The Democratic Popular Republic of Algeria

Ministry of Higher Education and Scientific Research

University of Abdel Hamid Mehri Constantine 2

Faculty of New Technologies of Information and Communications

Department of Computer Science and its Applications

Graduation project submitted in partial fulfillment of the requirement for the degree of

Bachelor of computer science

Specialization: Information Technology

Design and implementation of a web application for Internship management

Supervised by:

Dr. Wissem Bouarroudj

carried out by:

Mohamed Achraf Damous

Mohamed Islem Belhadef

-June 2023-

Table Of Contents

List of Figures

List of tables

General introduction:

Project context:

Internships are a crucial step in a student's transition from academia to the professional world. They provide students with the opportunity to gain practical experience, develop industry-specific skills, and establish important professional connections.

Internships also offer an opportunity for students to network with professionals in their field and build relationships that can help them in their future careers. By working with experienced professionals, students can gain valuable insight into the industry and learn about potential career paths.

At the University of Constantine 2 Abdelhamid Mehri the internship application process can be time-consuming and challenging for students, who often have academic commitments or other responsibilities. Currently, students must physically visit the administration office to collect information about available internship opportunities and then apply for the desired internship by submitting physical application forms to the relevant companies.

Overall, the current internship application process can be a significant obstacle for students who are seeking to gain practical experience and launch their professional careers. By streamlining the application process and making it more accessible and transparent, we can help to ensure that all students have an equal opportunity to gain practical experience and build the skills they need to succeed in their future careers.

Existing problems:

- Time consumption: The current process requires students to physically visit the administration office to collect information about available internship opportunities and then apply for the desired internship by submitting physical application forms to the relevant companies. This process can be time-consuming and burdensome for students, who often have academic commitments or other responsibilities.
- Travel expenses: The current process also requires students to travel to the administration office and to the relevant companies to submit their physical application forms. This can pose financial difficulties for students, particularly those with limited financial resources.
- Limited accessibility to information: The current process limits the accessibility and availability of information about internship opportunities. Students may miss out on opportunities that they would have been interested in due to a lack of access to information.
- Limited scope of opportunities: The current process may limit the scope of internship opportunities available to students, as companies may not be aware of the talent pool that exists at the University of Constantine 2 Abdelhamid Mehri and may not choose to advertise their internship opportunities to the university community.
- Material consumption: The classic procedure requires the university and the hosting company to print multiple forms and documents, which eventually will end up using a lot of paper and ink and other materials, this can be not only expensive but also harmful to the environment.

Contributions:

In order to solve some of the problems students and other actors may encounter in the classic procedure we propose a web application to simplify and streamline the internship application procedure.

The web application will allow students to make their accounts, check available internship offers, send demands to new internships and also stay notified about their internship applications.

Heads of departments are in charge of validating the internships for students will be able to check all the demands and applications on their account with the possibility to validate or deny the demands.

Companies will have the opportunity to create new internship offers in the website so the eligible students can apply directly, the company or its internship department can also check the students' internship applications and demands.

Document organization:

This thesis is organized as next:

General introduction: This introduction contains the basic project context, current problems, contributions and our document organization.

First chapter: Project context: In this chapter, we present the detailed context of our project as well as stating the existing platforms that offer similar services.

Second chapter: Preliminary study and requirements specification: In the second chapter, we present the project we are looking to realize, identification of the actors, the app specifications as well as the functional and non-functional requirements. Use case diagrams and the textual description of three use cases.

Third chapter: Analysis and design: In this chapter, we focus mainly on the design of our application, presenting the different UML diagrams: class diagram, navigation diagram, activity diagram with the different use cases, sequence diagram and the transition from UML class diagram to relational database.

Fourth chapter: Implementation: The final chapter presents the result of system implementation: its architecture, the hardware and software resources used for the completion of the project, some examples of data and processing implementation, present the structure of databases manipulated by the application, present the use and manipulation of the software through some user interfaces.

General conclusion: Citing any difficulties encountered, the objectives achieved, and the prospects of the project (remaining tasks to be completed).

Chapter 1 : Project context

1.1 Detailed presentation of the context

1.1.1 Internships: A Crucial Step in Student Development

Internships have been an essential part of student development for decades. They provide students with practical experience in their field of study, allowing them to apply the concepts they have learned in a real-world setting. This essay will examine the importance of internships, the application procedure between the student, the university, and the company, how interns are evaluated during their time with the organization, and some suggestions on how to make the process easier.

1.1.2 The Importance of Internships

Internships are a critical step in a student's transition from the academic world to the professional world. These work experiences provide invaluable opportunities to gain hands-on experience in a chosen field and develop skills that cannot be learned in a classroom. Internships are essential because they allow students to gain a real-world understanding of the field they are interested in, learn about the day-to-day operations of a company, and see how their education can be applied to practical situations. They allow students to apply the knowledge and skills they have learned in the classroom to real-world situations. In addition, internships can help students develop new skills, such as problem-solving, communication, and teamwork. Internships also provide students with the opportunity to build a network of professional contacts in their chosen industry, which can be valuable when looking for future job opportunities.

Internships also help students establish professional connections, which can be vital when looking for a job after graduation. By interning with a company, students can network with professionals who may be able to offer job recommendations, write letters of recommendation, or even hire the student after graduation. Internships also provide students with an understanding of the job market and what employers are looking for in potential candidates. This knowledge can help students tailor their resumes and job applications to stand out from other candidates.

Moreover, internships offer an opportunity to build a professional portfolio that showcases a student's work experience, skills, and achievements. This portfolio can be used to impress future employers and demonstrate that the student has a genuine interest and experience in their field of study. Additionally, internships provide an opportunity for students to explore different career paths within their field and decide which path they want to take after graduation.

Internships are also beneficial to employers. They provide companies with a low-cost way to evaluate potential employees, as well as access to fresh ideas and new perspectives. Interns can also provide valuable assistance with projects and daily tasks, freeing up full-time employees to focus on more complex tasks.

1.1.3 The Application Procedure

Becoming an intern is an exciting opportunity for students to gain hands-on experience in their chosen field. To start, the first step a student needs to take is to research and find companies that are offering open spots for interns. This can be done by browsing job boards, reaching out to company career centres, or networking with professionals in the field. Once a student has identified an internship opportunity that they are interested in the next step is to approach the concerned company and request an internship interview.
This interview is an opportunity for the student to showcase their skills, knowledge, and enthusiasm for the position. During the interview, the student should be prepared to discuss their academic background, relevant coursework, and any relevant experience they have.

After being accepted the student can request an internship demand form from their university administration. The internship demand form is an important document that the student must fill out and get signed by the head of their department. This form includes essential details about the student and the internship, such as their academic background, the desired internship position, and the duration of the internship. The university administration verifies that the student meets the eligibility criteria, such as academic performance and required courses, and approves the student's request for an internship.

Once the student is offered the internship position and starts working, they will be evaluated throughout their internship by their supervisor. This evaluation typically includes feedback on the student's performance, professional conduct, and work quality. At the end of the internship, the student's evaluation is sent to the University for a Review.

In conclusion, the process of becoming an intern involves several steps, including researching and finding internship opportunities, filling out and getting the internship demand form signed by the head of the department, requesting an internship interview, and getting evaluated by the supervisor. By following these steps, students can secure an internship that provides valuable experience and opens doors to future job opportunities.

1.1.4 The Evaluation Process

During their time with the organization, interns are typically evaluated on a variety of factors, including their job performance, attitude, and work ethic. The company may also provide feedback on specific skills or areas of improvement for the intern.

In addition, the university may require interns to submit regular progress reports or complete assignments related to their internship experience. This helps the university monitor the student's progress and ensures that they are receiving a valuable learning experience.

At the end of the internship, the company may provide the intern with a letter of recommendation or an evaluation of their performance. This can be a valuable asset for the student when applying for future job opportunities.

1.1.5 Making the Process Easier

While internships are a valuable part of student development, the application procedure can be time-consuming and expensive. Companies may receive hundreds of applications for a single internship, and students may need to spend a significant amount of time researching potential opportunities and submitting applications.

To make the process easier, universities and companies could consider using a centralized internship application platform. This would allow students to search for internships from a single platform, and companies could receive applications from a larger pool of potential candidates. This would save time for both students and companies, and could also help ensure that students are matched with internships that are a good fit for their skills and interests.

In addition, universities could provide students with more guidance on the internship application process, including tips on writing resumes and cover letters, and information on how to conduct themselves during interviews.

Furthermore, some universities offer internship programs that provide students with additional support during the internship experience. These programs may include regular check-ins with a faculty advisor or the opportunity to participate in a seminar or workshop related to the academic topics of the student.

1.2 Presentation of the existing:

Figure 1 : LinkedIn logo

1.2.1 LinkedIn:

LinkedIn is a social networking platform designed for professionals to connect, communicate, and build relationships with other professionals in their field. It serves as a virtual resume and portfolio, allowing users to showcase their skills, work experience, and education. With over 700 million members, LinkedIn has become a powerful tool for career advancement and professional networking.

One of the advantages of LinkedIn for internships is the ability to find and apply for internship opportunities. Companies often post their open internships on LinkedIn, providing a centralized location for job seekers to browse and apply. Additionally, users can follow companies and organizations they are interested in to stay up to date on their latest news and job postings. Interns can also use LinkedIn to network with professionals in their desired industry, gaining valuable insights and potentially even securing a job offer after their internship. Finally, LinkedIn allows interns to showcase their skills and accomplishments to potential employers, making them more attractive candidates for future opportunities.

Figure 2 : Emploitic logo

1.2.2 Emploitic:

Emploitic is a leading online job board in Algeria that connects job seekers with potential employers. It offers a wide range of job opportunities across various industries and sectors, including internships. Emploitic provides job seekers with a platform to browse through a comprehensive list of internship opportunities and apply for the ones that suit their qualifications and interests. Employers can also post their internship openings on Emploitic, allowing them to reach a large pool of qualified candidates

One of the advantages of Emploitic for internships is that it provides a platform for students and recent graduates to gain practical work experience and build their skills. Interns can get hands-on experience in their chosen field, gain insight into the industry, and make valuable connections that could help them advance their careers. Emploitic also allows students to find internships that align with their academic interests, allowing them to apply their classroom knowledge in a practical setting.

Emploitic is widely used in Algeria as it is a trusted and reliable platform for job seekers and employers alike. Many companies in Algeria prefer to post their internship opportunities on Emploitic due to its wide reach and targeted audience. Additionally, Emploitic provides job seekers with helpful resources and tools, such as interview tips and resume advice, making it a comprehensive platform for all job search needs. Overall, Emploitic has become a go-to resource for job seekers and employers in Algeria, particularly for internships.

Figure 3 : Indeed logo

1.2.3 Indeed:

Indeed is a global job search engine that allows job seekers to search and apply for job opportunities posted by companies around the world. It is one of the largest job search platforms, with millions of job postings and over 250 million unique visitors each month. Indeed offers a user-friendly interface that allows job seekers to search for jobs based on their location, industry, and job title. It also provides helpful resources such as salary information, company reviews, and interview tips.

When it comes to internships, Indeed is a useful tool for job seekers looking to gain practical work experience. It features a dedicated section for internships, where users can search for internship opportunities by location, industry, and job title. Users can also save their searches and set up email alerts to receive notifications when new internship openings are posted. Once they find an internship they are interested in, they can apply directly through Indeed by uploading their resume and cover letter or using the "Apply with Indeed" button.

Using Indeed to apply for internships has several advantages. It offers a convenient and efficient way to search for internship opportunities across various industries and sectors. Additionally, Indeed allows job seekers to apply for internships with just a few clicks, without having to navigate to different company websites or send emails manually. Finally, job seekers can use the platform's helpful resources to research potential employers and prepare for interviews, increasing their chances of securing an internship offer.

Chapter 2 : Preliminary study and requirements specification

2.1 Presentation of the project to be realised

Our web application is all about connecting together all the concerned parties in the internship process and help them get rid of the problems discussed previously that comes with the classic procedure and accompany students through their internships journey.

Give the student an easy access to internships

Students are allowed to create accounts using their university emails, edit their profiles and update their information.

Once logged in they will be able to browse different internship offers from well-established companies and apply for the ones that match their vision.

Students can also send internship demands to their university by filling a demand form and provide the necessary information about the internship and they will stay updated with notifications about their demands, applications status and new offers.

The university stays involved

All requests for internships will be handled first by the head of department.

The head of department can login to their account and examine all the demands and applications concerning the students of his department and decide whether to approve or reject them.

Once an internship request is approved, a notification is sent to the student and the application will be transferred to the internship supervisor to manage.

In case the supervisor account does not already exist, it will be automatically created and sent to his email address provided in the internship request.

Keep companies close to students

This platform will bridge the gap between students and companies by giving internship supervisors on behalf of their organizations the opportunity to create and manage internship offers and review the applications and demands approved by the university and either accept or refuse them.

Through their accounts, internship supervisors will be able to manage their interns, mark their presence and remain connected with them.

At the end of the internship the supervisor will evaluate the intern and print their internship certificate.

Provide administrative support

A super admin will be in charge of managing the platform and its users, he will be able to create, edit and delete accounts for students, head of departments and supervisors and also provide the support to ensure the satisfaction of the users.

Get your information anytime, anywhere

This web application is ideal place to store and keep your internships information to access anytime even after the end of the internship, the student will always have the possibility of consulting his completed internships, evaluations and certificates.

2.2 Identification of actors

2.2.1 Student

Our first and main actor is the student who's enrolled in the 3rd year of a Bachelor's degree or the 2nd year of a Master's degree at the University of Constantine 2 Abdelhamid Mehri. Through this platform the student will have the chance to browse different internships that companies are offering to the students of his university, apply to these offers or send new internship demands if the offer does not exist. All of this while the student will be notified in each step of his internship application.

2.2.2 Head of department

The university administrator who's in charge of students' internships. Using this platform he will be able to verify every student's internship application or demand, carefully read it and then decide whether his application should be accepted or denied.

2.2.3 Internship supervisor

A company worker, in charge of the internships' department in his company, will have an account in this platform where he can treat the internships' applications that passed through the university's head of department, give it another read and then accept or deny the demand or application. He will be also in charge of creating the new internship offers that his company has and post them on this web application.

2.2.4 Super administrator

A university worker, working in the administration office. His role in this platform is creating and managing every user's account, he can create, edit or delete any of the students or HODs or supervisors accounts.

2.3 Specifications document

2.3.1 Functional requirements

1. User registration: Students should be able to register to the system using their email address and password.
2. User login: Students, heads of departments and internship supervisors should be able to log in to the system using their email and password.
3. Application submission: Students should be able to submit applications to companies or send demands to the university through the web application.
4. Administrative management: Super administrators should be able to manage user accounts.
5. Offer management: Internship supervisors (or companies) should be able to add new internship offers and manage these offers.
6. Evaluation system: Internship supervisors should be able to evaluate their interns in the end of the internship and their evaluation is sent to the students afterwards.
7. Presence system: Internship supervisors should be able to mark their interns' presence throughout the internship duration and their presence should be an effective mark in their final evaluation.

2.3.2 Non-functional requirements

1. Usability: The web application should be user-friendly and intuitive.
2. Security: The web application should provide a secure environment for storing user data and preventing unauthorized access.
3. Performance: The web application should have a fast response time and be able to handle a large number of concurrent users.

