

**Imam Mohammad ibn Saud Islamic University**

**College of Computer and Information Sciences**

**Information Systems Department**

**AOUN**

**By:**

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**Supervised by:**

Prof. Abdul Kader Jilani Saudagar

Project Submitted in Fulfillment for the IS496 Course requirements

Semester-Year



**Imam Mohammad ibn Saud Islamic University**

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|  |  |
| --- | --- |
| **Supervisor Name** | Prof. Abdul Kader Jilani Saudagar |
| **Date** |  |
| **Signature** |  |

**تعهد**

أتعهد بعدم المشاركة في الفعاليات أو المبادرات أو المسابقات ذات العلاقة دون أخذ موافقة خطية مسبقة من الكلية، و أقر بمعرفتي أنني إذا خالفت هذا التعهد ستتم محاسبتي وفق اللوائح و الأنظمة.

|  |  |  |
| --- | --- | --- |
| إسم الطالب | الرقم الجامعي | التوقيع |
| 1. صالح جمال المطيري | 442015756 |  |
| 1. يزيد ايمن كردي | 442020048 |  |

# Declaration

We Saleh Jamal Almutairi / 442015756, and Yazeed Ayman Kordi / 442020048 being members of final year project group number 06, declare that this report contains only work completed by members of our group except for information obtained in a legitimate way from literature, company or university sources. All information from these other sources has been duly referenced and acknowledged in accordance with the University Policy on Plagiarism.

Furthermore, we declare that in completing the project, the individual group members had the following responsibilities and contributed in the following proportions to the final outcomes of the project:

|  |  |  |  |
| --- | --- | --- | --- |
| **Student ID** | **Responsibilities[[1]](#footnote-1)** | **Contribution[[2]](#footnote-2) %** | **Signature** |
| 442020048 | Team Leader | 50% |  |
| 442015756 | Team Member | 50% |  |

# Dedication

This work is dedicated to our family, whose unwavering support and unconditional love has been our greatest source of strength and motivation. To our parents, whose sacrifices and encouragement have shaped our journey and given us the courage to pursue our dreams, we owe the deepest gratitude for their guidance and patience through every challenge.

To our siblings, who have always believed in us and offered words of encouragement when we needed them most, thank you for being our inspiration.

This achievement is as much yours as it is ours, and we are honored to share it with all of you.

# Acknowledgment

First and foremost, we are deeply thankful to Almighty ALLAH for His countless blessings, guidance, and for granting us the strength and patience to bring this project to completion. His grace has been a constant source of inspiration and perseverance throughout this journey.

We would like to express our sincere gratitude to our supervisor, Prof. Abdul Kader Jilani Saudagar. His thoughtful guidance, encouragement, and invaluable expertise have played a pivotal role in the development of this project. Prof. Abdul Kader Jilani Saudagar support and constructive feedback at every stage have been instrumental in helping us overcome challenges and refine our work. We are truly grateful for his dedication and the time he invested in helping us succeed.

We also wish to extend our heartfelt appreciation to our families. Their constant encouragement, patience, and understanding have been a tremendous source of strength. Throughout the long hours of study and work, they have stood by us, providing unwavering support that has been essential to our achievements.

We also express our deep appreciation to all the university teachers who supported us, not only throughout this project but also during our entire Bachelor’s journey. Their dedication to teaching and their guidance have been invaluable in building our knowledge and developing our skills. We are profoundly grateful for their contributions to our academic growth.

Additionally, our thanks also go to our friends, who have provided us with motivation and companionship during this journey. Their enthusiasm and encouragement have made the process more fulfilling, and their belief in us has been truly uplifting.

Finally, we acknowledge everyone who has contributed to our learning experience in various ways, including our professors, mentors, and peers. Each interaction has enriched our knowledge and understanding, enabling us to reach this milestone.

# Abstract

The Aoun Cooperative Training System aims to develop an application that consolidates all companies, students, and faculty into a single application. This application will facilitate students in finding suitable cooperative opportunities and automate the process of submitting files for all parties involved. From the student's perspective, the application allows for easy file submission. From the company's perspective, it enables the review and approval of submissions before they are sent to the faculty. From a faculty perspective, the application allows for the review and evaluation of submissions.

The methodology chosen for this project is the waterfall model. This approach was selected to aid in the comprehensive planning and analysis of the current and future systems. The project began with the planning phase, where the team discussed the project idea and the problem it aims to solve. This was followed by the analysis phase, which involved gathering the necessary requirements through stakeholder interactions, including brainstorming sessions, interviews, and questionnaires.

The outcome of this project is a redefined and reengineered business process for applying to cooperative training, as well as a streamlined process for cooperative training itself. The main driving functionalities of the system have been clearly defined to ensure its success. Overall, the Aoun application aims to address many discrepancies within the current system, streamline processes, and reduce the number of steps unnecessary involved in cooperative training for all parties involved.

# Abstract (in Arabic)

*نظام التدريب التعاوني* **عُون Aoun** *يهدف إلى تطوير تطبيق يجمع جميع الشركات والطلاب وأعضاء هيئة التدريس في منصة واحدة. سيتيح هذا النظام للطلاب إيجاد فرص تدريب تعاوني مناسبة ويتمتع بالقدرة على تقديم الملفات بشكل آلي لجميع الأطراف المعنية.من جهة الطالب، يسمح التطبيق بتقديم الملفات بسهولة. ومن جهة الشركة، يمكنهم مراجعة وموافقة على الملفات قبل إرسالها إلى أعضاء هيئة التدريس. ومن جهة أعضاء هيئة التدريس، يتيح التطبيق مراجعة وتقييم الملفات.*

*المنهج المختار لهذا المشروع هو نموذج الشلال. تم اختيار هذا النهج للمساعدة في التخطيط الشامل والتحليل للأنظمة الحالية والمستقبلية. بدأ المشروع بمرحلة التخطيط، حيث ناقش الفريق فكرة المشروع والمشكلة التي يهدف إلى حلها. بعد ذلك مرحلة التحليل، التي تضمنت جمع المتطلبات اللازمة من خلال تفاعلات مع أصحاب المصلحة، بما في ذلك جلسات التفكير الجماعي والمقابلات والاستبيانات.*

*نتيجة هذا المشروع هي عملية أعمال معرفة وهندسة جديدة للتقديم على التدريب التعاوني، بالإضافة إلى عملية مبسطة للتدريب التعاوني نفسه. تم تحديد وظائف النظام الرئيسية بوضوح لضمان نجاحه. بشكل عام، يهدف تطبيق* **عُون Aoun** *إلى معالجة العديد من التناقضات داخل النظام الحالي، وتبسيط العمليات، وتقليل عدد الخطوات غير الضرورية المشاركة في التدريب التعاوني لجميع الأطراف المعنية.*

# Keywords

* Web Application.
* Management System.
* Cooperative Training.
* Aoun Application.
* Automate Report management.
* Information Systems.
* Requirement Gathering.
* Waterfall Approach.
* Work Breakdown Structure.
* Gantt Chart.
* Use Case Analysis.
* Functional Requirements.
* Non-functional Requirements.

# List of Abbreviations

**SDLC:** Software Development Life Cycle.

**CO-OP:** cooperative

**IS:** Information System.

**UI:** User Interface.

**GDP:** Graduate Development Program.

**OS:** Operating System.

**BPMN:** Business Process Model and Notation

**WBS:** Work Breakdown Structure

**HR:** Human Resources

**MoSCow:** M - Must have, S - Should have, C - Could have, W - Won’t have.

**CV:** Curriculum Vitae

**CLO:** course learning outcome

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# Chapter 1: Planning

## 

## 1.1 Project Overview

Aoun application is designed to streamline the process of finding cooperative training opportunities for university students nearing graduation. By bridging the gap between students and companies, Aoun simplifies the search and application process, making it more efficient for both parties.

With Aoun, students can effortlessly search and apply to companies offering cooperative training programs that align with their academic background and career aspirations. The application provides a centralized application to explore various opportunities, ensuring students find placements that are a perfect fit for their skills and goals.

Aoun serves as a valuable resource for companies seeking talented and eager trainees from universities. By posting training opportunities on the Aoun application, companies can specify their requirements and await applications from qualified students. This not only enhances the visibility of their programs but also streamlines the selection process.

Aoun functionality extends beyond merely connecting students with training opportunities. Once a student secures a placement, the application facilitates ongoing communication and feedback between the company's trainers and the student's university supervisor. Trainers can submit weekly reports or other necessary documentation directly through Aoun, enabling supervisors to monitor the student's progress and provide support as needed.

Aoun application represents a comprehensive solution for students and companies involved in cooperative training programs. By simplifying the search, application, and feedback processes, Aoun ensures that students can maximize their learning experiences, while companies benefit from a streamlined approach to finding and nurturing talent.

## 1.2 Problem Statement

The core issue driving the development of the Aoun Project is the significant gap in the accessibility and management of cooperative training opportunities for students nearing graduation. This gap manifests in two primary challenges: first, the lack of a centralized application where students can discover organizations offering co-op positions relevant to their field of study; and second, the inconvenient process of submitting and managing weekly reports for both students and supervisors.

The consequences of not addressing this problem are multifaceted and far-reaching. For students, this gap represents a missed opportunity in gaining vital hands-on experience, enhancing their employability, and bridging the theory-practice divide that is crucial for their transition into the workforce. For educational institutions and employers, the inefficiency and lack of coordination can result in a talent mismatch, underutilization of eager and capable students, and ultimately, a slower pace in addressing the skills gap in various industries.

The need for a solution like the Aoun application is underscored by evidence from academic studies and labour market analyses that highlight the growing importance of cooperative education. For instance, research indicates that students who participate in co-op programs are more likely to secure employment upon graduation, often with higher starting salaries [[1].](#_References) Additionally, organizations that provide cooperative training opportunities report higher retention rates among employees who participated in these programs as students, underscoring the mutual benefits of such initiatives [[2].](#_References)

By facilitating easier access to cooperative training opportunities and streamlining the reporting and management process, the Aoun Project aims not only to enhance the educational outcomes for students but also to contribute to a more skilled and ready-to-work graduate pool. This, in turn, supports the broader goal of strengthening the link between academia and industry, thereby fostering a more dynamic and responsive workforce.

## 1.3 Project Impact

Upon implementation, our Application is positioned to majorly impact the Information Systems (IS) department. By providing a comprehensive framework to enhance Co-op programs, we aim to create a more professional and skilled workforce, better equipped to meet the needs of modern companies. This initiative not only strengthens individual students' skills but also contributes to the overall advancement of the IS field.

On a global scale, our ambition is to establish our application as the standard across all universities worldwide. The broad implementation will revolutionize recruitment practices globally, ensuring a more effective and efficient matching of talent with opportunities. By bridging the gap between academia and industry, our application will play a integral role in shaping the future workforce, making it more agile, and ready for the challenges of the future.

## 1.4 Project Stakeholders

### 1.4.1 Students

The **Aoun** application is primarily intended to benefit students, with a focus on student-centered design. For students, the application creates new opportunities by streamlining the Co-op training program application process. It successfully resolves the issues with the present application system, such as the inability to find opportunities, guaranteeing that students may efficiently and easily apply for training programs.

### 1.4.2 Faculty

Faculty members with the correct tools to systematically supervise and review students, promoting a structured approach that fosters a conducive environment for continuous student improvement. This systematic approach not only enhances the quality of supervision but also creates opportunities for faculty to provide targeted feedback and support, leading to a more enriching training experience for students. By facilitating a better environment for constant evaluation, the application plays a pivotal role in the holistic development of students, ensuring they are well-prepared for their future endeavors.

### 1.4.3 Companies

**AOUN** optimizes the registration of co-op programs for companies, simplifying the process of discovering suitable student candidates, sanctioning efficient acceptance or rejection workflows. It enables easy scheduling and conduction of follow-up interviews, all while significantly reducing the reliance on hard copies and signatures for weekly or monthly reviews. This solution is designed to enhance the professionalism and success of co-op program management.

## 1.5 Objectives

**AOUN** goal is to help students find cooperative training easily, as well as help companies find students for training, and this is done by achieving the following objectives:

* Enhance the co-op program application and training for students to access and utilize co-op training opportunities by enabling a smooth process between companies and students.
* Streamline the administration of co-op programs for trainers by creating strong, three-way channels of communication between companies, faculty, and students.
* Optimize the co-op evaluation process that enables faculty members to review evaluations, organizing the students’ evaluation process, and allows trainers to approve forms submitted by students, ensuring thorough assessment and continuous improvement.

## 1.6 Approach

In our project, we adopted the waterfall approach, which is a traditional methodology and methodology within the software development life cycle (SDLC). The waterfall model is known for its linear and sequential progression, which ensures that all phases are completed before the next one starts, thus creating a clear structure for our project execution. This method has been proven to be effective in various software engineering and product development projects, making it an ideal choice for achieving our goals.

The reasons why we chose the waterfall approach is that the requirements are clear and well-known, and the solution to our problem is straightforward.

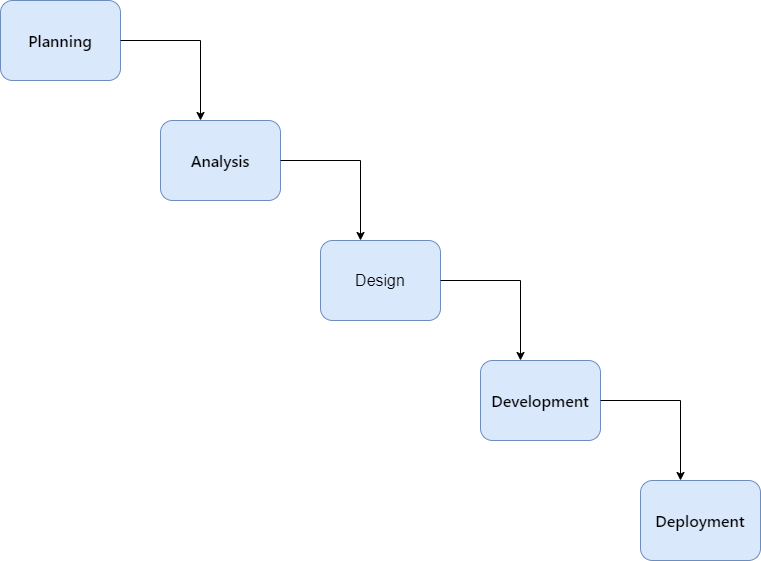


Figure :Waterfall Approach.

