

# **CS 353**

# DATABASE MANAGEMENT SYSTEMS PROJECT

# **Project Final Report**

# National Judiciary Informatics System

21.05.2019

Group 22

Ali Yümsel - 21601841 Sina Şahan - 21602609 Ömer Fatih Çelik - 21601387 Faruk Ege Hatırnaz - 21601441

# Table of Contents

I. BRIEF DESCRIPTION	2
2. FINAL E/R DIAGRAM	3
3. RELATIONAL TABLE SCHEMAS	4
4. IMPLEMENTATION DETAILS	6
5. ADVANCED DATABASE COMPONENTS	7
5.1 VIEWS	7
5.1.1 ONGOING LAWSUITS FILED WITHIN 30 DAYS VIEW	7
5.1.2 TOP RATED CONCILIATORS	7
5.2 REPORTS	7
5.2.1 LAST 30-DAY TRIAL REPORT:	7
5.3 TRIGGERS	7
5.4 CONSTRAINTS	8
5.5 PRELIMINARY RESULTS	8
5.5.1 Example #1:	8
5.5.2 Example #2:	9
6. USER MANUAL	10
6.1 HOME PAGE	10
6.2 LOGIN PAGE	12
6.3 REGISTER PAGE	13
6.4 MANAGE ACCOUNT	14
6.5 REGULAR CITIZEN	15
6.5.1 Lawsuits	15
6.5.2 Request Lawsuit	17
6.6 JUDGE	18
6.6.1 My Cases	18
6.6.2 Trials	20
6.6.3 Assigning Conciliator	22
6.6.4 Final Verdict for the Case	23
6.6.5 Final Verdict for the Trial	24
6.7 LAWYER	25
6.7.1 My Cases	25
6.7.2 File Lawsuit	27
6.7.3 Possible Cases	28
6.7.4 Trials	29
6.8 CONCILIATOR	31
6.8.1 My Cases	31
6.8.2 Settle the Case	33

# 1. BRIEF DESCRIPTION

This project aims to construct an application. The application is about a small fraction of national judiciary informatics system which is solving **cases** that are suitable for reconciliation.

The application has a **user** super class as citizens. All users are considered as regular citizens when they are registered to the website. Those accounts then can be converted to **judge**, **lawyer** or **reconciliator** by the admins when it is requested from the state.

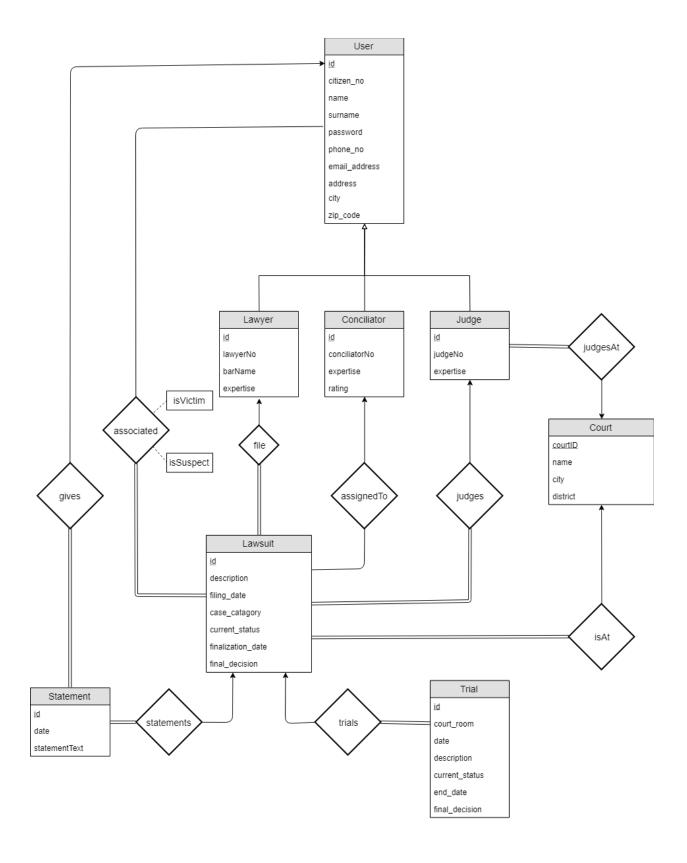
There are **trials** connected to their respected **lawsuits** with *different* types, categories for crimes, personal statements, evidences, cities etc. as their properties. Those lawsuits are connected to a particular **court**, in which the assigned judge is a member of that court. Any citizen is able to file a lawsuit through their lawyer in a particular court.

Certain crimes can be handled with reconciliation between two parties. Each **reconciliation case** is assigned by the case's associated judge to a particular conciliator, who is responsible for making peace between two parties.

At the end, judge gives the final decision, their verdict on the case. The case *status* will be updated related to the decision of the judge.

The database will hold all the information on the elements of a lawsuit. Our project will provide the means to maintain these information by selecting and/or updating with the usage of queries. The project will show only the relevant information to the specific user type. The database will also store the information of previous (closed) cases.

