**CMPUT 391 Project Report**

**Radiology Information System(RIS)**

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**Basic Idea for the project:**

**Our goal is to implement a stable and useful radiology information system which can satisfy the basic use of a clinic or a hospital.**

**The user is consisted of 4 roles which are administrator, doctor, radiologist and patient. The following content is a brief explanation of the structures and the SQLs contained.**

**\*Login Module**

This module will be used by all users to login to the system with proper privileges, and to modify their personal information and/or the password.

**.jsp files contained:**

**oracleLogin.jsp**

This is the .jsp file for a user to login the oracle database first.

**login.jsp**

This is the jsp file for a user to login the RIS.

**"select password from users where user\_name = '"+userName+"'"**

This query will select the password by a given username from the table users for checking whether it is a valid combination of username and password.

**"select class from users where user\_name = '"+userName+"'"**

This query will select the user’s class, and return a value among admin, radiologist, doctor and patient. The returned value will decide the next page the user could enter in.

**\*User management module**

This module allows a system administrator to manage (to enter or update) the user information, i.e., the information stored in tables

**.jsp files contained:**

**newPerson.jsp**

This is the .jsp file for creating a new person who is not in our database previously.

**“insert into persons (person\_id,first\_name,last\_name,address,email,phone”**

This query is for creating a new person who is not in our database previously by inserting the person’s information to the database.

**newUser.jsp**

This is the .jsp file for creating a new user who is not in our database previously.

**"INSERT INTO USERS (user\_name, password, class, person\_id, date\_registered"**

This query is for registration by inserting the user’s information to the database .

**UpdateUser.jsp**

This is the .jsp file allows the administrator to modify one’s personal information.

**select \* from persons where person\_id = '"+personid+"'**

This query is for selecting a user’s information in the database.

**select distinct doctor\_id from family\_doctor where patient\_id = '"+personid+"'**

This query is for selecting all the doctors’ ID of a given patient in the database.

**select distinct patient\_id from family\_doctor where doctor\_id = '"+personid+"'**

This query is for selecting all the patients’ ID of a given doctor in the database.

**finishUpdateUser.jsp**

This is the last step of updating information for a user.

**"select class from users where person\_id = "+personID+" and user\_name <> '"+userName+"'"**

This query is helping us check if one has two user accounts with a same class.

**"UPDATE persons SET first\_name = ?, last\_name = ?, address = ?, email = ?, phone = ? where " +"person\_id = "+personID+""**

This query is helping us to update a person’s information we get from the user input on the website.

**"UPDATE users SET password = ?, class = ? where " +"person\_id = "+personID+" AND user\_name = '"+userNameB+"'"**

**"UPDATE users SET user\_name = ?, password = ?, class = ? where " +"person\_id = "+personID+" AND user\_name = '"+userNameB+"'"**

These two queries are for updating information for a user. In our system, the change of username is accepted.

**\*Uploading module**

This module will be used by radiologists to first enter a radiology record, and then to upload medical images into the radiology record.

**.jsp files contained:**

In this part we build the relation between an image with its corresponding record (create a new record first if there is no such a corresponding record)

**uploadRecord.jsp**

This .jsp file is to show the records.

**insertRecord.jsp**

**"INSERT INTO radiology\_record (record\_id,patient\_id,doctor\_id,radiologist\_id,test\_type,prescribing\_date,test\_date,diagnosis,description)"**

This query is to create a new radiology\_record and store it into the database.

**getImage.jsp**

**"INSERT INTO pacs\_images VALUE "SELECT \* FROM pacs\_images WHERE record\_id="+rec\_id+" AND image\_id="+pic\_id+" FOR UPDATE"**

This query is building the relation between an image with its corresponding record.

**\*Report generating module**

.jsp files contained:

**reportGenerating.jsp**

**"select p.person\_id,min(rr.test\_date), rr.diagnosis from persons p, radiology\_record rr " +"where p.person\_id = rr.patient\_id and rr.diagnosis = '"+diagnosis+"' and rr.test\_date between '"+From+"' and '"+To+"' " +"group by p.person\_id, rr.diagnosis"**

This is the query helping an administrator to get the list of all patients with a specified diagnosis for a given time period.

**\*Search module**

This module will be used by all the registered users to search the database for a list of relevant radiology records and to view medical images with the zoom-in facility.

.jsp files contained:

**"SELECT distinct record\_id,patient\_id,doctor\_id,radiologist\_id,test\_type,P\_date,t\_date,diagnosis, description, Rank FROM resultSet "+"where t\_date between '"+From+"' and '"+To+"' order by Rank desc"**

This query is for showing the result of search by a admin.

Also, the queries for doctors, patients and radiologists are similar to this one.

**"SELECT distinct score(1), person\_id, full\_name FROM fullname WHERE contains(full\_name, ?, 1) > 0 order by score(1) desc"**

This is the query for search results by keyword of type of "full name". Also, the queries searching by "diagnosis" and "description" are similar to this one.

**"CREATE TABLE resultSet (record\_id varchar(48),patient\_id varchar(48),doctor\_id varchar(48),"+"radiologist\_id varchar(48),test\_type varchar(48),P\_date date, t\_date date,"+"diagnosis varchar(128), description varchar(1024),Rank int)"**

This query is putting all searched result into a new table called resultSet. Then when we need to show the search result, we only need to select \* from this table.

**"SELECT distinct record\_id,patient\_id,doctor\_id,radiologist\_id,test\_type,P\_date,t\_date,diagnosis, description, Rank FROM resultSet "+"where t\_date between '"+From+"' and '"+To+"' order by Rank desc"**

This query is for an admin to show all the result. Queries for other roles are similar.

**\*Data analysis module**

This module will be used by the system administrator (i.e., a user named "admin") to

generate and display an OLAP report for data analysis.

**.jsp files contained:**

dataAnalysis.jsp

The start page of data analysis.

dataAnalysis1GetType.jsp

This is the page for making sure the analysis type.

dataAnalysis2GetResult.jsp

**"select p.first\_name,p.last\_name,count(\*) " +"from radiology\_record rr,persons p,pacs\_images pp where rr.patient\_id = p.person\_id and pp.record\_id = rr.record\_id " +"group by p.first\_name,p.last\_name " +"order by p.first\_name,p.last\_name,count(\*)";**

**There are 16 queries for different analysis requirements. This is a basically one which is "analysis by name".**

dataAnalysis3PrintResult.jsp

This is the page to display the analysis result.

**Additional:**

**Security:**

**There are also some security requirements for this project. For example, when I doctor choose to logout after view some records of his patients, when you click "back" , the website will not show the page of records since after the logout, the record are invisible since the lack of authorities.**