Specification of software requirements

Draft: Prototype of virtual ID for first level student of the Universidad de las Fuerzas Armadas “ESPE”
Review

MAJOF Developers

2020

Revision history

Date	Review	Description	Author
23/01/2021		implementation: JSON, class and usage diagrams	Moromenacho Tipan, Mishell Estefania Navarro Zambrano, Johny Nicolay Ocaña Bolaños, Francisco Javier Pallasco Mancero, Oscar Fernando Pazmiño Gordon, Bryan Alexander
03/03/2021		MongoDB Cloud Database Implementation (BSON), GUI	Navarro Zambrano, Johny Nicolay Ocaña Bolaños, Francisco Javier Pallasco Mancero, Oscar Fernando Pazmiño Gordon, Bryan Alexander Rivera Verdezoto, Amanda Liliana
05/04/2021		Design patterns, CRUD, File Manager	Navarro Zambrano, Johny Nicolay Ocaña Bolaños, Francisco Javier Pallasco Mancero, Oscar Fernando Pazmiño Gordon, Bryan Alexander Rivera Verdezoto, Amanda Liliana

Document validated by the parties on date:

For the client	By the supplying company
Universidad de la fuerzas armadas ESPE	MAJOF Developers

Signed. Mr. / Mrs.	Signed. Mr / Mrs

Content

1 Introduction

1.1 Purpose

This report is based on the Software Requirements Specification (ERS) format, governed by the IEEE830 standard.
This program is a virtual identification prototype for new students of the IT career, where the student will require said card and it will be redirected where the career director must enter their data in order to generate the card with its respective QR code. The student will have the benefit of being treated by the doctor, for this the student must already have his student card, he can also schedule medical appointments.

1.2 Scope

The idea of this virtual card system is directed more for the first level students of the Engineering career in information technology, in addition to the medical attention offered by the polyclinic by the doctor, the student has the ease of entry of your personal data so that you have access to the virtual card

1.3 Involved personnel

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1.4 Definitions, acronyms and abbreviations

VR: Virtual Card
IEE 830: Standard comprising software requirements.
Java: It´s a programming language.
MongoDB: is a document database that offers great flexibility and an Advanced query and indexing model.
GIT: A version control system will help us to work as a team in a much easier and more optimal way when we are developing software.
JSON: (JavaScript Object Notation) is a simple text format for data exchange
BSON: (Binary Object Notation) is a data exchange format used mainly for storage and transfer in the MongoBD database
JFrame: is a class used in Swing (Graphic Library) to navigate windows on which to add different objects where you can interact
Software: Set of programs and routines that allow the computer to perform certain tasks.
NOSQL: Not Only Structured Query Language
CRUD: Create, read, Update, Delete.
SOLID: Single Responsibility, Open Closed, Liskov substitution principle, Interface substitucion principle, Dependecy inversion principle.
Singleton: design pattern ensures that a given class can only have a single object. Normally a class can instantiate all the objects it needs.
MAE: Modularity, Abstraction, Encapsulation.

1.5 References

Reference	Title	Author
IEEE	Standard IEEE 830 - 1998	Lajos Hanzo, Ramesh Karri, Don Towsley
MongoDB Atlas	MongoDB Atlas	MongoDB Inc
Design Patterns	Object-oriented Design Patterns: Quick Reference Guide	Dr. Stephen Clyde, Utah State University
Design Patterns	Design Patterns Elements of reusable Object-Orient Software	Erich Gamma Richard Helen Ralph Jhonson John Vlissides
SOLID PRINCIPLES	INTRODUCTION TO THE SOLID PRINCIPLES	STEPHEN CLYDE PH.D.,
MAE	ABSTRACTION, MODULARITY, AND ENCAPSULATION	Stephen W. Clyde, Jorge Edison Lascano
GIT	THE JOY OF “GIT”	Stephen W. Clyde, Jorge Edison Lascano
Unit Testing	QUICK START TO UNIT TESTING	Edison Lascano
Design Patterns	Head firts Design Patterns	Kathy Sierra, Elisabeth Freeman

1.6 Summary

In the next chapter, there is the general explanation. Explains the requirements used in this system, an environment for the description of technical requirements.

