POLITECNICO
MILANO 1863

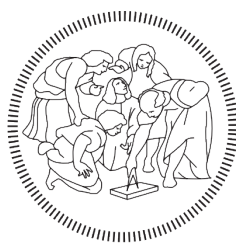# Requirements Analysis and Specification Document

Students & Companies

December 14, 2024

Authors:

- Dimić Nikola
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- Žiga Edin

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Contents

1 Introduction

1.1 Purpose

The purpose of the Students&Companies (S&C) platform is to provide a centralized, user-friendly environment where university students can search for internship opportunities, and companies can advertise their offerings. By consolidating internship advertisements in one place, the platform allows students to easily compare opportunities based on criteria such as required skills, offered benefits, and other terms. It ensures a safe and transparent process, minimizing the risk of exploitation by providing mechanisms for university supervision and feedback. Companies benefit from the platform's reach, enabling them to connect with a broad pool of talented students efficiently. In addition, the platform fosters trust by ensuring university oversight, making it a reliable space for students and companies to interact.

1.1.1 Goals

- **G1** Companies create internship advertisement

- **G2** Students find appropriate internship and initiate contact with the company

- **G3** Students become interns in the companies in order to gain experience

1.2 Scope

The Students&Companies platform is designed to streamline the internship process by addressing the needs of three main user groups: Companies, Students, and Universities. Each group is provided with tailored functionalities to support their respective roles in the internship ecosystem.

The platform enables companies to efficiently create and manage internship advertisements. These advertisements include detailed descriptions of requirements, projects, and relevant terms, ensuring clarity for prospective applicants. Companies can accept internship applications from students and handle the entire selection process, supported by tools for conducting interviews and distributing structured questionnaires. Once an internship is filled, companies are encouraged to provide feedback on their experience with the platform and its functionalities, ensuring continuous improvement.

Students can utilize the platform to upload their data and CVs, creating comprehensive profiles that highlight their skills and experiences. They can search for internship opportunities that align with their goals and proactively initiate the application process. The platform facilitates seamless

participation in the selection process by allowing students to respond to invitations to interviews and questionnaires. In addition, students receive timely notifications regarding their selection status and are encouraged to provide feedback on their experience. For any challenges encountered during an internship, the platform provides a mechanism for students to submit complaints.

Universities play a crucial role in ensuring the integrity of the internship process by handling complaints submitted by students. They monitor and resolve issues, ensuring that internships provide a safe and productive environment. This oversight contributes to maintaining the reputation of the platform as a trusted intermediary between students and companies.

1.2.1 World Phenomena

- **WP1** Students have their own CVs, experiences, and preferences when looking for internships.

[handwritten: Да он оно "WP" мора да буде без сумње одвојен од машине.]

- **WP2** Companies create internship opportunities and search for qualified candidates for their roles.

[handwritten: Нагласит овдје да је ово екстерно од платформе.]

- **WP3** Companies decide how the process of selection will look like

- **WP4** Complaints and conflicts can arise during internships, requiring resolution by a neutral entity (universities).

- **WP5?** Students participate in interviews and selection processes conducted by companies.

[handwritten: Да ли ово ради преко платформе или преко екстерног програма? Ово треба нагласити у "Scope" мјесту.]

1.2.2 Shared Phenomena

World controlled

- **SP1** Students upload their CVs, experiences, projects and personal data *[handwritten: ← Тачка фокти]*

- **SP2** Companies interact with the system to upload internship advertisements and define the process of selection.

- **SP3** Students use the system to search for internships and submit applications.

- **SP4** Students and companies exchange information through the platform, including interview schedules and questionnaires.

- **SP5** Companies evaluate students who went through the selection process and mark the selected ones.

[handwritten margin notes: Објаснити све ниже што има, али не пише што нема. Треба додати нешто попут: "While the platform facilitates the ideal of an internship, it does not cover task management, and other features" Тј, гдје овој наведени "Scope" стоје и што не укључује.]

