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# PROJECT 1 REPORT

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Project 1 CS505 spring 2017



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## **Part I: Description of Requirement**

### **1.1 The objective of the project**

This project is aiming at implementing the process of separating two sides in a large legal office. The legal office adopts Chinese Wall security policy trying to establish standards of professional conduct for lawyers and maintain the secure privacy of company documents and data.

In the simplified system of litigations, the legal office has a fiduciary obligation to its customers. To act in the best interest of their clients, the legal offices responsibilities should cover both the ethical and the legal parts. The standards also require an information protection officer(IPO) to avoid breach of privacy and safety of its customers and ensure the professional and integral behavior of lawyers.

### **1.2 Conflicts of interests at assigning the lawyers**

First strict care needs to be taken is to ensure that there are no conflicts of interest arising between the lawyers and companies. The highest level of trust and confidence must exist between an attorney and its clients. The lawyers cannot profit from or take advantage of his/her early experience and old cases of that company. Also the lawyer, who has the legal responsibility for managing and handling the issues of his/her clients, must act with complete fairness, loyalty and fidelity in each representation of and dealing with clients. Thus, it is considered as inappropriate for a lawyer to defend against a company which has been represented by her/him before. The unfairness may come from, lawyers previous background, experience and familiarity with the client and the documents and secret of the clients which the lawyer may have accessed and read. It is reasonably likely that a material violation could occur.

In our case, this circumstance of violation will be prohibited by the IPO of the legal office. He or She is obligated to assign the qualified lawyer to the appropriate cases, while keeping the confidentiality of the documents of clients. The qualified lawyer on a case could only be the one who never been previously representing that company which is being the adversary now. To prevent the conflicts of interests from occurring, at the time of assigning the lawyer to each individual case, the DBMS will notify the IPO if the lawyer fails to meet the criteria at the time of assigning. Unless the IPO designate the qualified lawyer for the case, the system would not set up the case in the database system.

### **1.3 Conflicts of interests at accessing documents of clients**

Second part is about the appropriate management and control of client files. A lawyer would have the access to the documents of the client company at the time when he or she is representing. And clients have to reasonably believe that the legal office will provide enough protection of the confidential information and documents that would embarrass them or get them in legal trouble if public. The documents of past legal cases may contain valuable information affecting the current ones, especially the documents is stored in the legal office whose lawyer is now again a client whose have been represented by the same legal office before. It is the lawyers duty and professional performance to protect the interests of the clients.

The proposed rule of lawyer conduct in this project is that the lawyer on behalf of his/her clients could not engage in any activity that might access the confidential information and documents of his/her opponents from the legal office itself. The system of legal office will prohibit the conflict of interests by not allowing the lawyer to read the old documents on his/her adversary in the filing system. And the database system will take all the action to notify the event in the logbook if the lawyer attempts to the documents. The ipo will be aware of the violation.

### **1.4 Conflicts of interests in communication between lawyers**

The last rule is about the communication between the members in the legal office, the behavior conducting of a lawyer. The public believes that lawyers should not be believed, fickle and motivated by self-interest. The attorney has the duty to preserve the privacy and integrity of the file of the clients

and not disclose any copies of the document to others without the permission of the clients. The information is a valuable commodity in the court. The colleagues in the same office probably create materials or have a copy of the documents of the opponents. But the lawyer should not contact his/her lawyer fellows about the adversary and the possible information. Making a profit from a colleague by stealing information will introduce unfairness and bias at the court. The benefits of the old clients will be compromised if the documents was being accessed by other lawyers to defend against. Contacting those lawyers who have managed the documents of the opponent company is considered as a breach the fiduciary duty under this circumstance.

Thus, in this project, the database system will impose limitations on the communication between the members in the legal office. On behalf of the clients, the documents and information owned by that clients should be preserved securely. If a lawyer tries to approach his or her colleagues who probably have information about his opponents, this kind of attempts will be prevented by the system. Meanwhile, all the unprofessional behavior of lawyers will be kept in the log book, which the ipo has the authority to read.

## Part II: Description of Programs

In this project, we use PHP to connect and query the database and the interface for users are designed by using HTML.

### 2.1 Design of database

First, we create the database called legal\_office. In our database, we have four tables together with their relations are shown in Figure1.