4. Compatibility: The web application should be compatible with a variety of devices and web browsers.
5. Accessibility: The web application should be accessible to users with disabilities.
6. Reliability: The web application should be available and functional at all times, with minimal downtime.
7. Scalability: The web app should be able to handle increasing numbers of users and data as the user base grows.

2.4 Use case diagram and its textual descriptions

2.4.1 Use case diagrams

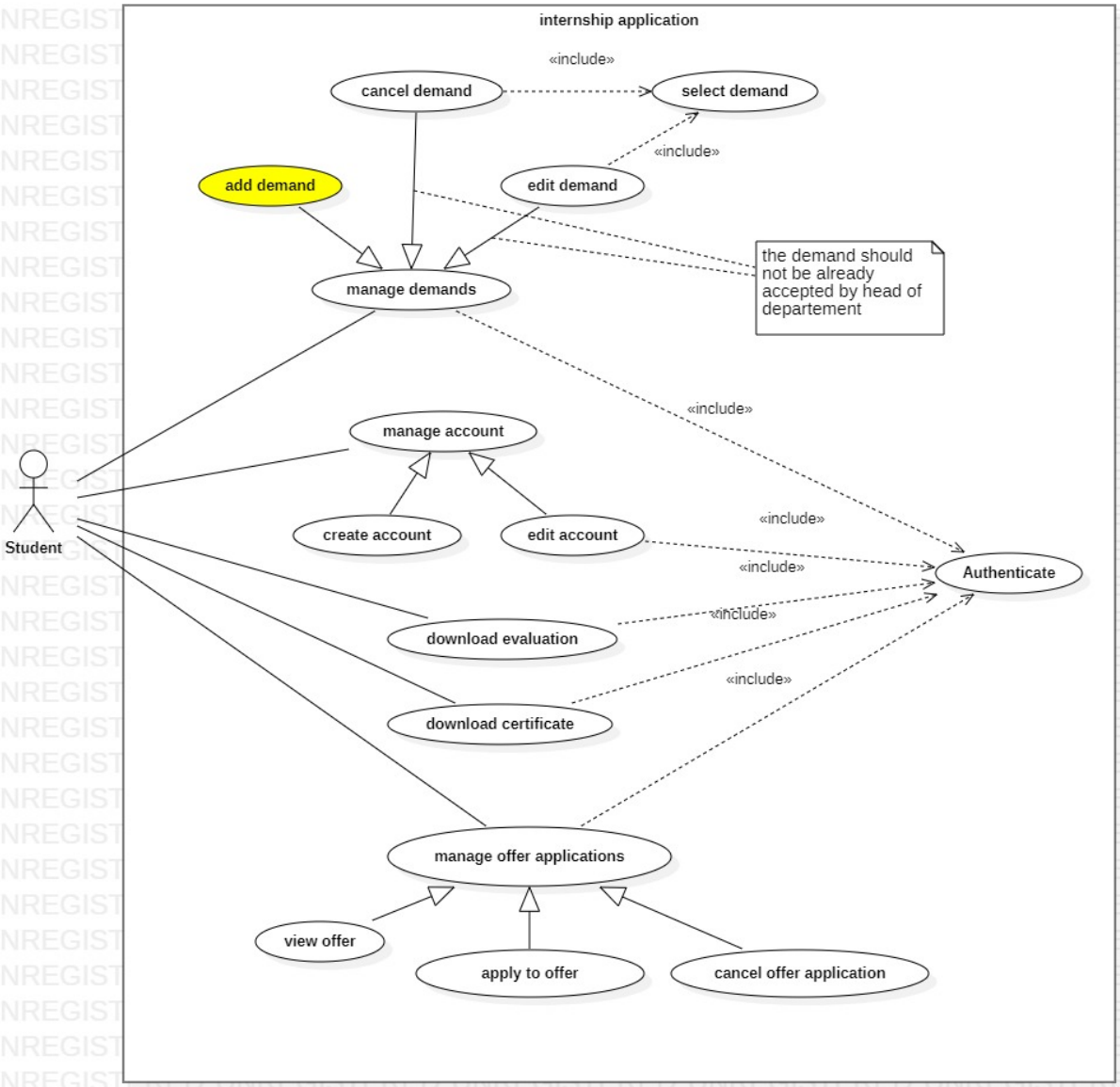

Figure 4 UCD Student

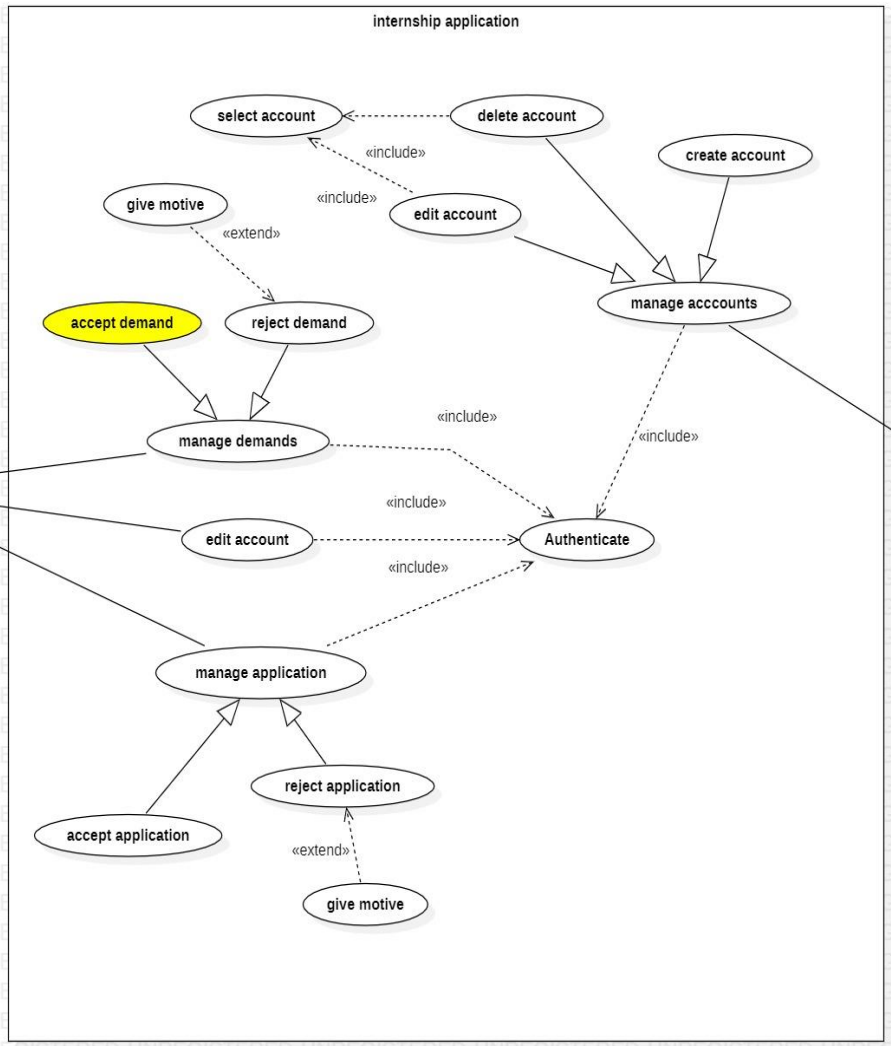

Figure 5 UCD Head of department & Super Admin

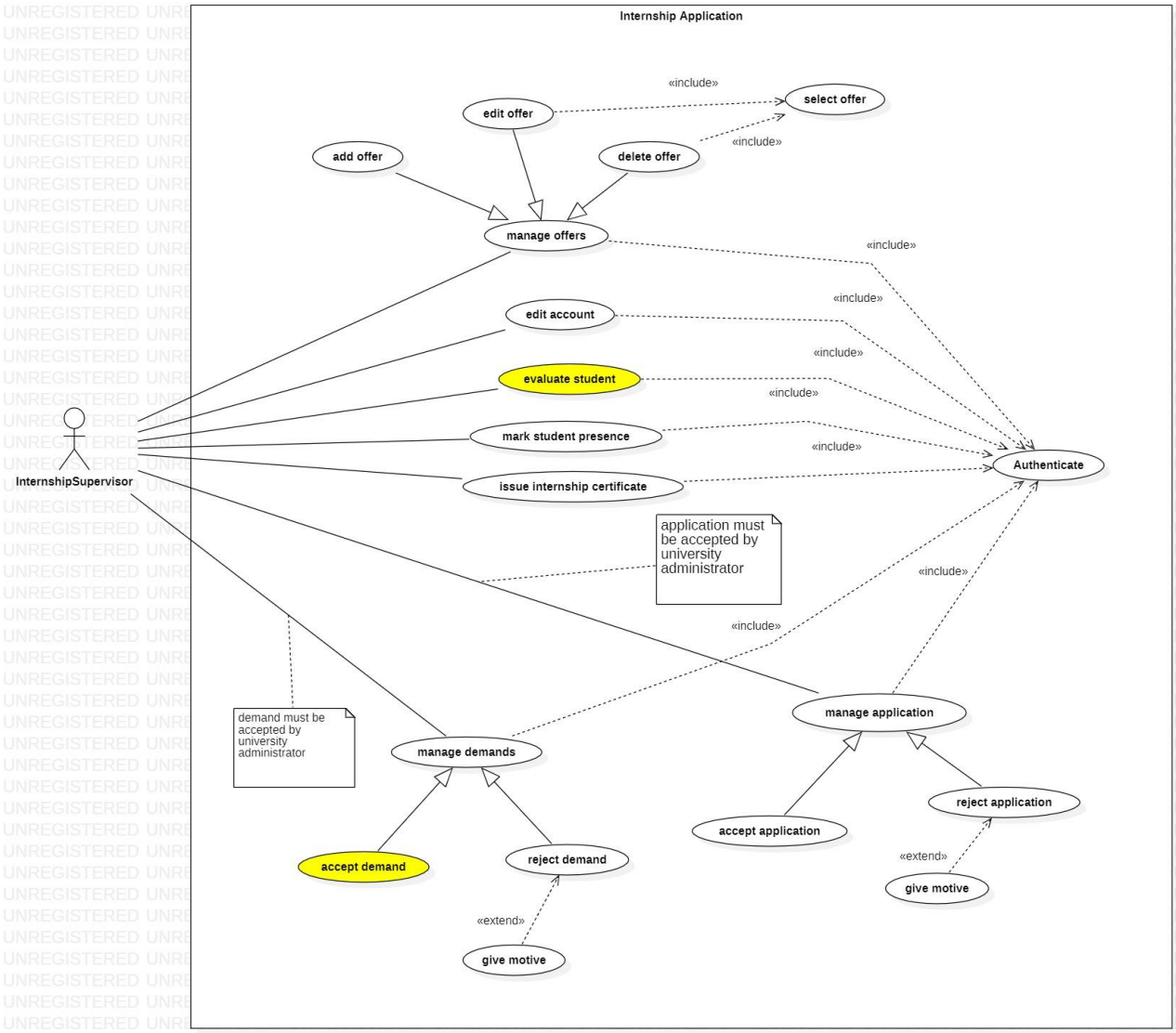

Figure 6 : UCD for Supervisor

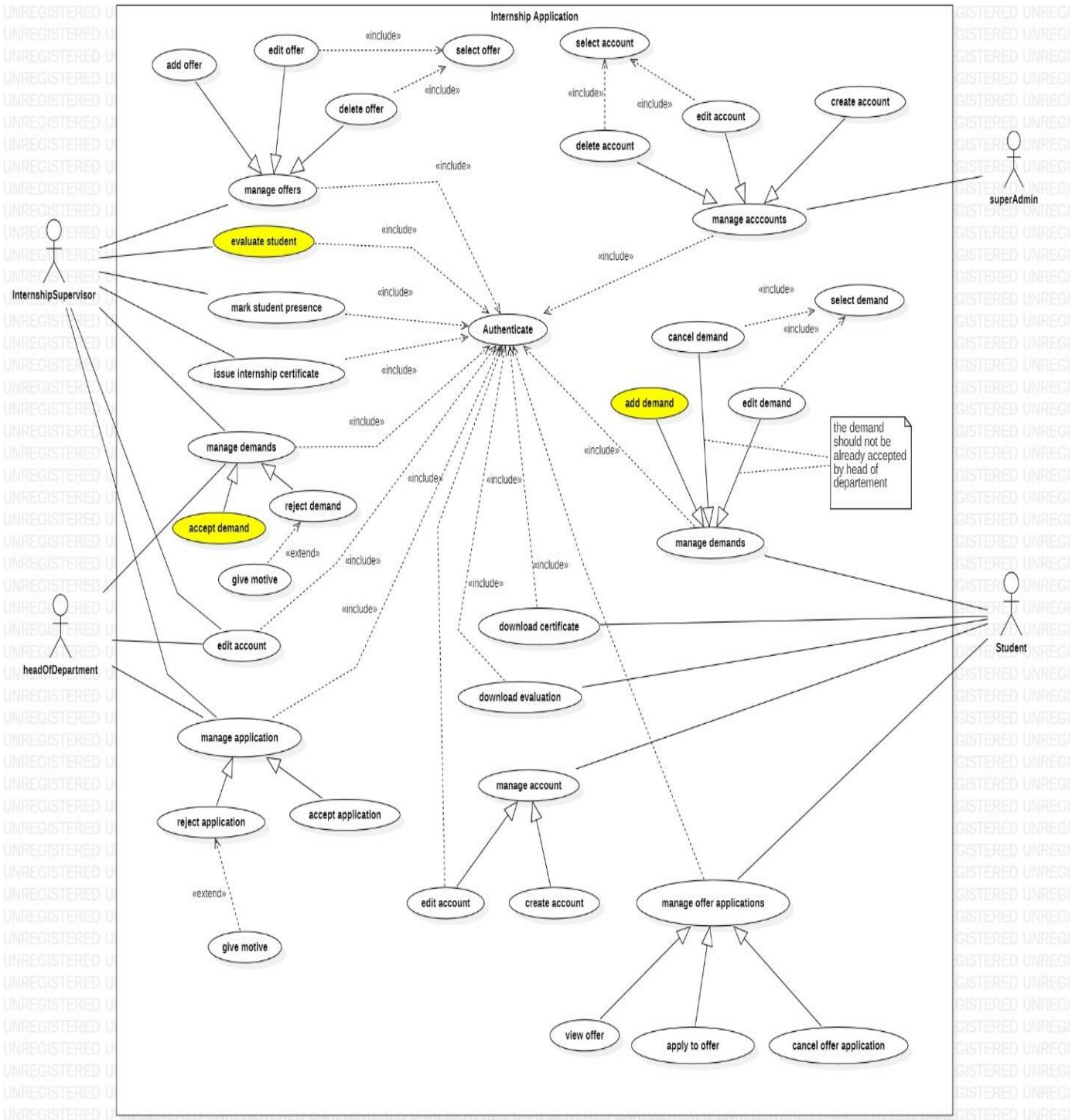

Figure 7 : Use case Diagram

2.4.2 Textual description for add internship demand use case

Title Add internship demand
Description The student can create a demand for internship by providing the necessary information about the internship, the company and the internship supervisor.
Primary actors • Student
Secondary actors
Pre-conditions • Student must be connected to the internet. • Student must have an account • Student must be authenticated.
Post-conditions • The internship demand is saved into the database. • The demand is transferred to the concerned head of department's account to treat.
Main scenario 1. The student clicks on "add new demand". 2. The system shows demand form. 3. The student fills the required fields with internship information. 4. The student confirm demand. 5. The system checks and validate the form. 6. The demand is saved to the database and sent to the head of department. 7. The system shows a success message to the student.
Alternative scenarios **A.1** The form is not valid. Starts in step 5 from the main scenario The system indicates to the student that the form is not correctly filled the system highlights the missing or incorrect form field Return to main scenario at step 2.
Extensions **E1.** The system fails to save the internship demand to the database. The system shows a network failure message. **E2.** Actor cancels the operation. This exception can happen anywhere between step 2 and step 4

Table 1 : textual description for use case 'add internship demand'

2.4.3 Textual description for accept application use case

Title Accept internship demand
Description The head of department can accept the student's internship demands after checking them, after that the internship supervisor can accept the demands already accepted by the head of department.
Primary actors • Head Of department
Secondary actors
Pre-conditions • The Head of department must be connected to the internet • The Head of department must be authenticated
Post-conditions • Internship supervisor account automatically created and the credentials sent to his email address if his account doesn't already exist • The demand is transferred to the internship supervisor to manage
Main scenario 1. The head of department checks the available demands 2. The head of department clicks on demand 3. The application shows all demand information 4. The head of department reads the demand information 5. The head of department clicks on accept demand button 6. A message is showed to confirm the creation of the internship supervisor's account. 7. The head of department clicks on confirm 8. The demand is registered and saved to the database
Alternative scenarios
Extensions **E1**. Error occurs when validating the demand The system shows an error message "Error occurred when validating the internship demand. The scenario continues from the step 4 of main scenario. **E2**. Actor cancels the operation This exception can happen anywhere between step 1 and step 4 The scenario continues from the step 1 of main scenario.