# 2. FINAL E/R DIAGRAM



# 3. RELATIONAL TABLE SCHEMAS

**User**(<u>id</u>, citizen\_no, name, surname, password, phone\_no, email\_address, address, city, zip\_code)

**UserRole**(<u>id</u>, name)

**UserRoleTable**(<u>id</u>, user\_id, role\_id)

**FK:** role\_id references UserRole(id)

**FK:** user\_id references User(id)

**Lawyer**(<u>id</u>, user\_id, bar\_name, expertise)

**FK:** user\_id references User(id)

**Conciliator**(<u>id</u>, user\_id, expertise, rating)

**FK:** user\_id references User(id)

Judge(id, user\_id, expertise, court\_id)

**FK:** user\_id references User(id)

**FK:** court\_id references Court(id)

**Court**(<u>id</u>, name, city, district)

**Lawsuit**(<u>id</u>, description, filing\_date, case\_catagory, current\_status, finalization\_date, final\_decision, court\_id, judge\_id, victim\_id, suspect\_id filed\_lawyer\_id, conciliator\_id)

**FK:** court\_id references User(id)

**FK:** judge\_id references User(id)

**FK:** victim\_id references User(id)

**FK:** suspect\_id references User(id)

**FK:** filed\_lawyer\_id references User(id)

**FK:** conciliator\_id references User(id)

**Trial**(<u>id</u>, lawsuit\_id, date, court\_room, description, current\_status, end\_date, final\_decision)

**FK:** lawsuit\_id references Lawsuit(id)

**Statement**(<u>id</u>, lawsuit\_id, date, statement\_text, user\_id)

**FK:** lawsuit\_id references Lawsuit(id)

**FK:** user\_id references User(id)

# 4. IMPLEMENTATION DETAILS

We have used PHP, HTML, CSS and Javascript in our website. Utilizing Bootstrap helped us to maintain a responsive website design. With the strong Bootstrap classes and its grid layout, JQuery was also used to enhance our abilities of manipulating our existing data for a more pleasant experience.

Docker Desktop was used for hosting our implementations. By creating a Docker container, we were able to have a localhost development environment with Nginx, PHP, MySQL and even SSL certificates. PHPMyAdmin was used for observing and working on our database. The docker-compose file opened the ports 8000 and 8080 and they were used for web/public files and PHPMyAdmin in the respective order.

To maintain the principle of security, inputs are validated in both JS and PHP + MySQL. Before using inputs in our queries, we have secured our inputs with 'mysqli\_real\_escape()' to ensure there would be minimal possibility of SQL injections. While storing passwords, we used MD5 with a user-dependent salt.

To present our data in a clean way, the obtained data from the SQL queries are parsed within the page and echoed from PHP to HTML code. By doing this, we were able to populate our input fields with already existing data, ready to make any changes on them.

We have implemented a few of controller pages. For example, Lawyer's case accepting page: The ID of a chosen case from the 'Possible Cases' tab is sent to our controller page (accept.php). With the help of the Session variables, we made sure that the user had the authority to accept a case as a lawyer and the case is a available for taking. In the end of these validations, our Lawsuits table is updated with newly assigned lawyer to a case.

# 5. ADVANCED DATABASE COMPONENTS

# 5.1 VIEWS

#### 5.1.1 ONGOING LAWSUITS FILED WITHIN 30 DAYS VIEW

```
CREATE VIEW ongoing_lawsuits_30days AS
SELECT * FROM Lawsuit
WHERE current_status = '0'
AND(UNIX_TIMESTAMP() - filing_date <= 2592000);"</pre>
```

# 5.1.2 TOP RATED CONCILIATORS

```
CREATE VIEW top_rated_conciliators AS
SELECT * FROM Conciliator ORDER BY rating DESC";
```

# 5.2 REPORTS

#### 5.2.1 LAST 30-DAY TRIAL REPORT:

```
CREATE VIEW last30_trial AS
SELECT * FROM Trial WHERE (UNIX TIMESTAMP() - date <= 2592000)</pre>
```

# 5.3 TRIGGERS

- When new account is created by any user or new account is provided by the administration, the user would be added on to the related table (user) by administration with considering its national ID.
- When new lawsuit is filed by lawyer the following lawsuit would be added on relevant table(lawsuit) as tuple with required entities. The system itself would provide the lawsuitID automatically after creation.

- When conciliator is assigned to a new specific case, the attributes of reconciliation change accordingly
- After the finalized conciliated case, the rating of the relevant conciliator would be updated with regarding the success or the failure of the conciliator on that specific case.
- After acception of a possible case by lawyer, the system would automatically consider that case is filed by the lawyer, so it would be added on "My Cases" page.

# **5.4 CONSTRAINTS**

- A conciliator cannot participate in a lawsuit that is not in their expertise area.
- A lawyer, a conciliator or a judge cannot be represented as suspect and/or victim associated in a lawsuit in which they participate in their respective roles.
- A statement date or a trial date related to a lawsuit cannot be later than the stated lawsuit's date of finalization.

