Cover

Final-Year Project Report

Submitted in partial fulfilment of the requirements for the National Bachelor's Degree in Business Computing

Specialisation: Business Information Systems (BIS)

Development of a Web Platform for the Higher School of Applied Sciences and Private Technology of Gabès (ESSAT)

Prepared by: Faten Helmi

Supervised by: Mr Mohamed Nasr

Presented before the examination committee: Ms Nihel Sahli and Mr Mohamed Nasr

Reviewer: Ms Hajer Ben Fraj

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General Introduction

Over the past few decades, the world has witnessed unprecedented technological development. Rapid advances in technology have revolutionised every aspect of daily life, from the way we communicate and interact with others to the way we work, learn and entertain ourselves.

Digital transformation, which encompasses the widespread adoption of information and communication technologies (ICT), has played a major role in this evolution. Innovations such as the internet, mobile devices, artificial intelligence, cloud computing and robotics have made our world increasingly connected and digitalised.

This digital transformation has had a profound impact on every sector of the economy and society, particularly higher education. The digitalisation of universities' information systems is essential to meet students' expectations, improve the efficiency of administrative processes, encourage collaboration and communication, and support informed decision-making. Higher-education institutions must adapt to new technologies and implement digital-transformation strategies to remain competitive and provide a high-quality learning experience.

In this context, the administration of the Higher School of Applied Sciences and Private Technology of Gabès (ESSAT) entrusted me, as part of my final-year project, with developing a website to improve communication, information sharing and the efficiency of administrative tasks.

This report describes the different stages I followed to complete the project.

Chapter I – Preliminary Study

I.1. Introduction

The purpose of this chapter is to place the project in context, examine the problem it aims to solve, and analyse existing solutions before developing our own.

I.2. Project Context

This work was carried out as part of my final-year project. Its main objective was to put into practice the knowledge I had acquired throughout my studies at the Higher School of Applied Sciences and Private Technology of Gabès (ESSAT).

In this context, I completed a six-month project at ESSAT. The objective was to develop a digital solution that would improve the administrative services provided to students and enhance the overall image of the school's previous website.

I.2.1. Presentation of the Host Institution

ESSAT Private School of Gabès was established in 2007 around an educational vision combining high-level teaching, personal initiative, the development of professional behaviour and the use of innovative methods in higher education.

Figure1:Logo of ESSAT:

ESSAT aims to remain open to its surrounding environment through programmes that respond to labour-market needs, a compulsory internship system that helps students enter the professional world, and partnerships with leading universities and companies that support students' professional integration.

The school offers several study pathways, allowing students to personalise their academic programmes and shape their careers. Its programmes include:

• A bachelor's degree in business computing (LBC).

• A preparatory cycle for engineering studies.

• An engineering cycle in Software Engineering (GL).

• An engineering cycle in Networks and Telecommunications Engineering (GRT).

• An engineering cycle in Electrical and Automation Engineering (GEA).

• An engineering cycle in Civil Engineering (GCV).

ESSAT is managed by a qualified administrative and academic team, with responsibilities distributed according to the institution's process map. The map in the original report shows quality management and steering at the top, core processes covering student affairs, studies and internships, and design and development management, and support processes covering human resources, infrastructure maintenance, and purchasing and procurement.

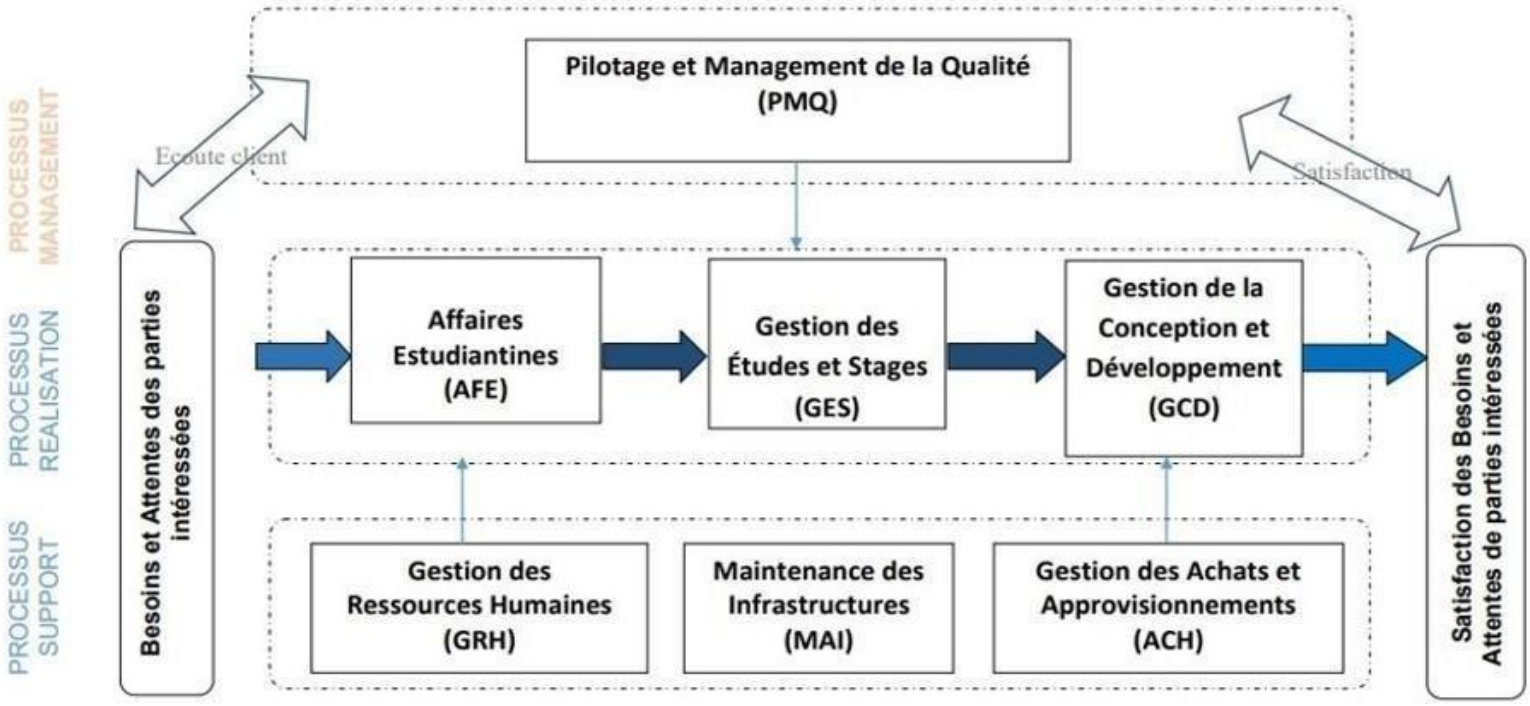


Figure 2: Process Mapping for the Private ESSAT in Gabès.

I.2.2. Project Mission

As part of my final-year project, ESSAT's management entrusted me with developing a dynamic website to ensure reliable, continuous communication among the school's various stakeholders.

The project involved several tasks. First, I examined ESSAT's existing website to identify its shortcomings and weaknesses. I then conducted a survey among the institution's different stakeholders, including students and administrative staff, to gather information that could help guide the project.

Based on the needs expressed by the people surveyed and the analysis of the existing website, I identified the main features to be incorporated into the proposed solution.

I then moved on to the design and development phases, obtaining stakeholder feedback after each stage to collect comments and assess progress. The remainder of this report describes the project's development stages in detail.

I.3. Study of the Existing System

The purpose of this study is to highlight the strengths and weaknesses of the current system. The following sections analyse ESSAT's existing website and list the problems identified.

*Link to the university's static website: https://www.essat-gabes.com

I.3.1. Analysis of the Existing System

ESSAT's official website was almost entirely static. It provided visitors with information about the school, its programmes, student clubs, vision and quality policy, among other topics. Some information had been updated compared with the previous version.

We also observed that communication between the website administrators and visitors was one-way. Administrators could publish news, update timetables and share events organised at ESSAT. Visitors, however, had no way to interact with the published content.

An administrative staff member confirmed that information relating to students, teachers, programmes and other areas was managed traditionally, either on paper or using office software such as Microsoft Word and Excel.



Figure 3. Home interface of the official ESSAT website.

I.3.2. Criticism of the Existing System

The shortcomings of ESSAT's existing website were apparent not only to visitors but also to the school's management. They affected several groups within the ESSAT community, particularly:

- Students: They had no dedicated area in which to view examination results, check timetable changes or access their courses and related information.
- Visitors and prospective students: There was no online space in which prospective students could submit a pre-registration request. Such a feature could simplify the administrative workload. The experience offered to ordinary visitors was also unsatisfactory.
- Administrative staff: Information about students, courses, research and internship classification was managed manually. Administrative staff therefore needed a digital tool that could speed up processing and provide secure, persistent data storage.

I.4. Proposed Solution

Based on the findings of the analysis, I concluded that a platform bringing all members of the ESSAT community together in a single virtual space would be the most suitable way to address the identified problems.

The platform would be dynamic and interactive, with regularly updated content and a range of features for users. It would make information sharing easier and allow it to be tailored to different users. The platform would therefore have two components:

- Frontend: the visible, interactive interface through which users interact with ESSAT.
- Backend: the administrative part of the platform, responsible for internal operations and for managing and controlling the data being processed.

I.5. Objectives

The proposed solution aims to achieve the following objectives:

- Digitalise the management of administrative activities, including information management, pre-registration, courses and examination results.
- Ensure reliable and permanent data storage.
- Speed up access to data and search operations.
- Make data updates simple and fast.
- Provide an optimal and personalised user experience.

I.6. Description of the Design Methodology

To design the platform, I followed a lifecycle model characterised by iterative development cycles and the gradual delivery of features. This model included the following stages:

- Identifying user needs.
- Analysing requirements and designing the solution.
- Implementation.
- Feedback and evaluation.

