



**Politécnico
Castelo Branco**

Escola Superior
de Tecnologia

Specifications for an Intelligent Project Management System

Smart Scheduler

Trabalho de Projeto apresentado à Escola Superior de ESTCB do Instituto Politécnico de Castelo Branco para cumprimento dos requisitos necessários à obtenção do grau de Licenciado em Engenharia Informática, realizada sob a orientação científica do Professor Adjunto Doutor Filipe Miguel Bispo Fidalgo, do Instituto Politécnico de Castelo Branco.

Academic Year 2024/2025

Composição do júri

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Vogais

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Dedicatória

Dedico este trabalho à minha família, cujo apoio incondicional e encorajamento foram o alicerce desta jornada. Aos meus amigos, por sua constante inspiração e motivação para alcançar o melhor. Também dedico este trabalho a todos os educadores que tornam o aprendizado uma experiência transformadora, com um agradecimento especial ao meu professor e supervisor, Sr. Filipe Miguel Bispo Fidalgo, pela sua orientação e dedicação inestimáveis ao longo deste projeto.

Agradecimentos

Em primeiro lugar, gostaria de expressar a minha profunda gratidão ao meu supervisor, Sr. Filipe Fidalgo, pelo seu constante apoio, paciência e orientação inestimável ao longo deste projeto. O seu compromisso em garantir que eu compreendesse todos os aspetos do meu trabalho não só aprimorou as minhas competências, mas também tornou este processo de aprendizagem verdadeiramente gratificante.

Gostaria também de estender o meu agradecimento ao Sr. Eurico Lopes, presidente do júri, por enriquecer a minha jornada com feedback perspicaz e por criar oportunidades para interagir com empresas. Os seus esforços adicionaram um grande valor à minha experiência académica e profissional.

Por fim, estou profundamente grata a todos os meus professores, colegas e a todos que contribuíram, direta ou indiretamente, para o sucesso deste projeto. O vosso incentivo e apoio foram fundamentais para alcançar este marco.

Preamble

This document aims to structure **the development project of an intelligent project management system.**

The objective of this project is to provide a comprehensive solution that allows teams to efficiently *manage their tasks* and *propose an optimal task scheduling* while considering **time, resource, and budget constraints.**

The specifications will help define the needs, objectives, features to be implemented, as well as the constraints related to the system's development.

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I. Company Overview

1. My Contact Information

Company Name : University project carried out by a student from IPCB

Student Name : Lina Mosrati

Supervisor : Mr. Filipe Fidalgo

Email : Lina.mesrati@gmail.com

2. My Business Activities

I am a student at IPCB, working on a project under the supervision of **Mr. Filipe Fidalgo**. This project involves developing an intelligent project management system to enable optimized task and resource management in a professional or educational context.

3. My Competitors

To better position my system in the market, I have identified several existing solutions like Trello and Jira, which offer similar project management capabilities.

 **Trello**



 **Jira**



However, my differentiation lies in the automatic optimization of tasks based on minimizing resources and costs, a feature that is less emphasized by currently available tools. I also offer a modernized user interface built with Angular to enhance the user experience.

II. Project Overview

I present an innovative web platform dedicated to intelligent project management. This system is designed to meet the needs of businesses and work teams by offering powerful tools to create, organize, and track projects optimally. With an intuitive interface, users can manage their projects and sub-projects, assign tasks to team members, and monitor work progress in real time.

1. Project Objectives

- Simplify team coordination with an intuitive interface for task and project management.
- Improve productivity with detailed reports on project progress.
- Ensure real-time tracking with instant notifications for increased responsiveness.
- Optimize resource and deadline management to achieve goals more efficiently.

2. My Target Audience

The system primarily targets:

- Companies of all sizes.
- Project teams collaborating in professional environments.
- Groups working on shared tasks in a collaborative context.

III. Project Scope

1. Site Structure

The website structure will include the following main sections:

- **Dashboard:** Overview of ongoing projects, assigned tasks, and deadlines.
- **Projects:** Section to create, view, and manage projects, including subtasks and resource allocation.
- **Reports:** Analytical tools to track project progress and evaluate performance (generating by AI).

2. Technical Solutions

The technologies used for development are:

- **Angular** for front-end development, providing an interactive and dynamic user interface.
- **Express.js** as the framework and **Node.js** for the back end, facilitating data exchange between the server and the database.
- **MySQL** for database management, allowing for the storage of information related to projects, tasks, and resources.