Planning Phase**:** This stage involves thorough discussions to define our project idea and the problem we aim to solve. We evaluate the system's benefits, drawbacks, and expected performance, aiming to align our goals with user needs and expectations.

Analysis Phase: We will collect system requirements through stakeholder interactions, employing brainstorming, interviews, and questionnaires. Our objective is to create a complete list of requirements, guaranteeing that the final product meets all user necessities.

Design Phase**:** Next, we will analyze the requirements to understand them deeply, translating this information into a structured model for guiding subsequent design and development.

Development Phase**:** With a clear understanding of requirements, our development phase involves coding and building the project components as per specifications, focusing on collaboration, problem-solving, and iteration.

Deployment Phase**:** The project is launched in the deployment phase, transitioning it to a real-world setting and marking the start of its operational life. This phase is crucial for delivering our solution.

Our goal throughout the Waterfall model is to maintain high quality and efficiency standards, while delivering a product that exceeds user expectations and effectively solves the identified problem.

## 1.7 Project Scope

The project focuses on the development of a comprehensive application tailored to facilitate the application process for students seeking co-op training programs. This application will also serve as a registration portal for companies looking to offer co-op opportunities, all under the compass of the IS department. Notably, the application does not extend to providing graduates with GDP (Graduate Development Program) or other similar services.

Communication channels will be established to facilitate three-way interactions between students, companies, and faculty members exclusively. This approach’s goal is to create a focused and efficient system for the management of co-op positions.

To ensure a fair and structured process, students will be required to apply for co-op positions and await acceptance based on their resumes, the application will not grant students co-op opportunities freely.

## 1.8 Work Breakdown Structure

We utilized the Work Breakdown Structure (WBS) to segment the project into smaller, manageable phases, facilitating easier execution and ensuring high-quality outcomes.

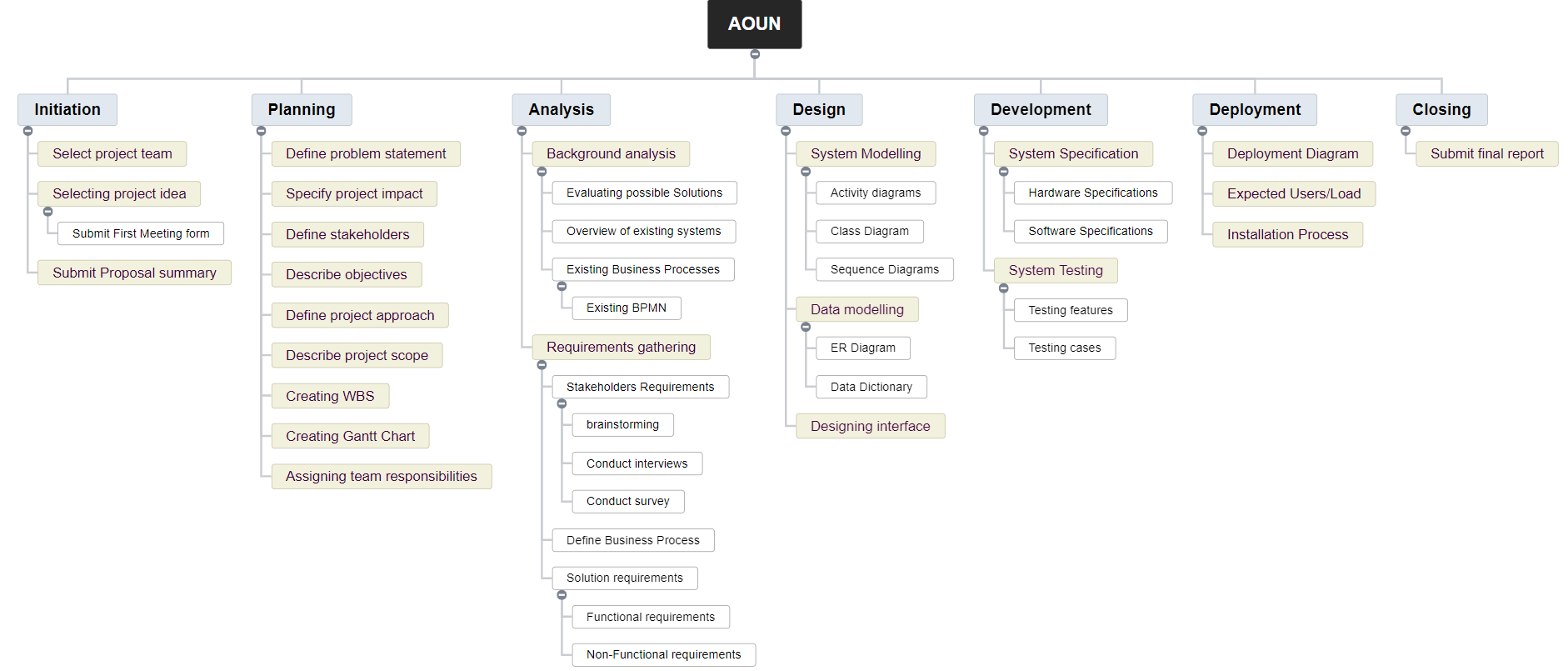


Figure : WBS.

## 1.9 Gantt Chart (Time Frame)

The Gantt chart plays a critical role in our project, as it is developed based on the Work Breakdown Structure (WBS) outlined in section 1.8. This ensures a structured approach to managing timelines and tasks.

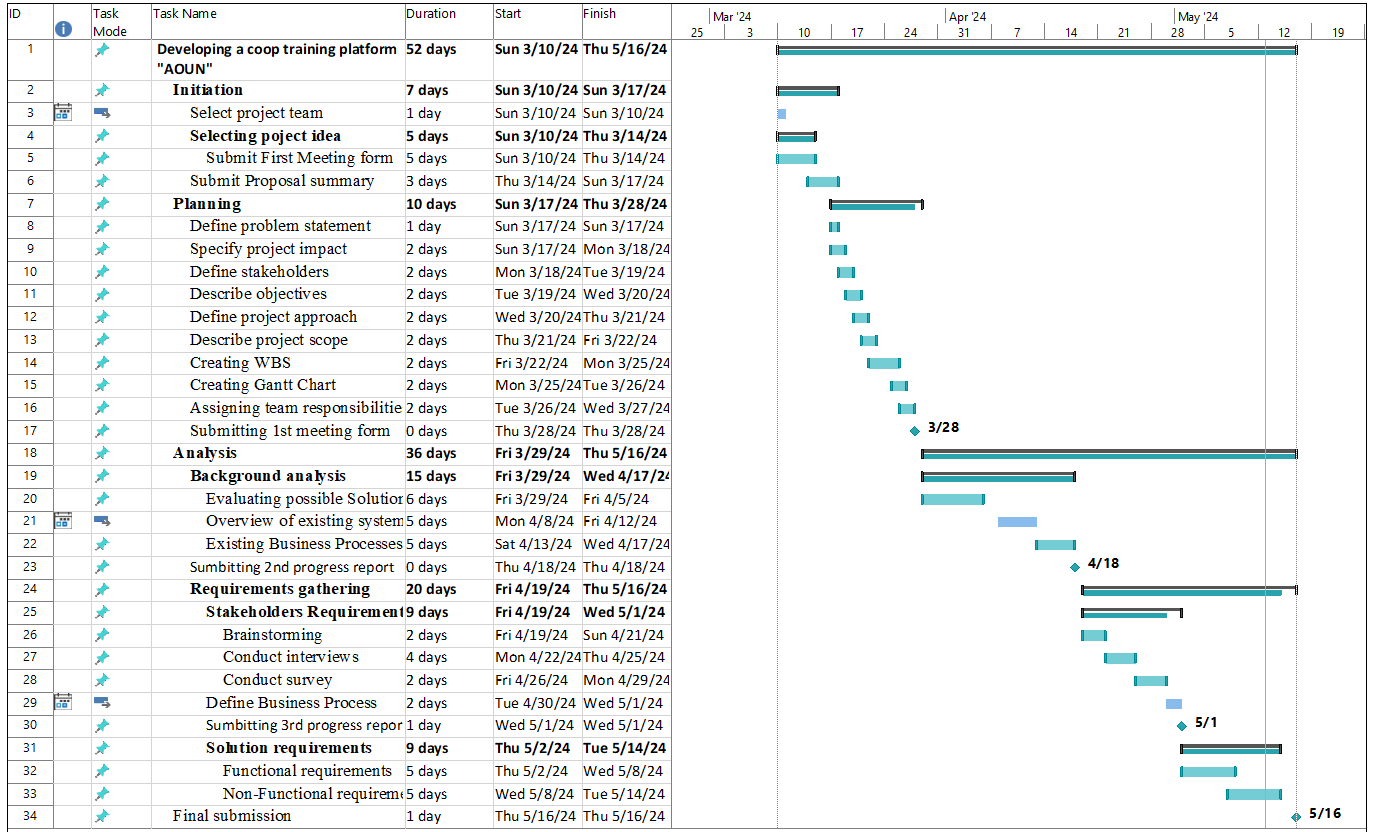


Figure : Gantt Chart

## 1.10 Team Member's Responsibilities

|  |  |  |
| --- | --- | --- |
| Task | | Student responsible |
| **1.Planning** | | |
| 1.1 Define problem statement | | Saleh |
| 1.2 Specify project impact | | Yazeed |
| 1.3 Define stakeholders | | Yazeed |
| 1.4 Describe objectives | | Saleh & Yazeed |
| 1.5 Define project approach | | Saleh |
| 1.6 Describe project scope | | Yazeed |
| 1.7 Creating WBS | | Saleh & Yazeed |
| 1.8 Creating Gantt Chart | | Saleh & Yazeed |
| 1.9 Assigning team responsibilities | | Saleh |
| **2.Analysis** | | |
| * 1. **Background analysis** | | |
| 2.2.1 Evaluating possible Solutions | | Saleh |
| 2.2.2 Overview of existing systems | | Yazeed |
| 2.2.3 Existing Business Processes | | Yazeed |
| 2.2.3.1 Existing BPMN | | Saleh & Yazeed |
| **2.3 Requirements gathering** | | |
| 2.3.1 Stakeholders Requirements | | |
| 2.3.1.1 brainstorming | | Saleh & Yazeed |
| 2.3.1.2 Conduct interviews | | Saleh & Yazeed |
| 2.3.1.3 Conduct survey | | Saleh & Yazeed |
| 2.3.2 Define Business Process | | Saleh & Yazeed |
| 2.3.3 Solution requirements | | |
| 2.3.3.1 Functional requirements | | Saleh & Yazeed |
| 2.3.3.1 Non-Functional requirements | | Saleh & Yazeed |
| **3. Design** | | |
| **3.1 System Modelling** | | |
| 3.1.1 Activity diagrams | Saleh & Yazeed | |
| 3.1.2 Class diagrams | Yazeed | |
| 3.1.3 Sequence diagrams | Saleh & Yazeed | |
| **3.2 Data Modelling** | | |
| 3.2.1 ER Diagram | Yazeed | |
| 3.2.2 Data Dictionary | Saleh | |
| **4. Development** | | |
| **4.1 System Specification** | | |
| 4.1.1 Hardware Specification | Saleh & Yazeed | |
| 4.1.1 Software Specification | Saleh & Yazeed | |
| **4.1 System Testing** | | |
| 4.2.1 Testing features | Saleh | |
| 4.2.2 Testing cases | Saleh | |
| **5. Deployment** | | |
| 5.1 Deployment Diagram | Saleh & Yazeed | |
| 5.2 Expected User/Load | Saleh & Yazeed | |
| 5.3 Installation Process | Saleh & Yazeed | |
| **6. Closing** | | |
| 6.1 Submit final report | Saleh & Yazeed | |

Table : Team Responsibilities

# Chapter 2: Background Analysis

## 

## 2.1 Possible Solutions

2.1.1 The first possible solution is an "independent application [[1]](#Hayerd)" This is a website that enables companies to offer co-op training opportunities and students to apply for them. This website does not offer a feature to submit or manage weekly reports.

2.1.2 The second possible solution involves a "Manual process for co-op training" This traditional approach requires students to search for co-op training opportunities manually. Similarly, the submission and management of weekly reports are conducted manually, with reports typically submitted in hard copy.

2.2.3 The third possible solution is an application called "AOUN application." This application is a website developed under the Information System Department's umbrella. It facilitates students' search and application process for companies offering cooperative (co-op) training. Additionally, once a student is accepted for co-op training, trainers can upload the required weekly reports about the student. This allows the student's university supervisor to review the reports submitted by the trainer.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Criteria | Independent application | Manul process for co-op training | Aoun application | |
| Benefit | | | | |
| 1. Automate Report management | × | × | √ | |
| 1. Esay to use | √ | × | √ | |
| 1. Integration with University Systems | × | × | √ | |
| 1. Simplicity of Tools | × | × | × | |
| 1. Scalability | √ | × | √ | |
| 1. Customization | √ | × | √ | |
| 1. Data Accuracy | √ | × | √ | |
| 1. Functional suitability | × | × | √ | |
| 1. Maintainability | √ | × | √ | |
| 1. Feedback process | × | √ | √ | |
| COST | | | | |
| 1. Cost Development | Medium | Low | | Low |

Table :Cost-Benefit Analysis.

## 2.2 Overview of Existing systems

### 

### 2.2.1 Manual Process of co-op training program

The current system starts off by retrieving papers from the field training website [[3]](#_References) and choosing certified program alternatives from a dropdown menu are the first steps in the co-op application process. Then, using a variety of resources, students look for opportunities that fit their needs. They give the supervisor a co-op training plan if they decide on an uncertified curriculum. The supervisor receives weekly progress reports, and site visits may be undertaken as part of the review process. Three crucial forms are completed to signify the conclusion of the co-op training program.

**Advantages of Current System:**

* Cost-effective
* Perceived simplicity from an outsider's perspective

**Disadvantages:**

* Excessive complexity leading to confusion.
* Potential issues with document stamping
* Management challenges due to numerous participants

### 2.2.2 Independent applications

Using different applications for Example: Hayerd [[4]](#_References) ,to look for co-op opportunities, independent application enables people to investigate a variety of options outside of those offered by a particular program. Nevertheless, this method has drawbacks, like having to navigate websites that offer options for every major, which can make it more difficult to find the best positions. Upon identification of an opportunity, the user is frequently redirected to the company website to complete additional application procedures.