# 5.5 PRELIMINARY RESULTS

# 5.5.1 Example #1:

To observe the details of an ongoing lawsuit, we run the following query:

```
SELECT 1.* , s.citizen_no AS suspectNo, v.citizen_no AS victimNo FROM Lawsuit 1
   INNER JOIN User s
   ON 1.suspect_id = s.id
   INNER JOIN User v
   ON 1.victim_id = v.id
   WHERE 1.filed_lawyer_id = '$userID' AND 1.current_status = '0'"
```

The actual result of the query structure is the following:

```
array (size=1)
0 =>
  array (size=15)
  'id' => string '2' (length=1)
  'description' => string 'New Lawsuit!' (length=12)
```

```
'filing_date' => string '1558380154' (length=10)
'case_category' => string 'Cyber Security' (length=14)
'current_status' => string '0' (length=1)
'finalization_date' => null
'final_decision' => null
'court_id' => string '1' (length=1)
'judge_id' => string '12' (length=2)
'victim_id' => string '15' (length=2)
'suspect_id' => string '16' (length=2)
'filed_lawyer_id' => string '13' (length=2)
'conciliator_id' => null
'suspectNo' => string '000000000006' (length=11)
'victimNo' => string '00000000005' (length=11)
```

#### 5.5.2 Example #2:

To observe the details of an ongoing lawsuit, we run the following query:

```
"SELECT c.* , u.citizen_no AS conciliatorID, u.name AS name, u.surname AS surname FROM Conciliator c NNER JOIN User u

ON c.user_id = u.id

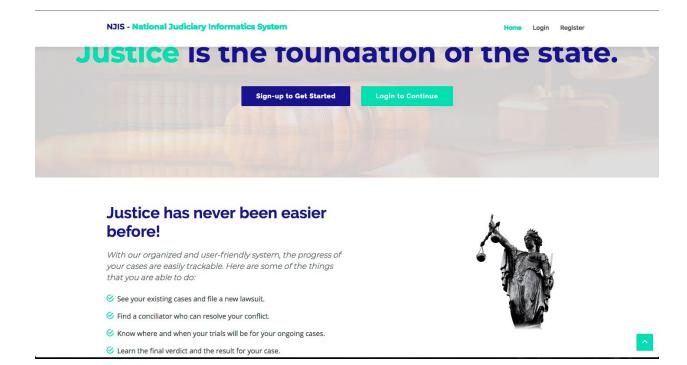
WHERE lower(`expertise`) = '$caseCategory'";
```

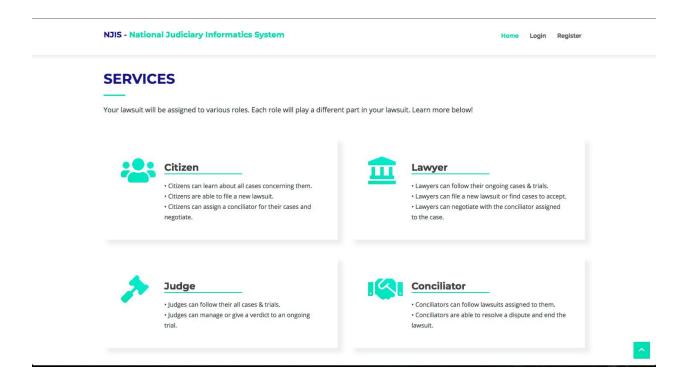
The actual result of the query structure is the following suitable conciliator user information:

```
array (size=1)
0 =>
array (size=7)
'id' => string '1' (length=1)
'user_id' => string '14' (length=2)
'expertise' => string 'Cyber Security' (length=14)
'rating' => string '5' (length=1)
'conciliatorID' => string '00000000004' (length=11)
'name' => string 'Connor' (length=6)
'surname' => string 'Conciliator' (length=11)
```

# 6. USER MANUAL

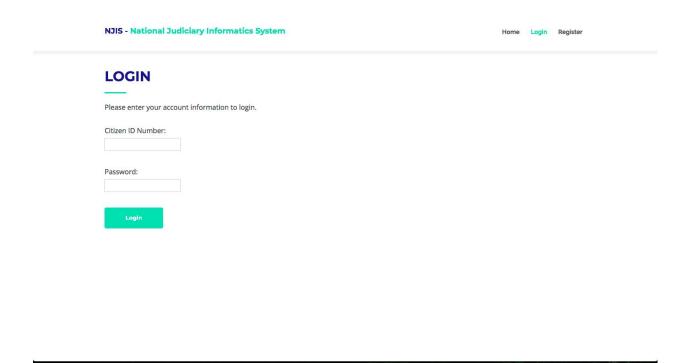
# 6.1 HOME PAGE





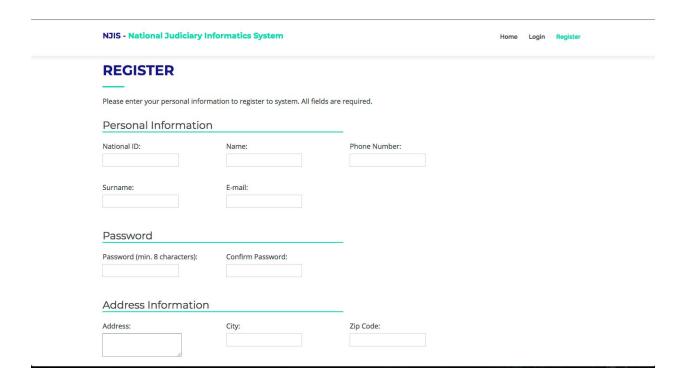
This is the NJIS home page. From here, users can get information about our website and services. They can also navigate to login and register pages from the top menu on this page.