3. Methodology

For the development of this project, I have chosen to use the Scrum framework, which is part of Agile practices. Scrum allows us to manage the project in an iterative and incremental manner, promoting collaboration and adaptation to changes throughout the development process.

a. Principles of Scrum

Scrum is based on the following principles:

- **Transparency:** All stakeholders have a clear view of the project's progress through dashboards and tracking tools.
- **Inspection:** The ongoing work is regularly evaluated to ensure that the project is on the right track.
- **Adaptation:** Adjustments are made quickly based on feedback and newly identified priorities.

b. Roles in Scrum

The main roles within the Scrum team are as follows:

- **Product Owner:**
Mr. Filipe Fidalgo— He will be responsible for defining the product vision, prioritizing the features to be developed, and ensuring that the team focuses on the most important objectives for the project.
- **Scrum Master :**
Mr. Filipe Fidalgo— He will also play the role of Scrum Master, ensuring that the team follows Scrum practices, overcomes any obstacles encountered, and continuously improves its work processes.
- **Development Team:**
Lina Mosrati will transform the product requirements into concrete and deliverable features.

IV. Requirements Specification

1. Functional requirements

The project management system will include the following features:

- Creation and management of projects with tasks and subtasks.
- Assignment of team members to each task.
- Definition of priorities and deadlines for each task.
- Management of resources allocated to each project.
- Proposal of an optimal scheduling of tasks to minimize time and costs.
- Tracking of task progress with customizable statuses (in progress, completed, postponed).
- Visualization of deadlines and milestones in an integrated calendar.
- Search and filtering system for quick navigation between tasks.

2. Non-Functional Requirements

- **Security:** Ensures robust authentication to protect user information.
- **Usability:** User-friendly interface design and ease of use.
- **Scalability:** Ability to handle a growing number of users and data.
- **Compatibility:** Operates on all major browsers and devices.
- **Ease of Use:** Intuitive interface with a user guide available.
- **Availability:** Ensures continuous access for users, operational 24/7.

3. Dynamic Modeling

i. Key Actors of the System

- Administrator (Admin)
 - **Description:** The administrator is the person with the highest rights on the platform. They are responsible for the overall management and configuration of the system.
 - **Roles and Responsibilities:**
 - Manage users and their roles (add, modify, delete).
 - Ensure system maintenance and security.
- Project Manager
 - **Description:** The project manager is responsible for the daily management of projects. They coordinate activities, track task progress, and allocate resources.
 - **Roles and Responsibilities:**
 - Create, modify, and close projects.
 - Define tasks and subtasks, as well as deadlines for each task.
 - Assign tasks to team members.
 - Track the progress of tasks and projects.
 - Generate and analyze performance reports.
- Team Member
 - **Description:** Team members are the users who work on the tasks assigned as part of a project.
 - **Roles and Responsibilities:**
 - Receive and accept assigned tasks.
 - Update the status of tasks (in progress, completed, postponed).
 - Consult reports related to their tasks.
- Client
 - **Description:** Clients or partners may have limited access to the platform to track the status of projects relevant to them.
 - **Roles and Responsibilities:**
 - Consult the progress of assigned projects.
 - Receive reports on project status.

V. Sprints

1. Sprint 1

i. Backlog

Name of Sprint	Actors	User Story	Acceptance Criteria	Priority	Estimation
Profile Management	Administrator	As an administrator, I want to add a new user with predefined roles in order to manage access to the platform.	<ul style="list-style-type: none"> ✓ The administrator can add a user with predefined roles. ✓ The administrator receives a confirmation after adding a user. 	High	4 days
		As an administrator, I want to modify the information of an existing user in order to update their access or roles on the platform.	<ul style="list-style-type: none"> ✓ The administrator can modify a user's information. ✓ The administrator receives a confirmation after modifying a user. 	High	5 days
		As an administrator, I want to delete a user in order to revoke their access to the platform.	<ul style="list-style-type: none"> ✓ The administrator receives a confirmation after deleting a user. 	Medium	3 days

Name of Sprint	Actors	User Story	Acceptance Criteria	Priority	Estimation
Project Management	Project manager	As a project manager, I want to create a new project with details such as name, description, start date, and end date in order to plan the work effectively.	<ul style="list-style-type: none"> ✓ The project manager can create a project by providing the name, description, start date, and end date. ✓ The project appears in the list of active projects. 	High	2 days
		As a project manager, I want to modify the information of an existing project in order to reflect changes in resource management or objectives.	<ul style="list-style-type: none"> ✓ The project manager can modify the name, description, start date, and end date of an existing project. ✓ The changes are saved and immediately visible. 	High	6 days
		As a project manager, I want to close a completed project in order to archive it for future reference and remove it from the list of active projects.	<ul style="list-style-type: none"> ✓ The project manager can close a project. ✓ The project is removed from the active projects and appears in the archives for future reference. 	Medium	4 days

