
Software requirements specification

Project: SELI Smart Learning Environment and Inclusion

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Document file

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1 Introduction

This document is a Software Requirements Specification (SRS) for the Smart Environment Learning and Inclusion platform SELI. This specification has been structured based on the guidelines given by the IEEE Recommended Practice for Software Requirements Specifications. ANSI / IEEE 830

1.1 Purpose

This document is to define functional, non-functional specifications for the development of a virtual platform with the purpose of showing its functionality.

1.2 Scope

Virtual Platform

This requirements specification is focused on developing the SELI platform from the point of view of the user, which includes the following in a more detailed way:

- **User Administration**
 - Add user
 - Login to the platform
 - Browse user list
- **Course Management**
 - Create course
 - Create activities
 - Enroll Users
 - Assign Profile to users
- **Grades Management**
 - Generate reports
- **Certificate Management**
 - Create certificates
 - store certificates

- Check certificate

1.3 Personal Involved

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1.4 Definitions, acronyms and abbreviations

Name	Description
User	That habitually uses something (person who uses a program)
ERS	Requirements Specification Software
RF	Functional
RNF	Non Functional Requirement
NDL	Nature Digital Learning Platform
SELI	SMART Environment LEARNING and INCLUSION
Moodle	Virtual Classroom
LMS	Learning Management System

1.5 References

Reference	Title	Route	Date	Author
	Standard IEEE 830	⇒ document format template © & Coloriuris http://www.qualitatis.org		

1.6. Summary IEEE 830

This list of requirements is divided into three sections. The first section provides an introduction and an overview of the resource specification of the SELI platform.

The second section of this document makes a general description of the virtual platform, to know each of the main functions that it must perform, a visual approach, the factors, associated data, restrictions, assumptions and dependencies that affect to the development of the product.

Finally, the third section presents each of the requirements that must be met by the SELI platform for optimal performance and that allows compliance with the specifications provided by the user.

1.6.1. General Description

Product Perspective

The SELI platform will have three fundamental components: course management, user management, qualifications, content management (optional) and the incorporation of blockchain.

Functionality of the product

For the virtual platform, three subsystems are proposed, including user administration, course administration, and rating management; for the proper functioning of SELI (See Figures 1).

