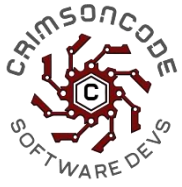
Software Requirement Specification

Project: Integrated Environmental Management System "SIMA" for the management of environmental projects of the environmental consulting company Biosigma Ambiental

Revision 3.0



May

Document Summary Sheet

Date	Revision	Author	Verified quality department.
01/05/2025	3.0	Mateo Llumigusin, Gabriel López, Mateo Medrandada	

Document validated by the parties on:

By the client	By the supplier company

Content

1. Introduction

1.1 Purpose

This document seeks to define the functional and non-functional requirements for the SIMA (Integrated Environmental Management System) web application requested by Biosigma. CIA. LTDA., which will allow the company to manage, view, and update environmental projects safely and efficiently.

1.2 Scope

The system will allow for creation, reading, updating, and deletion (CRUD) operations for the following elements: projects, legal permits associated with the project, environmental management plans, activities within each plan, monitoring, reminders, users, and roles.

In addition, it will facilitate the organized and easily accessible viewing of stored information, ensuring confidentiality control over information through user profiles with different access levels.

1.3 Personnel involved

Name	Gabriel López
Role	Scrum Master
Professional category	Software Engineer
Responsibilities	Monitor and manage tasks during the course of development
Contact information	gmlopez11@espe.edu.ec
Approval	

Name	Mateo Llumigusin
Role	Scrum Team
Professional category	Software Engineer
Responsibilities	Monitoring proposed tasks and designing innovative ideas.
Contact information	msllumigusin@espe.edu.ec
Approval	

Name	Mateo Medranda
Role	Product Owner
Professional category	Software Engineer
Responsibilities	Meetings and direct contact with the client to gather requirements
Contact information	mdmedranda1@espe.edu.ec
Approval	

1.4 Definitions, acronyms and abbreviations

Name	*Description*
CHASM	Integrated System for Environmental Management
ERS	Software Requirements Specification
RF	Functional Requirement
RNF	Non-Functional Requirement
FTP	File Transfer Protocol
CRUD	Principle for creating, reading, updating, and deleting data

1.5 References

Reference	*Qualification*	*Route*	*Date*	*Author*
(IS 1998)	*Requirements Specification according to the standard IEEE 830*	*https://www.fdi.ucm.es/profesor/gmendez/docs/is0809/ieee830.pdf*	*08/22/2008*	Ucm.es

2 Overview

2.1 Product Outlook

The SIMA system will be developed as a standalone web application. It will feature modern frameworks such as Bootstrap 5.0 and JavaScript (AJAX), and will have a database connection via PHP.

It is primarily intended for use on computers with modern browsers, but will also feature responsive technology geared toward mobile devices or smaller screens to avoid compatibility issues and ensure product quality.

2.2 Product functionality

Within the system's functionalities, permissions can vary depending on the customization when creating a new role, so the present use cases are based on three specific users and bases within the program.

