

# Project E4 for Exchange Students

Platform for the Selecting Scientific Articles for Publication in a Journal

## Final Report

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# **1 Introduction**

## **1.1 Title**

Development of a Platform for The Process of Selecting Scientific Articles for Publication in a Journal

## **1.2 Context**

The International Association of Medical Informatics publishes a journal each year which contains, among other things, the best articles in the discipline in 13 different sections. The process of selecting these best articles is done in several stages. Section editors make an initial selection of articles (between 10 and 15 per section). These articles are then evaluated by reviewers (evaluators) with a predefined form. There are several types of assessments, depending on the profile of the assessor. The result of these evaluations is used to determine a score, which is used to classify scientific articles. This ranking, ratings and reviewer comments allow section editors to make their final choice of the best article(s) in their section. The confirmation is made during a final jury of the editorial committee bringing together all the sections.

As editorial assistant for the selection of the best articles, Adrien Ugon is responsible for supporting the selection process. Its role is to find reviewers, support section editors in the submission of the first selection of scientific articles, assign them to reviewers, collect reviews, generate rankings and finally, help with the final selection of the best articles.

## **1.3 The Goal**

The goal of this project is to develop a web platform adapted to the need described above to facilitate the work.

# **2 Current System**

The current system for the process of selecting scientific articles for publication in a journal is done by EasyChair. Their publication services are integrated with conference management, thus providing a process of submission-to-publication of reviewed content. However, it does not

provide a free service. We will try to combine the existing ones and implement new ones to make everyone's life easier.

## **3 Proposed System**

### **3.1 Overview**

The platform for the process of selecting scientific articles for publication in a journal is an all-in-one web-based application that will help reviewers, section editors, chief editors, vice president, selection assistant editors and all other users who are involved in the procedure for selecting articles. The main input data sources of this system will possibly be the scientific articles. There will be different tabs for different functionalities:

### **3.2 Functional Requirements**

#### **3.2.1 Grading Skills**

The reviewers should have the ability to grade their skills in 13 different sections. For each skill they will choose between 0 and 10 points. Each skill corresponds to a section with the pool of papers. This information will be used to distribute reviewers into sections and assign the papers to them.

#### **3.2.2 Sending E-mails**

It will be possible to send emails to the new and existing users with the platform. The email types include invitations and reminders. Selection assistant editors will be able to add email addresses of external reviewers to the pool of email addresses used by the platform.

#### **3.2.3 Sending Invitations**

The platform will generate the invitation emails with the link to the sign-up page and a short guidance on how to use the platform and will send them to external reviewers using the pool of email addresses. This feature will automate the process of inviting new external users to the platform.

### **3.2.4 Sending Reminders**

The reminder email type will be used by the Selection assistant editor to inform users to submit the reviews form of the papers. The platform will generate the reminder email with the link to the platform and information on the papers that need to be reviewed and the deadlines. This functionality will alleviate the work of the Selection assistant editor and speed up the process of collecting the reviews.

### **3.2.5 Downloading and Uploading PDFs**

All the papers will be uploaded to the platform by the section editors as “pdf” files, so data inside these files will not be extracted and processed in the database. The users of the platform will have the ability to download these “pdf” files to read the paper and submit the review form.

### **3.2.6 Grading a Paper**

There will be two types of grading forms. First type is a full review form which is dedicated to the external reviewers and section editors. It asks to grade the paper in ten different fields by choosing from 0 to 10 points. The second type is a light review form which is designed for the Chief Editors and the Vice president. It will have just a couple of questions with “no or yes” type of answers.

### **3.2.7 Making Rankings**

The platform will prepare a ranking of all candidate best papers grouped by the sections and automatically generate the table with titles, authors and scores. This table will be used by the Selection assistant editor and section editors to prepare a proposition of publications.

### **3.2.8 Making a Proposition of best papers selection**

This functionality will be used by the Section editors to prepare a proposition of the best papers of their sections.

## **3.3 Non-functional Requirements**

### **3.3.1 Performance**

The performance of the website is one of the most important issues. We will aim for the website to be loaded in 2 seconds when the simultaneous user count is less than 5.000. If the simultaneous user count exceeds 5.000, the time for the loading website will be closer to 4 seconds as the user count closes to the 20.000 limit. To accomplish that, the application must have small-sized image extensions like “.webp” and a well-organized database.

