IPT B4 Assignment

Thomas Fraser | 12 Hamilton

Stages 1-3

Table of Contents

IPT B4 Assignment

Thomas Fraser | 12 Hamilton

Stages 1-3

Table of Contents

Stage 1 - Identification

Preamble

Solution

Stage 2 - Conceptualisation

Data Table Example

WireFrame UI Example

Example Data Table

Stage 3 - Formalisation

Elementary Facts

Data Dictionary

Conceptual Schema Diagram (CSD)

Optimal Normal Form CSD

Relational Schema Diagram

UI and Form Design

Stage 1 - Identification

Preamble

All too often do room changes at schools cause confusion and cause a waste of time for both staff and students. As the current system stands, there is no clear communication between students and staff relating room changes. Room changes are often never communicated to students. This project to be introduced aims to solve this problem with automation of the room change system and database controlled information.

Solution

The aforementioned project provides a solution to the problem of classroom scheduling. The solution to the problem is to conceive, design and build a web based application using Python and Flask that will allow teachers to create, modify and notify students to room changes. The solution must be capable of allowing teachers to request room changes, confirm room changes while giving a reason and to notify students via either email or integration with school box, the primary web tool used at the school. Teachers should have the ability to, via a web interface, view the class allocated to a classroom in a period and request a change. The system should be intuitive and the staff should have to enter minimal details. Some details required would be the time frame that the classroom is needed for, the date and a reason for the change. This information would then be sent via email to the staff member occupying the requested classroom. The staff member will then be offered a chance to accept the change. If the change is accepted, the teacher will be found a new free classroom automatically by the system. Once this process is completed, both teacher will be emailed a confirmation of the switch and the students of both classes will either be emailed or notified via school box about the changes.

Stage 2 - Conceptualisation

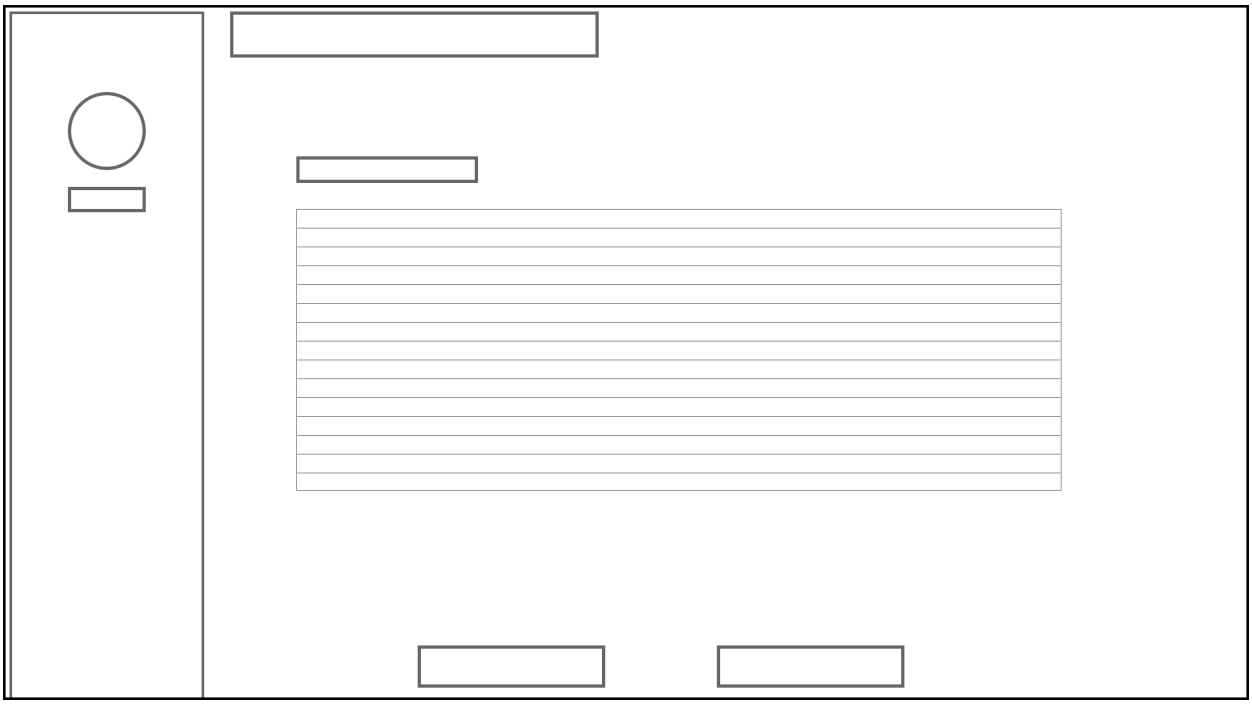
The goal of the project is to make a useful application that can be used by the staff and students of Brisbane Boys' College to make menial day to day tasks much easier and intuitive to complete. The success of the system will be determined by two factors; the ease of use of the system and overall acceptance of the system by staff. The project can be deemed a success if it is widely accepted at the college as the most functional system for organising room changes. The end user of the project should be able to easily organise room changes without lengthy email chains and an outdated system. The system will contain data relating to rooms, classes, teachers, students and subjects. The information will be organised into tables in a database and related to each other using primary and foreign keys.