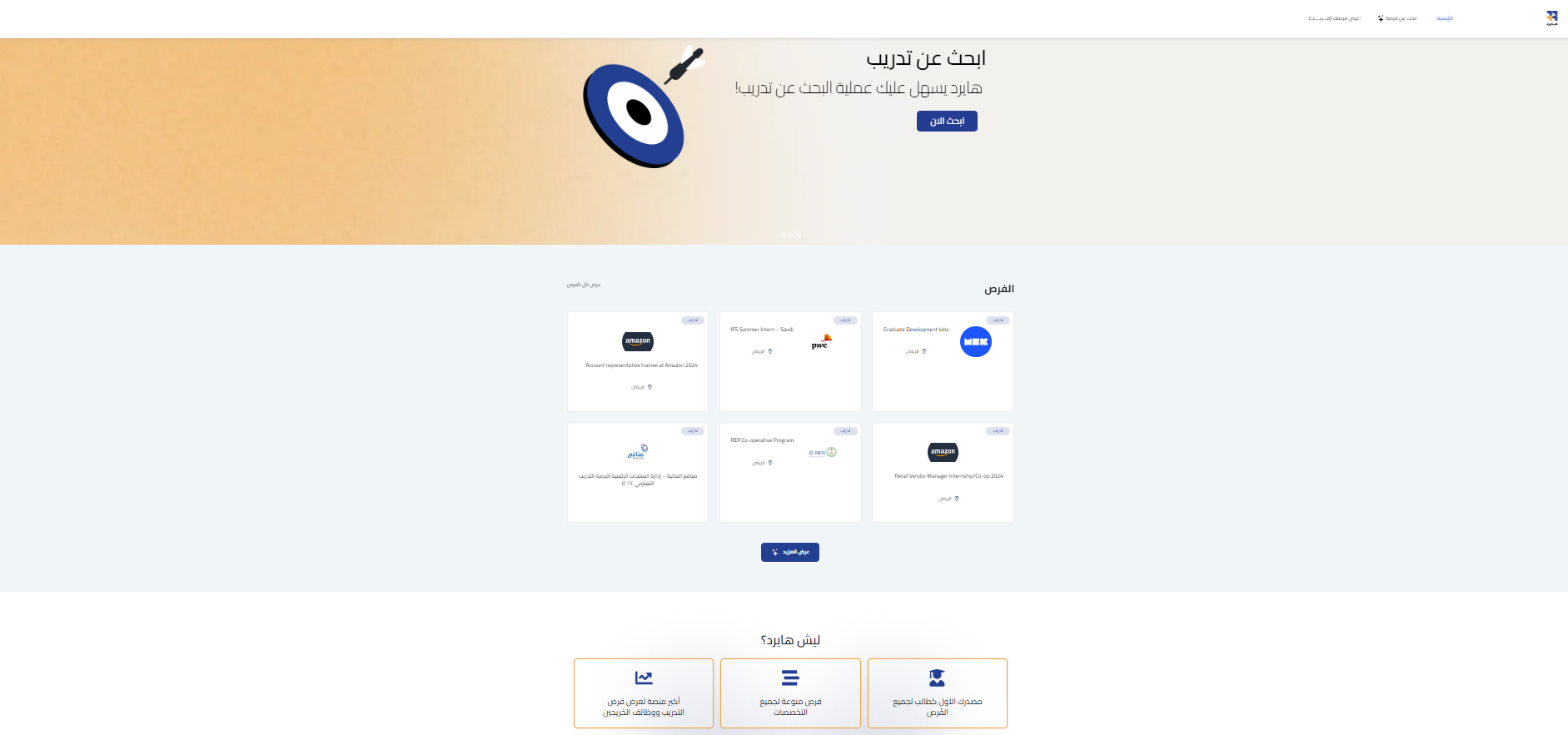


Figure 4: Hayerd.

**Advantages:**

* Possibility of finding opportunities outside of one's major, enhancing career exploration and range.

**Disadvantages**:

* Weekly reporting features are not integrated, which makes progress tracking difficult.
* Lack of a centralized platform for interactions between students, department, and companies, which hinders the efficiency and streamlining of the application process.

### 2.2.3 Aoun Improvements

Establishing a comprehensive application that integrates co-op application, submissions, and facilitating company communication, the proposed “AOUN” project seeks to address these drawbacks. This centralized solution will transform the co-op application landscape by streamlining procedures, reducing inconsistencies, and improving user experience.

## 2.3 Existing Business Processes

The current system is started off by retrieving documents from the field training website is the first manual step in the process of establishing a co-op application. The website features a dropdown menu that makes choosing programs easier by providing certified options. After that, students search for appropriate possibilities using a variety of venues, such as social media and independent co-op websites.

If a student opts for a program that is not on the certified list, they must gain a co-op training schedule and submit it to the supervisor. After then, a form called a joining report needs to be filled out, A significant drawback arises if the HR (Human Resource) department fails to stamp the form, necessitating the cumbersome step of informing them to send it via mail to the relevant department.

Students communicate with their co-assignee immediately after identifying them; this person is usually a faculty member acting as the supervisor. Weekly progress reports are delivered via Blackboard, hardcopy, or any other method the supervisor deems appropriate. They include tasks, activities, and training materials. To evaluate the student's development, supervisors may also ask for site visits, which will facilitate communication with the HR and management departments.

Three crucial forms must be completed at the end of the program: an attendance form, a detailed final report detailing the full experience, and a report intended for direct managers or team leads. The co-op training program is completed upon submission of these forms.

We used BPMN (Business Process Model and Notation) diagrams [[5]](#_References) to outline the systems and processes that students engage with. The first BPMN diagram illustrates the procedure students follow to obtain the necessary forms before starting their training and applying to companies. The second BPMN diagram details the co-op training process, including the steps for submitting required reports.

2.3.1 Applying for Co-op Training Process

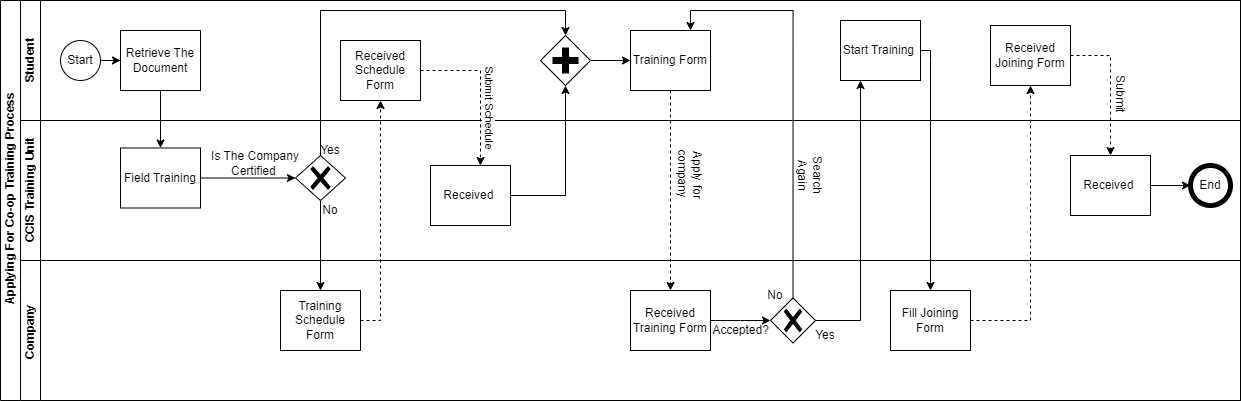


Figure 5: Applying for co-op training.

2.3.2 Co-op Training Process

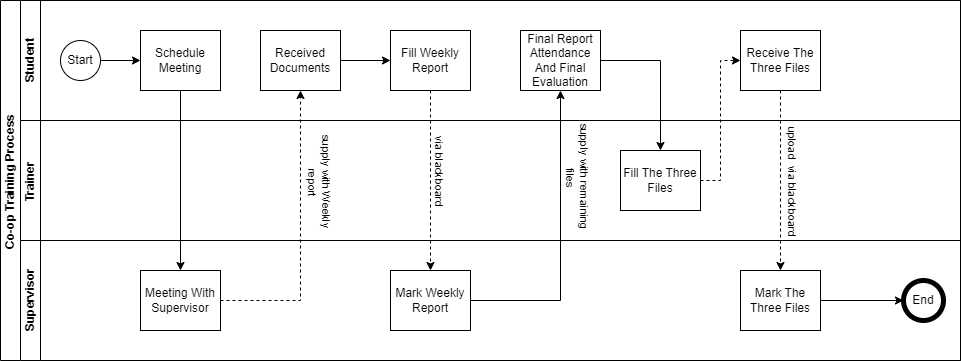


Figure 6:Co-op Training Process.

## 

# Chapter 3: Requirements Analysis

## 3.1 Requirement Gathering Summary Results

To define the requirements for the **AOUN** application, we utilized three different techniques. Firstly, we conducted brainstorming sessions to generate ideas and identify crucial features for the application. Secondly, we interviewed stakeholders from three different companies and five faculty members to gain insight into their specific challenges and needs. Lastly, we distributed questionnaires to students who had completed their co-op training to obtain a wide range of feedback on the challenges they are faced and the features they value the most.

We used the **MoSCoW** **[[6]](#_References)** method to prioritize the requirements which is method that is particularly useful for effectively managing time and resources. This technique helps teams to differentiate between the essential and non-essential features of a project.

**- Must have (M):** These are the most important and non-negotiable requirements that are critical to the system's core functionality. The project will be considered a failure if these requirements are not completed, so they must be included in the final product.

**- Should have (S):** These features are important but not vital to the project's success. They should be included in the final product if possible, but they can be postponed if necessary.

- **Could have (C):** These features are desirable but not necessary. If time and budget allow, they can be included to improve the user experience or customer satisfaction.

**- Won't have this time (W):** These requirements are the least critical or those that have been deliberately excluded from the current project scope. They might be considered in the future, but they are not necessary for the current delivery.

### 3.1.1 Interview Summary Results

To collect crucial feedback for the AOUN application, we reached out to 15 companies via email and LinkedIn. Unfortunately, only three companies responded positively to our request. However, we were able to conduct thorough interviews with these companies to gain a better understanding of their unique needs and challenges.

**Company X requirements:**

Company x is a tier 4 company in the Artificial Intelligence industry, they mainly deliver products and services for physical activity.

**Challenges:** Company X faces significant challenges in their recruitment process, specifically in finding students who possess the necessary skills for their operations. They have expressed concerns about the effectiveness of traditional CVs (Curriculum Vitae) and profiles in showcasing a candidate's abilities.

**Desired Features:** Company X would like to integrate a feature into the AOUN application that allows students to upload video presentations or interviews. This feature would help recruiters at Company X assess communication skills and get a better understanding of the applicant's personality and suitability for their work environment.

**Company Y requirements:**

Company Y is a tier 1 company in the retailing industry, they are focused on retailing home furniture.

**Challenges:** Company Y is limited by the current system, which only allows them to offer co-op training during certain periods of the year, leading to missed opportunities for both students and the company. Additionally, they struggle to find students who meet their skill requirements.

**Desired Features:** Company Y wants the AOUN application to support open and flexible registration periods for co-op training, making it easier to match company needs with student availability. They also want enhanced profiles that include detailed information about students' skills, majors, and areas of interest to streamline the recruitment process.

**Company Z requirements:**

Company z is a tier 1 company, one of the most significant companies in the middle east selling dairy and juice products.

**Challenges:** Company Z finds LinkedIn inadequate for their specific needs as it often fails to provide sufficient student details necessary for initiating contact. This forces them to rely on universities to provide comprehensive student information, which can be time-consuming and inefficient.

**Desired Features:** Company Z is interested in a direct channel within the AOUN application that provides full access to student information, including contact details, facilitating easier outreach and communication with potential candidates.

**Faculties Requirements**

We have conducted interviews with four faculty members from the college to evaluate their needs and challenges with the current coop training process. One of the interviewees was from the female section, and the other 3 were from the male section.

All interviewees expressed concerns about the existing system's inefficiency and the lack of automation in handling required documentation for students. They all suggested that the current system needs to be re-engineered to streamline processes.

Furthermore, the faculty members emphasized the need for improved communication tools. They suggested integrating real-time chat and email messaging features within the AOUN application to facilitate easier supervision and more effective communication with companies hosting students. These enhancements aim to simplify oversight and improve the overall management of students.

### 3.1.2 Questionnaire Summary Results [[See Appendix A]](#_Questionnaire_results.)

As part of the process to gather requirements for our project, we sent a questionnaire to students who had completed their co-op training. We asked them 6 key questions to understand how they currently search for co-op opportunities and the challenges they face with existing systems. We also asked about the specific difficulties they encountered and how our proposed AOUN application could help address them and simplify the process. We were pleased to find that 100% of the respondents believed that the AOUN application could effectively resolve the current system's shortcomings and improve the search process. We also gathered their opinions on the desired features for the AOUN application to ensure that it aligns with their needs and expectations.

### 3.1.3 Brainstorming summary Results

We organize brainstorming sessions together to think of new ideas and identify important features for the Aoun application. Our goal is to completely change the way Co-op training is done to make it better. In these sessions, we share our thoughts and suggestions, and we write down all the ideas. After gathering all the ideas, we use the MoSCoW method to decide which features are the most important to work on first. This method helps us focus on the most necessary features, making sure we are spending our time and resources on improvements that will make the biggest difference.

## 3.2 Stakeholder Requirements

### 3.2.1 Student Requirements

1. The student must be able to create profile.
2. The student must be able to apply for companies.
3. Student must be able to view when the company training positions are open for hiring.
4. Student must be able to attach the required documents for Co-op training.
5. Student must see their application status.
6. Student should be able to filter the opportunities that the companies offer.
7. Student should be able to view the number of positions available.
8. Student should view the needed skills for the required position.
9. Student could only use one application for Co-op training.
10. Student could view company profile.
11. Student could be able to upload a video for interview purpose.
12. Student could write feedback on their previous experience.
13. Student could check-in for his attendance.
14. Student could specify if he has earned the job after training.

### 3.2.2 Faculty Requirements

1. Faculty must be able to create profile.
2. Faculty must be able to view the status of students.
3. Faculty must view the files submitted by students.
4. Faculty must mark the files submitted by students.
5. Faculty could be able to check if the students have achieved CLOs.
6. Faculty could communicate with company through real-time messaging.