### **3.3.2 Portability and Compatibility**

The application must be able to be implemented on different browsers at any time. When the users use the application through A browser and change the browser to B, the application must behave in the same way on browser B. Also, It is considered that the application must use new libraries and frameworks which make the application useful and easily understandable. So, the versions of browsers that our application can be implemented on are listed below:

- Chrome (version 49) (release: 2016)
- Firefox (version 50) (release: 2016)
- Safari (version 10) (release: 2016)
- Internet Explorer (version 10) (release: 2012)
- Edge (version 14) (release: 2016)

### **3.3.3 Reliability, Maintainability and Availability**

Our application will be performed with success in 95 percent of the general use cases and success in 99 percent of the most important use cases such as approving or rejecting cases. The users can access our web application at any time every day.

### **3.3.4 Security**

The information stored in our database must be encrypted to be sure about their security. Every encryption and decryption algorithm will be generated randomly to be specific for that user. There must be one base secret key for implementing encryption and decryption, but every user's secret key must be randomly created from this key. Because every user has a different secret

key, even if one user's encryption method is exposed, other users' data must remain safe. The ability to access the database must be authorized to people who have an "Admin" role. In addition to this, the application must store log records on the database.

### **3.3.5 Usability**

Our application must be useful to new users. Therefore, the designs of the pages must be easy to understand and use. The "Review Platform" application must meet this need by designing the pages according to new generation methods such as "Tab Bar Menu" and "Pop-up Menu". In this way, the users can see whatever they need without any detailed search. Also, the application must have different interfaces for different authority levels to go away any kind of complication. Most used functions of the application must be located in the main perspective of the user's view on the pages.