# 6.2 LOGIN PAGE



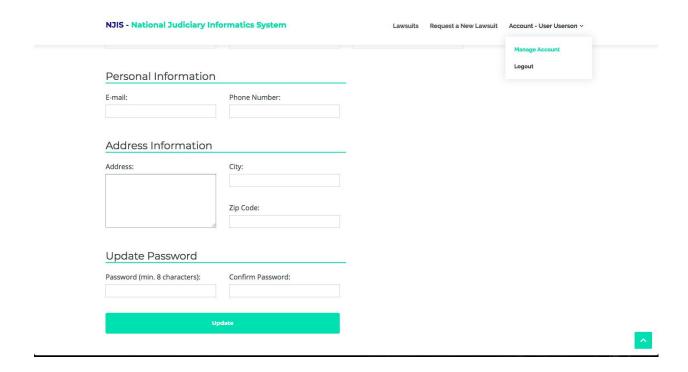
This is the 'Login' page. Users can log in to the system with their citizen id no's and passwords.

# 6.3 REGISTER PAGE



This is the 'Register' page. Citizens can register to the website as new users by filling out the form.

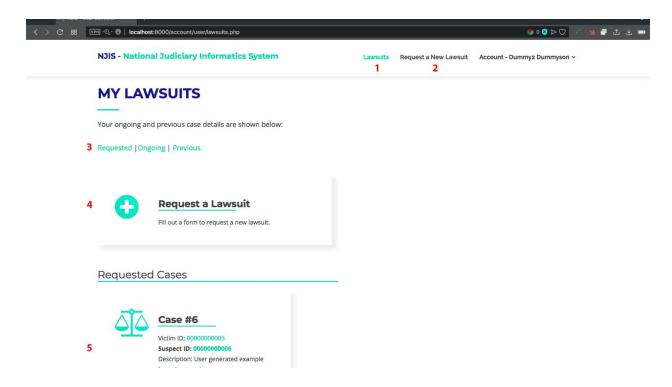
# 6.4 MANAGE ACCOUNT



This is the 'Manage Account' page. This page can be accessed after the user logs in to the website by navigating through the menu at the top of the page. At this page, users can view and update information about their accounts.

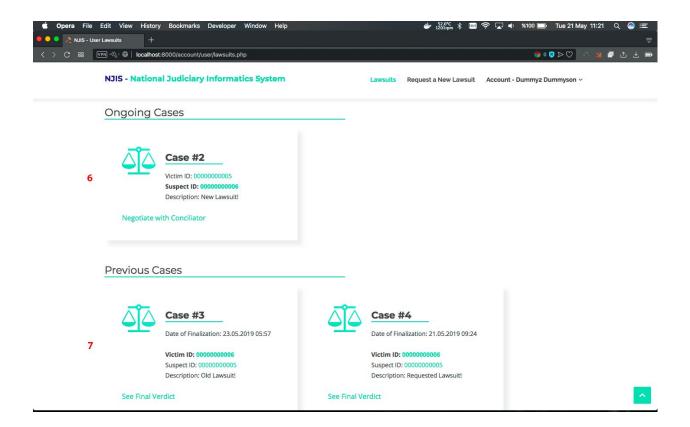
# 6.5 REGULAR CITIZEN

#### 6.5.1 Lawsuits



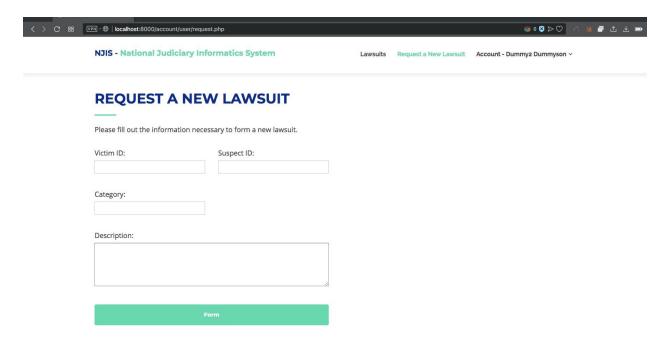
This is the 'Lawsuits' page where citizens can see their lawsuits and get information about those lawsuits. The page elements are:

- **1.** Link to the current page.
- 2. Link to the 'Request Lawsuit' page...
- **3.** Buttons to select between requested, ongoing and previous(finalized) cases. This will change the lawsuits listed at 5.
- **4.** Button to redirect to 'Request Lawsuit' page. This button is here for convenience. It does the same job with 2.
- **5.** The list of ongoing or previous lawsuits. For each lawsuit, the user can observe the victim's and suspect's id (can see the other side of the case) and can click on the lawsuit number to view lawsuit details like judge name, conciliator name, trial dates, etc.



