



University of Cyprus  
Department of Computer  
Science

**EPL441 – Advanced Software Engineering**

**Spring Semester 2022**

**Group Project – Mental Health System**

**Team 4:**

**Michail-Panagiotis Bofos**

**Demetra Hadjicosti**

**Ioanna Theophilou**

**Lucia – Jimenez Garcia**

**Implementation Technology: Client -Server**

## Basic Structure of the System



Each client communicates with the main server by sending a Query object in JSON format over TCP, which the server decodes and then executes it accordingly. If the query requests something in return, the server sends back its answer again in JSON over TCP. All the database communication is achieved via the JDBC program which calls any stored procedures we need from the database.

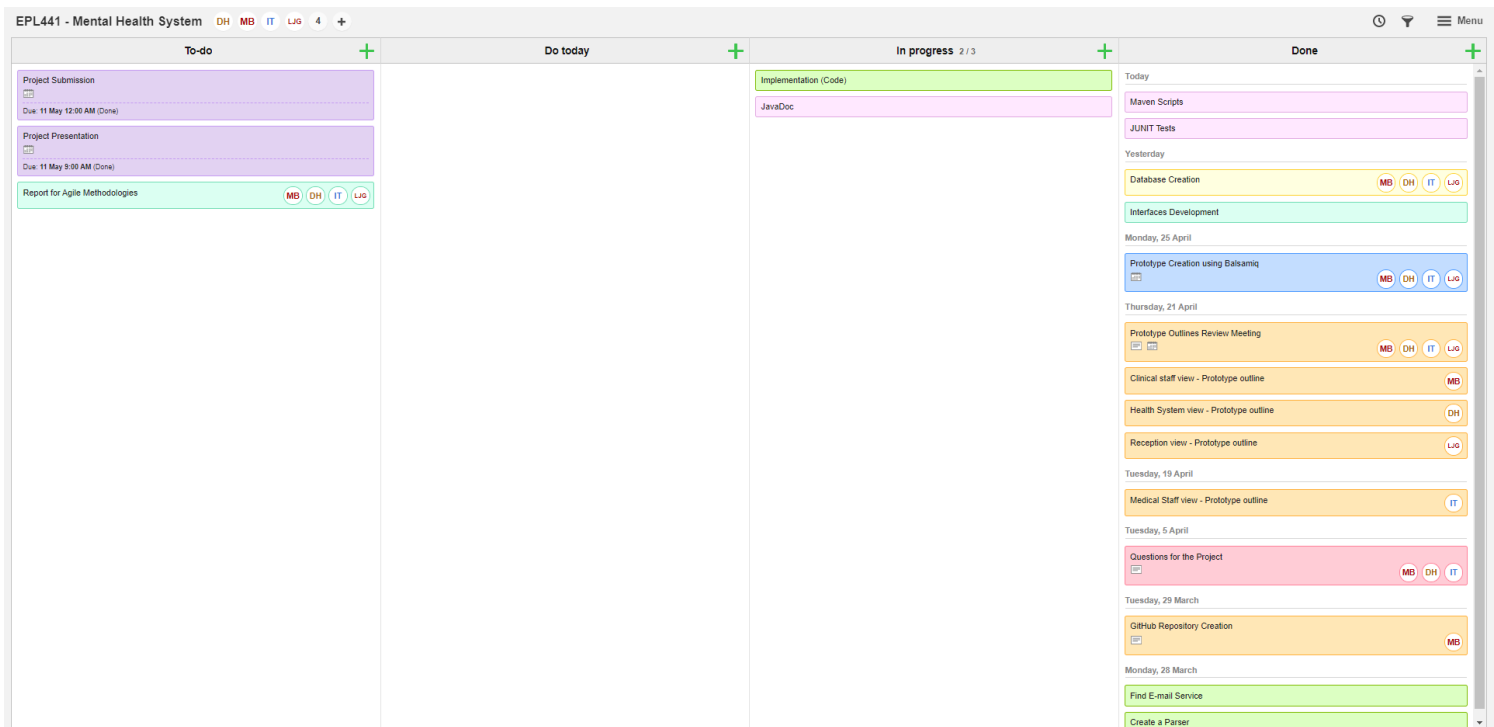
## Agile Methodologies used during development

### 1. *GitHub*

For the development of our system, we used a GitHub repository which supported code hosting for version control and collaboration.

