 **MINISTRY OF EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

**Timetable Management Support Tools**

|  |  |
| --- | --- |
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| **Capstone Project code** | TMST |

-Ho Chi Minh City, 05/01/2015-

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# Definitions, Acronyms, and Abbreviations

|  |  |
| --- | --- |
| **Name** | **Definition** |
| TMST | Timetable Management Support Tools |
| API | Application Programming Interface |

# Software Design Description

## Design Overview

* This document describes the technical and user interface design of Timetable Management Support Tools. It includes the architectural design, the detailed design of common functions and business functions.
* The architectural design describes the overall architecture of the system and the architecture of each main component and subsystem.
* The detailed design describes static and dynamic structure for each component and functions. It includes class diagrams, class explanations and sequence diagrams for each use cases.
* The database design describes the relationships between entities and details of each entity.
* Document overview:
* **Section 2:** The overall description of the system architectural design.
* **Section 3:** Component diagrams that describe the connection and integration of the system.
* **Section 4:** Detail design description, which includes class diagram, class explanation, and sequence diagram to describe the application functions.
* **Section 5:** The user interface of application.
* **Section 6:** Database design with entity relationship diagram.
* **Section 7:** The algorithms used for timetable, schedule suggestion.

## System Architectural Design

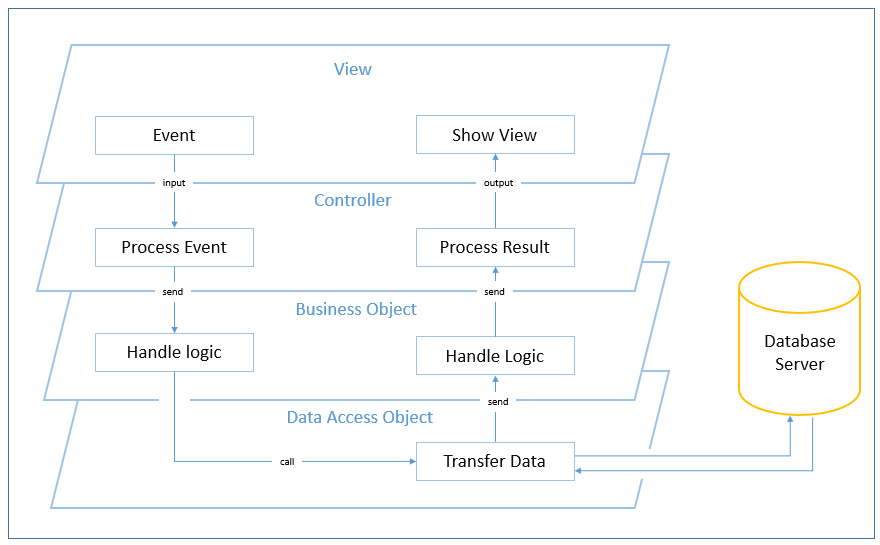


Figure : TMST System Architectural

* The System Architectural model of system is Multi Layered Architecture (MLA) model for some reason:

+ TMST is a desktop application which contain many features, so using MLA model could reduce complexity of code, and also reduce code per layer.

+ Requirement is changed and updated frequently, so using MLA model could provide the easy way to test, maintain code and add new functionality or reuse code.

## Component Diagram

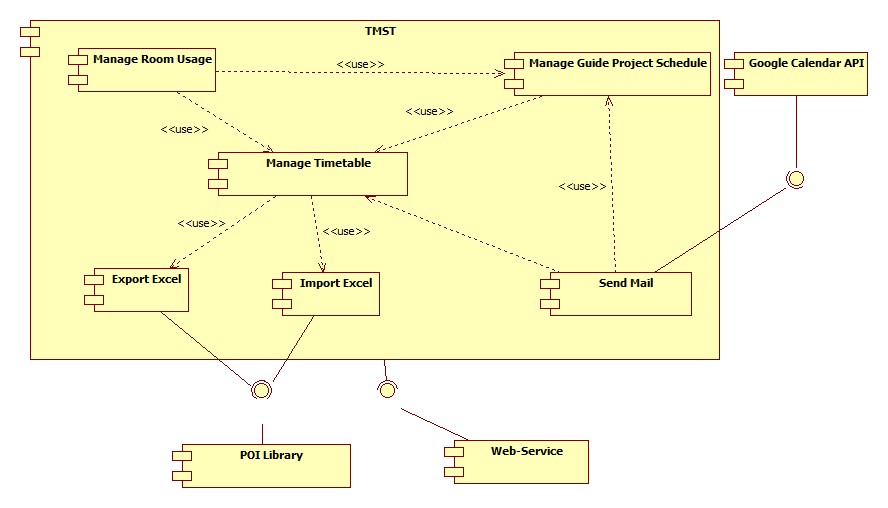


Figure : Component Diagram

|  |  |
| --- | --- |
| Component dictionary | |
| Component Name | Description |
| Manage Timetable | Component contains all modules about Suggest, Create, Edit, Check Conflict Temporary Timetable and Completed Timetable. |
| Manage Room Usage | Component contains all modules about Suggest, View, and Edit Room Usage. |
| Manage Guide Project Schedule | Component contains all modules about Suggest, View, and Edit Guide Project Schedule. |
| Export Excel | Component contains module that is used to export Timetable, Manage Guide Project Schedule, and Room Usage to Excel file. |
| Import Excel | Component contains module that is used to import Plan Semester, Class List, Instructor List, and Guide Project List into System. |
| Send Mail | Component contains module that is used to send Timekeeping, Timetable, and Project Schedule to Instructor. |
| POI library | Component contains library that is used for system can import or export excel file. Download at:  <http://poi.apache.org/download.html> |
| Web Service | Component contains module that is used for get access key to system can synchronize Timetable and Guide Project Schedule to Google Calendar. |
| Google Calendar API | Component contains Google Calendar API to help system can synchronize and send mail to Google Calendar. |