### 3.2.3 Companies Requirements

1. Company must be able to create profile.
2. Company must be able to offer Co-op Training.
3. Company must be able to view the student profile.
4. Company must be able to upload the training schedule.
5. Company trainer must be able to add feedback or approve the documents submitted by students.
6. Company should be able to offer Co-op Training at any period.
7. Company Could be able to filter student based on their major and skills.
8. Company could verify student attendance.

## 3.3 Proposed Business Process

The proposed systems as seen below for the applying process will begin by the student and the company will both need to register. The business will then offer co-op positions. The student has access to these positions and can apply. After reviewing the applications, the company will determine which students to accept or reject. Students can return to the list of co-op positions and reapply for other positions if they are rejected. The company must provide a joining report form to the training unit if a student is approved. After that, the student can begin training.

The co-op training process assumes that the student and company are already registered. It begins with the faculty member registering. Then, the faculty member will be assigned to the student. The student will submit weekly reports, which the company will review and add notes to. The supervisor will mark the reports, and the student will receive feedback. This process also applies to the final report submission. Finally, after the student has completed the co-op training program, they will be able to review their experience.

### 3.3.1 Aoun Applying for co-op training process.

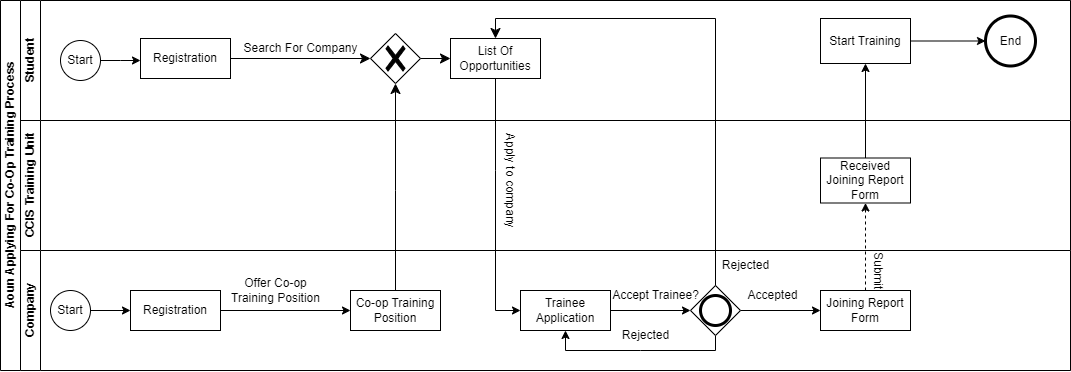


Figure 7: Aoun applying for Co-op training process.

### **3.3.2 Aoun co-op training process**

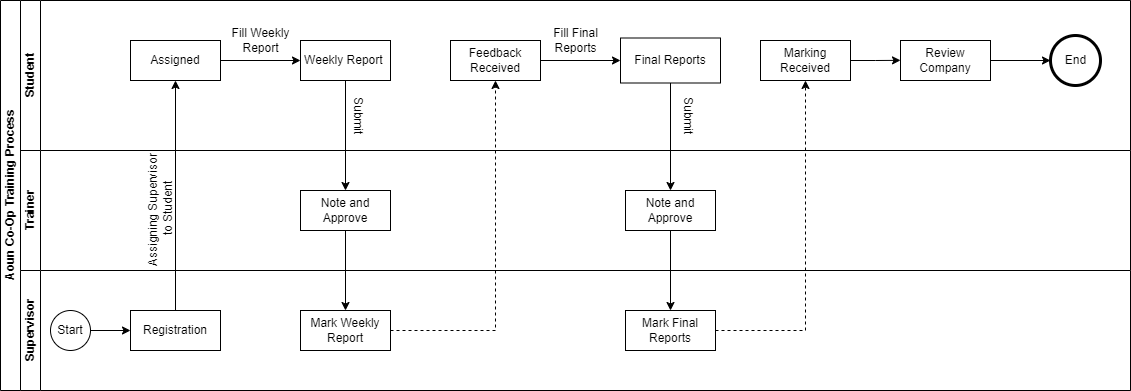


Figure 8:Aoun co-op training process.

## 3.4 Functional Requirements

### 3.4.1 Use Case diagram

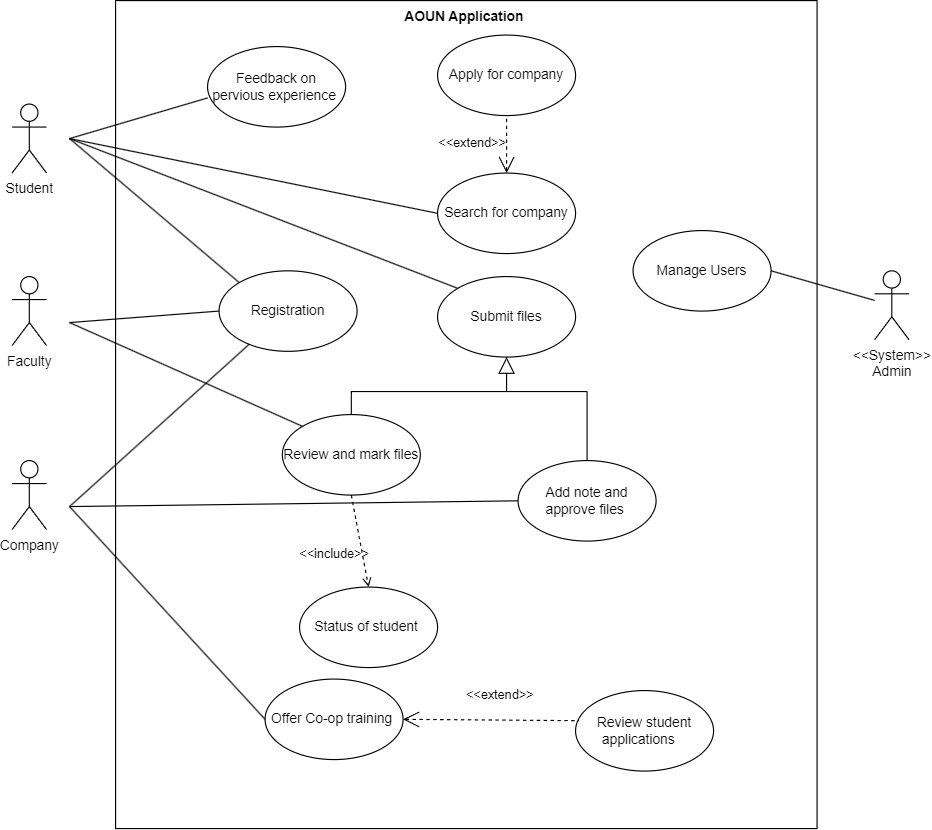
****

Figure 9: AOUN use case.

### 3.4.2 Use Case description

|  |  |  |
| --- | --- | --- |
| **Importance Level:** High | **ID:** 1 | **Use Case Name:** Registration |
| **Use Case Type:** Detail, Essential | | **Primary Actor:** Student, Faculty, Company. |
| **Stakeholders and Interests:**  Students: Seeking to register for co-op training opportunities.  Faculty: Register in order to evaluate student performance during co-op programs.  Company: Registering Looking to offer co-op training positions. | | |
| **Brief Description:** A user will apply for access to the website, user entry will be gathered, an account will be created and will allow for future access. | | |
| **Trigger:** The user enters the website and clicks on registration button.  **Type:** User Action. | | |
| **Relationships:**  **Association:** Student, Faculty, Company  Include:  Extend:  Generalization: | | |
| **Normal Flow of Events:**   1. Enter website. 2. Click on the registration button. 3. Enter name, e-mail, and password. 4. User has been registered. | | |
| **SubFlow:**   * Log In if the user has an account already created. | | |
| **Alternate/Exceptional Flows:**   * If user has been previously registered an error message will display. | | |

Table :Registration use case.

|  |  |  |
| --- | --- | --- |
| **Importance Level:** Medium | **ID: 2** | **Use Case Name:** Feedback On previous experience |
| **Use Case Type:** Detail, Essential | | **Primary Actor:** Student |
| **Stakeholders and Interests:**  **Student:** The students can write their previous experience | | |
| **Brief Description:** To help other students make informed decisions about co-op opportunities by sharing personal experiences with different companies. | | |
| **Trigger:** The student completes their co-op training and receives an invitation or prompt from the Aoun application to share their experience.  **Type:** User Action | | |
| **Relationships:**  **Association:** Student  **Include:**  **Extend:**  **Generalization:** | | |
| **Normal Flow of Events:**   1. The student logs into the Aoun application. 2. The student navigates to the "Feedback" section dedicated to sharing experiences from completed co-op placements. 3. After filling out the form, the student submits their feedback by clicking the "Submit" button. 4. The submitted experience is added to the database and displayed on the relevant company's profile within the application. | | |
| **Sub Flow:** | | |
| **Alternate/Exceptional Flows:**   * The student tries to submit feedback for the same co-op experience more than once. * The student tried to submit the experience form, but he didn't finish the Cc-op Training | | |

Table : Feedback use case.

|  |  |  |
| --- | --- | --- |
| **Importance Level:** High | **ID: 3** | **Use Case Name:** Search for company |
| **Use Case Type:** Detail, Essential | | **Primary Actor:** Student |
| **Stakeholders and Interests:**  **Student:** The student searches for company to find Co-op Training. | | |
| **Brief Description:** This use case enables students to easily search and access details about companies offering co-op training, enabling them to find opportunities that align with their career aspirations. | | |
| **Trigger:** The student logs and then accesses the co-op search feature within the Aoun app.  **Type:** User Action | | |
| **Relationships:**  **Association:** Student  **Include:**  **Extend:** Apply for company  **Generalization:** | | |
| **Normal Flow of Events:**   1. The student logs into the Aoun application. 2. The student accesses the co-op search feature within the Aoun app. 3. The system generates a list of companies. 4. If a student is interested, they can select a company from the list to explore opportunities and apply for a co-op position or continue to search for other companies. | | |
| **Sub Flow:**   * The student filters the opportunities that the companies offer. | | |
| **Alternate/Exceptional Flows:**   * The student's search criteria yield no matching results. | | |

Table : Company search use case.

|  |  |  |
| --- | --- | --- |
| **Importance Level:** High | **ID: 4** | **Use Case Name:** Submit files |
| **Use Case Type:** Detail, Essential | | **Primary Actor:** Student |
| **Stakeholders and Interests:**  **Student:** The students can Submit the required Files | | |
| **Brief Description:** The student submits the required files and waiting for approval form the company trainer and the marks form the faculty. | | |
| **Trigger:** The student completes filling the required files for their co-op and is ready to submit them for approval and review.  **Type:** User Action | | |
| **Relationships:**  **Association:** Student  **Include:**  **Extend:**  **Generalization:** Faculty and company | | |
| **Normal Flow of Events:**   1. The student logs into the Aoun application. 2. The student navigates to the section of the application that is intended for submitting files. 3. The student click on the file must submitted. 4. The student inputs the details of the file and the click on "Submit File". 5. The system processes the files, registers the submission, and sends a confirmation email to the student. | | |
| **Sub Flow:**   * The student waits for feedback and approval from the company trainer and the mark from faculty. | | |
| **Alternate/Exceptional Flows:**   * The student attempts to upload files that exceed the system's maximum allowed file size. | | |

Table : File submission use case.

|  |  |  |
| --- | --- | --- |
| **Importance Level:** High | **ID:** 5 | **Use Case Name:** Offer Co-op training |
| **Use Case Type:** Detail, Essential | | **Primar Actor:** Company |
| **Stakeholders and Interests:** Company looking to offer co-op training opportunity, enhancing a company’s reputation. | | |
| **Brief Description:** Company uses the application seeking to offer co-op training positions to students, procuring talent benefiting companies and students. | | |
| **Trigger:** The company user clicks on offer training positions, publishing co-op training positions.  **Type:** User Action. | | |
| **Relationships:**  **Association:** Company  Include:  Extend: Review student application.  Generalization: | | |
| **Normal Flow of Events:**   1. Click on offer co-op training positions. 2. Fill in details about the position. 3. Confirm posting details making it available for student to apply for. 4. Review applications. 5. Select suitable candidates. 6. Offer Acceptance. | | |
| **SubFlow:**   * Company rejected students’ applications. * Rejection notification to applicants. * Company requires the conduction of an interview; an interview will be scheduled. | | |
| **Alternate/Exceptional Flows:** | | |

Table :Offer co-op use case.

|  |  |  |
| --- | --- | --- |
| **Importance Level:** High | **ID:** 6 | **Use Case Name:** Manage Users |
| **Use Case Type:** Detail, Essential | | **Primar Actor:** System admin |
| **Stakeholders and Interests:** Efficiently manage the stakeholders accounts. | | |
| **Brief Description:** System admin handling user accounts, facilitating secure account management. | | |
| **Trigger:** System admin manages accounts by create, update, delete actions.  **Type:** State Change. | | |
| **Relationships:**  **Association:** System  Include:  Extend:  Generalization: | | |
| **Normal Flow of Events:**   1. System administrator logs in. 2. Verify admin privileges. 3. Navigate to account management. 4. List of all users 5. Perform create, update, delete actions. 6. Confirm changes occurred. | | |
| **SubFlow:** | | |
| **Alternate/Exceptional Flows:**   * During performance of operations where the case might be that an error has occurred, the system will display an error message. * The admin will perform actions for error handling. | | |

Table :Manage users use case.

## 3.5 Non-functional Requirements

1. **Availability:**
2. The system Must be available 24/7.
3. The system must be available for all web browsers.
4. **Security**
5. The system must give access only to the authorized users.
6. The system must protect the privacy of stakeholders’ information.
7. **Performance**
8. The system should respond to requests within 5 second.
9. The system could handle up to 300 concurrent users.
10. **Maintenance**
11. The system should be maintained each semester.

# Chapter 4: System design

## 4.1 System Modelling

### 4.1.1 Activity diagrams

**Figure 10:** describes the process where a student logs into the system, searches for available opportunities, applies for one, and receives a confirmation upon successful submission, with the system verifying login credentials and ensuring that the student has not already applied for the same opportunity.