Data Table Example

STUDENT	Subject	TEACHER	ROOM	ROOMCHANGE	STUDENT-SUBJECT
StudentID	SubjectID	TeacherID	RoomID	RequestID	StudentSubjectID
Student Name	Name	Teacher Name	Block	Course1ID	
Student Email	RoomID	Teacher Email	Subject	Course2	
SubjectID	TeacherID				
	Old_room				
	New_Room				

The staff members will interact with the database using a Graphical User Interface (GUI) based in a web browser that will be written using web technologies such as HTML and CSS for the front end with a robust PYTHON and FLASK backend. The user interface will allow teachers to access with the database in a simple, intuitive and informative fashion. The user interface should be designed so that little to no instruction or training should be provided to the teachers prior to the introduction of the project into the school ecosystem.

WireFrame UI Example



Example Data Table

STUDENT TABLE	Data
StudentID	18135
Student Name	Thomas Fraser
Student Email	18135@bbc.qld.edu.au
Subject ID	181201

SUBJET TABLE	Data
1SubjectID	181201
Name	IPT
RoomID	R207
TeacherID	1415
Old_room	R207
New_room	R205

TEACHER TABLE	Data
TeacherID	1415
Teacher Name	Ron Plumlee
Teacher Email	rplumlee@bbc.qld.edu.au

ROOM TABLE	Data
RoomID	R207
Block	Rudd Block
Subject	IPT

ROOMCHANGE TABLE	Data
RequestID	2038
Course1ID	IPT
Course2ID	ITS

	Data

STUDENT-SUBJECT TABLE	Data
StudentSubjectID	6574

Stage 3 - Formalisation

The following elementary facts, data dictionaries, CSDs, RSDs and UI/form design were designed using the Data Table example found in stage two along with the example data. The elementary facts define what each table will contain, including examples for each row. The data dictionary table takes the definitions from the Elementary Facts and further defines them in terms of SQL by using the correct SQLITE3 data types and constraints. The data dictionary also contains a small description of what each row contains. The CSDs were designed following the design criteria provided and learnt from the 'Designing Databases' book. The optimal normal form diagram expands on the CSD and describes the different tables on the CSD. The relational schema diagram relates the seperate tables to each other. The diagram explains how the tables interact using primary and foreign keys. Finally the UI / form examples give a rough estimation of how the end user will interact with the database via a web application. The UI examples display all the important pages that the website will consist of including the landing page, login page and logged in landing page.