Table : Component Dictionary

## Detailed Description

### Class Diagram

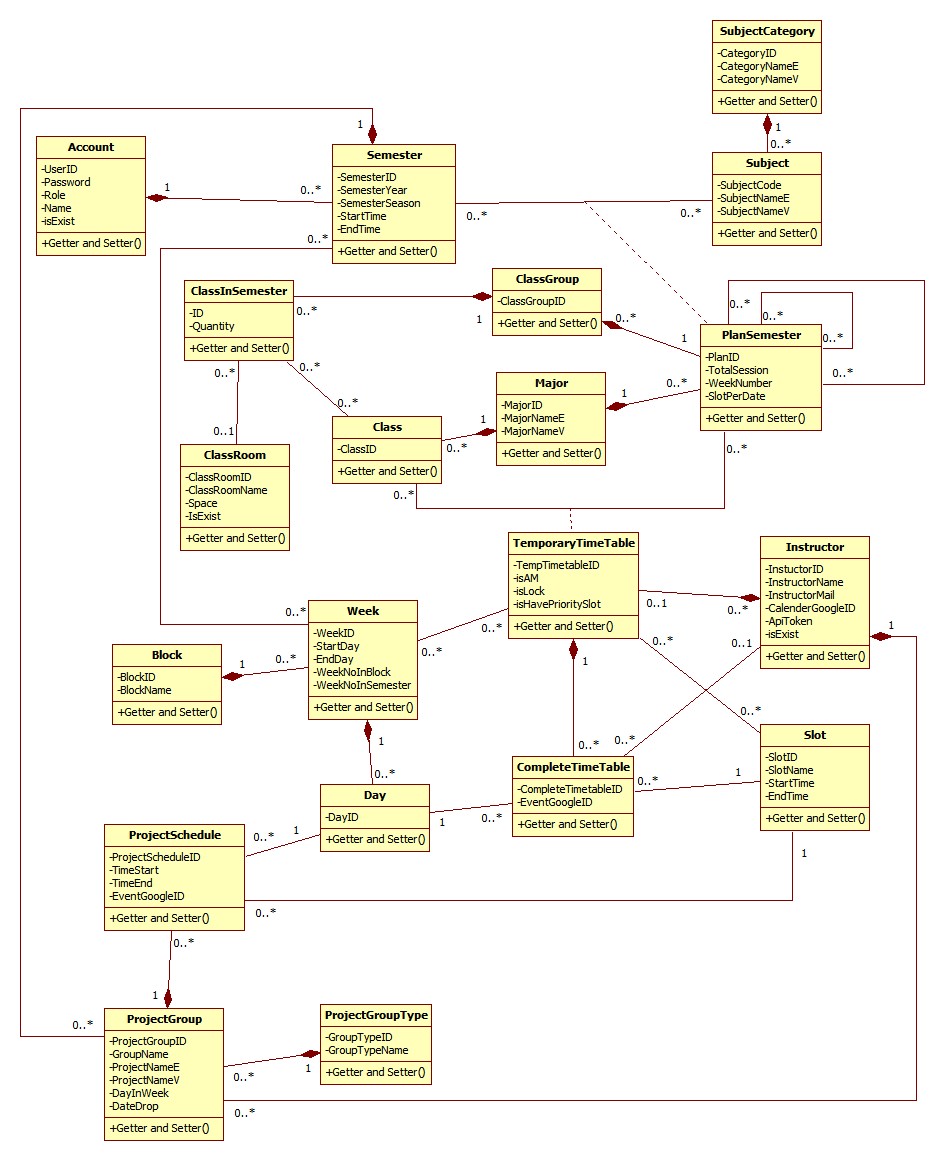


Figure : Class Diagram

|  |  |
| --- | --- |
| **Class dictionary** | |
| **Class Name** | **Description** |
| Account | Describe all user of the system. Each user has only one account. |
| Semester | Describe the semesters of FPT University, each semester at FPT University is about 4 months. |
| ClassRoom | Describe the rooms of FPT University which can be used for teaching. |
| Class | Describe the classes in FPT University. Each class is a set of students who have same courses. |
| ClassInSemester | Describe the specific class in a specific semester. |
| ClassGroup | Describe the sets of class in FPT University have the same plan in a semester. |
| Major | Describe the sets of class in FPT University have the same major. |
| Slot | Describe the slot in FPT University. Each slot is 90 minutes. |
| Day | Describe the official day in FPT University’s curriculum. Each day has 8 slots. |
| Week | Describe the week in FPT University’s curriculum. |
| Block | Describe the sets of weeks defined by FPT University. |
| Subject | Describe all available subject in FPT University. |
| SubjectCategory | Describe the sets of Subject. |
| PlanSemester | Describe the specific subjects which are available for each class group in a specific semester. Each semester has many plan semesters. |
| Instructor | Describe all instructors in FPT University. |
| CompletedTimetable | Describe the timetable in FPT University. Each timetable is about a set of answers for these question: which class has which subjects, teaching by who (instructor), at which specific period? |
| TemporaryTimetable | Describe the timetable in a brief description way. |
| ProjectGroup | Describe the set of students who is doing Capstone Project and Graduation Thesis. |
| ProjectGroupType | Describe the type of project group. |
| ProjectSchedule | Describe the time for meeting of project groups with their Instructor. |

Table : Class Dictionary

### Class Diagram Explanation

#### Account

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| UserID | String | Private | Unique identifier of an Account |
| Password | String | Private | Password of account user |
| Role | Integer | Private | Role name |
| Name | String | Private | Name of account user |
| isExist | Boolean | Private | Identifier of active account or not |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Semester

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| SemesterID | Interger | Private | ID of semester |
| SemesterYear | Interger | Private | Year of semester |
| SemesterSeason | String | Private | Season of semester |
| StartTime | Date | Private | Start time of a semester |
| EndTime | Date | Private | End time of a semester |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### SubjectCategory

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| CategoryID | String | Private | ID of category |
| CategoryNameE | String | Private | Category name in English |
| CategoryNameV | String | Private | Category name in Vietnamese |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Subject

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| SubjectCode | String | Private | ID of subject |
| SubjectNameE | String | Private | Subject name in English |
| SubjectNameV | String | Private | Subject name in Vietnamese |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### PlanSemester

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| PlanID | Integer | Private | ID of a plan semester |
| TotalSession | Integer | Private | Number of session for a plan semester |
| WeekNumber | Integer | Private | Number of week for a plan semester |
| SlotPerDate | Integer | Private | Number of slot for a plan semester |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Major

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| MajorID | String | Private | ID of major |
| MajorNameE | String | Private | Name of major in English |
| MajorNameV | String | Private | Name of major in VietNam |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### ClassGroup

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| ClassGroupID | Integer | Private | ID of group class |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Class

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| ClassID | String | Private | ID of class |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### ClassInSemester

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| ID | Integer | Private | ID of a class in semester |
| Quantity | Integer | Private | Number of student of class in semester |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### ClassRoom

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| ClassRoomID | Integer | Private | ID of classroom |
| ClassRoomName | String | Private | Name of classroom |
| Space | Integer | Private | Room space of classroom |
| IsExist | Boolean | Private | Identifier if room is valid to use |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### TemporaryTimeTable

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| TempTimetableID | Integer | Private | ID of temporary timetable |
| isAM | Boolean | Private | Identifier if timetable is AM or PM |
| isLock | Boolean | Private | Identifier if timetable is lock |
| isHavePrioritySlot | Boolean | Private | Identifier if timetable have priority slot |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Slot

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| SlotID | Integer | Private | ID of slot |
| SlotName | String | Private | Name of slot |
| StartTime | Time | Private | Start time of slot in a day |
| EndTime | Time | Private | End time of slot in day |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Instructor