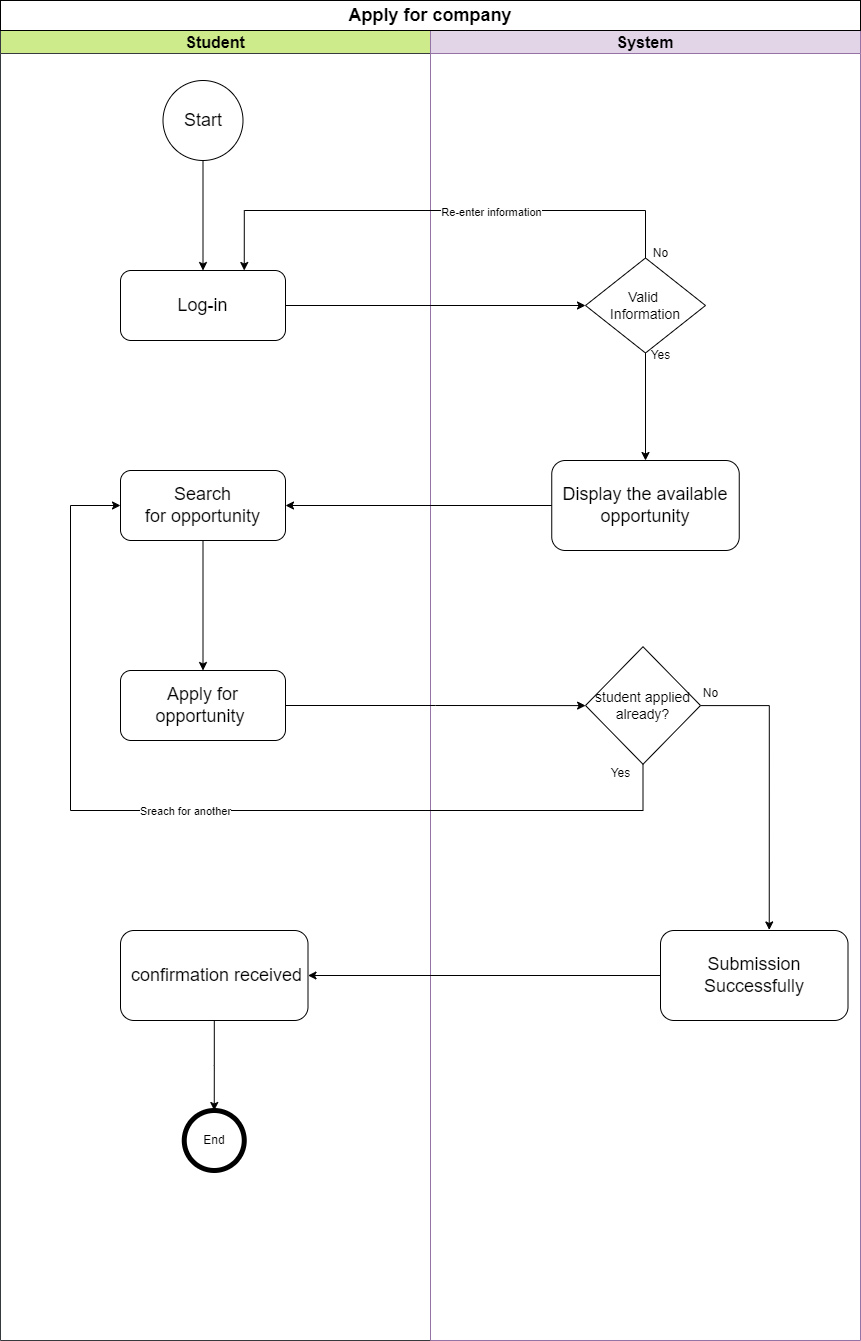


Figure : apply for coop

**Figure 11:** describes process where a student enters the Aoun platform, uploads a document after being accepted into a co-op program, the trainer and supervisor review, approve, or request re-uploads of the documents, with the final status being marked as received once all approvals are complete.

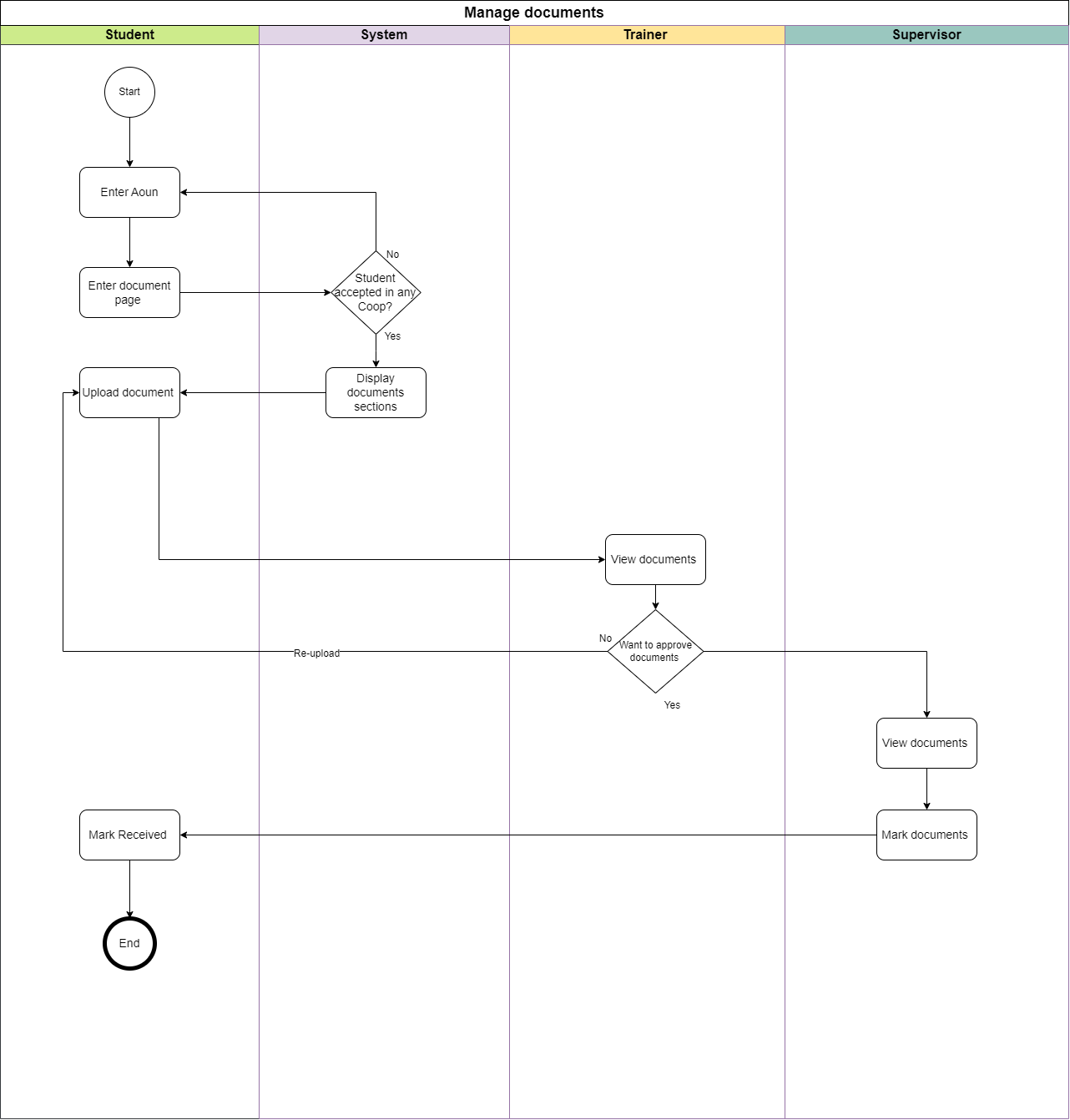


Figure : Manage documents

**Figure 12:** describes how to submit an offer, start by visiting the AOUN website and clicking on the offer button. You will be prompted to enter the required details. If the information entered is valid, the company will be allowed to submit the offer. If not, the system will request that the necessary details be re-entered. Once the correct information is provided, the offer will be successfully displayed on the website.

A diagram of a workflow

Description automatically generated

Figure : Offer Coop

**Figure 13:** Describe how the company will begin by entering the AOUN website, clicking on the sign-up button, and selecting a role. After entering the required details, the system will check if the information provided is correct. If the details are valid, the account will be marked as pending verification. An admin must then verify the account for the company to gain access and be fully registered on the application.

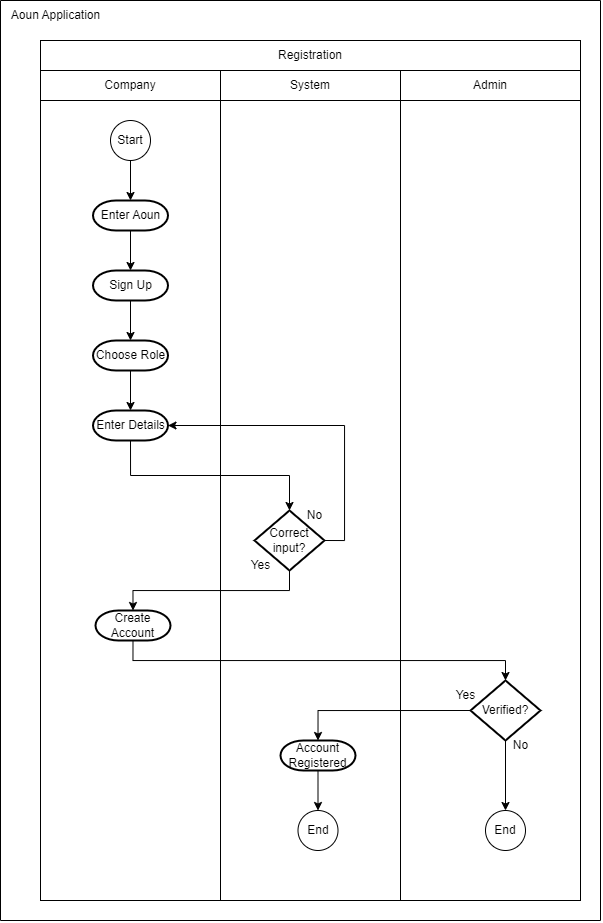


Figure :Company Registration

4.1.2 **Class Diagram**

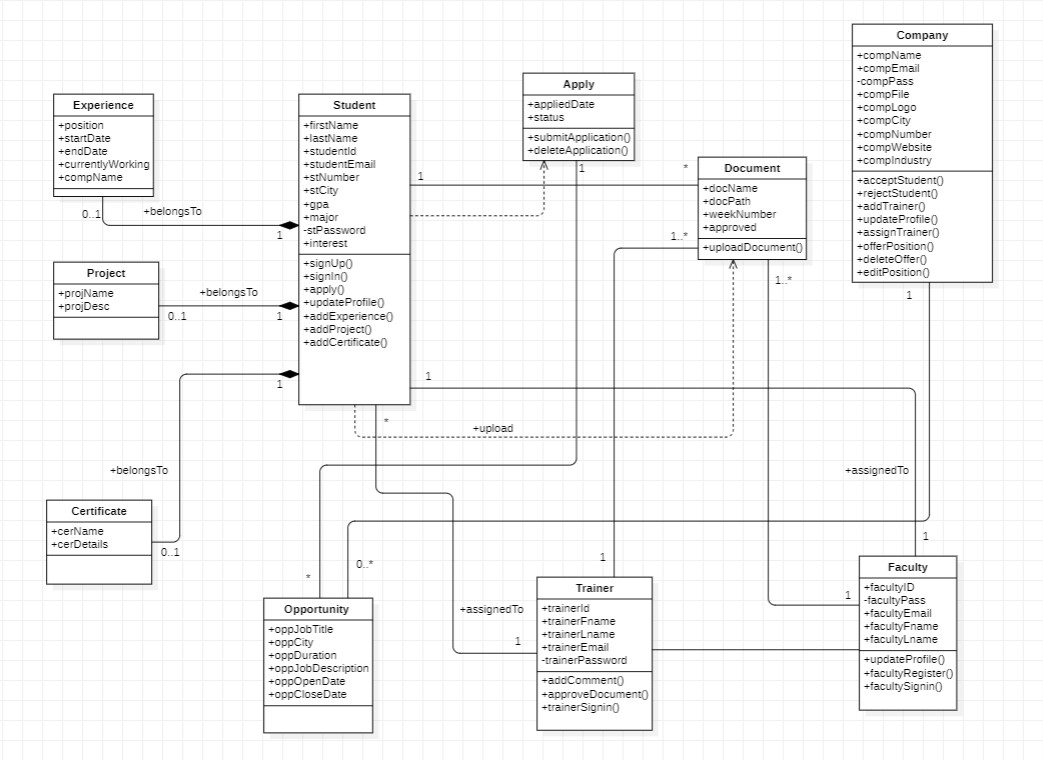


Figure : Class Diagram

This class diagram represents a student cooperative training management system. The **Student** class, central to the diagram, can have multiple **Experiences**, **Projects**, **Certificates**, **Applications** (handled by the **Apply** class), and **Documents**. **Company** manages **Opportunities** and is associated with **Trainers** and **Faculty**. **Opportunities** link students' applications to companies. Each **Trainer** is assigned to a company and can approve documents and add comments. **Faculty** members are also associated with companies and have methods for registration and profile updates. The system facilitates student applications, company job offers, and document management within the cooperative program structure.

### 4.1.3 Sequence Diagrams

**Figure 14:** describe the process where a student logs into the Aoun system to apply for a co-op opportunity. The system validates the user's credentials by checking the email, password, and role with the database. If the user is found, they log in successfully; otherwise, the login fails. After login, the system displays available co-op opportunities. When the student applies, the system checks if the student has already applied. If so, the student is notified that they have already applied; otherwise, the system stores the new application in the database and confirms successful submission.

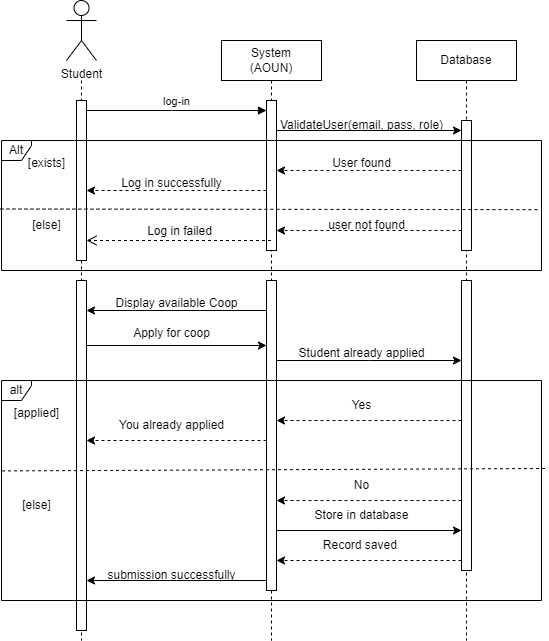


Figure : apply for coop

**Figure 15:** describethe process where a student logs in, enters the document page upon being accepted into a co-op program, uploads a document for review, and the trainer or supervisor approves it, adds marks, and saves the information in the system's database.

