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E DELL'INFORMAZIONE

# Requirement Analysis and Specification Document (RASD)

Students & Companies Problem

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# Contents

<b>Contents</b>	<b>iii</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Purpose . . . . .	1
1.1.1 Goals . . . . .	2
1.2 Scope . . . . .	3
1.2.1 World Phenomena . . . . .	3
1.2.2 Shared Phenomena . . . . .	4
1.2.3 Machine Phenomena . . . . .	5
1.3 Definitions, Acronyms, Abbreviations . . . . .	5
1.4 Revision History . . . . .	5
1.5 Reference Documents . . . . .	5
1.6 Document Structure . . . . .	5
 <b>2 overall description</b>	 <b>7</b>
2.1 Product Perspective . . . . .	7
2.1.1 Scenarios . . . . .	7
2.1.2 Domain Class Diagram . . . . .	25
2.1.3 State Diagram . . . . .	25
2.2 Product Functions . . . . .	25
2.3 User Characteristics . . . . .	26
2.4 Assumptions, Dependencies, and Constraints . . . . .	28
 <b>3 Specific Requirements</b>	 <b>29</b>
3.1 External Interface Requirements . . . . .	29
3.1.1 User Interfaces . . . . .	30
3.1.2 Hardware Interfaces . . . . .	46
3.1.3 Software Interfaces . . . . .	46
3.1.4 Communication Interfaces . . . . .	46
3.2 Functional Requirements . . . . .	46
3.3 Performance Requirements . . . . .	46
3.4 Design Constraints . . . . .	46
3.4.1 Standards Compliance . . . . .	46
3.4.2 Hardware Limitations . . . . .	46
3.4.3 Any Other Constraint . . . . .	46

3.5	Software System Attributes . . . . .	46
3.5.1	Reliability . . . . .	46
3.5.2	Availability . . . . .	46
3.5.3	Security . . . . .	46
3.5.4	Maintainability . . . . .	46
3.5.5	Portability . . . . .	47
4	Formal Analysis Using Alloy	49
5	Effort Spent	51
	Bibliography	53
	List of Figures	55
	List of Tables	57

# 1 | Introduction

For university students finding the right internship that match their interest and their skills can sometimes be hard. At the same time companies sometimes suffers to clearly defines their projects and what they are looking for from the students. For almost 60% of United States students, not knowing how to find an internship was the main reason for not taking one [1].

The number of internships available for students has plunged by 30%, with only 3,817 opportunities in October 2024 being advertised compared to almost 5,500 a year ago [2]. Also the estimated number of American college students take up formal work experience is 21.5% while only 8.7% of UK students take this path. Even among students studying at the top ten universities, the rate is only 19% [2].

While platforms like LinkedIn offer a broad range of job opportunities, they are not tailored specifically to internships, thus make it difficult for students to find internships that align with their skills and interests. Furthermore, companies may struggle to clearly define their projects and requirements, leading to mismatches and inefficiencies in the recruitment process.

Before COVID-19 in the United States, internship rates were between 50% and 60%. However, recent research indicates a much lower number of 21.5% [1].

Even if in the United States, students on average reported being very satisfied with their internship experiences, there are still many students (1 in 4 reported) that had less than satisfactory experiences showing the needs of both students and companies to clearly define what they are looking for from the internships experience. [1].

## 1.1. Purpose

"Students&Companies" is imagined to be a platform dedicated solely to internships that can implement sophisticated matching algorithms to facilitate the interaction of students with the companies offering an internship and leading to more successful internship experiences.

The scope of the platform is to facilitate the matching between students and companies by assessing the student experiences, skills and attitudes (available in his/her CVs) and the projects and terms offered by the companies.

S&C can be used by the companies, who want to attract students with internships, and by the students who are looking to work for a company by actively searching for an internship

or which receives a recommendation from a system implemented in the platform.

If both the student and the company have a mutual interest in each other then a contact is established, followed by a selection process during which the student is interviewed, S&C also support the selection process by helping managing the interview and finalize the selections.

If the student and the company agree, the platform can collect various kind of informations (such as feedback and suggestions), additionally S&C provides suggestions both to companies and to students on how to improve the company and student appearance on the platform (in terms of CVs for students and project descriptions for companies).

Lastly, S&C monitors the internship and the outcomes of the matchmaking process by allowing students and company to complain, communicate problems and more. Universities can also use the platform to monitor the situation of internships and handle complains.

The main goals of the platform "Student&Companies" are reported in subsection 1.1.1.

#### 1.1.1. Goals

- **[G1]** Match students with internships that align with their experiences, skills and attitudes.
- **[G2]** Match companies with students that might be interested to an internship in that company.
- **[G3]** Let companies advertise the internships that they offer.
- **[G4]** Provide suggestions to students on how to make submission more appealing for the companies.
- **[G5]** Provide suggestions to companies on how to make their internship advertisement more appealing to students.
- **[G6]** Allow students to proactively look for an internship.
- **[G7]** Allow students to apply for internships proposed by companies.
- **[G8]** Offers recommendations to students for internships that match their experiences, skills and attitudes listed in their CVs.
- **[G9]** Use a matching algorithms to improve recommendations.
- **[G10]** Allow the interaction between students, companies and universities.
- **[G11]** Help companies managing the selection process.
- **[G12]** Track the status of applications and selections.
- **[G13]** Collect feedback from students and companies to enhance the matching.
- **[G14]** Collect data to perform statistical analyses for the recommendation system.
- **[G16]** Provide a method for students, companies and universities to communicate.

- [G17] Allow to report complains to universities.
- [G18] Let universities monitor their students internships.
- [G19] Maintain data security and privacy on the platform.

## 1.2. Scope

This section focuses on identifying the phenomena within the "Students&Companies" (S&C) domain, distinguishing between phenomena controlled by the world, by the machine, and those shared by both, thereby adopting the "World-Machine Approach." S&C is a platform designed to facilitate connections between university students and companies, supporting the entire cycle of internship offer management. The main actors interacting with the system are students, companies, and universities.

### Students

Students use the platform to receive, search for, and apply to internships. They can explore the different available offers, submit applications, and receive notifications about opportunities that match their interests and profile. They can also receive feedback from the system to improve their resumes, making their profiles more attractive to companies.

### Companies

Companies use the platform to post internship offers, receive relevant applications, and manage the entire selection process. They can view students' resumes, invite them for interviews, and provide evaluations upon the completion of the internship experience. They can also receive feedback from the system to improve the description of their job offers, helping them attract better talent.

### Universities

Universities monitor the progress of internships and support students in their educational journey. Through the platform, universities can verify the correct conduct of internships, offer support to students, and manage any issues that arise during the work experience. For example, if a student reports difficulty adjusting to the assigned tasks, the university can intervene by coordinating with the company to provide additional guidance or adjust the workload.

#### 1.2.1. World Phenomena

World phenomena are events that occur in the real, external context, outside the platform, and thus are not observed or controlled by the machine. These phenomena influence the operations of the system. They include:

- [WP1] Students create their resumes with information about experiences, skills, and attitudes.

- **[WP2]** Companies define internship offers with details about tasks, technologies used, and required qualifications.
- **[WP3]** Companies set the terms for internship offers, including salary details, working hours, work type (full-remote, smart-working, office-only), and schedule.
- **[WP4]** Universities provide guidelines for internships, such as minimum required hours, student placement areas, and the requirement for at least one company mentor.
- **[WP5]** Companies and universities collaborate through the platform to establish internship requirements and objectives.
- **[WP6]** Universities weekly contact students via messages to monitor internship progress.
- **[WP7]** Universities manage student complaints by taking concrete actions against companies (reminders via messages/calls, legal actions, etc.).

### 1.2.2. Shared Phenomena

Shared phenomena involve both the external world and the machine, requiring direct interactions between the system and users. These phenomena are crucial for the correct execution of system functionalities and represent the point of contact between the machine and the world. Shared phenomena are usually classified in 2 subcategories: World controlled and Machine controlled.

#### World controlled

- **[SP1]** Student creates a profile on the platform.
- **[SP2]** Company creates a profile on the platform.
- **[SP3]** Students upload their resumes on the platform.
- **[SP4]** Companies upload internship-related information (technical and contractual details) on the platform.
- **[SP5]** Students manually search for internship offers, using possible filter parameters (field, city, distance from a specific location, paid/unpaid).
- **[SP6]** Students manually view and select internship offers that interest them.
- **[SP7]** Students submit applications for relevant internships for himself/herself through the platform, which makes them visible to companies.
- **[SP8]** Universities have the option to terminate an internship due to severe conditions between students and companies, indicating the reason for such termination.

#### Machine controlled

- **[SP9]** The system sends notifications to students when new internship offers matching their interests are available.



- **[SP10]** The system sends notifications to companies when new candidates matching their interests are available.
- **[SP11]** Companies receive student applications through the platform.
- **[SP12]** The system provides a section for message exchange, for organizing meetings between companies and student candidates, as well as updating internship progress and reporting student complaints to universities.
- **[SP13]** The system facilitates the organization of interviews between students and companies: scheduling section (calendar).
- **[SP14]** The system facilitates the organization of interviews between students and companies: section for conducting interviews (video call platform).
- **[SP15]** The system requests students and companies to complete a questionnaire (multiple-choice and open-ended questions) to provide feedback on the internship experience (recommended or completed) to improve the recommendation system.
- **[SP16]** The system provides feedback to students and companies on their uploaded content (resumes and internship details) to obtain better matches and improve engagement.

### 1.2.3. Machine Phenomena

Machine-controlled phenomena are automatic operations performed by the system, which are crucial for its functioning. These phenomena occur without human intervention, and thus without being observed by the "world." They include:

- **[MP1]** The system processes student resume data and company internship offers to generate personalized recommendations.
- **[MP2]** The system collects statistics on offered internships and provided feedback, creating reports to improve recommendation processes.
- **[MP3]** The platform manages automatic notifications, sending updates to students, companies, or universities about new matches or messages, and reminding them of scheduled meetings.
- **[MP4]** The platform automatically verifies the completeness of student profiles and company offers, suggesting necessary corrections or additions.

## 1.3. Definitions, Acronyms, Abbreviations

## 1.4. Revision History

## 1.5. Reference Documents

## 1.6. Document Structure



## 2 | overall description

This section provides a general overview of the Students & Companies (S&C) system, describing its operational context and interaction with users and the external environment. This part of the document is essential to understand the system's structure, its main actors, and how it fulfills user requirements. Specifically, it covers:

- The product perspective, offering a detailed analysis of usage scenarios.
- Conceptual diagrams representing the main domain entities and their interactions.
- The lifecycle of states for key system functionalities.

### 2.1. Product Perspective

The Students & Companies (S&C) system is a platform designed to facilitate interactions among students, companies, and universities in the context of internships. This subsection provides an overview of the system's scope and purpose, highlighting how it addresses key challenges in managing internships effectively.

The Product Perspective section is structured into the following subsections:

- **Scenarios:** Describes typical use cases for the system, illustrating how students, companies, and universities interact with its functionalities.
- **Domain Class Diagram:** Provides a conceptual representation of the main entities within the system and their relationships.
- **State Diagram:** Outlines the lifecycle of the system's core processes, detailing the transitions between different states.

These subsections collectively define the operational context of the system, offering insights into how its components work together to meet user requirements.

#### 2.1.1. Scenarios

The purpose of this section is to illustrate the operational contexts in which the Students & Companies (S&C) system will function. It depicts how the system's functionalities are designed to meet user requirements by presenting a comprehensive exploration of the entire operational cycle of the software from the perspective of all user types. The description thus begins with the creation of the profile and concludes with the completion

of the internship. To ensure clarity and transparency, we employ a narrative style to describe these scenarios. This approach not only improves readability, but also allows us to introduce the key stakeholders, settings, and motivations driving their actions. Each scenario narrates a story that portrays real-life use cases through the interactions of the main characters.

The protagonists of the following scenarios are:

- **Lorenzo:** Lorenzo is a university student who pursues a Bachelor's degree in Artificial Intelligence at the University of Pavia. As part of his academic program, he is required to complete an internship which he also intends to use as the basis for his thesis. After not receiving positive responses to his CV submissions through various company websites, Lorenzo decides to explore the S&C platform.
- **David:** David works at AISent, a small and medium-sized company (PMI). He is looking for a student to collaborate on a Computer Vision project, making him an ideal example of a company recruiter who benefits from the S&C platform.
- **Claudio:** Claudio is a professor at the University of Pavia. Lorenzo contacts him to request that he serve as his academic tutor. In this capacity, Claudio will act as a liaison between the company and the intern, oversee the internship's progress.

The interaction lifecycle between these three stakeholders and the S&C platform will be analyzed in detail through the following stages:

1. Student's (Lorenzo) scenarios.
2. Company Recruiter (David) scenarios.
3. University tutor (Claudio) scenarios.

Although there are common user scenarios, it was decided to present everything separately in order to make the process clear from start to finish for each type of user.

## Stage A: Student's Scenarios

### Scenario [A-1]: *The Student Opens the S&C Application*

The first interaction between the student **Lorenzo** and the S&C application focuses on accessing the platform. Upon entering, Lorenzo is presented with the following options on the access page which features the system's logo:

- **Login:** If Lorenzo already has an account, he can log in to access his profile and continue using the platform.
- **Registration:** If Lorenzo is a new user, he may choose to create an account, allowing him to explore the platform and assess how his profile aligns with available internships.
- **Language Change:** Lorenzo can switch the system language via a dropdown menu to suit his preference.

- **Assistant:** If Lorenzo encounters issues or has questions, he can open a chat to receive support from the platform's LLM with RAG.

This scenario focuses solely on the student's access. The subsequent four points will now be analyzed in detail as individual scenarios. They are presented here to provide context for the genesis of this scenario. The analysis will proceed with scenarios spanning from the student's initial application access to the internship's conclusion.