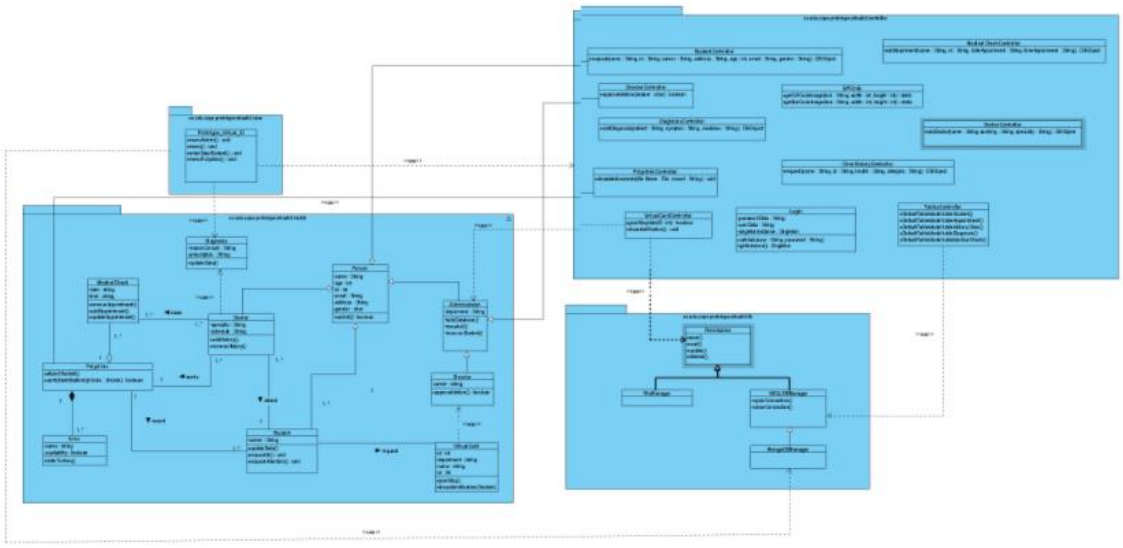
The third chapter, Requirements Description part, of this file is written primarily for developers and explains in technical terms the details of the system's functionality.

2 General description

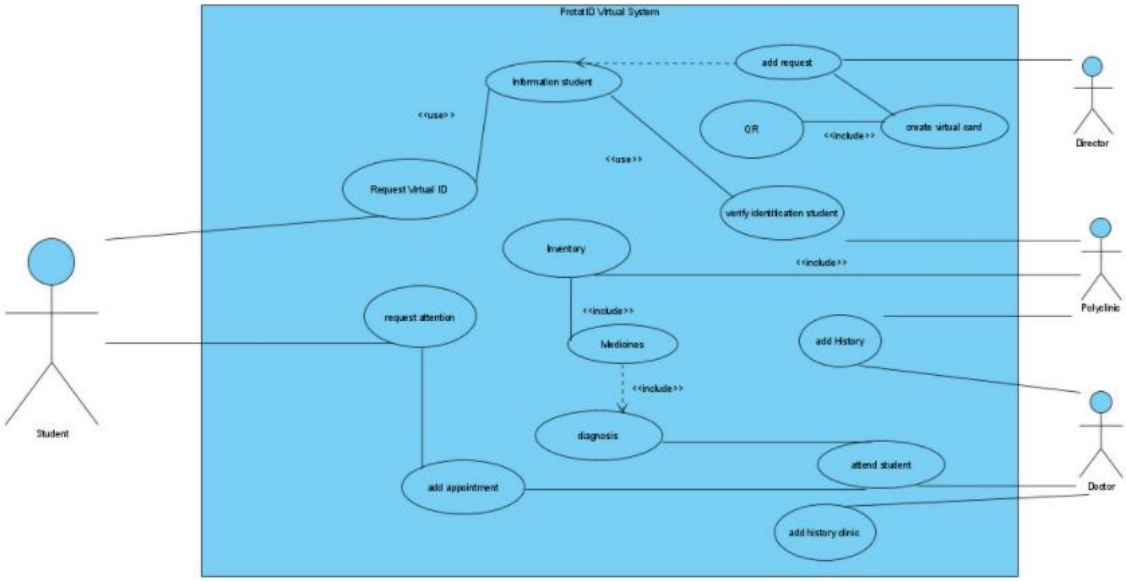
2.1 Product perspective

The system works thanks to the connections that each class has since one class depends on the other to carry out the assigned action. One of the cases would be that of the director class, since without his consent the student could not access the services of the polyclinic since the director identifies through the database whether or not he is a student belonging to the institution.