I.7. Conclusion

This chapter established the context of the project through an analysis of the existing system. It identified issues to be addressed, including one-way communication between the administration and users and the usability of the interface. This analysis guided the proposed solution and defined the project's challenges. The next chapter focuses on the conceptual design of the solution.

Chapter II – Conceptual Study

II.1. Introduction

This chapter presents the conceptual study of the project. It models the proposed system and describes the development approach adopted. It also lists the software tools and programming languages used to implement the platform.

II.2. Development Tools

The main development tools used to build the platform are described below.



Figure 4. phpMyAdmin logo.

phpMyAdmin

phpMyAdmin is a widely used open-source tool written in PHP that simplifies MySQL database administration through a web interface. Its user-friendly graphical interface lets database administrators and developers create databases, design tables, and run SQL queries without complex command-line operations. It is suitable for users of all experience levels.



Figure 5. Visual Studio Code logo.

Visual Studio Code

Visual Studio Code is a source-code editor developed by Microsoft for Windows, Linux and macOS. It includes support for debugging, integrated Git version control, syntax highlighting, intelligent code completion,

snippets and code refactoring. It is also customisable, allowing users to change the editor theme, keyboard shortcuts and preferences.



Figure 6. PlantUML logo.

PlantUML

PlantUML is a tool for creating UML (Unified Modelling Language) diagrams using a simple text-based syntax. It is a graphical description language that makes it possible to represent concepts, processes, structures and interactions between system components visually.



Figure 7. Canva logo.

Canva

Canva is a graphic-design platform offering users a wide range of customisable templates. It makes graphic design and design tools accessible to a broad audience, simplifying the creation of visual materials through an intuitive and educational website. The platform can be used to create many types of visual content for personal or professional purposes.

II.3. Development Languages



Figure 8. HTML5 logo.

HTML5

HTML (HyperText Markup Language) is a markup language used to structure documents. It uses tags to define how a document should be presented and to specify the links it establishes with other documents.



Figure 9. CSS3 logo.

CSS3

CSS (Cascading Style Sheets) is a declarative language used to style HTML pages and XML documents. It defines the visual presentation of a web page, including fonts, margins, borders, colours and the positioning of different elements.



Figure 10. JavaScript logo.

JavaScript

JavaScript is a scripting programming language mainly used to create interactive web pages. It is therefore an essential part of web applications. Together with HTML and CSS, JavaScript is one of the core technologies used by web developers.



Figure 11. PHP7 logo.

PHP 7

PHP (PHP: Hypertext Preprocessor) is a programming language that can be embedded in HTML pages. Among other things, it can automate repetitive tasks, particularly through communication with a database, which is one of its most common uses.



Figure 12. MySQL logo.

MySQL

MySQL is a relational database management system. It is fast, reliable, easy to use and available as open-source software. It was originally developed to manage very large databases more quickly than existing solutions. It offers a broad set of features, and its speed and security make it suitable for internet applications.

II.4. Requirements Specification

Requirements specification is the starting point for any application to be developed. This section focuses on the functional and non-functional requirements expressed by end users.

II.4.1. Functional Requirements

Functional requirements represent the expectations of each actor who will use the future system. The solution must meet these requirements in order to define its scope.

The platform's priority functional requirements are:

- Viewing the website's content.
- Managing registrations.
- Managing user accounts.

II.4.2. Non-functional Requirements

A non-functional requirement is a restriction or constraint affecting a system service. It may relate to the operating environment, implementation or performance expectations.

The main non-functional requirements include:

- Usability: the platform must provide a user-friendly interface that is easy to use.

- Performance: the platform must provide fast access to information and update data in real time.
- Maintainability: the code must be clear so that the platform can be extended or improved in the future.

II.5. Platform Design

II.5.1. Identification of Actors

An actor is an abstraction representing a role played by an external entity that interacts directly with the system. The actors targeted by the proposed solution are:

- Visitor: anyone who accesses the platform to find information about ESSAT, including prospective students who wish to apply using a form.
- Administrator: the user with the highest level of privileges, authorised to manage all aspects of the platform.
- Student: a person enrolled at ESSAT who has a platform account allowing them to view their timetable, examination results and other information.

II.5.2. Use-Case Diagrams

A use case represents a distinct unit of interaction between an actor and a system. The set of use cases is represented in a UML diagram, providing an overall view of the system's functional behaviour.

II.5.2.1. Graphical Description

To provide an efficient overview while maintaining clarity and readability, all actors were grouped into a single general use-case diagram.

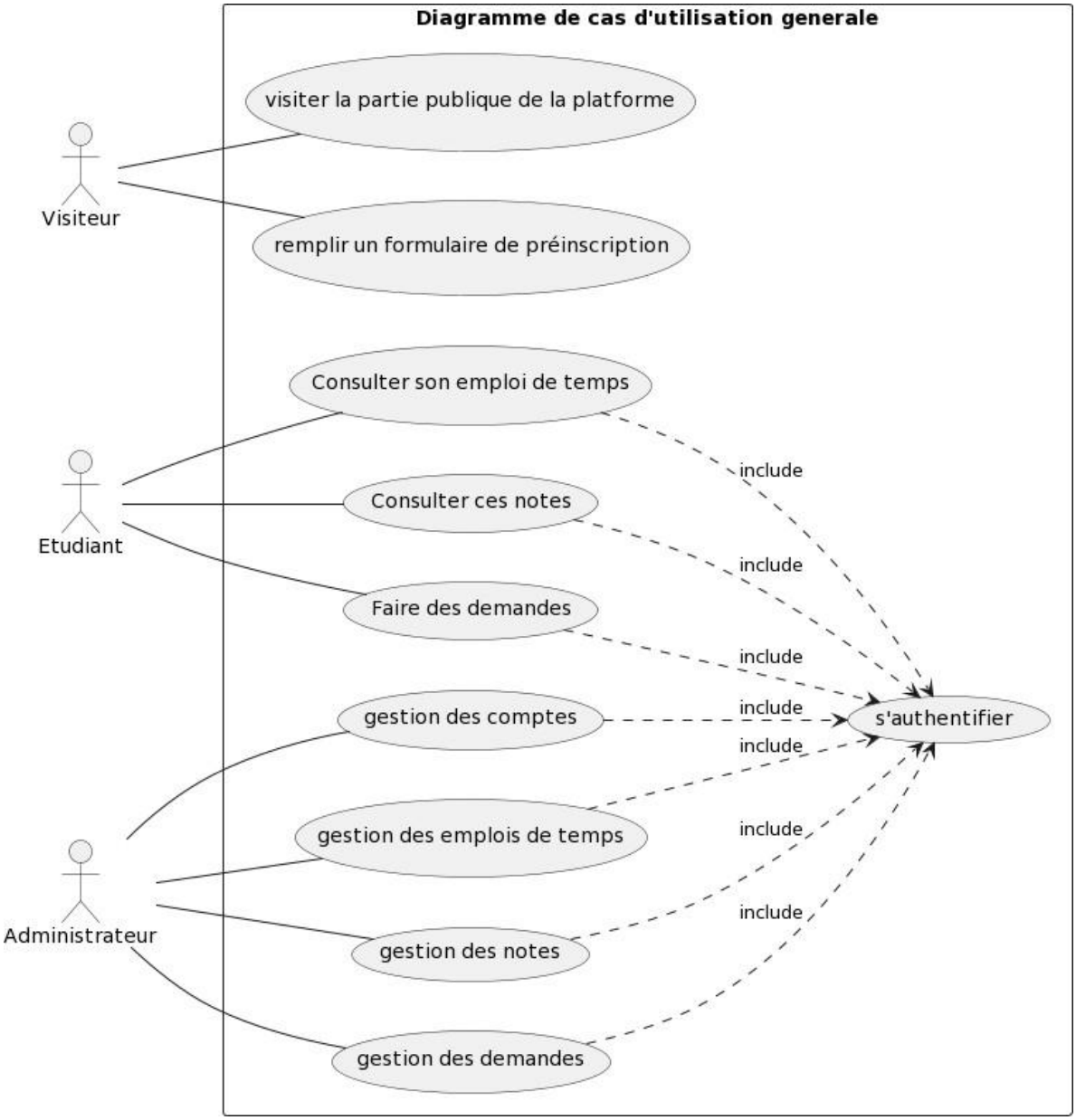


Figure 13. General use case diagram.

II.5.2.2. Refinement of the Authentication Use Case

To provide a clearer understanding of the general diagram, a dedicated use-case diagram was created for authentication.

Authentication – Use-case Description

The authentication use case allows an actor to access their personal area.

Field	Description
Title	Authenticate / Sign in

Purpose	Allow the actor to access their personal workspace.
Actors	Administrator, Student
Precondition	The user is already registered and is on the home page.
Main flow	1. The user selects the login button.\n2. The user chooses either the student area or the administrator area.\n3. The system displays the login form.\n4. The user enters their username and password.\n5. The system verifies the entered credentials.\n6. The system opens the workspace corresponding to the user's profile.
Alternative flow	If the username or password is incorrect, or if a field is left empty, the system displays an error message and asks the user to enter the information again.

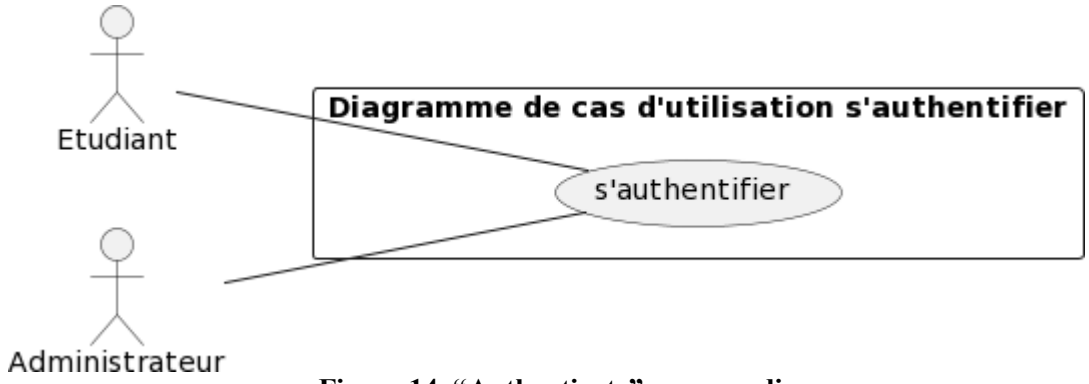


Figure 14. "Authenticate" use case diagram.