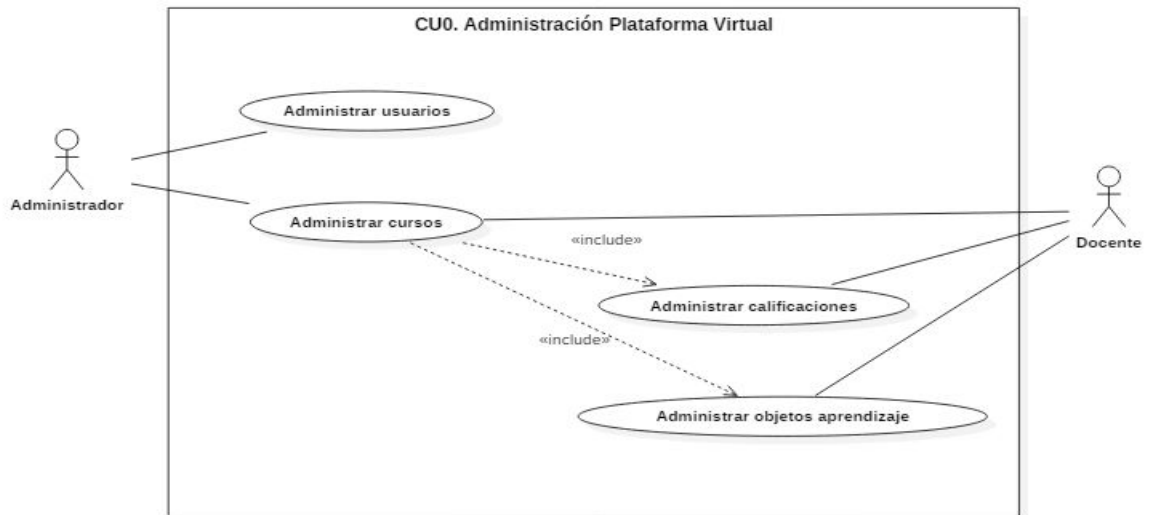


Figure 1. Use case 0

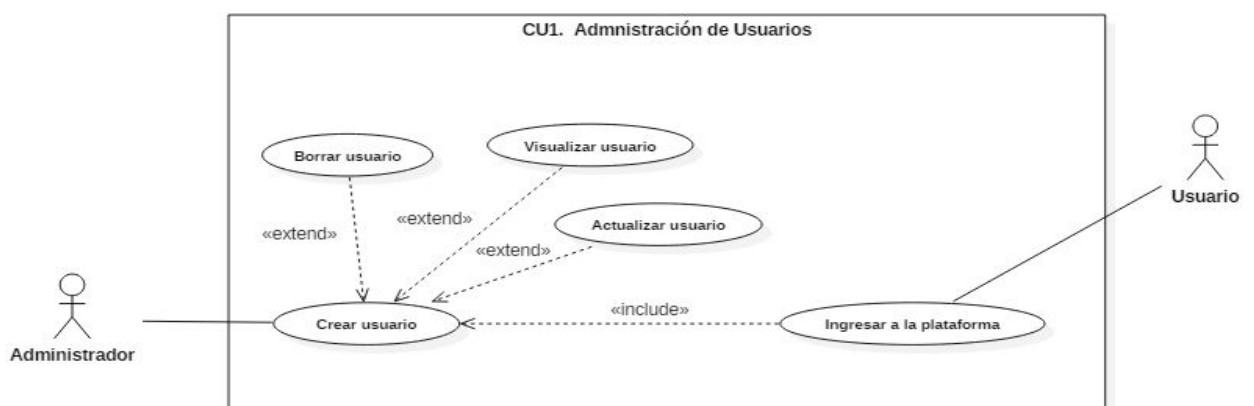


Figure 1. Use case 1

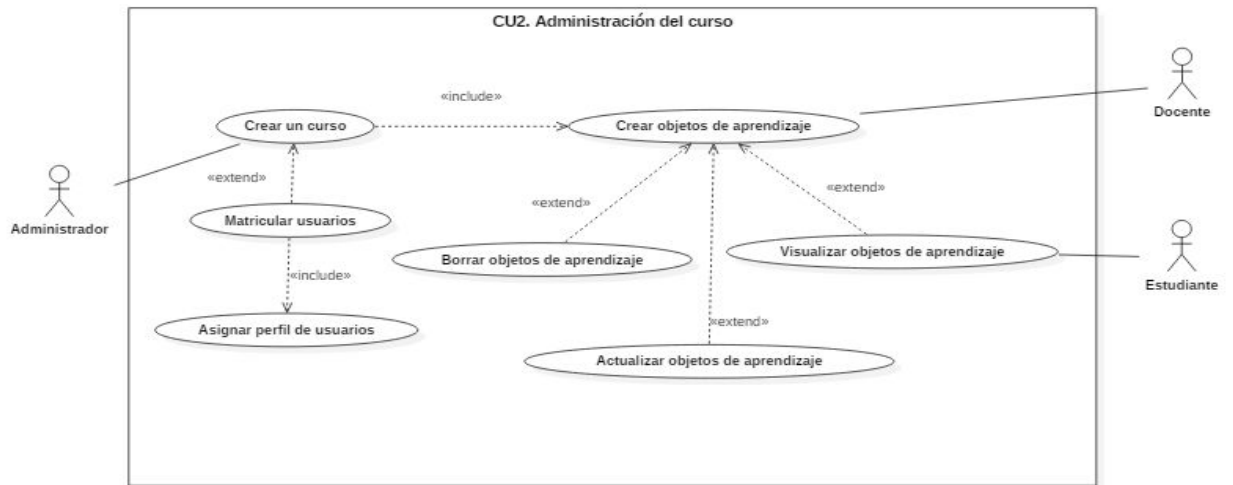


Figure 3. Use case 2

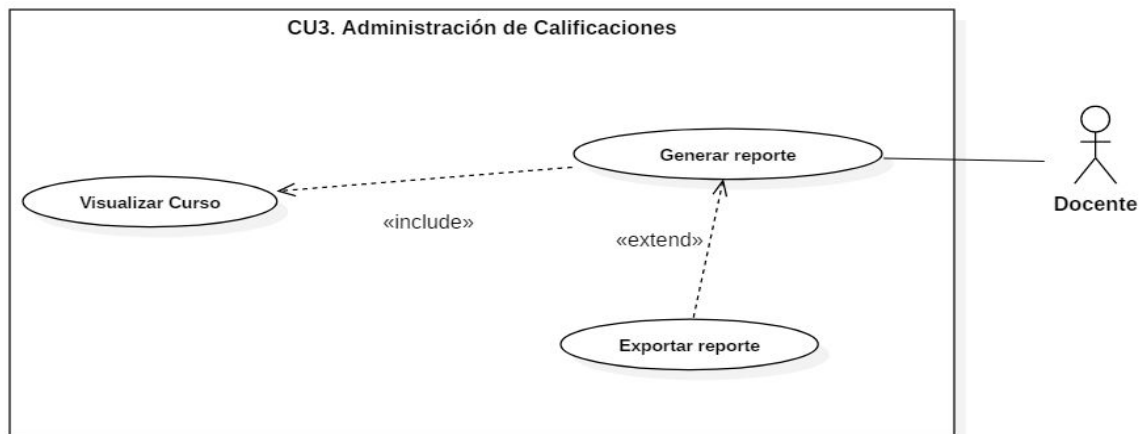


Figure 4. Use case 3

User Features

User Features

Type of user	Administrator
Training	Systems engineer (Specializations also admitted).
Skills	Ease of application management, prompt and practical use of digital tools.
Activities	Control and management of the platform in general.
Type of user	Teacher
Training	Degree in Educational Sciences (Specializations also admitted).
Skills	Active communication with students.

Activities	Interaction with students, provides help and guides on the use of the courses.
Type of user	Administrator
Training	Systems Engineer (Specializations also admitted).
Skills	Basic skills of web page management.
Activities	Learning activities in the courses.

Bonuses and Restrictions

The SELI platform must have the following restrictions:

- SELI must be a platform developed with free software.
- The information must be totally friendly with the users, so that the data can be accessed quickly and efficiently.
- **The platform must be completely accesible, for disadvantaged people.**
- The platform must be supported by different browsers such as Firefox, Google Chrome, Opera. From PCand from smart device.
- The platform should be easily accessible for users who do not have advanced knowledge in computing, or at the same time be easy to understand for their corresponding training.
- The platform must consider the integration module Blockchain.
- The platform must raise content in author tools that manage accessibility in such a way that the contents are accesible.**(Not only the contents must be accesible, also the platform.)**
- The teacher can upload content that has text, text and images, videos, animations or simulations in embedded code, that is to say that it has been done in a tool that allows exporting embedded code to include it within the platform.

The SELI platform must have the following restrictions for its proper functioning:

- The platform must be developed in **Node.js** and **Angular** for the ease of applying the **blockchain API**.
- The blockchain module will be applied in the **authentication** of the user, certificates and diplomas will not contemplate the incorporation of transactions with cryptocurrencies.
- The platform will not contemplate synchronous communication systems, the contents must be self-directed.

Assumptions and dependencies

The SELI platform will be developed in **node.js**, **angular** and **javascript** that runs in different browsers, hosted in the cloud. There should be at least three servers in the countries of Finland, Brazil, Uruguay, Turkey and Ecuador to be able to handle replicas of the platform.