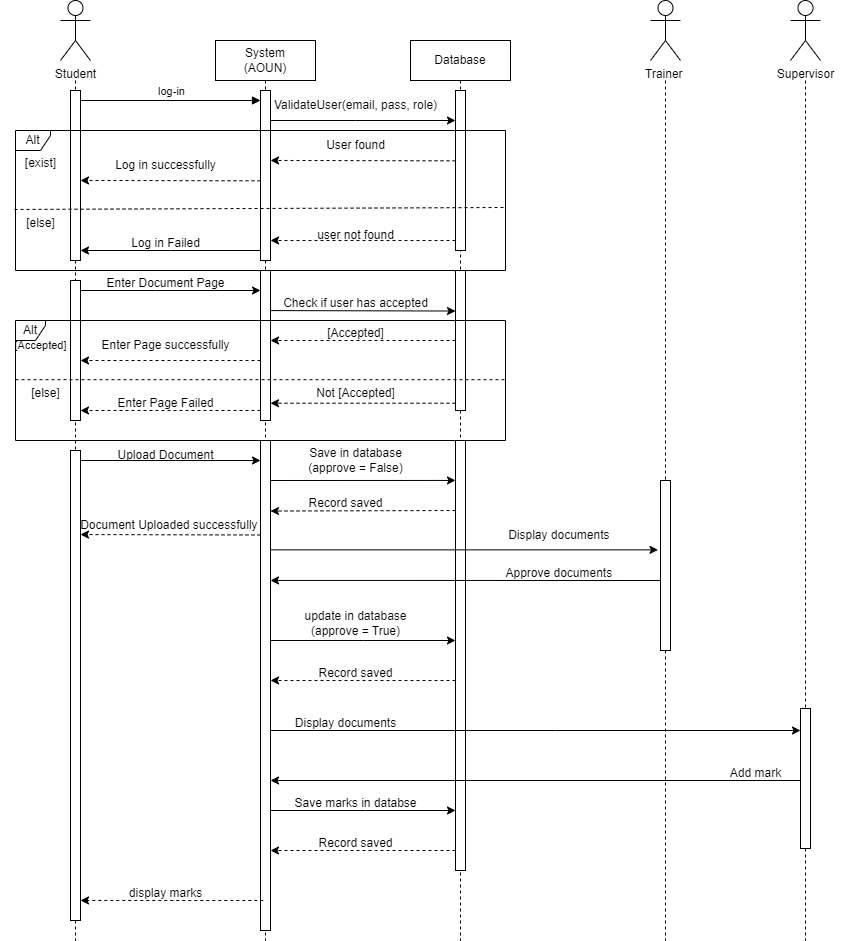


Figure : manage documents

**In this figure**, the company will log in, and the system will validate the user information against the database. If the credentials exist, the login will proceed; if not, access will be denied. After successfully logging in, the company will enter the homepage, click on the offer button, and submit the required details. If the details are correct, the company will be able to complete the submission. Once submitted, the system will save the offer in the database and display it both on the system and to the company.

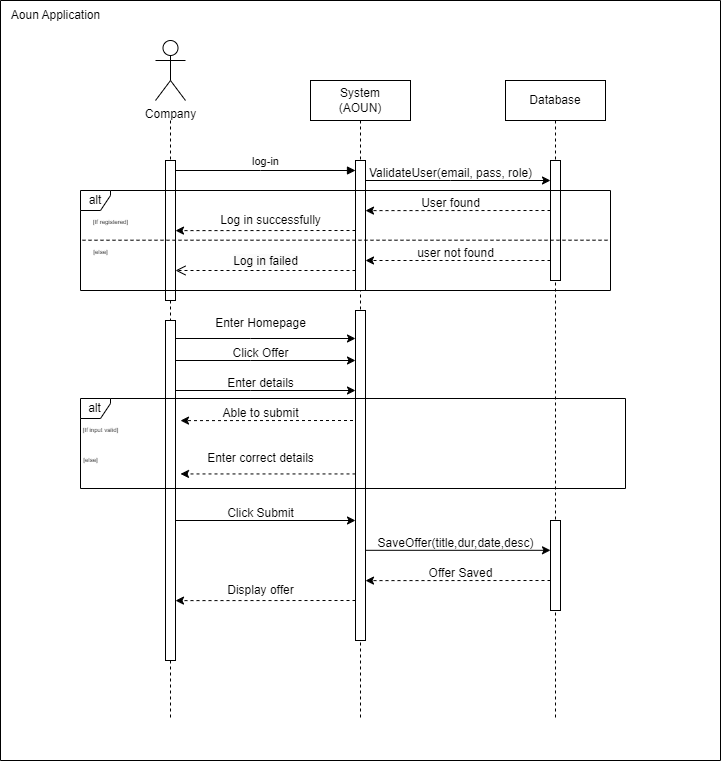


Figure :Offer Coop

The company will begin by signing up on the application, where the system will validate the entered information. If the information already exists in the database, the system will return a message indicating that an account is already registered. If not, a new account will be created. Afterward, the admin will need to access the database to verify the account for the company to gain full access.

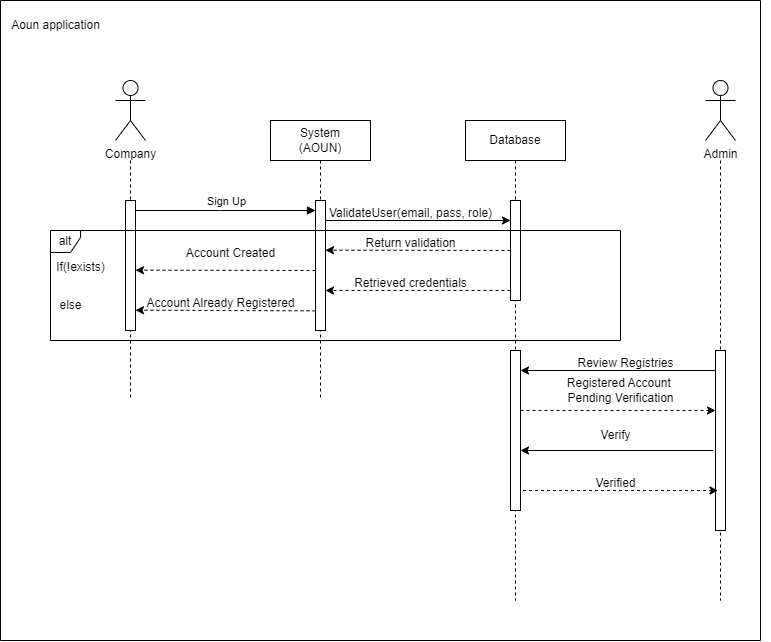


Figure :Registration

## 4.2 Data Modelling

### 4.2.1 ER Diagram

[Provide ER diagram after performing normalization]

### 4.2.2 Data Dictionary

#### 4.2.2.1 Student table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| StudentID | Primary Key | Integer | No | Yes |
| StFName | Student's first name | String(100) | No | No |
| StLName | Student's last name | String(100) | No | No |
| StEmail | Student's email | String(100) | No | No |
| StPhNum | Student's phone number | String(15) | Yes | No |
| StCity | City of residence | String(50) | Yes | No |
| GPA | Grade Point Average | Float | Yes | No |
| StPic | Profile picture | String(200) | Yes | No |
| Major | Student's major | String(50) | Yes | No |
| Interest | Student's interest | String(100) | Yes | No |
| StPassword | Password | String(100) | No | No |
| faculty\_id | Foreign Key - Faculty | Integer | Yes | No |

Table : Student table

#### 4.2.2.2 Certificate table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| id | Primary Key | Integer | No | Yes |
| CerName | Name of the certificate | String(100) | No | No |
| CerDetails | Details about the certificate | Text | Yes | No |
| student\_id | Foreign Key - Student | Integer | No | No |

Table : Certificate table

#### 4.2.2.3 Project table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| id | Primary Key | Integer | No | Yes |
| ProjName | Name of the project | String(100) | No | No |
| ProjDesc | Description of the project | Text | No | No |
| student\_id | Foreign Key - Student | Integer | No | No |

Table : Project table

#### 4.2.2.4 Experience table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| id | Primary Key | Integer | No | Yes |
| ExpPosition | Position in the company | String(100) | No | No |
| ExpCompName | Company name | String(100) | No | No |
| StartDate | Start date of experience | DateTime | No | No |
| EndDate | End date of experience | DateTime | Yes | No |
| CurrentlyWorking | Currently working flag | Boolean | No | No |
| student\_id | Foreign Key - Student | Integer | No | No |

Table : Experience table

#### 4.2.2.5 Opportunity table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| id | Primary Key | Integer | No | Yes |
| OppDuration | Duration of the opportunity | String(50) | No | No |
| OppCity | City of the opportunity | String(50) | No | No |
| OppJobTitle | Job title | String(100) | No | No |
| OppJobDesc | Job description | Text | No | No |
| open\_date | Opening date | DateTime | No | No |
| close\_date | Closing date | DateTime | No | No |
| company\_id | Foreign Key - Company | Integer | No | No |

Table : opportunity table

#### 4.2.2.6 Company table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| id | Primary Key | Integer | No | Yes |
| CompName | Company name | String(100) | No | No |
| CompCity | City of the company | String(50) | Yes | No |
| CompNum | Company phone number | String(15) | Yes | No |
| CompEmail | Company email | String(100) | No | No |
| CompWebsite | Company website | String(100) | Yes | No |
| CompIndustry | Industry | String(100) | Yes | No |
| CompPic | Profile picture | String(200) | Yes | No |
| CompPass | Password | String(100) | No | No |
| CompFile | Company file | String(100) | No | No |
| verify | Verification flag | Boolean | Yes | No |
| CompLogo | Profile picture | String | Yes | No |

Table : Company table

#### 4.2.2.7 Trainer table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| TrainerID | Primary Key | Integer | No | Yes |
| TraFName | Trainer's first name | String(100) | No | No |
| TraLName | Trainer's last name | String(100) | No | No |
| TraEmail | Trainer's email | String(100) | No | No |
| TraPass | Password | String(100) | No | No |
| company\_id | Foreign Key - Company | Integer | No | No |

Table : Trainer table

#### 4.2.2.8 Faculty table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| FacID | Primary Key | Integer | No | Yes |
| FacFName | Faculty first name | String(100) | No | No |
| FacLName | Faculty last name | String(100) | No | No |
| FacEmail | Faculty email | String(100) | No | No |
| FacPass | Password | String(100) | No | No |

Table : Faculty table

#### 4.2.2.9 Apply table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| id | Primary Key | Integer | No | Yes |
| student\_id | Foreign Key - Student | Integer | No | No |
| opportunity\_id | Foreign Key - Opportunity | Integer | No | No |
| applied\_date | Date of application | DateTime | No | No |
| status | Application status | String(20) | No | No |

Table : apply table

#### 4.2.2.10 Assigned table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| id | Primary Key | Integer | No | Yes |
| student\_id | Foreign Key - Student | Integer | No | No |
| faculty\_id | Foreign Key - Faculty | Integer | Yes | No |
| trainer\_id | Foreign Key - Trainer | Integer | Yes | No |
| opportunity\_id | Foreign Key - Opportunity | Integer | No | No |

Table : Assigned table

#### 4.2.2.11 Document table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Attribute** | **Description** | **Data Type** | **Allow Null** | **Primary Key** |
| id | Primary Key | Integer | No | Yes |
| doc\_name | Name of the document | String(100) | No | No |
| doc\_path | File path | String(200) | No | No |
| upload\_date | Upload date | DateTime | No | No |
| approved\_by\_trainer | Approved by trainer | Boolean | No | No |
| approved\_date | Approval date | DateTime | Yes | No |
| status | Status | String(50) | Yes | No |
| Week\_number | The number of the week for document | Integer | Yes | No |
| Trainer\_comment | The feedback provide by the trainer | String(255) | Yes | No |
| Mark | Mark added by supervisor | Integer | Yes | No |
| Is\_marked | The status of the document if it is marked or not yet | Boolean | Yes | No |
| student\_id | Foreign Key - Student | Integer | No | No |
| trainer\_id | Foreign Key - Trainer | Integer | No | No |
| faculty\_id | Foreign Key - Faculty | Integer | Yes | No |

Table : Document table

## 4.3 Detailed Interface Design

1. **Aoun Home page interface design:**

|  |  |
| --- | --- |
| Home Page | |
| A screenshot of a computer  Description automatically generated | |
| Description | Purpose |
| This is the homepage of Aoun application, which helps manage co-op training for students and companies. It contains:   * **A login form** that allows users to sign in with their email address and password. * **Role selection buttons** where users can specify if they are a student, faculty member, company representative, or trainer. * **Links** to contact support, tutorial resources, and a sign-up page for users without an account. | The purpose of this page is to provide an entry point for users to access the system. Based on their role (student, faculty, company, or trainer), they will be directed to relevant parts of the system after signing in. |

Table : Aoun Home page interface design

1. **Aoun sign-up interface design:**

|  |  |
| --- | --- |
| Sign-Up | |
|  | |
| Description | Purpose |
| This is the signup of Aoun application, which allows for the creation of accounts:   * **Role selection Drop Down menu** where users can specify if they are a student, faculty member, company. * Different input will appear for the chosen roles | The purpose of this page is to provide a registry point for users to access the system. Based on their role (student, faculty, company) |

Table : Aoun sign-up interface design

1. **Student home page design:**

|  |  |
| --- | --- |
| Student home Page | |
|  | |
| Description | Purpose |
| The homepage is the main focus which contains offering that have been listed by companies. | The purpose of this page is to allow a student to view offering based on what their preference is. |