4

[handwritten top] Мислим да овдје иде:
"Students that got accepted ~~decide~~ /confirm or deny~ whether they........—
Јер студенти извршавају радњу која контролише овај феномен.
(у тандему)
са фирмама

[handwritten left margin] Други систем органа Нпр. SPW 1,2,3,4... и SPM 1,2,3...

- **SP6** Students that got accepted have a choice whether they want to enroll the selected internship

- **SP7** Universities use the system to access complaints submitted by students and monitor internship progress.

Machine controlled

- **SP8** The system recommends internships to students based on their CVs, projects and preferences

- **SP9** The system asks *[→ "requests"]* for feedback and ratings from both students and companies, contributing to platform analytics and recommendations.

- **SP9** The platform provides suggestions to students and companies to improve their CVs or internship postings, based on statistical and user feedback.

[handwritten] → "Events, actions or states which occur within the machine. Entirely internal and not observable by the environment."

1.2.3 Machine Phenomena

- **MP1** The system stores and processes student profiles, including CVs and other personal data. *[handwritten: Овдје можда боље "Contains".]*

- **MP2** The system provides a searchable database of internship advertisements.

- **MP3** Notifications about new internships or application statuses are automatically sent to users. *[handwritten: → Ако има интеракцију са корисником, зар није онда "Shared"?]*

- **MP4** The system tracks and records complaints submitted by students and sends them to universities.
[handwritten: → Исто, процес је интерн, али интеракција/резултат су екстерн.]

1.3 Definitions, Acronyms, Abbreviations

1.3.1 Definitions *[handwritten: → Као да фали нешто овдје?]*

1.3.2 Acronyms

- S&C: Students & Companies;

- UI: User Interface;

- UML: Unified Modeling Language.

1.3.3 Abbreviations

- G*: goal

- WP*: world phenomena

- SP*: shared phenomena

- R*: functional requirement

- UC*: use case

1.4 Revision history

v1.0 - 7/12/2024 - Release → *Initial release*

1.5 Reference documents

1.6 Document structure

Фали одбјие свега понало

This RASD document consists of the following parts:

1. **Introduction**: It aims to give a brief description of the project. In particular it's focused on the reasons and the goals that are going to be achieved with its development;

   Никад не пиши као да је 100% сигурно. Пиши у фазону "are aimed to" или "are strived for" итд..

2. **Overall Description**: it is a high-level description of how the system works with a detailed explanation of the phenomena that involve the world, the machine or both;

3. **Specific Requirements**: ~~in this section there is~~ a detailed analysis of the requirements needed to achieve the goals. Moreover, ~~it~~ contains more information useful for developers;

   "It is"

4. **Formal analysis**: ~~it's~~ a formal description of the world phenomena ~~by the means of~~ Alloy; → *"Using"*

   Такође, у формалном писању нема "it's", "doesn't", "won't", "can't" итд.

5. **Effort spent**: ~~it shows~~ the time spent to realize this document ~~organized~~ by section; → *Presents* / *grouped* / *a list of*

   Веш се користе пуне ријечи.

6. **References**: ~~it contains the~~ references to any documents and software used to ~~write this paper.~~ *Create this document*

Пази да није исто као у оном примјеру, да се не би означило као плагијат.

6

2 Overall Description

2.1 Product perspective

2.1.1 Scenarios

User creates an account on the platform
Two main users of the platform have to create an account (companies and students). Company has to provide all the information relevant for the company, while student uploads their CV and other relevant information to create a profile that showcases their skills and experiences.

Company creates an internship advertisement
A company access the platform using their credentials and selects an option to create an internship advertisement. After opening the page for creation of the advertisement, the platform requires detailed internship description, specifying required skills, project descriptions, offered benefits, and application instructions. Also, the company must define how will the selection process look like (e.g. if there will be more then one interview, questionnaire or more than one round of selection process)

Company manages internship advertisements
Anytime, a company has an option on the platform to manage active internship advertisements. A company has possibility to update or remove an existing advertisement, ensuring it reflects the latest requirements or availability.