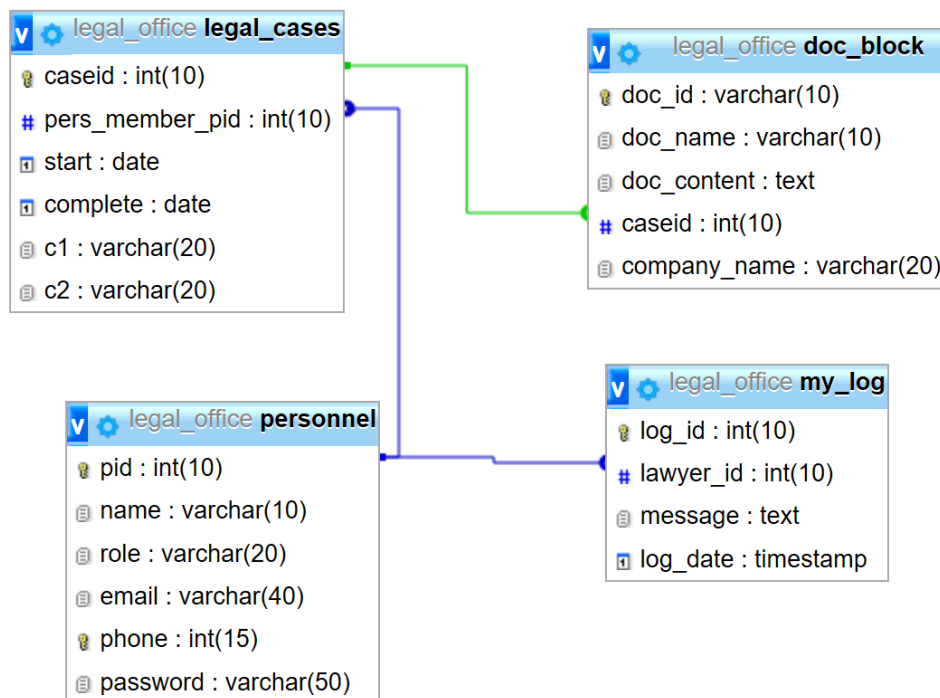


Fig. 1: Legal\_office database and its relational schema

To give more details about our database, we will describe the tables we have created:

1) personnel: It stores the personal information of the lawyers and also of Information Protection Officer. In this table, we set **pid** as the primary key and we have two roles, namely lawyer and ipo.

| Column   | Type        | Attributes | Null | Default |
|----------|-------------|------------|------|---------|
| pid      | int(10)     |            | No   |         |
| name     | varchar(10) |            | No   |         |
| role     | varchar(20) |            | Yes  | NULL    |
| email    | varchar(40) |            | Yes  | NULL    |
| phone    | int(15)     |            | Yes  | NULL    |
| password | varchar(50) |            | No   |         |

TABLE I: personnel table definition

2) legal\_cases: It stores the past and current cases of this law office. For this table, **caseid** is the primary key with **pers\_member\_pid** defined as foreign key which links to the **pid** in personnel table. For each case, we have **c1** denoting the company that the office is supporting or have supported before and **c2** denoting the company that the office is against. The complete time can be NULL as for new cases or ongoing cases the complete time has not been set yet.

| Column          | Type        | Attributes | Null | Default | Extra | Links to  |
|-----------------|-------------|------------|------|---------|-------|---|
| caseid          | int(10)     |            | No   |         |       |   |
| pers_member_pid | int(10)     |            | Yes  | NULL    |       | → personnel.pid<br>ON UPDATE RESTRICT<br>ON DELETE RESTRICT |
| start           | date        |            | No   |         |       |   |
| complete        | date        |            | Yes  | Null    |       |   |
| c1              | varchar(20) |            | No   |         |       |   |
| c2              | varchar(20) |            | No   |         |       |   |

TABLE II: legal\_cases table definition

3) doc\_block: We store the documents of companies that have been represented by this law office. The documents are pertained to cases as we only collect documents when the office supports that particular company. In this table, we set **doc\_id** as primary case and **caseid** is the foreign key linking to **caseid** field in table of legal\_cases. The **doc\_content** could be NULL.

| Column       | Type        | Attributes | Null | Default | Extra | Links to  |
|--------------|-------------|------------|------|---------|-------|---|
| doc_id       | varchar(10) |            | No   |         |       |   |
| doc_name     | varchar(10) |            | No   |         |       |   |
| doc_content  | text        |            | Yes  | NULL    |       |   |
| caseid       | text        |            | No   |         |       | → legal_cases.pid<br>ON UPDATE RESTRICT<br>ON DELETE RESTRICT |
| company_name | varchar(20) |            | No   |         |       |   |

TABLE III: doc\_block table definition

4) my\_log: This is for auditing purpose. The violation of Chinese Wall activity will be tracked and stored in this table so that the information protection officer can view this and find out potential attacks. We set **log\_id** as the primary key which has auto increment property. The **lawyer\_id** is linking to **pid** in table of personnel.

| Column    | Type      | Attributes | Null | Default          | Extra                         | Links to  |
|-----------|-----------|------------|------|------------------|-------------------------------|---|
| log_id    | int(10)   |            | No   |                  | auto_inrement                 |   |
| lawyer_id | int(10)   |            | No   |                  |                               | → personnel.pid<br>ON UPDATE RESTRICT<br>ON DELETE RESTRICT |
| message   | text      |            | No   |                  |                               |   |
| log_date  | timestamp |            | No   | CURREN_TIMESTAMP | on update<br>CURREN_TIMESTAMP |   |

TABLE IV: my\_log table definition

## 2.2 Design of webpage

Figure 2 presents the design of the website of our legal office.