### 2. *KanbanFlow*

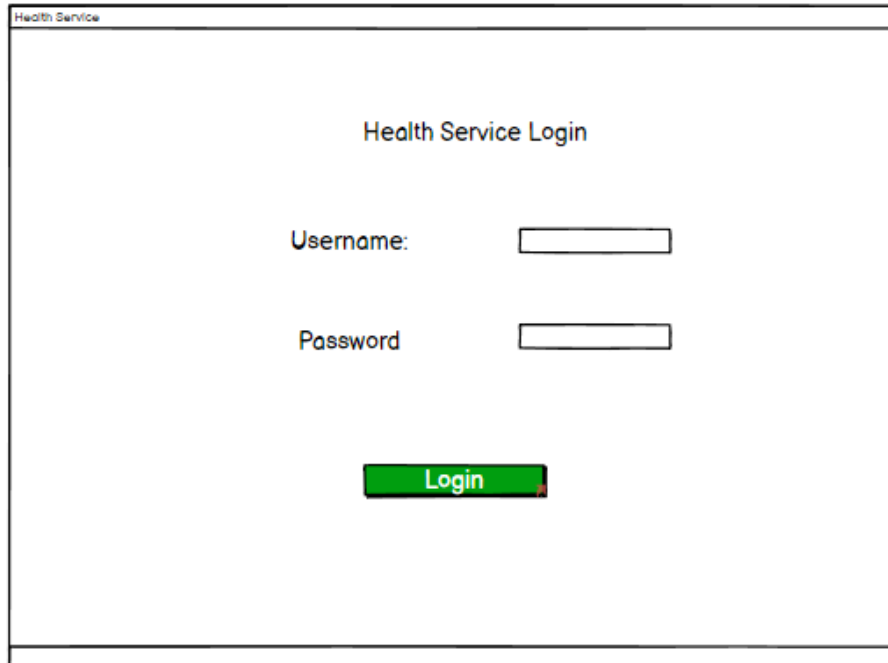
Used for the coordination of the team.



## Prototype Development

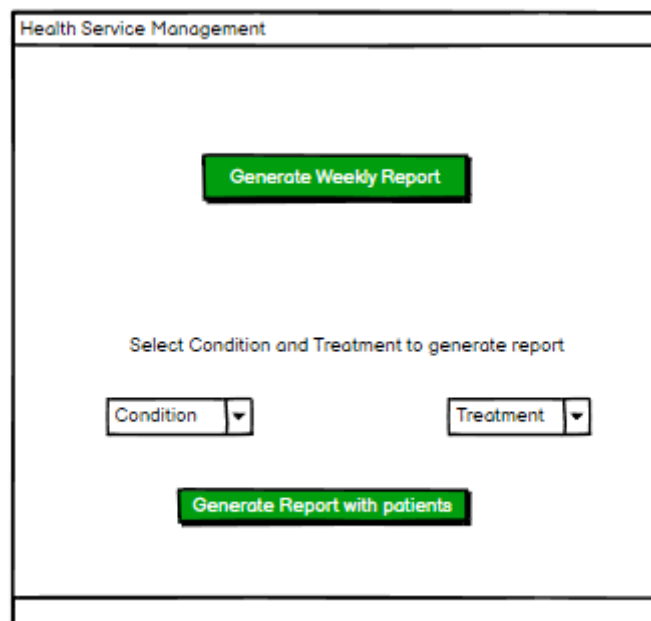
### Health Service Management Viewpoint

#### **1. Login Interface for Health Service Management**



A screenshot of a web browser window titled "Health Service". The page content is centered and features the title "Health Service Login". Below the title, there are two input fields: "Username:" followed by a text box, and "Password" followed by a text box. Below these fields is a green button with the text "Login".

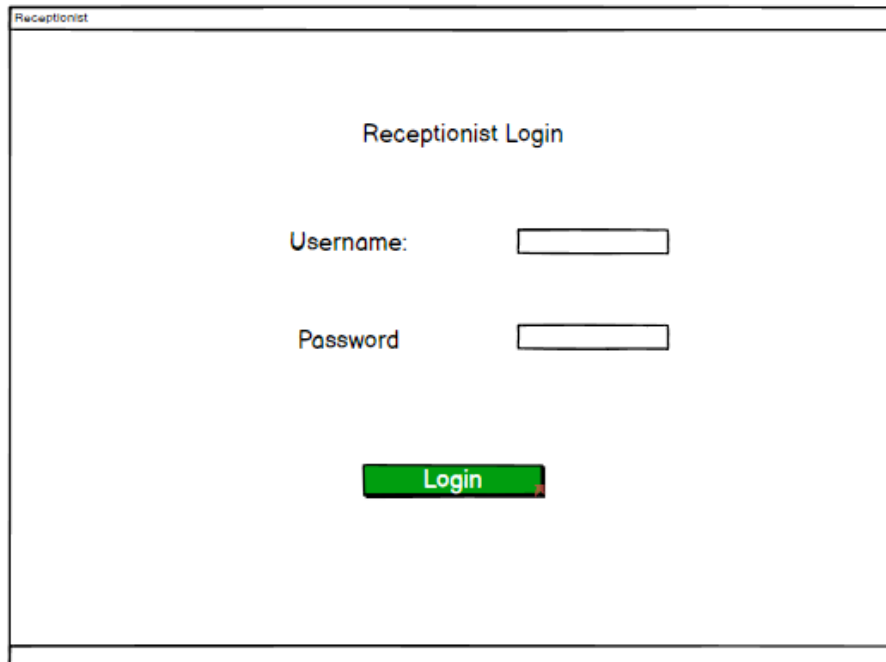
2. **Main page for Health Service Management:** Contains button for generating the weekly report in pdf that shows interesting information for the whole system



A screenshot of a web browser window titled "Health Service Management". The page content is centered and features a green button with the text "Generate Weekly Report". Below this button, there is a text label "Select Condition and Treatment to generate report". Underneath this label are two dropdown menus: "Condition" and "Treatment". Below these dropdowns is a green button with the text "Generate Report with patients".