Student searches and applies for internship opportunities
A student after logging in with his credentials on the platform, the home page is populated with the active internship advertisements which one can browse, filtering by location, required skills, or other criteria. After finding and selecting appropriate internship, the platform opens page with the detailed description, requirements and other information about the internship. Student has an option to apply for the selected internship.

Company reviews student applications
A company, on their profile can view student applications for every active internship advertisement. The company can evaluate every student's suitability based on uploaded CV, skills and preferences. The platform provides an option for the applied students to accept and continue with the selection process as the company has chosen in the creation of the advertisement, or reject student if they believe they are not right fit for the company. After the acceptance of the certain students, the company has to send them questionnaire.

[handwritten notes:]

Мислим да је ово неформални начин писања сценарија.

- Не мислим да ово треба овако, али ћу провјерити

Размак

Размаке средит обрк на почетак параграфа иде размак.

Морау или могу?

Student participates in the selection process

After the company selects the student to continue with the selection process, the student receives a notification and has an option to complete a questionnaire provided by a company. The student submits filled questionnaire and waits for the company to send him an invitation for the interview. During the selection process, student has an option to see his progress and all the rounds he has to pass in order to finish the selection process (e.g., questionnaire completed, interview completed).

User provides feedback on the platform *a feedback questionnaire."

After the internship concludes, users will get feedback questionnaire from the platform in order to collect statistical data and improve the recommendation system. The company has to provide feedback about the student's performance and the platform's usefulness, while the student has to give some insights about the internship and the company that he worked for.

The platform recommends internships to students

The recommendation system integrated in the platform recommends internships to the student based on his projects, CV and relevant data that the student uploaded when creating an account. The recommendation system analyzes a student's profile and suggests internships that match their skills, experiences, and preferences. The recommendation system utilizes simple keyword searching in order to match the internships that could be related to the student's portfolio.

User submits a complaint to the platform

During the internship, both the student and the company can file a complaint about issues that can arose.* Both users have an option on the platform to file a complaint on the active or completed internship. The platform handles the complaint further.

*"about the issues that can arise." или "about the issues that arose."
"arose" → je прошло вријеме.

University reviews and handles complaints

After the complaint has been filled, the university gets a notification about an active complaint request with all the information that user mentioned. The university communicates with the company and the student to resolve the issue, potentially leading to corrective actions or termination of the internship. If the university decides that the company has not met the benefits and requirements that were mentioned in the internship advertisement, the university can request from the platform to forbid internships from that company to its students.

University monitors internship progress

The university has an option to monitor the internship progress through feedback related to ongoing internships to ensure compliance with academic

and ethical standards. Also, the university has an option to monitor an active internship in order to assign the points to the student in the case of an obligatory internship.
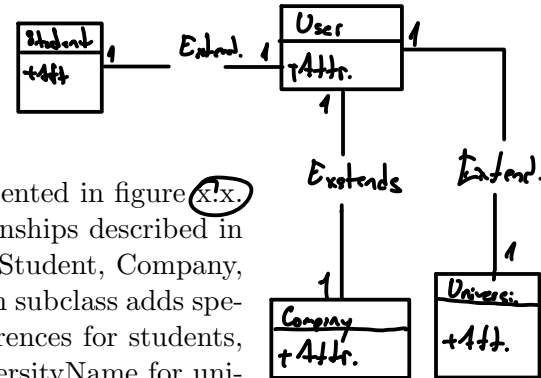
2.1.2 Domain class diagram