Elementary Facts

STUDENT has StudentID (Number) '18135'

STUDENT '18135' has Name (Name) '*Thomas Fraser*'

STUDENT '18135' has Email (Email) '*18135@bbc.qld.edu.au*'

STUDENT '18135' has CourseID (Number) '*IPT_4*'

SUBJECT has SubjectID (Number) '181201'

SUBJECT '181201' has Name (Name) '*IPT*'

SUBJECT '181201' has RoomID (Number) '*R207*'

SUBJECT '181201' has TeacherID (Number) '*1451*'

SUBJECT '181201' has Old_Room (Number) '*R207*'

SUBJECT ' 181201' has New_Room (Number) '*R205*'

TEACHER has TeacherID (Number) '1415'

TEACHER '1451' has Name (Name) '*Ron Plumlee*'

TEACHER '1415' has Email (Email) '*rplumlee@bbc.qld.edu.au*'

ROOM has RoomID (Number) 'R207'

ROOM 'R207' has Block (Name) '*Rudd Block*'

ROOM 'R206' has Subject (Name) '*IT*'

ROOMCHANGE has RoomChangeID (Number) '2038'

ROOMCHANGE '2038' Course1ID (Name) '*IPT*'

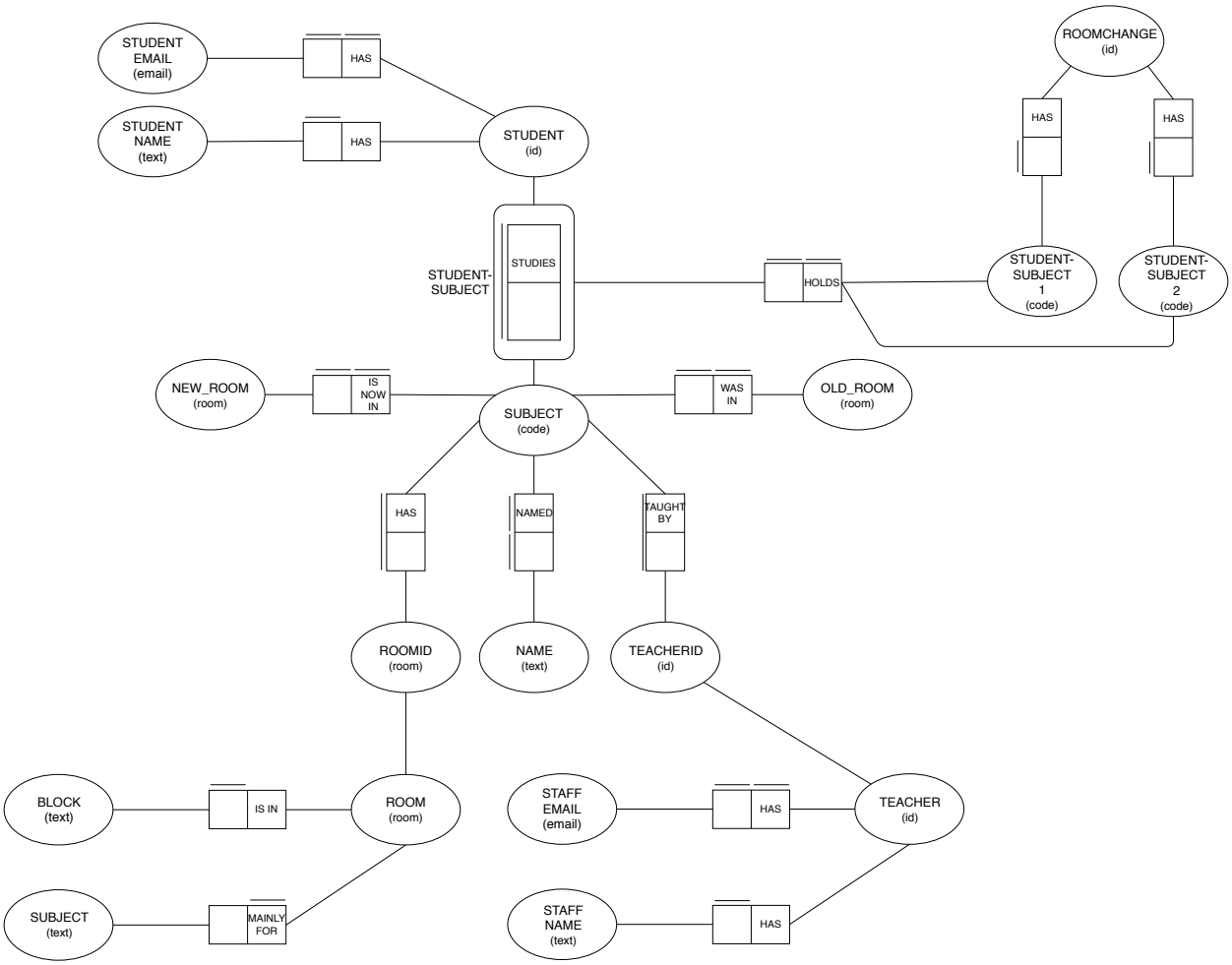
ROOMCHANGE '2038' Course2ID (Name) '*ITS*'