Authentication – Class Diagram

The authentication class diagram represents the structure and relationships between the classes involved in the authentication process. It includes the main entities, such as User and Account, together with their attributes and methods. Relationships, including the association between the user and the login system, are also presented, providing a concise view of how the system components interact to enable authentication.

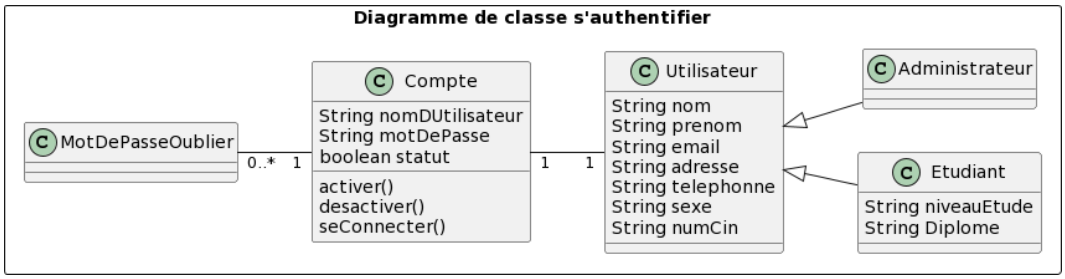


Figure 15. Authentication class diagram

Authentication – Sequence Diagram

The authentication sequence diagram presents the interactions between the different actors and components in chronological order. It highlights key steps such as the user submitting their credentials, the system checking those credentials and the authentication being validated. The diagram provides a clear sequential view of the event flow and the interactions between the components involved.

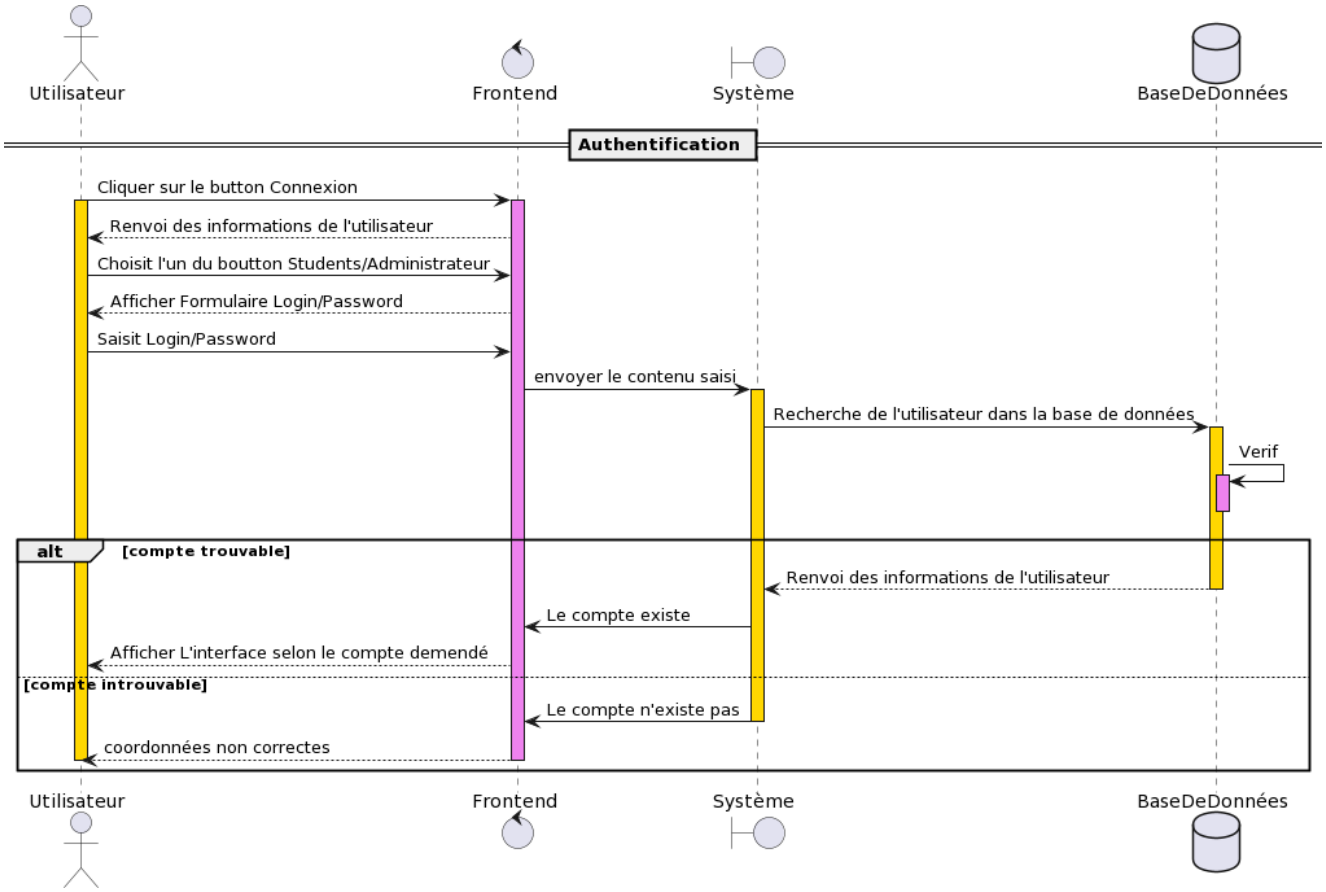


Figure 16. "Authenticate" sequence diagram.

II.5.2.3. Refinement of the Examination-Results Use Case

This section introduces a more detailed use-case diagram for viewing examination results.

The student can view examination results, and the use case includes authentication. Downloading the results in PDF format is represented as an extension of the viewing process.

Field	Description
Purpose	Allow the student to download examination results in PDF format.
Actor	Student
Precondition	The student is authenticated.
Main flow	1. The student accesses their school account.\n2. The student clicks the Examination Results button.\n3. The student selects a link.\n4. The system displays the selected PDF.\n5. The student clicks the Download button.\n6. The system saves the PDF to the student's device.

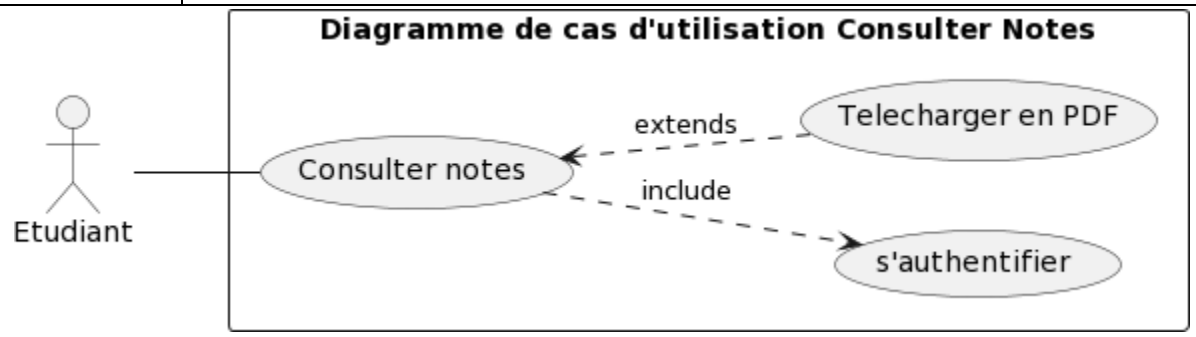


Figure 17. "View exam grades" use case diagram.

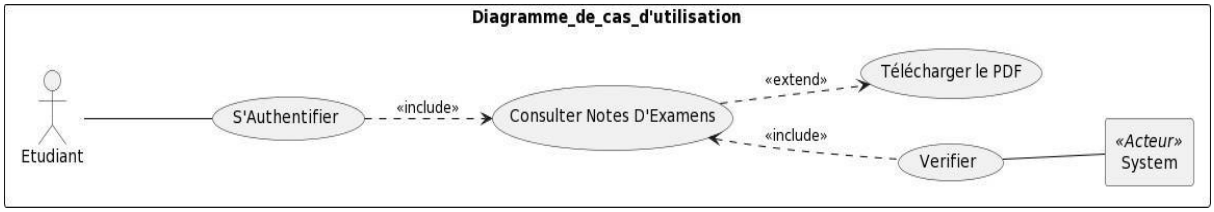


Figure 18. Use case diagram for "Download exam grades as PDF."

Examination Results – Class Diagram

The class diagram for downloading examination results in PDF format details the structure and relationships between the classes involved in viewing examination results. The main entities, such as Student and Examination Results, are represented with their respective attributes. Key relationships, such as the association between a student and their examination results, are defined. The diagram provides a view of how the system components interact to allow students to access their results efficiently and securely.