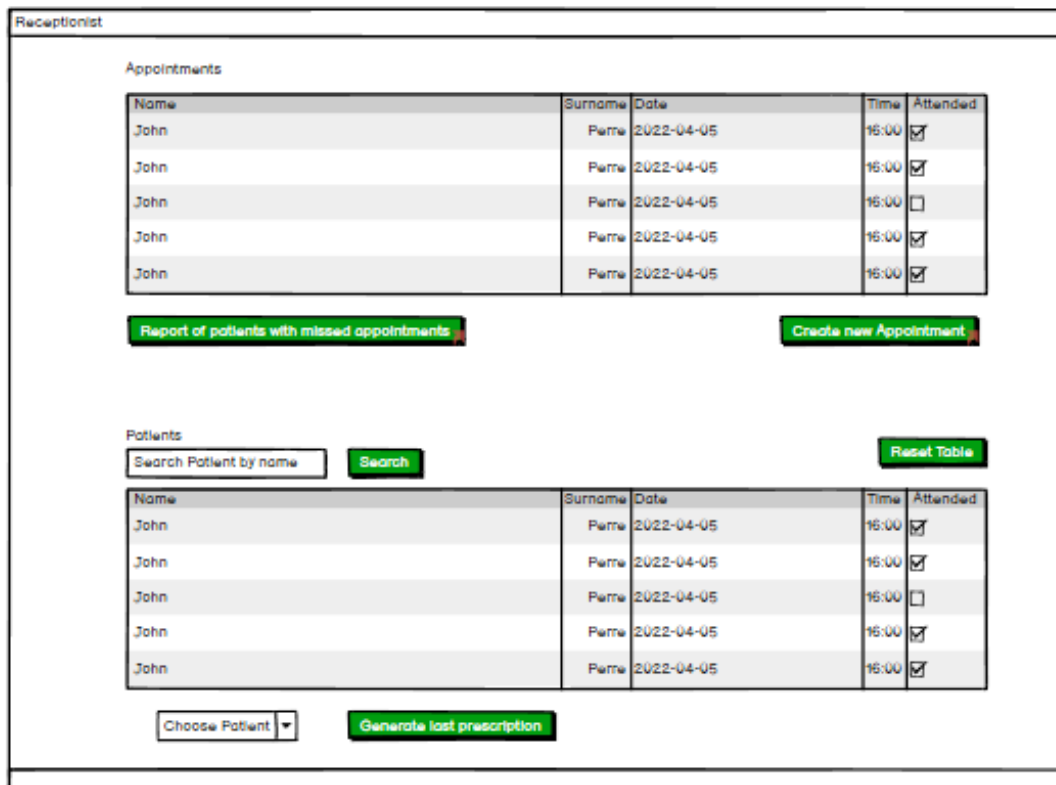
## Receptionist Viewpoint

### 1. Login Interface for Receptionists



The screenshot shows a web application window titled "Receptionist". Inside, the title "Receptionist Login" is centered. Below the title, there are two input fields: "Username:" followed by a text box, and "Password" followed by a text box. Below these fields is a green button with the text "Login".

2. **Main page for Receptionists:** Shows the Appointments of the clinic that the receptionist is in, gives the opportunity to create a new appointment, and via double click on a specific record of the appointment table the



The screenshot shows a web application window titled "Receptionist". The main content area is titled "Appointments" and contains a table with the following data:

Name	Surname	Date	Time	Attended
John	Perre	2022-04-05	16:00	<input checked="" type="checkbox"/>
John	Perre	2022-04-05	16:00	<input checked="" type="checkbox"/>
John	Perre	2022-04-05	16:00	<input type="checkbox"/>
John	Perre	2022-04-05	16:00	<input checked="" type="checkbox"/>
John	Perre	2022-04-05	16:00	<input checked="" type="checkbox"/>

Below the table are two green buttons: "Report of patients with missed appointments" and "Create new Appointment".

Below the appointments section is a section titled "Patients". It contains a search bar with the placeholder "Search Patient by name", a green "Search" button, and a green "Reset Table" button. Below the search bar is a table with the following data:

Name	Surname	Date	Time	Attended
John	Perre	2022-04-05	16:00	<input checked="" type="checkbox"/>
John	Perre	2022-04-05	16:00	<input checked="" type="checkbox"/>
John	Perre	2022-04-05	16:00	<input type="checkbox"/>
John	Perre	2022-04-05	16:00	<input checked="" type="checkbox"/>
John	Perre	2022-04-05	16:00	<input checked="" type="checkbox"/>

Below the patients table are a dropdown menu labeled "Choose Patient" and a green button labeled "Generate last prescription".

receptionist can update the attendance of the appointment. Shows the patients of the whole system as well, receptionist can search for a patient by name, and receptionist can repeat a treatment given before to a patient. Lastly, the receptionist can generate a report for the patients that have not attended an appointment.