The doctor has a great connection with the other classes since he is in charge of the care of the polyclinic.



2.2 Product functionality



The student requires a virtual id for that he adds information which is accepted by the director and the creation of the virtual id depends on this information.

Once the data has been entered, the student requires medical attention for which he adds an appointment which is accepted by the doctor who is in charge of treating the student, giving the diagnosis and adding it to the clinical history.

The Polyclinic user first verifies the student's information, adds to the history and has the inventory of medicines which are necessary for diagnosis.

2.3 User characteristics

Type of user	First level students
Training	IT engineering
Skills	study
Activities	Student

Type of user	Race director
Training	Teaching
Skills	Engineer
Activities	Inspection

Type of user	Administrator
Training	IT engineering
Skills	Engineer
Activities	Administrator

Type of user	Doctor
Training	Medicine
Skills	Attend
Activities	Cure

2.4 Restrictions

The program, being a prototype, is limited to many things when designing, such as the number of users, the types of uses in different areas, the access of different users, etc.
In the type of user we limit ourselves to only new students of the IT career and with respect to the types of areas we limit ourselves only to the area of medicine, likewise we have a limit of person who can access the system such as the director, Administrator and Doctor.

2.5 Assumptions and dependencies

As the program is a prototype, its dependencies are not defined, however at the time of terminating the program it would depend on the operating system of the device since it would have to have several versions of the program depending on the device it is on.

2.6 Predictable evolution of the system

In future versions it is desired to expand the types of uses in different areas of the institution such as parking lots or laboratories, in addition to the size of users who can access the system.

Specific requirements

Requirement number	RF01

Requirement name	Register Students		
Description	If the new student wants the code, they will have to go to the direct to have access to the virtual card, where they will have to give their personal data		
Type	X Requirement	☐ Restriction	
Requirement source	Document, “Prototype of virtual ID for first level students of the Universidad de las Fuerzas Armadas”		
Requirement priority	X High / Essential	☐ Average / Desired	☐ Low / Optional

Requirement number	RF01.1		
Requirement name	Old student data entry		
Description	The system may be consulted by the old user depending on the level of accessibility		
Type	X Requirement	☐ Restriction	
Requirement source	Document, “Prototype of virtual ID for first level students of the Universidad de las Fuerzas Armadas”		
Requirement priority	X High / Essential	☐ Average / Desired	☐ Low / Optional

Requirement number	RF01.2		
Requirement name	new student request		
Description	The system may be consulted by the new user depending on the level of accessibility		
Type	X Requirement	☐ Restriction	
Requirement source	Document, “Prototype of virtual ID for first level students of the Universidad de las Fuerzas Armadas”		
Requirement priority	X High / Essential	☐ Average / Desired	☐ Low / Optional

Requirement number	RF03		
Requirement name	Polyclinic registry		
Description	The student will have this benefit only if he is part of the institute		
Type	X Requirement	☐ Restriction	
Requirement source	Document, “Prototype of virtual ID for first level students of the Universidad de las Fuerzas Armadas”		
Requirement priority	X High / Essential	☐ Average / Desired	☐ Low / Optional

Requirement number	RF04		
Requirement name	Doctor consultation		
Description	Collects the query information about the student and gives it a perscripsion		
Type	X Requirement	☐ Restriction	
Requirement source	Document, “Prototype of virtual ID for first level students of the Universidad de las Fuerzas Armadas”		
Requirement priority	X High / Essential	☐ Average / Desired	☐ Low / Optional