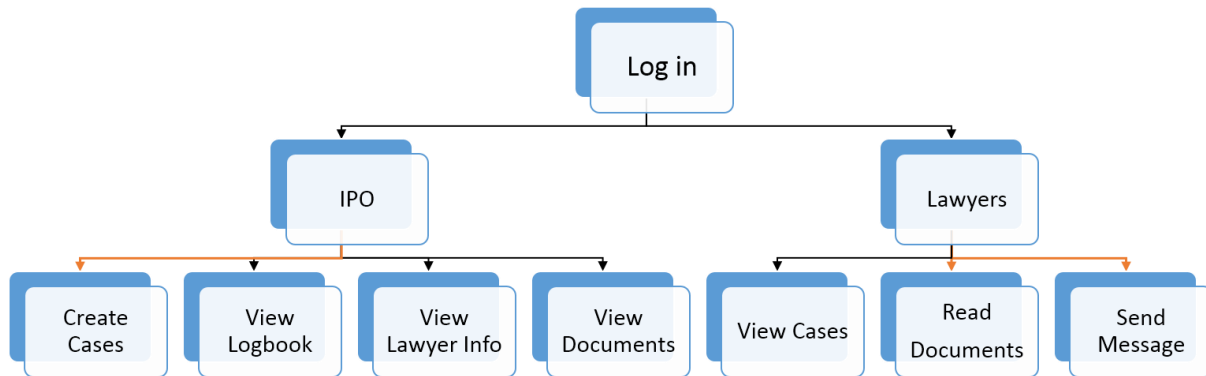


Fig. 2: The flowchart of the website design attorney.com

At login page, the IPO and lawyer are asked to enter their username and password. At login page the role based access control is implemented for the sake of integrity of the database. The lawyer and IPO will be leaded to different pages based on their roles.

### 2.2.1 The design of webpage for IPO

The IPO will go his/her menu page and has the authority to manage cases, view logbook and view all the lawyer information and documents.

For managing cases, the IPO could view all the information of cases list including the caseID, assigned lawyer, start date, complete date, representing company (C2), against company (C2). Meanwhile the IPO could create cases using a form below the cases list, entering the caseID, start date, company1 (representing), company2 (opposing). As for creating cases, the IPO should not involve the lawyer who have had access the document of his/her opponent in the past. If the lawyer is not qualified, the system will send a warning message to the IPO instantaneously and asking the IPO resign another lawyer.

If going into the page of view logs, the IPO will find out all the violation attempts by the lawyers. Specifically, trying to read the documents of his opponent in the database system or contacting the lawyers who have the information of his opponent will be recorded in the logbook. The IPO could read the information and ensure the professional integrity of all the lawyers in the office.

The IPO will also have the authority to read all the contact information of the lawyers and details of the documents of each company by clicking the corresponding link at the page.

### 2.2.2 The design of webpage for lawyer

For the lawyers, they are entitled to access the cases, read documents and send message to his colleagues.

By viewing the cases, the lawyer will find out the current and past cases under his or her name.

The “Chinese Wall” are implemented for lawyers under subjects of view documents and send messages. For viewing documents, the lawyers could only select and read the information of the company who is not against him at court currently. Under any circumstances if the lawyer intended to reach the documents which belongs his adversary, the logbook will notice and record the behavior.

The same rule holds when sending message between the colleagues of the legal office. The lawyers could communicate to others by sending the message, but only restrict to those who don’t have the possibilities of providing him/her the information of the adversary. Had the recipient have accessed or

managed the documents of the adversary, the lawyer will be prohibited from send the message. This kind of violation attempt also will be recorded in the logbook and viewed by the IPO.

## Part III: Program Functions

In this part, we will describe the detailed implementation and user interface of our system. We have three major parts which include user login/logout, office lawyers system and office administration system or IPO system.

### 3.1 Login and logout (index.php)

First of all, the user will get into our main page of the office. The user is supposed to login to see any information. Such as figure 3 shows.