### **Scenario [A-2]: *Student Registration***

Upon choosing to register on the Students & Companies (S&C) platform, Lorenzo is presented with a registration form that requires filling out various fields. He has the option to upload his CV, which the system can use to auto-fill these fields. If he does not upload a CV, he must enter his information manually:

- *Profile Photo*
- *Personal Data:* Name and Surname.
- *Contacts:* Phone Number, LinkedIn profile.
- *Institutional Email*
- *Department and Role*
- *Professional Biography*
- *Certifications, Awards, Recognitions*
- *Languages Spoken*
- *Security Question*

The institutional email plays a crucial role on the platform, as it is used to verify a user's status as a student along with their university affiliation. This verification is possible through a list of email domains provided by university staff such as secretaries or professors during the university profile setup process. As detailed in section C-3, "University Profile Generation" these administrators must include all relevant institutional email domains. This inclusion enables the system to accurately categorize each user's type and university affiliation.

A feature at the bottom of the registration form, "Information Improvement," uses an LLM to analyze and suggest improvements for the clarity and quality of the entered information. Upon revising the details with the LLM's suggestions, Lorenzo can proceed to confirm the creation of his profile. Potential outcomes post-registration include:

- **Subscenario [A2-1] Mandatory fields incomplete:** Lorenzo will be prompted to complete any missing fields.
- **Subscenario [A2-2] All fields completed, domain registered:** If the email domain matches one registered by his university, Lorenzo is directed to his new homepage to start using the application.

- **Subscenario [A2-3] Fields complete, domain not registered:** If Lorenzo's email domain is not recognized, he is put in contact with a support operator. Together, they discover that although he is part of a registered university, his specific email domain has not yet been added to the system. The university's profile creator, typically an administrative staff member like Claudio, is then requested to add Lorenzo's specific email domain to the list of recognized domains. Once this addition is made, Lorenzo will receive an email confirmation allowing him to proceed with his registration.
- **Subscenario [A2-4] Domain and university not registered:** If Lorenzo's email domain is not recognized, he is put in contact with a support operator. They determine that his university does not have an institutional profile on the platform. Consequently, registration cannot proceed until an administrative member or academic tutor from the university registers the institution and includes all potential institutional email domains. Lorenzo can opt to be notified via email once his university is registered, allowing him to complete his registration afterward.

#### **Scenario [A-3]: *The Student Login in the S&C Application*** .

**Lorenzo** (or any other student) proceeds to log in using the credentials obtained during the registration process. From the initial page, the student navigates to the dedicated login page with the intent of accessing the functionalities of the **S&C** platform. To complete the login process, Lorenzo must enter his username and password into the designated fields for student credentials. Once authenticated, he gains access to the platform.

#### **Scenario [A-4]: *The Student Credential Recovery*** .

Despite having created a profile, **Lorenzo** (or any other student) has forgotten both his email and password. Using the credential recovery feature, Lorenzo provides the answers to the security questions he selected during registration. The **S&C** system validates his responses, retrieves the email associated with his profile, and sends a temporary password to that email. Lorenzo can then use the provided credentials to regain access to his account and reset his password if needed.

#### **Scenario [A-5]: *The Student and the Chatbot Interaction*** .

**Lorenzo** is uncertain about the detailed functionalities of the **S&C** application and wants to understand how his data will be used before providing his information. To address this and other doubts, Lorenzo interacts with the platform's chatbot. The chatbot offers clear explanations, providing information about data usage and the platform's features. If Lorenzo requires further clarification, the chatbot escalates his query to a human representative for additional support.

#### **Scenario [A-6]: *Student Language Change*** .

Whenever Lorenzo wishes to change the platform's language, he can easily do so without navigating away from his current activity. A flag icon representing the current language is visible on every page of the **S&C** platform. By clicking on this icon, Lorenzo is presented with a dropdown menu featuring other available languages, each represented by its re-

spective flag. He selects his preferred language, such as Italian, English, French, Spanish, or German. The platform instantly updates to his chosen language.

#### **Scenario [A-6]: *The Student Create its CV (Student First Access into S&C)***

This scenario occurs when **Lorenzo** logs into the **S&C** application for the first time. Before accessing the platform's full features, Lorenzo is required to complete the creation of his profile, which is linked to the credentials used during login. As part of this process, Lorenzo must create his CV within the application. The CV creation process offers Lorenzo two options:

- **Option 1: Manual CV Creation.** Lorenzo can build his CV from scratch by filling out the mandatory fields and, if desired, adding optional customizable fields. This approach allows Lorenzo to tailor his CV to his specific preferences and needs.
- **Option 2: Upload an Existing CV.** If Lorenzo already has a CV prepared, he can upload it directly to the application. Using advanced Large Language Model (LLM) technology, the platform analyzes and transfers the data from Lorenzo's uploaded CV into the system's standardized format.

After the CV is processed, Lorenzo is given the opportunity to manually review and edit any fields where data may not have been correctly transferred. Once the CV is complete, Lorenzo can request an automatic review to enhance its quality. This review, powered by an agent-based approach leveraging LLMs, provides suggestions and improvements for optimizing the CV. Finally, Lorenzo can confirm and save the CV within his profile, completing the setup process. With his CV finalized, Lorenzo can proceed to use the application and explore its features.

#### **Scenario [A-7]: *The Student Searches for an Internship***

After successfully logging into the **S&C** application, **Lorenzo** is ready to search for an internship. The internship search process encompasses all actions taken before a **contact** is established (i.e., when Lorenzo expresses interest in a position and the company deems him a suitable candidate). The student has three distinct methods to search for internships, corresponding to the three primary ways a contact can occur. These methods are presented in descending order of interaction friction:

##### **Subscenario [A-7.1]: *Monitoring Page***

In the **Monitoring Page**, Lorenzo can view a list of positions for which companies have invited him to participate in their selection processes. Each position includes detailed information about the role and the company. If Lorenzo finds a position appealing, he can indicate his interest by accepting the company's invitation. This action results in a **contact**, allowing both parties to proceed with the next steps in the internship process.

If a contact is established in this way, in our example, Lorenzo has accepted a request in his Monitoring Page to participate in the selection process for a Computer Vision Intern role at the company **AISeT**.

### Subscenario [A-7.2]: *“For You” Section in Matchmaking*

The **“For You” Section** of the matchmaking system presents a list of recommended positions tailored to Lorenzo’s CV details. In this section, Lorenzo can review the descriptions of suggested positions and express interest by assigning a **like** to roles he finds appealing. If Lorenzo wishes to refine the list, he can use system-recommended tags to filter positions by job type or category. When Lorenzo assigns a like to a position, the corresponding recruiter is notified. If the recruiter reciprocates the interest, a **contact** is established.

If a contact is established in this way, in our example, Lorenzo has used the “For You” section to send a request to participate in the selection process for a Computer Vision Intern role at the company **AI Sent**. This request was then accepted, establishing the contact.

### Subscenario [A-7.3]: *Custom Search in Matchmaking*

If the system-recommended tags or positions in the **“For You” Section** do not meet Lorenzo’s preferences, he can perform a **custom search**. Using the application’s comprehensive search engine, Lorenzo can manually explore all open positions listed on the platform. This approach provides maximum flexibility for finding opportunities that align with his specific interests.

If a contact is established in this way, in our example, Lorenzo used the custom search feature to find the position and sent a request to participate in the selection process for a Computer Vision Intern role at the company **AI Sent**. This request was then accepted, establishing the contact.

### Scenario [A-8]: *The Student Monitors the Progress of Their Applications*

Within the **Monitoring Page**, Lorenzo can not only view the positions for which he has received invitations to participate in the selection process but also track the progress of applications he has submitted to various positions across different companies. The **Monitoring Page** also provides detailed updates on Lorenzo’s applications, including:

- Whether the company has issued a negative response to his application.
- Whether the company has viewed his application but has not yet responded.
- Whether the company has not yet viewed his application.

This feature allows Lorenzo to stay informed about the status of all his internship applications and take appropriate actions if needed.

In the case of our example from subscenarios [A-7.2] and [A-7.3], the Computer Vision Intern position at **AI Sent**, as in [A-7.1], will appear in the monitoring section. However, unlike in [A-7.1], this position will be listed under the section for submitted applications rather than the section for received offers.

### Scenario [A-9]: *A Contact is Established Between the Student and the Company*

A contact is established between **Lorenzo** and a company when mutual interest has been



expressed, regardless of the order in which the interest was shown. Once this connection is made, the system sends a notification to inform Lorenzo of the successful match. The notification includes key details, such as the **name of the company** and the **position** for which the contact was made. This notification is stored in the **Notifications Section** of the application, allowing Lorenzo to review it at any time. This ensures that Lorenzo remains informed about new opportunities and can easily keep track of his connections as they arise, supporting effective engagement with companies.

#### **Scenario [A-10]: *The Selection Process (Student perspective)***

The **selection process** from the student's perspective begins when **Lorenzo** is notified of a **contact** established with a company. This notification, as described in Scenario **A-9**, includes details about the company and the position. Lorenzo then accesses the **Selection Page**, where he views the stages of the recruitment process defined by the company. These stages may include screening, technical tests, interviews, and final evaluations. Each stage provides clear instructions and deadlines. To progress, Lorenzo completes the required tasks, such as submitting documents or tests and attending interviews scheduled via the platform. Throughout the process, real-time updates are provided in the **Notifications Section**, and the **Calendar Widget** helps him manage deadlines. Communication with recruiters is facilitated through the **Messaging Page**, allowing Lorenzo to ask questions or respond to feedback. If successful, the company extends an offer, which Lorenzo can review and accept directly on the **Selection Page**.

#### **Scenario [A-11]: *The Student Receives an Internship Offer***

After successfully completing all stages of the selection process defined by the company, **Lorenzo** is notified of an official offer for the position. This notification is accessible within the **Selection Section** of the application. Lorenzo is given a defined number of days, as specified by the company, to respond to the offer. He can take one of the following actions:

- **Decline the Offer:** Lorenzo can choose to reject the offer outright.
- **Request an Additional Call:** Lorenzo can request a follow-up call for clarification or discussion before making his decision. However, the company is not obligated to accommodate this request.
- **Accept the Offer:** Lorenzo can immediately accept the position and proceed with onboarding.

This feature ensures that Lorenzo has sufficient flexibility to evaluate the offer and make an informed decision within the specified timeframe.

#### **Scenario [A-12]: *The Student Accepts the Formal Offer Received***

After completing all stages of the selection process, **Lorenzo** receives a formal offer from the company through the **Selection Page**. The notification includes all relevant details about the position, such as the internship duration, start date, and specific terms. Lorenzo carefully reviews the offer and chooses to accept it through the platform. Upon acceptance, the system updates the status of the offer and notifies the company of his decision.

Following this, Lorenzo is required to take the next step in the process by finding a **University Tutor**. This is essential for ensuring proper academic oversight and compliance with university requirements for internships. Through the **Tutor Selection** section in the Active Stage Page of the platform, Lorenzo can search for and contact a professor from his university who is eligible to act as his academic tutor. Once the tutor agrees, their details are linked to Lorenzo's internship profile, completing the administrative setup and allowing the internship to officially begin.

**Scenario [A-13]: *The Student Provides Weekly Internship Updates*** .

When the internship is active, **Lorenzo** receives a weekly notification prompting him to complete the **Weekly Progress Questionnaire**. This ensures regular updates on his internship experience. The questionnaire can be accessed in the **Active Internship Section** of the application. In this section, Lorenzo finds a designated box where he is required to complete the questionnaire each week. This feature helps track Lorenzo's progress and provides structured insights into his internship activities.

**Scenario [A-14]: *The Student Reports Problems During the Internship*** .

During the internship, **Lorenzo** may encounter various types of issues that need to be addressed to ensure his rights and well-being are protected. To facilitate this, the platform allows Lorenzo to contact his assigned professor (academic tutor) directly through the **Active Internship Section**. This feature provides Lorenzo with a secure and efficient way to report problems and seek guidance or intervention when necessary.

**Scenario [A-15]: *The Student Completes the Internship*** .

At the conclusion of the internship, **Lorenzo** is required to complete a **Final Evaluation Questionnaire**. This questionnaire is designed to collect feedback on his overall internship experience.

The questionnaire includes:

- A rating and written feedback on the company, assessing aspects such as the work environment, the relevance of the tasks, and the support provided during the internship.
- A rating and evaluation of the academic tutor, focusing on their guidance, communication, and availability throughout the internship.
- A self-reflection section, where Lorenzo can describe what he has learned and how the internship has contributed to his personal and professional growth.

This feedback is used to improve the platform's matchmaking process, ensure quality standards for future internships, and provide valuable insights to both companies and academic tutors. Once the questionnaire is completed, the internship is marked as finalized, and Lorenzo can access a certificate of completion if applicable.

## Stage B: Company Recruiter's Scenarios

### Scenario [B-1]: *The Recruiter Opens the S&C Application* .

When David, a recruiter from AISent, accesses the S&C application, his first interaction is with the access page. He is faced with several options:

- **Login:** David can log in using his existing credentials to manage internship postings and review applications.
- **Registration:** New recruiters can register their account to start using the platform.
- **Language Change:** David can modify the system's language through a drop-down menu, facilitating communication in his preferred language.
- **Assistant:** For any assistance or queries, David can access immediate support through the chat feature powered by the platform's LLM with RAG.

This scenario outlines the initial access steps for the company recruiters. Further scenarios will detail each action individually as they relate to the recruiter's interaction with the S&C platform.

### Scenario [B-2]: *Company Recruiter Registration* .

David, a recruiter from AISent, decides to register on the Students & Companies (S&C) platform and is directed to complete a registration form specifically designed for company recruiters. The information required includes:

- *Profile Photo*
- *Personal Data:* Name and Surname.
- *Contacts:* Phone Number, LinkedIn profile.
- *Institutional Email*
- *Department and Role*
- *Professional Biography*
- *Certifications, Awards, Recognitions*
- *Languages Spoken*
- *Security Question*

At the bottom of the registration form, David can use the "Information Improvement" button, which employs an LLM to analyze and suggest improvements to the clarity and quality of the information provided.

Once the form is completed and refined, David can proceed to confirm the creation of his company recruiter profile. Depending on the information provided, the following subscenarios may occur:

- **Subscenario [B2-1]: Mandatory fields incomplete.** If any required fields are left unfilled, David will be prompted to complete them.