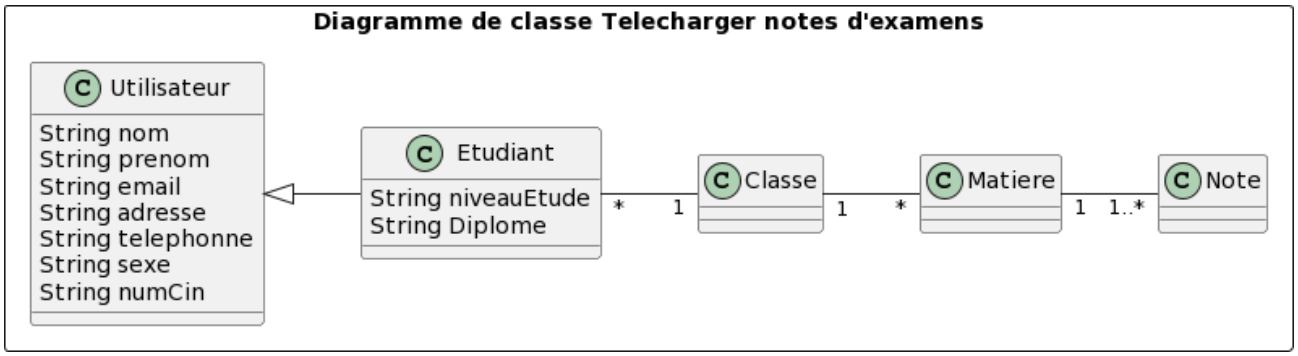


Figure 19. Class diagram for "Download exam grades as PDF."

Examination Results – Sequence Diagram

The sequence diagram illustrates the chronological interactions between the actors and components when a student views examination results. The key steps include the student's request to view the results, retrieval of the results from the system and presentation of the results to the student. It provides a sequential representation of the process and clarifies the interactions between the student and the system.

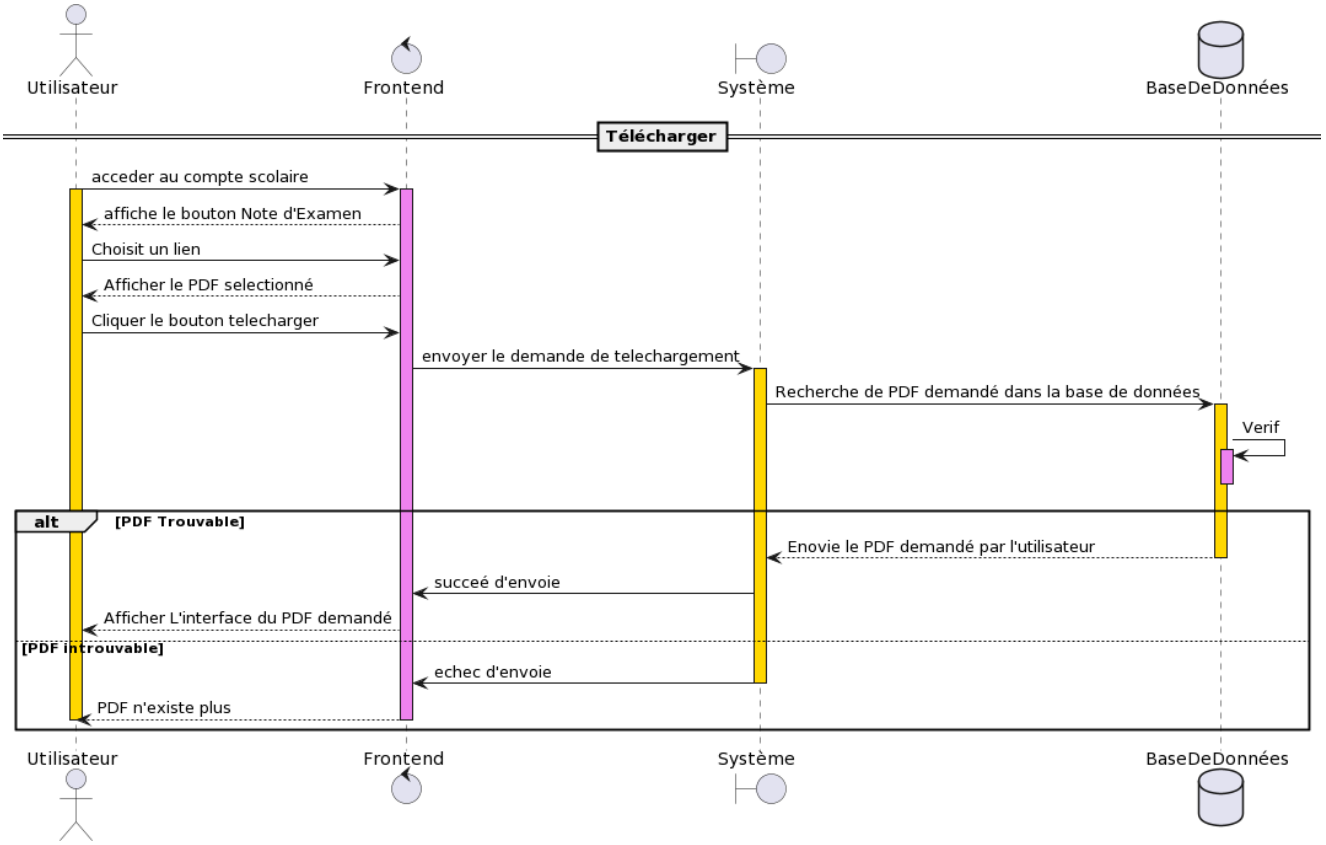


Figure 20. "Download exam grades as PDF" sequence diagram.

II.5.2.4. Refinement of the Prospective Student's Pre-registration Use Case

This section provides a textual description of the pre-registration use case.

Field	Description
Purpose	Pre-registration.
Actor	Prospective student.
Precondition	The student is not yet registered and is currently on the website.
Main flow	1. The user clicks the Pre-Registration button.\n2. The system displays the pre-registration form.\n3. The user enters the requested information.\n4. The user clicks the Submit button.\n5. The system displays the result.
Alternative flow	An input or validation problem occurs in one of the form fields.



Figure 21. "Pre-registration" use case diagram.

Pre-registration – Class Diagram

The pre-registration class diagram presents the structure of the classes and their relationships in the context of a user's pre-registration. The key entities, including Administrator and User, are described through their specific attributes. Important links, such as the association between the system and the user, are defined.

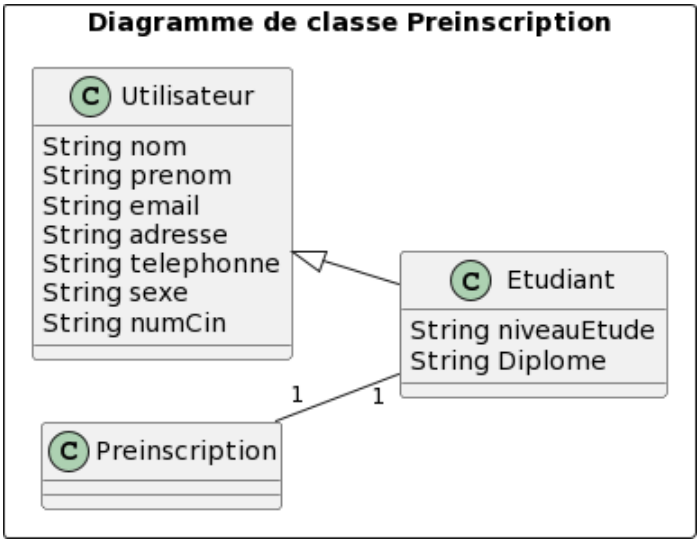


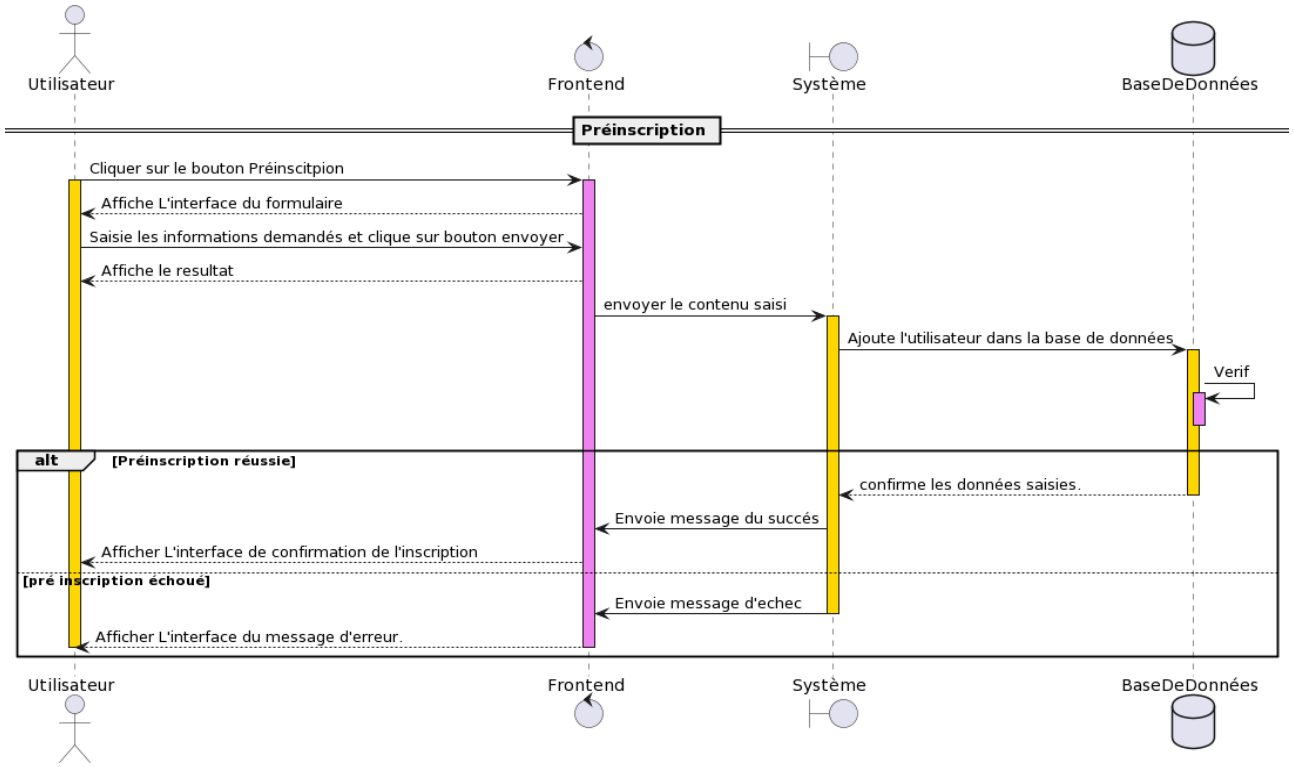
Figure 22. "Pre-registration" class diagram.