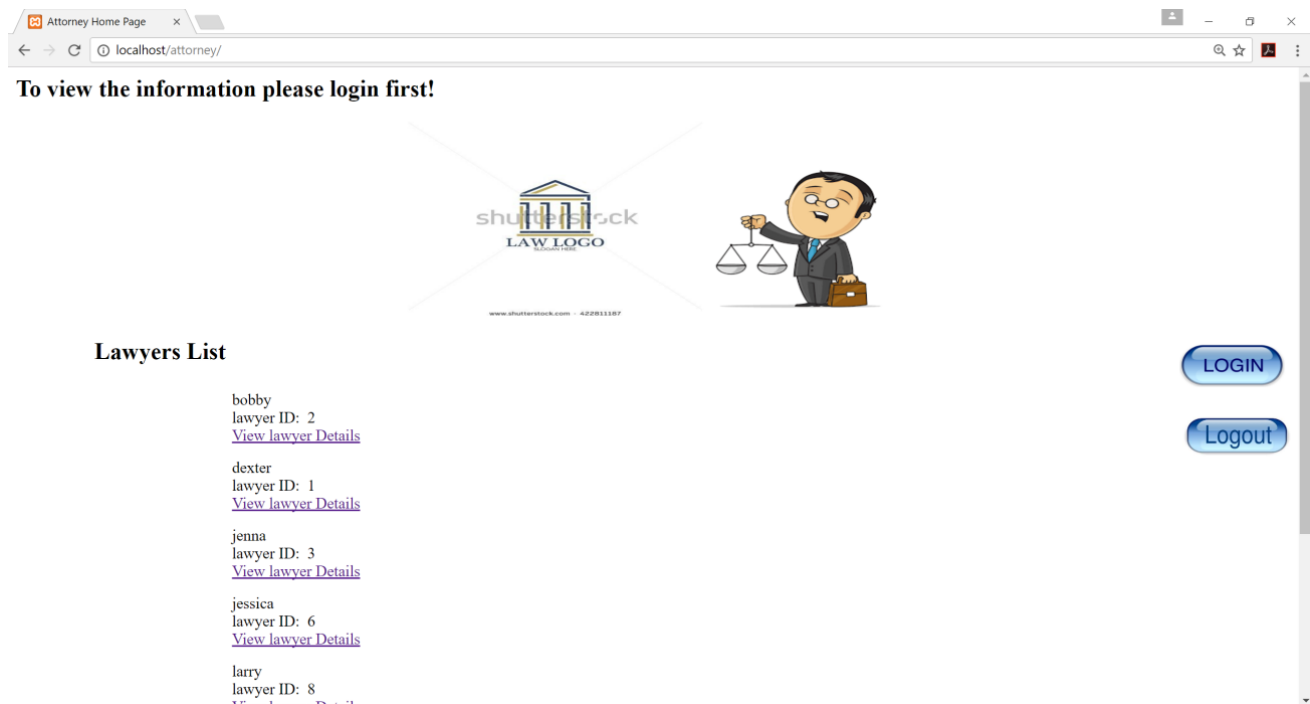


Fig. 3: The main page of the office

After pressing the Login button, the user comes to the log in page. Such as figure 4 shows.

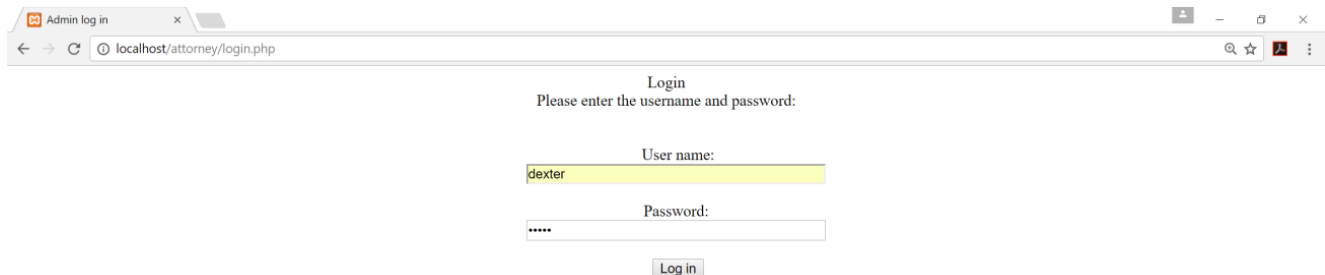


Fig. 4: The login page of our system

We will check the role of the user, and if the user is IPO then he/she will go to the office administration page, while for the ordinary lawyer will be redirected to the lawyer page. To achieve this, we connect the database and perform query on the table of personnel to check the username and password and also his/her role.

### 3.2 Lawyer (lawyer.php)

The lawyers are allowed to view cases, contact other lawyers and read documents of the companies.

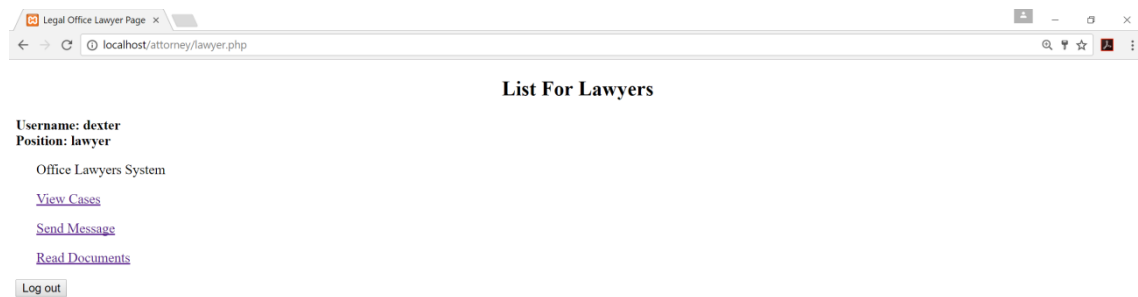


Fig. 5: The main menu for Lawyer.

#### 3.2.1 View Cases (lawyerCases.php)

We search into the table of legal\_cases and list all the past and current cases of the user.



Fig. 6: View current and past cases for lawyer.

#### 3.2.2 Send Message (view\_lawyer.php)

The lawyer is allowed to contact other lawyers that are not in the conflict of interests. This is implemented by searching into the table of legal\_cases to see if the lawyer that the current user wants to contact has supported the adversary of the current user. The user can contact the lawyer if this is not the case, otherwise we will inform IPO about the attempt which violates the Chinese Wall policy. An alter message will insert into table of my\_log.



Fig. 7: View Lawyer information and contact other lawyers.

### 3.2.3 Read documents (view\_document.php)

The lawyers are allowed to search and read documents of companies which he/she is not currently against to. Otherwise, any attempt to read documents of the adversary will be audited and an alter message will get inserted into table of my\_log.