Requirement number	RF05
Requirement name	Inventory requirements

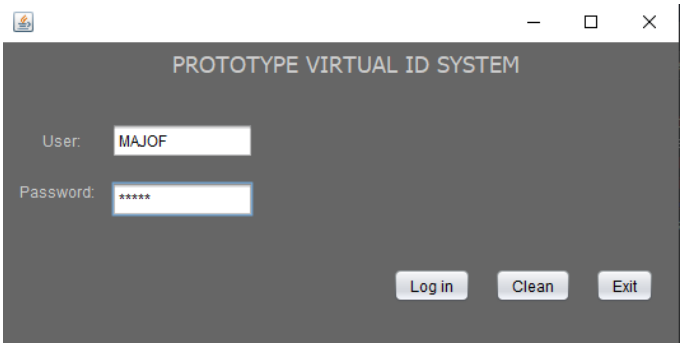
Description	All medications are added in this area, but the medications are already established and the student will be able to access them based on their ailments		
Type	X Requirement	☐ Restriction	
Requirement source	Document, “Prototype of virtual ID for first level students of the Universidad de las Fuerzas Armadas”		
Requirement priority	X High / Essential	☐ Average / Desired	☐ Low / Optional

Requirement number	RF06		
Requirement name	Appointment data		
Description	Allows the student to add a date and time to create a shift or appointment at the polyclinic		
Type	X Requirement	☐ Restriction	
Requirement source	Document, “Prototype of virtual ID for first level students of the Universidad de las Fuerzas Armadas”		
Requirement priority	X High / Essential	☐ Average / Desired	☐ Low / Optional

2.7 Common interface requirements

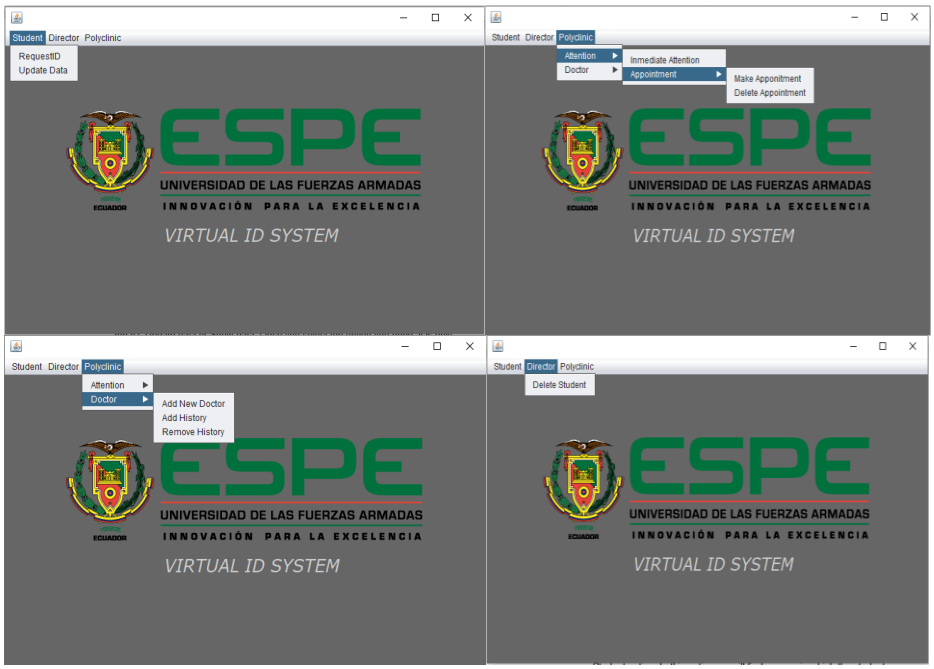
2.7.1 User interfaces

For the graphical interface, a simple and functional design is considered where once the user identifies himself by entering his username and password, he will have several windows where he can access the system services.

