SOFTWARE PLANNING AND UML

for

ESPOLTEL HIRING MANAGER

Version 1.0

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Submitted to: Francisco Ramirez

January 15, 2025

Revision History

Name	Date	Reason for Changes	Version
Team 3	2025-1-10	Initial draft	1.0

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1 Introduction

1.1 Summary

This document presents a comprehensive framework for the design, planning, and execution of the ESPOLTEL HIRING MANAGER system. This product integrates a robust risk management strategy, a detailed project execution timeline, and a structured Sprint Backlog plan. Through the inclusion of Unified Modeling Language (UML) diagrams, we provide a thorough representation of both the static and behavioral logic of the system, ensuring that the architecture adheres to SOLID principles and eliminates implementation inefficiencies.

Our primary objective is to meticulously define the planning and breakdown of the system's static structure, logical flow, behavioral processes, implementation strategies, and activity sequences. These components collectively support the realization of a user-centric, scalable, and maintainable product.

1.2 Key features and Objetives

The ESPOLTEL HIRING MANAGER product is designed to streamline and enhance the recruitment process, leveraging a combination of web and mobile modules for maximum efficiency. Key objectives include:

1. **Risk Mitigation:** Developing a proactive risk management plan to address potential challenges in implementation and deployment.

2. **Comprehensive Planning:** Structuring the project execution into manageable phases using Agile methodologies.

3. **System Design:** Crafting static and behavioral UML diagrams to visualize the architecture, interactions, and workflows.

4. **Adherence to SOLID Principles:** Ensuring maintainability and scalability by avoiding anti-patterns and promoting clean code practices.

2 Risk management, product and sprint backlogs and scheduling

2.1 Risk management

In this section, we will identify, quantify, and classify the various risks that may arise during the software development process. Additionally, we will provide a detailed assessment of the likelihood of occurrence, the potential impact of each risk, and the corresponding protocols to be followed in the event they materialize.

Description	Probability Range
Not Probable: The event is highly unlikely to occur.	0% - 20%
Low Probability: The event is unlikely but possible.	21% - 40%
Moderate Probability: The event has an even chance of occurring.	41% - 60%
High Probability: The event is likely to occur.	61% - 80%
Very High Probability: The event is almost certain to occur.	81% - 100%

Table 2.1: Probability of Occurrence

Impact Level	Description
Low Impact	Minimal effect on the project. No significant changes required.
Moderate Impact	Some delays or adjustments needed but manageable within the team.
High Impact	Significant disruptions, requiring immediate attention and resource allocation.
Critical Impact	Severe consequences on project delivery, with major delays or failure possible.

Table 2.2: Impact Levels

The following table outlines the identified risks associated with the project, including their probability of occurrence, potential impact, and the corresponding action protocol.

Id	Name	Probability	Impact	Action Protocol
001	Changes in requirements after development completion	High Probability	High Impact	Establish a communication protocol to clarify that no new requirements will be accepted after the design phase is finalized.
002	Discovery of implicit requirements not considered in the design	Very High Probability	High Impact	Accept and address the risk by updating the design and implementing the missing requirements.
003	Need for developer training	High Probability	High Impact	Provide immediate training on the required frameworks to minimize delays and ensure smooth development progress.
004	Difficulty understanding prior implementation, causing delays	Low Probability	Critical Impact	Reduce the probability by consulting previous implementers to gain insights into the system before development begins.
005	Schedule misalignment affecting task timelines	Not Probable	High Impact	Mitigate the risk by redistributing tasks and holding regular progress meetings to stay on track.
006	Performance drop due to prior monolithic architecture	Low Probability	High Impact	Accept the risk, inform the client, and propose alternative solutions to improve performance.
007	Database schema not designed for extensions	Low Probability	Moderate Impact	Accept the risk and adapt the existing schema to accommodate the new requirements.
008	Insufficient documentation provided by the client	High Probability	Critical Impact	Reduce probability by maintaining active communication with the client to obtain necessary documentation.