Sprint 3

i. Backlog

Name of sprint	Actors	User Story	Acceptance Criteria	Priority	Estimation
Task Management	Team Member	As a team member , I want to define tasks with detailed descriptions and deadlines, to ensure a good distribution of work.	<ul style="list-style-type: none"> ✓ The team member can create tasks with detailed descriptions. ✓ The team member can set deadlines for each task. 	High	6 days
		As a team member, I want to assign tasks to one or more team members, to ensure a good distribution of work.	The team member can assign tasks to one or more team members.	High	5 days
		As a team member, I want to update the status of the tasks assigned to me to reflect the progress of my work.	The team member can change the status of a task (in progress, completed, postponed).	Medium	1 day

Name of sprint	Actors	User Story	Acceptance Criteria	Priority	Estimation
Resource Management	Project Manager	As a project manager , I want to add resources in order to manage project resources efficiently.	✓ The project manager can create a new resource with a name, type, and details.	High	6 days
		As a project manager , I want to edit existing resources in order to update the information if necessary.	✓ The project manager can edit the information of an existing resource.	High	3 days
		As a project manager , I want to delete unused resources in order to keep the list of resources up to date.	✓ The project manager can delete an existing resource.	High	1 days
	Team Member	As a team member , I want to assign a resource to a task to use in completing that task.	<ul style="list-style-type: none"> ✓ The team member can select an existing resource and assign it to a task. ✓ The team member can view the resources already assigned to a task. 	Medium	2 days