Table 2 : textual description for use case 'accept internship demand'

2.4.4 Textual description for evaluate intern use case

Title Evaluate intern
Description The internship supervisor marks notes based on the intern activity and productivity during his internship
Primary actors • Internship supervisor
Secondary actors • Student
Pre-conditions • Supervisor must be connected to the internet • Supervisor must be authenticated • The internship must end before the Supervisor can evaluate student
Post-conditions • The evaluation is sent to the concerned student
Main scenario 1. The supervisor opens his internships page 2. The supervisor selects the intern 3. The supervisor clicks on evaluate intern button 4. The system shows a form for the intern notes 5. The supervisor fills in the required information and notes 6. The supervisor clicks on finish evaluation 7. The system validates the entered information 8. The system registers the evaluation and saves it to the database
Alternative scenarios **A1**. The filled information are incorrect or missing • The scenario starts on step 7 of main scenario when the supervisor enters incorrect data or misses a required field. • The system shows an error message saying fill in the required field with correct information. • The scenario resumes from step 4 of the main scenario.
Exceptional scenarios **E1**. The supervisor cancels the evaluation process The scenario can start anywhere from step 1 to step 5 of the main scenario

Table 3 : textual description for use case 'evaluate intern'

Chapter 3 : Analysis and Design

3.1 System class diagram

The class diagram of our system will be the following.