- **Subscenario [B2-2]: All fields completed, domain registered.** If the email domain matches one already registered with the platform and associated with his company, David is directed to his new homepage to start managing internship postings and reviewing applications.
- **Subscenario [B2-3]: Domain not registered.** If David's email domain is not recognized, he is put in contact with a support operator. Together, they discover that while his company is registered with the platform, his specific email domain has not yet been added to the system. David is then instructed to contact a company administrator to add his specific email domain to the list of recognized domains. Once this addition is made, David will receive an email confirmation allowing him to proceed with his registration.
- **Subscenario [B2-4]: Domain and company not registered.** If David's email domain is not recognized, he is put in contact with a support operator. Together, they determine that his company does not have a profile on the platform. Consequently, registration cannot proceed until a company administrator registers the institution and includes all potential company email domains. David will be prompted to initiate the company profile setup as described in scenario [B-3]. He can also opt to be notified via email once his company is registered if he do not wanna create the company profile.

### **Scenario [B-3]: *Company Profile Creation***

As said in Scenario B2-4, If a company recruiter like David finds that his company's domain is not registered on the S&C platform, he is put in contact with a support operator. Together, they verify that the company does not have a profile on the platform. Following this verification, David is sent a link via email to a profile creation page. This page allows him to establish a complete profile for his company with the following required fields:

- *Logo*
- *Name*
- *Contacts*
- *Office Address*
- *Operational Sector*
- *Size*
- *Description*
- *Certifications, Awards, Recognitions*
- *Tutor Domain(s)*
- *Information Improvement*
- *Language Change*
- *Assistant*

- *Continue*

Once the profile is submitted, it undergoes a verification process. If it meets the platform's standards, it is activated, and David receives an email with a link to his company's homepage. If the profile is not approved, he will receive detailed feedback with a link to revise and resubmit the profile.

#### **Scenario [B-4]: *Recruiter Login*** .

**David** (or any other recruiter) proceeds to log in using the credentials obtained during the registration process. From the homepage, David navigates to the login page, intending to access the **S&C** platform to manage internship opportunities and applications. To log in, David must enter his username and password into the fields designated for recruiter credentials. Upon successful authentication, he gains access to the platform.

#### **Scenario [B-5]: *The recruiter Credential Recovery*** .

**David** (or any other recruiter) encounters a situation where he has forgotten both his email and password. Using the credential recovery feature, David answers the security questions he set up during registration. Upon verifying his responses, the **S&C** system provides him with the email linked to his account and sends a temporary password to that email address. With these credentials, David can log in and reset his password for continued access.

#### **Scenario [B-6]: *The recruiter and the Chatbot Interaction*** .

**David** has questions about how to use specific features of the **S&C** application, such as creating an internship posting or reviewing student profiles. To resolve his doubts, David interacts with the platform's chatbot. The chatbot provides step-by-step guidance and answers frequently asked questions. If David's concerns are not fully addressed, the chatbot escalates his query to a human representative for further assistance.

**Scenario [B-7]: *Company Recruiter Language Change*** David can change the platform's language at any time during his session by interacting with the flag icon displayed on every page. This icon opens a dropdown menu containing options like Italian, English, French, Spanish, and German, each accompanied by its national flag. Selecting a new language from this menu immediately updates the interface, allowing David to continue his recruitment activities in the language of his choice.

#### **Scenario [B-6]: *The Company Staff Member Links to Their Company*** .

During his first interaction with the **Students & Companies (S&C)** platform, after completing the initial login, **David**, a Company Staff Member at AISent, must connect his personal profile to his company. This connection is necessary to enable full functionality of the platform and is achieved through one of two possible subscenarios.

##### **Subscenario [B-6.1]: *The Company is Already Registered*** .

If **AISent** is already registered on the platform, David connects his profile using the **Company Code**, which was generated when the first staff member from AISent registered

the company. If David does not have the code, he can initiate a recovery process by requesting it via email to the company's initial contact or by using the **"Resend Code"** option, which sends the code to the registered company email. If these options fail, David can verify his affiliation by uploading his employment contract to the platform, which will then be manually reviewed and validated by an S&C administrator.

***Subscenario [B-6.2]: The Company is Not Yet Registered*** .

If **AISent** is not yet registered on the platform, David must create a new company profile. This involves providing details such as AISent's name, address, and industry. Once the required fields are completed, David can use the **LLM (Large Language Model)** feature integrated into the platform to review and optimize the entered details. By selecting the **"Review and Optimize"** option, the LLM ensures the input is accurate and professional. After finalizing the profile, David submits it for verification by the S&C administrative team, ensuring compliance with the platform's standards before it becomes active.

***Scenario [B-7]: The Company Staff Member Creates Their Profile*** .

After successfully linking his account to the company, **David**, a staff member at AISent, proceeds to create his personal profile on the **Students & Companies (S&C)** platform. This step allows David to specify his role within the company and include a personal introduction that can help students get to know him better. David fills out the necessary fields in his profile, such as his job title, a brief description of his responsibilities, and a personal message or bio to make his profile approachable to potential internship candidates. To ensure professionalism and accuracy, David can utilize the platform's integrated **LLM (Large Language Model)** feature. By selecting the *"Review and Optimize"* option, David allows the LLM to suggest enhancements to his profile before finalizing it. Once reviewed and confirmed, the completed profile is securely linked to David's credentials and becomes accessible within the platform, enabling seamless interaction with students and the management of internship processes.

***Scenario [B-8]: The Company Staff Member Creates a New Job Position*** .

After setting up his profile, **David**, a staff member at AISent, accesses the **New Position** page to create a new internship or job posting for the company. This page provides an intuitive interface designed to simplify the creation of detailed and attractive job postings while ensuring that critical elements of the selection process are properly defined. David begins by entering the essential details of the position, such as the job title, description, required qualifications, and duration. Additionally, this section allows David to define the specific selection process for the position, including steps such as *Initial Screening*, *Technical Tests*, and *Final Interviews*. Defining these steps is fundamental as they guide both the company and students during the recruitment process. To assist with the creation of the job posting, the platform offers **predefined templates** tailored to common roles, such as Programmer, Human Resources Specialist, or Translator. By selecting a template, David can quickly populate the fields with industry-standard information, reducing the effort required to start from scratch. To further refine the job posting, David can utilize the **LLM (Large Language Model)** feature integrated into the platform. By enabling the

"Review and Optimize" option, the LLM analyzes the entered information and suggests improvements to make the job posting more appealing to potential candidates. These enhancements may include adjustments to the job description, qualifications, or other details to better align with industry best practices. Once all fields, including the selection process, are reviewed and optimized, David confirms the creation of the job posting. The finalized posting is then made available on the platform for students to discover and apply.

#### ***Scenario [B-9]: Company Staff Member Saves a Draft of a Job Position***

While creating a new job position on the **New Position** page, **David**, a staff member at AISent, decides to save his work as a draft without publishing it immediately. This feature allows David to save incomplete or tentative postings and revisit them later for further edits or finalization. David fills in the necessary details for the position, such as the title, description, and required qualifications. However, if he needs more time to finalize the content or wants to revisit specific details later, he selects the "**Save Draft**" option. The draft is securely stored within the **Drafts** section of the platform, accessible only to authorized company staff members. At a later time, David can return to the **Drafts** section, open the saved draft, and make additional changes or refinements.

#### ***Scenario [B-10]: The Company Staff Member Invites Students to Selection***

On the **Matchmaking** page, **David**, a staff member at AISent, reviews a list of potential candidates for open job positions. The platform's recommender system identifies students whose profiles align with the job requirements, providing David with a curated list for each position. For each student, David can click on their name to view a detailed page containing the student's CV, offering insights into their skills, experiences, and qualifications. Next to each student's name, their **interest status** is displayed, which can take one of three values: "Yes," "No," or "Not Yet Defined." If the student has indicated "**No**", David can still send a request to participate in the selection process if he believes the student might be a good fit for the position. This allows the company staff member to encourage candidates who may have initially overlooked the opportunity. For students whose status is "**Not Yet Defined**," David can send a request to invite them to the selection process. This ensures that students who have not yet expressed a preference are given a chance to engage with the position. Once the request is sent, the platform updates the student's status and notifies them of the company's interest. If the student has already expressed "**Yes**" as their interest status, David does not need to send a request but can instead approve the application. However, the detailed process for handling students with "Yes" status is addressed in the next scenario.

#### ***Scenario [B-11]: Selection Process (Company Staff Perspective)***

From the perspective of the **Company Staff Member**, the selection process begins once a **contact** is established with a student, as outlined in Scenario **B-11**. This occurs when mutual interest is expressed, either by the student accepting an invitation to participate or the staff member inviting a student who has shown interest. The **Selection Page** allows the staff member, such as **David**, to manage the recruitment process for each position. The page provides a detailed view of the selection stages, including initial screening, questionnaire, technical tests, interviews, and final evaluations. For each stage, David

can view the progress of individual candidates and track completion statuses. David can use the platform's tools to communicate with students through the **Messaging Page**, providing instructions, feedback, or scheduling interviews. The **Calendar Widget** helps David manage deadlines and events related to the recruitment process, ensuring that both the company and candidates remain aligned. Once a student successfully completes all stages, David can use the **Offer Management** section to extend an internship offer. This functionality allows David to define the terms of the offer, notify the student, and track their response. If the student declines, David can efficiently proceed with other candidates in the process.

#### **Scenario [B-12]: The Company Staff Member Makes a Formal Offer .**

Once a student successfully completes all stages of the selection process, **David**, a company staff member at AISent, proceeds to make a formal offer through the **Offer Management** section of the platform. This process allows David to define and communicate the terms of the internship or job position to the student. David begins by accessing the details of the specific position and selecting the student to whom the offer will be extended. He enters the key terms of the offer, such as the internship duration, start date, and any other relevant conditions.

#### **Scenario [B-13]: The Company Staff Member Organizes the First Call with the Student and the University Tutor .**

After the student accepts the formal offer and selects a university tutor, **David**, a staff member at AISent, schedules an initial call with the student and their university tutor through the platform's **Communication Tools**. This meeting aims to provide a detailed explanation of the student's responsibilities during the internship and address any potential questions or concerns. David coordinates the meeting by proposing a time and date through the **Calendar Widget**, which sends invitations to both the student and the tutor. During the call, David outlines the key tasks, expectations, and deliverables, ensuring alignment among all parties. This step fosters a clear understanding of the internship objectives and establishes a solid foundation for collaboration.

#### **Scenario [B-14]: The Company Staff Member Reports Issues with the Student to the University Tutor .**

If challenges arise during the internship, such as the student not meeting expectations or encountering difficulties at the workplace, **David** uses the platform to notify the university tutor. This reporting is handled through the **Active Internship** section, where David can document specific concerns, such as lack of engagement, underperformance, or other workplace issues. The platform facilitates seamless communication between David and the tutor via the **Messaging Page**, enabling them to discuss potential solutions. This process ensures that problems are addressed collaboratively, balancing the company's expectations with the academic oversight provided by the university tutor.

#### **Scenario [B-15]: The Company Staff member Completes the Final Evaluation of the Student .**

At the end of the internship, **David** completes the final evaluation of the student through



the **Internship Evaluation Form** provided by the platform. This form includes structured questions about the student's performance, skills, and overall contribution during the internship. David provides detailed feedback on areas such as technical abilities, teamwork, communication, and adherence to deadlines. The platform allows for both quantitative ratings and qualitative comments. Once submitted, the evaluation is shared with the student and their university tutor, contributing to the student's academic record and professional development. This final step ensures a comprehensive assessment of the internship experience from the company's perspective.

## Stage C: University Tutor's Scenarios

### Scenario [C-1]: *The University Tutor Opens the S&C Application* .

Claudio, a university professor, upon entering the S&C application, is greeted with the access page that provides:

- **Login:** Claudio can log in to manage his monitoring duties and oversee his students' internships.
- **Registration:** New university staff can create accounts to connect with their students and manage internship affairs.
- **Language Change:** Claudio has the option to switch the system's language via a dropdown menu to ensure comprehension.
- **Assistant:** For any technical support or questions, Claudio can utilize the chat feature to receive guidance from the LLM with RAG.

This scenario introduces the access options available to university tutors. It sets the stage for further detailed analysis of each option as individual scenarios, covering the full spectrum of the tutor's interactions with the S&C platform.

### Scenario [C-2]: *University Tutor Registration* .

When Claudio, a professor from the University of Pavia, decides to register on the S&C platform, he follows a registration process tailored for academic staff. The form he fills out includes:

- *Profile Photo*
- *Personal Data:* Name and Surname.
- *Contacts:* Phone Number, LinkedIn profile.
- *Institutional Email*
- *Department and Role*
- *Professional Biography*
- *Certifications, Awards, Recognitions*
- *Languages Spoken*

- *Security Question*

At the bottom of the registration form, Claudio can use the "Information Improvement" button, which employs an LLM to analyze and suggest improvements to the clarity and quality of the information provided.

Once the form is completed and refined, Claudio can proceed to confirm the creation of his university tutor profile. Depending on the information provided, the following subscenarios may occur:

- **Subscenario [C2-1]: Mandatory fields incomplete.** If any required fields are left unfilled, Claudio will be prompted to complete them.
- **Subscenario [C2-2]: All fields completed, domain registered.** If the email domain matches one already registered by his university, Claudio is directed to his new homepage to start utilizing the application for his academic and administrative duties.
- **Subscenario [C2-3]: Domain not registered.** If Claudio's email domain is not recognized, he is put in contact with a support operator. Together, they determine that although his university is registered, his specific email domain has not yet been added to the system. Claudio is then instructed to contact a university administrator to add his specific email domain to the list of recognized domains. Once this addition is made, Claudio will receive an email confirmation allowing him to proceed with his registration.
- **Subscenario [C2-4]: Domain and university not registered.** If Claudio finds that his email domain is not recognized, he is put in contact with a support operator. They determine that his university does not have a profile on the platform. Consequently, Claudio is prompted to initiate the university profile setup. This process must be completed before he can finalize his registration, as will be detailed in Scenario [C-3].