- **6.** The list of ongoing cases. For each case, the user can observe victim's and suspect's id (can see the other side of the case) and can click on the case number to view case details like statements, conciliator name, trial dates, etc.
- **7.** The list of closed cases. You can basically check final verdict of the case and observe related information.

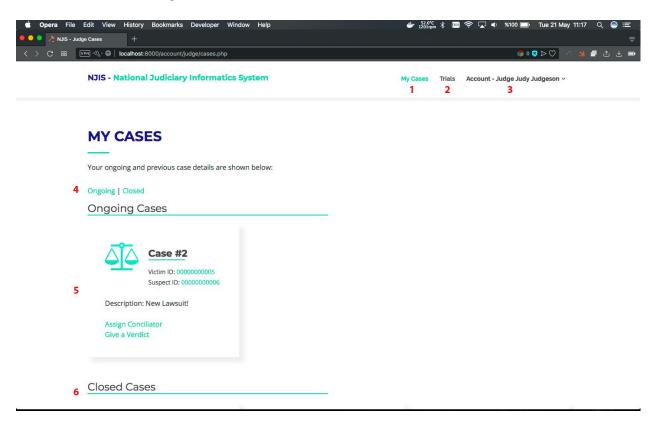
# 6.5.2 Request Lawsuit



This is the 'Request Lawsuit' page. Citizens can request a lawsuit to be filed by a randomly assigned lawyer. When the form is submitted, the request can be seen by the assigned lawyer at his/her 'Possible Cases' page. If the citizen wants their own lawyer for the lawsuit instead of a randomly assigned lawyer, they have to contact their lawyer to file a lawsuit on their behalf instead of using this page.

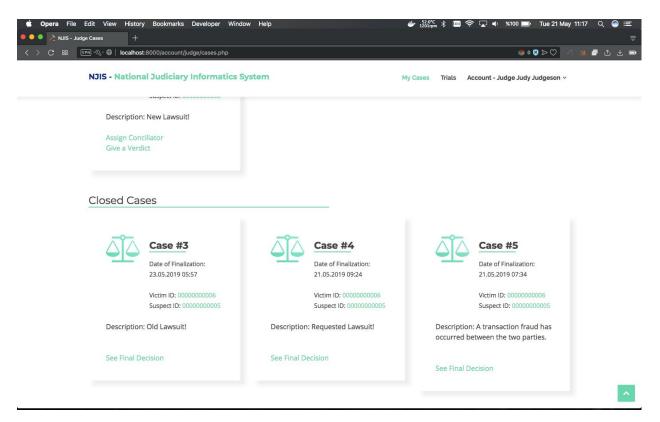
# 6.6 JUDGE

# 6.6.1 My Cases



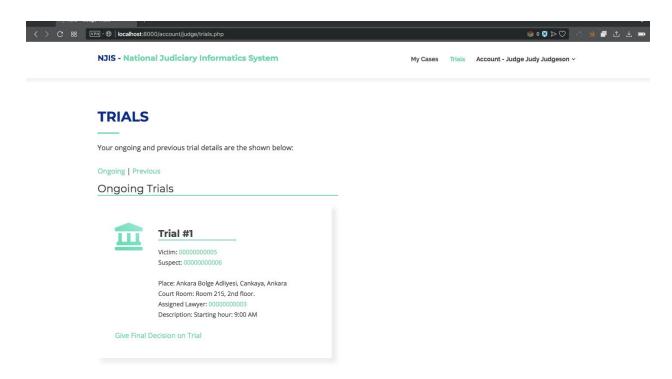
This is the 'My Cases' page where judges can see ongoing cases and get specific information about those cases. The page elements are:

- **1.** Link to the current page.
- **2.** Link to the 'Trials' page.
- 3. Link to Account Operations. These operations are: 'Manage Account' and 'Logout'.
- 4. Buttons to select between ongoing and previous(closed) cases.
- **5.** The list of ongoing cases. For each case, the user(judge) can assign conciliator if needed by using the button, can give a final verdict for the case again with the following button and can click on the case number to view case details like statements, conciliator name, trial dates, etc.
- **6.** The list of closed cases. You can basically observe date of finalization and observe related information.