# 4 System Models

## 4.1 Use-Case Model

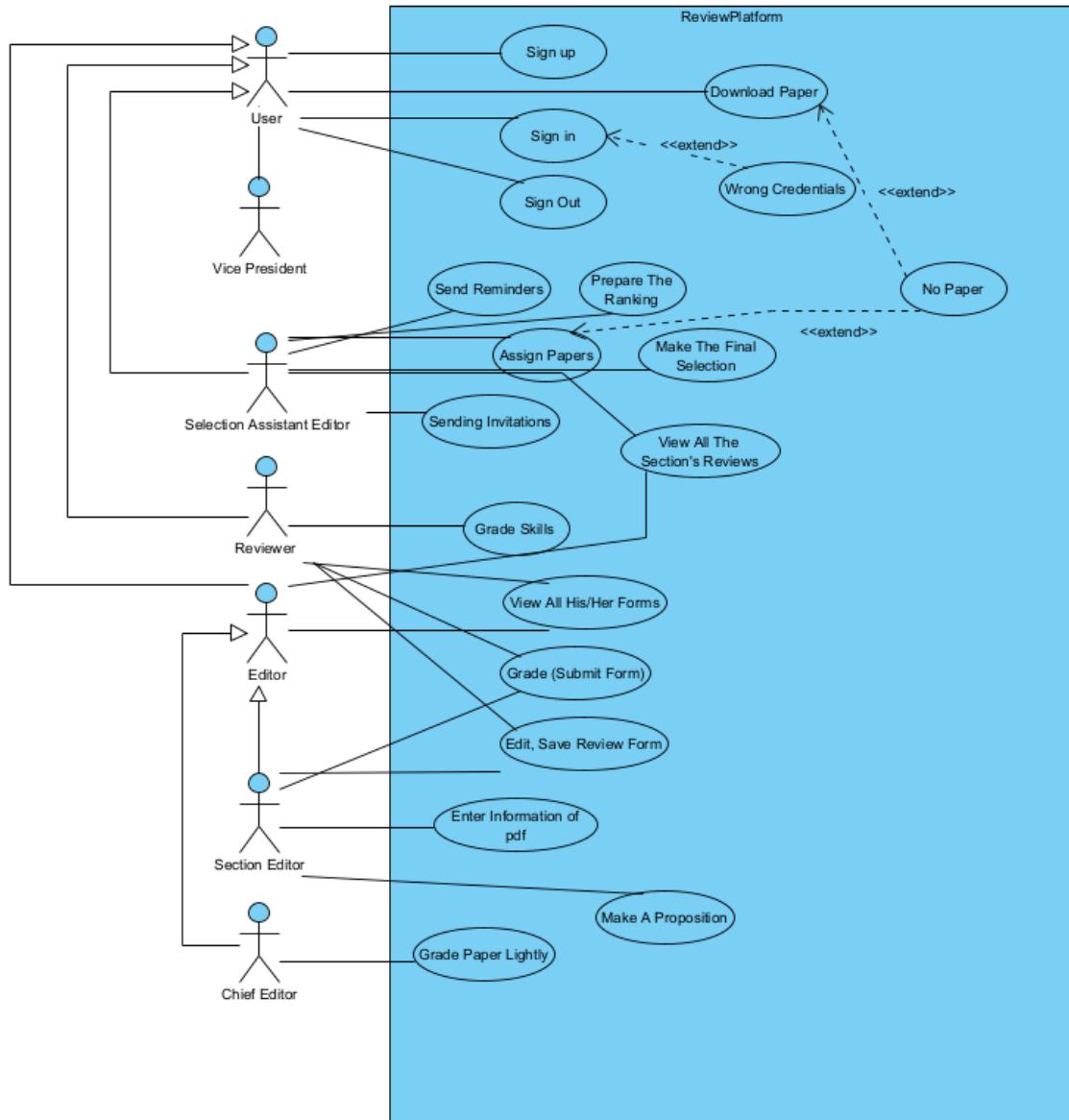


Figure 4.1.1 Use Case Diagram

## 4.2 Object and Class Model

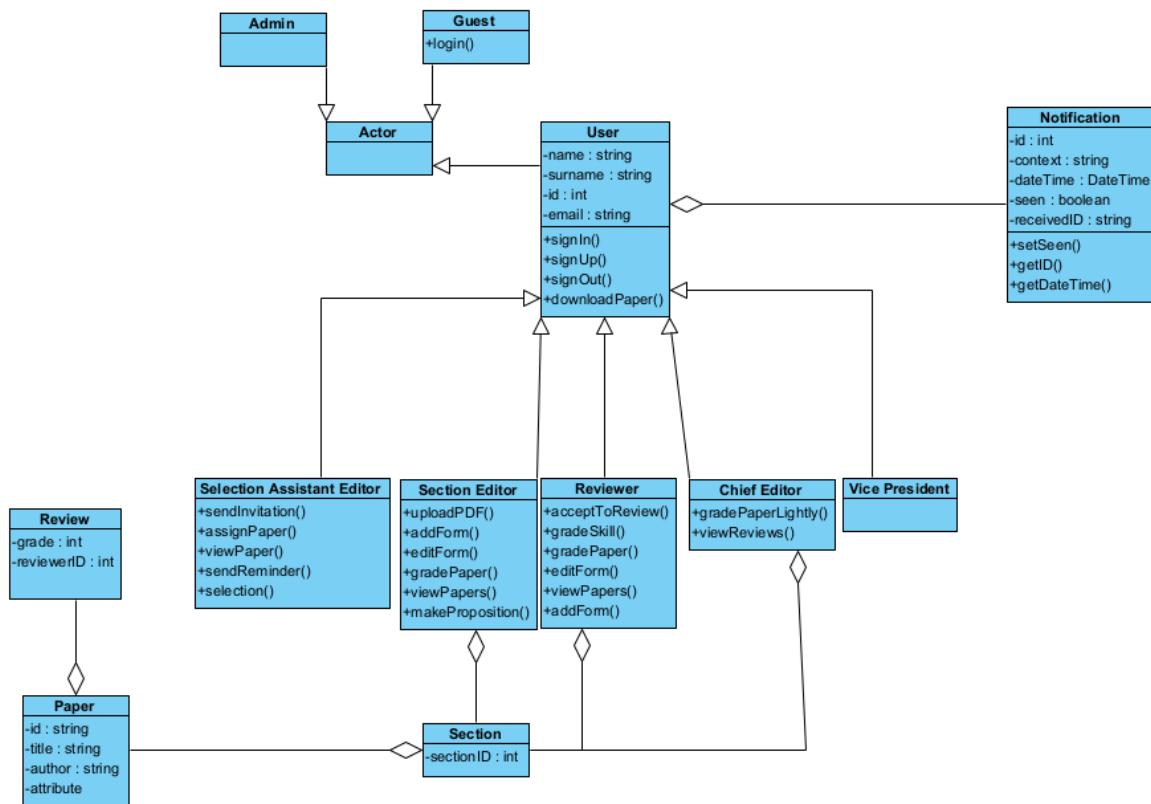


Figure 4.2.1 Class Diagram

## 4.3 Schema of the Database

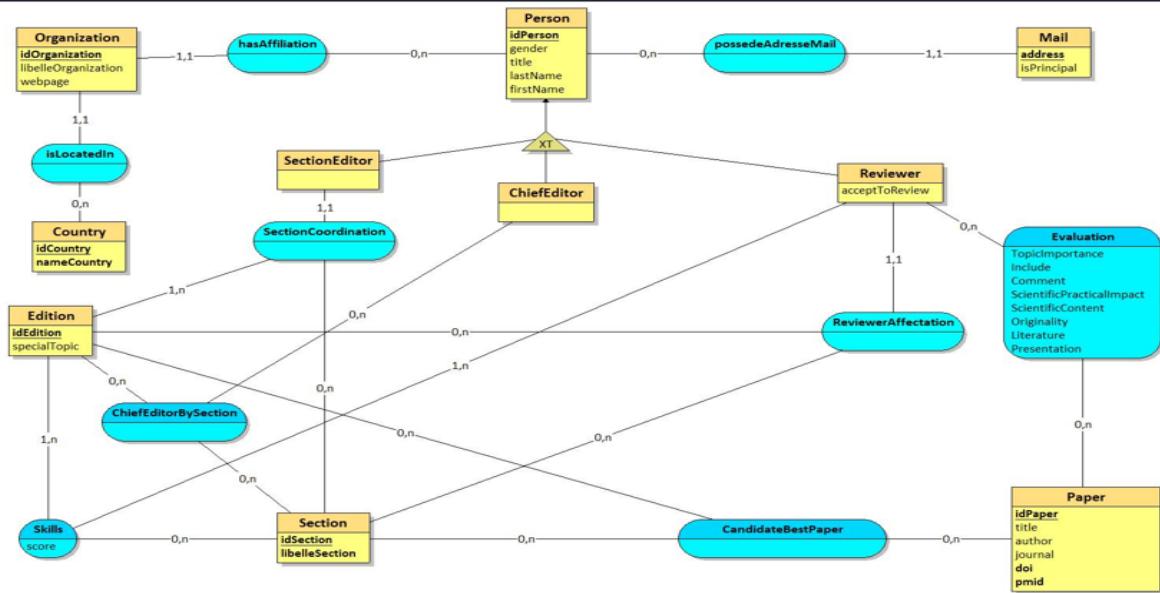