Table 2.3: Risk Assessment and Action Protocols

2.2 Product backlog

ID	Priority	Dependencies	Item	Estimation (hours)
PB1	0	None	Research Spring Boot platform: Investigation of the architecture, modules, and functionalities of Spring Boot relevant to the project. Includes feasibility evaluation and the creation of a document with findings and recommendations.	4
PB2	0	None	Definition of the database schema: Design the database schema, including the definition of tables, relationships, and constraints. An Entity-Relationship diagram and the SQL script for database creation will be generated.	8

ID	Priority	Dependencies	Item	Estimation (hours)
PB3	1	PB1, PB2	**As** a user of ESPOLTEL Hiring Manager, **I want** to create my own account **so that** I can access all controls related to my role, ensuring my information and permissions are separate from other users.	6
PB4	1	PB3	**As** a user of ESPOLTEL Hiring Manager, **I want** to verify my email address upon registration **so that** I can ensure secure access to the system and confirm my identity.	8
PB5	2	PB3	**As** a user of ESPOLTEL Hiring Manager, **I want** to create my own account using the mobile app, **so that** I can access all controls corresponding to my role, and ensure that my information and permissions are separate from those of other users.	6
PB6	1	PB5	**As** a user of ESPOLTEL Hiring Manager, **I want** to verify my email address when registering from my mobile device, **so that** I can ensure secure access to the system and confirm my identity.	10
PB7	1	PB3	**As** a user of ESPOLTEL Hiring Manager, **I want** to log in securely using my credentials **so that** I can access features and project management tools.	4
PB8	1	PB7	**As** a user of ESPOLTEL Hiring Manager, **I want** to select my role (Aspirant, Project Manager, Project Director, or HR member) before logging in **so that** I am directed to the appropriate login process and access functionalities specific to my role.	6
PB9	2	PB7	**As** a user of ESPOLTEL, **I want** to securely log in to the system using my credentials on my mobile device, **so that** I can access the appropriate functions and features according to my user role.	5
PB10	2	PB8	**As** a user of ESPOLTEL, **I want** to be able to select my role (Aspirant, Project Manager, Project Director, or HR member) on my mobile device before logging in, **so that** I can be directed to the specific features and functionalities relevant to my role.	6
PB11	3	PB3	**As** a user of ESPOLTEL Hiring Manager, **I want** to be able to recover my password through a secure and efficient process if I forget it, **so that** I can regain access to the system and continue with my responsibilities without delay.	5

ID	Priority	Dependencies	Item	Estimation (hours)
PB12	3	PB12	**As** a user of ESPOLTEL Hiring Manager, **I want** to be able to recover my password through a secure and efficient process by email from my mobile device if I forget it, **so that** I can regain access to the system and continue with my responsibilities without delay.	6
PB13	2	PB1,PB2	**As** an aspirant or manager, **I want** to have access to contracts or confidential agreements pending my signature, **so that** I can review and sign them digitally within the web application.	12
PB14	1	P13	**As** an aspirant, **I want** to upload my digital certificate to the platform **so that** I can sign documents such as contracts or confidentiality agreements for the projects I have applied to.	5
PB15	1	P13	**As** a manager, **I want** to upload my digital certificate to the platform **so that** I can sign multiple documents such as contracts or confidentiality agreements for the projects I manage.	5
PB16	1	P14	**As** an aspirant, **I want** to digitally sign my contract and confidentiality agreement **so that** I can complete the paperwork required for my hiring process.	12
PB17	1	P15	**As** a manager, **I want** to digitally sign multiple documents, such as contracts or confidentiality agreements, simultaneously, **so that** I can save time and work more efficiently.	12
PB18	3	PB16	**As** an aspirant, **I want** to view the contracts of the projects I have applied for and that are currently active, **so that** I have a clear view of the agreements I have signed.	6
PB19	3	PB18	**As** an aspirant, **I want** to download the contracts of the projects I have applied for and that are currently active, **so that** I have a record of the agreements I have signed.	4
PB20	3	PB16	**As** an aspirant, **I want** to view the contracts of the projects I have applied for and that are currently active on my smartphone, **so that** I have a clear view of the agreements I have signed.	6
PB21	3	PB20	**As** an aspirant, **I want** to download the contracts of the projects I have applied for and that are currently active on my smartphone, **so that** I have a record of the agreements I have signed.	4
PB22	1	PB16	**As** an HR member, **I want** to validate the digital signatures of aspirants **so that** I can ensure contracts and agreements are formalized.	8
PB23	2	PB3	**As** a project manager, **I want** to create a project by defining its name, description, start date, end date, and type, **so that** the project's objectives and timeline are clearly established.	12