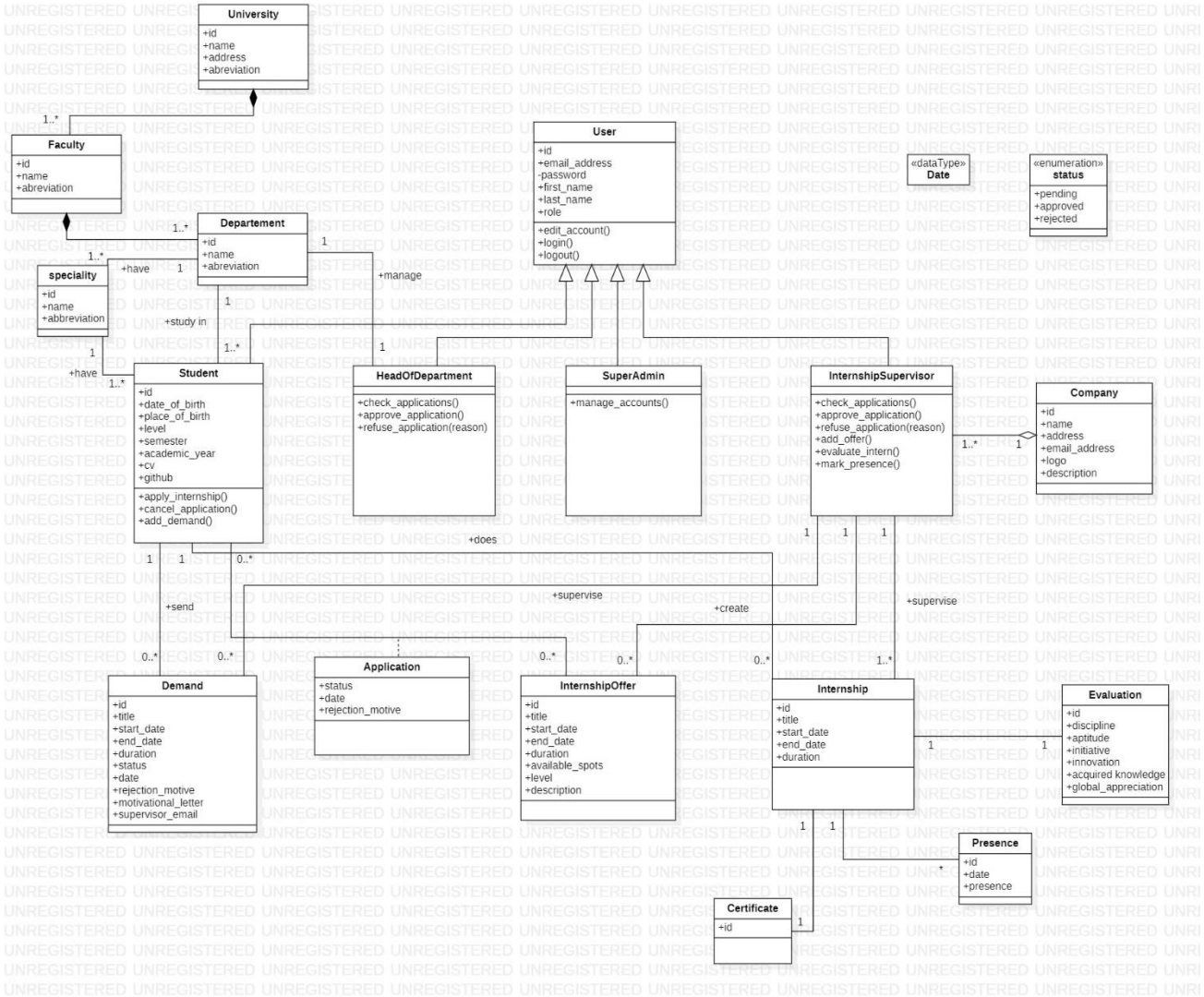

Figure 8 system class diagram

3.2 Navigation diagrams according to the HMI

3.2.1 Student navigation system

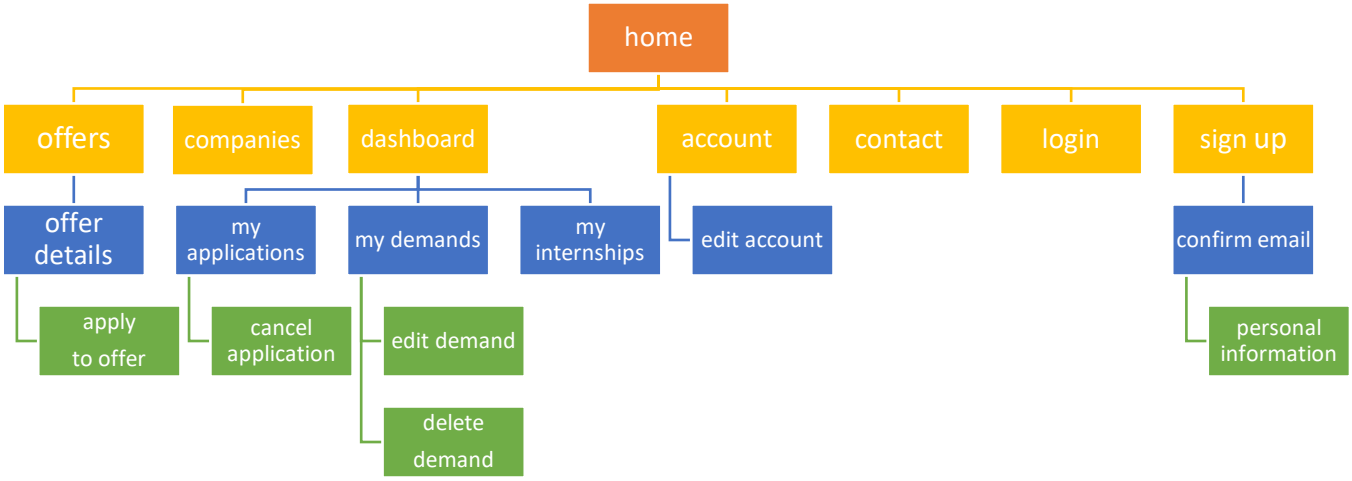

Figure 9 navigation diagram for student

3.2.2 Head of department navigation system

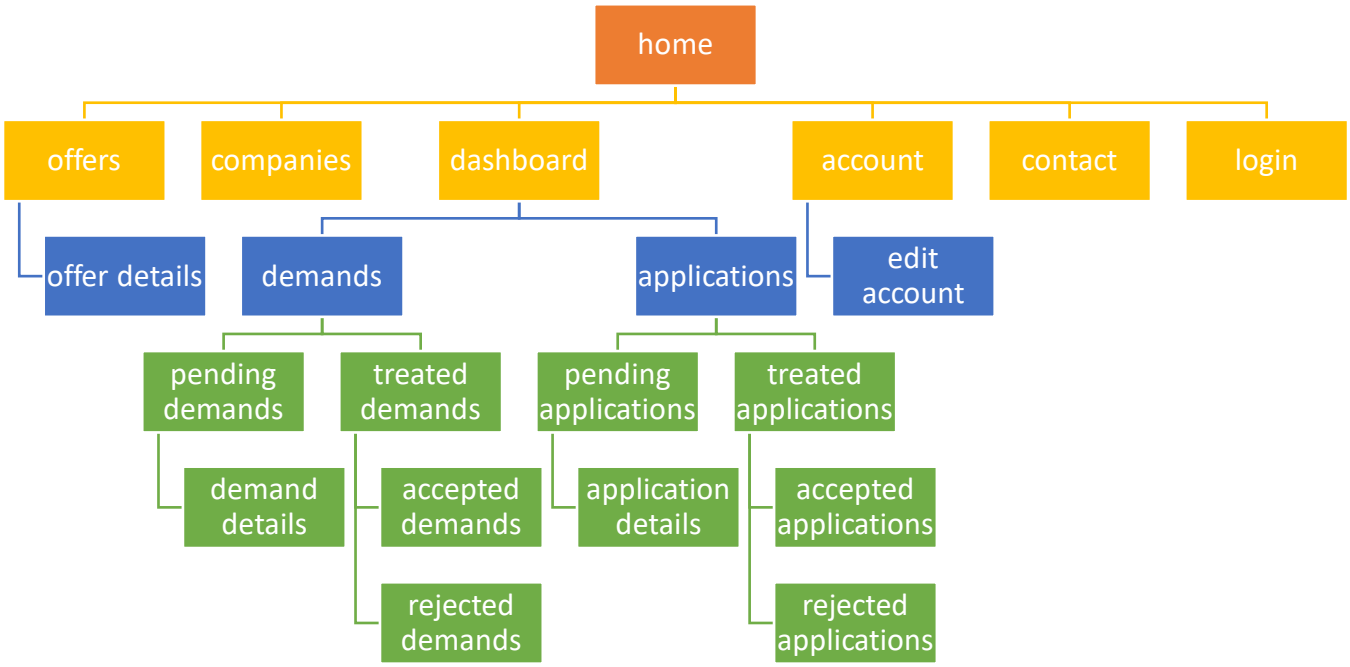

Figure 10 navigation diagram for head of department

3.2.3 Internship supervisor navigation system

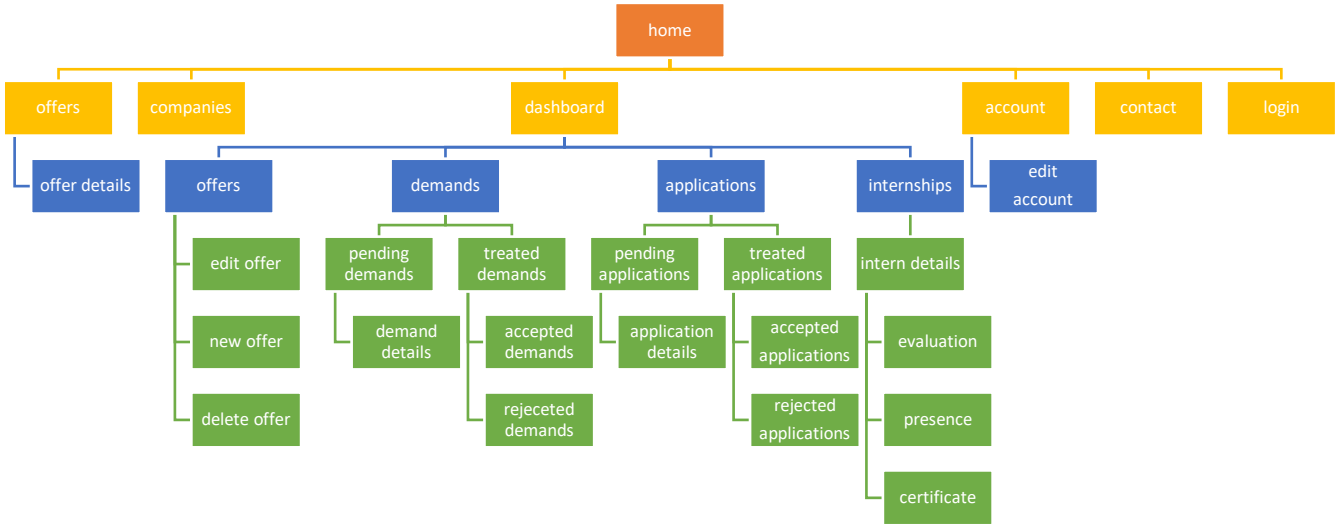

Figure 11 navigation diagram for internship supervisor

3.2.4 Super administrator navigation system

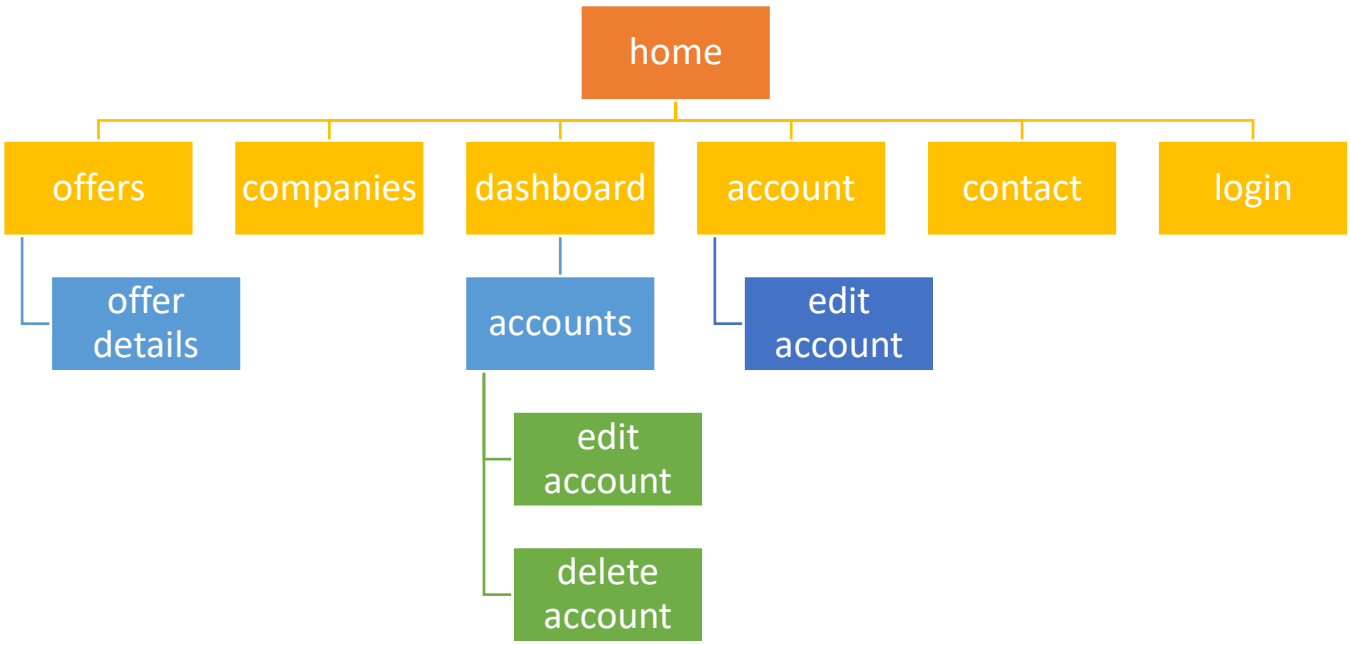

Figure 12 navigation diagram for super administrator

3.3 Activity Diagrams

3.3.1 Activity Diagram for add internship demand use case

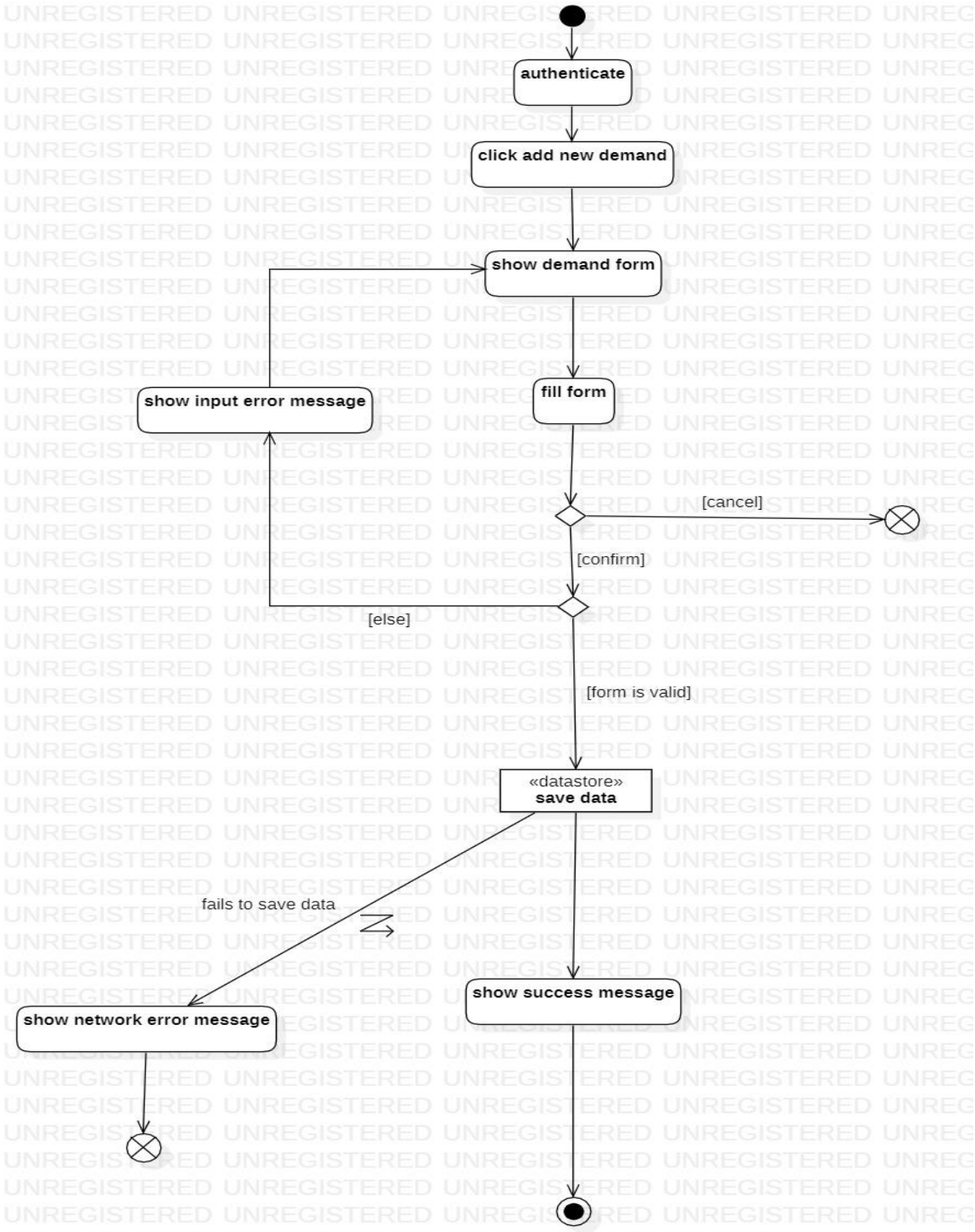

Figure 13 activity diagram for 'add internship demand' use case

3.3.2 Activity Diagram for accept application use case

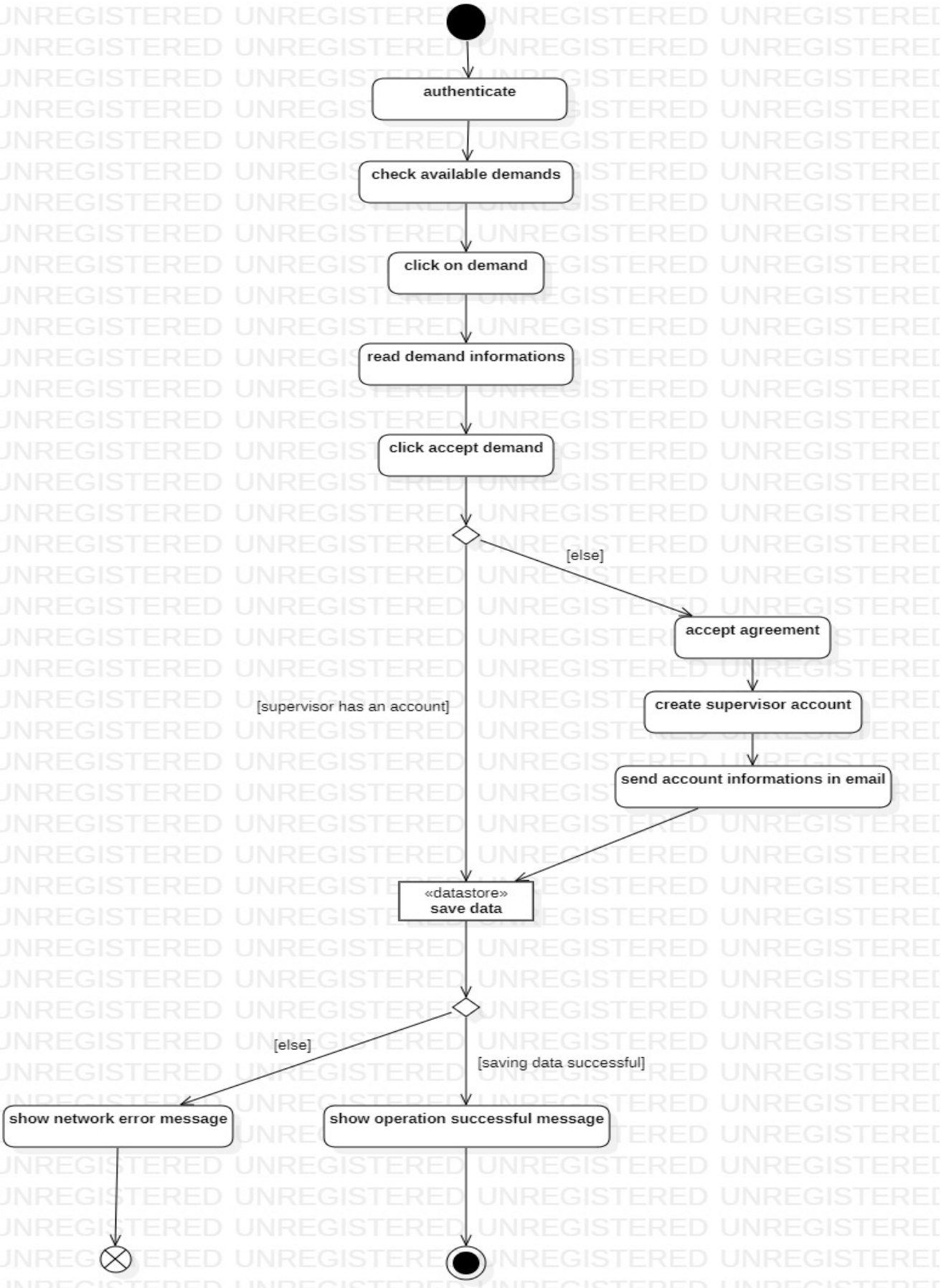

Figure 14 activity diagram for 'accept application' use case

3.3.3 Activity Diagram for evaluate student use case

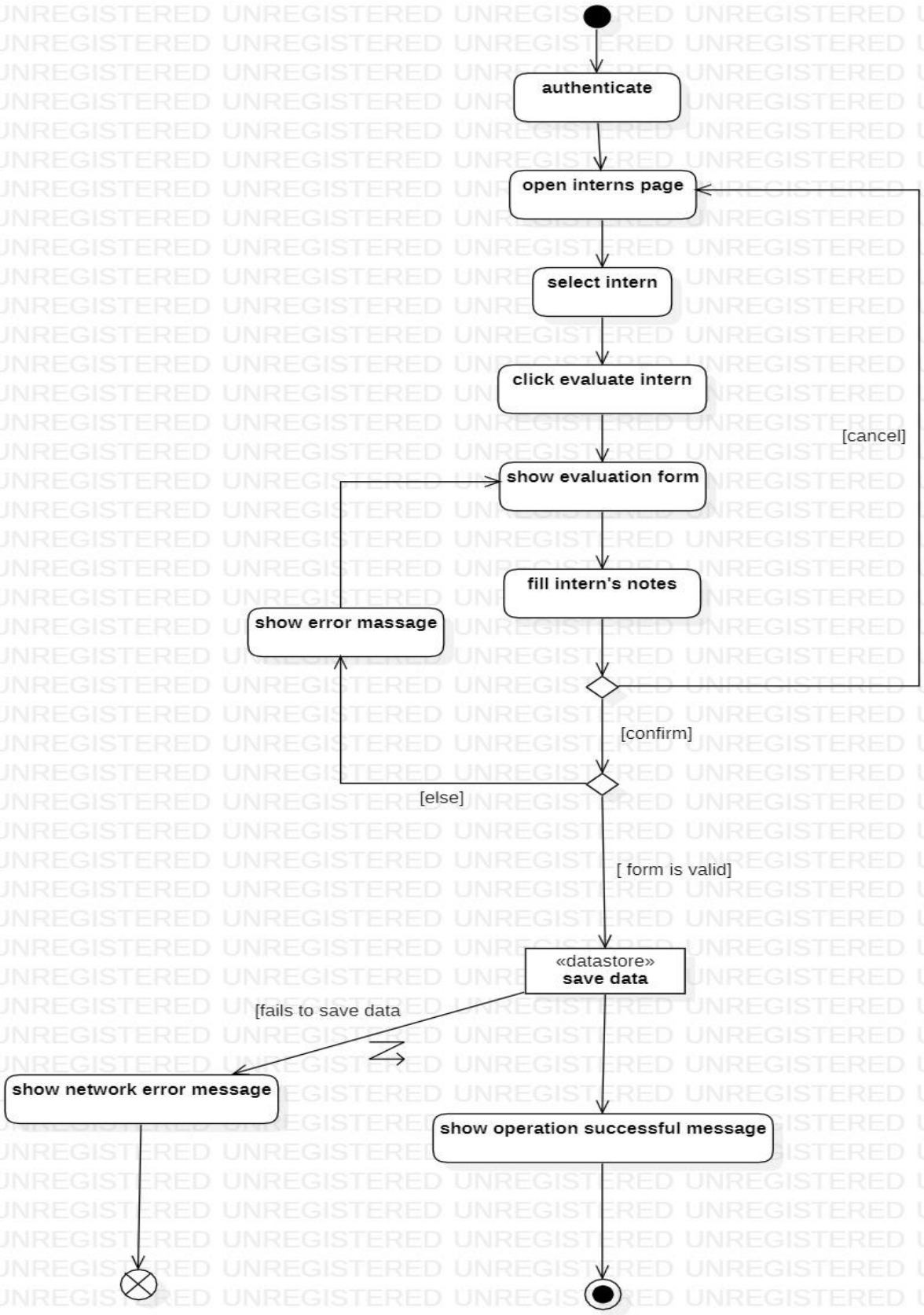

Figure 15 activity diagram for 'evaluate student' use case

3.4 Sequence Diagrams

3.4.1 Sequence diagram for add internship demand use case

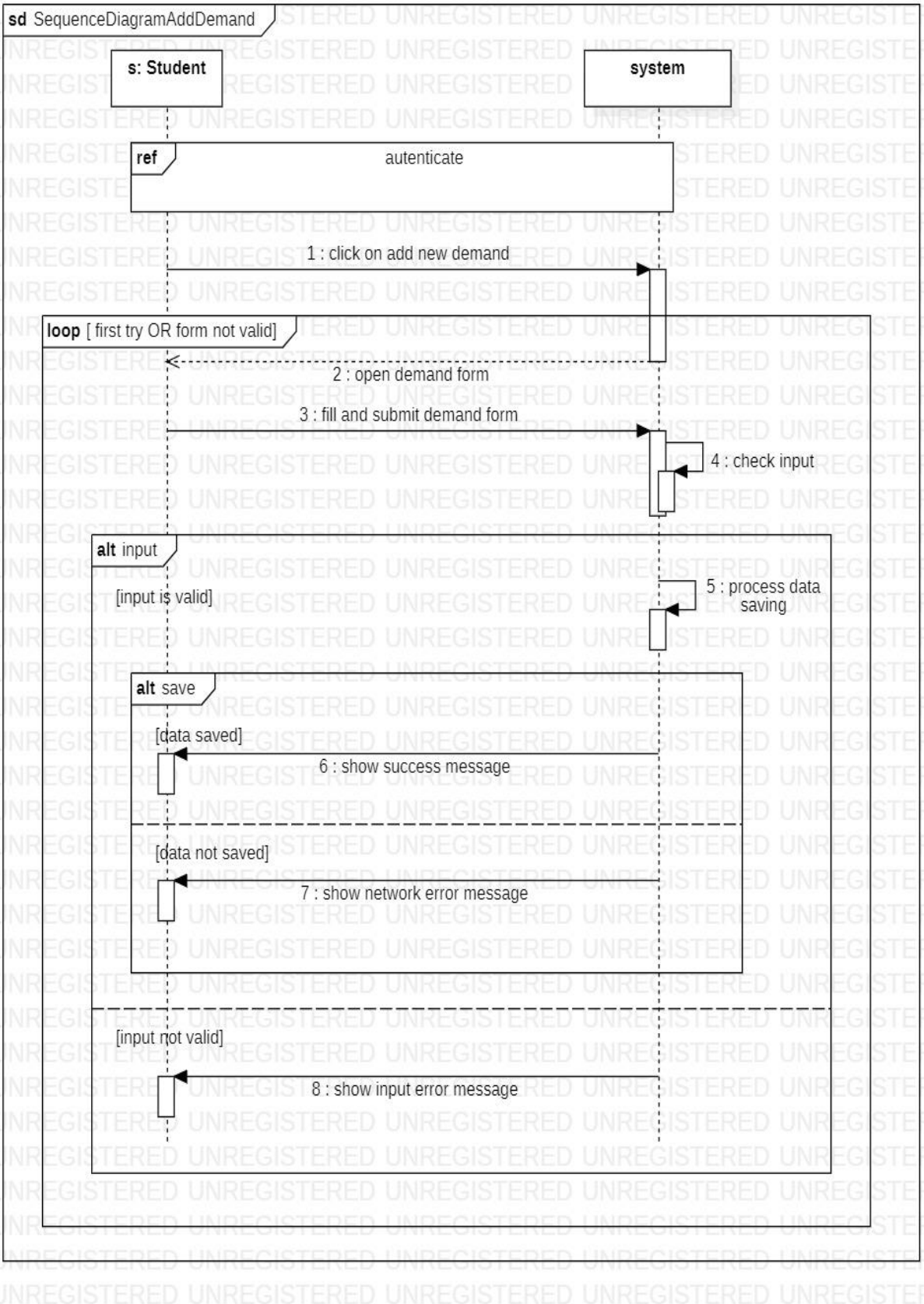

Figure 16 sequence diagram for 'add internship demand' use case

3.4.2 Sequence diagram for accept application use case

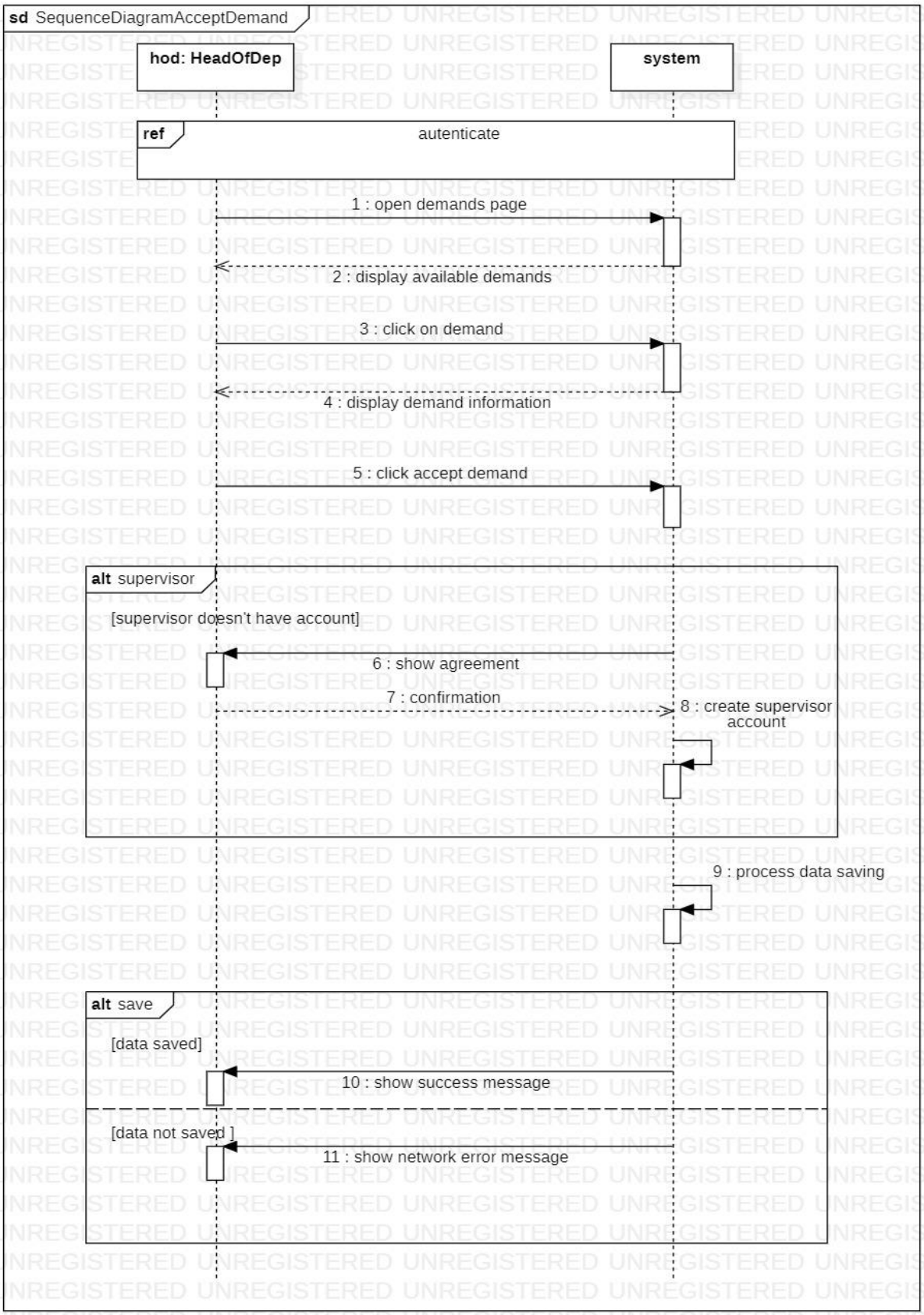

Figure 17 sequence diagram for 'accept application' use case

3.4.3 Sequence diagram for evaluate student use case

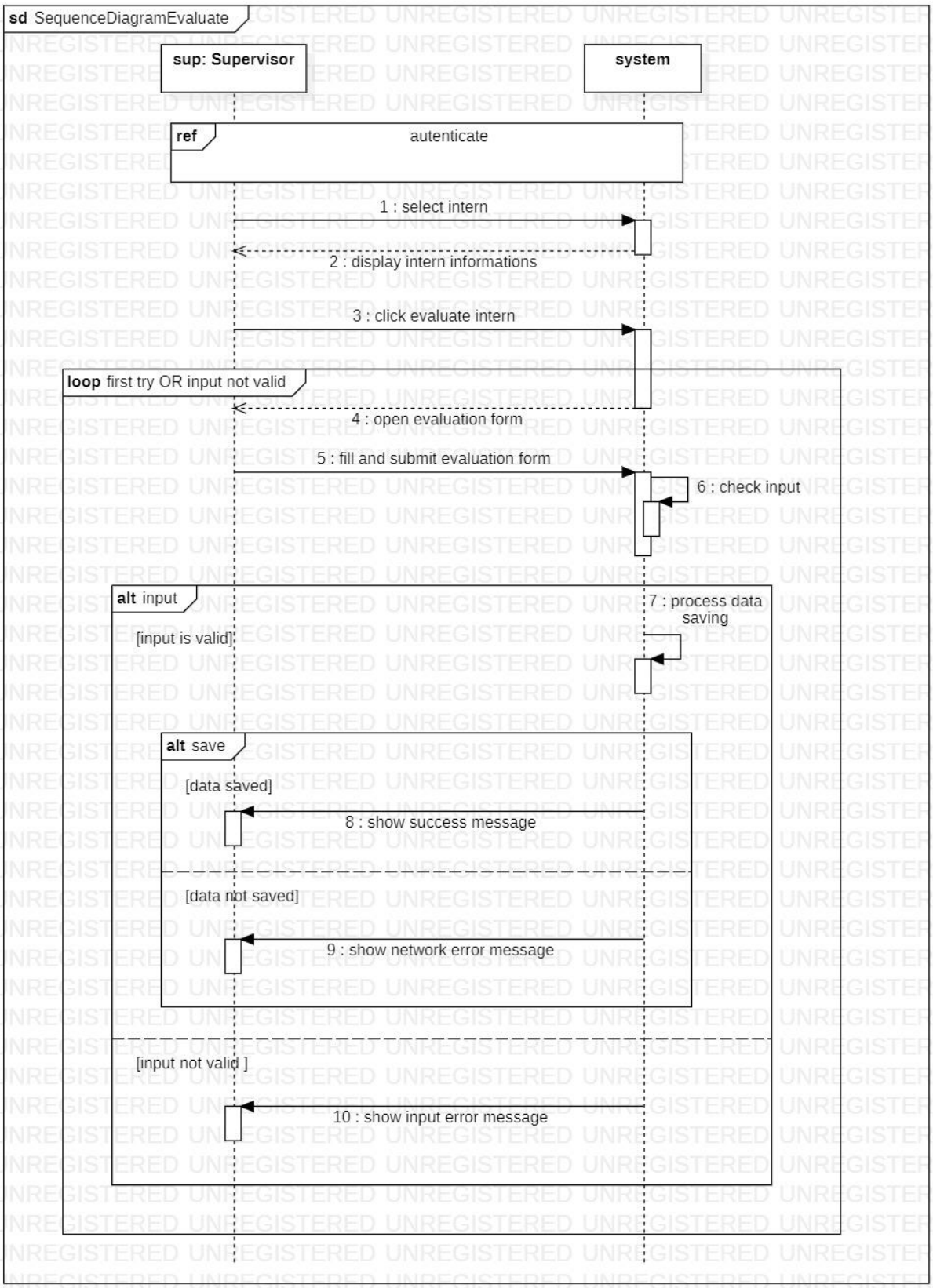

Figure 18 Sequence diagram for 'evaluate student' use case

3.5 Moving from class diagram to relational model

3.5.1 Rules of transition from class diagram to relational model

1- Transform each class into a table

- The primary key to this relation is one of the keys to the class
- Each class attribute is transformed into a table column

2- Association transformation