Table : Student home page design

1. **Student profile page design:**

|  |  |
| --- | --- |
| Student Profile Page | |
|  | |
| Description | Purpose |
| This is the profile page of a student, which creates the cv of student. It contains:   * **Basic Information** such as mobile, email, etc.. * **Projects** that the student has worked on. * **Experience** the student has previously had. * Certificates student has achieved | The purpose of this page is to provide a detailed resume for a student. |

Table : Student profile page design

1. **Student applications page interface design:**

|  |  |
| --- | --- |
| Student Application Page | |
|  | |
| Description | Purpose |
| The applications page contains the student’s application to coop offerings. | The purpose of this page is to allow the student to view whether he has been accepted or rejected for a specific coop program. |

Table : Student applications page interface design

**4.3.6 Faculty home page interface design:**

|  |  |
| --- | --- |
| Faculty Home Page | |
|  | |
| Description | Purpose |
| The homepage contains information for students assigned to the faculty member. | The purpose of this page is to enable a faculty member of knowing whom they will be supervising for. |

Table : Faculty home page interface design

* + 1. **Faculty profile page design:**

|  |  |
| --- | --- |
| Faculty Profile Page | |
|  | |
| Description | Purpose |
| The profile page contains faculty member information | The purpose of this page is to provide the faculty member of altering their profile if needed. |

Table : Faculty profile page design

* + 1. **Faculty Documents page design:**

|  |  |
| --- | --- |
| Faculty Documents Page | |
| A screenshot of a computer  Description automatically generated | |
| Description | Purpose |
| The document page shows the files submitted by students after verification by their trainer. | The purpose of this page is to allow the faculty member of reviewing student documents. |

Table : Faculty Documents page design

* + 1. **Trainer home page design:**

|  |  |
| --- | --- |
| Trainer Home Page | |
| A close-up of a white box  Description automatically generated | |
| Description | Purpose |
| The trainer home page contains:   * Students who are assigned to the trainer. * Documents needing to be approved. | The purpose of this page is to give the trainer a view of their trainees and approve documents that have been submitted. |

Table : Trainer home page design

* + 1. **Company home page design:**

|  |  |
| --- | --- |
| Company Home Page | |
|  | |
| Description | Purpose |
| The company home contains:   * Coop Offers that the company can make * A view of all students who have applied | The purpose of this page is to give the company a way of offering coop position as well as accept or reject students. |

Table : Company home page design

* + 1. **Company profile page design:**

|  |  |
| --- | --- |
| Company Profile Page | |
|  | |
| Description | Purpose |
| The company profile page contains all the information regarding the company and the trainers.  The company must create trainer accounts. | The purpose of this page is to enter company information and allow the company of creating their own trainers accounts that will be assigned to students. |

Table : Company profile page design

# Chapter 5: System Implementation

## 5.1 System Specification

### 5.1.1 Hardware Specifications

[List recommended hardware specifications for your system from user point of view and provide justifications]

### 5.1.2 Software Specifications

[List recommended software specifications for your system from user point of view and provide justifications]

## 5.2 System Testing

### 5.2.1 Features to be tested

1. Verify that students can register.
2. Verify that students can login.
3. Ensure that students can update personal information (profile).
4. Ensure students can apply for co-op opportunities.
5. Verify that students can track their application status.
6. Ensure companies can update their profiles
7. Ensure companies can post and edit co-op opportunities.
8. Ensure companies add trainers’ information.
9. Ensure students can upload required documents.
10. Ensure trainers can approve or add comment to Student documents.
11. Verify that supervisor can view the student documents after the trainer approves it
12. Verify that admin can view the dashboard of the website

### 5.2.2 Test Cases

1. Verify that students can register.

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that students can successfully register a new account. |  Student’s first name: "Saleh"   Student’s last name: "Almutairi"   Email: [saleh@gmail.com](mailto:saleh@gmail.com)   Student’s ID: “442015756”  Password: "SecurePass123" |  The system creates a new student account   A confirmation message appears  (Account created successfully for Saleh").  The student is redirected to the login page. |  Pass: The account is created, a confirmation message appears, and the student is redirected to the login page.   Fail: Any error occurs, such as missing fields, weak password, duplicate email or student ID. |
| Test result | | | |
| A screenshot of a computer  Description automatically generated | | | |

Table :Verify that students can register

1. Verify that students can login.

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that a student can log in using valid credentials. |  Email: [saleh@gmail.com](mailto:saleh@gmail.com)  Password: "SecurePass123" |  The student is logged in successfully.   The student is redirected to the student home page. |  Pass: The student is successfully logged in and redirected to student home page.   Fail: The student is not able to log in, or an error message appears incorrectly. |
| Test result | | | |
|  | | | |

Table : Verify that students can login

1. Ensure that students can update personal information (profile).

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that a student can successfully update their personal information on their profile. |  Mobile number: “0580990178”  city: "Riyadh"   Major: "Information system"   GPA: "4.56"   Interest: “Database” |  The updated information is saved to the student's profile.   A confirmation message appears ("Profile updated successfully").  The updated information is displayed on the profile page. |  Pass: The profile information is updated and displayed correctly, with a confirmation message.   Fail: The information is not updated, or an error message appears unexpectedly. |
| Test result | | | |
|  | | | |

Table : Ensure that students can update personal information

1. Ensure students can apply for co-op opportunities.

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that a student can apply for more than one co-op opportunity. |  None |  Confirmation messages appear for each successful application submission.   Both co-op opportunity statuses are updated to show that the student has applied. |  Pass: Both applications are submitted successfully, confirmation messages appear, and both opportunity statuses update accordingly.   Fail: applications fail to submit, student applied for the same co-op opportunity twice, co-op opportunity is closed or not open yet, or error messages appear unexpectedly. |
| Test result | | | |
|  | | | |

Table :Ensure students can apply for co-op opportunities

1. Verify that students can track their application status and delete it.

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that a student can view the status of their co-op application. |  None |  The student is able to navigate to the application page.   A message appears confirming the deletion "Application deleted successfully"). |  Pass: The application is deleted, a confirmation message appears, and it no longer appears in the application list.   Fail: The application is not deleted,. |
| Test result | | | |
|  | | | |

Table : Verify that students can track their application status and delete it

1. Ensure companies can update their profiles

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that students can successfully register a new account. |  Student’s first name: "Saleh"   Student’s last name: "Almutairi"   Email: [saleh@gmail.com](mailto:saleh@gmail.com)   Student’s ID: “442015756”  Password: "SecurePass123" |  The system creates a new student account   A confirmation message appears  (Account created successfully for Saleh").  The student is redirected to the login page. |  Pass: The account is created, a confirmation message appears, and the student is redirected to the login page.   Fail: Any error occurs, such as missing fields, weak password, duplicate email or student ID. |
| Test result | | | |
| A screenshot of a computer  Description automatically generated | | | |

Table : Ensure companies can update their profiles

1. Ensure companies can post and edit co-op opportunities.

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that a company can post a new co-op opportunity. |  Opportunity Title: "business analyst"   Location:  " Riyadh."   duration:  " Riyadh."   Opportunity Description: " Gathering requirements."   Start Date: "2024-10-04"   End Date: "2024-11-05" |  The new opportunity is created and saved in the system.   A confirmation message appears ("Co-op opportunity offered successfully").  The opportunity appears in the company’s home page in section “Offered Positions”. |  Pass: The opportunity is posted, a confirmation message appears, and it is visible in the company’s list of positions.   Fail: The opportunity is not posted, or an error message appears unexpectedly. |
| Test result | | | |
|  | | | |

Table : Ensure companies can post and edit co-op opportunities

1. Ensure companies add trainers’ information.

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that a company can add a trainer with all required information. |  Trainer first name: "Yazeed"   Trainer last name: "Kordi"   Trainer Email: [Yazeed@gmail.com](mailto:Yazeed@gmail.com)  Trainer Password: "SecurePass@123" |  The trainer's information is saved to the company’s list of trainers.   A confirmation message appears ("Trainer Yazeed Kordi added successfully"). |  Pass: The trainer is added, a confirmation message appears, and the trainer’s information is visible on the trainers' page.   Fail: The trainer is not added, or an error message appears unexpectedly. |
| Test result | | | |
|  | | | |

Table : Ensure companies add trainers’ information.

1. Ensure students can upload required documents.

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that a student can upload a required document. |  File: "week1.pdf" |  The document is uploaded and saved to the student's documents page.   A confirmation message appears (e.g., "Document uploaded successfully").   The document is visible in the student's document list. |  Pass: The document is uploaded, a confirmation message appears, and it is listed in the student's profile.   Fail: The document is not uploaded, or an error message appears unexpectedly. |
| Test result | | | |
|  | | | |

Table :Ensure students can upload required documents

1. Ensure trainers can approve or add comment to Student documents.

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that a trainer can approve a student’s uploaded document. |  None |  The document status is updated to "Approved."   A confirmation message appears ("Document approved successfully"). | Pass: The document status updates to "Approved," a confirmation message appears, and the updated status is visible to both parties.   Fail: The document is not approved, or an error message appears unexpectedly. |
| Test result | | | |
|  | | | |

Table : Ensure trainers can approve or add comment to Student documents

1. Verify that supervisor can view the student documents after the trainer approves it

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that students can successfully register a new account. |  None |  The system creates a new student account   A confirmation message appears  (Account created successfully for Saleh").  The student is redirected to the login page. |  Pass: The account is created, a confirmation message appears, and the student is redirected to the login page.   Fail: Any error occurs, such as missing fields, weak password, duplicate email or student ID. |
| Test result | | | |
|  | | | |

Table : Verify that supervisor can view the student documents after the trainer approves it

1. Verify that admin can view the dashboard of the website

|  |  |  |  |
| --- | --- | --- | --- |
| Purpose | Inputs | Expected outputs | Pass/Fail criteria |
| Verify that an admin can access and view the dashboard of the website. |  None |  The website dashboard loads, displaying the information of student, company, faculty, trainer |  Pass: The dashboard loads successfully and displays the expected metrics and information.   Fail: The admin cannot access the dashboard, or an error message appears. |
| Test result | | | |
|  | | | |

Table :Verify that admin can view the dashboard of the website

## 5.3 System Deployment

### 5.3.1 Deployment Diagram

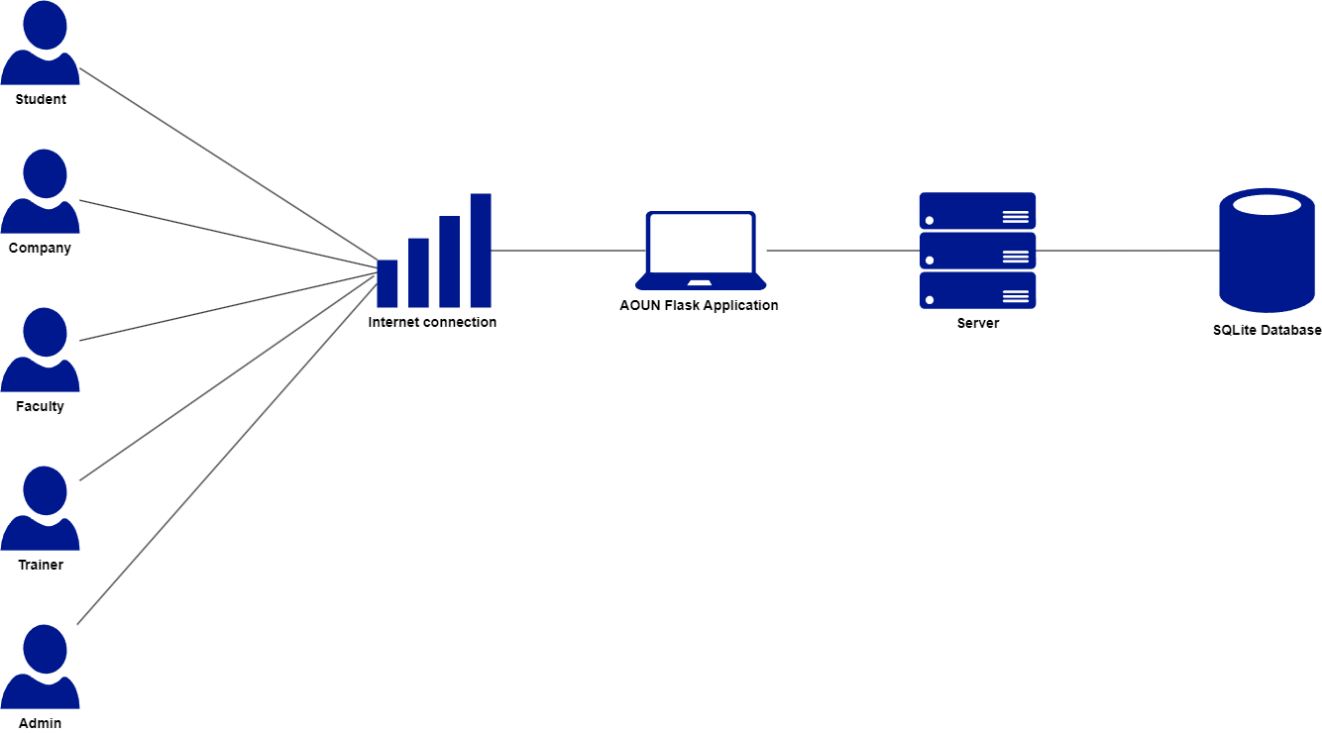


Figure 19: deployment diagram

### 5.3.2 Expected Users/Load

**1. User Types and Their Activities:**

* **Students**: The primary users of the platform, likely accessing the website to view and apply for opportunities, upload documents, and manage their profiles. Depending on the institution's size, you might expect hundreds to thousands of student users.
* **Companies**: Companies are expected to create opportunities and review applications. Typically, fewer companies than students will use the system, but their usage involves more intensive data interactions, such as managing job postings and viewing applicant profiles.
* **Trainers**: Trainers interact with student documents and provide feedback. They might access the platform less frequently, mainly during specific review periods.
* **Faculty**: Faculty members oversee students' progress and may not be as active as students but will periodically log in to monitor and approve documents.

**2. Expected Load:**

* **Traffic Peaks**:
  + Peak usage is expected at the beginning of new application periods and near application deadlines.
  + Estimate around 50-100 concurrent student users during peak times. Company and faculty activity around 50 - 100, with occasional bursts during high review periods.

### 5.3.3 Installation Process

* Open a web browser (such as Chrome, Firefox, or Safari).
* Go to the website by entering the URL provided by the admin or institution into the browser’s address bar.
* Press **Enter** to load the website.