ID	Priority	Dependencies	Item	Estimation (hours)
PB24	2	PB23	**As** a project manager, **I want** to define roles and profiles required for the project, including necessary skills and experience for each profile, **so that** aspirants can understand the requirements and apply to suitable positions.	6
PB25	3	PB24	**As** a Director, **I want** to recommend an aspirant who has previously worked for ESPOLTEL for a role in a project, based on their past performance and experience, **so that** I have a worker I trust in my project.	8
PB26	2	PB24	**As** an HR member, **I want** to validate the profiles created by project directors **so that** I can edit, approve, the profiles and positions defined for a project, ensuring they align with the company's standards and requirements.	12
PB27	2	PB23	**As** a project manager or director at ESPOLTEL, **I want** to monitor on my smartphone the projects under my supervision, **so that** I can maintain better control and make informed decisions.	8
PB28	2	PB23	**As** a Director or Manager, **I want** to view the resources and budget assigned to my project, **so that** I can track project expenses and resource utilization.	10
PB29	1	PB8	**As** an aspirant, **I want** to apply for a position in a project of interest where I meet the required profile **so that** I can obtain the desired position.	10
PB30	2	PB29	**As** an aspirant, **I want** to cancel my postulation for a specific role or hiring profile, **so that** I can withdraw from a recruitment process if my circumstances change.	8
PB31	2	PB8, PB29	**As** an HR member, **I want** to schedule interviews with aspirants, specifying the date, time, and interviewer, **so that** the selection process can be efficiently conducted.	10
PB32	2	PB31	**As** a HR member, **I want** to record interview results and observations, including scores and comments, **so that** there is a formal record of each aspirant's evaluation.	8
PB33	2	PB24, PB29	**As** an HR member, **I want** to verify the requirements based on the information of an aspirant, **so that** I can ensure they meet the necessary qualifications for a project.	8
PB34	3	PB32	**As** an HR member, **I want** to add private comments in aspirants' postulations **so that** I can keep a record of observations and notes during the selection process.	4

ID	Priority	Dependencies	Item	Estimation (hours)
PB35	2	PB32, PB33, PB34	**As** an HR member, **I want** to select the best aspirants based on interview results and fulfilled requirements, **so that** I can identify the most suitable candidates for each role.	10
PB36	2	PB8	**As** an HR member, **I want** to create and manage forms for pre-hiring and hiring processes, defining mandatory fields and document uploads, **so that** aspirants can provide the necessary information.	15
PB37	2	PB8	**As** an HR member, **I want** to upload templates for contracts and agreements, **so that** appropriate templates are available for generating personalized documents for aspirants.	12
PB38	2	PB29, PB36	**As** an aspirant, **I want** to upload my personal documents (such as CV, ID, certificates, etc.) and relevant information **by completing forms defined by HR, so that** I can fulfill postulation requirements.	8
PB39	2	PB37	**As** an HR member, **I want** to generate contracts and agreements from templates, **so that** I can save time in creating personalized documents.	12
PB40	2	PB32, PB33, PB34	**As** an HR member, **I want** to view aspirants by specific skills and experience, **so that** I can make it easier to select candidates who meet the project requirements.	4
PB41	2	PB8	**As** a Director, HR Member, or Manager, **I want** to view the hires or personnel associated with a project, **so that** I have an overview of the team composition and recruitment progress.	10
PB42	2	None	**As** a user of ESPOLTEL Hiring Manager, **I want** to be able to search and filter information across the platform, including projects, aspirants, roles, documents, and other relevant data, **so that** I can quickly find and focus on the data I need.	8
PB43	1	PB10	**As** a user of the ESPOLTEL Hiring Manager mobile app, **I need** to receive notifications for any important events in the recruitment process, **so that** I can stay informed and respond promptly.	12
PB44	2	PB8	**As** an aspirant, **I want** to monitor on my smartphone the projects I have applied for, **so that** I can stay updated on their progress and better manage my involvement.	10
PB45	2	PB31	**As** an aspirant, **I want** to receive notifications about my scheduled interviews, including reminders and updates, **so that** I can be prepared and attend interviews on time.	8