- In one-to-many (1: N) relationship: we simply add to the table from the N side a foreign key which is the identifier of the table on the 1 side.
- In many-to-many (N: M) relationship: a new table is created; the primary key of this table is the concatenation of the two foreign keys to the two tables.

3- Transformation of generalization relationship

- Create a table for the parent class with the generic attributes
- Create a table for each child class with its specific attributes
- Add a foreign key in each subtype table to link data with the parent table

4- Transformation of aggregation and composition relationships

- These relationships are treated as a simple One-to-many association

3.5.2 The Relational model

After applying the rules mentioned previously, we established the following relational model

Universities (id, name, address, abbreviation)

Faculties (id, #university_id, name, abbreviation)

Departments (id, #faculty_id, name, abbreviation)

Specialities (id, #department_id, name, abbreviation)

Users (id, first_name, last_name, email, password,role)

Students (id, #user_id, #department_id, #speciality_id, date_of_birth, place_of_birth, level, academic_year, semester, cv ,github)

Internship_supervisors (id, #user_id, #company_id)

Head_of_department (id, #user_id, #department_id)

Super_administrator (id, #user_id)

Companies (id, name, email, address, logo_link, description)

Demands (id, #student_id, #supervisor_id, supervisor_email, company, title, start_date, end_date, duration, status, date, rejection_motive, motivational_letter)

Internship_offers (id, #supervisor_id, title, level, start_date, end_date, duration, available_spots, description)

Applications (id, #offer_id, #student_id, date, status, rejection_motive)

Internships (id, #student_id, #supervisor_id, title, start_date, end_date, duration)

Evaluation (id, #internship_id, discipline, aptitude, initiative, innovation, acquired_knowledge)

Presences (id, #internship_id, date, presence)

Certificates (id, #internship_id)