Payroll → The domain class diagram for the S&C platform is presented in figure (x!x.) It is designed to represent all major entities and relationships described in the scenarios. The User class serves as a base class for Student, Company, and University. It encapsulates common attributes. Each subclass adds specific details needed for each role, such as CV and preferences for students, companyName and description for companies, and universityName for universities. Other key classes include InternshipAdvertisement for managing detailed internship postings, InternshipApplication for tracking application statuses, and Complaint for handling issues raised by users. Additional classes like Recommendation and Feedback enhance platform functionality by supporting personalized internship suggestions and collecting user feedback. → *Напиши: "University, Student, Company extend the User class."*

The relationships between these classes reflect real-world interactions. For instance, companies create and manage InternshipAdvertisement objects, which are linked to multiple InternshipApplication objects submitted by students. The Recommendation class associates student profiles with internships using criteria (e.g. skills and preferences). Both students and companies can provide Feedback about internships and file Complaint objects for university review. Universities handle complaints, monitor internships through the InternshipMonitoring class, and ensure compliance with academic standards. These relationships and associations ensure seamless functionality, from the internship advertisement creation to application management, selection processes, and complaint resolution. *ChatGPT? Much.*

This design emphasizes scalability, maintainability, and data integrity. Its modular structure supports future feature expansion, such as additional user roles or advanced recommendation algorithms. By separating responsibilities among students, companies, and universities, the system ensures clarity and efficiency. Strong associations between classes enforce data consistency, while role-specific features improve usability for all stakeholders. Overall, the diagram provides a comprehensive foundation for implementing the S&C platform.

Без увреде али овдје ниси ништа рекао.

ChatGPT? Much .

Ова секција је опис дијаграма и допуњавање логике која није наглашена у дијаграму. Држи се тога, остали било какав опис зашто то „вало".

Ало бре гдје су ти дијаграми???

9

2.1.3 State diagrams

This section is going to visually present lifecycle of different components on the platform using state diagrams. Following state diagrams are covering management of internship advertisement, internship application and complaint handling.
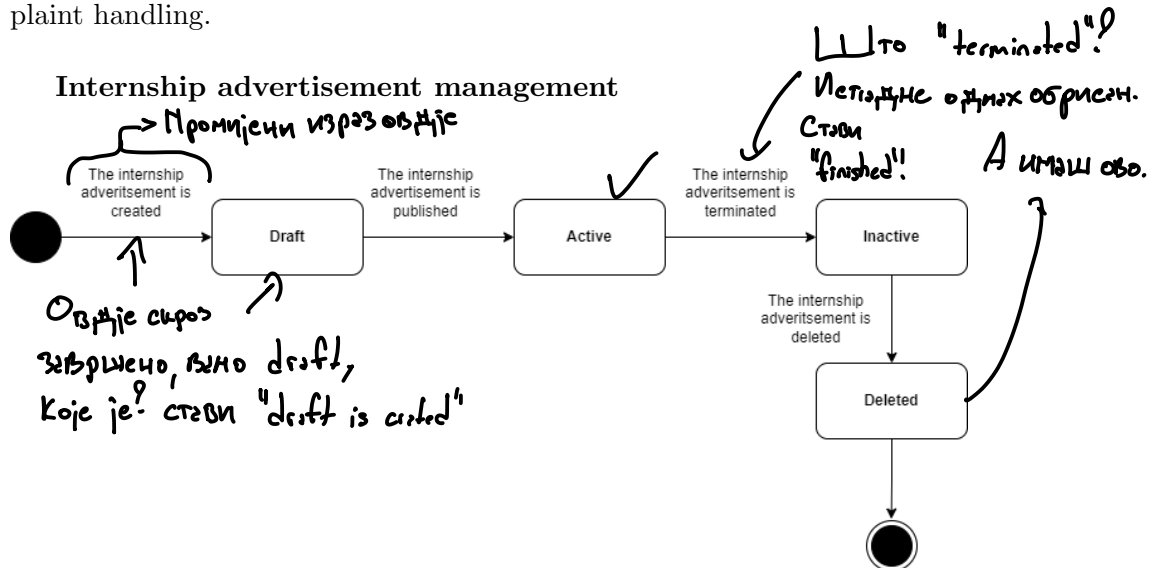
Internship advertisement management