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| InstuctorID | Integer | Private | ID in instructor |
| InstructorName | String | Private | Name of instructor |
| InstructorMail | String | Private | Mail of instructor |
| CalenderGoogleID | String | Private | ID of Google calendar |
| ApiToken | String | Private | Access token to synchronize Google calendar |
| isExist | Boolean | Private | Identifier if instructor is valid to use |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Block

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| BlockID | Integer | Private | ID of block in semester |
| BlockName | String | Private | Name of block in semester |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Week

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| WeekID | Integer | Private | Unique identifier of a week |
| StartDay | Date | Private | The start date of this week |
| EndDay | Date | Private | The end date of this week |
| WeekNoInBlock | Integer | Private | Ordinal numbers of week in a block |
| WeekNoInSemester | Integer | Private | Ordinal numbers of week in the semester |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Day

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| DayID | Date | Private | Unique identifier of a date |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### CompleteTimeTable

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| CompleteTimetableID | Integer | Private | ID of complete timetable |
| EventGoogleID | String | Private | ID of Google Event |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### ProjectGroupType

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| GroupTypeID | Integer | Private | ID of group type |
| GroupTypeName | String | Private | Name of group type |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### ProjectGroup

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| ProjectGroupID | Integer | Private | ID of project group |
| GroupName | String | Private | Topic name of project group |
| ProjectNameE | String | Private | Name project in English |
| ProjectNameV | String | Private | Name project in Vietnamese |
| DayInWeek | Integer | Private | Number of meeting times with instructor in a week |
| DateDrop | Date | Private | Date drop if a group dropped |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### ProjectSchedule

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| ProjectScheduleID | Integer | Private | ID of project schedule |
| TimeStart | Time | Private | Time start of project schedule |
| TimeEnd | Time | Private | Time end of project schedule |
| EventGoogleID | String | Private | ID of Google event |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