ID	Priority	Dependencies	Item	Estimation (hours)
PB46	4	PB45	Testing and deployment	24

Table 2.4: Product Backlog of ESPOLTEL Hiring Manager

2.3 Sprint backlog

Product Backlog Item	User Story	Tasks	Assigned To
PB1	Research Spring Boot platform (4 hours)	-Research architecture, modules, and functionalities of Spring Boot. - 3 hours -Feasibility evaluation of this framework. - 1 hour	- Jeremy Poveda, Diego Flores, Ariana Palacios - Alex Vizuete, Jose Ramos
PB2	Definition of the database schema (8 hours)	-Design the database schema (tables, relationships, and constraints). - 4 hours -Generate Entity-Relationship diagram and SQL script. - 4 hours	- Diego Flores, Ariana Palacios - Jeremy Poveda, Alex Vizuete
PB3	**As** a user of ESPOLTEL Hiring Manager, **I want** to create my own account **so that** I can access all controls related to my role, ensuring my information and permissions are separate from other users. (6 hours)	- Design UI for user registration (web). - 2 hours - Implement backend logic for user registration and role management. - 3 hours - Database integration for user accounts. - 1 hour	- Jeremy Poveda - Jose Ramos - Ariana Palacios
PB4	**As** a user of ESPOLTEL Hiring Manager, **I want** to verify my email address upon registration **so that** I can ensure secure access to the system and confirm my identity. (8 hours)	- Implement email sending functionality (e.g., using Spring Mail). - 3 hours - Create email verification endpoint. - 3 hours - Integrate email verification with registration flow. - 2 hours	- Alex Vizuete - Diego Flores - Jeremy Poveda
PB5	**As** a user of ESPOLTEL Hiring Manager, **I want** to create my own account using the mobile app, **so that** I can access all controls corresponding to my role, and ensure that my information and permissions are separate from those of other users. (6 hours)	- Design UI for user registration (mobile). - 2 hours - Implement backend logic for user registration and role management (mobile). - 3 hours - Database integration for user accounts (mobile). - 1 hour	- Diego Flores - Jose Ramos - Ariana Palacios

Product Back- log Item	User Story	Tasks	Assigned To
PB6	**As** a user of ESPOLTEL Hiring Manager, **I want** to verify my email address when registering from my mobile device, **so that** I can ensure secure access to the system and confirm my identity. (10 hours)	- Adapt email sending functionality for mobile. - 3 hours - Create email verification endpoint (mobile). - 4 hours - Integrate email verification with mobile registration flow. - 3 hours	- Alex Vizuete - Jeremy Poveda - Jose Ramos
PB7	**As** a user of ESPOLTEL Hiring Manager, **I want** to log in securely using my credentials **so that** I can access features and project management tools. (4 hours)	- Design UI for user login (web). - 1 hour - Implement backend logic for authentication. - 2 hours - Implement session management. - 1 hour	- Jose Ramos - Ariana Palacios - Alex Vizuete
PB8	**As** a user of ESPOLTEL Hiring Manager, **I want** to select my role (Aspirant, Project Manager, Project Director, or HR member) before logging in **so that** I am directed to the appropriate login process and access functionalities specific to my role. (6 hours)	- Design UI for role selection. - 3 hours - Implement role-based access control logic. - 3 hours	- Diego Flores - Jeremy Poveda
PB9	**As** a user of ESPOLTEL, **I want** to securely log in to the system using my credentials on my mobile device, **so that** I can access the appropriate functions and features according to my user role. (5 hours)	- Design UI for user login (mobile). - 2 hours - Implement backend logic for authentication (mobile). - 2 hours - Implement session management (mobile). - 1 hour	- Jeremy Poveda - Ariana Palacios - Alex Vizuete
PB10	**As** a user of ESPOLTEL, **I want** to be able to select my role (Aspirant, Project Manager, Project Director, or HR member) on my mobile device before logging in, **so that** I can be directed to the specific features and functionalities relevant to my role. (6 hours)	- Design UI for role selection (mobile). - 3 hours - Implement role-based access control logic (mobile). - 3 hours	- Diego Flores - Jose Ramos