- 3. Create/Update Appointment Interface:** Via this interface, the receptionist can create a new appointment for a patient. The names of doctors and patients are fetched. Via the same interface, the update

Create Appointment

Appointment ID

1

Patient

1 John Doe

Doctor

0 Maria Loni

Receptionist ID

1

Date

Time

Clinic ID

1

☐ Drop - In

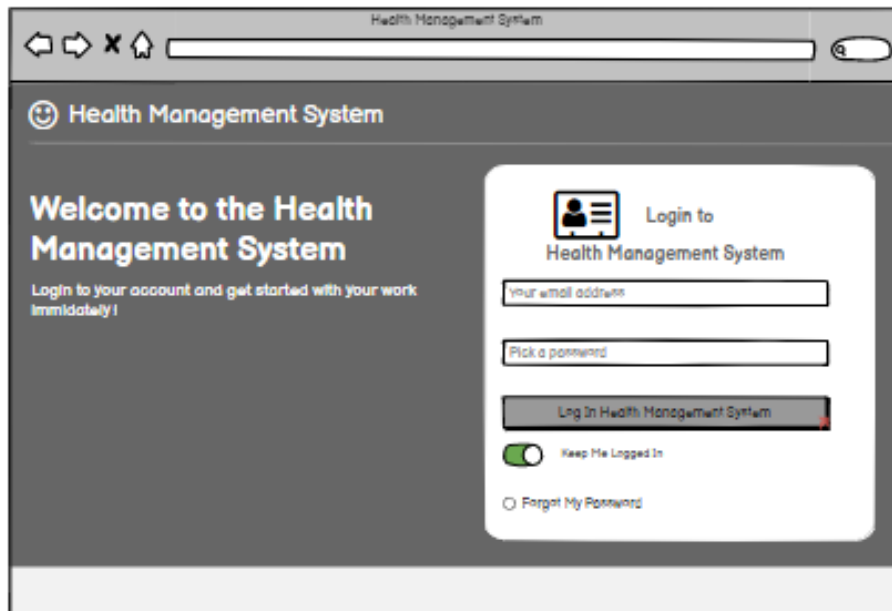
☐ Attended

Submit

procedure for the attendance takes place. All the fields in this case are disabled except of the attend check box.