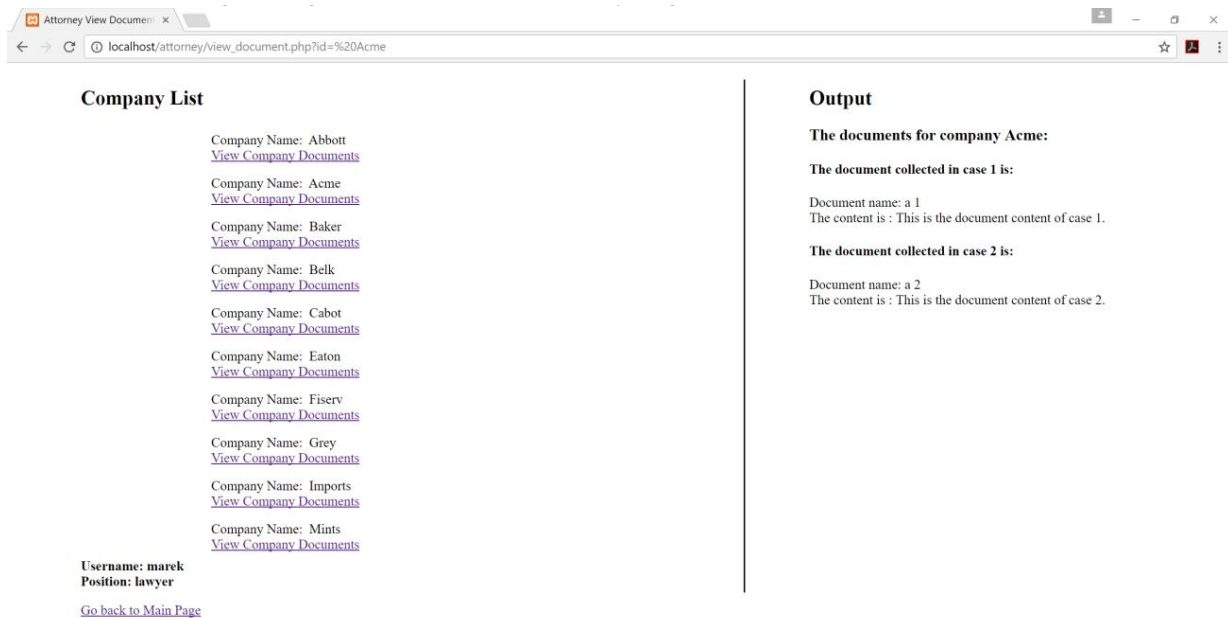


Fig. 8: read documents of companies.

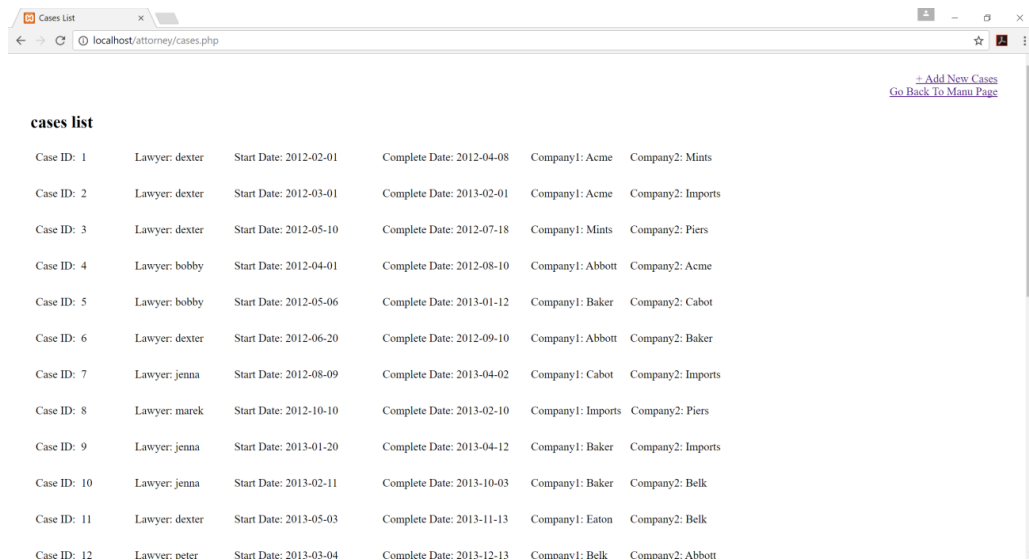


### 3.3 Information Protection Officer (admin.php)

Different from the ordinary lawyers, the IPO cannot be assigned any cases, instead he has the rights to create new case and assign new case to lawyer. Also, he can view the logs of all the violation alters of Chinese Wall policy. Besides, the IPO is also allowed to view documents and contact lawyers. We have made the simplification here and allow the IPO to view all the documents, which means that the IPO requires lots of trust.