# Chapter 6: Conclusion and Future Work

## 6.1 Conclusion

[Discuss the results you got and the obstacles you have face during the project different phases. Explain how you overcome these obstacles (training, self learning, etc) and Summarize what was learned and how it can be applied.]

## 6.2 Future Work

[Discuss possible extensions to your work in the future]

# References

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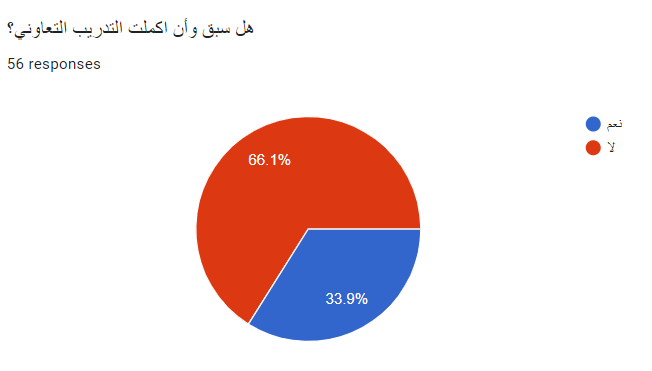
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[[6]](#MoSCoW) D. Clegg and R. Barker, Agile Project Management Using MoSCoW Prioritization: A Comprehensive Guide, 2nd ed. London, UK: Apress, 2021. pp. 34-56.

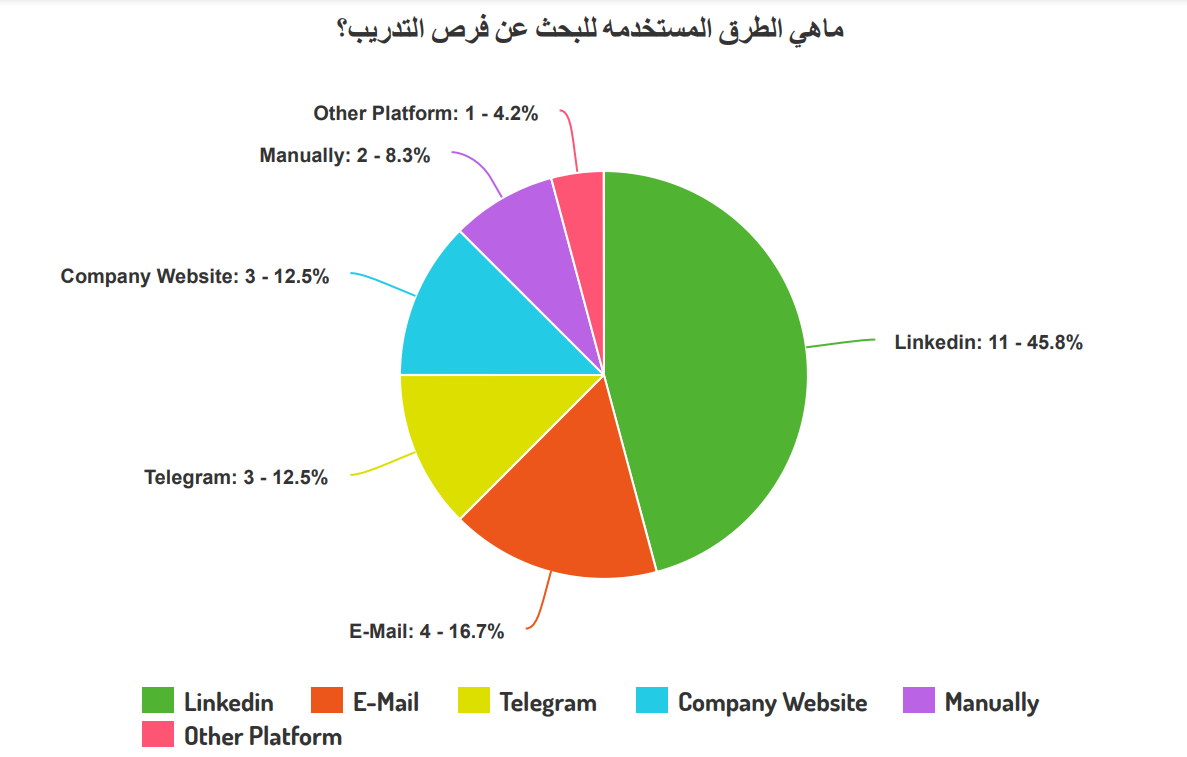
# Appendix

## [A.](#_3.2_Questionnaire_Summary) Questionnaire results



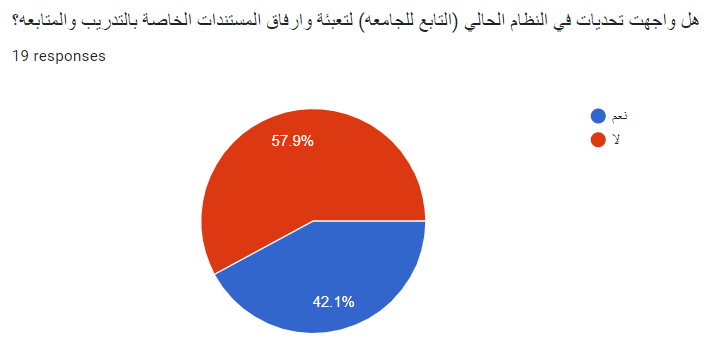




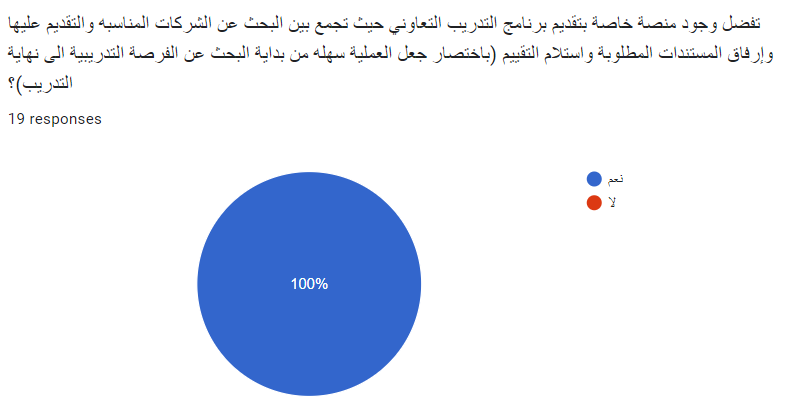










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# A. Miscellaneous

|  |  |
| --- | --- |
| **Faculty Interview Form** | |
| 1. **Name:** |  |
| 1. **Position/Role:** |  |
| 1. **Department:** |  |
| 1. **Date:** |  |
| Supervision Experience   1. Have you ever supervised a student in cooperative training?    * If yes, please provide details of your experience.   Challenges and Difficulties   1. What are the difficulties and challenges you faced during the period of supervising a cooperative training student?   Current System Evaluation   1. What is your view of the current system during the cooperative training period in terms of delivery of weekly documents and other documents?   Credibility Issues   1. Do you think that there is a lack of credibility in the attendance and departure of students in the area in which they are trained?   Solutions   1. From your point of view, what is the appropriate solution to the problems mentioned?   Expectations from Aoun Website   1. What are your expectations for the characteristics and features that the Aoun website will provide? 2. Do you think that the Aoun website will facilitate the process of searching for training for the student and will also facilitate the process for supervisors of accessing the documents that the student has attached and that will be certified by the trainer?   Long-term Benefits   1. What long-term benefits do you expect from implementing a collaborative training application for students, faculty members, and employers?   Additional Features   1. What are the features or additions that you would like us to take into consideration on the Aoun website that will be an enriching addition to the site? | |

Table : Faculty interview form

|  |  |
| --- | --- |
| **Company Interview Form** | |
| 1. **Company Name:** |  |
| 1. **Representative's Name:** |  |
| 1. **Position/Role:** |  |
| 1. **Department:** |  |
| 1. **Date:** |  |
| Training Experience   1. Have you previously trained cooperative training students in the region?    * If yes, can you mention any memorable experiences?   Training Volume   1. Approximately how many students do you train in a year?   Recruitment Methods   1. What are the methods and procedures for presenting cooperative training opportunities?   Recruitment Challenges   1. Do you face difficulties in finding students for cooperative training based on your training requirements?    * If yes, please elaborate on these difficulties.   application Utility   1. Do you think that if you had an application to display your cooperative training opportunities, also to accept applications and schedule interviews, and have documents uploaded, it would facilitate an easier process for you?   Desired Features   1. What are the features or additions that you would like us to take into consideration on the Aoun website that will be an enriching addition to the site? | |

Table 44: Company Interview Form

# B. Code Snippets

**1. Apply for Company (Student Perspective)**

This involves students searching for companies and submitting applications.

@app.route('/apply/<int:opportunity\_id>', methods=['POST'])

def apply\_opportunity(opportunity\_id):

    student\_id = request.form.get('student\_id')

    opportunity = Opportunity.query.get(opportunity\_id)

    # Check if the application is within the allowed dates

    if datetime.utcnow() < opportunity.open\_date:

        flash('Applications have not opened yet.', 'danger')

        return redirect(url\_for('HomePage\_student'))

    if datetime.utcnow() > opportunity.close\_date:

        flash('The application period has closed.', 'danger')

        return redirect(url\_for('HomePage\_student'))

    # Check if the student has already applied to this opportunity

    existing\_application = Apply.query.filter\_by(student\_id=student\_id, opportunity\_id=opportunity\_id).first()

    if existing\_application:

        flash('You have already applied to this opportunity.', 'warning')

    else:

        # Create a new Apply object

        new\_application = Apply(student\_id=student\_id, opportunity\_id=opportunity\_id)

        # Add and commit the new application to the database

        db.session.add(new\_application)

        db.session.commit()

        flash('Application submitted successfully!', 'success')

    return redirect(url\_for('HomePage\_student'))

**2. Submit Files (Student Perspective)**

This use case allows students to upload required documents, which can then be reviewed by the relevant faculty and trainers.

@app.route('/upload\_document/<int:week\_number>', methods=['POST'])

def upload\_document(week\_number):

    if 'student' not in session:

        flash('You must be logged in as a student to upload documents.', 'danger')

        return redirect(url\_for('login'))

    student\_id = session['student']['StudentID']

    assignment = Assigned.query.filter\_by(student\_id=student\_id).first()

    if not assignment or not assignment.trainer\_id:

        flash('No trainer assigned to you. Please contact your administrator.', 'danger')

        return redirect(url\_for('document'))

    trainer\_id = assignment.trainer\_id

    if 'document' not in request.files:

        flash('No file part', 'danger')

        return redirect(request.url)

    file = request.files['document']

    if file.filename == '':

        flash('No selected file', 'danger')

        return redirect(request.url)

    if file and allowed\_file(file.filename):

        filename = secure\_filename(file.filename)

        file\_path = os.path.join(app.config['UPLOAD\_FOLDER'], filename)

        file.save(file\_path)

        # Check if a document already exists for the student and the same week

        existing\_document = Document.query.filter\_by(student\_id=student\_id, trainer\_id=trainer\_id, week\_number=week\_number).first()

        if existing\_document:

            # Update the existing document

            existing\_document.doc\_name = filename

            existing\_document.doc\_path = file\_path

            existing\_document.status = 'Completed'

        else:

            # Create a new document entry if none exists

            new\_document = Document(

                doc\_name=filename,

                doc\_path=file\_path,

                student\_id=student\_id,

                trainer\_id=trainer\_id,

                week\_number=week\_number,  # Store the week number

                status='Completed'  # Set the status to Completed when uploaded

            )

            db.session.add(new\_document)

        db.session.commit()

        flash('Document uploaded successfully.', 'success')

        return redirect(url\_for('doucment'))

    flash('File type not allowed.', 'danger')

    return redirect(url\_for('doucment'))

def allowed\_file(filename):

    ALLOWED\_EXTENSIONS = {'pdf', 'doc', 'docx', 'jpg', 'jpeg', 'png'}

    return '.' in filename and filename.rsplit('.', 1)[1].lower() in ALLOWED\_EXTENSIONS

**3. Offer Co-op training (Company Perspective)**

Company can offer Co-op training.

@app.route('/offer\_coop', methods=['POST'])

def offer\_coop():

    # Retrieve data from the form

    job\_title = request.form.get('jobTitle')

    location = request.form.get('location')

    duration = request.form.get('duration')

    job\_description = request.form.get('jobDescription')

    # Convert string dates from form into datetime objects

    open\_date = datetime.strptime(request.form.get('open\_date'), '%Y-%m-%dT%H:%M')

    close\_date = datetime.strptime(request.form.get('close\_date'), '%Y-%m-%dT%H:%M')

    # Assuming company\_id is stored in the session, retrieve it

    company\_id = session.get('company').get('CompanyID')

    if not company\_id:

        flash('You need to log in as a company to offer a co-op.', 'danger')

        return redirect(url\_for('HomePage\_company'))

    # Create a new Opportunity instance

    new\_opportunity = Opportunity(

        OppDuration=duration,

        OppCity=location,

        OppJobTitle=job\_title,

        OppJobDesc=job\_description,

        open\_date=open\_date,

        close\_date=close\_date,

        company\_id=company\_id

    )

    # Add and commit the new opportunity to the database

    db.session.add(new\_opportunity)

    db.session.commit()

    flash('Co-op opportunity offered successfully!', 'success')

    return redirect(url\_for('HomePage\_company'))

2. Queries used for report generation/display of summarized data along with brief description of the queries.]

# B. Presentation Slides

A computer screen with a screen on it

Description automatically generated

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Description automatically generated

A screenshot of a computer

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Description automatically generated

A blue screen with white text

Description automatically generated

A computer screen with a blue background

Description automatically generated with medium confidence

A blue rectangle with white text

Description automatically generated

A blue rectangular sign with white text

Description automatically generated

A blue and white diagram

Description automatically generated

A blue rectangle with white text

Description automatically generated

A blue and white document with text

Description automatically generated

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Description automatically generated

A blue and white diagram

Description automatically generated

A diagram with text on it

Description automatically generated

A blue and white screen with a blue background

Description automatically generated with medium confidence

A blue screen with white text

Description automatically generated

A computer screen with a display

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# D. Poster

[fit in one page]

1. Write down your responsibilities in the project [↑](#footnote-ref-1)
2. Must add to 100% [↑](#footnote-ref-2)