### **Scenario [C-3]: *University Profile Creation***

Similarly, if a university tutor like Claudio discovers that the university's domain is not registered, he receives an email with a link to a profile creation page for educational institutions. Claudio must fill out the following mandatory fields to complete the university profile:

- *Logo*
- *Name*
- *Contacts*
- *Office Address*
- *Operational Sector*
- *Size*

- *Description*
- *Certifications, Awards, Recognitions*
- *Student Domain(s)*
- *Information Improvement*
- *Language Change*
- *Assistant*
- *Continue*

The profile is then reviewed by the platform's team. If it complies with the platform's standards, it is activated, and Claudio is notified with a link to his new homepage. If there are issues, he will receive feedback and a link to adjust and resubmit the profile.

#### **Scenario [C-4]: *The academic tutor Login in the S&C Application***

**Claudio** (or any other academic tutor) proceeds to log in using the credentials obtained during the registration process. From the homepage, Claudio navigates to the login page, intending to access the **S&C** platform for overseeing and managing internships. To complete the login process, Claudio enters his username and password into the fields designated for tutor credentials. Once successfully authenticated he gains access to the platform.

#### **Scenario [C-5]: *The academic tutor Credential Recovery***

**Claudio** (or any other academic tutor) forgets his login credentials, including both his email and password. To recover them, Claudio uses the credential recovery feature and submits answers to the security questions he chose during registration. After validating his responses, the **S&C** system provides Claudio with the email associated with his profile and sends a temporary password to that email. This enables Claudio to log in and update his password as necessary.

#### **Scenario [C-6]: *The academic tutor and the Chatbot Interaction***

While navigating the platform, **Claudio** encounters a situation requiring assistance, such as managing student evaluations or communicating with companies. To resolve his query, Claudio interacts with the platform's chatbot. The chatbot offers automated assistance, providing answers to common questions or guiding Claudio step by step through the issue. If Claudio's problem requires further support, the chatbot escalates the query to a human representative who contacts him directly.

#### **Scenario [C-7]: *University Tutor Language Change***

Claudio has the flexibility to switch the operating language of the platform directly from any page he is working on. The visible flag icon at the top of every page reveals a dropdown menu with various language options, each denoted by a flag. Claudio selects his preferred language from this menu, ensuring that the platform instantly reflects this change. This immediate update allows Claudio to manage his tasks in a language he is most comfortable with, supporting his administrative and academic duties.

### **Scenario [C-6]: The University Staff Member Links to the University**

During their first interaction with the **Students & Companies (S&C)** platform, the **University Staff Member**, such as **Claudio**, must connect their profile with their respective university. This connection is essential for enabling access to functionalities such as monitoring student internships and communicating with companies. The process unfolds through one of two options: If the university is already registered on the platform, Claudio connects his profile using the **University Key**, a unique identifier generated when the university was first registered. If Claudio does not have access to the key, he can request it via email to the initial registrant or use the **"Resend Key"** option, which sends the identifier to the registered university email. Alternatively, Claudio can verify his affiliation by uploading an official document, such as proof of employment, which will be reviewed and validated by the S&C administrative team. If the university is not yet registered, Claudio must create a new **University Profile**. This involves providing details such as the university's name, address, and departments. The platform offers an **LLM (Large Language Model)** feature to optimize and review the entered information, ensuring the data is accurate and professional. After completing the profile, it is submitted for verification by the S&C administrative team. Once validated, Claudio's profile is linked to the university, granting him access to all relevant features.

### **Scenario [C-7]: University staff member Profile Creation**

After linking his account to the university, **Claudio**, a university staff member, creates his **Profile** on the **Students & Companies (S&C)** platform. This profile is essential for enabling interaction with students and companies during internship management. Claudio fills out key information such as his academic title, department, and contact details. He also provides a brief bio, describing his areas of expertise and how he can assist students during their internships. To ensure the profile is professional and appealing, Claudio can use the platform's integrated **LLM (Large Language Model)** feature to review and optimize the content. By selecting the *"Review and Optimize"* option, he ensures the profile meets the highest standards. Once completed and confirmed, Claudio's profile is securely linked to his credentials, making it visible to students and companies interacting with him on the platform.

### **Scenario [C-8]: The University Staff Member Monitors the Internship**

During the internship, **Claudio**, the university staff member, monitors the progress of the student through the **Active Internship** section on the **Students & Companies (S&C)** platform. This section provides Claudio with detailed updates on the student's weekly reports, tasks, and overall performance. Claudio can access the weekly questionnaires submitted by the student, which highlight completed tasks, challenges faced, and skills developed. These updates allow Claudio to ensure that the internship aligns with the educational objectives of the student's academic program. If any concerns arise, Claudio can initiate communication with both the student and the company through the platform's **Messaging Page** to address and resolve them promptly.

### **Scenario [C-9]: The University Staff Member Handles a Complaint During the Internship**

If a complaint arises during the internship, **Claudio** is notified through the **Active Internship** section. Complaints may be raised by either the student or the company and can involve issues such as miscommunication, unmet expectations, or serious breaches that may require the internship's interruption. Claudio reviews the details of the complaint and assesses its severity. If necessary, he uses the **Messaging Page** to discuss the issue with both parties, seeking clarification and possible resolutions. In cases where the complaint cannot be resolved amicably, Claudio uses the **Internship Management Tools** to initiate the process for pausing or terminating the internship. This step involves documenting the reasons for the decision and notifying all stakeholders of the outcome, ensuring transparency and accountability.

#### **Scenario [C-10]: The University Staff Member Finalizes the Internship Review**

At the conclusion of the internship, **Claudio** conducts a final review to assess the success of the internship from an academic perspective. Using the **Internship Evaluation Form**, Claudio evaluates the student's performance based on the weekly updates, feedback from the company, and the student's own reflections. Claudio submits a comprehensive report detailing the student's achievements, skills gained, and areas for improvement. This report is shared with the student and becomes part of their academic record, ensuring that the internship experience contributes to their professional and educational development.

### **2.1.2. Domain Class Diagram**

### **2.1.3. State Diagram**

Here we include scenarios and further details on the shared phenomena and a domain model (class diagrams and state diagrams).

## **2.2. Product Functions**

Here we include the most important requirements.

## 2.3. User Characteristics

### Student Characteristics

Students represent the primary user group of the **Students & Companies (S&C)** platform, and their unique characteristics guide the system's design and functionality. The platform is tailored to address their diverse technical, educational, and accessibility requirements to provide an optimal user experience.

**Demographics and Background:** Students engaging with the platform are typically undergraduate or postgraduate individuals seeking internships or job opportunities. They come from a wide range of fields of study, requiring the system to support varied industry-specific needs.

**Technical Expertise:** Most students possess moderate to high levels of digital literacy, particularly in using online platforms for academic and career-related purposes. However, the platform prioritizes usability to cater to less tech-savvy users, ensuring minimal training is needed. The interface is designed to offer intuitive navigation, helpful tooltips, and clear error feedback.

**Motivation:** Students are driven by the desire to secure internships and job opportunities that align with their academic background and career aspirations. The platform must provide clear and actionable pathways to navigate their options effectively.

**Engagement Patterns:** Students tend to interact with the platform intermittently, often during academic breaks, before deadlines, or when actively seeking opportunities. To support this behavior, the system sends timely reminders and notifications for pending actions, upcoming deadlines, and relevant opportunities.

**Constraints:** Due to academic commitments, students may have limited time to interact with the platform. Consequently, the system prioritizes efficiency by streamlining core functionalities and minimizing the steps required to complete essential tasks.

### Company Staff Member Characteristics

Company staff members form a critical user group of the **Students & Companies (S&C)** platform. These users, typically recruiters or human resource personnel, interact with the system to manage internship and job opportunities, track applications, and communicate with students and academic staff. The platform is designed to accommodate their professional needs and operational workflows effectively.

**Demographics and Background:** Company staff members engaging with the platform are professionals from various industries responsible for recruitment processes. Their roles range from hiring managers to HR representatives, requiring tailored functionalities to meet diverse industry needs.

**Technical Expertise:** Company staff members generally have moderate to advanced technical proficiency, particularly in using recruitment tools and professional platforms. However, the system emphasizes ease of use, allowing for quick onboarding and minimal training. Features are designed to facilitate task completion with intuitive navigation and clear instructions.

**Motivation:** Company staff members are motivated to identify and recruit the best talent for their organizational needs. The platform must provide efficient tools to streamline the recruitment process and offer insightful recommendations to improve candidate selection.

**Accessibility Requirements:** To ensure inclusivity and usability for all company staff members, the platform includes:

- Support for assistive technologies, such as screen readers and keyboard navigation, to accommodate diverse accessibility needs.
- Compliance with WCAG standards, enabling usability for staff members with visual, motor, or cognitive impairments.

**Engagement Patterns:** Company staff members typically use the platform during working hours, focusing on tasks such as posting job opportunities, managing applications, and conducting interviews. The system supports asynchronous engagement by allowing users to save drafts, set reminders, and access real-time notifications for pending tasks.

**Constraints:** Given their professional responsibilities, company staff members often have limited time to spend on recruitment platforms. To address this constraint, the platform ensures that all functionalities are streamlined and time-efficient, reducing the number of steps required for key actions such as creating postings or reviewing applications.

## University Staff Member Characteristics

University staff members are a distinct user group of the **Students & Companies (S&C)** platform, primarily consisting of academic tutors, internship coordinators, and administrative staff. Their primary role involves monitoring student internships, addressing any issues, and ensuring the academic and professional value of these engagements.

**Demographics and Background:** University staff members are professionals associated with academic institutions, including professors, academic advisors, and internship coordinators. Their focus is to support and oversee students' practical learning experiences, ensuring alignment with academic requirements.

**Technical Expertise:** University staff members generally possess moderate technical expertise, particularly in using academic and administrative platforms. The system is

designed with a user-friendly interface, ensuring minimal learning curves for seamless interaction.

**Motivation:** University staff members are motivated by their responsibility to support students in gaining meaningful and valuable professional experiences. They aim to ensure that internships provide educational and professional benefits, aligning with institutional goals.

**Engagement Patterns:** University staff members typically use the platform intermittently, focusing on specific tasks such as reviewing internships, communicating with students and companies, and evaluating reports. The system is designed to support asynchronous usage, allowing flexibility in completing tasks without strict time constraints.

**Constraints:** University staff often balance multiple responsibilities, including teaching and administrative tasks. To address this, the platform ensures a streamlined interface, reducing the time required for core actions like reviewing applications, resolving issues, and submitting feedback.

## 2.4. Assumptions, Dependencies, and Constraints

Here we include domain assumptions.



## 3 | Specific Requirements

The **Specific Requirements** section of this document outlines the detailed and technical aspects of the system. This section serves as a crucial guide for developers and designers, providing them with the necessary information to implement and test the functionalities of the **Students & Companies (S&C)** platform.

The requirements detailed in this section are derived from the scenarios and use cases described earlier. Each requirement is structured to ensure traceability, clarity, and alignment with the system's objectives. The content of this section is designed to address the following key aspects:

- **Functional Requirements:** These define the specific behaviors and functionalities the system must exhibit, such as user authentication, profile management, CV creation, and internship tracking.
- **External Interface Requirements:** This includes user interfaces, hardware interfaces, software dependencies, and communication channels, ensuring the system interacts seamlessly with users and external systems.
- **Performance Requirements:** This addresses the system's expected performance in terms of speed, reliability, and scalability.
- **Design Constraints:** Any limitations or preconditions that must be considered during development.
- **Non-functional Requirements:** This includes usability, security, and compliance requirements to ensure the system's overall quality and robustness.

The structure and content of this section are intended to provide a comprehensive reference for all stakeholders, ensuring that the system is built and maintained according to the specified requirements.

### 3.1. External Interface Requirements

This subsection focuses on the external interfaces with which the **S&C** platform will interact. These interfaces are essential for ensuring seamless communication and interaction between the system, its users, and external components. The external interfaces are categorized as follows:

- **User Interfaces:** This includes visual representations, such as wireframes or mock-ups, to clarify how users (students, recruiters, and academic tutors) will interact with

the system. While UI design is not the primary focus, these visuals help convey the intended user experience.

- **Hardware Interfaces:** If the system interacts with physical devices, such as computers, smartphones, or external sensors, this section describes the nature of these interactions and any specific requirements.
- **Software Interfaces:** This covers interactions between the **S&C** platform and external software components, such as APIs, third-party applications, or services integrated into the system.
- **Communication Interfaces:** This details the protocols and mechanisms used for data exchange, whether for system-to-system communication or user notifications over networks.

By defining these external interfaces, this subsection ensures clarity and consistency in the system's integration with external components.

### 3.1.1. User Interfaces

The purpose of this section is to define the user interfaces (UIs) of the **Students & Companies (S&C)** platform. User interfaces serve as the primary interaction points between the system and its users (students, recruiters, and academic tutors). This subsection outlines the structure, elements, and functionalities of these interfaces, ensuring they align with the requirements and workflows described in the overall description. User interfaces in this document are not intended to represent the final design but rather provide a clear understanding of the system's interaction points for implementers. Through wireframes and mockups, the UIs illustrated here establish a foundation for design and development while maintaining consistency with the system's overall goals and requirements. Each interface detailed below corresponds to specific functionalities. This section ensures the interfaces meet the needs of the users and support the operational goals of the platform.