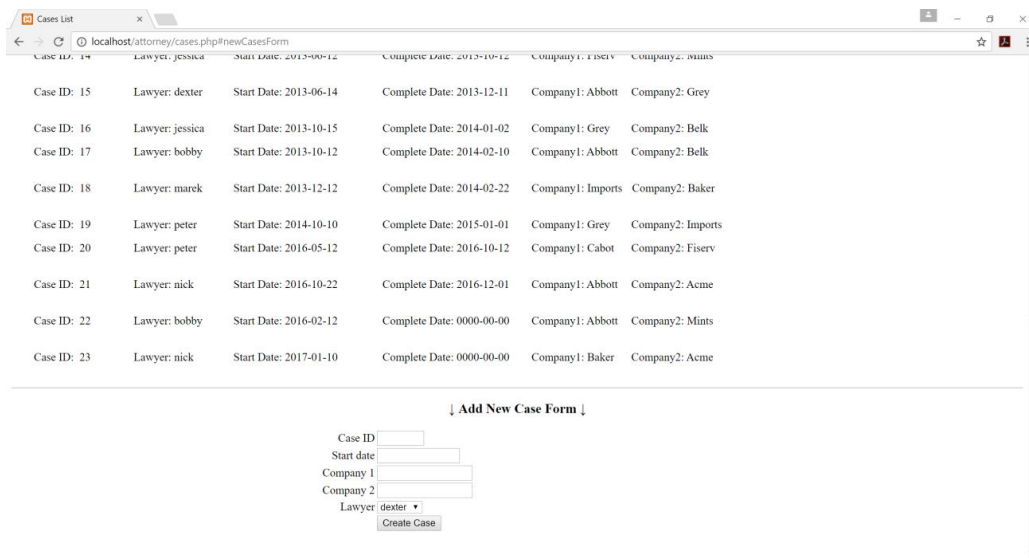
#### 3.3.1 Manage Cases (cases.php)

We search into the table of legal\_cases and list all the past and current cases of the office. In this page, the IPO can create new cases and also assign lawyer to the new case. We check if the selected lawyer is able to be assigned with the new case given the past and current cases he/she has defended.



|             |                |                        |                           |                   |                   |
|-------------|----------------|------------------------|---------------------------|-------------------|-------------------|
| Case ID: 1  | Lawyer: dexter | Start Date: 2012-02-01 | Complete Date: 2012-04-08 | Company1: Acme    | Company2: Mints   |
| Case ID: 2  | Lawyer: dexter | Start Date: 2012-03-01 | Complete Date: 2013-02-01 | Company1: Acme    | Company2: Imports |
| Case ID: 3  | Lawyer: dexter | Start Date: 2012-05-10 | Complete Date: 2012-07-18 | Company1: Mints   | Company2: Piers   |
| Case ID: 4  | Lawyer: bobby  | Start Date: 2012-04-01 | Complete Date: 2012-08-10 | Company1: Abbott  | Company2: Acme    |
| Case ID: 5  | Lawyer: bobby  | Start Date: 2012-05-06 | Complete Date: 2013-01-12 | Company1: Baker   | Company2: Cabot   |
| Case ID: 6  | Lawyer: dexter | Start Date: 2012-06-20 | Complete Date: 2012-09-10 | Company1: Abbott  | Company2: Baker   |
| Case ID: 7  | Lawyer: jenna  | Start Date: 2012-08-09 | Complete Date: 2013-04-02 | Company1: Cabot   | Company2: Imports |
| Case ID: 8  | Lawyer: marek  | Start Date: 2012-10-10 | Complete Date: 2013-02-10 | Company1: Imports | Company2: Piers   |
| Case ID: 9  | Lawyer: jenna  | Start Date: 2013-01-20 | Complete Date: 2013-04-12 | Company1: Baker   | Company2: Imports |
| Case ID: 10 | Lawyer: jenna  | Start Date: 2013-02-11 | Complete Date: 2013-10-03 | Company1: Baker   | Company2: Belk    |
| Case ID: 11 | Lawyer: dexter | Start Date: 2013-05-03 | Complete Date: 2013-11-13 | Company1: Eaton   | Company2: Belk    |
| Case ID: 12 | Lawyer: peter  | Start Date: 2013-03-04 | Complete Date: 2013-12-13 | Company1: Belk    | Company2: Abbott  |

Fig. 9: The page for ipo to view case list.



|             |                 |                        |                           |                   |                   |
|-------------|-----------------|------------------------|---------------------------|-------------------|-------------------|
| Case ID: 15 | Lawyer: dexter  | Start Date: 2013-06-14 | Complete Date: 2013-12-11 | Company1: Abbott  | Company2: Grey    |
| Case ID: 16 | Lawyer: jessica | Start Date: 2013-10-15 | Complete Date: 2014-01-02 | Company1: Grey    | Company2: Belk    |
| Case ID: 17 | Lawyer: bobby   | Start Date: 2013-10-12 | Complete Date: 2014-02-10 | Company1: Abbott  | Company2: Belk    |
| Case ID: 18 | Lawyer: marek   | Start Date: 2013-12-12 | Complete Date: 2014-02-22 | Company1: Imports | Company2: Baker   |
| Case ID: 19 | Lawyer: peter   | Start Date: 2014-10-10 | Complete Date: 2015-01-01 | Company1: Grey    | Company2: Imports |
| Case ID: 20 | Lawyer: peter   | Start Date: 2016-05-12 | Complete Date: 2016-10-12 | Company1: Cabot   | Company2: Fiserv  |
| Case ID: 21 | Lawyer: nick    | Start Date: 2016-10-22 | Complete Date: 2016-12-01 | Company1: Abbott  | Company2: Acme    |
| Case ID: 22 | Lawyer: bobby   | Start Date: 2016-02-12 | Complete Date: 0000-00-00 | Company1: Abbott  | Company2: Mints   |
| Case ID: 23 | Lawyer: nick    | Start Date: 2017-01-10 | Complete Date: 0000-00-00 | Company1: Baker   | Company2: Acme    |