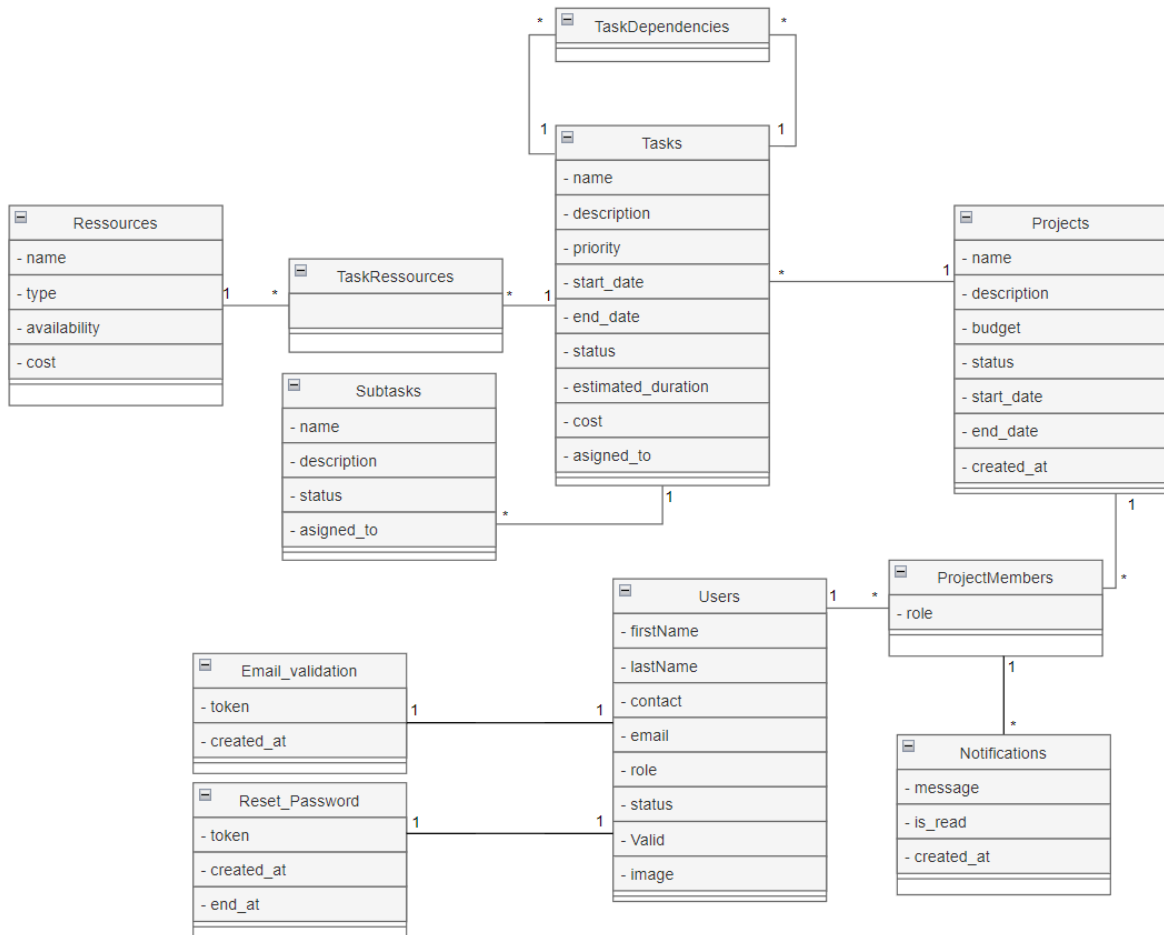
4. Sprint 4

i. Backlog

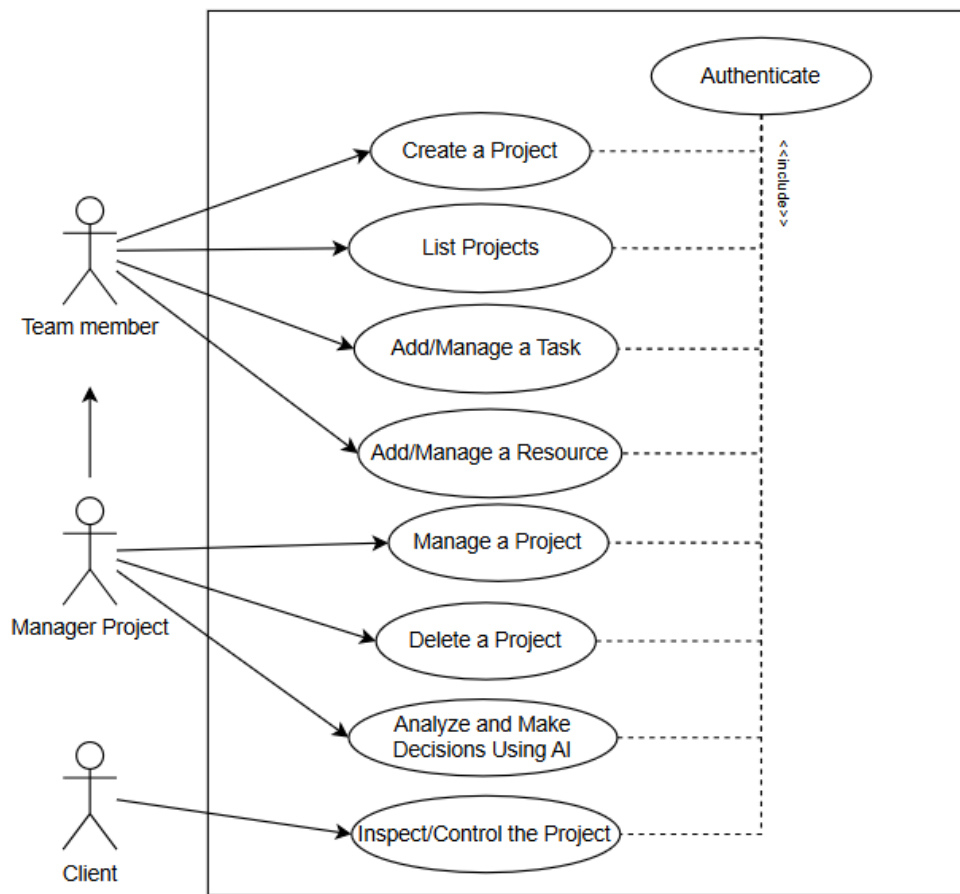
Name of Sprint	Actors	User Story	Acceptance Criteria	Priority	Estimation
Project Tracking	Project manager	As a project manager, I want to generate performance reports to assess the progress of the projects.	✓ The project manager can generate detailed reports on task progress and team member performance.	High	4 days
		As a project manager, I want to export reports in various formats to facilitate data sharing and analysis.	✓ The project manager can export the generated reports in various formats (PDF, Excel).	Medium	4 days
	Client	As a client, I want to view the progress of the projects that concern me to stay informed about the status of the work.	✓ The client can access a dashboard displaying the current status of the projects.	High	2 days
		As a client, I want to receive periodic reports on the progress of the projects to stay informed and provide feedback.	<ul style="list-style-type: none"> ✓ The client receives periodic reports on the progress of the projects. ✓ The client has the option to leave comments on the reports received. 	High	2 days