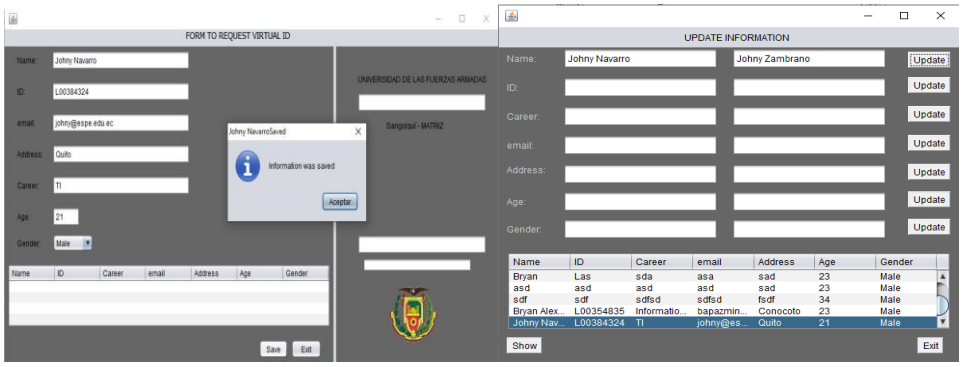


Main elements

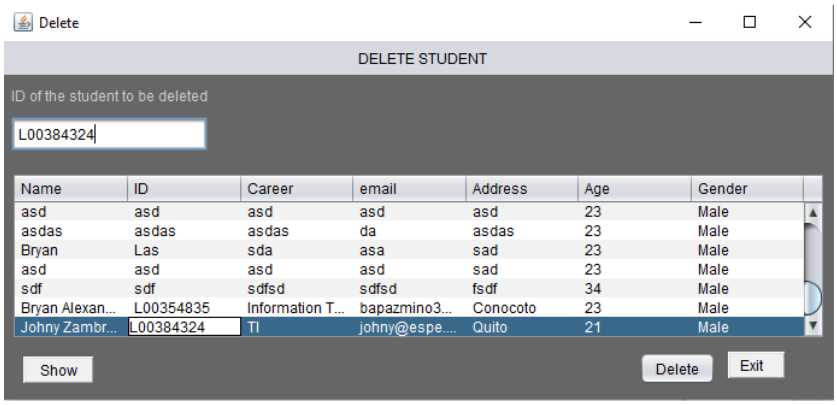
Main menu: In the menu we will be able to visualize a bar where the services will be according to the user who requires the services.



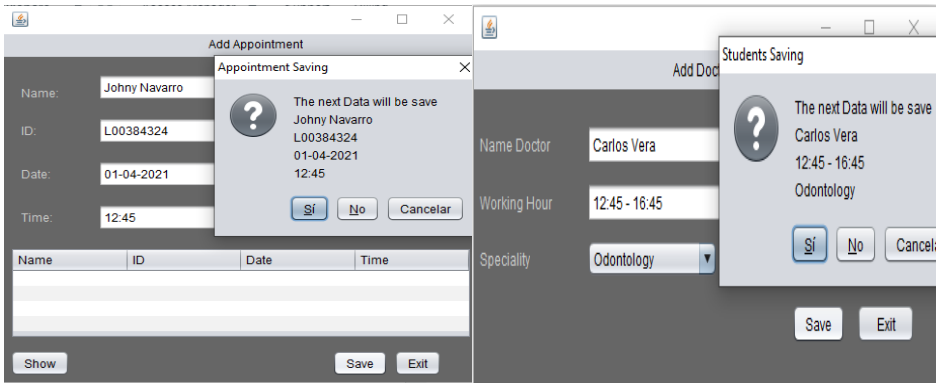
Student option: In this option we will find a menu in which the student can request the ID, Update data or Show data. Once you select the option you need, it is only a matter of entering your information and following the instructions.



Director option: In this part there is only one option that is "delete student", in this way the Director can access the system and delete the data of the student who is no longer in the institution or in the event that the data has been incorrectly entered.



Polyclinic Option: In this option, you will see two options where one is for the attention of the student and the other is to add, update, view or delete the data of the doctors. At the same time you can register the exit and entry of the doctors.



2.7.2 Hardware interfaces

The program itself does not have hardware as it is a virtual ID prototype.