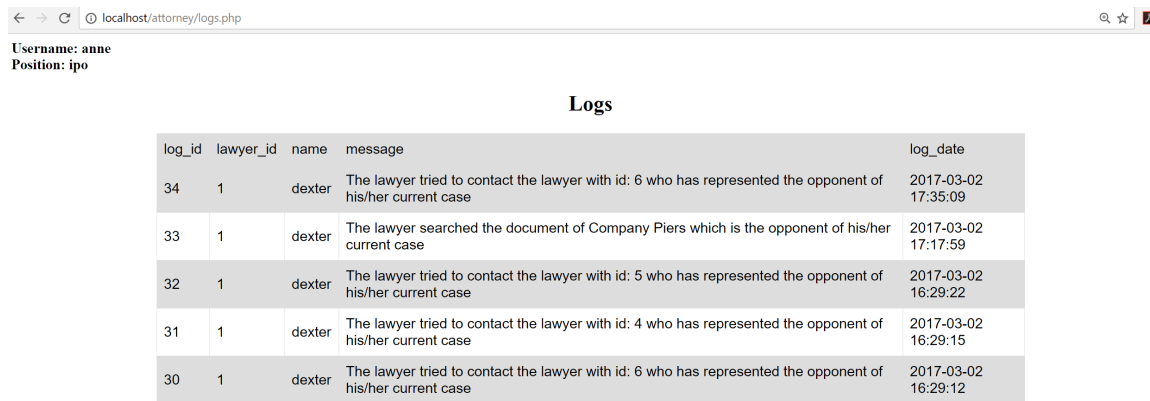
↓ Add New Case Form ↓

Case ID:   
Start date:   
Company 1:   
Company 2:   
Lawyer:

Fig. 10: The page for ipo to create cases.

### 3.3.2 View Log (logs.php)

For auditing purpose, we provide the ipo all the alter information about violation of Chinese Wall policy, including the attempt of searching and reading documents and also contacting lawyers that are in conflict of interest.



| log_id | lawyer_id | name   | message  | log_date            |
|--------|-----------|--------|--|---------------------|
| 34     | 1         | dexter | The lawyer tried to contact the lawyer with id: 6 who has represented the opponent of his/her current case | 2017-03-02 17:35:09 |
| 33     | 1         | dexter | The lawyer searched the document of Company Piers which is the opponent of his/her current case            | 2017-03-02 17:17:59 |
| 32     | 1         | dexter | The lawyer tried to contact the lawyer with id: 5 who has represented the opponent of his/her current case | 2017-03-02 16:29:22 |
| 31     | 1         | dexter | The lawyer tried to contact the lawyer with id: 4 who has represented the opponent of his/her current case | 2017-03-02 16:29:15 |
| 30     | 1         | dexter | The lawyer tried to contact the lawyer with id: 6 who has represented the opponent of his/her current case | 2017-03-02 16:29:12 |

Fig. 11: ipo:view Log/alter

## Part IV: Testing

To validate that the database system could appropriately perform the process enforced by Chinese Wall policy and separate two sides in the large legal office as described in part I, in this part we will test our system with several cases.

### 4.1 Lawyer

The security policy for lawyer is that the lawyer on behalf of his/her clients could not get engaged in any activity that might access the confidential information and documents of his/her opponents from the database or the colleagues of legal office.

#### 4.1.1 Read documents

The system of legal office will prohibit the conflict of interests by not allowing the lawyer to read the old documents of his/her adversary in the filing system.

For example, **dexter** as lawyer is now undertaking a case of company **Mints** against **Piers**, as shown in Figure 12.

Username: dexter  
Position: lawyer

### cases list

|             |                |                        |                           |                  |                   |
|-------------|----------------|------------------------|---------------------------|------------------|-------------------|
| Case ID: 1  | Lawyer: dexter | Start Date: 2012-02-01 | Complete Date: 2012-04-08 | Company1: Acme   | Company2: Mints   |
| Case ID: 2  | Lawyer: dexter | Start Date: 2012-03-01 | Complete Date: 2013-02-01 | Company1: Acme   | Company2: Imports |
| Case ID: 3  | Lawyer: dexter | Start Date: 2012-05-10 | Complete Date: 2012-07-18 | Company1: Mints  | Company2: Piers   |
| Case ID: 6  | Lawyer: dexter | Start Date: 2012-06-20 | Complete Date: 2012-09-10 | Company1: Abbott | Company2: Baker   |
| Case ID: 11 | Lawyer: dexter | Start Date: 2013-05-03 | Complete Date: 2013-11-13 | Company1: Eaton  | Company2: Belk    |
| Case ID: 15 | Lawyer: dexter | Start Date: 2013-06-14 | Complete Date: 2013-12-11 | Company1: Abbott | Company2: Grey    |
| Case ID: 30 | Lawyer: dexter | Start Date: 2016-12-01 | Complete Date:            | Company1: Mints  | Company2: Piers   |
| Case ID: 36 | Lawyer: dexter | Start Date: 2017-02-02 | Complete Date:            | Company1: Acme   | Company2: Grey    |

Fig. 12: The cases of dexter.

