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SCUOLA DI INGEGNERIA INDUSTRIALE
E DELL'INFORMAZIONE

Requirement Analysis and Specification Document (RASD)

Students&Companies

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Academic Year: 2024-25

Deliverable:	RASD
Title:	Requirement Analysis and Verification Document
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Version:	1.0
Date:	November 23, 2024
Download page:	GitHub Repository
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Contents

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.

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:

- **[SP0]** Student creates a profile on the platform.
- **[SP0]** Company creates a profile on the platform.
- **[SP1]** Students upload their resumes on the platform.
- **[SP2]** Companies upload internship-related information (technical and contractual details) on the platform.
- **[SP3]** Students manually search for internship offers, using possible filter parameters (field, city, distance from a specific location, paid/unpaid).
- **[SP4]** Students manually view and select internship offers that interest them.
- **[SP5]** Students submit applications for relevant internships for himself/herself through the platform, which makes them visible to companies.

- **[SP6]** The system sends notifications to students when new internship offers matching their interests are available.
- **[SP6']** The system sends notifications to companies when new candidates matching their interests are available.
- **[SP7]** Companies receive student applications through the platform.
- **[SP8]** 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.
- **[SP9]** The system facilitates the organization of interviews between students and companies: scheduling section (calendar).
- **[SP10]** The system facilitates the organization of interviews between students and companies: section for conducting interviews (video call platform).
- **[SP11]** 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.
- **[SP12]** The system provides feedback to students and companies on their uploaded content (resumes and internship details) to obtain better matches and improve engagement.
- **[SP13]** Universities have the option to terminate an internship due to severe conditions between students and companies, indicating the reason for such termination.

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

2.1. Product Perspective

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

Here we include anything that is relevant to clarify their needs.

2.4. Assumptions, Dependencies, and Constraints

Here we include domain assumptions.

3 | Specific Requirements

Here we include more details on all aspects in Section 2 if they can be useful for the development team.

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

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 (nsci) 2021 report, 2021. URL 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

List of Tables