Data Dictionary

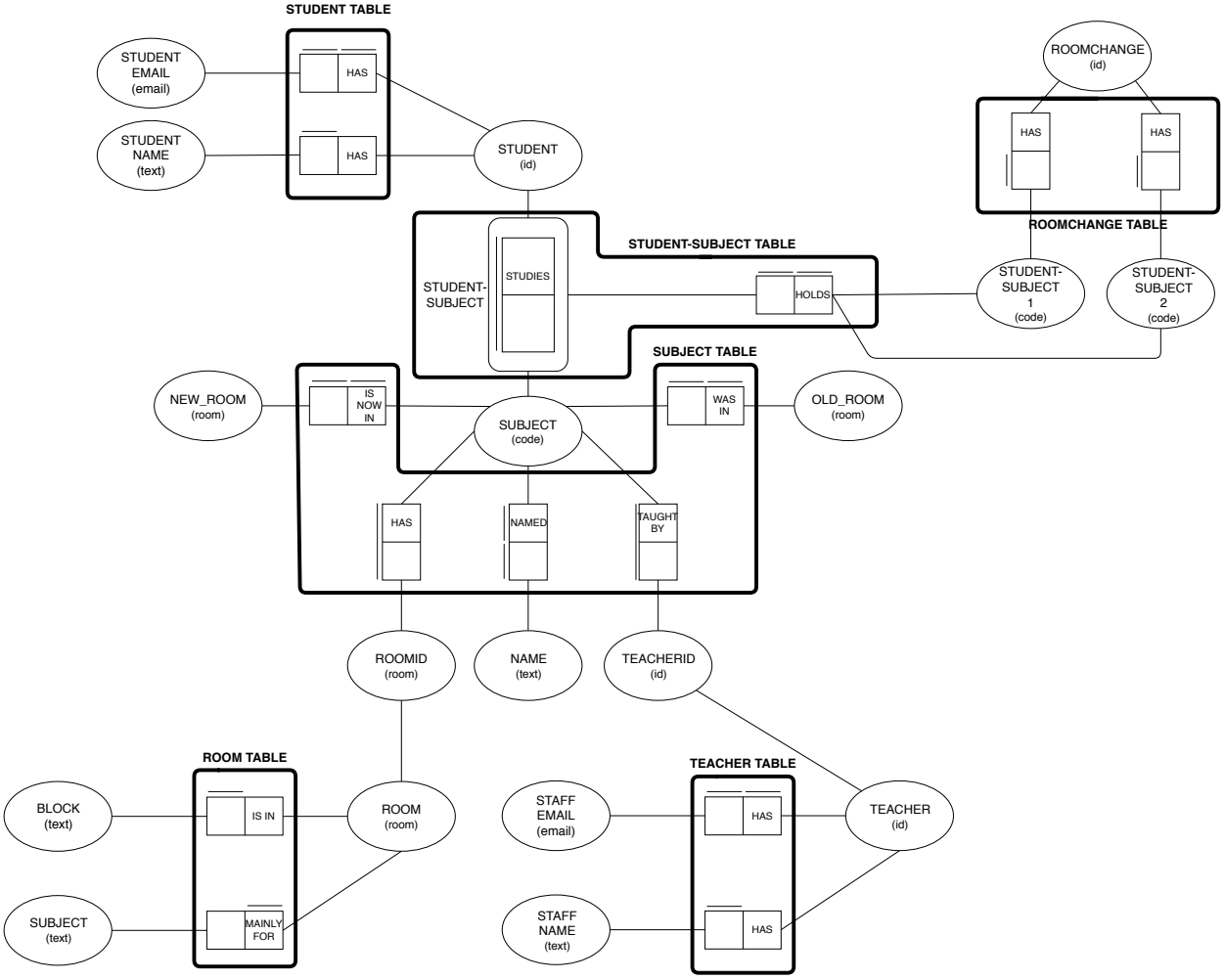
Field Name	Data Type	Constraint	Description
STUDENT TABLE			
StudentID	INT	Primary Key	Student Identifier
Student Name	TEXT	Not null	Name of the student
Student Email	TEXT	Not null	Email of the student
SUBJECT TABLE			
SubjectID	INT	Primary Key	Subject Identifier
Name	TEXT	Not null	Name of the subject
RoomID	INT	Foreign Key	Room that the class is normally in
TeacherID	INT	Foreign Key	Identifier for the teacher taking the class
Old_Room	INT	Not null	Old room for the subject