We will prohibit lawyer **dexter** from reading the documents of company **Piers** whose documents block is actually available in the offices document database. Therefore when dexter tries to click the documents of **Piers** on the website, the documents wont be accessible, and also a system warning will be displayed, as shown in Figure 13.

## Output

You cannot access the document of Company Piers because of conflict of interest

Fig. 13: Warning of reading documents.

Meanwhile logbook will record his behavior. The ipo will be aware of the violation of that lawyer, as shown in Figure 14.

### Logs

| log_id | lawyer_id | name   | message   | log_date            |
|--------|-----------|--------|---|---------------------|
| 33     | 1         | dexter | The lawyer searched the document of Company Piers which is the opponent of his/her current case | 2017-03-02 17:17:59 |

Fig. 14: The alert is inserted into logs and provided to ipo.

Normally, he can view the documents that have nothing conflict with him currently, as shown in Figure 15.

# Output

## The documents for company Acme:

### The document collected in case 1 is:

Document name: a 1

The content is : This is the document content of case 1.

### The document collected in case 2 is:

Document name: a 2

The content is : This is the document content of case 2.

Fig. 15: The documents of Company Acme which dexter is allowed to read.

#### 4.1.2 Contact other lawyers

Our system will impose limitations on the communication between the members in the legal office.

For example, again for lawyer **dexter** he is not allowed to contact the lawyer **jessica**, since **jessica** is currently defending the company **Piers**. In this case, this attempt of communication will be denied and audited, as shown in Figure 16 and Figure 17.

Failed! Violation of Chinese Wall! You cannot contact this lawyer!

Fig. 16: Warning of invalid communication.

#### Logs

| log_id | lawyer_id | name   | message  | log_date            |
|--------|-----------|--------|--|---------------------|
| 34     | 1         | dexter | The lawyer tried to contact the lawyer with id: 6 who has represented the opponent of his/her current case | 2017-03-02 17:35:09 |

Fig. 17: The alter is inserted into the log and provided to ipo about the invalid contact attempt between lawyers.

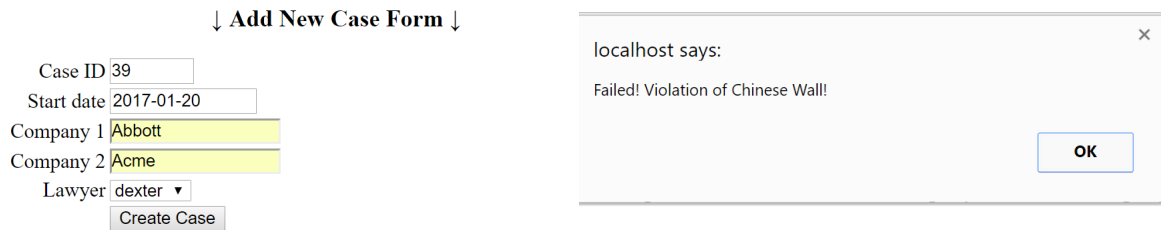
## 4.2 IPO

The Information Protection Officer (IPO) of the legal office ensure that there is no conflicts of interest arising between the lawyers and the companies. The highest level of trust and confidence must be established between an attorney and his client. The lawyers cannot profit from or take advantages of his/her early experience and old cases of that company.

#### 4.2.1 Create a new case and assign lawyers

IPO is obligated to assign the qualified lawyer to the appropriate cases while keeping the confidentiality of the documents of clients. The qualified lawyer of a case could only be the one who never been previously representing that company which is being the adversary now.

Again, we take **dexter** for an example, if in a new case the IPO tried to assign **dexter** to defend against a company **Acme** which has been represented by him in the past, the system will warn the IPO that the current case setting violates the Chinese Wall and ask the IPO to assign another lawyer to the new case. The output is demonstrated in Figure 18.



The image shows a web form titled "↓ Add New Case Form ↓" and a modal dialog box. The form contains the following fields: "Case ID" with value "39", "Start date" with value "2017-01-20", "Company 1" with a dropdown menu showing "Abbott", "Company 2" with a dropdown menu showing "Acme", and "Lawyer" with a dropdown menu showing "dexter". There is a "Create Case" button at the bottom of the form. The modal dialog box has a title bar with a close button (X). The text inside the dialog reads "localhost says:" followed by "Failed! Violation of Chinese Wall!". There is an "OK" button at the bottom right of the dialog.

Fig. 18: Test for creating and assigning a new case to a lawyer.

## Part V: Conclusion

In this project, we build up a simplified lawyer office system and enforce a security model based on Chinese Wall policy. This policy is used in conflict of interests situations. In our system, we control the access of lawyers to documents and their communications through this system. Any violation of the policy will be informed to IPO. Also, when IPO create new case and assign lawyers, the policy is enforced.