3.5.3 Database schema

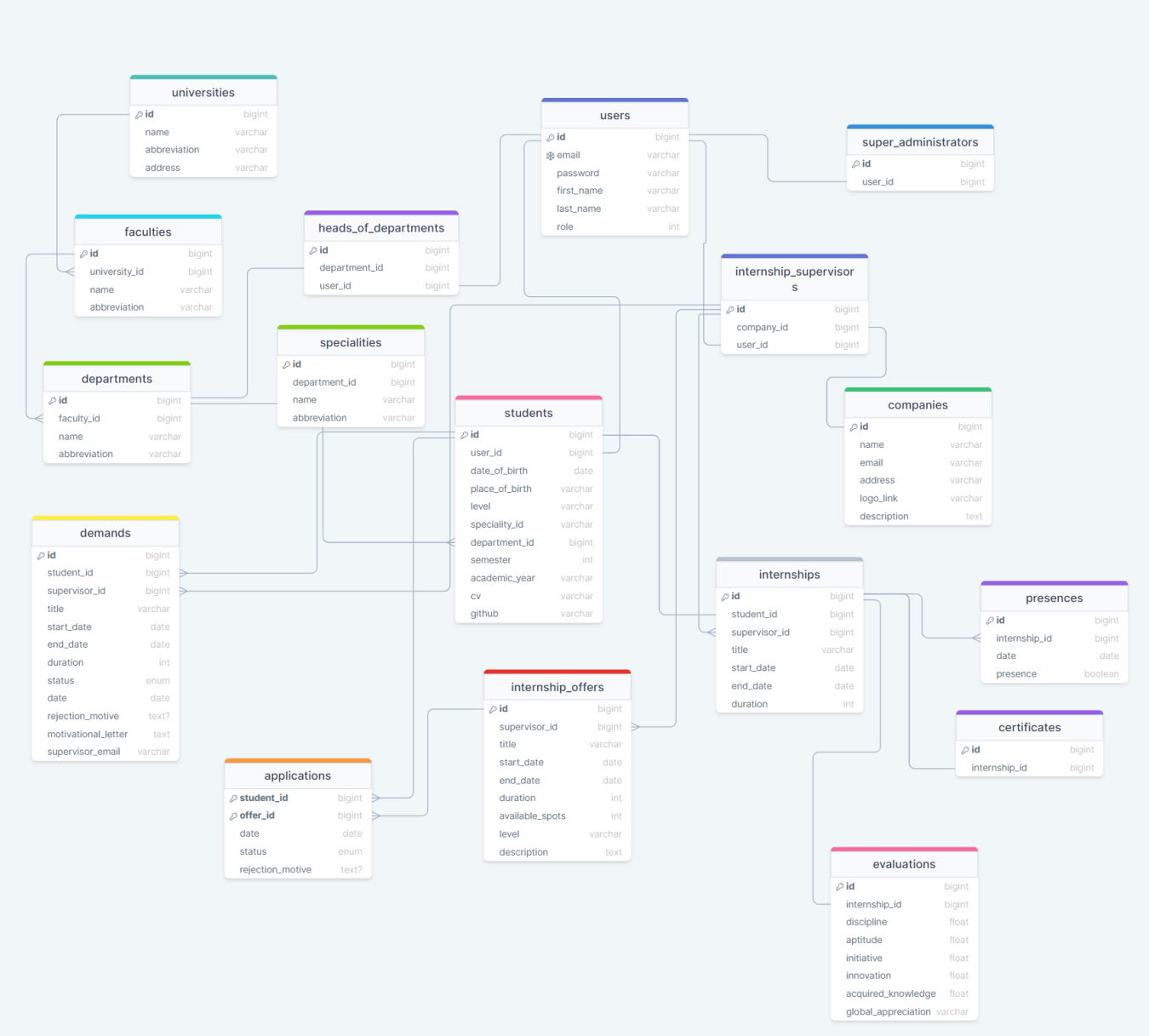

Figure 19 database schema

Chapter 4 : Implementation

4.1 Proposed system architecture

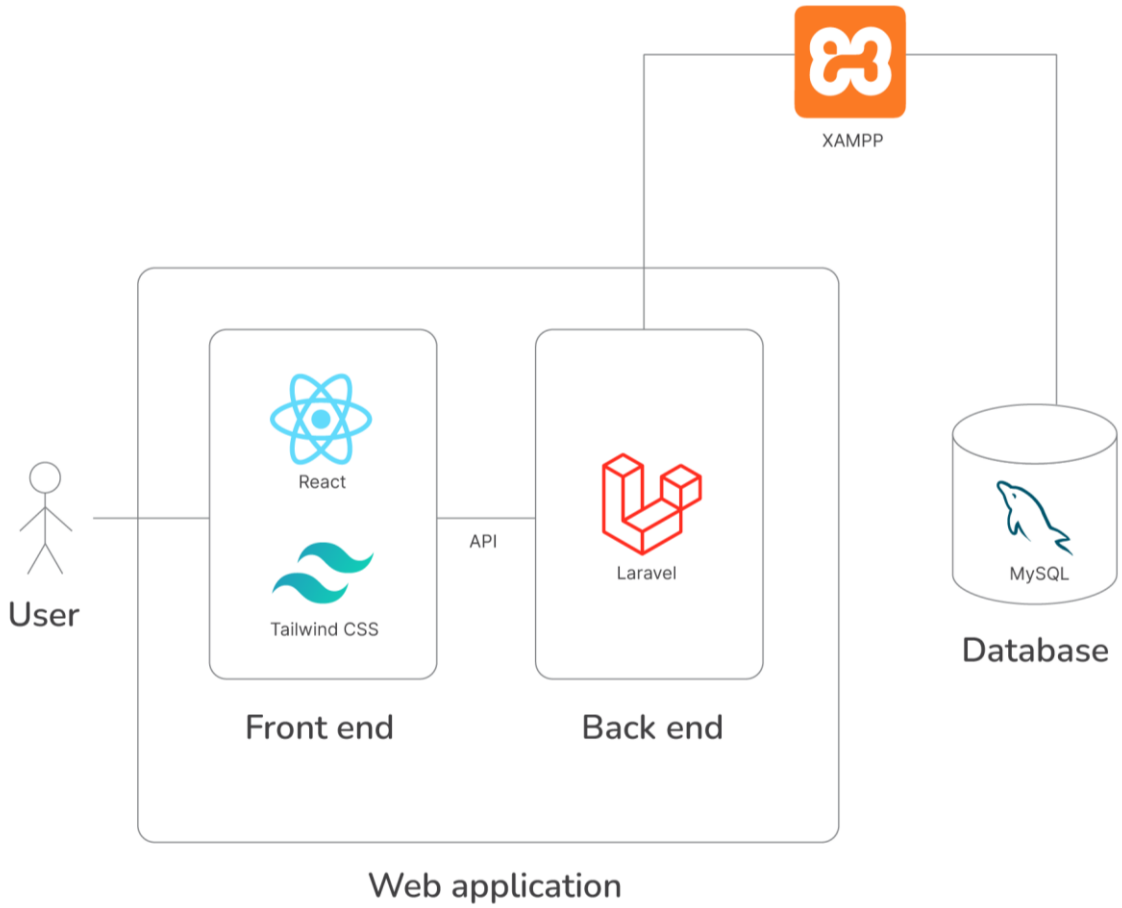

Figure 20 system architecture

This figure represents our system architecture which is composed of three main parts:

The user: the first part of our architecture is the user who based on our actors can be a student, head of department, internship supervisor or a super administrator.

The web application: this part contains our website with its two sides, the client side (front-end) that is built on JavaScript's most popular library React and its components styled using Tailwind CSS which is a CSS library. The server side (back-end) is built using PHP's best framework Laravel.

The database: connected to the back-end, our MySQL relational database contains all of our application data in 23 tables.

4.2 The hardware and software resources used for the project implementation

Type	Resource	Belhadef	Damous
Hardware	**PC**	Laptop Lenovo Ideapad - Type 81H7	Laptop Dell Vostro 3500
	Processor	8th Generation Intel® Core™ i5-8250U Processor(Core i5-8250U)	11th Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz 2.42 GHz
	RAM	1x 8GB DDR4 2133	1x 8GB DDR4 2700
	Hard drive	1x SSD Kingston 240GB	NVMe SK Hynix 256 GB
	Graphics card	1x Intel UHD 620	NVIDIA GeForce MX330
	Ports	2 USB 3.0; Combo of 3.5mm Stereo Headphone Output; DC in; RJ-45; HDMI; 4-in-1 Media Card Reader (SD)	
	Monitor	15.6in 1366x768 & HP-L1908wm 19in 1440x900	1920 x 1080 60Hz
Software	**Operating system**	Windows 11 PRO v22H2	Windows 10 PRO
	Browser	Mozilla Firefox v113.0.1 (64-bit)	Google Chrome
	Front-end code editor	Microsoft VSCode v1.78 (April 2023)	Microsoft VSCode v1.78 (April 2023)
	Back-end code editor	JetBrains PhpStorm version 2022.3.2 (64bit)	Microsoft VSCode v1.78 (April 2023)
	Local server	XAMPP v3.3.0 (64-bit) with PHP v8.2.4 and MySQL v15.1	WAMP
	API testing	Postman v10.13.0	Postman v10.13.0
	Back-end framework	Laravel v10	
	Front-end framework	React v18.2.0 & TailwindCSS v2.0	

Table 4 hardware and software resources

4.3 Examples of data and processing implementation

4.3.1 Front-end login function

```
const handleLogin = (e) => {
    e.preventDefault()
    axios
      .post("http://127.0.0.1:8000/api/auth/login", { email, password })
      .then((res) => {
        if (res.status === 200) {
          console.log(res.data)
          setCookie("token", res.data.token)
          setCookie("type", res.data.role)
          dispatch(login())
          setText("successfuly logged in")
          setMessage(true)
          setTimeout(async () => {
            setMessage(false)
            window.location.replace("/")
          }, 1500)
        }
      })
      .catch((err) => {
        if (err.response.status === 401) {
          setText("invalid credentials please try again")
          setMessage(true)
          setTimeout(() => {
            setMessage(false)
          }, 3000)
          console.log("invalid credentials")
        } else {
          console.log("login failed")
        }
      })
  }
```

Figure 21 login function code (front)

4.3.2 Back-end API routes

```php
// Auth routes
Route::prefix('/auth')->controller(AuthController::class)->group(function () {
    Route::post('/signup', 'signup');
    Route::post('/login', 'login');
    Route::post('/logout', 'logout')->middleware('auth:sanctum');
    Route::post('/email', 'verifyEmail');
    Route::post('/password/forgot', 'sendPasswordResetLink');
    Route::post('/password/reset', 'resetPassword');
    Route::get('/profile', 'getProfile')->middleware('auth:sanctum', 'verified');
});

// Internship demands routes
Route::prefix('/demands')->controller(DemandController::class)->middleware('auth:sanctum')->group(function () {
    Route::get('/', 'index');
    Route::get('/{id}', 'show');
    Route::post('/new', 'store')->middleware('verified');
    Route::put('/update/{id}', 'update')->middleware('verified');
    Route::delete('/destroy/{id}', 'destroy')->middleware('verified');
});

// Offer applications routes
Route::prefix('/applications')->controller(OfferApplicationController::class)->middleware('auth:sanctum')->group(function () {
    Route::get('/', 'index');
    Route::get('/{student_id}/{offer_id}', 'show');
    Route::post('/new','store');
    Route::put('/update/{id}','update');
    Route::delete('/destroy/{id}','destroy');
});

// Offers routes
Route::prefix('/offers')->controller(OfferController::class)->group(function () {
    Route::get('/', 'index');
    Route::get('/{id}', 'show');
    Route::get('/supervisorOffers/{supervisor_id}', 'supervisorOffers')->middleware('auth:sanctum', 'verified');
    Route::post('/new', 'store')->middleware('auth:sanctum', 'verified');
    Route::put('/update/{id}', 'update')->middleware('auth:sanctum', 'verified');
    Route::delete('/destroy/{id}', 'destroy')->middleware('auth:sanctum', 'verified');
});

// Internship routes
Route::prefix('/internships')->group(function () {
    Route::get('/', [InternshipController::class,'index']);
    Route::get('/{id}', [InternshipController::class,'show']);
    Route::post('/evaluate', [EvaluationController::class, 'store'])->middleware('auth:sanctum', 'verified');
    Route::post('/presence', [PresenceController::class, 'store'])->middleware('auth:sanctum', 'verified');
    Route::post('/certificate', [CertificateController::class, 'store'])->middleware('auth:sanctum', 'verified');
});

// Super Administrator routes
Route::prefix('/accounts')->controller(AccountsController::class)->middleware('auth:sanctum')->group(function(){
    Route::post('/new', 'store')->middleware('verified');
    Route::put('/update/{id}', 'update')->middleware('verified');
    Route::delete('/destroy/{id}', 'destroy')->middleware('verified');
});

// Extra routes
Route::post('/contact', [ContactController::class, 'store']);
Route::get('/questions', [ContactController::class, 'index']);
```

Figure 22 API routes code (back)

4.4 Structure of the database manipulated by the application

4.4.1 Structure of the database

Table	Rows	Type	Collation	Size	Overhead
applications	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
certificates	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
companies	1	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
demands	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
departments	1	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
evaluations	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
faculties	1	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
failed_jobs	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
heads_of_departments	0	InnoDB	utf8mb4_unicode_ci	48.0 KiB	-
internships	0	InnoDB	utf8mb4_unicode_ci	48.0 KiB	-
migrations	22	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
offers	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
password_reset_tokens	0	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
personal_access_tokens	0	InnoDB	utf8mb4_unicode_ci	48.0 KiB	-
presences	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
questions	4	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
specialities	1	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
students	0	InnoDB	utf8mb4_unicode_ci	64.0 KiB	-
supervisors	0	InnoDB	utf8mb4_unicode_ci	48.0 KiB	-
super_administrators	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
universities	1	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
users	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
verification_codes	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
23 tables	**31**	**InnoDB**	**utf8mb4_general_ci**	**752.0 KiB**	**0 B**

Figure 23 database structure

4.4.2 Structure of some of the most important tables

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	**id**	bigint(20)		UNSIGNED	No	*None*		AUTO_INCREMENT
2	**student_id**	bigint(20)		UNSIGNED	No	*None*		
3	**supervisor_email**	varchar(255)	utf8mb4_unicode_ci		No	*None*		
4	**start_date**	date			No	*None*		
5	**end_date**	date			No	*None*		
6	**duration**	int(11)			No	*None*		
7	**status**	tinyint(4)			No	0		
8	**rejection_motive**	text	utf8mb4_unicode_ci		Yes	*NULL*		
9	**title**	varchar(255)	utf8mb4_unicode_ci		No	*None*		
10	**created_at**	timestamp			Yes	*NULL*		
11	**updated_at**	timestamp			Yes	*NULL*		

Figure 24 structure of 'demands' table

4.5 Snippets of the usage and manipulation of the software

4.5.1 Create new internship demand page

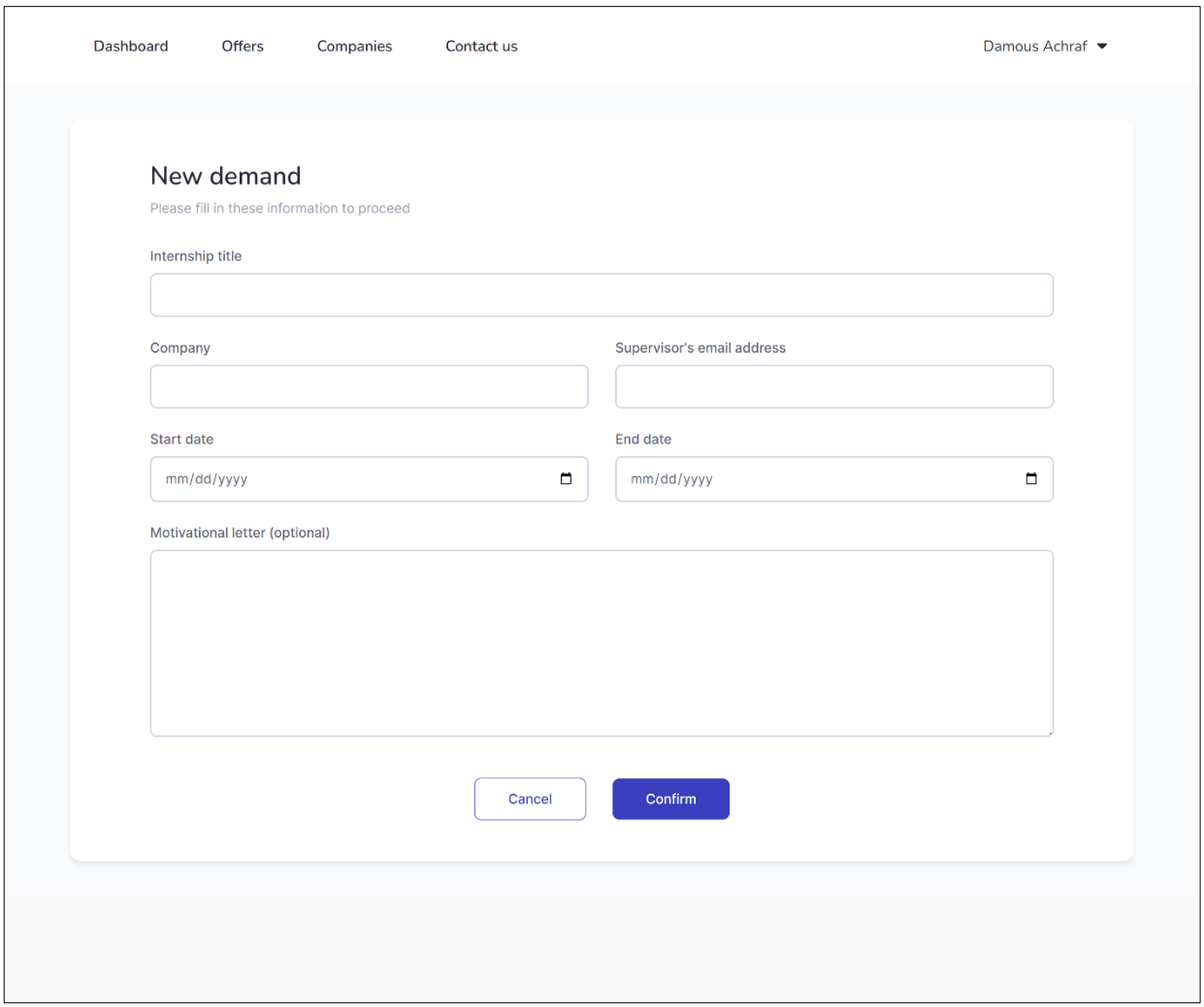

Figure 25 add new demand page

This page allows the student to add new demand by filling the required information about the internship.