New_Room	INT	Not null	New room for the subject
TEACHER TABLE			
TeacherID	INT	Primary Key	Teacher Identifier
Teacher Name	TEXT	Not null	Name of the teacher
Teacher Email	TEXT	Not null	Email of the email
ROOM TABLE			
RoomID	INT	Primary Key	Identifier of the room
Block	TEXT	Not null	Building that the class room is in
Subject	TEXT	Not null	The primary subject for the room
REQUEST TABLE			
RequestID	INT	Primary Key	The room change request Identifier
Course1ID	INT	Not null	STUDENT-SUBJECT table relating to course 1
Course2ID	INT	Not null	STUDENT-SUBJECT table relating to course 2
SS TABLE			
StudentSubjectID	INT	Primary Key	The ID for the combination table of student and subject

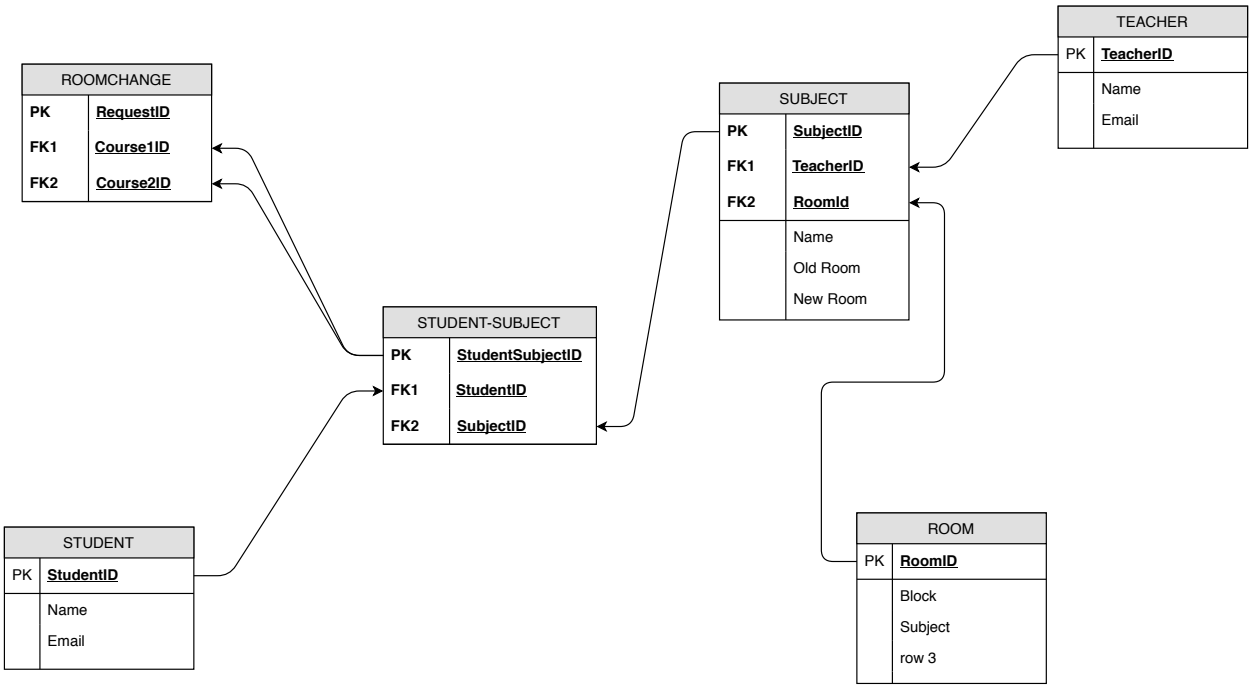
Conceptual Schema Diagram (CSD)



Optimal Normal Form CSD



Relational Schema Diagram



UI and Form Design

Landing Page

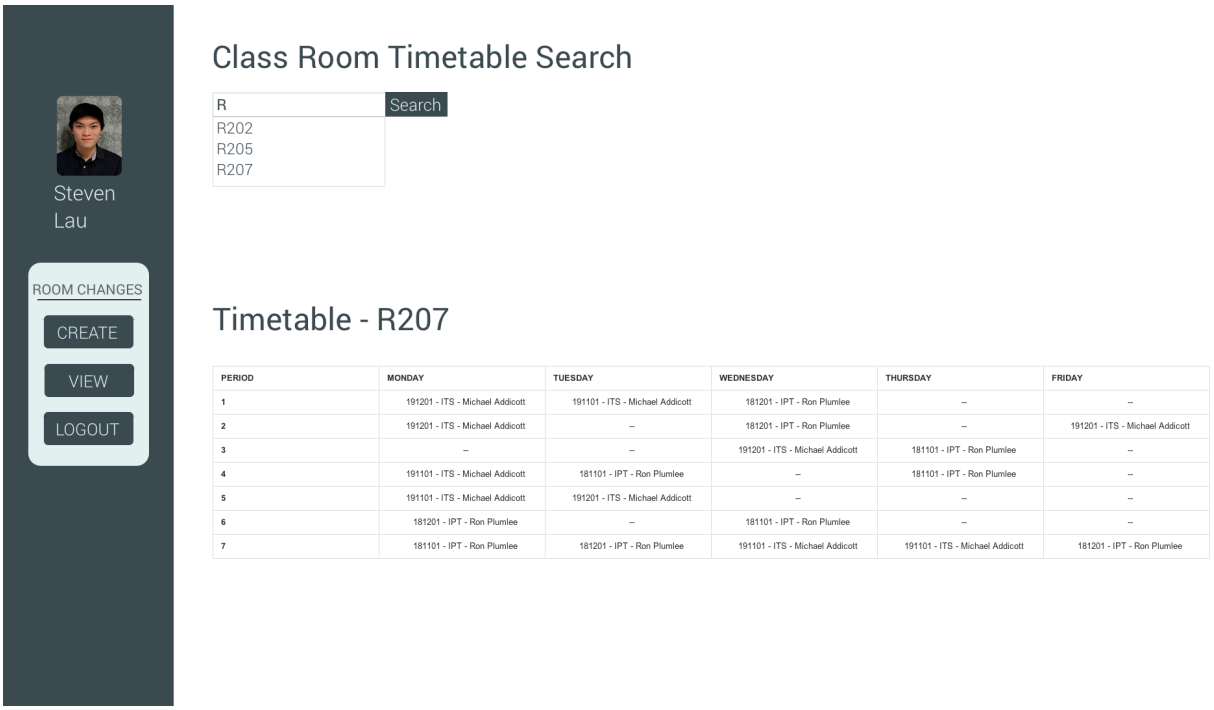
The landing page is where the end user will enter when they direct to the web address of the web application. The user interface contains a sidebar with an imbedded login button and A BBC Logo. When the login button is pressed, the sidebar animates to the right and the BBC Logo slides off screen. The screen animates to the Login Page.