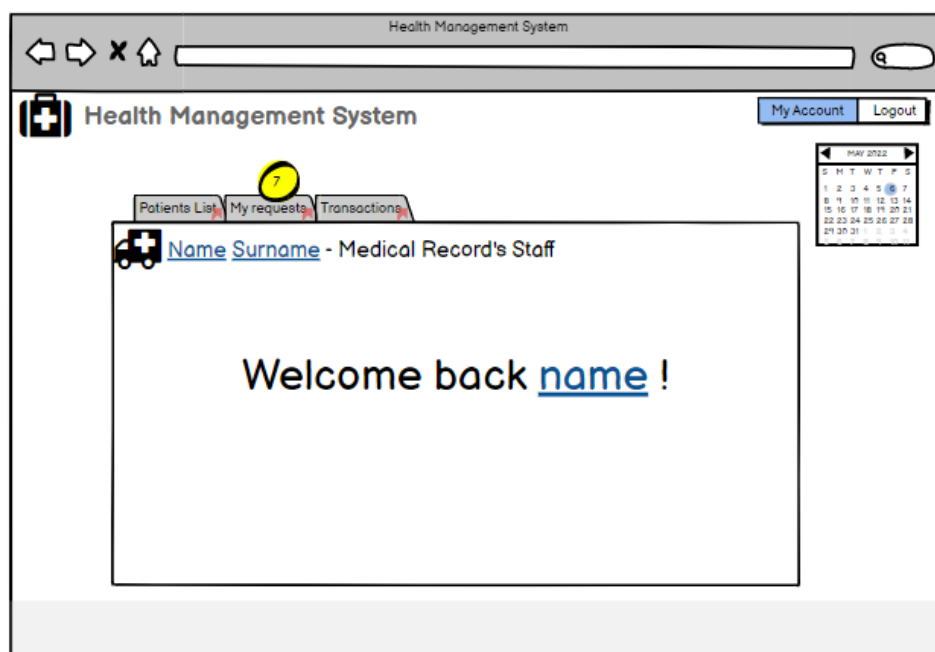
## Medical Records Staff Viewpoint

### **1. Login Interface for Medical Records Staff**



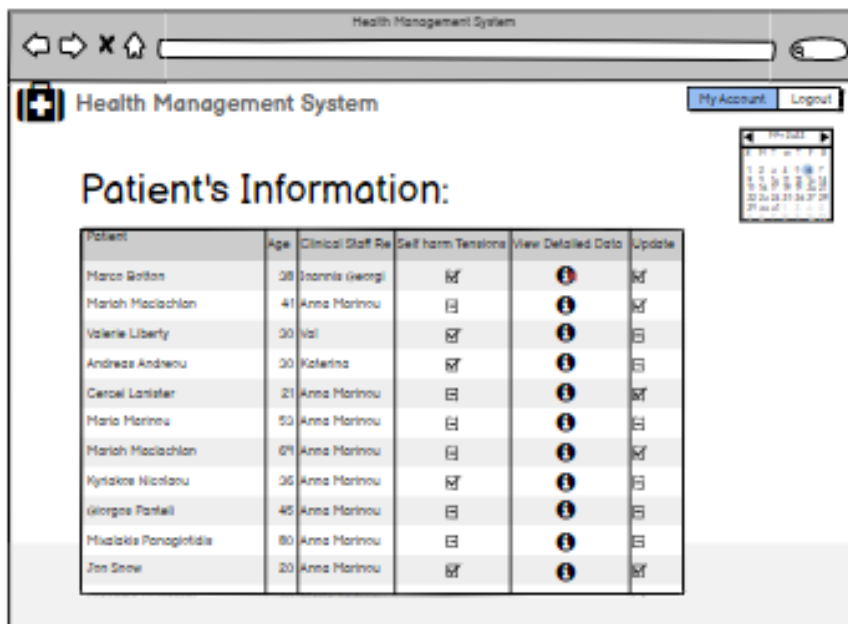
This is the sample login page of the Medical Records staff. This indicates that the system has access to the Medical Record's stuff username, name and surname. By logging to the system the user will be able to view the main menu.

### **2. Medical Records Main Menu**



This is the main menu of the Medical Records' staff. In this page, the user can choose between three actions. The first action is to view the Patients list, the second is to view the incoming requests from users of other Viewpoints and the last is to see the whole system's transactions. This action is mandatory due to the observative role of the Medical Record's staff. For a more personalized experience, each user will be greeted by a "Welcome back" message.

### 3. Medical Records Patients List Page

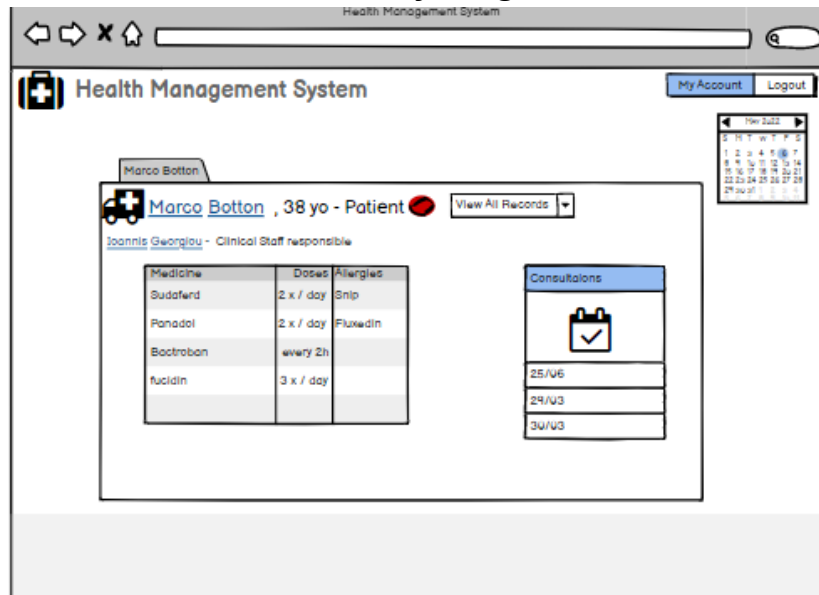


Patient	Age	Clinical Staff	Re	Self harm Tensions	View Detailed Data	Update
Marco Bolton	38	Stannia Georgi		✓		✓
Harish MacLachlan	41	Anna Marinou		✓		✓
Valerie Liberty	30	Vali		✓		✓
Andreas Andreou	30	Katerina		✓		✓
Cercel Lantier	21	Anna Marinou		✓		✓
Maria Marinou	53	Anna Marinou		✓		✓
Harish MacLachlan	67	Anna Marinou		✓		✓
Kyriakos Nicolazou	36	Anna Marinou		✓		✓
Georgos Pantell	45	Anna Marinou		✓		✓
Hristakis Panagiotidis	80	Anna Marinou		✓		✓
Jon Snow	20	Anna Marinou		✓		✓

This interface indicates the action where the user chose to view the Patients' personal information. A list of all the patients is then retrieved. This action is not available in the implementation, because it is not mandatory for the Medical Records' staff to know the patients' information. This action is done by the doctor, nurse or any other clinical due to their specializations and skills. A system observer should not have the right to access to the patients personal information, that's why this interface is not included in the Medical Records' implementation.