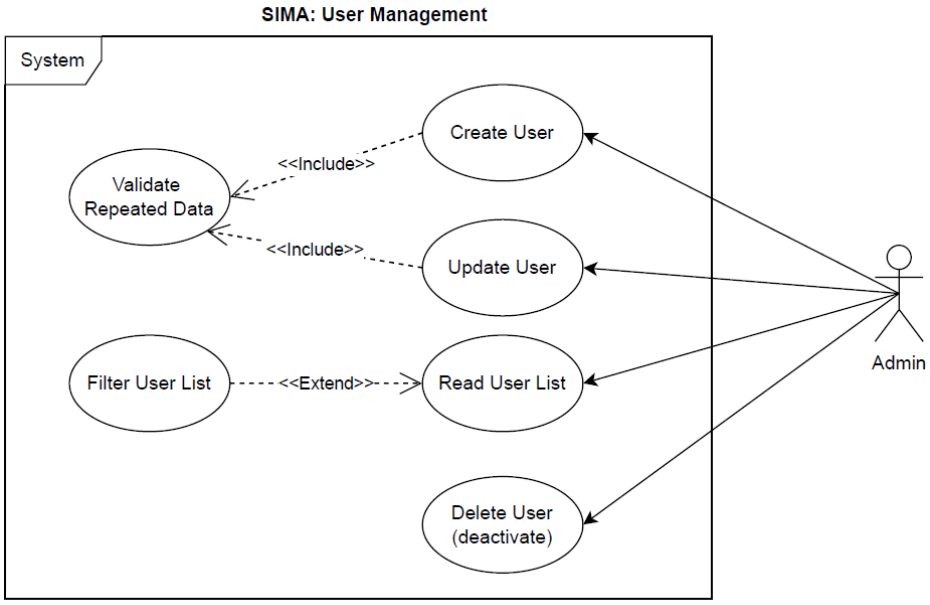


Illustration1Use Case Diagram for User Management

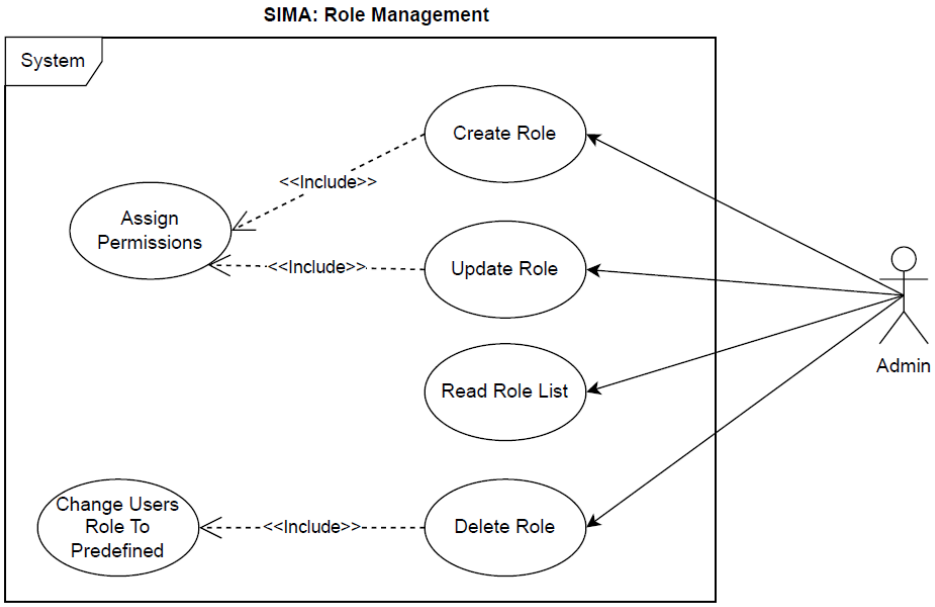


Illustration2Use Case Diagram for Role Management

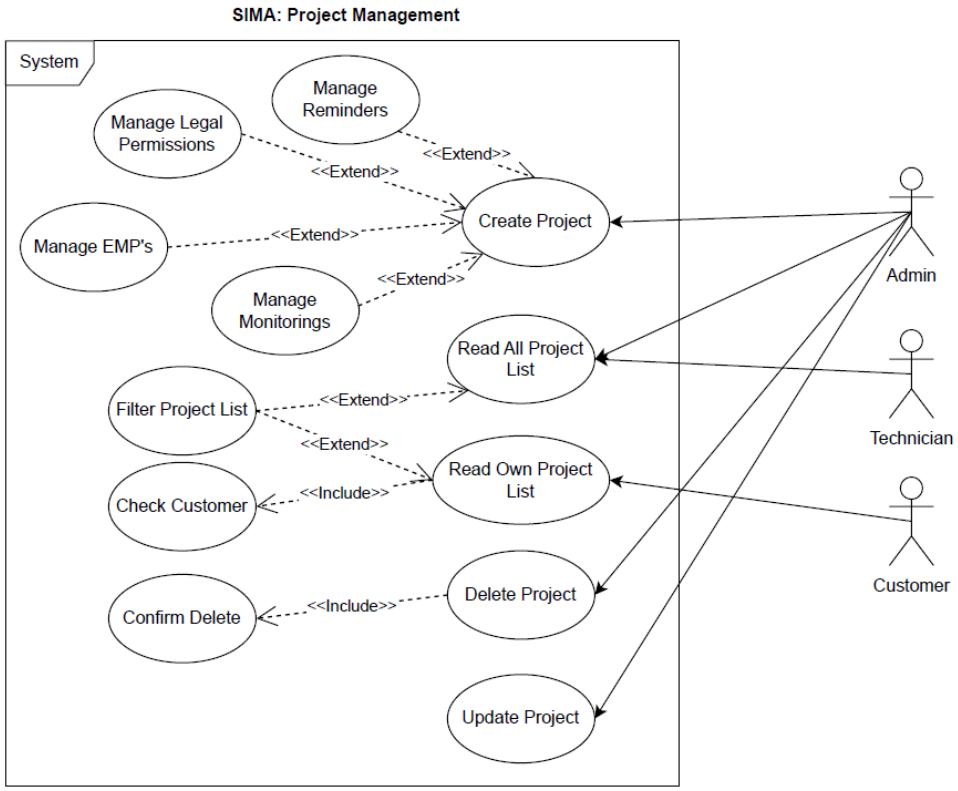


Illustration3Use Case Diagram for Project Management