Figure 4.3.1 Schema

## 4.4 Login Activity Diagram

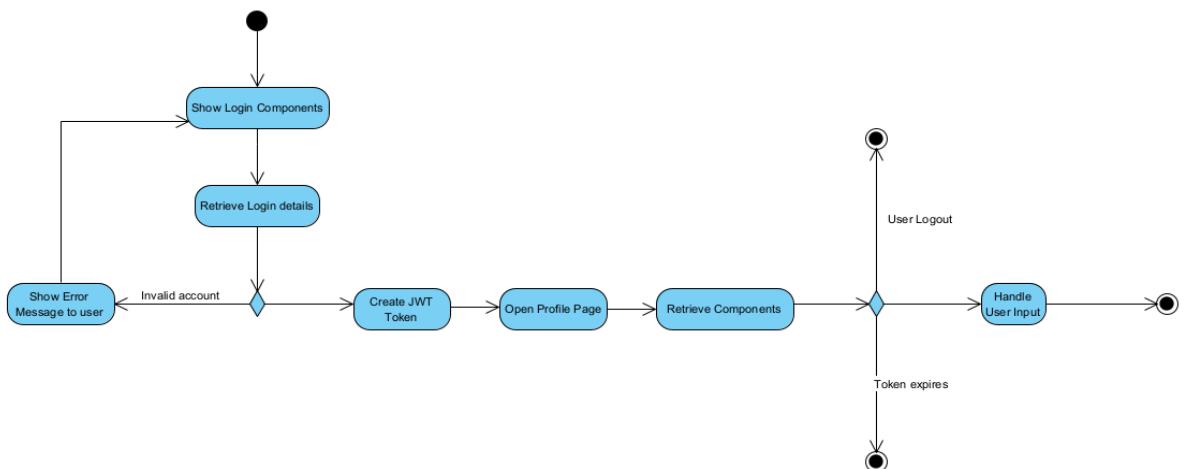


Figure 4.4.1 Login Activity Diagram

# **5 Developing the platform**

## **5.1 Technologies**

For the developing of the platform the following technologies were used.