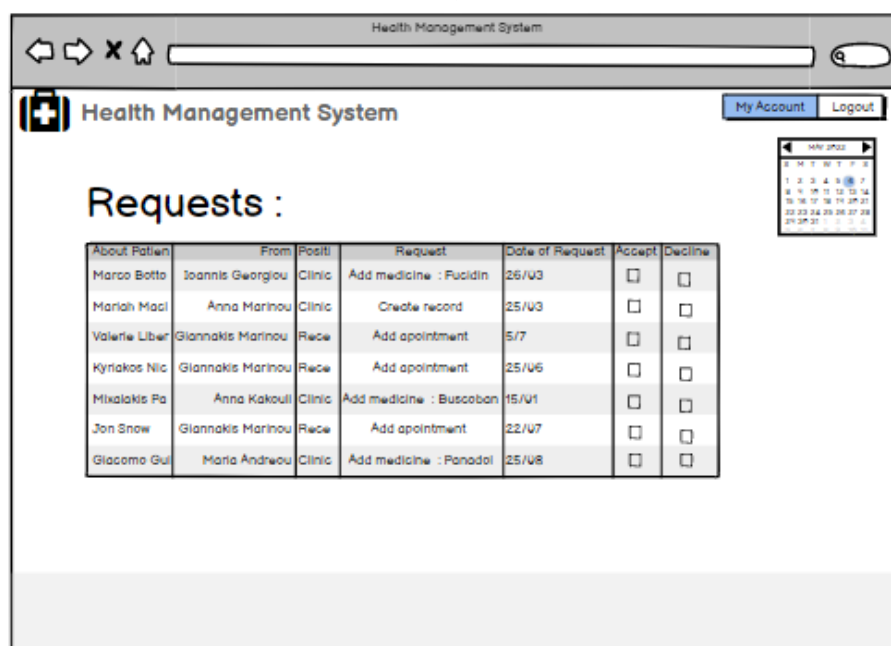


#### 4. Medical Records Patient Info Page



This extends the above idea, because this page is only shown to the user when the user selects a patient from the patient's list page. For the reasons explained above, this is not a Medical Records' staff responsibility and therefore is not presented in the implementation.

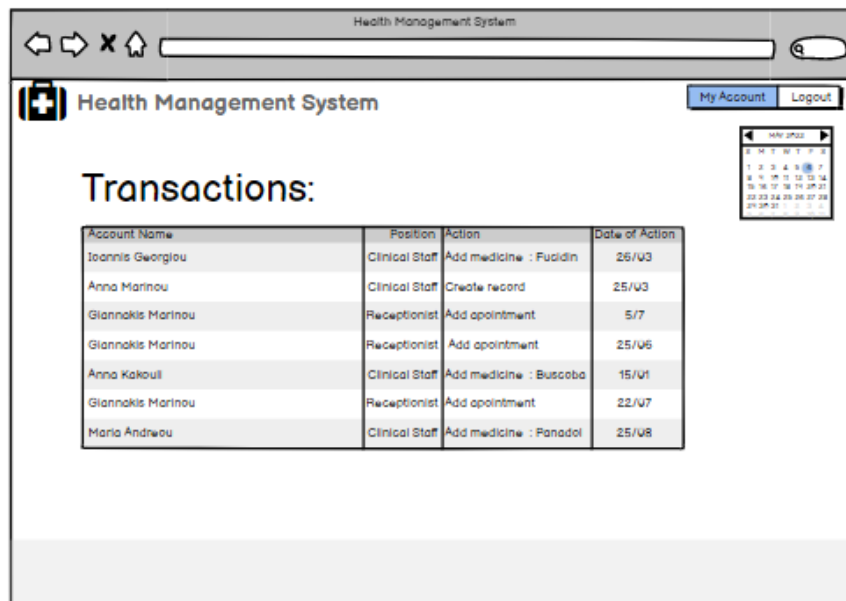
#### 5. Medical Records external Requests Action



One of the most important activities of the Medical Records' staff is to accept external requests. External meaning, from other viewpoints. In

this interface many request types are shown, and can be accepted or declined by the Medical Records' staff. In the implementation, there are four main request types : New Record , Override or add allergy to a patient, new Treatment and indication of death of a patient. By pressing on the request, more information about the request is available and the option to accept or decline the request.

## 6. Medical Records System's Transactions Observation



Account Name	Position	Action	Date of Action
Ioannis Georgiou	Clinical Staff	Add medicine : Fusidin	26/U3
Anna Marinou	Clinical Staff	Create record	25/U3
Giannakis Marinou	Receptionist	Add appointment	5/7
Giannakis Marinou	Receptionist	Add appointment	25/U6
Anna Kakouli	Clinical Staff	Add medicine : Buscoba	15/U1
Giannakis Marinou	Receptionist	Add appointment	22/U7
Maria Andreou	Clinical Staff	Add medicine : Panadol	25/U8

Another main activity of the Medical Records' staff is to view the transactions of the system. This page, allows the staff to observe the overall system.

## Clinical Staff Viewpoint

### 1. Login Interface for Clinicians

Log In Clinical

# Log in to the system

Username

Password

Log In

Cancel

**2. Main page – Appointment and patient management:** Shows the doctors a list of today's appointments, a list of all the possible drugs they can prescribe (and their side-effects) and a list of their patients.