Pre-registration – Sequence Diagram

The sequence diagram for pre-registration by a prospective student presents the interactions between the actors and components in chronological order. The key steps include the user entering personal information in the form, the new user being added to the database and confirmation that the process has

succeeded. The diagram provides a sequential view of the registration process and the interactions between the administrator and the system.

Figure 23. “Pre-registration” sequence diagram.



II.5.2.5. Refinement of the User-Account Activation Use Case

This section provides a textual description of the user-account activation use case.

Field	Description
Purpose	Activate a user account.
Actor	Administrator.
Precondition	The administrator is already authenticated and is on the dashboard.
Main flow	1. The administrator opens the user-management interface.\n2. The system displays the list of pre-registered students.\n3. The administrator selects a user account and clicks Activate.\n4. The system sends the user an email confirming the successful process.\n5. The system displays an account-activation confirmation message.

Alternative flow	A connection problem occurs.

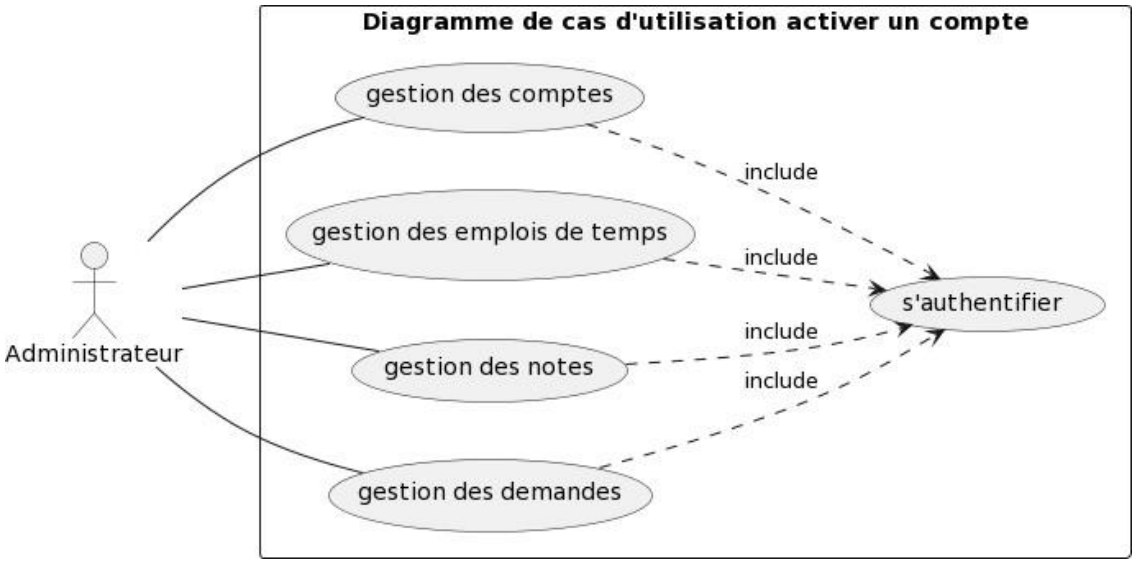


Figure 24. "Activate a user account" use case diagram.

User-Account Activation – Class Diagram

The class diagram for user-account activation presents the structure of the classes and their relationships in the account-activation process. The key entities, including Administrator and User, are described through their attributes. The relationships, such as the association between the administrator and the user account to be activated, are defined. The diagram shows the components required for the administrator to activate a user account efficiently and securely.

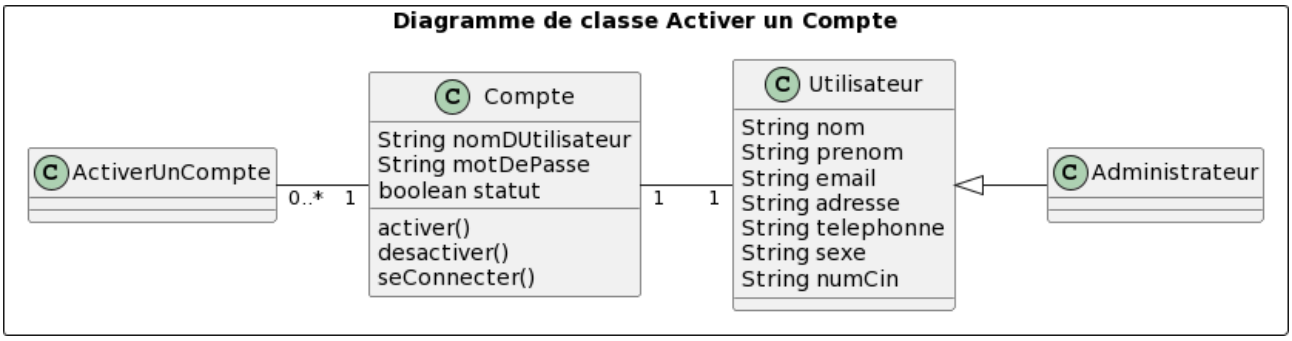


Figure 25. "Activate a user account" class diagram.

User-Account Activation – Sequence Diagram

The sequence diagram presents the chronological interactions between the actors and components during user-account activation. The key steps include the administrator requesting activation, the system searching for the user in the database and the account then being activated. The diagram provides a sequential view of the process and clarifies the interactions between the administrator and the system.

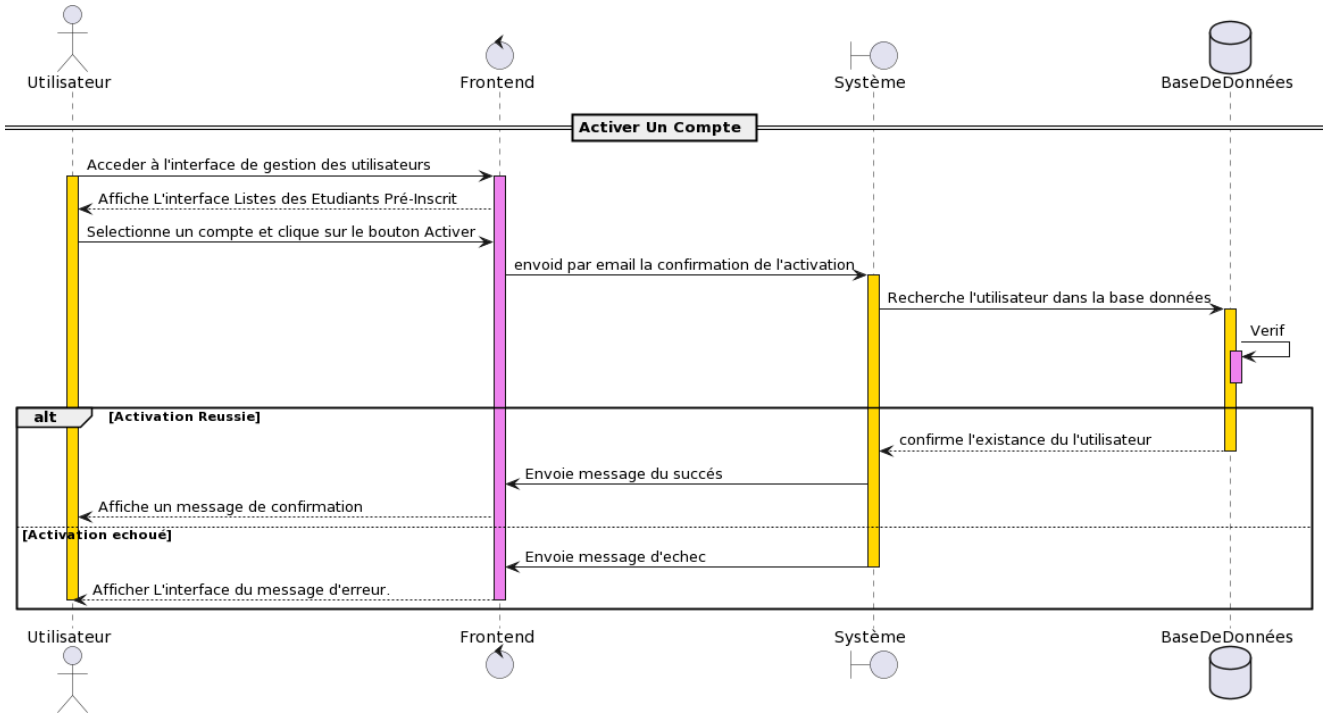


Figure 26. "Activate a user account" sequence diagram.

II.6. Conclusion

This chapter explained the proposed system model through several diagrams, including use-case, class and sequence diagrams. The next chapter describes the implementation of the platform.

Chapter III – Implementation and Testing

III.1. Introduction

After completing the platform design, this chapter addresses the final part of the report: the implementation phase. It concludes by illustrating how selected system tasks work through usage scenarios.

III.2. Interface Description

This section presents the main interfaces of the website through a usage scenario.

The scenario begins when the administrator accesses their area to populate the database with the information required to manage administrative tasks. The administrator first authenticates.