Figure 1: Internship advertisement state diagram

This diagram represents the lifecycle of an internship advertisement on the platform, focusing on states like *Draft*, *Active*, *Inactive*, and *Deleted*. Internship advertisement lifecycle starts from the state *Draft*. This is the initial state when a company starts creating an internship advertisement. Companies can add details such as required skills, project descriptions, and selection processes. Once the advertisement is finalized and submitted, it transitions to the *Active* state. Active advertisements are visible to students, allowing them to search and apply. The advertisement can be marked as inactive by the company if it's no longer available or requires updates. Inactive advertisements are not visible to students. If the advertisement is no longer needed, it transitions to the *Deleted* state. Deleted advertisements are permanently removed from the platform. Transitions between these states occur based on user actions.

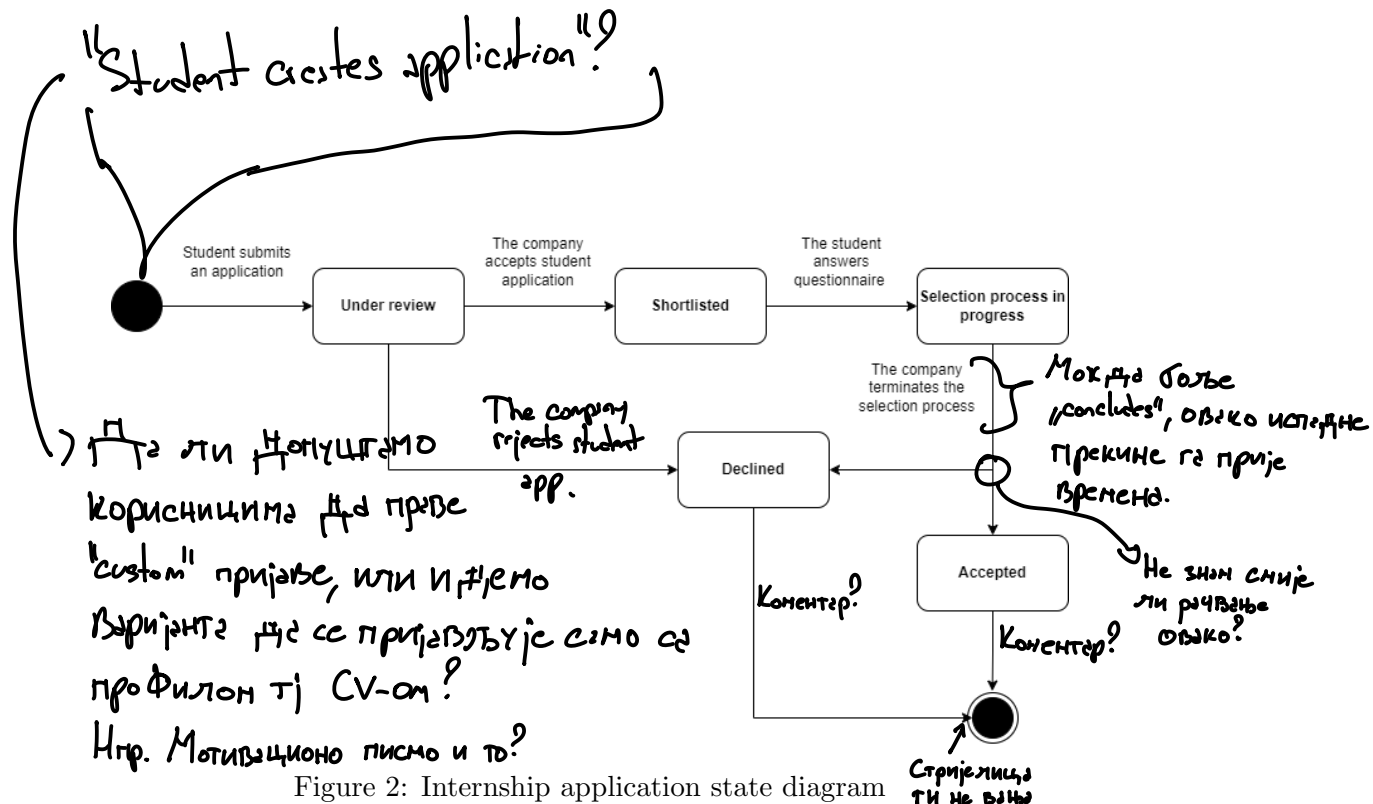**Internship application management**

10

Figure 2: Internship application state diagram

Application and selection process for students and companies are showed in the state diagram above (figure x.x). After a student applies for an internship, their application enters the *Under Review* state. The company evaluates the application based on the CV and profile. If the student's application meets the company's criteria, it transitions to the *Shortlisted* state. The student is notified of their progress. After shortlisting, the selection process begins. This could involve questionnaires, interviews, or other rounds defined by the company. The platform keeps track of the student's progress through each stage. If the student is not a fit, their application transitions to the *Declined* state. The student is notified of the rejection. On the other hand, if the student successfully completes all selection stages, their application moves to the *Accepted* state. This indicates that the student has secured the internship.
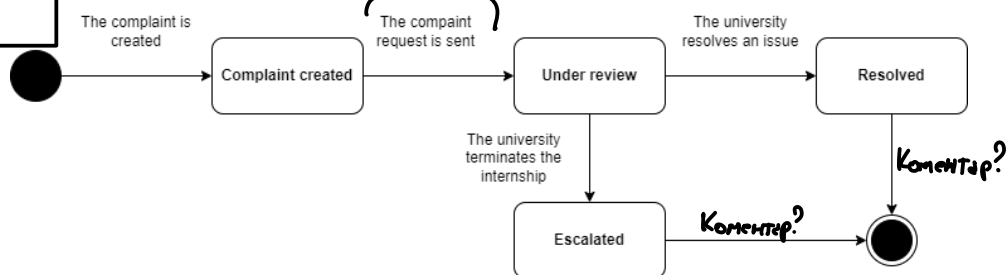
Complaint management

Figure 3: Complaint handling state diagram

11