[illegible]

Clinical Viewpoint

Dr. Gerald Boyle

Today's Appointments

Drug List

Benadril

Nardil

Neulactil

Mogadon

Molipaxin

See side effects

Bert Reynolds

Drop-in

Jason Williams

Scheduled

Robert Petric

Scheduled

Side Effects for <drug>

Benadril is responsible for headaches

Ok

Select Appointment

My Patients

B. Reynolds

J. Williams

N. White

R. Petric

Select Patient

Log Out

- 3. Patient view:** This page presents info for a specific patient and provides doctors the ability to export/import patients records, add allergies, add and view comments for the aforementioned patient and finally request their death. The red dot next to the patients' name shows that a patient

Patient View - Jason Williams

Back

Request death of patients

Jason Williams

12-04-2021 Scheduled

Completed

16-08-2021 Drop-In

Pending

Edit Selected

Name: Jason

Surname: Williams

Birthday: 11-02-2000

Telephone: +1 1984 2941

Email: example@domain.

Allergies

Export Record

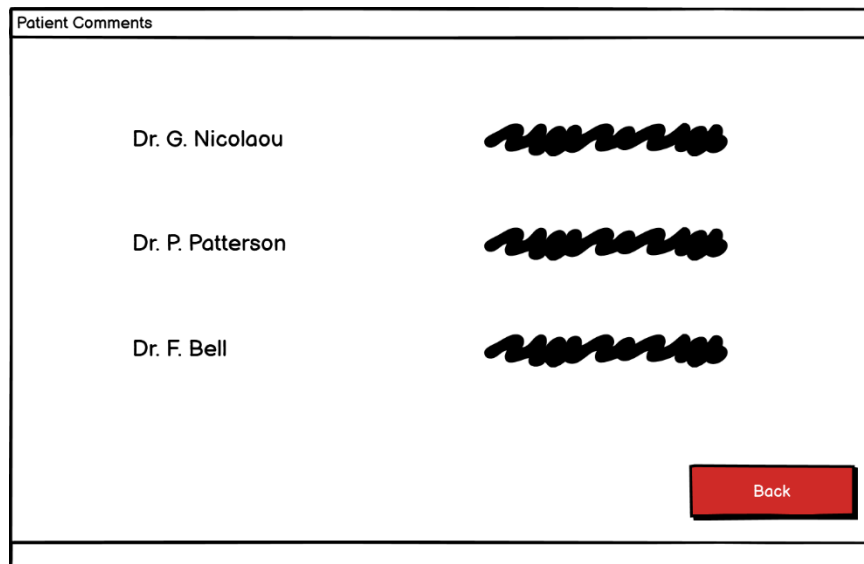
Import Record

Patient Comments

Add Comment

may be dangerous. If the patient has passed away some functions are disabled.

- 4. Comment view:** *The doctor can see their and other doctors comments for a patient.*

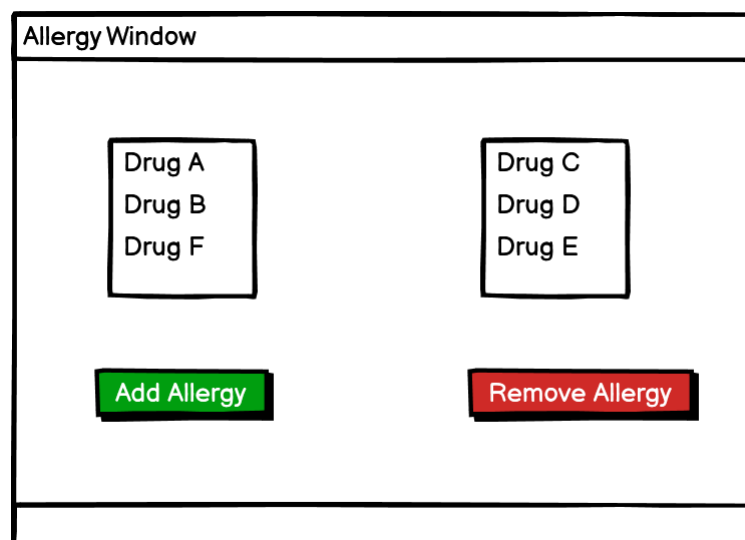


The 'Patient Comments' window displays a list of comments from three doctors: Dr. G. Nicolaou, Dr. P. Patterson, and Dr. F. Bell. Each name is followed by a redacted comment represented by a black scribble. A red 'Back' button is located in the bottom right corner.

Patient Comments	
Dr. G. Nicolaou	[Redacted]
Dr. P. Patterson	[Redacted]
Dr. F. Bell	[Redacted]

Back

- 5. Allergy view:** *The doctor can request the addition of an allergy to a patient.*



The 'Allergy Window' displays two columns of drug names. The left column contains Drug A, Drug B, and Drug F. The right column contains Drug C, Drug D, and Drug E. Below the drug lists are two buttons: a green 'Add Allergy' button and a red 'Remove Allergy' button.