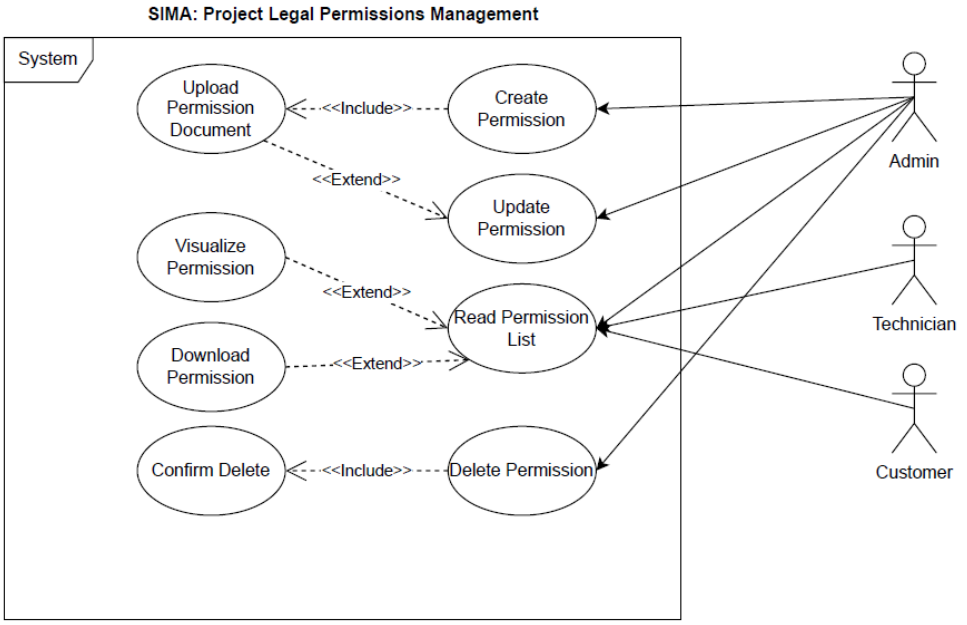


Illustration4Use case diagram for managing legal permissions within a project

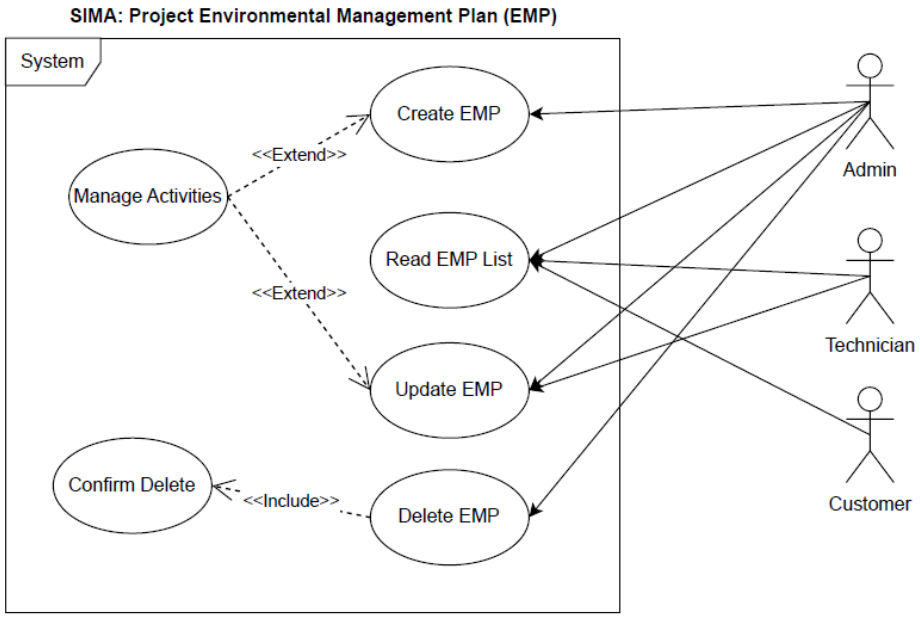


Illustration5Use Case Diagram for Environmental Management Plan Management