### Interaction Diagram

#### <Staff>Import Plan Semester

**Summary:** This diagram shows how staff import plan semester into system.

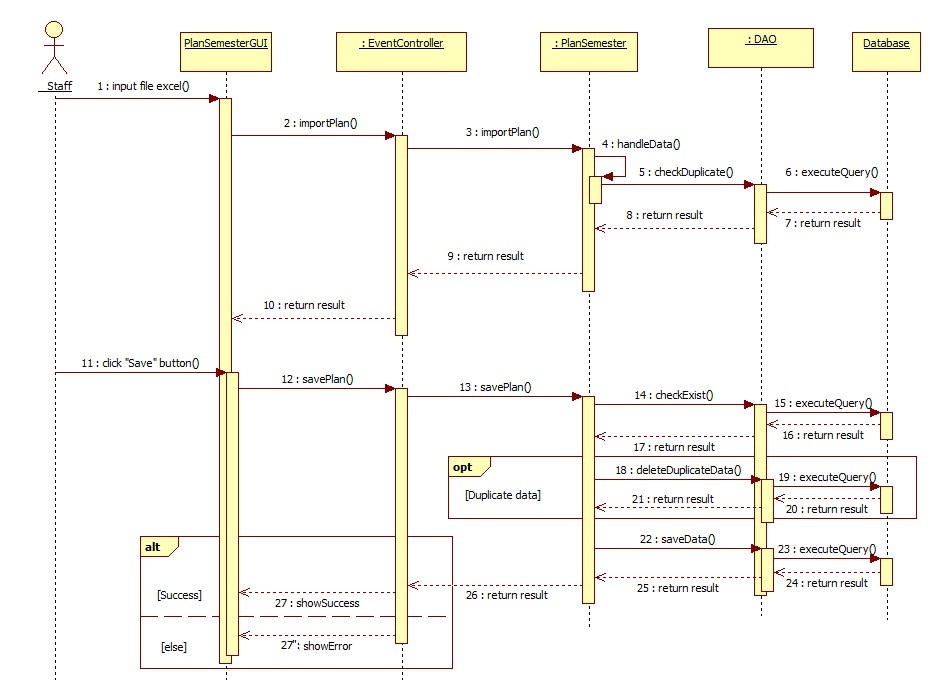


Figure : Sequence Diagram <Staff>Import Plan Semester

#### <Staff>Import Class in Semester

**Summary:** This diagram shows how staff import class into system.

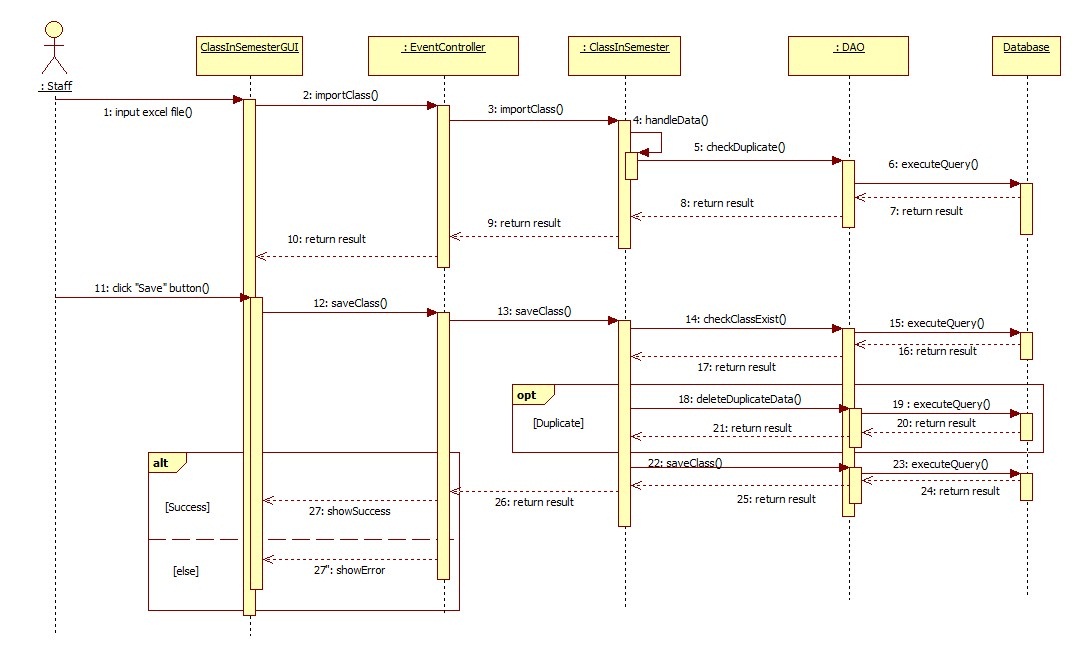


Figure : Sequence Diagram <Staff>Import Class in Semester

#### <Staff>Create Temporary Timetable

**Summary:** This diagram shows how system suggest temporary timetable.

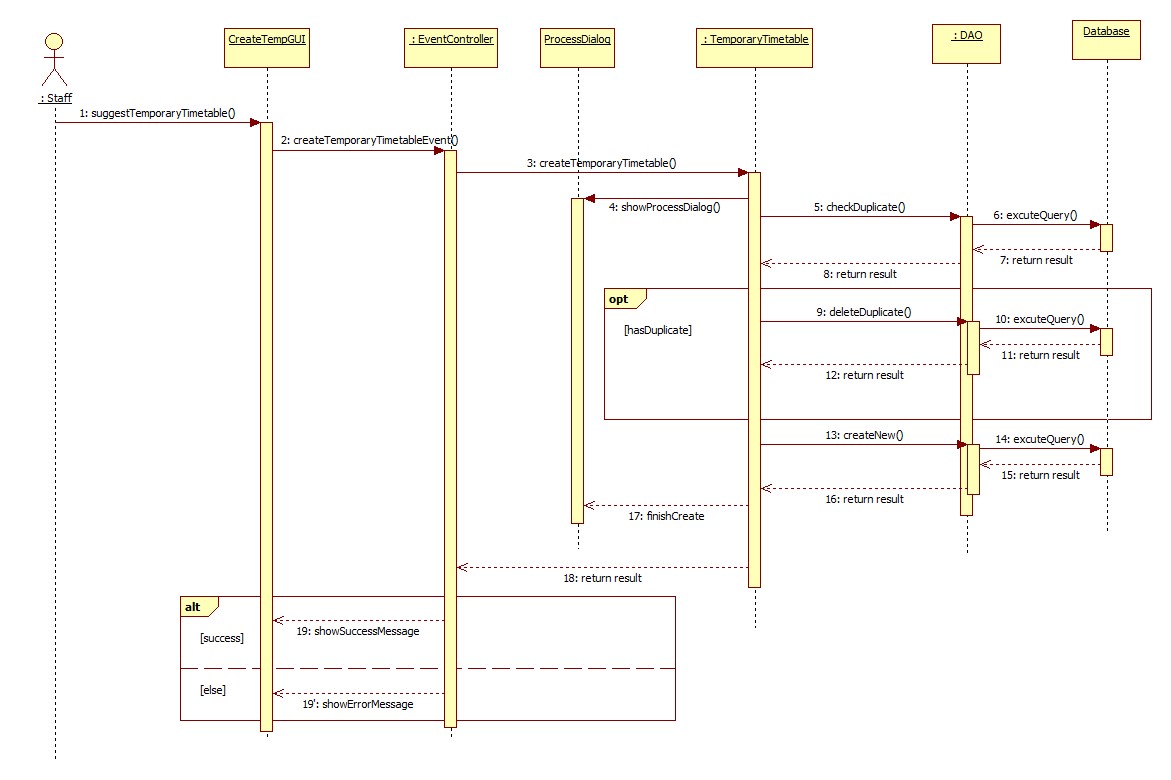


Figure : Sequence Diagram <Staff>Create Temporary Timetable

#### <Staff>View Temporary Timetable

**Summary:** This diagram shows how staff view temporary timetable.

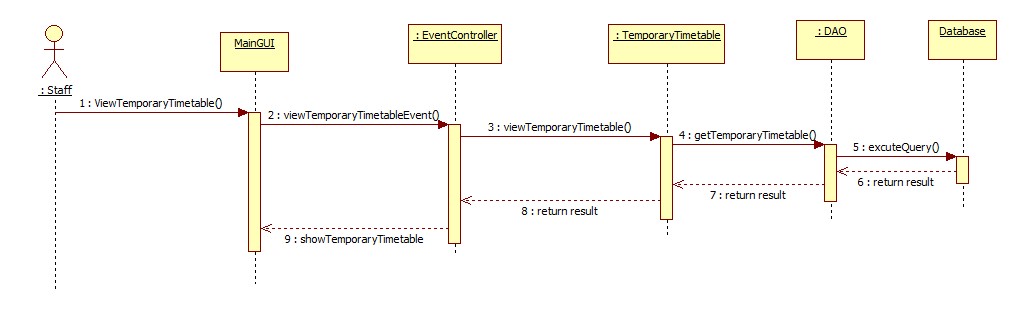


Figure : Sequence Diagram <Staff>View Temporary Timetable