4.5.2 Approval or rejection of demand for head of department

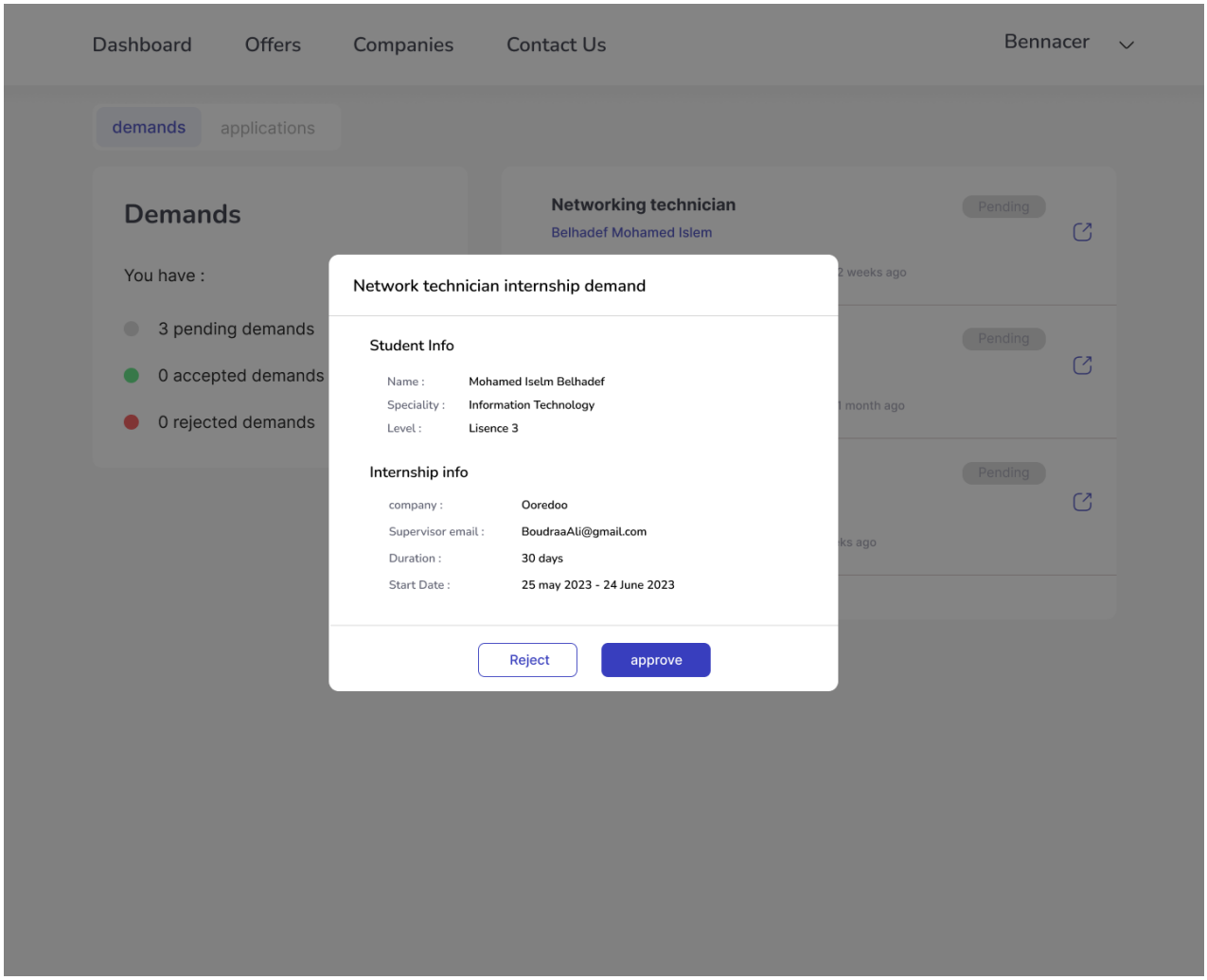

Figure 26 : Demand details page for head of department

After the internship demand has been successfully submitted, the head of department will be able to review the demand details including student's name, speciality and level as well as the internship's information like the company name and the supervisor email.

The head of department can either approve or reject the demand.

4.5.3 Approval or rejection of internship demand for supervisor

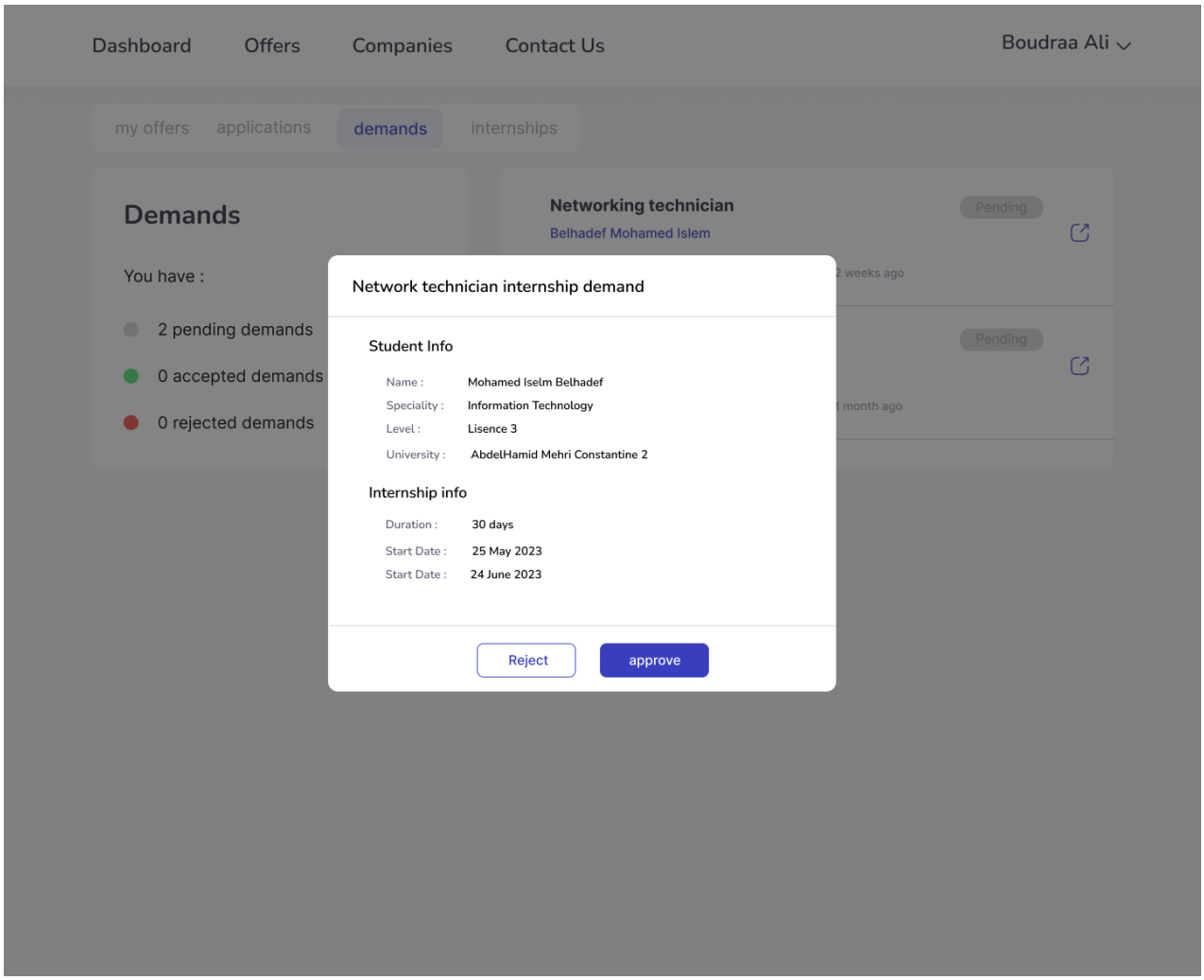

Figure 27 : Demand details page for supervisor

The demands approved by the head of department will be visible in the supervisor dashboard.

Similar to the head of department, the internship supervisor will consult the demand and the student information and can also approve or reject the internship demand.

4.5.4 Student evaluation page

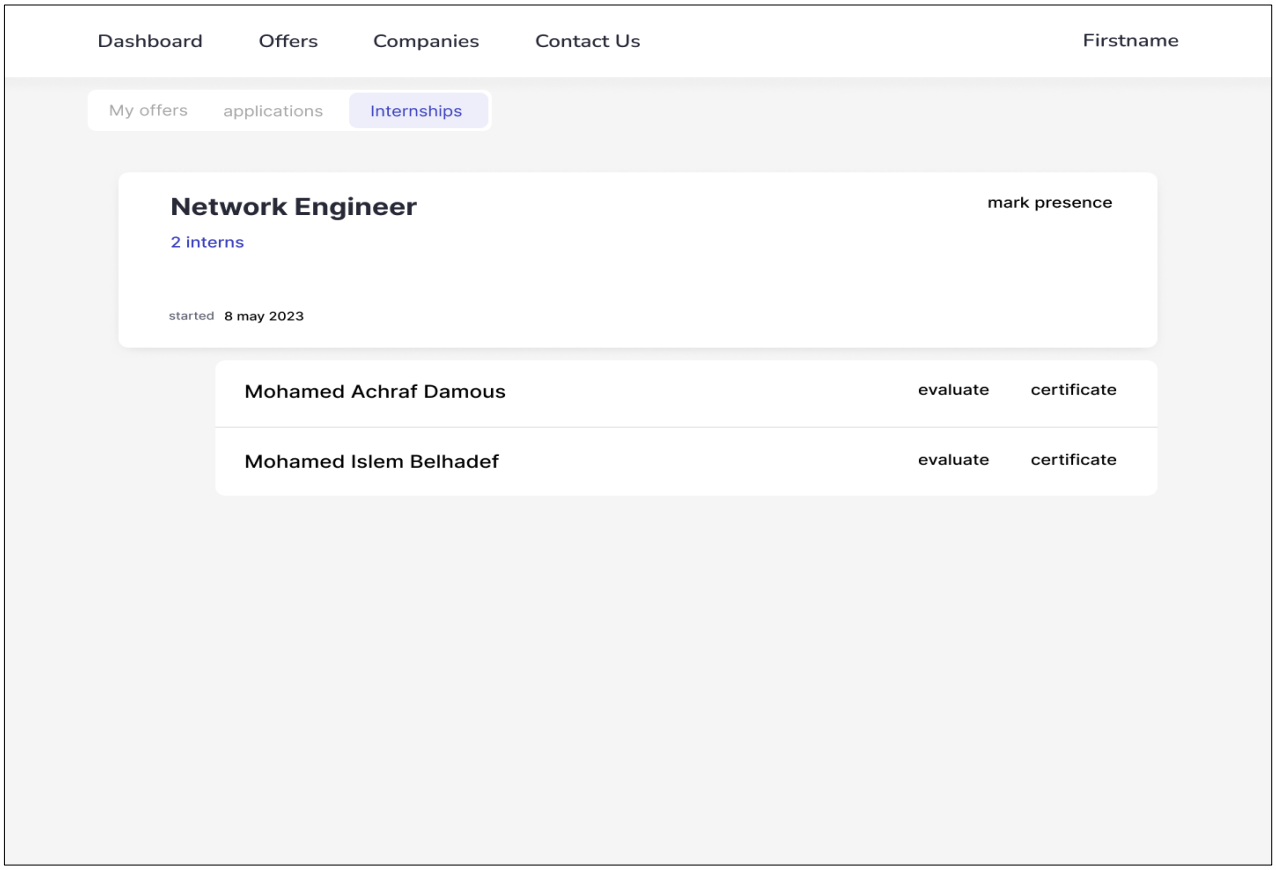

Figure 29 supervisor dashboard

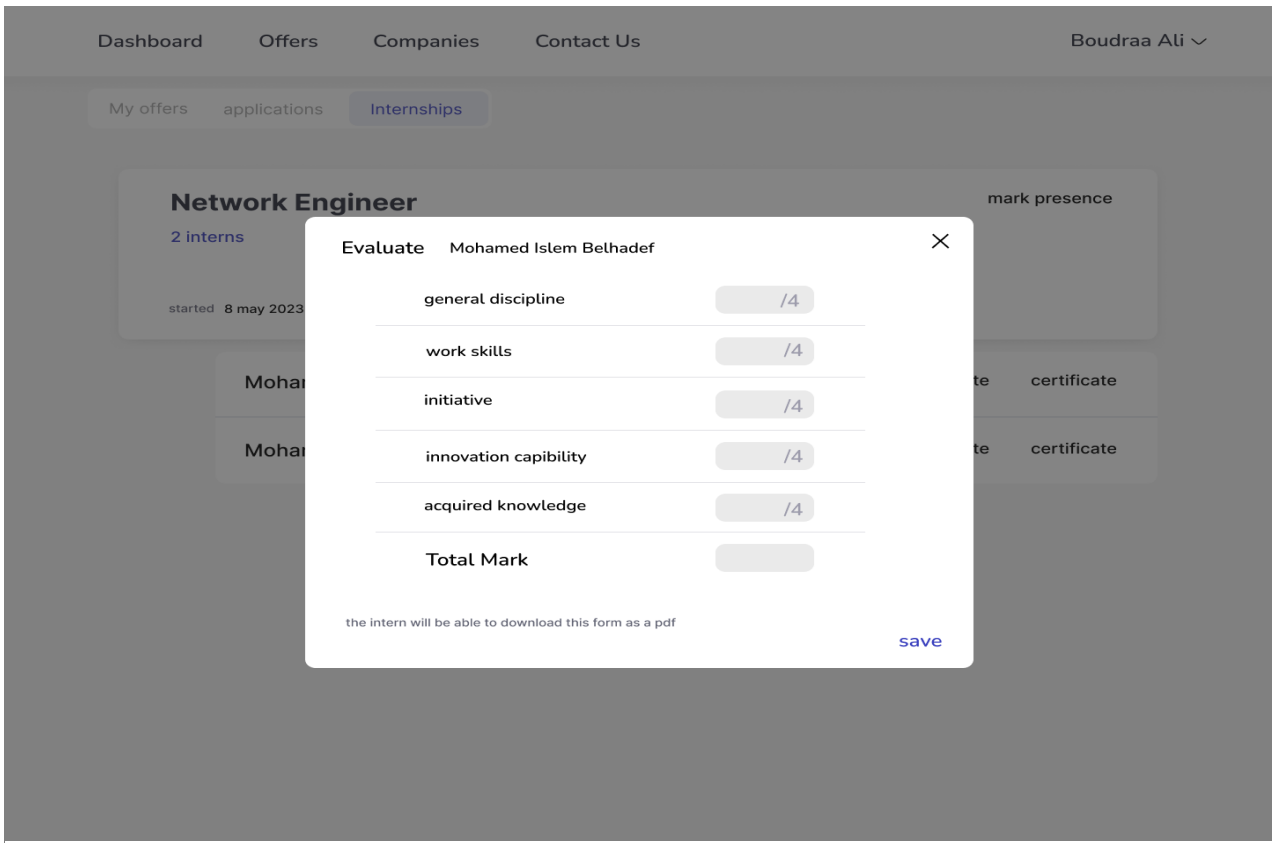

Figure 28 student evaluation interface

At the end the internship the supervisor will evaluate his interns by going to his dashboard under internships tab he can choose the interns then click on evaluate.