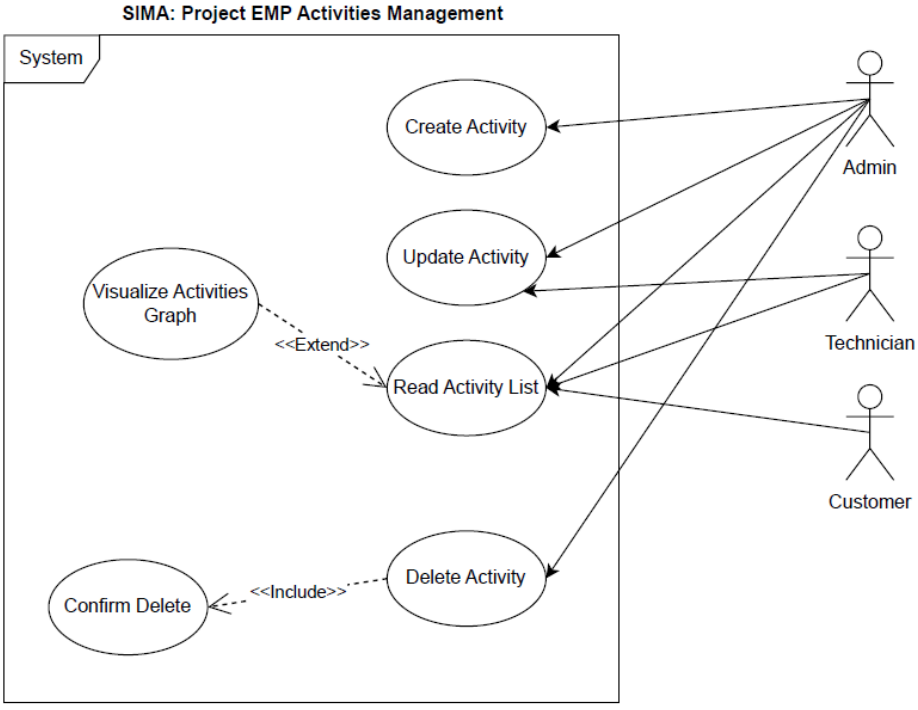


Illustration6Use Case Diagram for managing activities within the EMP

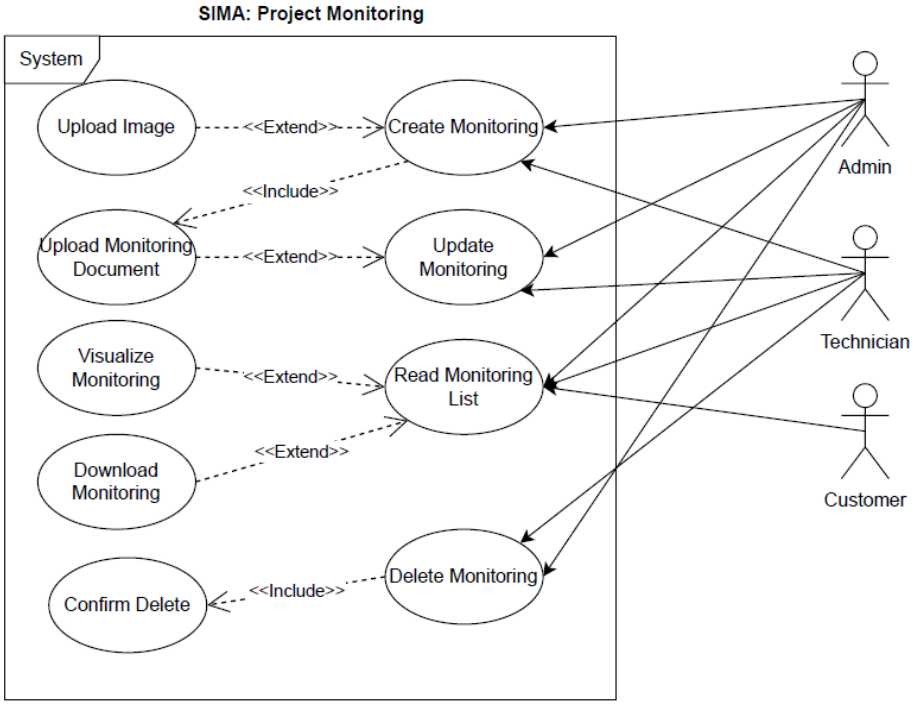


Illustration7Use Case Diagram for Project Monitoring Management

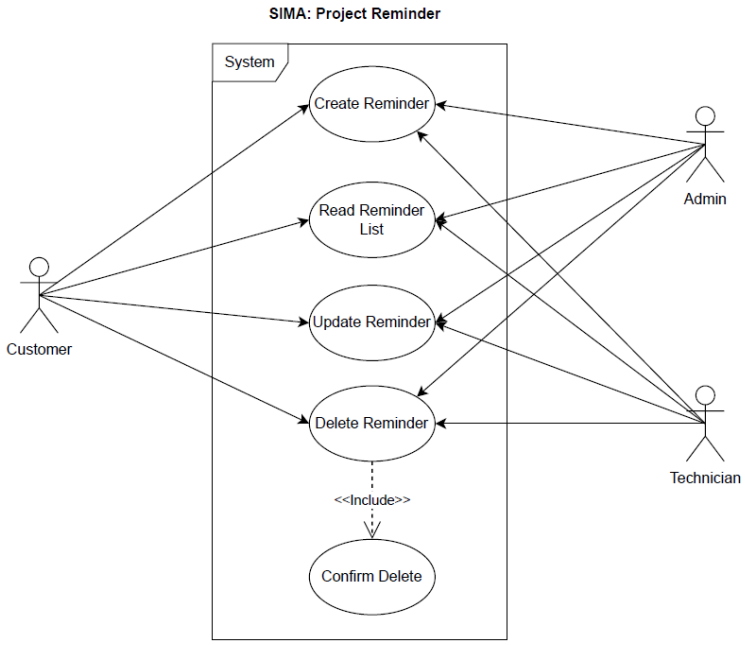


Illustration8Use Case Diagram for Project Reminder Management

Note 1: Use case diagram from the consulting processes

For a better understanding of the system, it will consist mostly of input forms and stored data view forms, with the following sections.