#### <Staff>Edit Temporary Timetable

**Summary:** This diagram shows how staff edit temporary timetable.



Figure : Sequence Diagram <Staff>Edit Temporary Timetable

#### <Staff>Export Temporary Timetable

**Summary:** This diagram shows how staff export temporary timetable to excel file.

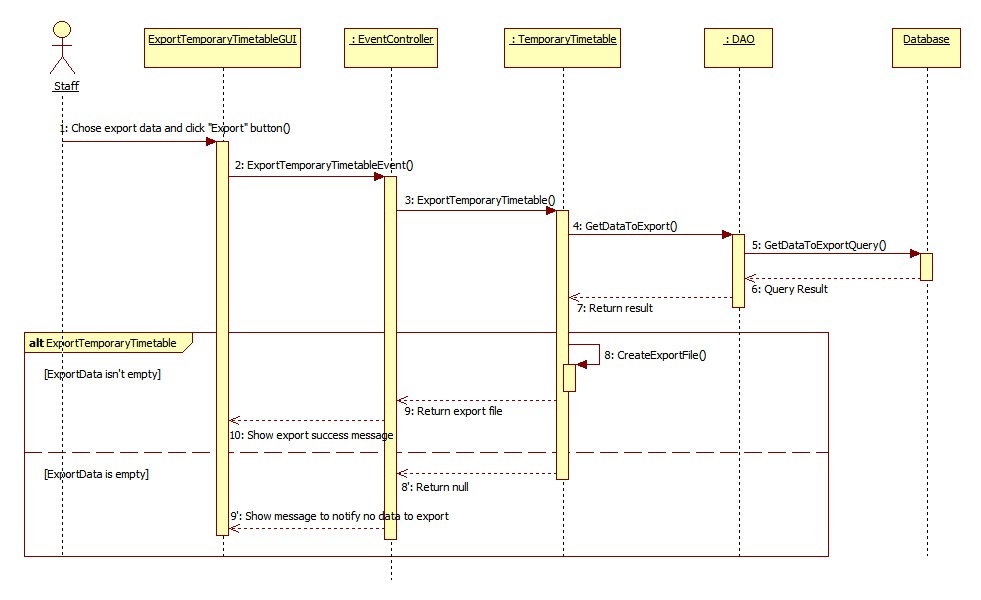


Figure : Sequence Diagram<Staff>Export Temporary Timetable

#### <Staff>Import Instructor List

**Summary:** This diagram shows how staff import instructor list into system.

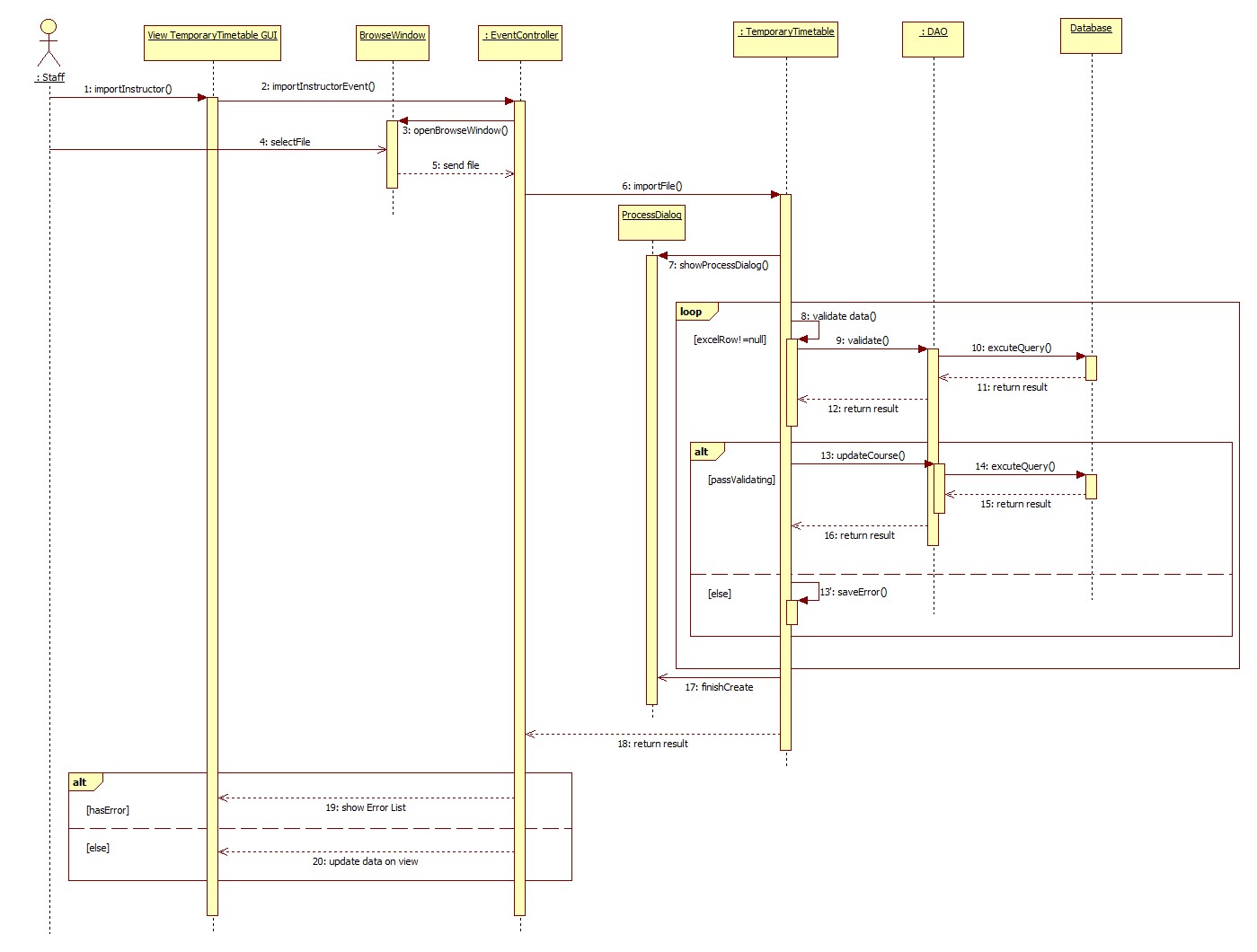


Figure : Sequence Diagram <Staff>Import Instructor List

#### <Staff>Check Conflict (Temporary Timetable)

**Summary:** This diagram shows how staff check conflict of temporary timetable

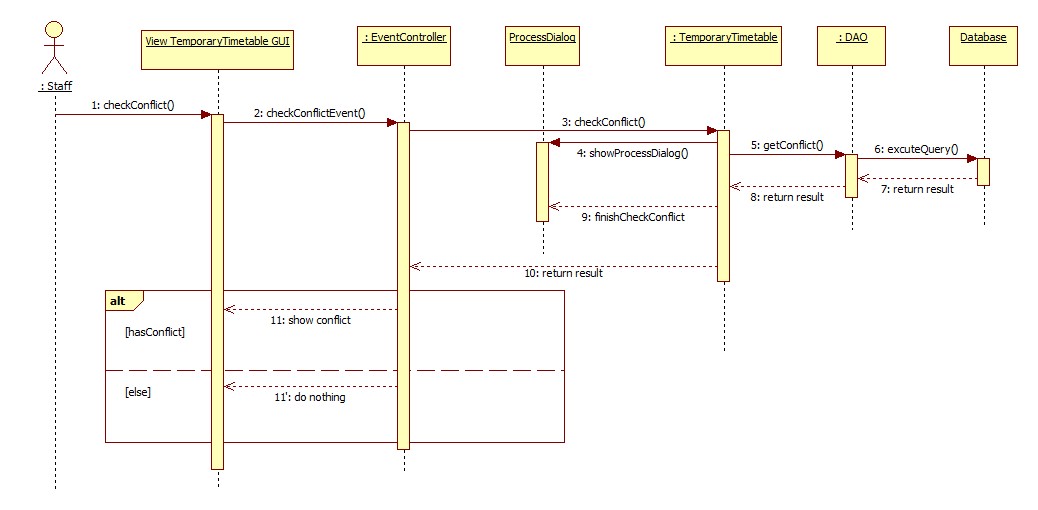


Figure : Sequence Diagram <Staff>Check Conflict (Temporary Timetable)

