information.

REQ-3: Taking the user's password

REQ-4: Selecting profession

REQ-5: Taking phone number

REQ-6: Taking category of job and job requirements.

REQ-7: Uploading an advertisement for job opportunity.

### 4.3 Programs and Events

#### 4.3.1 Description and Priority

In this section we can see the various programs that the alums of BUP need to participate in on a daily basis. What kind of events they are most likely to be found at, the address and invitations for that event. Users can find the latest news involving the respected alumnis. This also provides an idea about what kinds of events the alumnis can be invited to, and if they are likely to go. It also informs users if the alumnis are free on that particular day. We can see which alumnis have responded 'GOING' to which events held in which day at what time. This sector holds medium priority.

#### 4.3.2 Stimulus/Response Sequences

- Look up to see if there are any events being held.
- Look and check if any alumnis who are known to users will be present in any particular event.
- Know the time and location of any events involving alumnis concerning respected departments' alumnis.

#### 4.3.3 Functional Requirements

REQ-1: Registration

REQ-2: Taking the user's username and login information.

REQ-3: Taking the user's password

REQ-4: Displaying the events to held in the near future or events being held now.

REQ-5: Taking the option if alumni is going, interested or not going.

## 4.4 Notices and Announcements

### 4.4.1 Description and Priority

Here we, the users and even alumnis can check to see if there are any important notices involving themselves and concerning the university. Notices about the respected faculty members and staffs can be seen in this section. Any announcement of any kind, like the need for help during an event, any volunteers or the announcement of competitions can be viewed here. Anyone who check the website regularly will be completely upto date with the notices asnd annnouncements about important information. This sector holds medium priority.

### 4.4.2 Stimulus/Response Sequences

- Look up to see if there are any important announcements.
- Look and check if any important notice concerning their respected departments.
- Know the time and location of any important announcements made.

### 4.4.3 Functional Requirements

REQ-1: Click on notices and announcements.

REQ-2: Provides the notices to see relevant information.

REQ-3: Provides the imporantnt announcements made by relevant departments.

## 4.5 Online Directory

### 4.5.1 Description and Priority

This is a searching filter. All the alumnis will be put together to be found on this sector. Users can easily type in and find any one which would be of help to the users. But for this option, it is necessary to sign in. As all the respected alumnis will be at one place with search filters, it is important we restrict some movement of the general users. Those who has accounts or membership can only use this option efficiently.

### 4.5.2 Stimulus/Response Sequences

- First Information need to be typed into the search option.
- Type in name of person to search.
- Results are displayed.

### 4.5.3 Functional Requirements

REQ-1: Taking the user's username and login information.

REQ-2: Taking the user's password.

REQ-3: Providing information on required items.

REQ-4: Click on search bar

REQ-5: Type in name of person to search.

REQ-6: Results are displayed on screen.

## 4.6 Photo Gallery

### 4.6.1 Description and Priority

This sector contains some photographs about the respected alumnis to make them more recognizable. A centralized place to view all photos and albums for previous alumni activities and keep great memories alive. This holds low priority as even though the memories are nostalgic and provide heavy emotions, and makes the respected alumnis more recognizable, it is not essential in terms of work.

### 4.6.2 Stimulus/Response Sequences

- Provides the photos of the respected alumnis.
- Provides photos full of memories on tours or official outings concerning the alumnis.

### 4.6.3 Functional Requirements

REQ-1: Click on photos.

REQ-2: Scroll to see the various photos with names of the alumnies attached to them.

REQ-3: Scroll to see the tour photos along with some faculty photos.

## 5. Other Nonfunctional Requirements

This section will go into detail about the last set of requirements, which are called "non-functional requirements." Non-functional requirements include performance requirements, security requirements and portability requirements.

### 5.1 Performance Requirements

Since this software will be web-based, you will need a powerful server machine with a fast Internet connection.