1. **Project Management Panel:**

Here you'll see projects, whether completed or in progress, with access to create a new record, an action handled only by the administrator.

2. **Project management section:**

It's a tool that allows users, especially employees, to manage everything related to a project, managed by tabs within a project with the following sections: legal permits, environmental management plans, activities for each plan, monitoring, reminders, and the relevant files for each case.

3. **Calendar section:**

In this section, you can view upcoming company events, including milestones for certain projects, as well as user-generated reminders.

4. **Action Control and Traceability:**

In this section, supervisors and administrators will be able to view a control of the actions performed by users to review processes and activities in the system.

2.3 User characteristics

User type	Administrator
Training	Level of administrative training and experience in business management.
Skills	Make business decisions, manage resources, and oversee processes at “Biosigma Ambiental.” Knowledge of environmental, legal, and scientific consulting procedures.
Activities	Define requirements, monitor project progress, and make important decisions about the development and implementation of project activities and procedures.

User type	Supervisor: Responsible for managing problems and suggestions.
Training	Training in administration and management of ecological procedures in projects.
Skills	Knowledge of environmental consulting procedures, specializing in the technical aspects of resolutions.
Activities	Manage documentation, manage communication between clients and technical team, and assist in administrative solutions for documents to be generated for projects.

User type	Technician: Personnel responsible for field research and reporting.
Training	Technical training in field research, with experience in conducting surveys and environmental considerations.

Skills	Technical skills in equipment installation, technical troubleshooting, and form creation.
Activities	Take measurements with the necessary equipment, generate reports for documentation in the environmental plan and activities carried out.

User type	Biosigma Clients
Training	Training in administration and management of a specific company, with little knowledge of ecological processes.
Skills	Knowledge of business and other areas related to the type of company to which you belong.
Activities	Continuously monitor the projects to which you belong.

2.4 Restrictions

Restrictions arising from system design and development include:

- Specific and legal regulations: The system must comply with the Organic Law on Personal Data Protection (LOPDP) for the storage of personal data in force in Ecuador since May 2023, and follow standards such as ISO/IEC 27001, which defines proper information security management.

- Software Restrictions: The software must be compatible with a Dropbox file management system (Optional), with connection to legacy projects within the platform.

- Compatibility Restrictions: The software will be limited to web-based development, limiting its deployment to current browsers.

- Hardware Restrictions: The product must be deployed in the cloud, limiting resources at the customer's discretion.

2.5 Assumptions and dependencies

Some of the key assumptions for this project include:

- Hardware Availability: It is assumed that the hardware necessary to implement the system will be available and compatible with the developed software.

- Operating System Compatibility: It is assumed that the current operating systems used by the company, in this case Windows 10-11, will continue to be supported with website updates.

- Human Resources Availability: It is assumed that the development team, technical support have some knowledge in technology

2.6 Foreseeable evolution of the system

Regarding the future evolution of the system, the following improvements and expansions are anticipated:

- Feature Updates: New features are expected to be added based on changing business needs and user feedback.

- Support for New Technologies: As new technologies develop, new methods of data storage will become available, such as the cloud and a database for users' personal data.

- Maintenance and Security: There will be a continuous focus on maintaining system security against new threats, which may include regular patching and security reviews, as well as security protocols for the transmission and generation of system data.

3 Specific requirements

3.1 Common interface requirements

This section will focus on detailing the user interfaces with the system, with the goal of providing a useful and enriching experience.