#### Structure of Interfaces:

- **General Interfaces:** (From 1 to 3)
- **Student Interfaces:** (From 4 to 12)
- **Company Interfaces:**(From 1X–X)
- **University Tutor Interfaces:** (From X to X)

## 1/ Login/Sign-Up Interface .

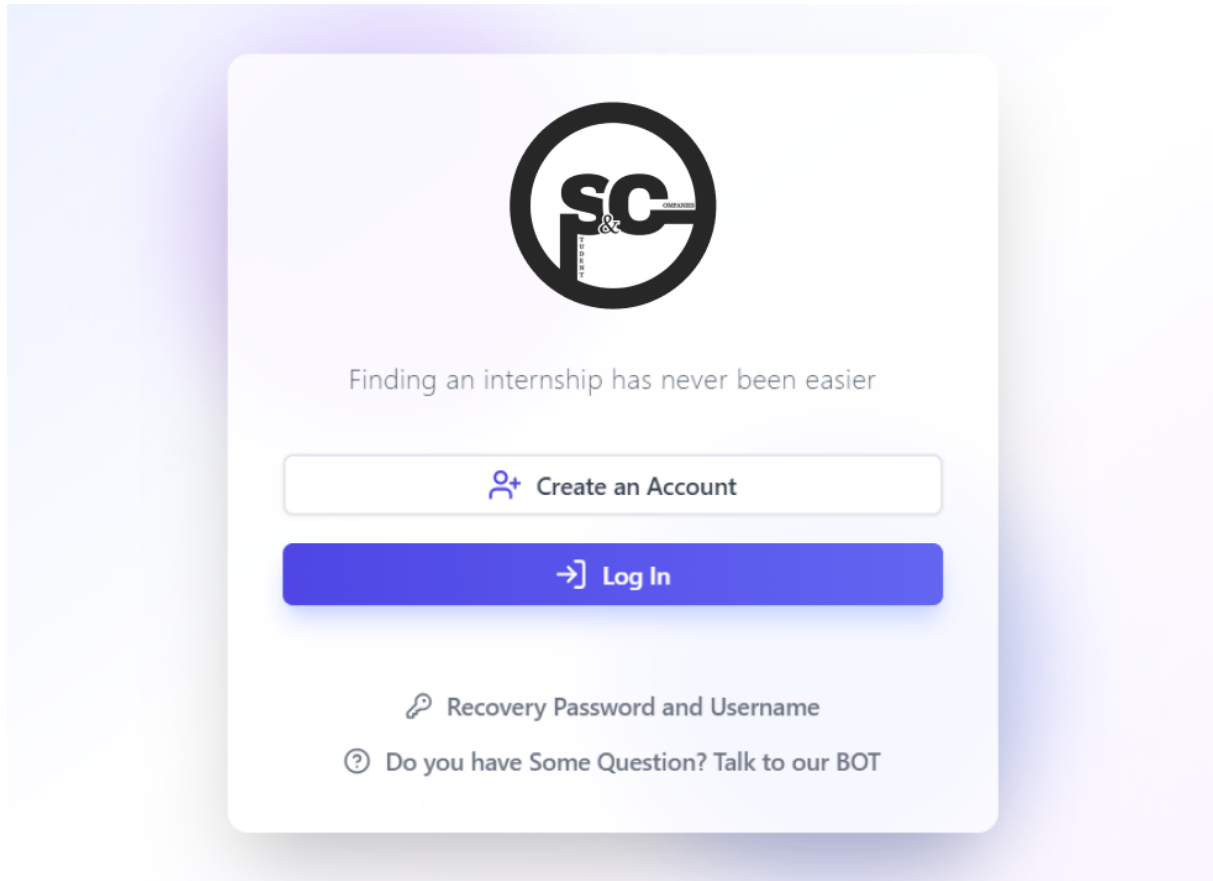


Figure 3.1: Login/Sign-Up Interface of the Students & Companies platform.

The Login/Sign-Up interface (Figure 3.1) acts as the primary access point to the **Students & Companies (S&C)** platform. This interface is carefully designed to be intuitive and straightforward, accommodating the diverse needs of its users, including students, recruiters, and university staff. At the top of the interface, the platform's logo and tagline, *"Finding an internship has never been easier"*, are prominently displayed, immediately conveying the platform's purpose and reinforcing its branding. Below, users are presented with two core actions: creating a new account or logging into an existing one. These actions are visually distinguished to ensure ease of use for both new and returning users.

Additionally, the interface incorporates support options to assist users in resolving potential issues. For instance, links to recover forgotten credentials and access chatbot assistance provide reassurance and maintain accessibility.

Overall, the Login/Sign-Up interface sets the tone for the user experience by combining simplicity with essential functionality, ensuring that all users can quickly and efficiently engage with the platform.

## 2/ Log In Interface .

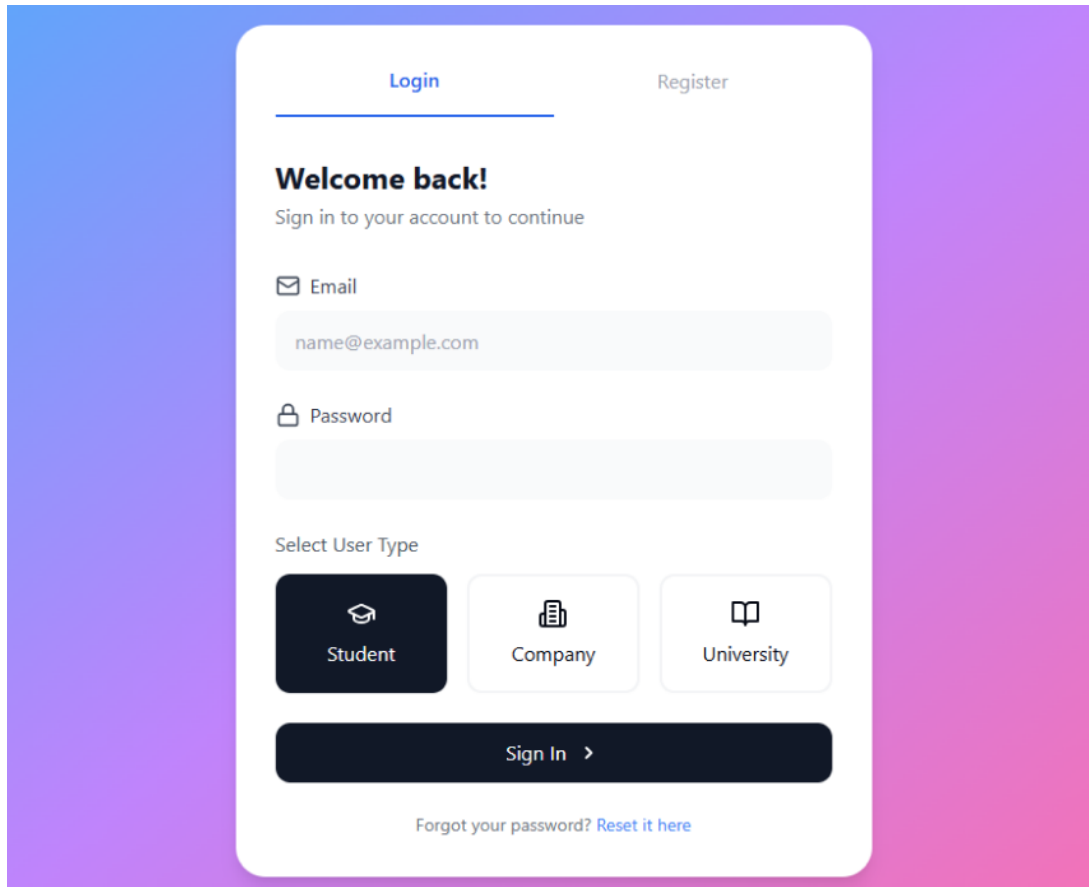


Figure 3.2: Log In Interface of the Students & Companies platform.

The Log In Interface (Figure 3.2) provides users with secure access to the **Students & Companies (S&C)** platform. Designed for clarity and functionality, it accommodates all user roles, including students, company staff, and university representatives, ensuring a seamless login process tailored to each user's needs.

The interface is structured to streamline access for returning users while guiding them to select the appropriate user role. The login form includes fields for securely entering email and password, paired with a user role selection that highlights three distinct categories: **Student**, **Company**, and **University**. By selecting their role, users ensure access to the features and data relevant to their specific needs.

The navigation tabs at the top of the page allow quick toggling between **Log In** and **Register**, providing clear pathways for both existing and new users. For those needing additional support, the interface includes a convenient link to reset forgotten passwords, maintaining accessibility for all. Overall, this page ensures that users can quickly and securely access the platform, with a simple, intuitive design that reflects the professionalism of the S&C system.

### 3/ Registration Page .

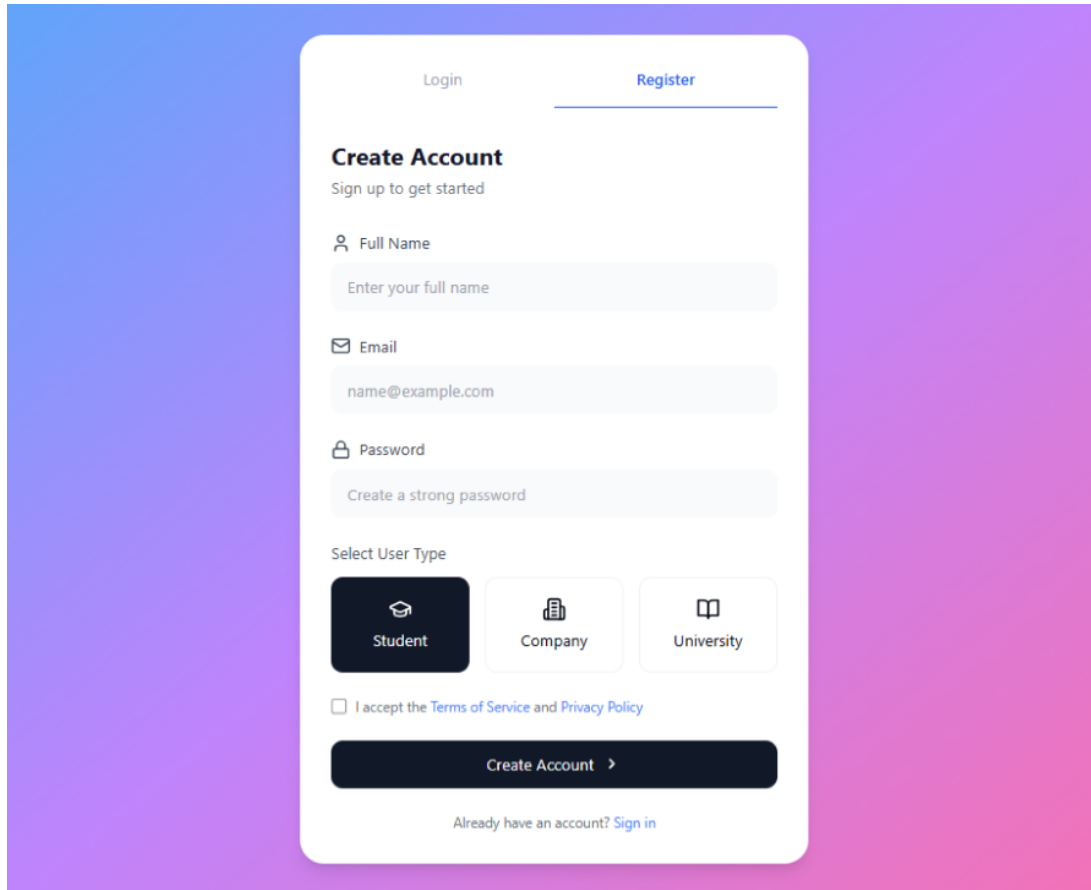
The image shows a mobile application registration screen. At the top, there are two tabs: 'Login' and 'Register', with 'Register' being the active tab. Below the tabs is a 'Create Account' section with the subtitle 'Sign up to get started'. The form includes three input fields: 'Full Name' with a person icon and placeholder 'Enter your full name', 'Email' with an envelope icon and placeholder 'name@example.com', and 'Password' with a lock icon and placeholder 'Create a strong password'. Below these is a 'Select User Type' section with three buttons: 'Student' (with a graduation cap icon), 'Company' (with a briefcase icon), and 'University' (with a book icon). The 'Student' button is highlighted. Below the buttons is a checkbox labeled 'I accept the Terms of Service and Privacy Policy'. At the bottom of the form is a large dark blue button labeled 'Create Account' with a right-pointing arrow. Below this button is a link that says 'Already have an account? Sign in'.

Figure 3.3: Registration Page of the Students & Companies platform.

The Registration Interface (Figure 3.3) enables new users to create an account on the **Students & Companies (S&C)** platform. Users enter their **full name**, **email address**, and a **password**, and select their role: **Student**, **Company Staff Member**, or **University Staff Member**. Role selection customizes their platform experience, guiding them to relevant functionalities.

After filling out the form, users are required to accept the **Terms of Service and Privacy Policy** enhancing protection.

The interface includes a simple **tab system**, allowing users to switch between **Registration** and **Login** pages for easy navigation. The process is finalized by clicking the **"Create Account"** button, ensuring a smooth and secure registration.

After this click the user will complete a security setup step by choosing a **security question** and providing an answer. This will be used if the user will lose his credentials.