For multiple users to be able to use the server machine at the same time, it needs a powerful CPU and fast internet access. Storage space is another requirement for performance. With more storage space, you can have more users and give each user a bigger workspace, which increases performance. The user's needs for performance mean that the web app needs to be small and easy to use on almost any platform, even with slower internet connections. At least 100 people should be able to use it at the same time. The system should be able to handle 100 users at the same time. Also, the system's database must always be able to handle at least 1,000 users. To summarize,

- The application should load and be usable within 3 seconds
- The application should update the interface on interaction within 2 seconds
- The database should be normalized to prevent redundant data and improve performance
- The database should be distributed to prevent outages

## 5.2 Security and Safety Requirements

Since this software will be hosted on a cloud server, all user data will be kept there. No one should be able to look at user data without permission. The user's workspace should only be accessible with the user's credentials, and no one else should be able to see the user's private data. Since execution will also happen on a machine in the cloud, user rights should be limited. With cloud-based programs, a user should only be able to see his own workspace and not be able to see other users' workspaces. Also, the user's rights should be limited so that the user can't hurt the system by running programs or typing commands at the terminal. Since all of the data will be sent over the Internet, the system should also have a way to encrypt and decrypt the data so that only the person who is supposed to see it can decode and access it. To summarize:

- Databases should use sharding to be redundant to prevent loss of data.
- Backups of the databases should be done hourly and be kept for one week.
- Any keys used for the REST API should be stored securely.
- Only the REST API should be able to connect to the databases.
- Databases should be behind a firewall.

## 5.3 Portability Requirements

The main reason for making a web-based IDE is to make the software development process more portable. Software should work on multiple platforms and connection speeds to make it easier to move. As explained in the section on performance requirements, software should be small so it can run on a computer with a slow internet connection. During development, the web application should be kept light by using simple libraries and tools. Even using JavaScript and HTML5 instead of Apache Flex.

Portability also means being able to run on as many platforms as possible without any extra work. To do this, web apps should be built with the same technologies and tools that all popular web browsers and operating systems offer, like HTML5, JQuery, etc.

## 5.4 Software Quality Attributes

- Availability: Because this application is critical to business communication, we will have a goal of four nines(99.99%) availability.
- Correctness: The application should never allow anyone to read messages or discussions not intended for that person.
- Maintainability: The application should use continuous integration so that features and bug fixes can be deployed quickly without downtime.
- Usability: The interface should be easy to learn without a tutorial and allow users to accomplish their goals without errors.

## 5.5 Maintainability Requirements

The application's architecture, design, implementation, and documentation must be made in a way that keeps maintenance costs as low as possible. Fixing a security flaw should take no more than two person days, including time for regression testing and updating documentation. If not, the software system or the offending feature must be taken offline or turned off. The average amount of time it takes one person to make a small change, including testing and updating documentation, must not be more than one person week.

## 5.6 Business Rules

The system needs at least a Super-User role and a User role for people to be able to log in and use it. As long as the business rules for the administrator and user roles are met, the system can have more roles. At the very least, the requirements for the data explorer, data curator, and administrator account types must be met by the Super-User role. At the very least, the User role must take into account the requirements for the data explorer account type.

# 6. Other Requirements

## 6.1 Usability Requirements

The whole website will be accessible to all people, of all ages and backgrounds. But some functions and information will be kept private. These information will only be available to the users directly related to the respected alumnis through camaraderie or being peers at the same place, which is Bangladesh University of Professionals. Users would need to register and be a member, then login to be able to use certain features like the searching directory.

The website can otherwise be accessed using not only desktop or laptops but also smartphones that can be connected to the internet.

# Appendix A: Glossary

## Definitions, Acronyms and Abbreviations

- Super-Users: Those directly incharge of the website, the admins
- Users: Those who will use the website from devices.
- Portability: Can be easily moved. I.e. run on any type of device.
- IEEE: Institute of Electrical and Electronic Engineers
- SRS: Software Requirements Specification
- BUP: Bangladesh University of Professionals