3.1.1 User interfaces

The “SIMA LayoutV2.0” document visually shows the page, the colors and how the data entry sections will look in the system, as well as conveniences for users.

3.1.2 Hardware interfaces

The system must be able to run efficiently on both high- and low-end computers, and it must also be optimized for efficient documentation generation.

3.1.3 Software interfaces

The system will be compatible with current web browsers and will utilize their components to optimize the user experience. It will be compatible with Google Chrome, Mozilla Firefox, Microsoft Edge, Safari, and derivatives, ensuring that visual and functional elements, such as buttons, menus, and forms, function correctly. The definition of the specific libraries and frameworks the system will utilize will be included, such as support for HTML5, CSS3, Bootstrap, and JavaScript.

3.1.4 Communication interfaces

To manage and send data from the system to the database, it will be necessary to use transmission protocols such as HTTPS, FTP, TCP/IP, among others, optimized for efficient and rapid data transfer and upload.

3.2 Functional Requirements

3.2.1 Functional requirement 1

Requirement number	RF1
Requirement name	Role Management
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The system must allow the creation of custom roles that restrict access to different sections of the web system by assigning permissions. The Administrator (with all permissions enabled) and Client (with permissions limited to viewing only the corresponding project) profiles must be preloaded.

Permissions must be aligned with the create, read, update, and delete (CRUD) operations of system records. That is, specific permissions must be defined for each section, such as: permission to insert projects, permission to update projects, permission to delete projects, and permission to view projects.

3.2.2 Functional requirement 2

Requirement number	RF2
Requirement name	User Management
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The system must allow users with the "Administrator" profile (or whoever has the corresponding permission) to register new users. To do so, they must complete a form with the following information: first name, last name, and ID number.

From the information entered, the system will automatically generate a username by combining the first and last name using a predefined algorithm (e.g., the first letter of the first name + the full last name, in lowercase).

The new user's initial password will be their ID number. However, upon first logging in, the system will require the user to change their password to ensure account security.

During the registration process, the administrator must also be able to assign a profile or role (Client, Technician, Supervisor, etc.) in a clear and intuitive way.

Finally, the system must offer full create, read, update, and delete (CRUD) operations for registered users, using logical (not physical) deletion to preserve data integrity.

The system must include a login based on a username and password. The login form will only contain these two fields, and end users will not be allowed to create accounts. Access will be restricted to those with credentials provided by the company.

3.2.3 Functional requirement 3

Requirement number	RF3
Requirement name	Login
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The system must allow access to the system through a login interface consisting of a form with the following fields: Username and password. It must also validate the role type of the logging in user to restrict access to certain tools.

Also, as a note, there will be no option to create an account from the login interface, but there will be a link to recover a forgotten password.

3.2.4 Functional requirement 4

Requirement number	RF4
Requirement name	Project management
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The web system must allow for creating, reading, updating, and deleting (CRUD) operations on a project. At the time of creation, a form must be filled out with the following fields: Project name, Project description, Start date, End date, and a field to enter a representative image.

As a note, the completion date and image will be optional.

3.2.5 Functional requirement 5

Requirement number	RF5
Requirement name	Project Legal Permit Management
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The web system must allow for create, read, update, and delete (CRUD) operations based on the legal permissions associated with each project.

Each permit will be presented as a PDF file, associated with the corresponding project. To register a new permit, the system will present a form with the following mandatory fields: Permit name, brief description, and PDF file.

The system must validate that the uploaded file has a .pdf extension and allow it to be viewed or downloaded later from the project interface.

3.2.6 Functional requirement 6

Requirement number	RF6
Requirement name	Environmental Management Plan Management
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA

Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

Within the web system, each project must allow the registration of environmental management plans using a form. This form must collect the following information: Name and brief description.

In addition, it must allow for create, read, update, and delete (CRUD) operations.