VI. Conceptual model

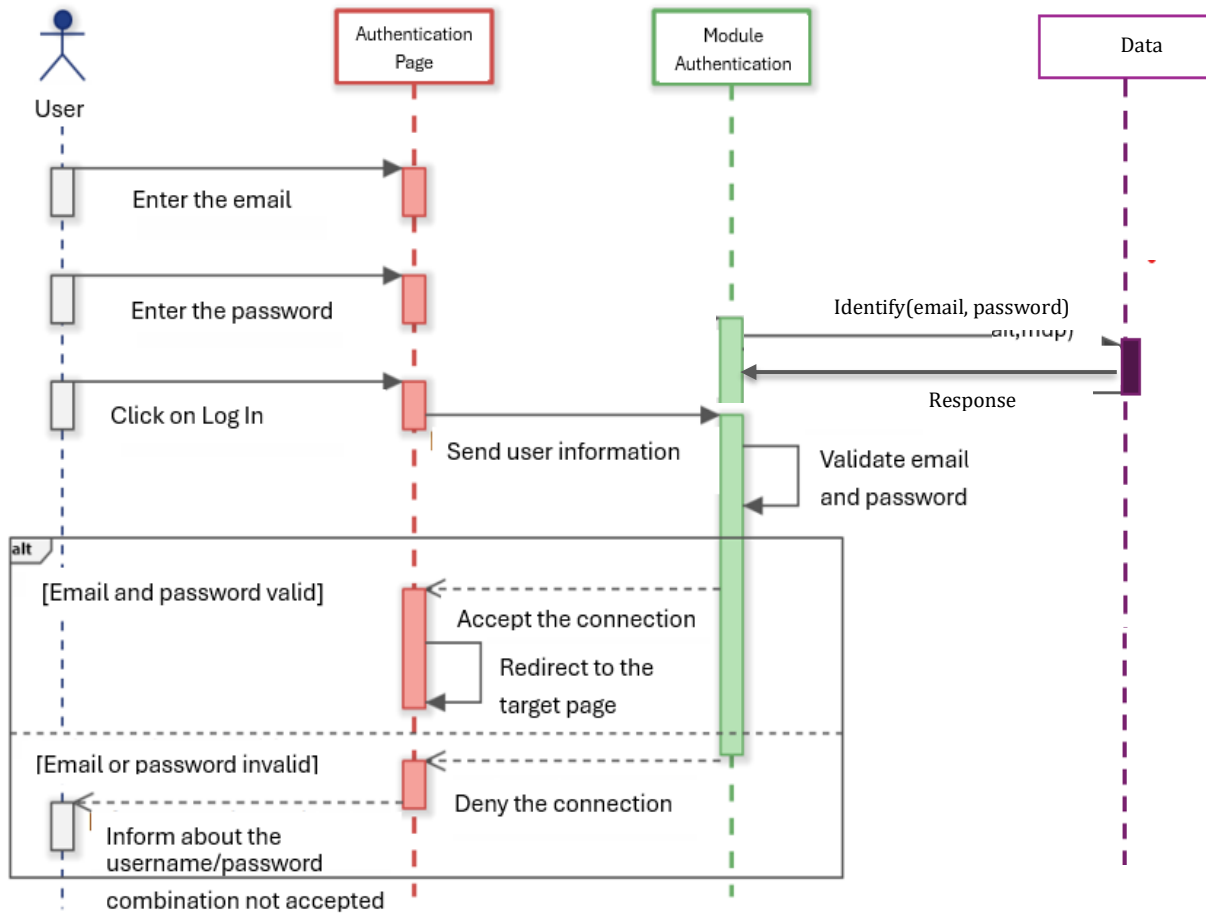
1. Global Class Diagram



2. Global Use Case Diagram



3. Sequence Diagram



VII. Project Monitoring

1. My Role

I will ensure the complete technical development of the project under the supervision of **Mr. Filipe Fidalgo**, who will act as a mentor and advisor.

2. Communication Methods

Communication will primarily take place via email and regular meetings with **Mr. Filipe Fidalgo** to assess the project's progress and discuss necessary adjustments.

3. Key Project Deadlines

- **Project Initialization:** September 29, 2024
- **Development Phase:** October 12, 2024, to December 31, 2024
- **Testing and Validation:** January 1, 2024, to January 16, 2024
- **Final Delivery:** January 17, 2024