The complaint process starts when a user (student or company) creates a complaint. The complaint moves to the state *Complaint created*. Immediately, the next state *Under review* is active. In that state, the university begins the review process. In this state, the university evaluates the complaint, gathering information from involved parties (e.g., students, companies, or both). If the issue cannot be resolved, the university has an option to terminate the internship and in that case state is *Escalated*. Whereas, if the university successfully resolves the complaint, complaint process transitions to the *Resolved* state.

2.2 Product functions

User Registration and Authentication

The platform allows students, companies, and universities to register by creating accounts and logging in using secure authentication methods. Users can register by pressing the button "Sign up" and the platform will send them on the registration page where they will enter necessary data. Students provide their CV and skills, companies enter relevant business information, and universities add institutional details. This ensures that all users are identified and role-specific functionalities are enabled. If the user is already registered on the platform, there is an option to login using user credentials.

Profile Management

Each user can manage their profiles by updating personal information. The platform offers the page with the possibility of viewing data of the logged in user and modifying it. Students can upload and update their CVs, skills, and preferences; companies can refine their organizational descriptions; and universities can manage their institutional profiles. This enables users to keep their information relevant and up-to-date.

Internship Advertisement Creation and Management

Companies are able to access the page for advertisement creation by pressing the button "Create new internship advertisement" where they can create internship advertisements by providing detailed information about the role, required skills, offered benefits, and the selection process. In addition, there is an option to view all active internship advertisements, where they can be updated, activated, deactivated, or deleted to ensure only relevant opportunities are visible to students.