Product Backlog Item	User Story	Tasks	Assigned To
PB11	**As** a user of ESPOLTEL Hiring Manager, **I want** to be able to recover my password through a secure and efficient process if I forget it, **so that** I can regain access to the system and continue with my responsibilities without delay. (5 hours)	- Design UI for password recovery. - 2 hours - Implement backend logic for password recovery. - 3 hours	- Jose Ramos - Ariana Palacios
PB12	**As** a user of ESPOLTEL Hiring Manager, **I want** to be able to recover my password through a secure and efficient process by email from my mobile device if I forget it, **so that** I can regain access to the system and continue with my responsibilities without delay. (6 hours)	- Design UI for password recovery (mobile). - 2 hours - Implement backend logic for password recovery, including email sending (mobile). - 3 hours - Integrate password recovery with mobile login flow. - 1 hour	- Diego Flores - Ariana Palacios - Alex Vizuete

Table 2.5: Sprint 1 of ESPOLTEL Hiring Manager

2.4 Scheduling

3 Static UML

3.1 Use Case - Web Module

3.2 Use Case - Mobile Module

4 Behavior UML

5 Individual Contributions

Student's Names	Contributions
Jeremy Rodrigo Poveda Gorotiza	Project Scope, Introduction, User Stories, Creation of GitHub Repository, prototype: web application for director and managers
Diego Fernando Flores Rengifo	Non functional requirements both Web and Mobile Application, prototype in figma: Authentification module and aspirants Platform
José David Ramos Rios	Product Overview, Product Features, Module Featuring: Mobile App, First Preview of Module Featuring: Web Application, and prototype in figma of Mobile App
Ariana Valentina Palacios Saenz	Revision, User Stories, and prototyping flows and module integration
Alex Javier Vizuete Pereira	Web Application Modules Breakdown, Mobile Application Modules Breakdown, prototype in figma: aspirants Platform, screens, and flow of postulation process

Table 5.1: Responsibilities of each member of team 3

6 Appendix

6.1 Appendix A: Github Repository

The versioning of the project prototype has been managed using Github. You can find it through the following link ESPOLTEL's versioning project:
Repository link

6.2 Appendix B: Commitment Agreement

6.3 Appendix C: Evidence of requirements gathering

Initial interview for requirements gathering with the client

Template Questions for the Interview

1. Are "Human Talent" and "Human Resources" distinct roles within the company?
   If yes, is the Human Resources area responsible for generating documents such as contracts and confidentiality agreements?

   What we understand is as follows:
Human Talent:

- Requests documents and information from aspirants.

- Verifies that aspirants meet the position requirements.

- Sends the data of candidates who meet the requirements to Human Resources.

Human Resources:

- Generates documents such as contracts and confidentiality agreements.

- Sends the generated contracts or agreements to the applicant.

- Verifies the applicant's signature.

- Sends the documents to managers for their signatures.

2. Must the contracts and confidentiality agreements be signed not only by the managers and aspirants but also by the project director?

3. In addition to requesting basic information such as names, surnames, cell phone numbers, etc., should the Human Talent area request specific documents according to the profile, such as copies of the ID, voting card, etc.?

4. Who is responsible for entering the templates of the contracts or confidentiality agreements into the system: Human Talent or Human Resources?

5. Should these templates be created directly within the system? If yes, would the data be in plain text, such as names, surnames, ID numbers, and the positions for electronic signatures (of managers, aspirants, and possibly project directors)?

6. Would the stages of the applicant acceptance process be as follows?

- Application for a profile by submitting information (plain text data and documents). Waiting for a response from Human Talent to verify if the applicant meets the requirements. If the applicant meets the requirements, waiting for the contract and confidentiality agreements to sign, generated by Human Resources.

- Signing the documents.

- Waiting for signature validation by Human Resources.

- Waiting for signatures from managers and directors.

- Confirmation of participation in the project.