An evaluation form will appear and the supervisor will fill the marks.

4.5.5 Student presence page

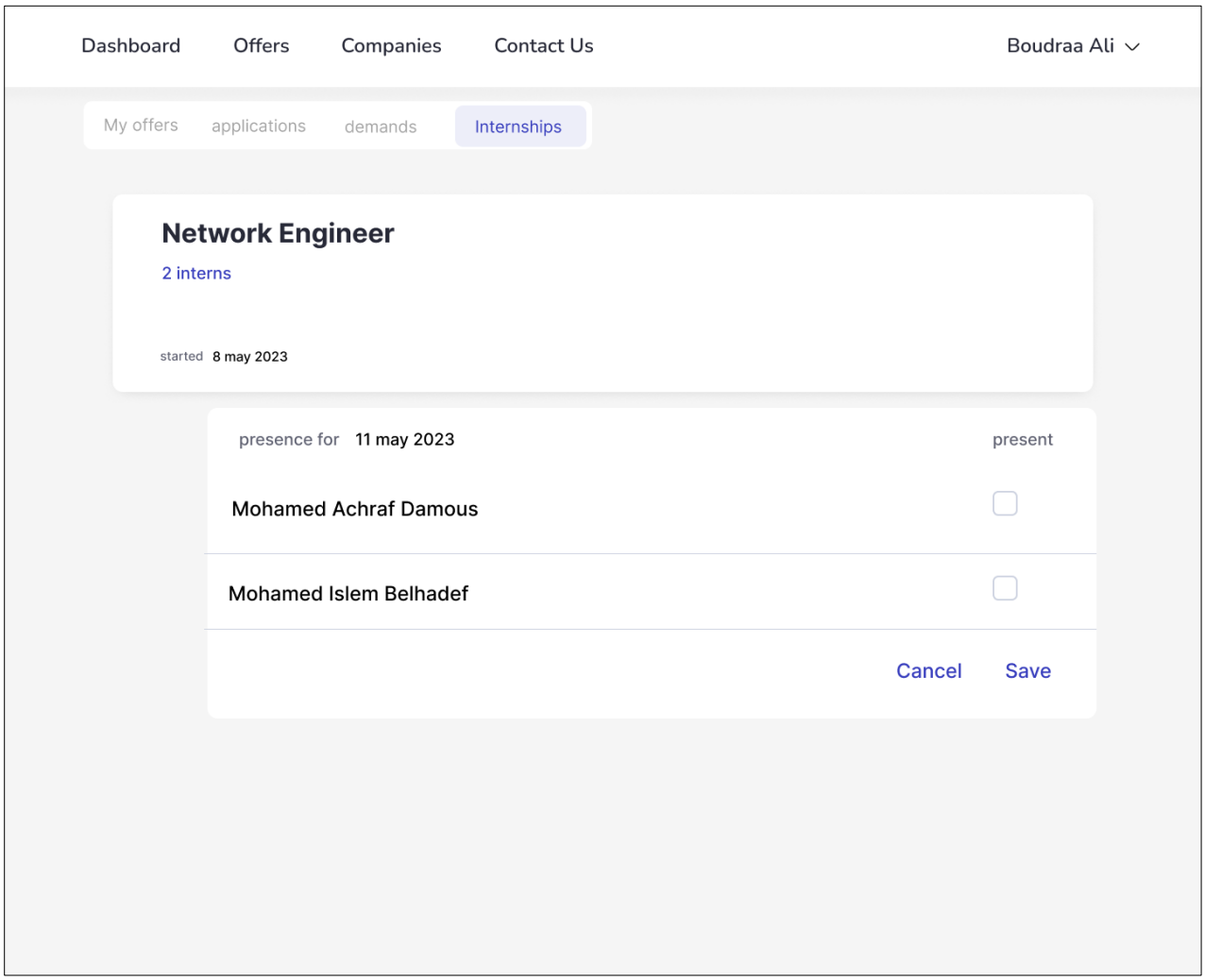

Figure 30 student presence page

The internship supervisor will be able to mark intern's attendance by simply clicking on 'mark presence' button on the current internship and checking the student's name and save.

4.5.6 Issuing Internship certificate interface

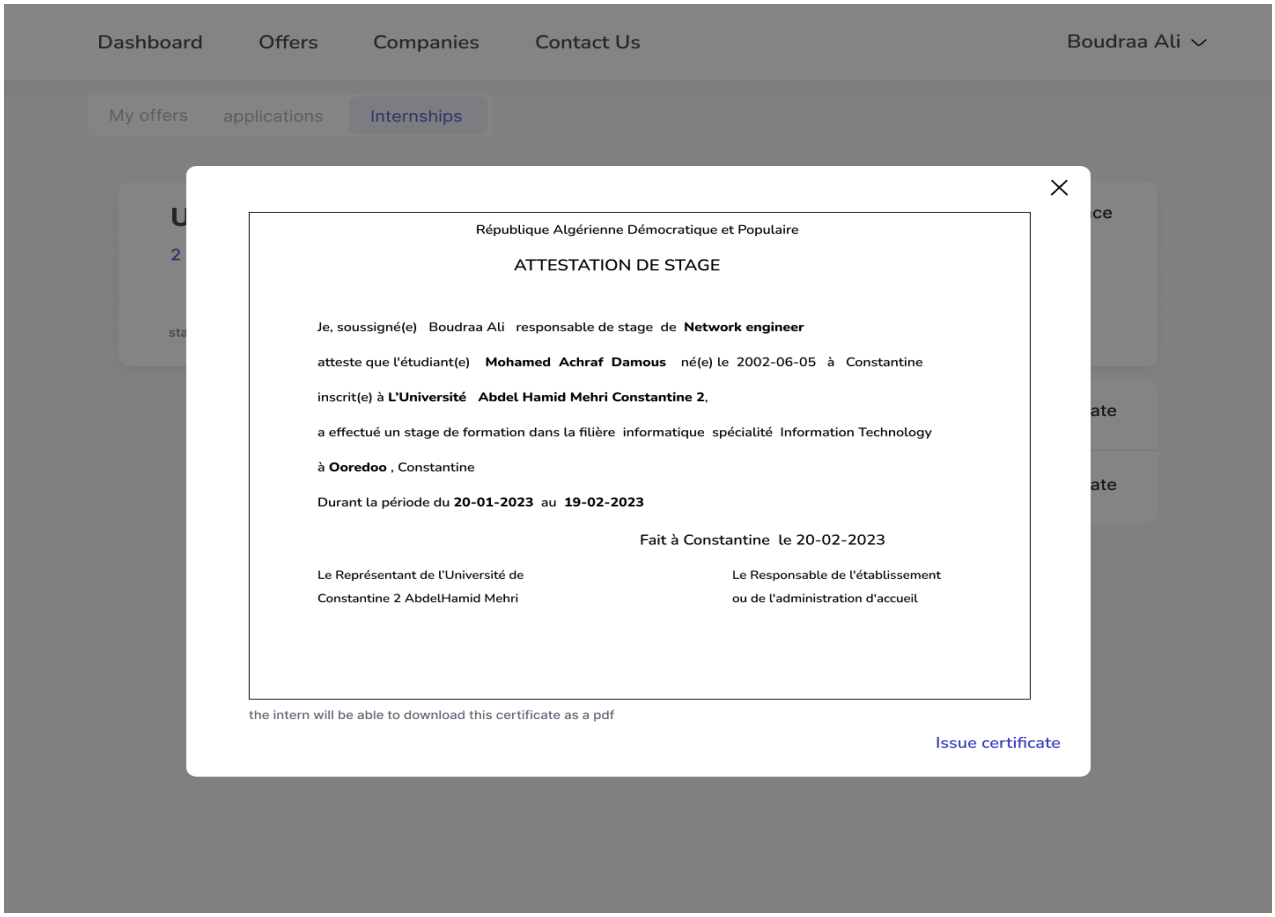

Figure 32 supervisor dashboard certificate

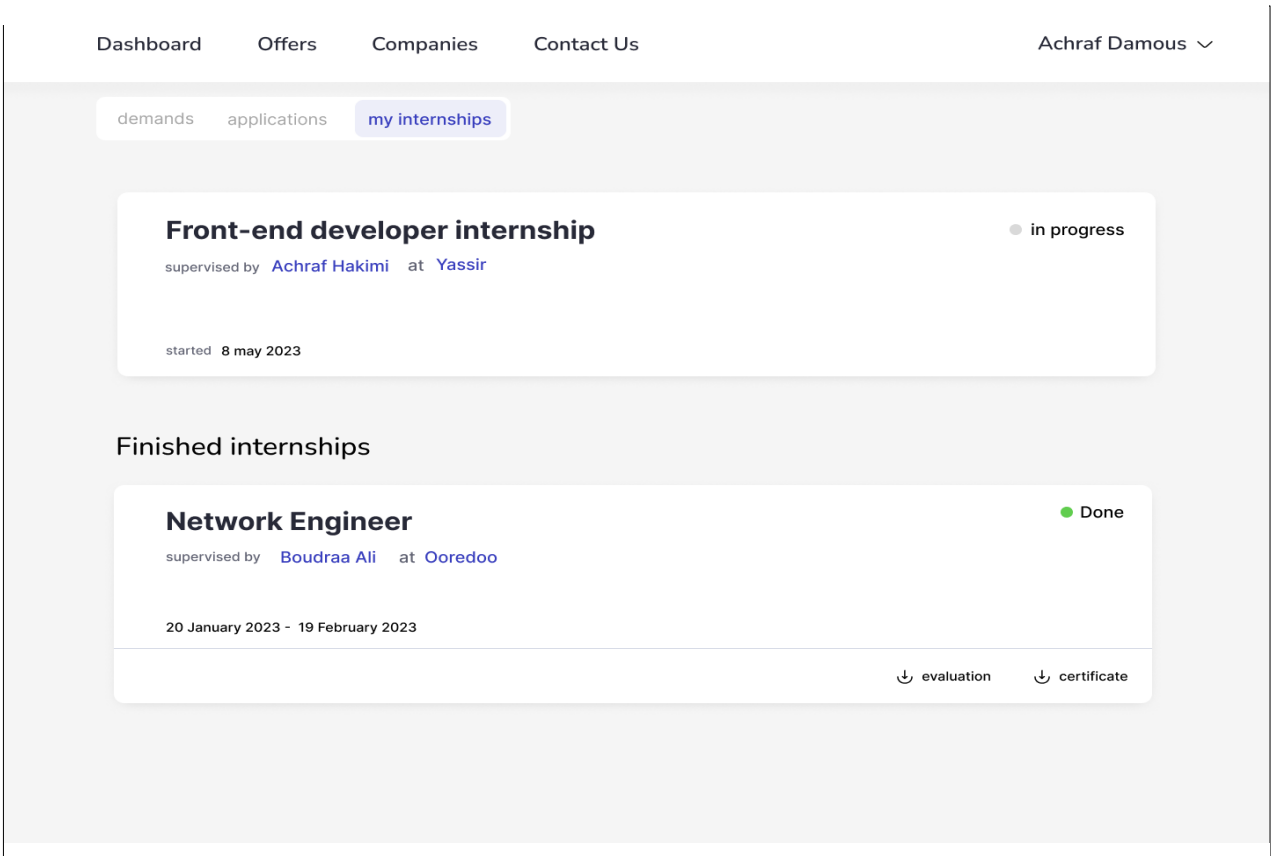

Figure 31 student dashboard

After the end of the internship the supervisor will issue the intern a certificate by clicking on certificate button next to the intern name.

A Certificate will appear with the student information on the screen and the supervisor can confirm it by clicking on issue certificate.

After the certificate has been issued the student will be able to download it along with the evaluation as pdf.

General conclusion

In conclusion, the development of the internship application web application for the University of Constantine 2 Abdelhamid Mehri has been a significant milestone in improving the internship application process for students. Throughout this project, we have recognized the importance of internships in a student's life as they enter their professional careers. Internships provide practical experience, skill development, networking opportunities, and insights into the industry. However, the current application process has posed several challenges for students, including time consumption, financial burdens, limited accessibility to information, and an inefficient administrative process.

The development of our web application aimed to address these challenges and provide a streamlined, accessible, and efficient platform for internship applications. By offering a centralized database of internship opportunities, personalized filter functionalities, an online application portal, and a messaging system, we have revolutionized the way students apply for internships. Moreover, the web application's administrative portal has improved the efficiency of managing internships and applications.

Difficulties Faced in the Project

Throughout the course of this project, we encountered several difficulties and obstacles. One of the major challenges was the need for extensive research and data collection to ensure the accuracy and comprehensiveness of the internship database. Additionally, developing a user-friendly and intuitive interface that caters to the diverse needs of students and companies required meticulous design and testing.

Another difficulty we got through was the number of actors we have (4 different user types) and how each of these actors has his own database table, functionalities and user interface suitable for his tasks and needs.

Integrating the messaging system through email within the web application while ensuring data privacy and security was another challenge. We prioritized the implementation of robust security measures to safeguard user information and maintain confidentiality and made sure users questions and emails were delivered safely and rapidly.

Goals Achieved

Despite the challenges faced, our project has successfully achieved several key goals.

Firstly, we have simplified the internship application process, eliminating the need for students to physically visit the administration office or companies. This has significantly saved students' time and reduced travel expenses.

Secondly, the comprehensive database and personalized filter functionalities have provided students with an extensive range of internship opportunities and improved their access to information. Thirdly, the online application portal has made the application process more convenient and streamlined, allowing for quick and efficient submission of applications.

Last but not least the different actors and their roles have made the usage of our application very convenient and easy where each of those have his own tasks to do on our platform.

Project Concepts (Future Functionalities)

While our web application has already made a significant impact, there are several concepts and future functionalities that could be explored to further enhance the platform. These include:

- Integration of a recommendation system: Implementing an algorithm that suggests internship opportunities based on a student's profile, interests, and previous applications, enhancing the personalized experience.
- Analytics and reporting: Developing analytics and reporting tools to track application trends, measure the success rate of internships, and provide insights to the administration office for continuous improvement.
- Expansion to full online internships: Introducing a new type of internships which can be fully applied to, taken and followed online without the need to ever attend the hosting company.

The development of our internship application web application has addressed the shortcomings of the current application process, empowering students to find and apply for internships with ease. By simplifying the process, providing a comprehensive database, and fostering efficient communication, we have paved the way for a more seamless and successful internship experience. The concepts and future functionalities mentioned will further enhance the platform, ensuring its continuous growth and relevance in the ever-evolving landscape of internship applications.

References

Definitions and text formalization: https://chat.openai.com/

Laravel documentation : https://laravel.com/

TailwindCSS documentation : https://tailwindcss.com/

React Router documentation : https://reactrouter.com/

User interface design inspiration: https://dribbble.com

Offers and internships inspiration: https://www.emploitic.com/offres-d-emploi

Code errors and fixes: https://stackoverflow.com/

SQL database visualization and structure: https://drawsql.app/

UML diagrams: https://staruml.io/