Internship Search and Application

The platform offers students possibility to search for internships using filters like location, required skills, and benefits. They can view detailed descriptions of each internship by pressing on the box where the advertisement is located. After pressing on the selected advertisement the platform sends user

on the page where details of the internship are presented. Button "Apply" is located on the internship page. That way, student can submit application directly through the platform.

Selection Process Management

On the company user page on the platform, the company can view the status of any student that is in the selection process. The company can distribute and view the ~~questionnaire that the student~~ answered, schedule an interview with the student, view the date and time of scheduled interview and also can terminate the selection process anytime if decides that the student is not right fit for the internship role, with giving the reason for such decision. On the other hand, the student that is in the active selection process can view their progress, view the questionnaire and the deadline for submitting it. As the company, the student can view the date and time of the scheduled interview.

Feedback System

Feedback system which is integrated on the platform is responsible for collecting information from the students and companies after the selection process finishes and after the internships conclude. Companies provide feedback on the students' performance and their experience using the platform, while students share their thoughts about the platform or about the internship and the company. Data collected this way is used for improvement of the platform and in order to build trust between users.

Recommendation System

The recommendation system is built with the intention to suggest internships to students based on their CVs, skills, and preferences. Method that the recommendation system uses is a keyword-matching algorithm to identify opportunities that align with a student's profile, helping them find relevant internships more efficiently. On the home page of the platform when the logged in user is student where the internship opportunities are shown, the first one which are showed are the ones that recommendation system chose. Those internship advertisements have label *Suggested* in order to highlight them.

Complaint Handling System

Both students and companies can submit complaints about issues that arise during selection process or internships that are active or completed. The platform provides an option on the page of the active internship or selection process to file a complaint. Complaints are reviewed by universities, which act as mediators to resolve disputes. When the complaint is requested by the student or the company, the university account gets a notification about the active complaint request. This system ensures that the platform main-

tains ethical and fair practices.

Internship Monitoring

Universities are able to monitor ongoing internships by accessing feedback and progress reports. Progress reports are requested for the student and the company every month. This function ensures compliance with academic and ethical standards. This way universities can monitor the internship progress and assign points to students for completed internships when required.

Notifications System

The platform is equipped with the notification system which sends notifications to students and companies at various stages, such as when new internships are posted, application statuses are updated, or when students are invited to the next step in the selection process. Notifications keep users informed and engaged.

2.3 User Characteristics

Users that are present on the platform and interact are: *Student, Company* and *University*.

2.3.1 Student

User *Student* has an option to sign up and login in order to access the platform. On the platform the student can search for the internships and apply for them. The student can be shortlisted or declined. If the student is shortlisted, he continues with the selection process which results with admission to the internship or rejection. The student has a possibility to file a complaint if the selection process or an active internship is not as described in the advertisement or are not by academic or ethical practices.

2.3.2 Company

User *Company* is, as the student, can sign up and login in order to access the platform. When logged in, the company can create and manage an advertisement for an internship role that is open. Company is able to manage the selection process and guide students through it. Also, the company may file a complaint if the internship progress is not as expected due to student misbehaviour.

2.3.3 University

User *University* is responsible for monitoring and supervising the process of selection and progress of the active internships. The university user are able

РАЗМАК.

to sign up and log in to the platform. In addition, this user has to handle complaint requests by students and companies.

Assumptions, dependencies, constraints

2.4 Product functions

→ Провјери могућност енкрипције
+ друге регулативе.
(Површно, само споменути)
+ Референце.

2.4.1 Regulatory policies

The S&C platform operates within the framework of applicable laws and regulations about employment and internships. It follows labor laws that protect interns from exploitation, ensuring fair compensation and working conditions. The platform complies with data protection regulations, such as GDPR, by securing user data and limiting access to authorized personnel. Companies must ensure that the internships meet employment standards and are according to anti-discrimination policies. Universities play a regulatory role by monitoring internships to ensure ethical practices and compliance with academic requirements.