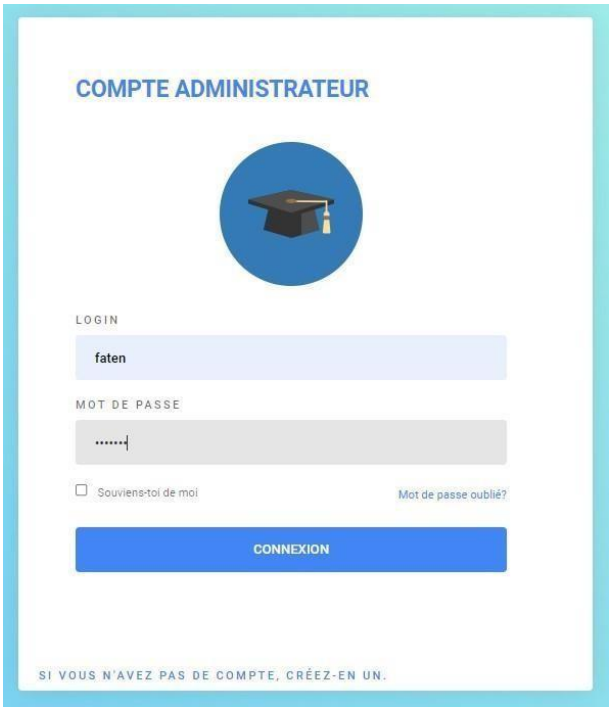


Figure 27. Authentication form.

Once logged in, the administrator proceeds to add students who wish to enrol at ESSAT.

The administrator can also add another administrator, namely an administrative staff member authorised to use the dashboard.

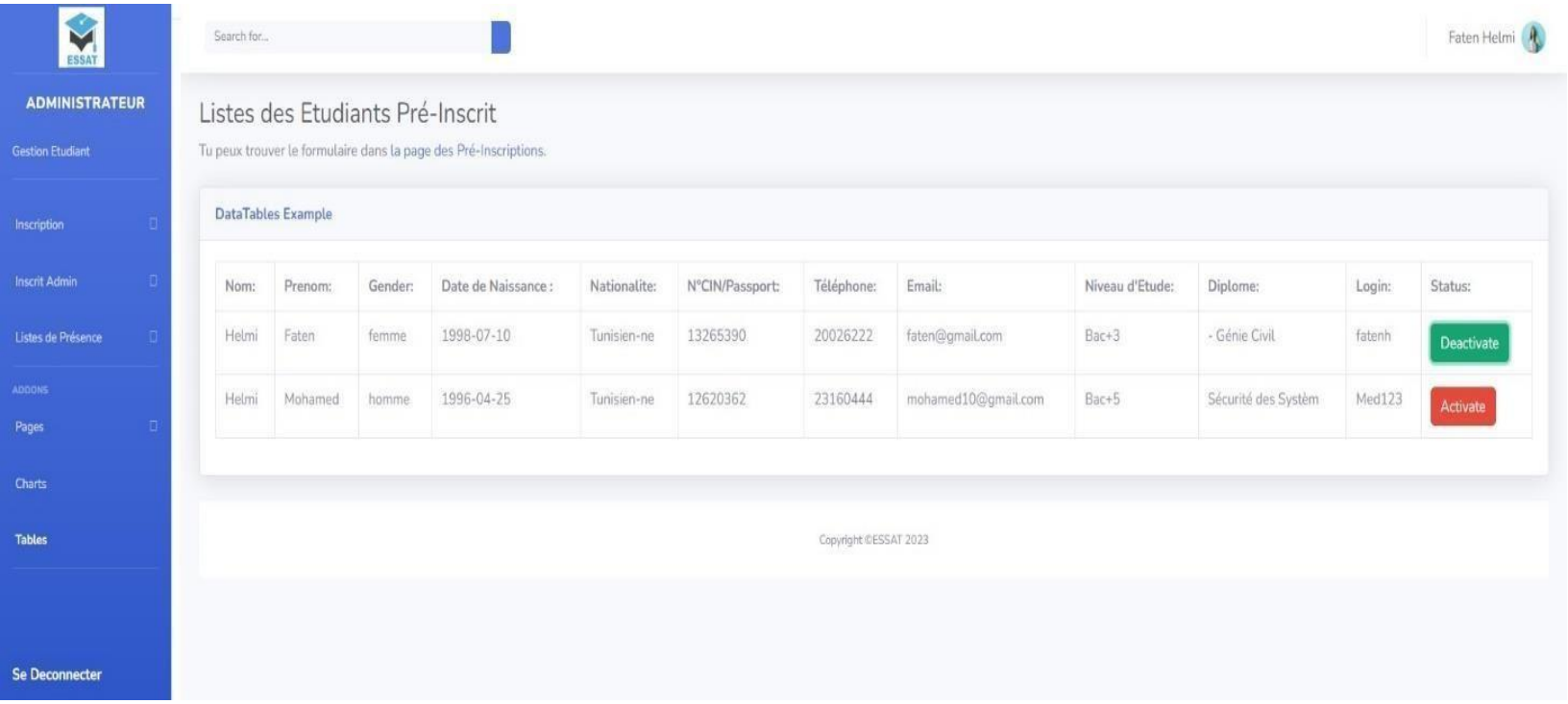


Figure 28. Interface for adding a new student

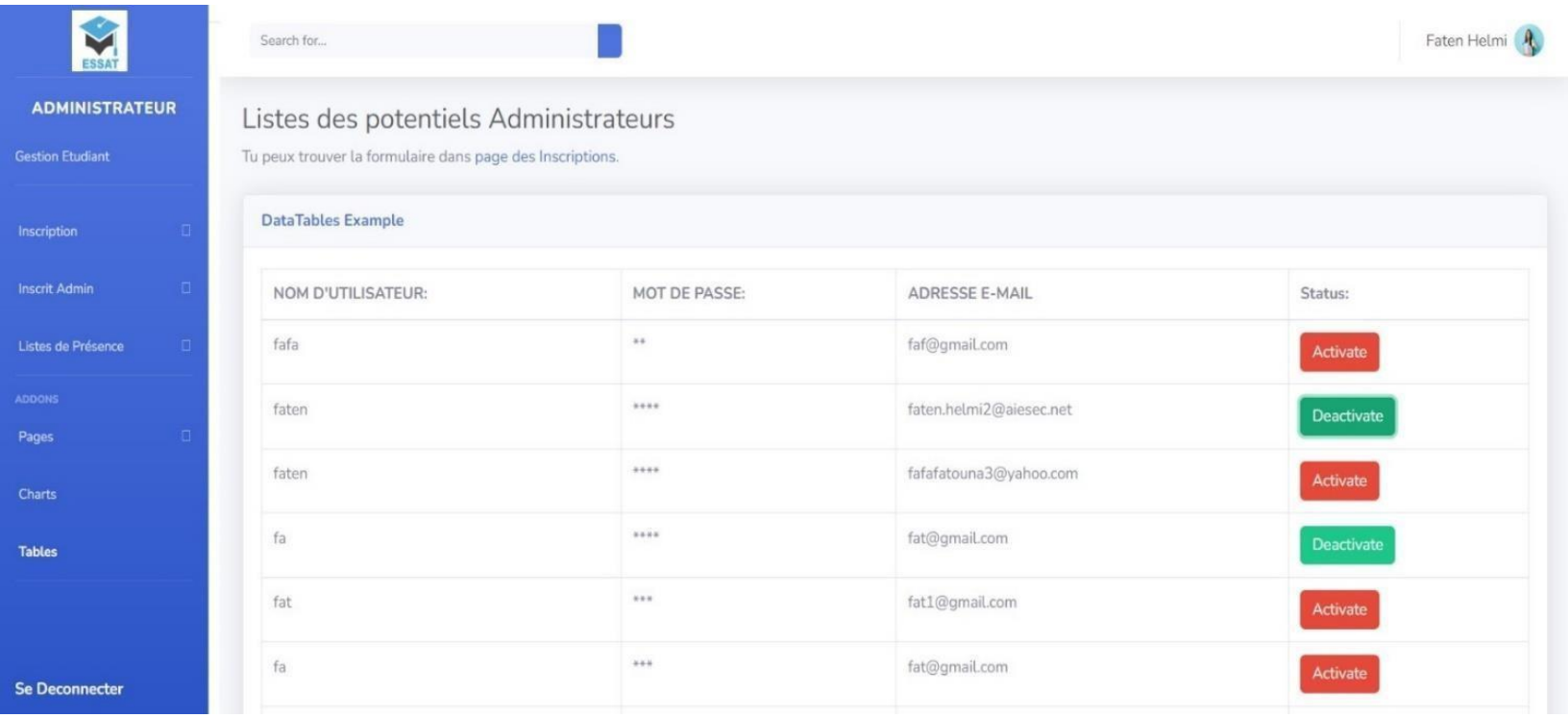


Figure 29. Interface for adding a new administrator.

In another scenario, a student wants to access their personal area to view their timetable or examination results. The student first authenticates.

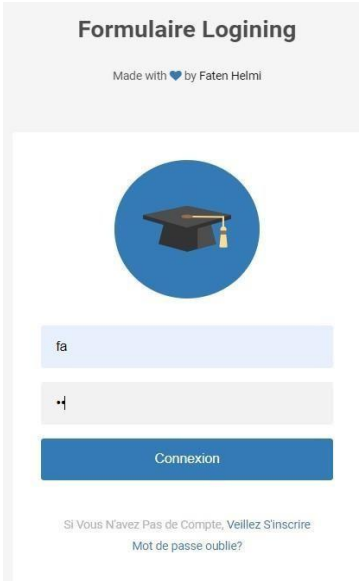


Figure 30. Authentication form.