#### <Staff>Create Complete Timetable

**Summary:** This diagram shows how system suggest complete timetable from temporary timetable data

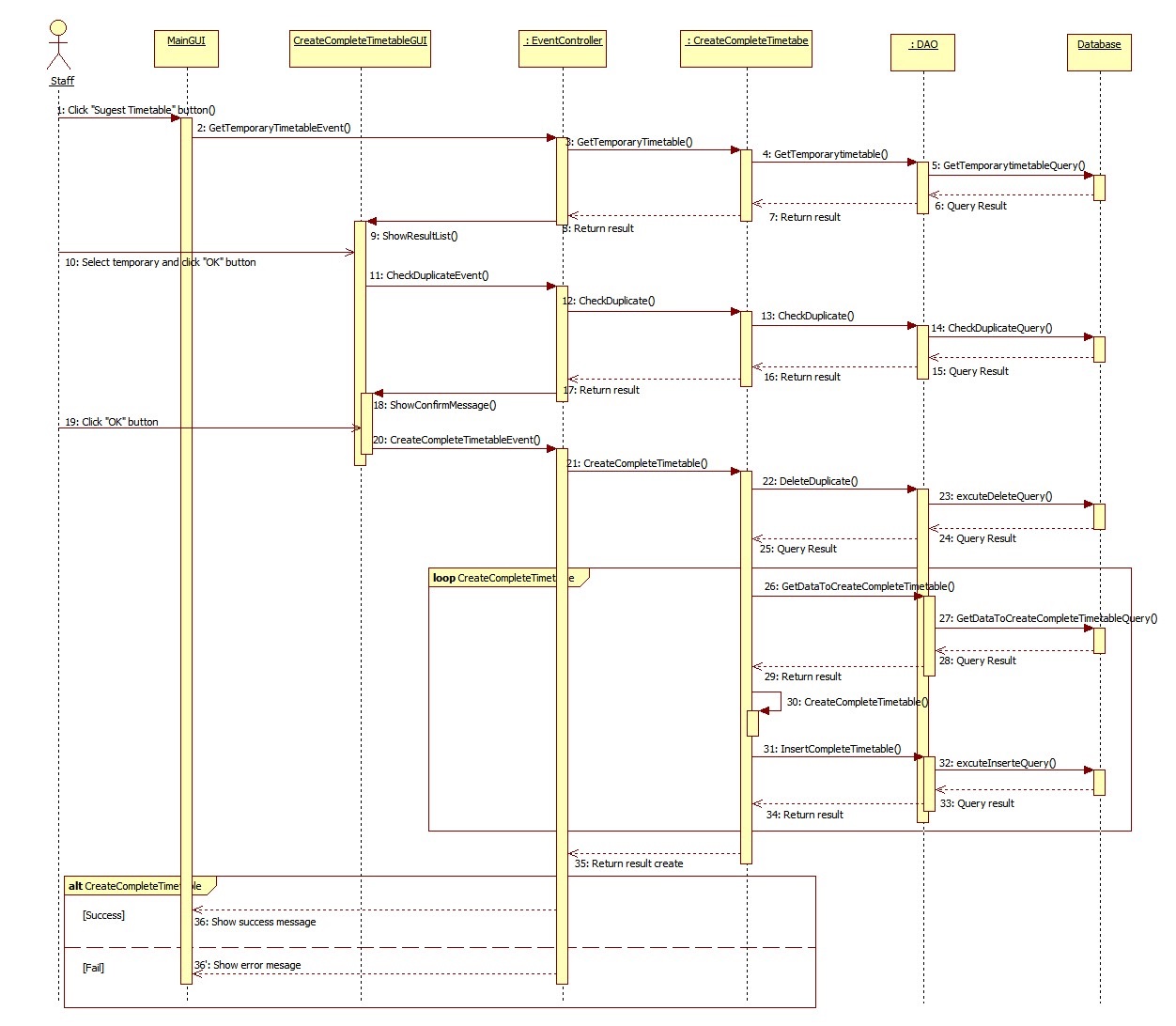


Figure : Sequence Diagram <Staff>Create Complete Timetable

#### <Staff>View Complete Timetable

**Summary:** This diagram shows how staff view complete timetable

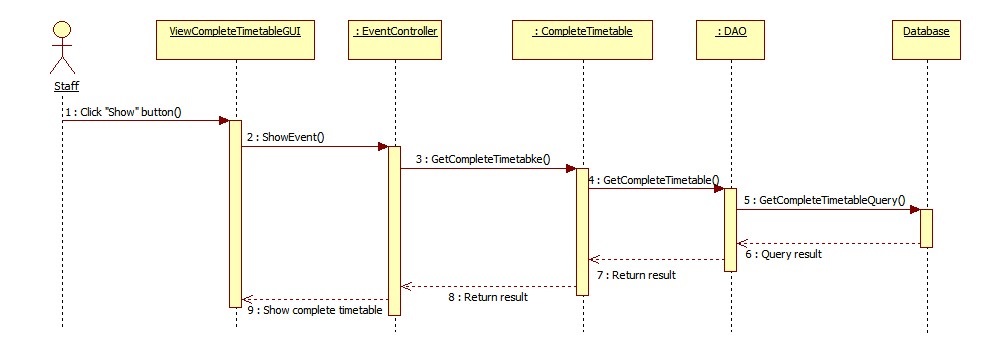


Figure : Sequence Diagram <Staff>View Complete Timetable

#### <Staff>Check Conflict (Complete Timetable)

**Summary:** This diagram shows how staff check conflict of complete timetable

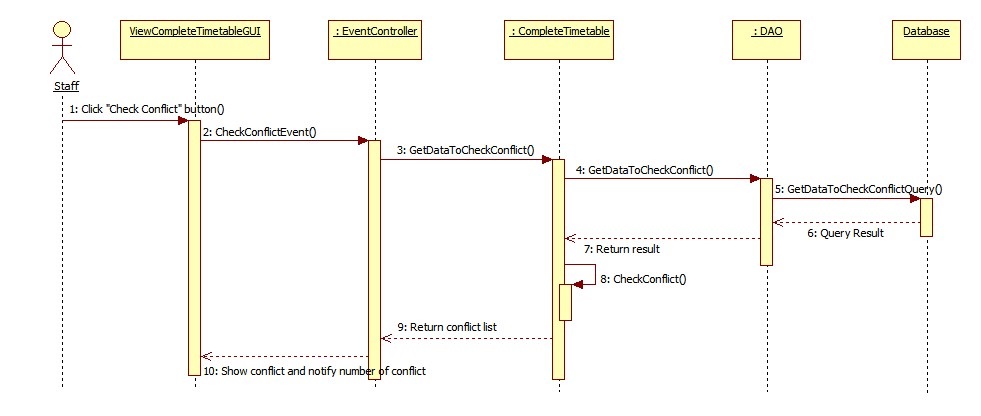


Figure : Sequence Diagram <Staff>Check Conflict (Complete Timetable)