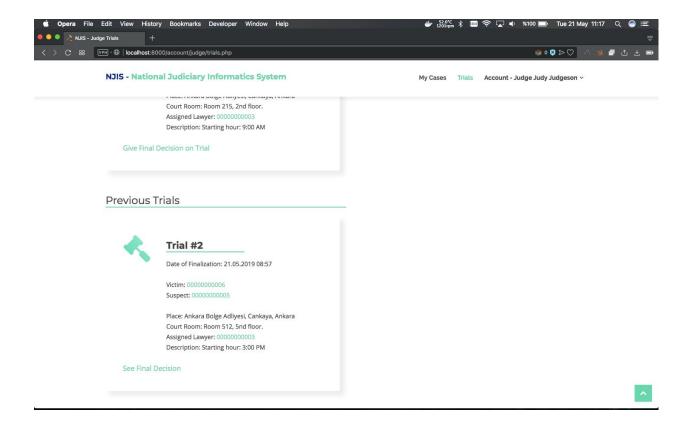
The list of closed cases. You can basically observe date of finalization and observe related information.

#### 6.6.2 Trials



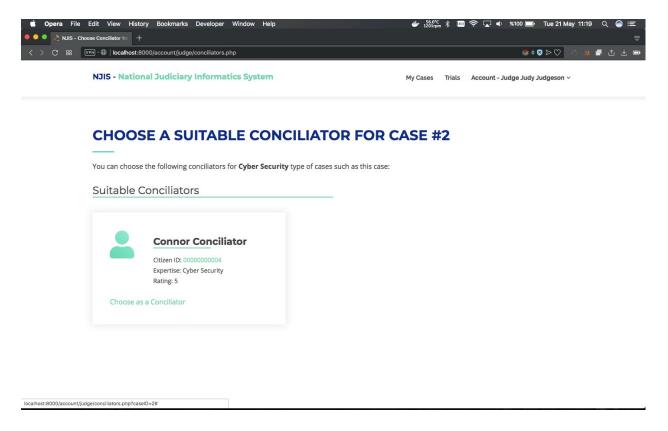
This is the 'Trials' page where judges can see ongoing trials and get specific information about them. The page elements are:

- Buttons to select between ongoing and previous(closed) trials.
- The list of ongoing trials. For each trial, the user(judge) can view the
  courtroom of the trial by using the button, can give a final verdict for
  the trial and click on the trial number to view case details like sides,
  statements, trial dates, etc.



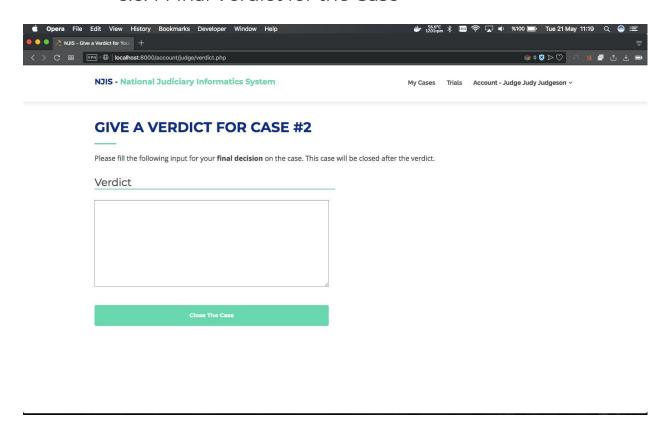
The list of completed trials. You can basically observe date of finalization and observe related information.

# 6.6.3 Assigning Conciliator



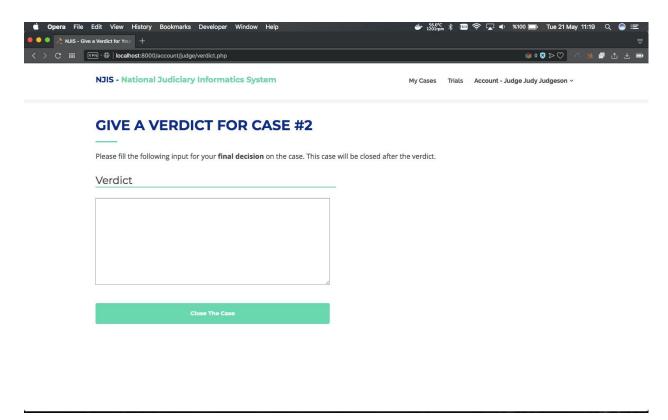
This is page to assign conciliator to the requested case. The judge can observe and check list of available and suitable conciliators and can choose one amongst them. For each conciliator, judge can observe the id of the conciliator, the expertise and the success rating of the conciliator.

# 6.6.4 Final Verdict for the Case



The judge can submit his/her final decision for the selected case in here.

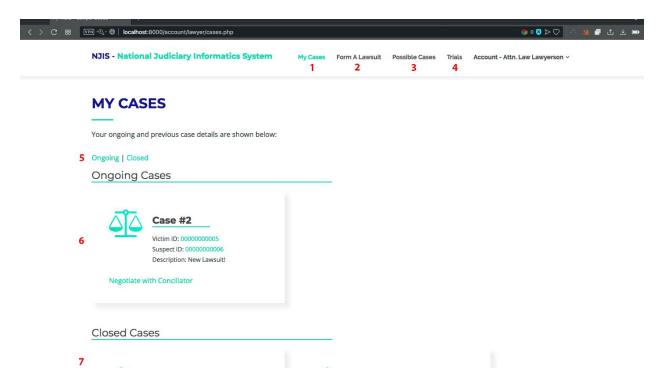
# 6.6.5 Final Verdict for the Trial



The judge can submit his/her final decision for the selected trial in here.