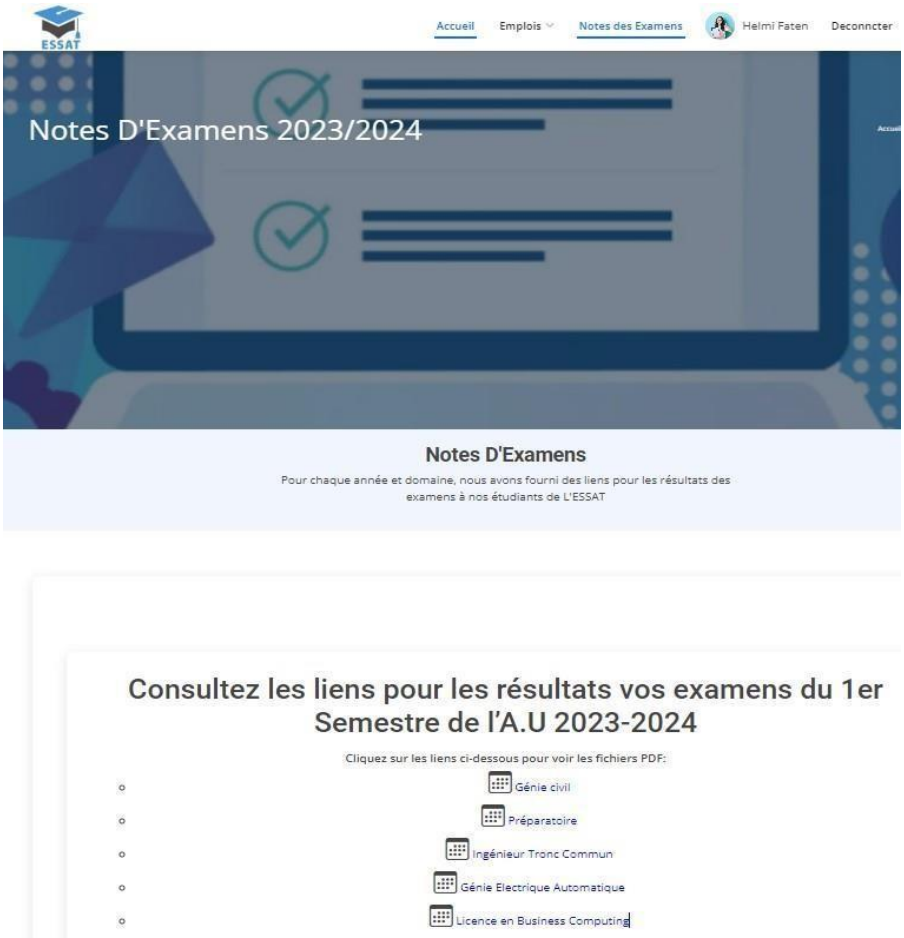


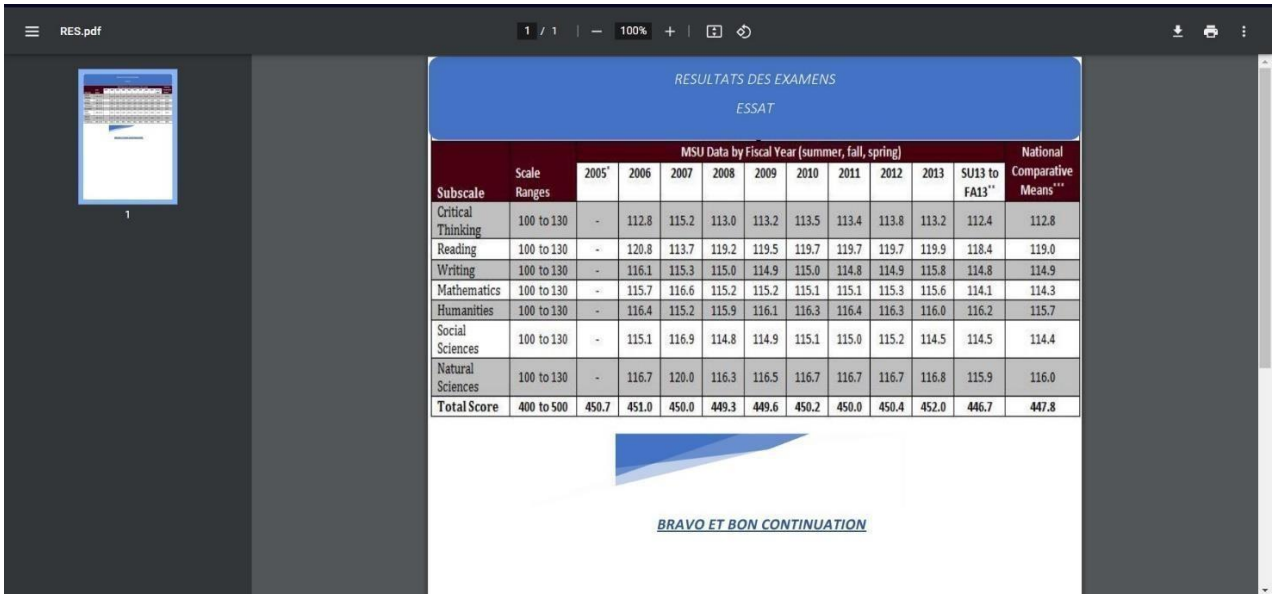
Figure 31. Student area: Interface for viewing exam grades.



Figure 32. Student Area: Interface for viewing class schedules

The student can view their year timetable.

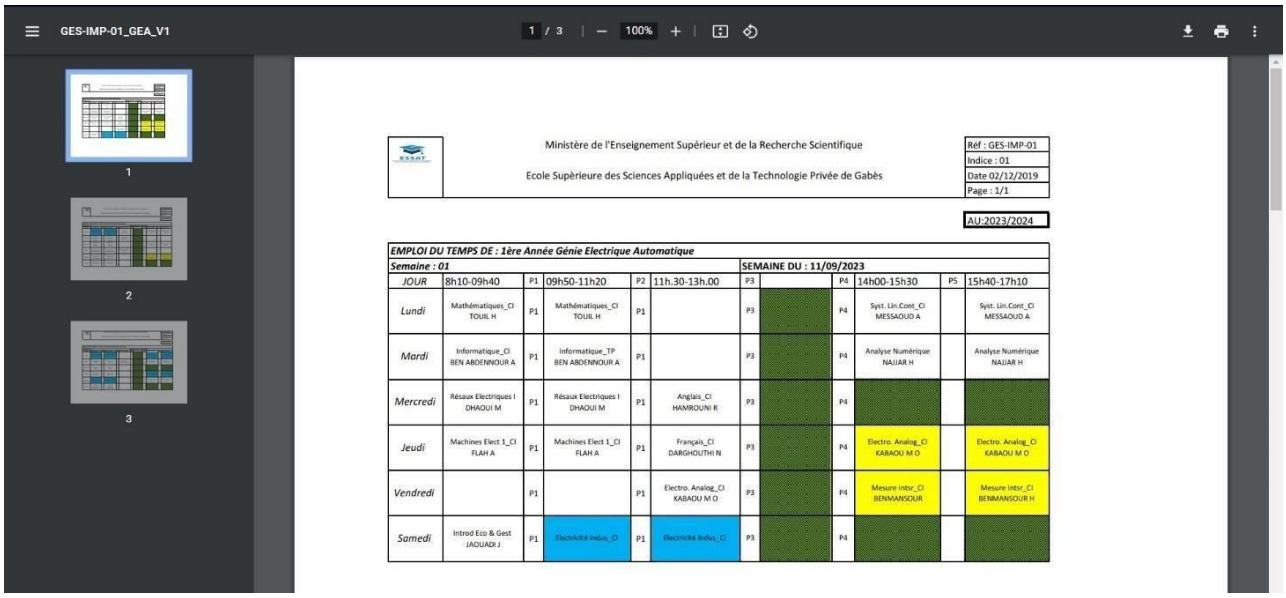
The student can also view and download examination results uploaded by the administrator.



Subscale	Scale Ranges	MSU Data by Fiscal Year (summer, fall, spring) 2005*	2006	2007	2008	2009	2010	2011	2012	2013	SU13 to FA13**	National Comparative Means***
Critical Thinking	100 to 130	-	112.8	115.2	113.0	113.2	113.5	113.4	113.8	113.2	112.4	112.8
Reading	100 to 130	-	120.8	113.7	119.2	119.5	119.7	119.7	119.7	119.9	118.4	119.0
Writing	100 to 130	-	116.1	115.3	115.0	114.9	115.0	114.8	114.9	115.8	114.8	114.9
Mathematics	100 to 130	-	115.7	116.6	115.2	115.2	115.1	115.1	115.3	115.6	114.1	114.3
Humanities	100 to 130	-	116.4	115.2	115.9	116.1	116.3	116.4	116.3	116.0	116.2	115.7
Social Sciences	100 to 130	-	115.1	116.9	114.8	114.9	115.1	115.0	115.2	114.5	114.5	114.4
Natural Sciences	100 to 130	-	116.7	120.0	116.3	116.5	116.7	116.7	116.7	116.8	115.9	116.0
Total Score	**400 to 500**	**450.7**	**451.0**	**450.0**	**449.3**	**449.6**	**450.2**	**450.0**	**450.4**	**452.0**	**446.7**	**447.8**

Figure 33. Student area: Interface for downloading exam grades.

Similarly, the student can view and download the timetable uploaded by the administrator.



JOUR	8h10-09h40	P1	09h50-11h20	P2	11h.30-13h.00	P3		P4	14h00-15h30	P5	15h40-17h10
Lundi	Mathématiques_Cl TOUIL H	P1	Mathématiques_Cl TOUIL H	P1		P3		P4	Syst. Lin.Cont_Cl MESSAOUD A		Syst. Lin.Cont_Cl MESSAOUD A
Mardi	Informatique_Cl BEN ABDENNOUR A	P1	Informatique_TP BEN ABDENNOUR A	P1		P3		P4	Analyse Numérique NAJJAR H		Analyse Numérique NAJJAR H
Mercredi	Réseaux Electriques I DHAOUI M	P1	Réseaux Electriques I DHAOUI M	P1	Anglais_Cl HAMROUNI R	P3		P4			
Jeudi	Machines Elect 1_Cl FLAH A	P1	Machines Elect 1_Cl FLAH A	P1	Français_Cl DARGHOUTHI N	P3		P4	Electro. Analog_Cl KABAOU M O		Electro. Analog_Cl KABAOU M O
Vendredi		P1		P1	Electro. Analog_Cl KABAOU M O	P3		P4	Mesure Intsr_Cl BENMANSOUR		Mesure Intsr_Cl BENMANSOUR H
Samedi	Introd Eco & Gest JAOUADI J	P1	Electricité Indus_Cl	P1	Electricité Indus_Cl	P3		P4			

Figure 34. Student area: Interface for downloading class schedule.