#### <Staff>Export Complete Timetable

**Summary:** This diagram shows how staff export complete timetable to excel file

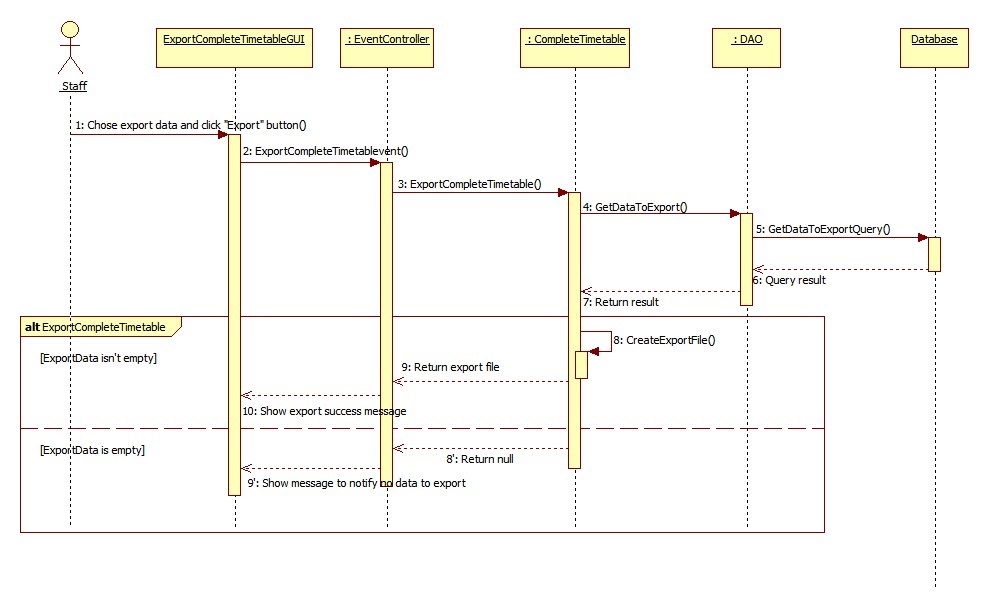


Figure : Sequence Diagram <Staff>Export Complete Timetable

#### <Staff>Edit Complete Timetable

**Summary:** This diagram shows how staff edit complete timetable

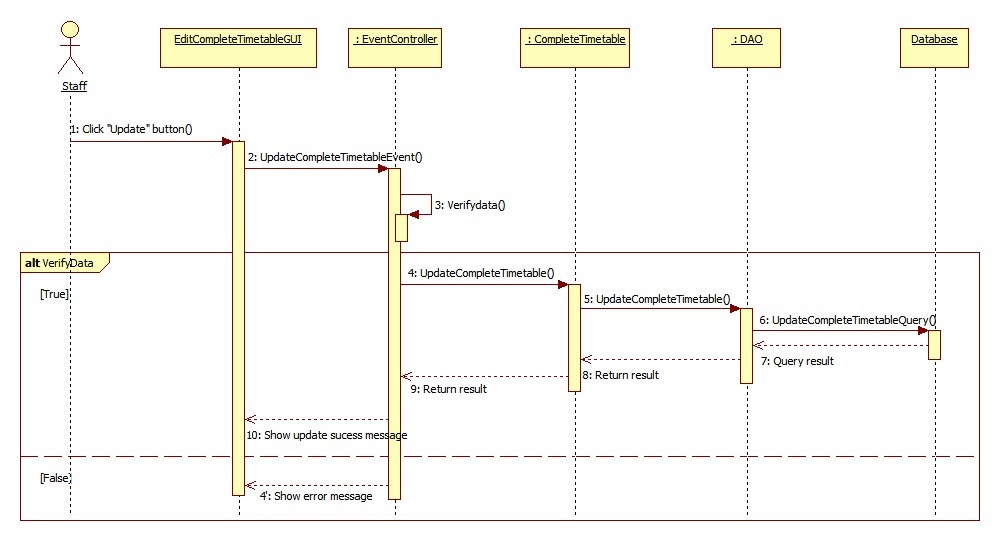


Figure : Sequence Diagram <Staff>Edit Complete Timetable

#### <Staff>Send Mail (Complete Timetable)

**Summary:** This diagram shows how staff send complete timetable to instructor’s mail

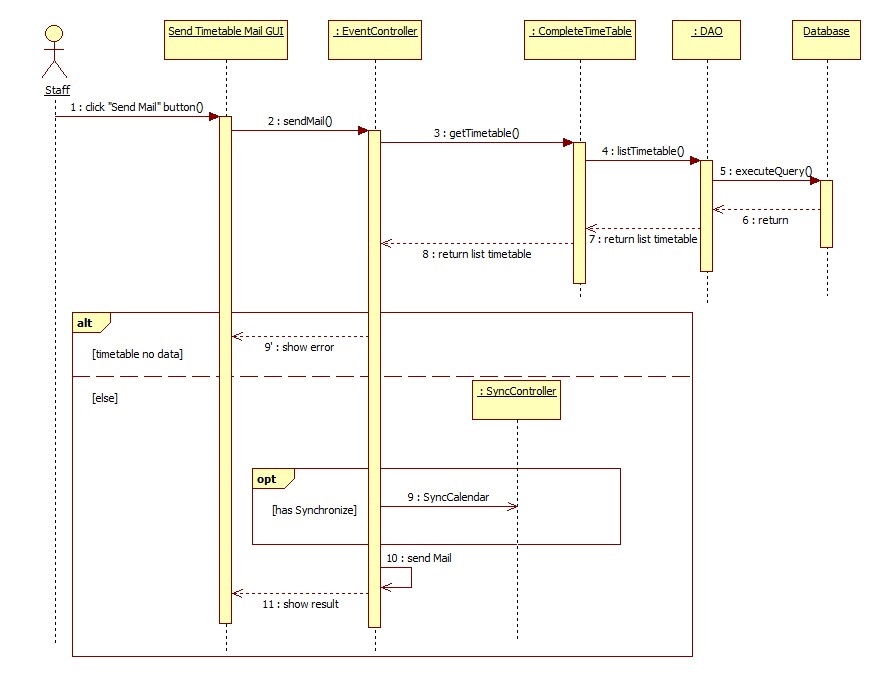


Figure : Sequence Diagram <Staff>Send Mail (Complete Timetable)

