Assignment

Course Code: CSE414

Course Title: Web Engineering

Assignment Topic: Data Collection and Requirements Analysis

Submitted to

Md. Ashraful Islam Talukder

Lecturer

Department of Computer Science and Engineering

Daffodil International University

Submitted by

Team:	
Name	**ID**
Sajjadul Islam Somon	221-15-5749
Abdullah Al Noman Bhuyan	221-15-5303

Department of Computer Science and Engineering
Daffodil International University

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DIU Forum—A Hub for Daffodils

Abstract

The online platform is a web-based application designed to create a system which allows the alumni and current people to post and to apply for jobs, get information related to higher studies and all the activities related to university and its clubs, labs, and associations like Computer & Programming Club (CPC), Robotics Lab & Club, HIRL Lab, Cyber Security Club (CS), Cyber Security Center (CSC) and international organizations like IEEE & its Branches etc.

Our platform allows anyone to view related information about club activities and information about jobs, internships and higher education. Many of our alumni are actively working in different companies both locally and remotely. A lot of the time internal hiring is done from the company. So if any of our alumni or faculty want to provide the information about these internal hiring they are allowed to post for such opportunities with a check mark which will only allow the students a detailed view who are from Daffodil International University. But this option is optional and depends on the person who is posting the job.

Besides, a lot of our alumnus and faculties are currently enrolled in their higher studies gaining different prestigious scholarships. To look for different scholarships in different countries is often a long term process and difficult for many students. Our system allows our alumnus and faculties to post about the scholarship opportunities which will save a lot of time and effort.

We are basically considering this system to be a hub for our university where all the relevant information about the university will be found but most importantly it will be a gateway to connect all our alumni and faculties with the current students.

Introduction

Overview of the project:

Our project is basically a system for our university where all the necessary and important information about the university which are usually scattered in different locations will be found in one central space but most importantly it will be a gateway to connect all our alumni and faculties with the current students. Any students can get information about different club and organizational activities and their specific schedule so they don’t miss any opportunities. Besides, students who are interested in job and internship can get to know about regular jobs along with any internal hiring which might be posted by our alumni or faculty members. Moreover a large number of our alumni and faculties are currently enrolled in higher education in foreign universities with scholarship opportunities. They can post all the information regarding higher education, review about different universities, scholarships and their opportunities and benefits. Students from any university and any department can be benefited using our web application as they don't have to take the hassle of finding different information in different places. This centralized system provides easy to use, time saving and valuable information in one place.

Purpose and significance:

The main purpose of this project is to connect all the alumnus, faculties and current students of our university. Besides, current students can get information regarding higher education, review about different universities, scholarships and their opportunities and benefits. We came to know that our university somehow isn't able to keep track of all our alumni, but through our web application it is possible to connect and keep track of the current status of all our alumni. This web application project serves as a gateway for all sorts of information about university and connection of all students of Daffodil International University.

Intended users and stakeholders:

Our intended users are any student who might be seeking job or internship opportunities. Besides our alumnus, faculties who are currently working in Bangladesh or studying abroad are our stakeholders. Moreover students who are starting their university life might miss a lot of information about clubs, organizations and volunteering opportunities. To address these problems we are building such a web application for these users and stakeholders.

Data Collection Process

Methods used (Surveys, Interviews, Observations, Online Forms, etc.):

Interviews and observations were considered to collect data from our target users. We went to our faculties, HIRL and currently enrolled students and provided them an idea about our web application project in a verbal form of interview. They heard our project idea and most of them provided some unique and valuable ideas and features that might be implemented which we found will be much more useful for the web application to be more useful to a broader community.

Target audience:

We went to students who are currently studying, faculties of Daffodil International University, communicated with our alumni, who are currently studying aboard with prestigious scholarship. They inspired us and suggested some ideas about the project. Our target audience is basically any students who has a connection with Daffodil International University, although our web application is open to anyone regardless of their current status. People who wants to know about club, organisational, volunteering activities opportunity, student who wish to pursue higher education with scholarship and job seeking candidates, alumni and faculties are our main target audience.

Key findings:

One of our key findings was shifting our idea from only a job seeking platform to a centralized university platform. Besides, we got an idea about different features that can be implemented in order to provide a better experience to the students and users in general. Besides features like filtering job and internship opportunities for department specific students was one of the key findings because this allows the user to get only the necessary information not everything. The filtering feature allows the students to select specific types of opportunities they are looking for and based on their filtering they are provided with necessary information rather than all the information which might lead the user to spend more time. Our main goal was to build a web application that will be easy to use, user friendly UI and all necessary information in one place with the minimum amount of time they need to spend.