#### 4/ Student First Access Page .

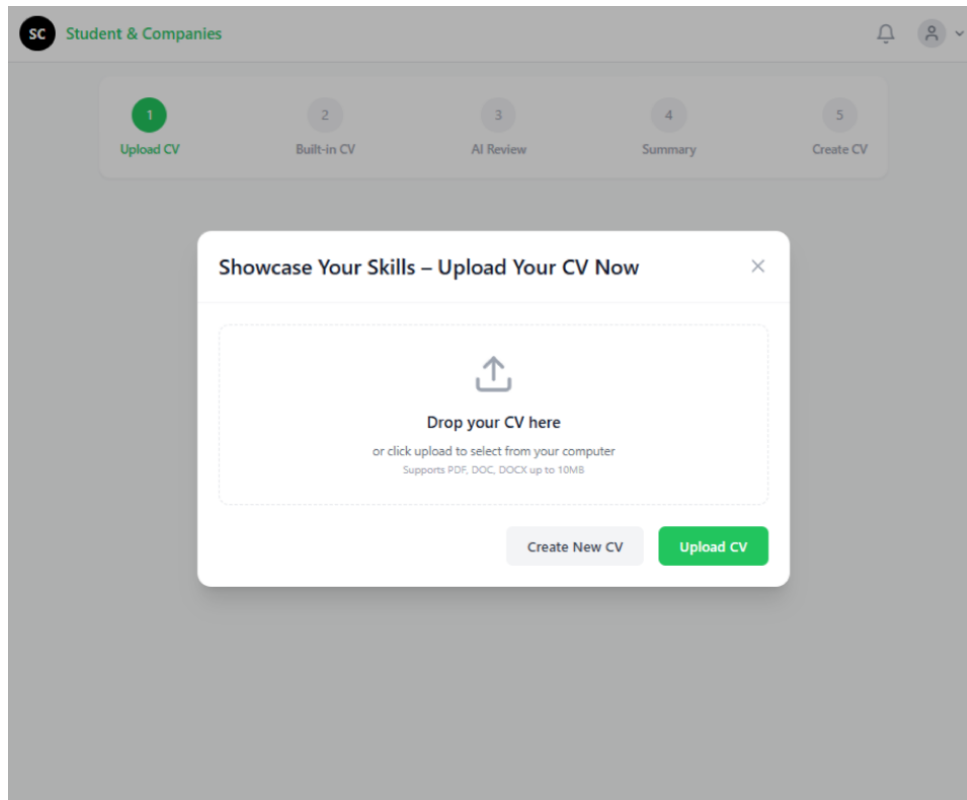
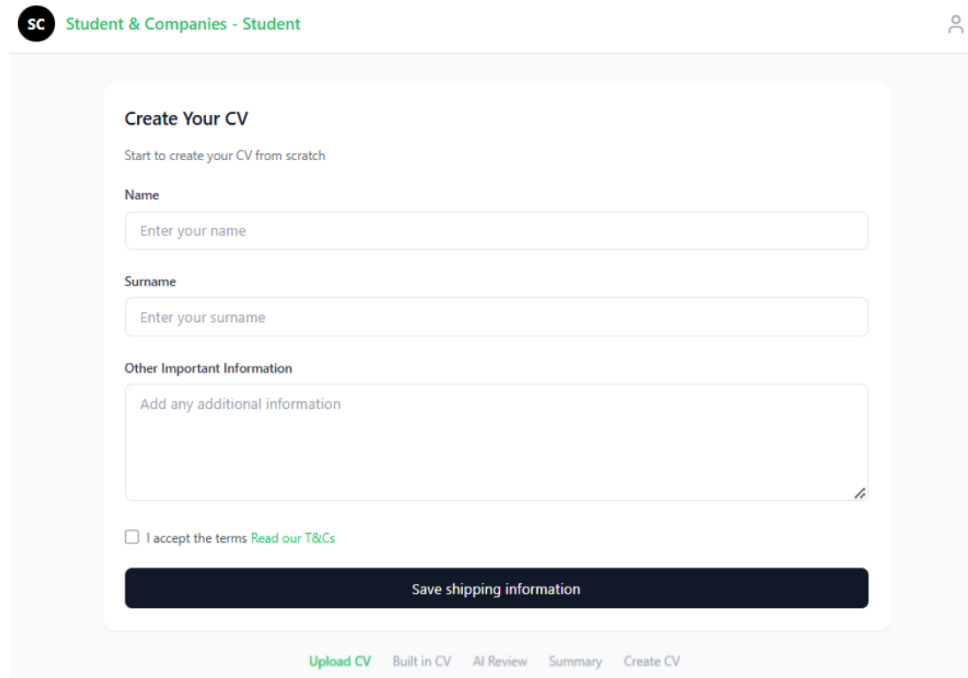


Figure 3.4: Student First Access Page of the Students & Companies platform.

The Student First Access Page (Figure 3.4) serves as the starting point for students after their initial login to the **Students & Companies (S&C)** platform. This interface plays a critical role in ensuring that students take the essential step of uploading or creating their CV, which is necessary to unlock the platform's core functionalities and begin exploring internship opportunities. The design of this page prioritizes simplicity and intuitive navigation. At the center of the interface, the title "Showcase Your Skills – Upload Your CV Now" prominently highlights the importance of completing this task. Students are presented with two primary options to proceed. They can either create a CV using the platform's integrated CV-building tool or upload an existing CV directly by dragging and dropping the file or selecting it from their device. This flexibility accommodates both students who already have a prepared CV and those who need assistance in crafting one.

A navigation bar displayed at the top of the page provides a clear visual representation of the steps involved in the CV management process. These steps include uploading or creating the CV, using the built-in CV editor, enhancing the CV through AI-powered suggestions, previewing the finalized document in the summary stage, and confirming its completion. This structured flow ensures that students are aware of their progress and the next steps required to finalize their profile.

## 5/ Create CV Page .



The screenshot shows the 'Create Your CV' page of the 'Student & Companies - Student' platform. The page has a light blue header with the 'SC' logo and the text 'Student & Companies - Student'. The main content area is a white box with a light blue border. It contains the following elements:

- Create Your CV**: The main title of the section.
- Start to create your CV from scratch**: A subtext encouraging students to start from scratch.
- Name**: A text input field with the placeholder 'Enter your name'.
- Surname**: A text input field with the placeholder 'Enter your surname'.
- Other Important Information**: A large text area with the placeholder 'Add any additional information'.
- ☐ **I accept the terms** [Read our T&Cs](#): A checkbox and a link to the terms and conditions.
- Save shipping information**: A large, dark blue button with white text.

At the bottom of the page, there is a navigation bar with five tabs: **Upload CV**, **Built in CV**, **AI Review**, **Summary**, and **Create CV**. The 'Create CV' tab is currently selected and highlighted in green.

Figure 3.5: Create CV Page of the Students & Companies platform.

The **Create CV Page** (Figure 3.5) provides students with the ability to construct their CV directly within the **Students & Companies (S&C)** platform. Designed for those who prefer to start from scratch rather than uploading an existing document, this interface ensures flexibility and user accessibility. The page is structured to guide students step-by-step through the CV creation process, beginning with the header that prominently displays the title "*Create Your CV*" and a subtext encouraging students to "*Start to create your CV from scratch.*" This header clearly communicates the purpose of the interface.

Key input fields are provided for essential details, including **Name**, **Surname**, and a free-text field for **Other Important Information**, which allows students to include additional personal details or key skills. To proceed, students must accept the terms and conditions by checking the provided box, accompanied by a link to the full **Terms & Conditions** for transparency. A visually distinct button labeled "**Save shipping information**" allows students to save their input and advance to the next stage. Navigation tabs for features such as **Upload CV**, **Built-in CV**, **AI Review**, **Summary**, and **Create CV** are accessible, enabling seamless movement between the platform's various CV-related functionalities. This design ensures a straightforward and efficient user experience.

## 6/ Review Extracted CV Page

The screenshot displays the 'Review Your CV' interface. At the top left is the 'SC Student & Companies - Student' header. The main content area is titled 'Review Your CV' with a subtext 'Check if there are any errors'. Below this are three input fields: 'Name' containing 'Lorenzo', 'Surname' containing 'Uttini', and 'Other Important Information' containing 'None'. A checkbox labeled 'I accept the terms' is checked, with a link 'Read our T&Cs' next to it. A dark blue button labeled 'Save shipping information' is positioned below the checkbox. At the bottom of the page, a navigation bar contains five tabs: 'Upload CV' (highlighted in green), 'Built in CV', 'AI Review', 'Summary', and 'Create CV'.

Figure 3.6: Review Extracted CV Page of the Students & Companies platform.

The **Review Extracted CV Page** (Figure 3.6) is the next step presented to students after they upload their CV to the **Students & Companies (S&C)** platform. Here, the system automatically extracts key details from the uploaded document and displays them for the student to review. This process ensures that all information is correct and provides an opportunity to make edits before proceeding.

The interface is intuitive and focuses on user verification. At the top, the header titled *"Review Your CV"* clearly directs the user to inspect the details. A subtext, *"Check if there is any error,"* emphasizes the importance of this step.

The main section of the page displays the extracted fields, including **Name**, **Surname**, and **Other Important Information**, such as a personal statement or additional details. All fields are editable, allowing students to correct inaccuracies or add any missing information.

To proceed, students must re-confirm their acceptance of the platform's terms and conditions by selecting the checkbox labeled *"I accept the terms."* A direct link to *"Read our T&Cs"* ensures transparency.

At the bottom of the page, the **"Save shipping information"** button allows students to finalize their edits and proceed to the next step. Additionally, a **Progress Tracker** with numbered steps (e.g., 1, 2, 3, ...) keeps students informed about their current position in the process. Navigation tabs for functionalities like *Upload CV*, *Built-in CV*, *AI Review*, *Summary*, and *Create CV* remain accessible, ensuring seamless navigation across the platform.



## 7] CV Creation Confirmation Page

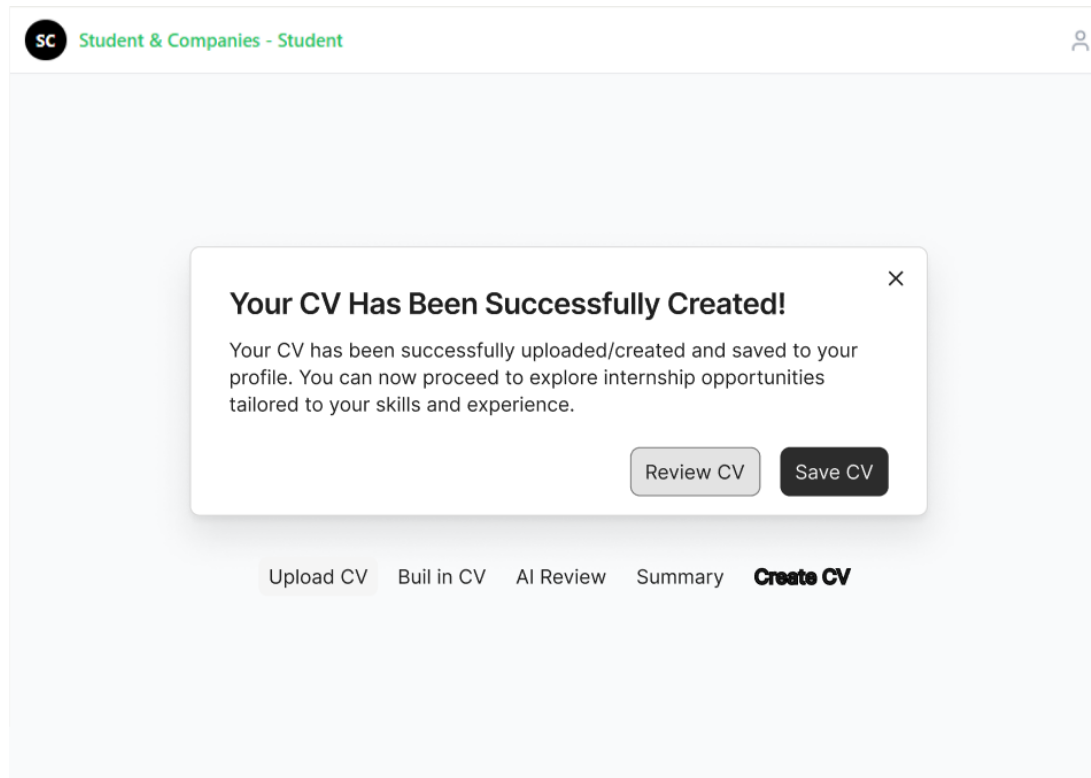


Figure 3.7: CV Creation Confirmation Page of the Students & Companies platform.

The **CV Creation Confirmation Page** (Figure 3.7) is presented to students once their CV has been successfully created or uploaded on the **Students & Companies (S&C)** platform. This page serves to confirm the completion of the CV process while offering actionable options to guide the next steps.

The interface prominently displays a confirmation message, titled *"Your CV Has Been Successfully Created!"*, reassuring the student that their CV is saved to their profile. Additional text provides further clarity, stating that the CV is now available for use in exploring internship opportunities tailored to their skills and experience.

The page includes two key action buttons for navigation: the **"Review CV"** button, which redirects the student to review the detailed content of their CV, and the **"Save CV"** button, which finalizes and saves the CV creation process. These options ensure that the student can either make final adjustments or proceed with their application process seamlessly.

At the bottom of the page, navigation tabs such as *Upload CV*, *Built-in CV*, *AI Review*, *Summary*, and *Create CV* remain accessible, allowing students to revisit any part of the CV management journey or explore additional features as needed.

## 8/ Homepage (Student Version)

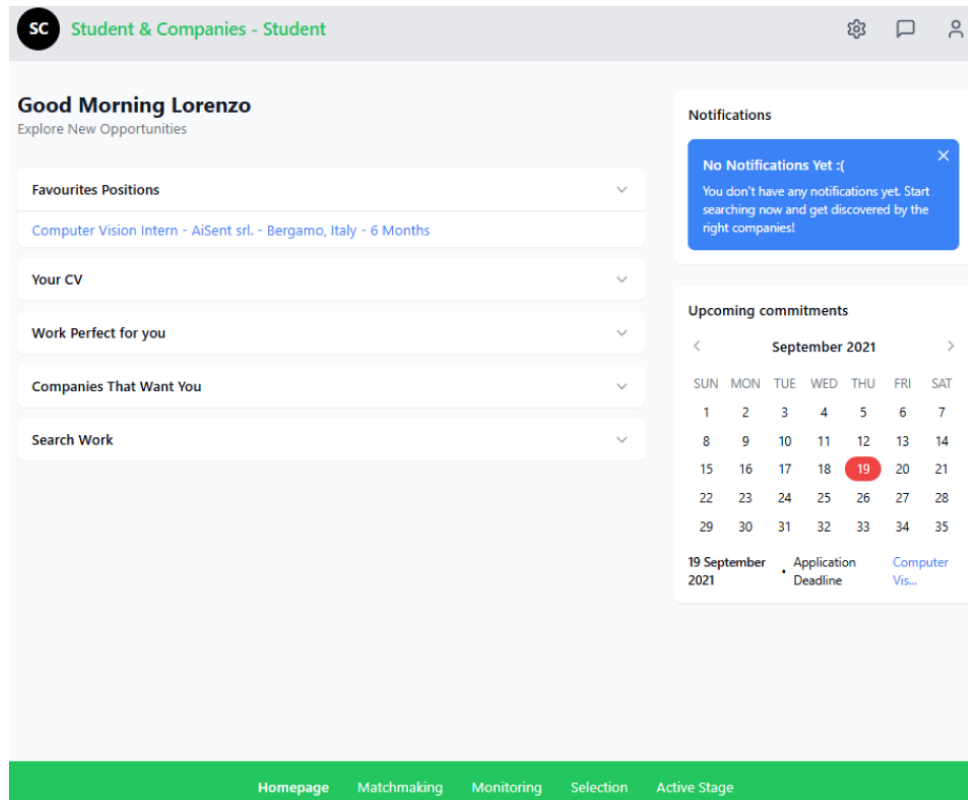


Figure 3.8: Homepage of the Students & Companies platform.