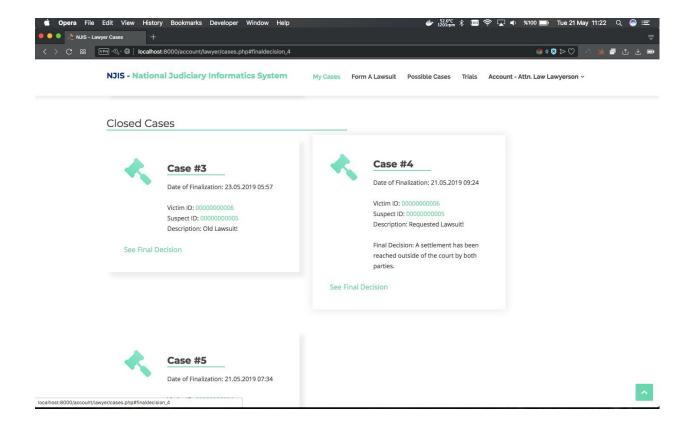
#### 6.7 LAWYER

# 6.7.1 My Cases



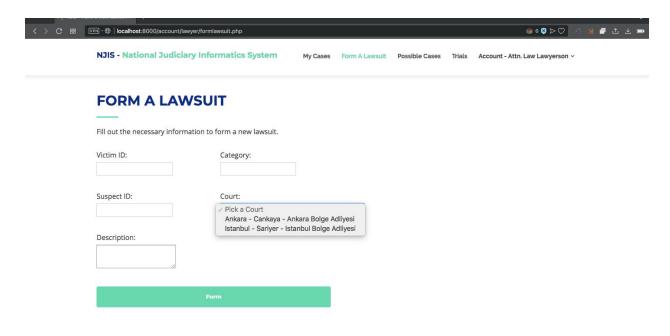
This is the 'My Cases' page where lawyers can see ongoing cases and get specific information about those cases. The page elements are:

- **1.** Link to the current page.
- **2.** Link to the 'Form a Lawsuit' page.
- 3. Link to the 'Possible Cases' page.
- **4.** Link to the 'Trials' page.
- 5. Buttons to select between ongoing and previous(closed) cases.
- **6.** The list of ongoing cases. For each case, the user(lawyer) can negotiate with the conciliator(if it is assigned) by using the button and can click on the case number to view case details like statements, conciliator name, trial dates, etc.
- **7.** The list of closed cases. You can basically observe the former client, date of finalization and observe related information.



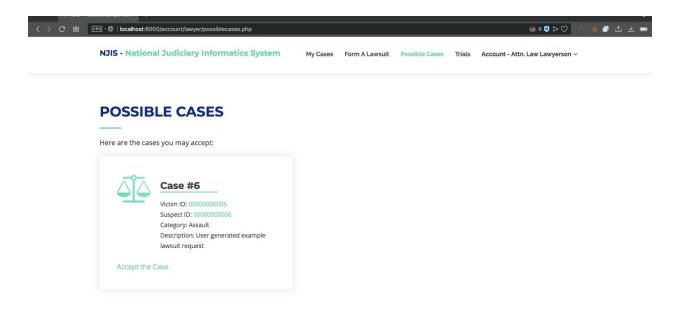
The list of closed cases. You can basically observe the former client, date of finalization and observe related information.

#### 6.7.2 File a Lawsuit



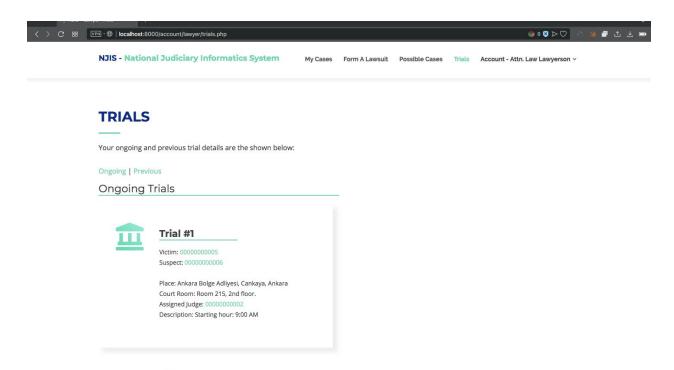
This is a page to form a lawsuit by the lawyer. Lawyer can form a lawsuit if there is such request. The lawyer should fill the necessary informations such as the victim side, suspect side, category, detailed description of the lawsuit and the requested court house in order to form a valid lawsuit by the system.