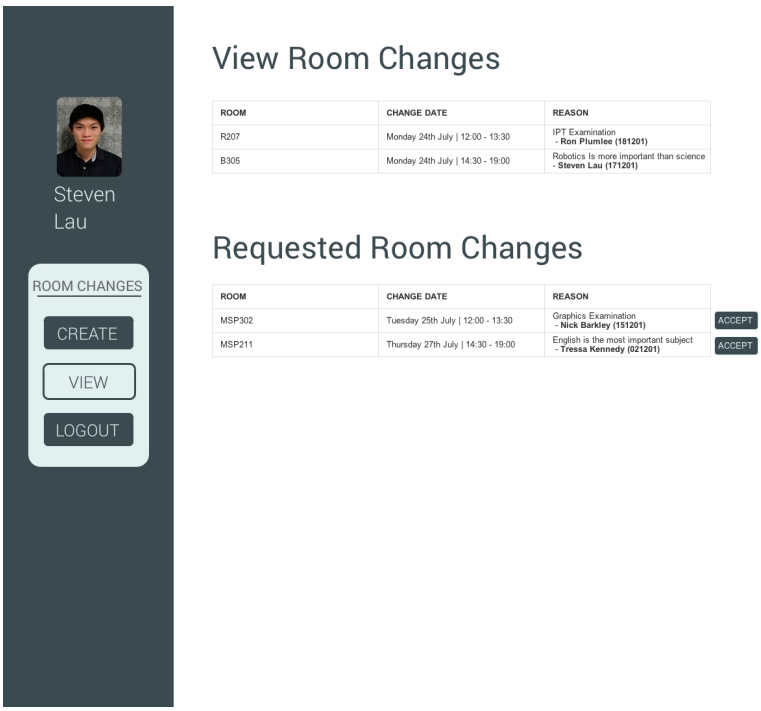
Login Page (Animated from Landing Page)

The login page is animated from the landing page. The login page allows the user the enter a username and password to login to the class room changing system. The username and password will be the same as the ones used by the schools IT system. Therefore, this part of the database will interface with the school IT system and therefore no login information needs to be stored in the database.

Class Search Page (Landing page after login)

Once a user is logged in they are faced with a class search page, which is the landing page from login. The sidebar returns to it original width from the landing page and user details such as an image and name are displayed. The main selectors for interaction with the website are also located in the sidebar. The primary options are 'CREATE', 'VIEW' and 'LOGOUT'. The 'CREATE' button is used to create a room change by interactively clicking on the Rooms timetable as displayed below. The 'VIEW' button redirects to the page displayed below. The 'LOGOUT' button logs the user out of the service.



View Page (After pressing view on Class Search Page)

The view page contains two tables and a sidebar. The tables include room changes that the teacher is part of and room change request made to the teachers classes. The sidebar has the 'VIEW' tab highlighted as it is the current selected option. The 'Requested Room Changes' table have options for the teacher to accept a room change.