The **Homepage** (Figure 3.8) acts as the central dashboard for students on the **Students & Companies (S&C)** platform. This interface consolidates critical features and updates, providing students with an organized view of their profile, opportunities, and commitments. The homepage welcomes users with a personalized greeting, such as "*Good Morning Lorenzo*", fostering engagement and interaction. Below the greeting, a series of expandable sections offer streamlined navigation to key areas. These include **Favourites Positions**, which highlights saved opportunities; **Your CV**, where students can review or update their CV; **Work Perfect for You**, presenting tailored internship recommendations; **Companies That Want You**, listing interested companies; and **Search Work**, enabling direct access to internship search features.

A notifications panel prominently displays recent updates or alerts. If no notifications are present, a placeholder message such as "*No Notifications Yet*" prompts the student to explore opportunities. Adjacent to the notifications panel is the **Upcoming Commitments** calendar widget, which showcases important dates and events, such as application deadlines, allowing students to stay on top of their schedules. At the bottom of the page, a navigation bar offers quick access to essential features, including **Homepage**, **Matchmaking** for personalized recommendations, **Monitoring** for tracking application statuses, **Selection** for managing selection processes, and **Active Stage** for overseeing active internships.

## 9/ Matchmaking Page

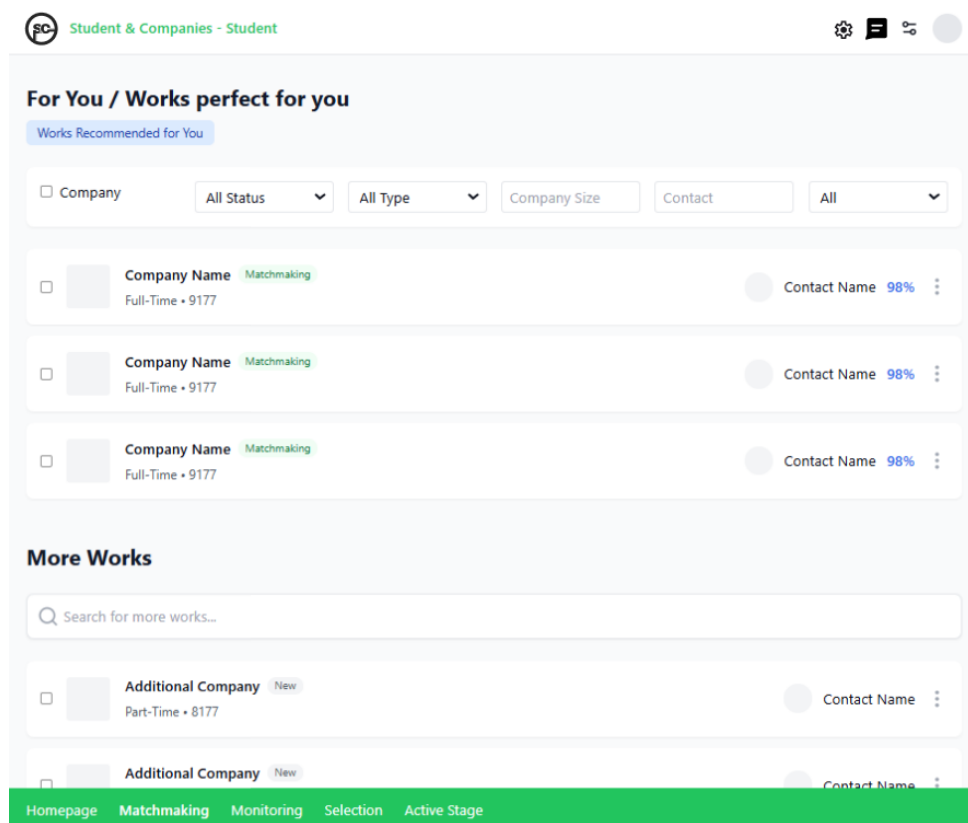


Figure 3.9: Matchmaking Page of the Students & Companies platform.

The **Matchmaking Page** (Figure 3.9) serves as a personalized interface for students to explore recommended internship opportunities. This page leverages the student's profile, skills, and preferences to connect them with positions most suitable to their background, streamlining the job search process. At the top of the page, the header *"For You / Works perfect for you"* establishes the purpose of the section, focusing on curated opportunities. The interface presents a dynamically updated list of positions, where each entry includes essential details such as the company name, type of position (*Full-Time* or *Part-Time*), company size, and a compatibility score (e.g., **98%**), which quantifies the alignment between the student's profile and the job requirements. Additionally, the contact information of a recruiter or company representative is displayed to facilitate communication.

Students can interact with each listing through an integrated action menu, which allows them to save positions for later review or proceed with an application. A comprehensive filter and search panel supports students in narrowing down their recommendations. Filters include criteria such as job type, industry keywords (e.g., *AI*, *NLP*, *Computer Vision*), and company size. The search bar enhances the ease of locating specific companies or roles. At the bottom of the interface, pagination tools provide seamless navigation through multiple pages of recommendations. This ensures students can thoroughly explore all suitable opportunities.

## 10/ Monitoring Page

The **Monitoring Page** (Figures 3.10 and 3.11) provides students with a centralized platform to oversee the progress of their internship applications and manage company offers. This page is divided into two main sections: **Your Applications** and **Your Selection Offers**, offering detailed insights into the various stages of the application process.

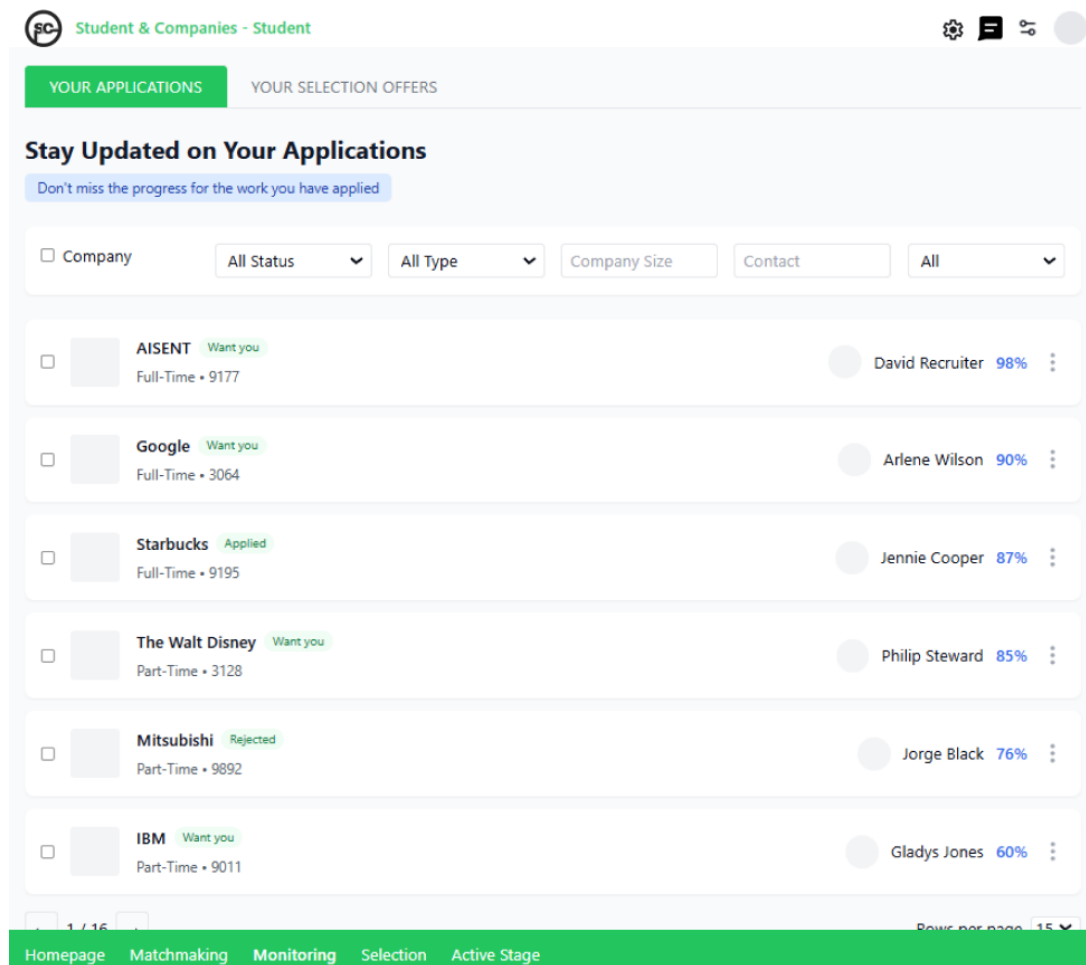


Figure 3.10: Monitoring Page - Stay Updated on Your Applications.

In the **Your Applications** section (Figure 3.10), students can track the status of their submitted applications. The interface includes a title, *"Stay Updated on Your Applications"*, which emphasizes the importance of maintaining awareness of application progress. A detailed table presents key information about each application, including the company name, the application status (such as *Not Seen*, *Seen*, or *Refused*), and the type of position, which may be either *Full-Time* or *Part-Time*. Additionally, the table displays the name of the recruiter or company contact managing the position and includes a compatibility percentage that indicates how well the student's profile aligns with the job requirements. The table also provides actionable options, allowing students to withdraw their application or explore further details about the position.

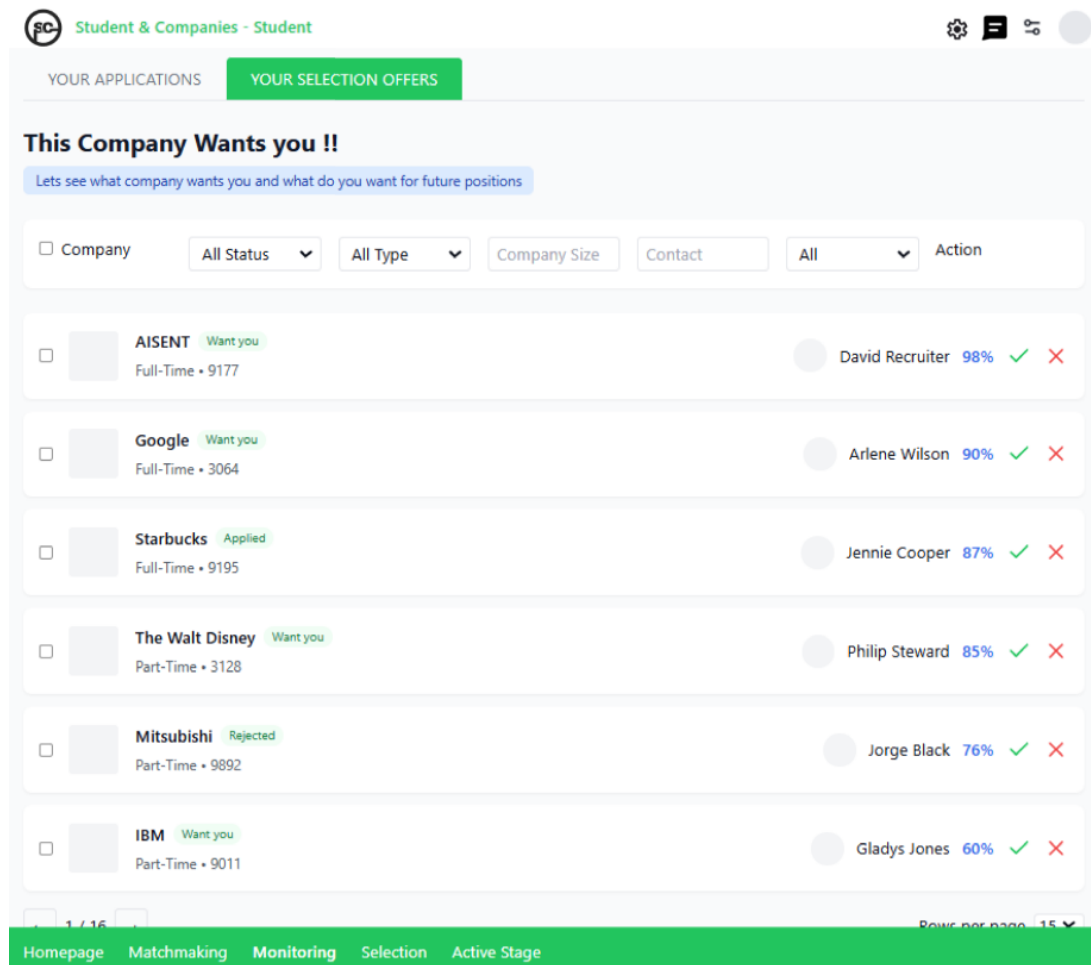


Figure 3.11: Monitoring Page - Your Selection Offers.

The **Your Selection Offers** section (Figure 3.11) highlights companies that have expressed interest in the student's profile. The header, *"This Company Wants You!!"*, is designed to encourage students to engage with tailored opportunities. A comprehensive table provides details about the interested companies, including their names, the status of the interaction (such as *Want You*, *Applied*, *Rejected*), and the type of position offered.

The table also specifies the recruiter or company staff member involved and provides a compatibility percentage that helps students evaluate the fit of each opportunity. Students can accept or decline offers directly from this page, facilitating quick and informed decision-making.

This page ensures that students remain informed and organized throughout their internship search, enabling them to respond effectively to both applications and offers while keeping track of their progress in a structured and user-friendly manner.