Node.js was used for backend part. Node.js is a cross-platform, open-source server environment and a back-end JavaScript runtime environment, that runs on the JavaScript Engine, and executes JavaScript code outside a web browser. Node.js lets developers use JavaScript, unifying web-application development around a single programming language, as opposed to using different languages for the server-side and client-side programming. Node.js has an event-driven architecture capable of asynchronous I/O. These design choices aim to optimize throughput and scalability in web applications with many input/output operations, as well as for real-time Web applications.

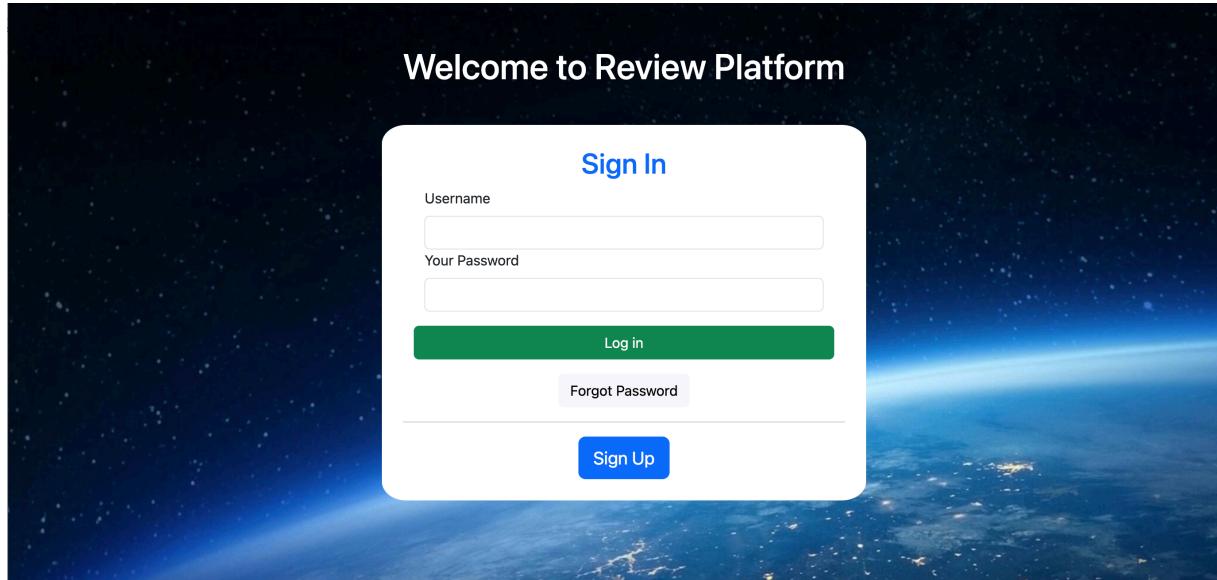
React was used for frontend part. React is a free and open-source front-end JavaScript library for building user interfaces based on components. A component is a mixture of HTML and JavaScript that captures all the logic required to display a small section of a larger UI. React makes use of the JavaScript structure known as virtual DOM (Document Object Model). The DOM serves as an interface for the web document so that JavaScript and other scripting languages can access, manipulate, and programmatically interact with the document's content. For example, developers can use DOM APIs to add or remove elements, modify their appearance, and perform user actions on web elements. It can be used with various systems and on both client and server sides is commendable.

As for database development and management Sequelize and MySQL were used. Sequelize is a Node.js-based Object Relational Mapper (ORM) that makes it easy to work with databases. An Object Relational Mapper performs functions like handling database records by representing the data as objects. Sequelize has a powerful migration mechanism that can transform existing database schemas into new versions. Overall, Sequelize provides support for database synchronization, eager loading, associations, transactions, and database migrations while reducing development time and preventing SQL injections.