On the other hand, the SELI platform will be designed as an adaptive solution which work under any browser, be it Internet Explorer, Mozilla Firefox or Google Chrome with support for HTML5 on PC and smart phones.

Foreseeable evolution of the system

The SELI platform can be accessed and viewed from any electronic device.

Specific requirements

Functional requirements

The following are the characteristics of the functional requirements of the SELI platform (See Table 1,2,3,4).

Table 1
Requirements referring to the administration of users

Identification of the requirement	RF-001
Name of the requirement	Register user.
Features	Process for registering users who will have access to the system.
Description of the requirement	The administrator and teacher user will register new users for their subsequent login to the virtual platform, which requests the following information: user name, password, first names, email address, city, country, time zone, description.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-003 ● RNF-004 ● RNF-006
Priority of the requirement	High
Identification of the requirement	RF-002
Name of the request	Update User
Characteristics	Process for updating user information.
Description of the requirement	The administrator and teacher user will update the information of the fields: password, first names, e-mail address, city, country, time zone, description of a registered user,
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-003 ● RNF-004 ● RNF-006
Priority requirement	High
Identification of requirement	RF-003

name requirement	delete user
Features	Process to delete a platform user
requirement description	user administrator and teacher can delete the user registration platform
requirement does not functional	High
Priority of the requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-003 ● RNF-004 ● RNF-006
Identification of the requirement	RF-004
Name of the request	Show User
Characteristics	Process to visualize the information of a user.
Description of the requirement	Users can view the information of a user registered in the platform, which takes its profile name.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-003 ● RNF-004 ● RNF-006
Priority of the requirement	High
Identification of the requirement	RF-005
Name of the requirement	Enter the platform
Characteristics	Users must log in to the platform to access the course, depending on of their role
Description of the requirement	The user will be able to access the session start depending on the level of accessibility. This, you must enter the username and password fields.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-003 ● RNF-004 ● RNF-006