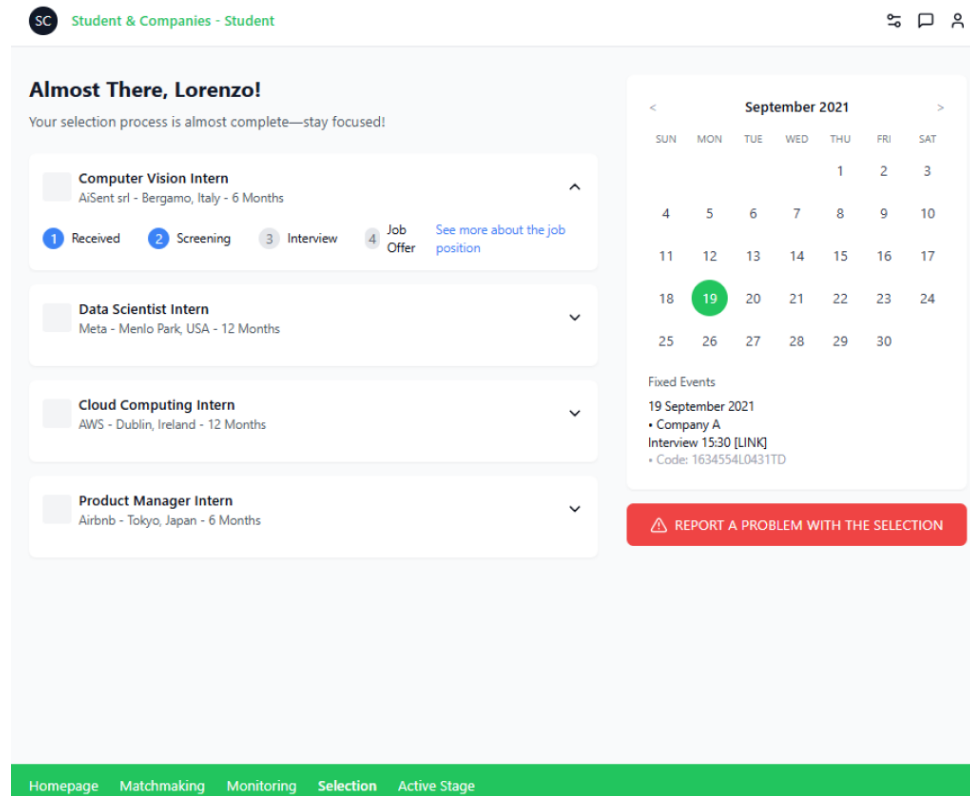


Figure 3.12: Selection Page of the Students & Companies platform.

The **Selection Page** (Figure 3.12) provides students with an organized and comprehensive view of their ongoing selection processes for internships. This page ensures that students are fully informed about their application progress and any upcoming events, helping them stay proactive throughout the recruitment stages. The interface begins with a motivational header, *"Almost There, Lorenzo!"*, accompanied by the subheading, *"Your selection process is almost complete—stay focused!"*, which reinforces the importance of perseverance at this stage. Below this, the page features a visual timeline that tracks the selection stages for each application. The stages—**Received**, **Screening**, **Interview**, and **Job Offer**—are clearly marked, with the current stage highlighted in blue for quick reference.

The main section lists all active applications, displaying key details about each position, such as the title and location. Each entry can be expanded to reveal additional information or provide navigation to the job description. A calendar widget is positioned on the right, displaying upcoming deadlines and events, such as interview schedules, with clickable links for quick access. To ensure that any concerns are promptly addressed, a prominent red action button labeled *"Report a Problem with the Selection"* allows students to communicate issues directly to the platform support team. At the bottom, a navigation bar facilitates seamless movement between the platform's core functionalities, such as *Homepage*, *Matchmaking*, *Monitoring*, and *Active Stage*.

SC Student & Companies - Student

**Computer Vision Intern**  
AiSent

Name of the position  
Computer Vision Intern - AiSent srl. - Bergamo, Italy - 6 Months

Position Detail

Company Detail

Your University Tutor

Your Contract

QUESTIONNAIRE Week 1

QUESTIONNAIRE Week 2

QUESTIONNAIRE Week 3

QUESTIONNAIRE ...

REPORT A PROBLEM WITH THE STAGE

Homepage Matchmaking Monitoring Selection Active Stage

Figure 3.13: Active Stage Page of the Students & Companies platform.

The **Active Stage Page** (Figure 3.14) provides students with essential tools and detailed information to effectively manage their ongoing internships. By centralizing progress tracking, communication, and problem reporting, this page ensures a seamless and transparent experience for students, companies, and academic tutors.

This interface begins with a clear header displaying the title of the internship, such as *"Computer Vision Intern"*, along with the associated company name (*"AiSent"*), providing an immediate context for the user. Expandable sections allow students to view key internship details, including the name of the position, specific responsibilities, and objectives, as well as detailed contact information for the company and the assigned academic tutor. The **Your Contract** section displays the terms and conditions of the internship, ensuring legal clarity and transparency.

A checklist for weekly questionnaires is prominently featured, enabling students to report their progress systematically. Each week is represented by a labeled box (e.g., *"Week 1," "Week 2," "Week 3"*), ensuring consistency in progress reporting throughout the internship duration. To address challenges, a bold red action button labeled *"Report a Problem with the Stage"* provides students with an immediate means to raise concerns directly through the platform. This ensures swift resolution of any issues that may arise during the internship.

### 13/ Profile Settings Page

The **Active Stage Page** (Figure 3.14) provides students with essential tools and detailed information to effectively manage their ongoing internships. By centralizing progress tracking, communication, and problem reporting, this page ensures a seamless and transparent experience for students, companies, and academic tutors.

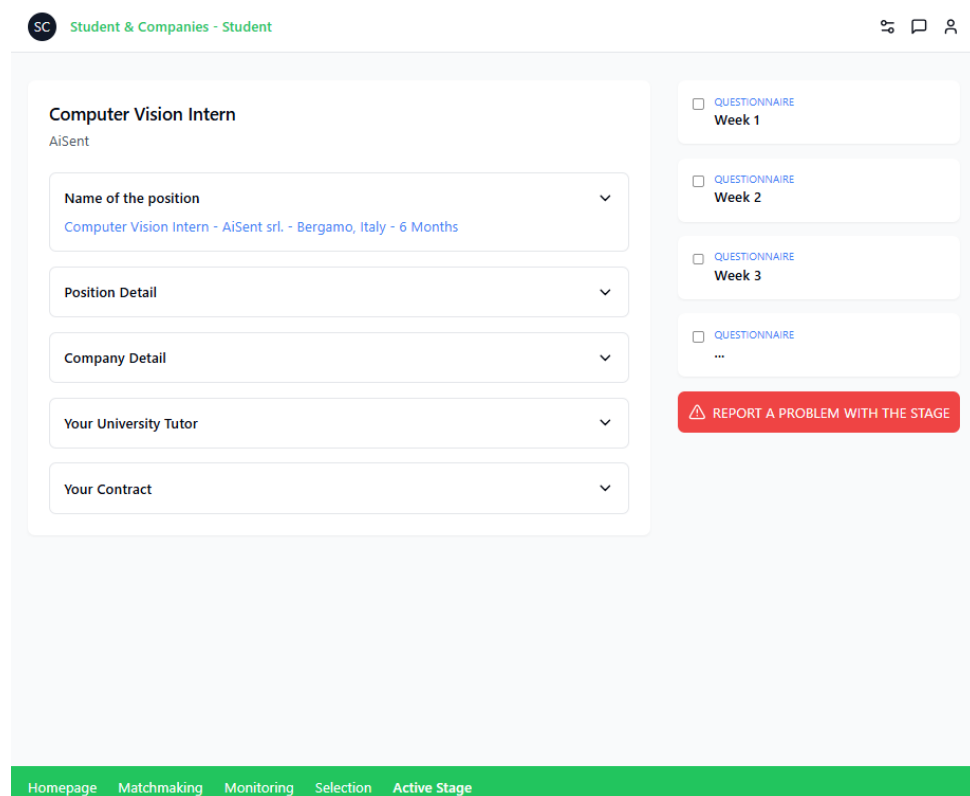


Figure 3.14: Active Stage Page of the Students & Companies platform.

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To address challenges, a bold red action button labeled *"Report a Problem with the Stage"* provides students with an immediate means to raise concerns directly through the platform. This ensures swift resolution of any issues that may arise during the internship.

At the bottom of the page, a navigation bar links to other core functionalities of the plat-



form, such as the *Homepage*, *Matchmaking*, *Monitoring*, and *Selection*, allowing students to navigate effortlessly between different sections of the platform.

#### 14] *Messaging Page*

The Messaging Page (Figure 3.15) enables direct communication between students, company representatives, and the platform's support team. This interface is essential for fostering effective dialogue throughout the internship search and application process.

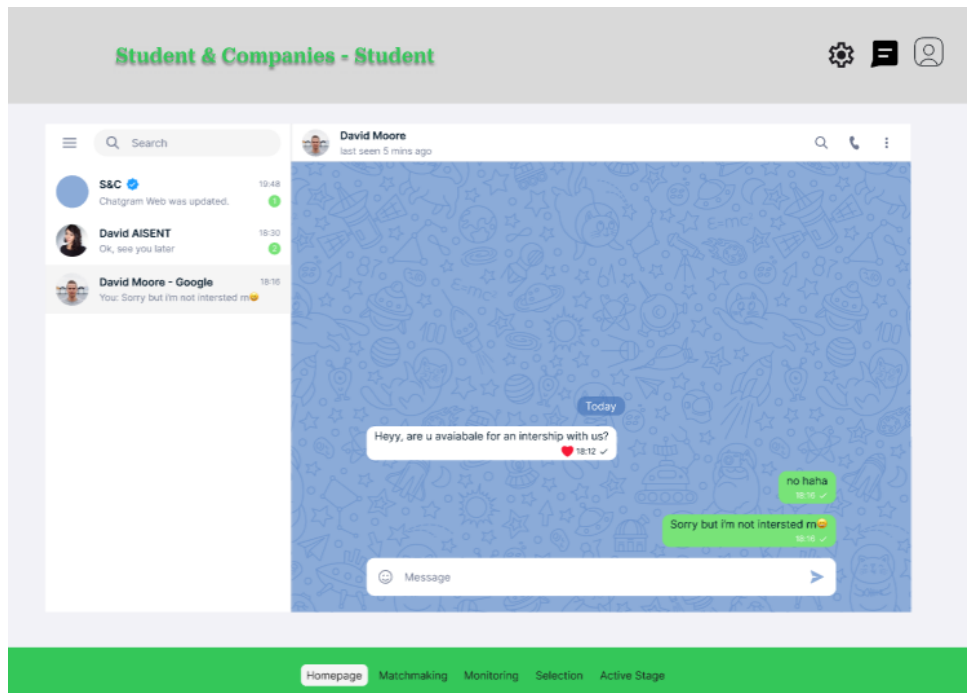


Figure 3.15: Messaging Page of the Students & Companies platform.

This page is designed to simplify communication, ensure clarity in messaging, and promote efficient interaction between all parties. Below is a breakdown of its components:

- **Chat List:** A panel on the left side displays all active conversations, including:
  - Messages from the platform's support team (*e.g.*, *S&C Verified*).
  - Conversations with recruiters (*e.g.*, *David Moore – Google*).
  - Timestamp indicators for the most recent messages.
- **Active Chat Window:** The main chat area features:
  - Messages exchanged between the student and the selected contact.
  - Visual indicators for read receipts (*e.g.*, checkmarks) and message reactions (*e.g.*, heart icon).
  - A toolbar at the top for additional actions such as searching within the conversation, initiating a call, or blocking the user.

- **Message Input Field:** A text box at the bottom allows students to type and send new messages.
- **Navigation Bar:** Located at the bottom of the page, linking to key sections such as *Homepage*, *Matchmaking*, *Monitoring*, *Selection*, and *Active Stage*.

**User Actions:** From this page, students can:

- Engage in real-time communication with company representatives or the platform's support team.
- Use message reactions to provide quick feedback.
- Search through past messages or escalate issues through the platform's messaging system.

### 3.1.2. Hardware Interfaces

### 3.1.3. Software Interfaces

### 3.1.4. Communication Interfaces

## 3.2. Functional Requirements

Definition of use case diagrams, use cases and associated sequence/activity diagrams, and mapping on requirements.

## 3.3. Performance Requirements

## 3.4. Design Constraints

### 3.4.1. Standards Compliance

### 3.4.2. Hardware Limitations

### 3.4.3. Any Other Constraint

## 3.5. Software System Attributes

### 3.5.1. Reliability

### 3.5.2. Availability

### 3.5.3. Security

### 3.5.4. Maintainability

### 3.5.5. Portability



## 4 | Formal Analysis Using Alloy

This section should include a brief presentation of the main objectives driving the formal modeling activity, as well as a description of the model itself, what can be proved with it, and why what is proved is important given the problem at hand. To show the soundness and correctness of the model, this section can show some worlds obtained by running it, and/or the results of the checks performed on meaningful assertions.



## 5 | Effort Spent

In this section you will include information about the number of hours each group member has worked for this document.





## Bibliography

- [1] U. o. W.-M. Center for research on College-Workforce Transitions (CCWT). National survey of college internships (nscl) 2021 report, 2021. URL [https://ccwt.wisc.edu/wp-content/uploads/2022/04/CCWT\\_NSCI-2021-Report.pdf](https://ccwt.wisc.edu/wp-content/uploads/2022/04/CCWT_NSCI-2021-Report.pdf).
- [2] T. T. Jane Hamilton. Tougher than ever to secure place on sought after internships, 2024. URL <https://www.thetimes.com/article/tougher-than-ever-to-secure-place-on-sought-after-internships-8rrfj30rm>.



## List of Figures

3.1	Login/Sign-Up Interface of the Students & Companies platform. . . . .	31
3.2	Log In Interface of the Students & Companies platform. . . . .	32
3.3	Registration Page of the Students & Companies platform. . . . .	33
3.4	Student First Access Page of the Students & Companies platform. . . . .	34
3.5	Create CV Page of the Students & Companies platform. . . . .	35
3.6	Review Extracted CV Page of the Students & Companies platform. . . . .	36
3.7	CV Creation Confirmation Page of the Students & Companies platform. . . . .	37
3.8	Homepage of the Students & Companies platform. . . . .	38
3.9	Matchmaking Page of the Students & Companies platform. . . . .	39
3.10	Monitoring Page - Stay Updated on Your Applications. . . . .	40
3.11	Monitoring Page - Your Selection Offers. . . . .	41
3.12	Selection Page of the Students & Companies platform. . . . .	42
3.13	Active Stage Page of the Students & Companies platform. . . . .	43
3.14	Active Stage Page of the Students & Companies platform. . . . .	44
3.15	Messaging Page of the Students & Companies platform. . . . .	45



## List of Tables