3.2.7 Functional requirement 7

Requirement number	RF7
Requirement name	Management of Environmental Management Plan Activities
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

Each environmental plan must allow for the management of multiple activities. These activities can be recorded using a form that compiles the following information: Name, Description, Start Date, End Date, and Status (In Progress, Completed, Cancelled). In addition, a responsible person must be assigned for each activity.

Finally, it should be noted that activities have a review frequency, and some are not applicable to their compliance. This information is key to generating a chart similar to the document submitted by the client.

3.2.8 Functional requirement 8

Requirement number	RF8
Requirement name	Monitoring Management
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The system must allow for the creation, reading, updating, and deletion (CRUD) of Monitoring Reports, which will be files of different formats, either PDF or DOCX.

The system will allow .pdf files to be viewed and any type of file to be downloaded from the project interface.

3.2.9 Functional requirement 9

Requirement number	RF9
Requirement name	Location Management by Project
Type	☑ Requirement ☐ Restriction

Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☐ High/Essential ☑ Average/Desired ☐ Low/Optional

Requirement description:

Each activity will have a location with information such as: name, latitude, longitude, province, and description. Additionally, this location can be part of multiple activities. This allows for more detailed records of the most important locations within the project.

3.2.10 Functional requirement 10

Requirement number	RF10
Requirement name	Traceability of system actions
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☐ High/Essential ☐ Average/Desired ☑ Low/Optional

Requirement description:

The system must record every action performed by users (create, modify, cancel) on projects, plans, activities and monitoring for audit and control purposes.

3.2.11 Functional requirement 11

Requirement number	RF11
Requirement name	Business calendar with reminders
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☐ High/Essential ☑ Average/Desired ☐ Low/Optional

Requirement description:

The system should allow for the creation of reminders in an integrated calendar to notify users of business-related events.

3.2.12 Functional requirement 12

Requirement number	RF12
Requirement name	Activity progress meter
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☐ High/Essential ☑ Average/Desired ☐ Low/Optional

Requirement description:

The system should display a progress meter based on the number of activities completed, take into account the frequency of completion of activities, and should not count activities that are not tracked.

This bar should be visible next to the project on the main page, allowing you to see the project's performance graphically.

3.3 Non-functional requirements

3.3.1 Performance

Requirement number	RNF-001
Requirement name	Request capacity
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The system must support a high level of simultaneous user requests, so it must respond quickly and efficiently. This requirement ensures that the system performs well under load, meeting customer expectations and ensuring adequate performance.

3.3.2 Usability

Requirement number	RNF-002
Requirement name	Intuitive and easy-to-use system
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The system must have an intuitive and easy-to-use environment. Users will be able to complete common tasks quickly. The environment should also be easy to learn, allowing users to navigate more comfortably and easily complete registrations with a minimum of 3-5 clicks.

3.3.3 Performance

Requirement number	RNF-003
Requirement name	Performance
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The system must guarantee a response time of less than 2 seconds for the most common operations, such as browsing, information loading, and record management, ensuring a smooth user experience.

3.3.4 Platform compatibility

Requirement number	RNF-004
Requirement name	Platform compatibility
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The system will be designed primarily for use on desktop or laptop computers, with a low priority on adapting to mobile devices, optimizing the experience for large screens.

3.3.5 Maintenance

Requirement number	RNF-005
Requirement name	Ongoing maintenance
Type	☑ Requirement ☐ Restriction
Source of the requirement	Interview with the manager of BIOSIGMA
Priority of the requirement	☑ High/Essential ☐ Average/Desired ☐ Low/Optional

Requirement description:

The system must be continuously maintained after its implementation and release to the public to ensure good service throughout its designated lifespan. This requirement must also guarantee security during any required upgrades or repairs.

4 Appendices

This section shows the links to each document created for this delivery.

4.1 Supplementary specifications

https://github.com/MateoMedranda/ESPE202550_CrimsonCode/tree/main/02-Requirements