Priority of the requirement	High
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Table 2
Requirements related to the administration of courses

Identification of the requirement	RF-006
Name of the requirement	Create a course.
Characteristics	Process for the creation of courses in the virtual platform.
Description of the requirement	The administrator can create different courses in the virtual platform, which must fill in the fields of the full name of the course, short name of the course, category of the course, visibility of the course, start date and end of the course, ID number of the course, summary of the course.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-003 ● RNF-004 ● RNF-006
Priority of the requirement	High
Identification of the requirement	RF-007
Name of the requirement	Enroll a user
Characteristics	Process for the process of registering users in a course.
Description of the requirement	The administrator user and the teacher can manually enroll the students of the course: select the user and assign them a role.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-004 ● RNF-006
Priority of the requirement	High
Identification of the requirement	RF-008

Name of the requirement	Assign user profile
Characteristics	Process for the assignment of a user profile.
Description of the requirement	The administrator user and the teacher assign a role: student, teacher, for a user registered in the platform.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-004 ● RNF-006
Priority of the requirement	High
Identification of the requirement	RF-009
Name of the requirement	Create activities and resources
Characteristics	Process for the creation of activities within the course.
Description of the requirement	<p>The administrator and teacher user may create activities or resources to the course.</p> <p>Activities such as: database, chat, consultation, H5P, questionnaire, survey, predefined surveys, forum, glossary, external tool, IADLearning, lesson, SCORM package, workshop, task, wiki.</p> <p>Resources such as: file, folder, label, book, page, presentation, url, IMS content package.</p>
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-003 ● RNF-004 ● RNF-006
Priority of the requirement	High
Identification of the requirement	RF-010
Name of the request	Delete activities
Characteristics	Process for the elimination of activities within the course.
Description of the requirement	The administrator and teacher user will be able to eliminate the activities within a course.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002

	<ul style="list-style-type: none"> ● RNF-004 ● RNF-006
Priority of the requirement	High
Identification of the requirement	RF-011
Name of the requirement	Update activities
Characteristics	Process for updating activities within the course.
Description of the requirement	The administrator and teacher user can update the information of the activity within a course the fields of: name of the activity, description, end of the activity.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-003 ● RNF-004 ● RNF-006
Priority of the requirement	High
Identification of the requirement	RF-012
Name of the requirement	Visualize activities
Characteristics	Process for the visualization of activities within the course.
Description of the requirement	The administrator and teacher user can visualize the activities created within the course.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-003 ● RNF-004 ● RNF-006
Priority of the requirement	High

Table 3
Requirements related to the management of qualifications / grades

Identification of the requirement	RF-013
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Name of the requirement	Generate Gradebook
Characteristics	Process for the generation of reports with the grades of the activities carried out by the students.
Description of the requirement	The administrator and teacher user may generate reports of the grades of each student enrolled in the course.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-004 ● RNF-006
Priority of the requirement	High
Identification of the requirement	RF-014
Name of the requirement	Export Report
Characteristics	Process in which the reports of the students' grades are exported.
Description of the requirement	The administrator and teacher user will be able to export the reports generated on the qualifications of the students enrolled in .xlsx format.
Non-functional requirement	<ul style="list-style-type: none"> ● RNF-001 ● RNF-002 ● RNF-004 ● RNF-006
Priority of the requirement	High

Table 4
Requirements related to the administration of content modules

Identification of the requirement	RF-015
Name of the requirement	Administration of content modules
Characteristics	Process for the visualization of the modules on the platform.
Description of the requirement	Users can view the content, activities and test modules.

Non-functional requirement	<ul style="list-style-type: none"> ● RNF-007 ● RNF-008 ● RNF-009 ● RNF-010 ● RNF-011
Priority of the requirement	High

Non-functional requirements

The characteristics of the non-functional requirements of the SELI platform are detailed below (See Table 5.6).