## **5.2 Platform's pages and functionality**

### **5.2.1 The sign-in page**

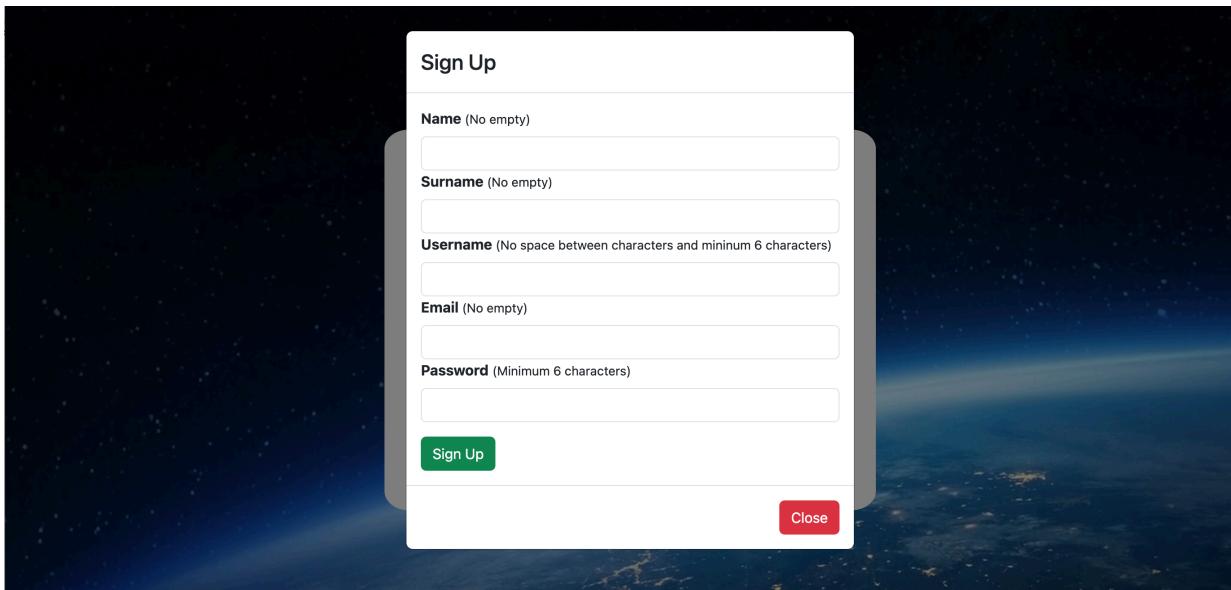
The sign-in page of the platform which is used to authenticate the users with an username and password.



*Figure 5.2.1.1 The sign-in page*

## 5.2.2 The sign-up window

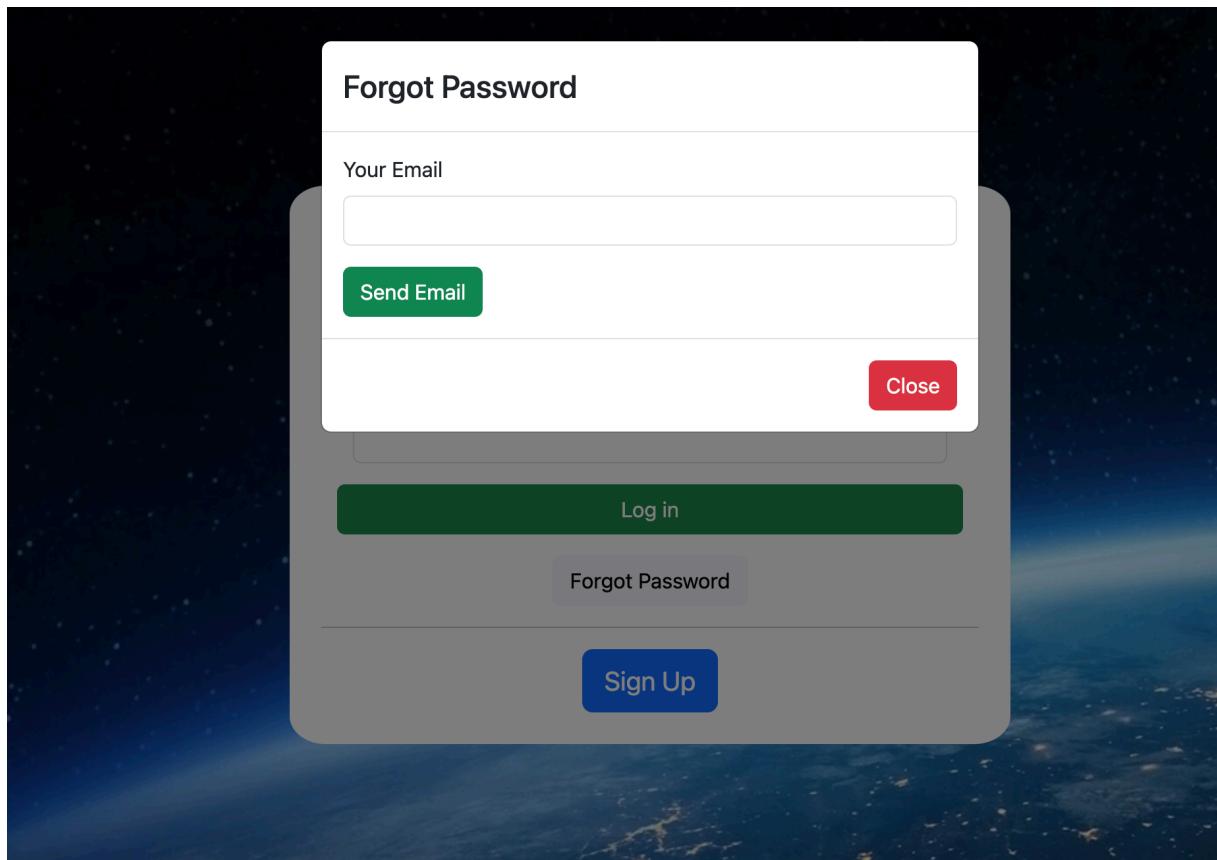
The sign-up window of the platform where users can be registered. There are 5 fields that need to be filled: name, surname, username and password that should contain minimum 6 characters, email. All the fields are mandatory.