2.7.3 Software interface

Java language

Java allows us to create or make our own methods and use them simply as well as to make use of the methods of other libraries (mathematical, arithmetic, file, date, etc. functions, etc. Whatever the case, the functions allow us to automate tasks that we require frequently and that can also be generalized by means of parameters or arguments.

Gson bookstore

It is an open source library for the Java programming language that enables serialization and deserialization between Java objects and their representation in JSON notation.

FileManager bookstore

Library created at the time of programming which will have classes and methods that will help us to save, delete and search for user data in the database.

MongoDB bookstore

A MongoDB record is a document, data structure made up of pairs of fields and value, these documents are similar to JSON objects. Field values can include other documents, arrays, and document sets

2.7.4 Communication interfaces

The database, clients and the program will communicate with each other, using standard internet protocols, whenever possible. The virtual identification program has to access the institution's database so that the student can access the campus services once her identity is validated by the system.

2.8 Functional requirements

Taking into account the requirements that are established for the correct management of the software, taking into account that this is a prototype, therefore, this system is only trained for students of the University of the Armed Forces - ESPE, taking into account the following functional requirements .

2.8.1 Functional requirement 1

- **User authentication:** Users must identify themselves to access the virtual card and be able to access different work modules.

  ✓ The system can be consulted by any user depending on the module in which is located.

2.8.2 Functional requirement 2

• **Consult Information:** The system will offer the user information about the accessibility of different work modules.

- ✓ **Library Accessibility:** Shows general information about the uses of the books you want to research for your respective works.
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2.8.3 Functional requirement 3

- **Register User:** The system will allow the user to register. The user must provide data such as: ID, Names, Age, email, Address, Phone

2.8.4 Functional requirement 4

- **Modify:** Allows the administrator to modify user data.

2.9 Non-functional requirements

2.9.1 Performance requirements

Taking into account the requirements that are established for the correct management of the software, it must be taken into account that this is a prototype, therefore this system will only be implemented only for first-time students of the information technology career, the program is expected to meet the established performance.

2.9.2 Security

In this section, the stability procedures that the program will present are detailed.

- The program will have a simultaneous functionality with a database where the data of the student, doctor will be stored.
- The program has a login and a user and password already established.
- The QR code is unique for each student.
- The program contains a menu where the client can enter the student and patient data, as well as the doctor's information.

2.9.3 Reliability

The data entered such as: personal and other related data will be stored in a database where the client can see all the data, in addition to keeping it safe.

2.9.4 Availability

Availability is one of the characteristics that measures the degree to which system resources will be available for use by the end user, over a given time.

2.9.5 Maintainability

The IEEE (19990) defines maintainability as: "The feasibility with which a system or software components could be modified to fix bugs, improve its handling or

other attributes or adjust to changes in the environment." Having said this, it is inferred that a program Well developed, it should have the primary flexibility to adjust to the future, as in addition, maintenance will have to be done instantly and positively, damaging the least feasible to the tasks of the entity that uses it. A maintainability analysis or maintenance project will be generated. This is a prototype where an expert will be in charge of validating this version of the program, this prototype will have to receive maintenance from the database where each academic period will have to be updated or also updating the version of the program when the distributor has a new version and You will have to maintain the security of each of the data that is entered

2.9.6 Portability

- First of all, it should be noted that the first model to generate is being programmed in "Java" language.
- 100% of the elements of the system are dependent on a database. Because without the database the system could not function.
- The NetBeans development platform, the JDK and JRE applications were used for its development.

2.10 Other requirements

At this point, we will define legal, cultural or political requirements as requested by the buyer entity.The program product that will be developed, since it is going to be implemented in the ESPE armed forces university, should be completed within the limits of the organization. In addition, it is determined that the program developed will only have the Spanish language as a choice, because the delegated personnel to use the program do not need the choice to view the system in another language, of course it is not ruled out that in future updates there is the translation into other languages. This last characteristic of the system corresponds to a cultural and / or political requirement.

3 Appendices

Students who are entitled to the benefits of the university of the armed forces ESPE will have to have the card, new students will have to approach the director so that he can enter their data and generate an ID, while old students will only have to approach the system administrator and make the request.