Table 5
Non-functional Requirement SELI

Identification of the requirement	RNF-001
Name of the request	Response time
Characteristics	The server will allow a minimum response time in the navigation of the virtual platform.
Description of the requirement	The virtual platform can navigate between activities or resources in the shortest possible time, in the same way the response time on the entry of information in the platform will be minimal.
Priority of the requirement	High
Identification of the requirement	RNF-002
Name of the requirement	Availability of the server
Features	The server will be available 24 hours a day, 7 days a week, 365 days a year.
Description of the requirement	The server must be active at all times, so that users can access from their homes or from their workplaces.
Priority of the requirement	High
Identification of the requirement	RNF-003

Name of the requirement	User friendly interface
Features	The virtual platform will show a simple and very visual interface for the users.
Description of the requirement	The interface of the virtual platform must be intuitive, visual and simple to show the information of the learning objects to the users.
Priority of the requirement	High
Identification of the requirement	RNF-004
Name of the requirement	Operation without problems of the platform
Characteristics	The platform will not show errors in the visualization of contents or in the entry of information
Description of the requirement	The platform will avoid showing erroneous content in the information entry nor in the visualization of content in the same way at the time of access to it.
Priority of the requirement	High
Identification of the requirement	RNF-005
Name of the requirement	Open source platform
Characteristics	The virtual platform will be open source so that it can be modified.
Description of the requirement	The virtual platform will be generated using the Node.js, Angular and javascript tools.
Priority of the requirement	High
Identification of the requirement	RNF-006
Name of the requirement	Role management
Characteristics	The virtual platform will be controlled through the management of user roles.
Description of the requirement	The user roles of the virtual platform will allow the proper management of the same,

	so that the roles are specifically oriented to the activities they must perform.
Priority of the requirement	High

Identification of the requirement	RNF-007
Name of requirement	Availability for any device
Features	The application will be installed in the cloud and available for any device.
Description of the requirement	The application must be available for mobile devices under the Android operating system minimum version 4.1 Jelly Bean
Priority of the requirement	High
Identification of the requirement	RNF-008
Name of the request	Fast navigation between scenes
Characteristics	The navigation behavior between the scenes of the application will be in the shortest possible time, since it depends on the resources of the mobile device.
Description of the requirement	Navigation between the scenes of the mobile application must be done quickly.
Priority of the requirement	High
Identification of the requirement	RNF-009
Name of requirement	Intuitive interface
Characteristics	The interface of the mobile application must be intuitive so that it is user-friendly, as well as appealing to the eye.
Description of the requirement	The mobile application must show a User-friendly interface and easy navigation, so that it is intuitive.
Priority of the requirement	High

common requirements of the interfaces

User interfaces

The interface of the SELI will consist of a set of windows, buttons, images, videos, for the visualization of the content, activities and self-evaluation. The design of the interfaces of the SELI platform in the **Balsamic Mockups** program will be carried out for practical visualization.

Hardware Interfaces

To achieve the optimal functioning of this software based on hardware, the minimum hardware requirements of both the computer and the mobile device are detailed in Table 7.

Table 7
Requirements for hardware interfaces

Computer	
Processor	Provided by CEDIA 8 vcpu
RAM	Provided by CEDIA 16 Gb de RAM
Hard disk	Provided by CEDIA 500GB

Software interfaces

To achieve the optimal functioning of this software, the computer must have the necessary characteristics for its execution. In the same way of the mobile device as detailed in table 8.

Table 8
Requirements software interfaces

Computer	
Operating system	Windows XP Service Pack 3 / Linux based OS
NodeJS	
Angular	
JavaScript	

It is also necessary that the user's computer has installed a browser such as: Mozilla Firefox, Google Chrome or Microsoft Edge, but you can also use the default browser: Internet Explorer.

Communication interfaces

The computer to be used must have an Internet connection through the TCP / IP protocol.

Functional requirements

The functional requirements were detailed in the specific requirements section.

Non-functional requirements

Performance requirements

To ensure performance and response time when accessing SELI platform information.

Security

To guarantee in an integral and consistent manner, the information obtained from each teacher and student, so that there is no type of filtration, therefore, there is trustworthiness on the part of the virtual platform towards its users. Blockchain application.

Reliability

The SELI platform must be able to operate in its entirety and therefore must function correctly for an adequate handling of the information.

Availability

SELI must operate full time (24 hours, 7 days a week), for reasons of data storage, facilitating its correct use.

Maintainability

The system must have updated documentation that allows several maintenance tasks in a period of time.

Portability

The SELI platform will be implemented in the cloud and accessed from any browser can be Mozilla Firefox, Google Chrome, Opera.