System Requirements

Functional Requirements :

When we went to collect data from the users we figured out that there are a lot of issues in job platforms and there is no centralized system for Daffodil International University. While collecting the data we figured out that we can do such a project which will allow any users to get information related to career, university clubs, filtered jobs and higher education with any login issues. This allows the user to save their time and get all the information in one place. These users' demands are the most important factors that were considered while implementing the features. The main functional requirements include:

- Login and Registration (implemented using Google Firebase for secure authentication and authorization)
- Job Posting
- Blog Post Creation
- Search by Specific Keywords and Filters.
- Filtering Options (e.g., job type, location, category)

Besides all the features that were mentioned by our users and stakeholders that we got while collecting the data was taken into consideration as well.

Non-Functional Requirements :

We will implement necessary logics to our features so that our web application performs the best under any circumstances for users. The application aims to provide a smooth and hassle-free experience for users. The application aims to provide a smooth experience for users which includes:

- **Usability:** The user interface is kept clean, intuitive, and easy to navigate. Clear and concise instructions are provided throughout the platform to ensure accessibility for users of all backgrounds.

- **Performance:** The web application is optimized to load quickly and handle multiple user requests efficiently so that it can handle large amounts of users together.

- **Security:** Most of the information on the platform is accessible without requiring users to authenticate. However, certain features for example:accessing specific job posts are sometimes restricted to logged-in users if the actual job poster wants to keep it private. For secure authentication and authorization, Google Firebase has been integrated, offering modern and trustworthy security measures.

- **Accessibility:** The system is designed to be accessible on various devices and screen sizes, ensuring any users can use the application any time without any issues.

Use Case Analysis

The users whom we collected the data from provided us with insights how we can implement the UI and other factors which are to be considered while designing the system. These insights helped to gain a better understanding of what the users actually looking for because from our perspective we had a very abstract idea but after collecting the data it turned out we found the required implementation that can be most beneficial for the end users.

Flow diagrams to show user/actor basic interactions:

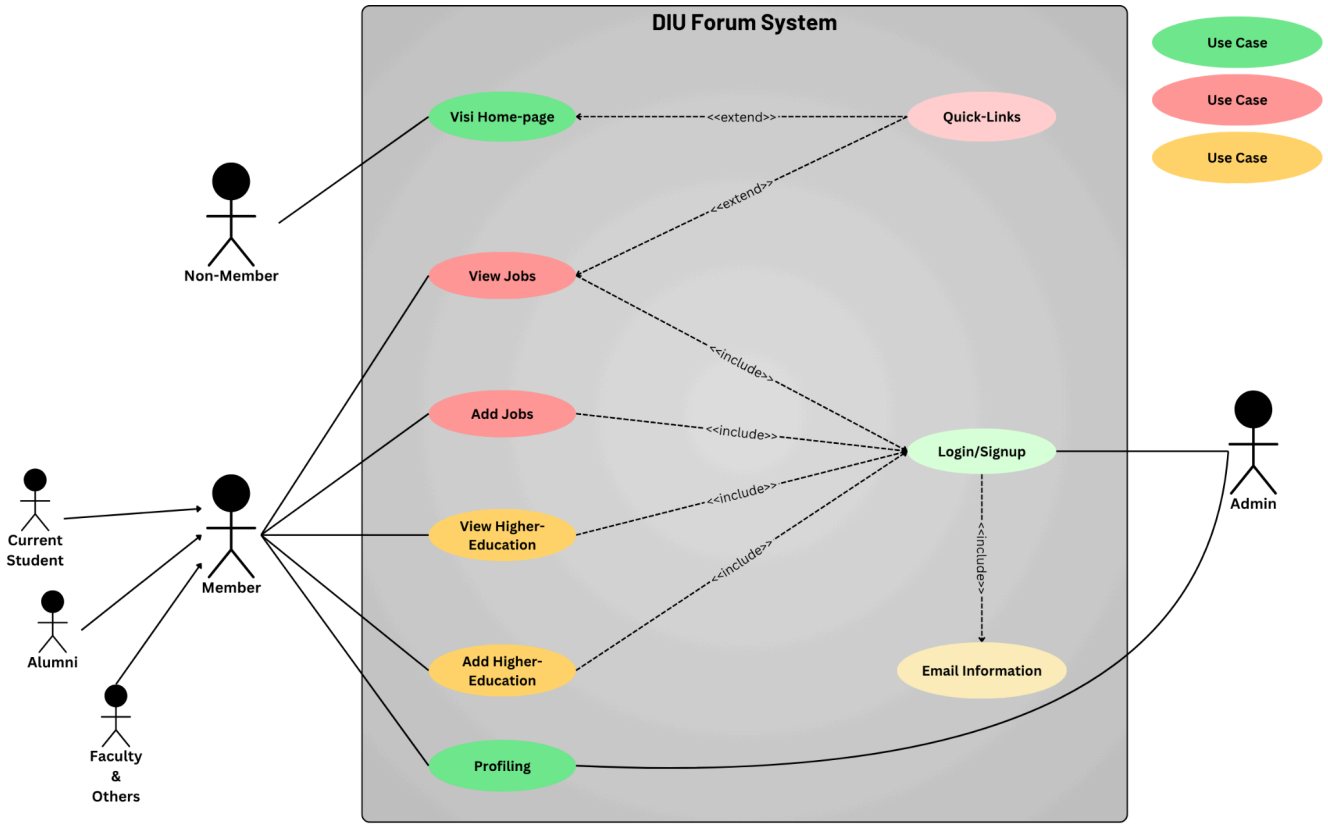

Fig: Use Case Diagram of DIU Forum.

Actors/ Users:

1. Member:
    i. Current Student
    ii. Alumni
    iii. Faculty & Others officials

2. Non-Member:
    i. Insider or Outsider of DIU personals.

3. Admin:
    i. Mainly System manager/Developers.

Some Basic Use Cases: Home page blog posts, Job posts, search, view, Higher Edu scope posts, Personal Profiling, etc.

Data Utilization in Design

How the collected data influenced UI/UX decisions:
We got an idea about adding some extra features to the platform and different ideas how we can implement the registrations and login of users, how the pages might be structured so that it's easy to navigate and users get a better experience.

Database structure :
To support the functional requirements of our application we implemented a database management system where we store all of our data. As the users register to our application and we implement the authentication the usernames or emails and passwords are stored in the database so that we can authenticate the users. Besides information about our faculty, alumni, specific jobs and scholarship opportunities are stored in the database which is much more secure and provides better user experience to the users.

System architecture considerations:
The system is divided into several parts which include the frontend, backend, database, security considerations, authentication and authorization.

- ➢ The frontend section are implemented using HTML, CSS, Tailwind CSS, and Javascript
- ➢ The backend section and database was implemented using PHP, PostgreSQL respectively.
- ➢ The authentication mechanism was implemented by Firebase for securely login with google accounts.

Here is the initial Home interface of DIU Forum:

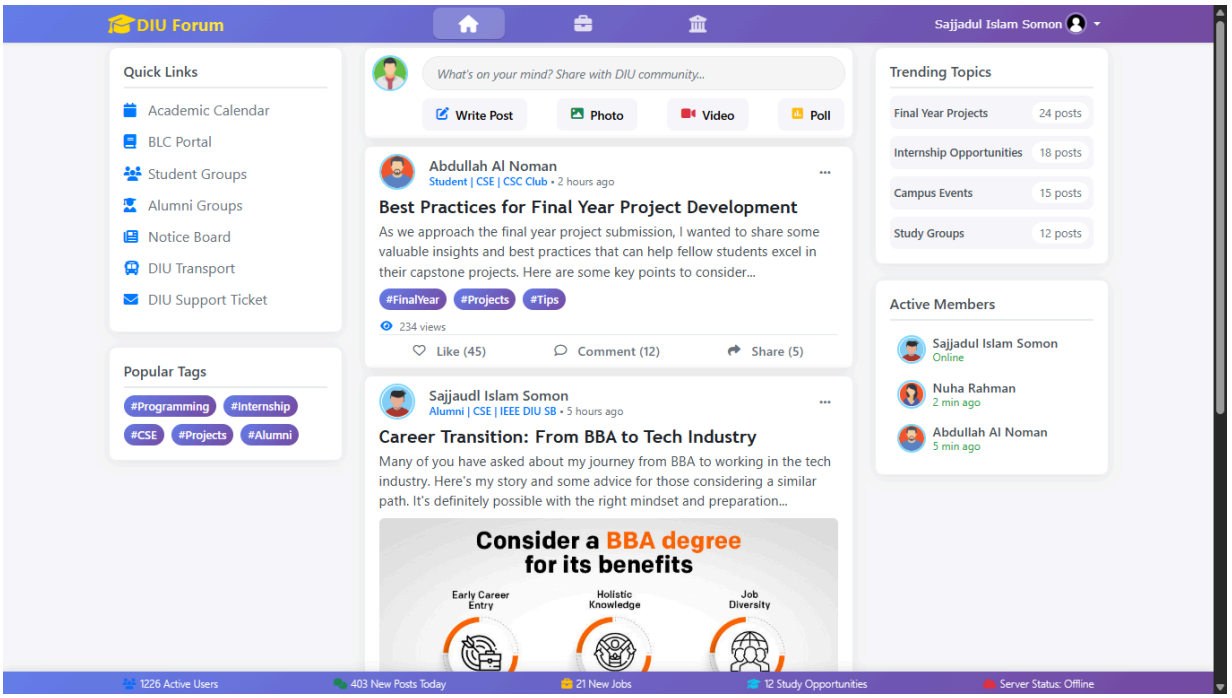

Fig: DIU Forum Home UI

Challenges & Limitations

Challenges in collecting data:

We didn't face much difficulty collecting the data because when we explained about our project everyone appreciated the idea and provided us with valuable ideas and insights which will allow us to improve the platform.
However, we understood the fact that if we were able to collect data from a larger and more diverse group of users it would have enhanced the reliability and applicability of our findings.

At first we thought of implementing a system which is specific for only jobs and internships only, but turned out it is not useful for everyone, rather it will be useful to just a specific group of people. Based on the users and stakeholders input, we decided to expand the scope of our project to include career-related resources, university club information, and opportunities for higher education along with jobs and internship opportunities. This shift of idea led us to build a project that can help any user from any university.

Conclusion & Future Considerations

Summary of findings:

Throughout this project, our data collection and implementation approach allowed us to identify critical gaps in the current university ecosystem which lack a centralized platform to connect all our alumni, faculty, and current students. By engaging with stakeholders through interviews and observations, we gained a large number of valuable and useful insights that helped to build our web application project.

One key finding was the necessity to move beyond a job and internship only platform. Based on the collected data, we decided to expand the project to support multiple use cases, such as accessing club, organizational and volunteering activities, internal job and internship posts, higher education resources, and more useful information like blogs etc. Features like job filtering, blog posting, and user role-based content access were directly influenced by the data collected from our users, leading to a more practical design of the web application project.

Besides, by integrating secure authentication through Google Firebase, a clean UI, and strong backend architecture, we created a system that brings together scattered information into one centralized, accessible platform. This has the potential to save students time and ensure they never miss important opportunities whether it's a job, higher studies or any.

Benefits of the project:

User-oriented Design: As we collected real feedback from the target users the design and implemented all the processes, it ensured the final product meets their actual needs and preferences.

- **Improved Scope and Relevance:** The original idea was changed rather refined a bit more based on users feedback to make the platform more inclusive and valuable to a broader audience, not just job seekers only.

- **Efficient Feature Prioritization:** Stakeholders feedback helped us focus on highly valuable features, such as job filters, structured information, and alumni connections for jobs and higher studies.
- **Scalable Architecture:** Data-oriented decisions allowed us to predict future user demands, which influenced the system's to be made more scalable for future enhancements.

Future Considerations

While the current version of the application is a strong foundation, there are several areas for future improvement and expansion:

- **AI integration:** Implementing personalized job or scholarship recommendations based on user profiles and interests.
- **Mobile App Version:** Creating a mobile application for easier access on the go.
- **Admin Dashboard:** Developing an advanced admin panel to manage posts, user activity, and content moderation.
- **Analytics Dashboard:** Adding analytics to track user engagement and system performance.
- **Broader User Testing:** Conducting usability tests with a more diverse group of users to further refine the platform.
- **Integration with University Systems:** Linking the platform with official university databases or portals for more useful data.

By continuing to evolve the platform based on real-world feedback and technological advancements, this project can grow into a powerful tool for fostering community, opportunity, and academic growth within and beyond Daffodil International University.

Development Site🔗

Appendix

Photos & Videos of our data collection and discussion on requirements with a variety of stakeholders:

Hasan Imam Bijoy (Alumni)
Lecturer, CSE, DIU
Advisor, IEEE DIU Student Branch
Mentor, IEEE DIU CS Chapter

Name Unknown (Alumni)
Assistant, HRDI, DIU

Merged Video:

Click on the Image

Audio Links:

1. Md. Ashraful Islam Talukder
2. Hasan Imam Bioy
3. Assistant, HRDI