*Figure 5.2.2.1 Sign-up window*

### **5.2.3 Forgot password window**

The forgot password window of the platform is used in case if a user wants to reset the password. A user types the email which is checked with a database. In case the email exists in database, the letter will be generated and sent with a reset link which is active for 1 hour. Once the user resets password it is changed in database and the link becomes inactive.



*Figure 5.2.3.1 Forgot password window*

## 5.2.4 Selection Assistant Editor

The user “Selection Assistant Editor” has several different functionalities among which show all users, assign roles to them, assign section to section editors and reviewers and assign papers to reviewers.

The screenshot shows the home page for the "Selection Assistant Editor" role. At the top, there is a blue header bar with the following navigation links: "Review Platform", "Profile", "Papers", and "Log out". Below the header, the main content area has a title "selectionassisteditor" and a user profile for "Zhanna Tursunbekova" with ID 1. The profile includes the email "ztursunbekova" and the main e-mail "tursunbekova.zhanna@gmail.com". Below the profile are two circular icons: a pencil icon and a graduation cap icon. At the bottom of the main content area, there is a row of five buttons: "Go To Users List" (highlighted in blue), "Assign Section Editors", "Assign Chief Editors", "Assign Sections to Reviewers", and "Assign Papers to Reviewers".

Figure 5.2.4.1 Home page for the role "Selection Assistant Editor"

The screenshot shows a table titled "Review Platform" with the following columns: ID, Name, Surname, Username, Email, Role, Go To Profile, New Role, Submit, and Delete. There is one user entry in the table:

ID	Name	Surname	Username	Email	Role	Go To Profile	New Role	Submit	Delete
1	Zhanna	Tursunbekova	ztursunbekova	tursunbekova.zhanna@gmail.com	selectionassisteditor	<a href="#">Profile</a>	New Role SAE	<a href="#">Submit</a>	

Figure 5.2.4.2 Users list of the platform

### **5.2.5 Section Editor**

The main functionalities of users with the role “Section Editor” are uploading the papers to their section, light reviewing the papers in the section.

*Figure 5.2.5.1 - Home page for the role "Section Editor"*

## **5.2.6 Reviewer**

The users with a role “Reviewer” have the following main functionalities: grade their skills, download the paper, evaluate the paper.

*Figure 5.2.6.1 - Home page for the role "Reviewer"*

## **5.2.7 Grading Skills**

First of all, reviews should grade their skill so they can be assigned to sections according to them.

*Figure 5.2.7.1 Grading Skills page*

### **5.2.8 Evaluation the paper**

Once the paper is assigned to a reviewer, it can be evaluated. There are several criteria and a reviewer needs to choose between 0 to 10 points.

*Figure 5.2.8.1 Form to evaluate the paper*

### **5.2.9 Sorting reviews**

*Figure 5.2.9.1*