Овдје се веже на "Scope" у смислу циљних корисника Циљели свијет? Само EU! Само Италија! Због закона регулатива и то

Можда нагласит да ће платформа пратит локалне законе.
+
Има конфликт мулти-националних пракси, на то све.

Пажљиво бирај ријечи.

Рестрикције и валидације при уносу података?

2.4.2 Domain assumptions

The following domain assumptions are needed in order for the platform to work successfully.

- ✓ [D1] User must have a reliable internet connection.

→ • [D2] All users provide accurate information when creating profiles.

- ✓ [D3] Universities actively engage with the platform in order to monitor active internships and to resolve complaints.

→ • [D4] Companies provide accurate information about an internship.

- [D5] The system will be available ensuring uninterrupted access to users. → Колико ми имамо утјецаја на ово?

- [D6] Submitted complaints are genuine and not misused to create unnecessary conflicts. → Филтери + Обновљење

- ✓ [D7] Companies respond to applications promptly.

- [D8] Students complete selection process steps within deadlines.

За 2.4.2. се треба
Питат „Колико ми имамо утјецаја на ово?", и гледат варијанту било каквог утјецаја, тј. ако га можемо икако реално ријешити, па макар дјелимично, да то урадимо. Па ово што остане је 100% ван наших руку. Попут [D1] нећемо му ни пружат интернет јебем му... ..

Дорад
минимални период за одговор студента? Нпр. 7. дена.

Додатни коментари, сугестије и то:

За 2.3.

In a **Requirements Analysis and Specification Document (RASD)**, the **User Characteristics** section typically describes:

1. Who the Users Are

The types of users the system is designed for, such as:
Primary users: End-users who directly interact with the system (e.g., customers, employees).
Secondary users: People who benefit indirectly or support the system (e.g., administrators, technical staff).
Stakeholders: Broader audience with an interest in the system (e.g., managers, regulators).

2. User Profiles

Key details about users, including:
Demographics: Age, education level, technical skills, etc.
Background Knowledge: Assumptions about the users' familiarity with similar systems or domain expertise.
Technical Proficiency: Whether users are tech-savvy or require a user-friendly interface.
Accessibility Needs: Consideration of disabilities or specific requirements (e.g., screen readers, language preferences).

3. Primary Needs

The specific problems or tasks the users aim to address using the system:
Examples: "Users need a fast way to upload and organize files" or "Users require real-time analytics for decision-making."
These needs often guide **functional requirements**.

4. Expectations and Limitations

What users expect from the platform (e.g., reliability, ease of use, speed).
Limitations or constraints users might face, like time availability or environmental factors (e.g., mobile device usage in poor network areas).

5. How the System Caters to Their Needs

A high-level description of how the system addresses user needs:
Examples: "The platform provides a highly intuitive interface tailored for non-technical users," or "The system includes features for advanced analytics to meet professional users' needs."
In short, **User Characteristics** outlines the *who, what, and why* for the users and ensures the platform design is aligned with their capabilities and goals. It's essential to balance understanding user needs with describing how the platform meets them, but avoid overlapping too much with detailed functional or non-functional requirements.

брт 2.15 је јебеш ово, оно х слабат.

Прелистај детаљно слајдове од, профе и искористи све што можеш за ове горе секције, јер сам ја узео да листам и доста неких ствари се не поклапа. Можеш да искористиш доста овог што си већ урадио, само надограђи/измијени.

3 Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

3.1.2 Hardware Interfaces

3.1.3 Software Interfaces

3.1.4 Communication Interfaces

3.2 Functional Requirements

3.2.1 Use cases Diagram

3.2.2 Use cases

3.2.3 Sequence diagrams

3.2.4 Requirement mapping

3.3 Performance Requirements

Performance requrements text

3.4 Design Constraints

3.4.1 Standards compliance

3.4.2 Hardware limitations

3.4.3 Any other constraints

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