#### 6.7.3 Possible Cases



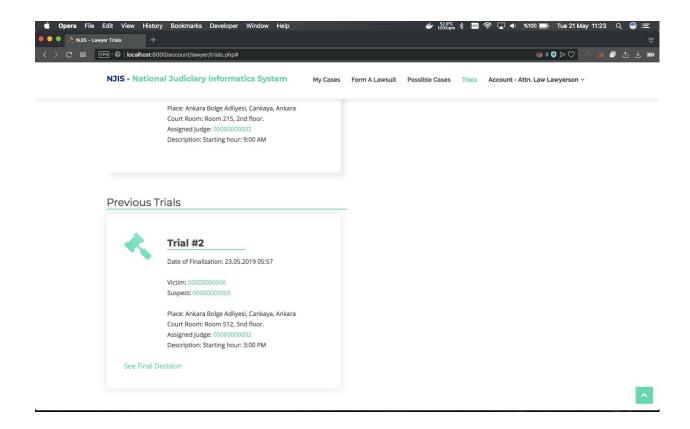
This is a page that basically the lawyer can observe the requested cases by the user. Since users cannot form a lawsuit directly, they need a lawyer to open a case. In this page lawyer can accept the case if s/he is interested.

#### 6.7.4 Trials



This is the 'Trials' page where lawyers can see ongoing trials and get specific information about them. The page elements are:

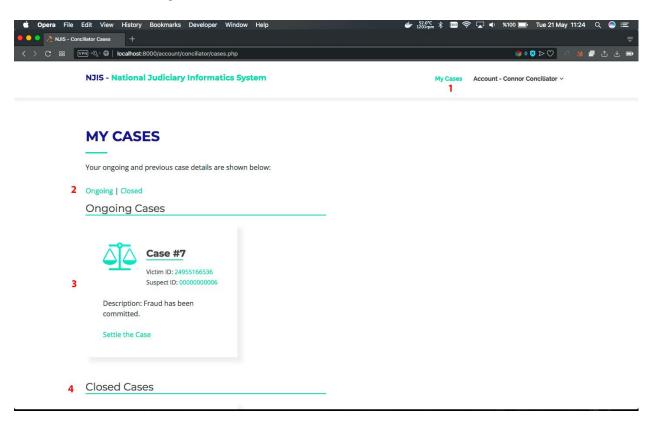
- Buttons to select between ongoing and previous(closed) cases.
- The list of ongoing trials. For each trial, the user(lawyer) can view the
  courtroom of the trial by using the button, can see the final verdict of
  the trial (if it is concluded) and can click on the trial number to view
  case details like sides, statements, trial dates, etc.



The list of completed trials. You can basically observe date of finalization and observe related information.

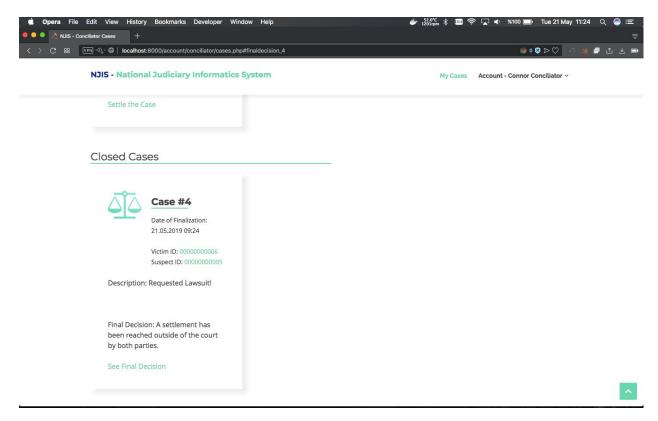
# 6.8 CONCILIATOR

# 6.8.1 My Cases



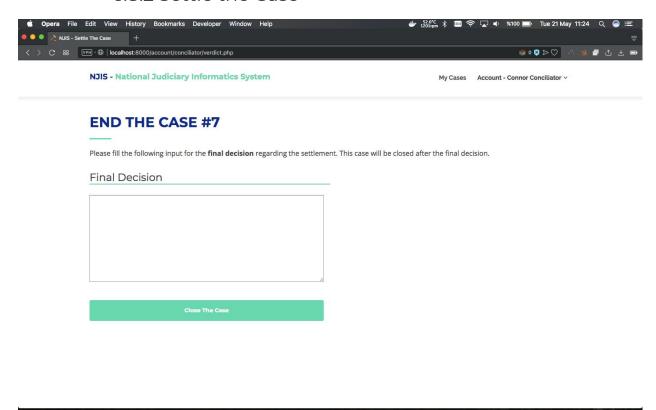
This is the 'My Cases' page where conciliator can see ongoing cases and get specific information about those cases. The page elements are:

- 1. Link to current page.
- 2. Buttons to select between ongoing and previous(closed) trials.
- **3.** The list of ongoing cases. The conciliator can see the details for each case, and use the 'Settle the Case' button to provide his final decision and settle the case.
- **4.** The list of closed cases. The conciliator can see details of his previous cases here.



The list of closed cases. The conciliator can see details of his previous cases here.

#### 6.8.2 Settle the Case



At this page, the conciliator can give his final decision about the reconciliation case. After the conciliator's final decision, the case can be seen by the judge as finished conciliation and the judge can accept or refuse the conciliator's decision.