In this scenario, the student or administrator has forgotten their password. They can recover it via email.



Figure 35. Student area: "Forgot password" interface.

In another scenario, a prospective student wishes to enroll at ESSAT. They begin by completing and submitting the pre-registration form.

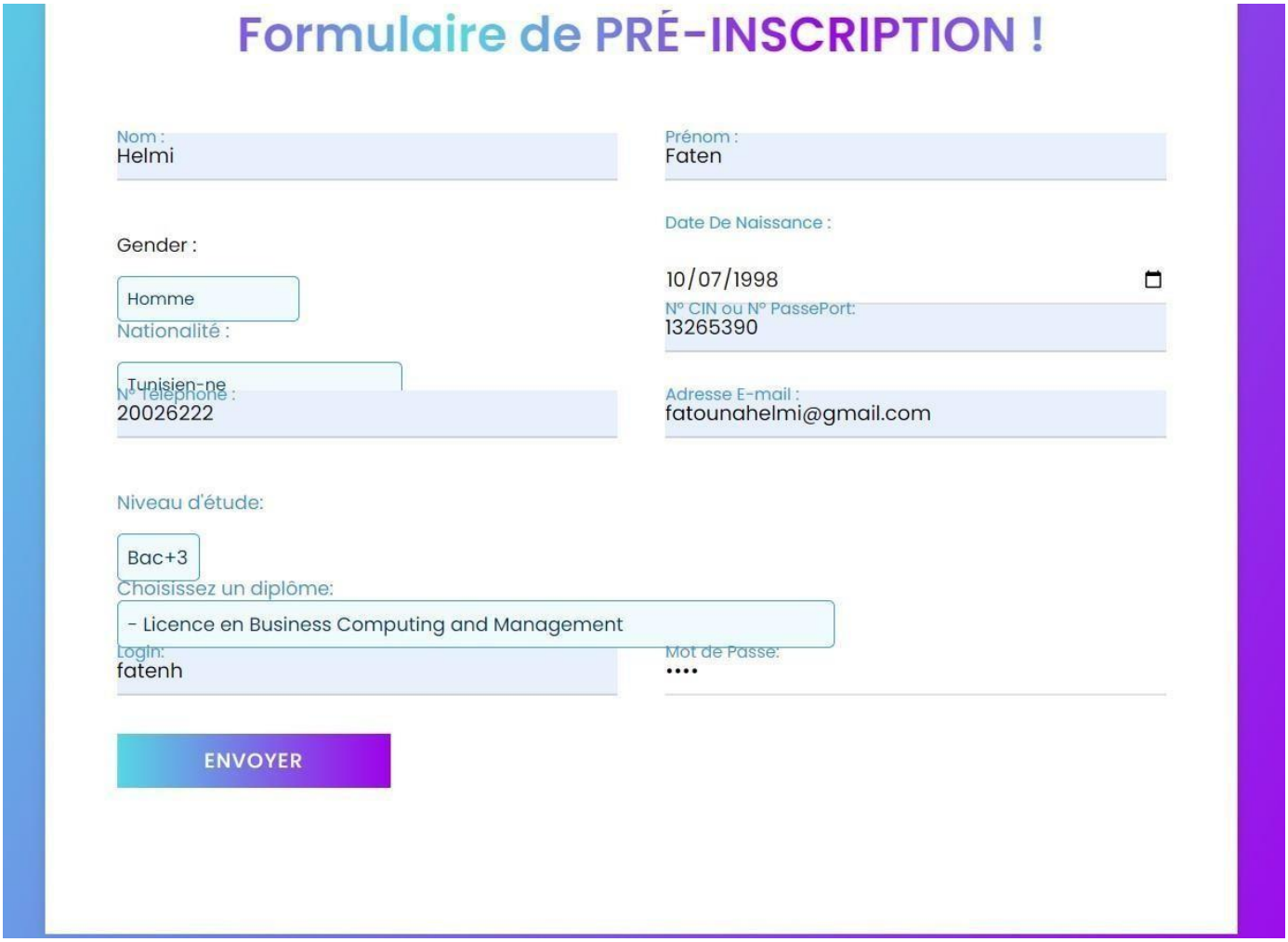


Figure 36. Pre-registration form interface.

The following screenshots show the home page displayed to visitors of the platform.



Figure 37. The home page interface.



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Cycles d'Ingénieur

- Génie Logiciel
- Génie Réseaux et Télécommunications
- Génie Electrique-Automatique
- Génie Civil



Mastères Professionnels

- Sécurité des Systèmes Informatiques et Architectures des Réseaux
- Management de la Qualité, Hygiène, Sécurité, Environnement et Energie



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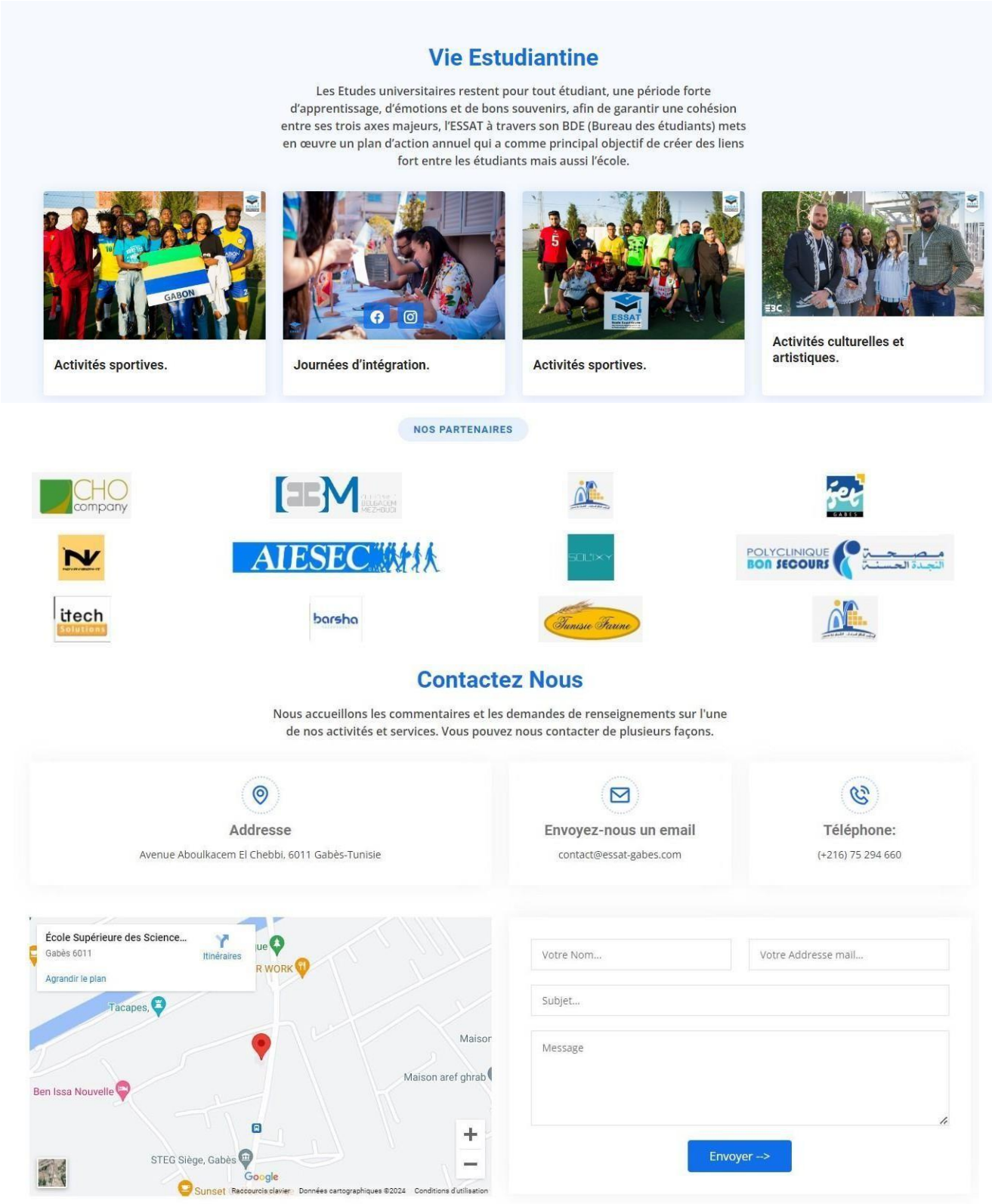


Figure 37. The home page interface

III.3. Conclusion

This chapter presented the outcome of the studies and implementation work carried out as part of the project, including the architecture used to develop the website, the working environment and, finally, the user interfaces.

General Conclusion:

In conclusion, I am proud of the progress I made and the skills I acquired through my final-year project, which focused on creating a web platform. Throughout this project, I applied the theoretical and practical knowledge gained during my studies, from designing a solution to implementing an innovative system.

This project enabled me to develop my technical, project-management and communication skills while facing stimulating challenges. Beyond technical skills, I also learned the importance of collaboration, adaptability and resilience when dealing with obstacles.

This experience helped me grow not only as a professional but also as a person, strengthening my confidence in my abilities and my determination to achieve my goals. I am grateful for this enriching experience, which has helped prepare me for the challenges ahead in my career.