Allergy Window	
Drug A Drug B Drug F	Drug C Drug D Drug E
Add Allergy	Remove Allergy

- 6. Diagnosis view:** *The doctor may add or edit a patients' record (condition and treatment). If the doctor tries to prescribe a drug that the patient is*

*allergic to, they'll be prompted with a dialog window asking them if they want to proceed.*

Diagnosis - Jason Williams

# Jason Williams

☒ Self-Harm  
☒ Possible Threat

Diagnosis:

Nardil  
Neulactil  
Mogadon  
Molipaxin

Diagnosis - Jason Williams

# Jason Williams

☒ Self-Harm  
☒ Possible Threat

Diagnosis:

Nardil  
Neula  
Moga  
Molipa

Alert

<drug> has side effects for <patient>. Are you sure you want to prescribe it?

No Yes

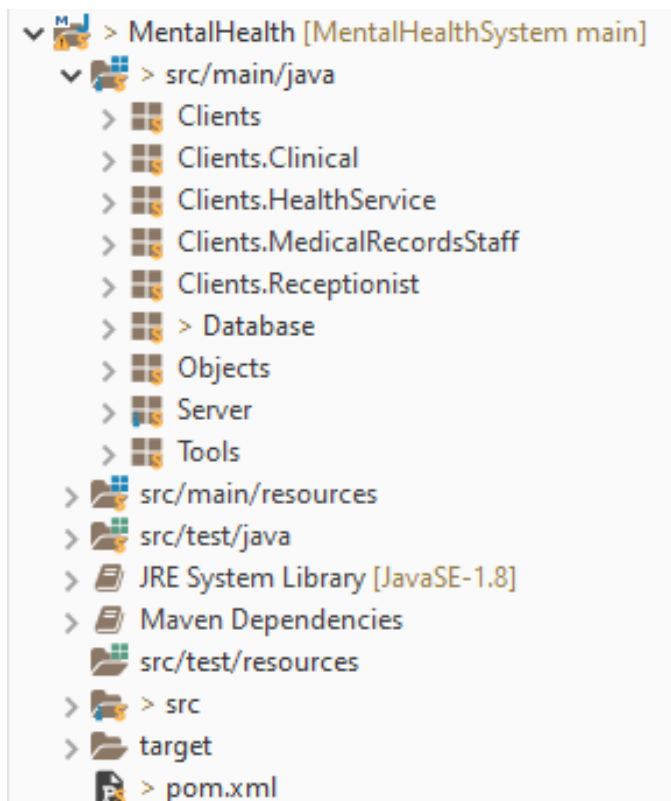
## Coding Conventions

### 1. *Maven*

For the automation of dependency control and the development phase, we used maven scripting. Some notable commands are:

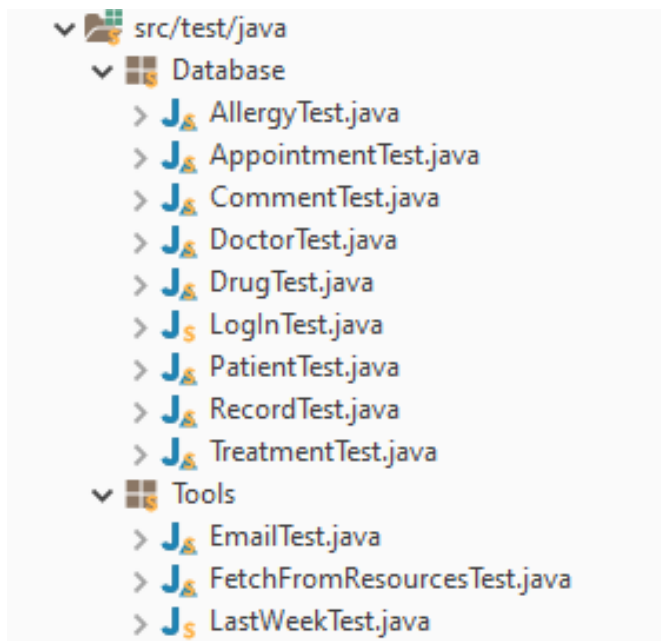
- package (which creates all five jar files we need, after running the unit tests)
- test (which runs the unit tests)
- clean (which cleans project from files like class objects and jar files)
- javadoc:javadoc (which creates the documentation files)
- We also used exec:java to run a single java program but this isn't useful in our case, because we have five different entry points.

### 2. *Packaging*



Our general project structure follows the maven project logic. To be more organized and avoid code rewriting, we used packages to store our classes. Each viewpoint has its own sub-package, under the clients' package. In addition, database transaction, server, tools, and general objects have their own package as well.

### 3. JUnits



For the implementation for the JUnits we used again the structure of maven, and the junit-jupiter plugin.

### 4. Code Indentation and Formatting

Code was written using proper indentations. This maximizes readability, Spaces were used as well to distinguish different blocks of code.

### 5. Comments

Comments are included in each class. Specific comments were written to describe each different method and class, to describe each one of the client procedures and comments are written throughout the classes to describe what is specifically done, in the step that the comment correspond to.