#### <Staff>Import Project Group

**Summary:** This diagram shows how staff import project group information into system

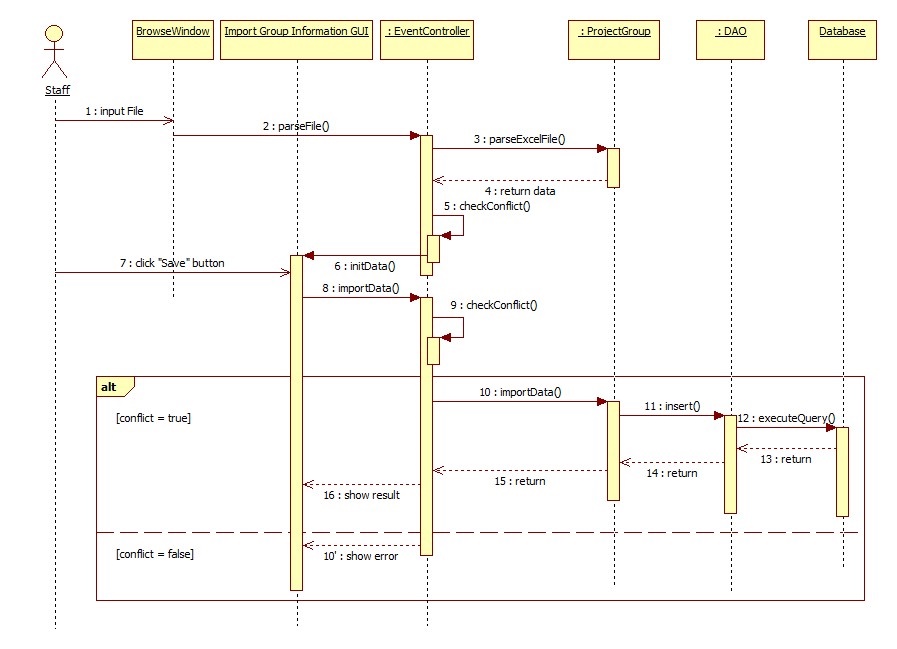


Figure : Sequence Diagram <Staff>Import Project Group

#### <Staff>Create Project Schedule

**Summary:** This diagram shows how staff suggest guild project schedule from complete timetable data

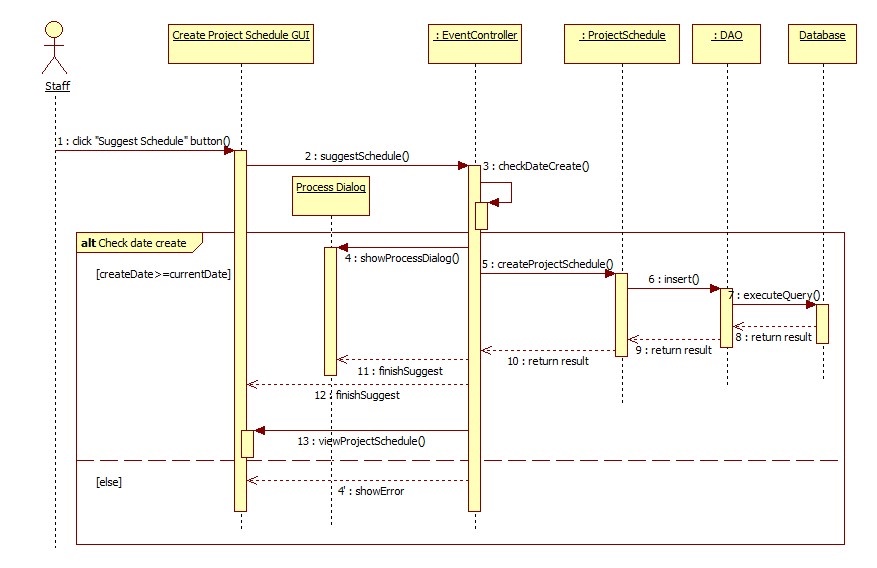


Figure : Sequence Diagram <Staff>Create Project Schedule

#### <Staff>Export Project Schedule

**Summary:** This diagram shows how staff export guild project schedule to excel file

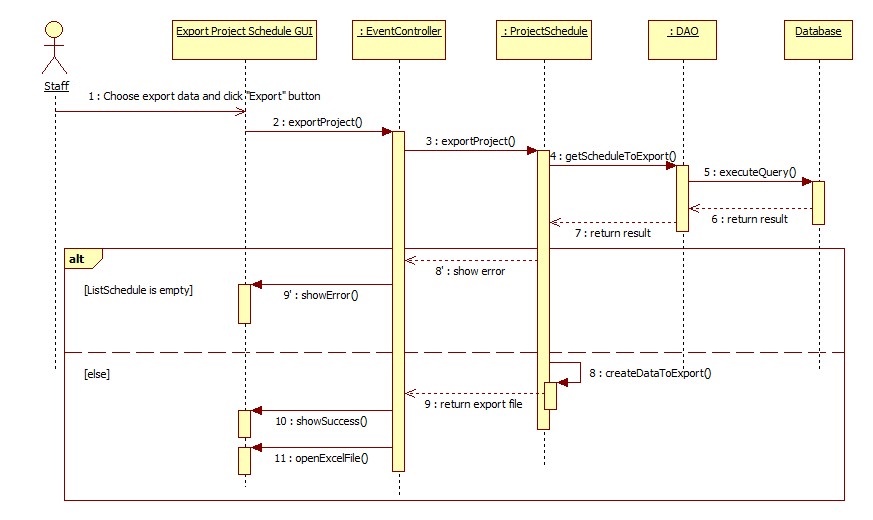


Figure : Sequence Diagram <Staff>Export Project Schedule

#### <Staff>Send Mail (Project Schedule)

**Summary:** This diagram shows how staff send guild project schedule to instructor’s mail

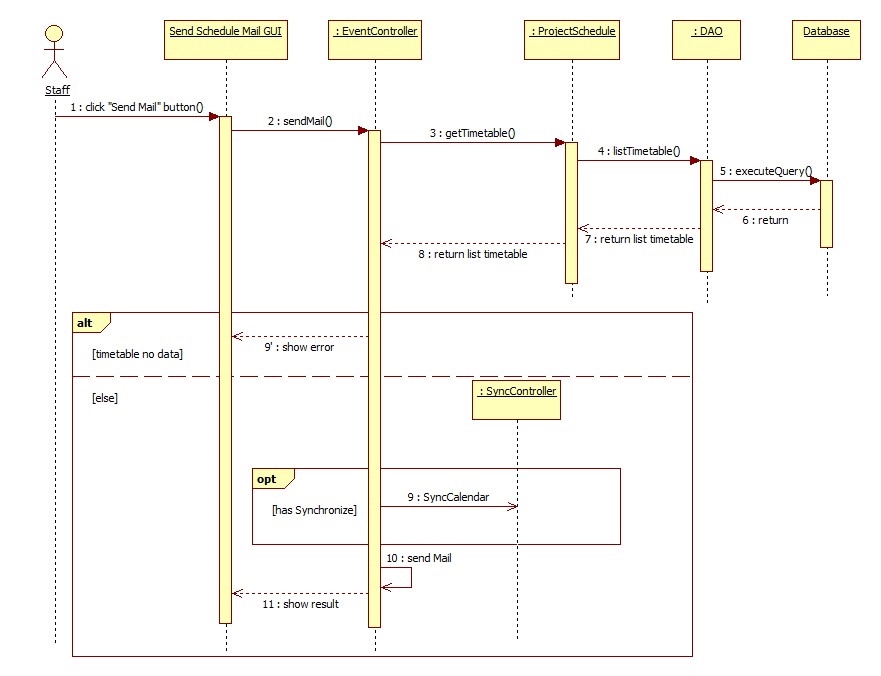


Figure : Sequence Diagram <Staff>Send Mail (Project Schedule)

#### <Staff>Calculate Timekeeping

**Summary:** This diagram shows how staff calculate timekeeping from complete timetable and guide project schedule data

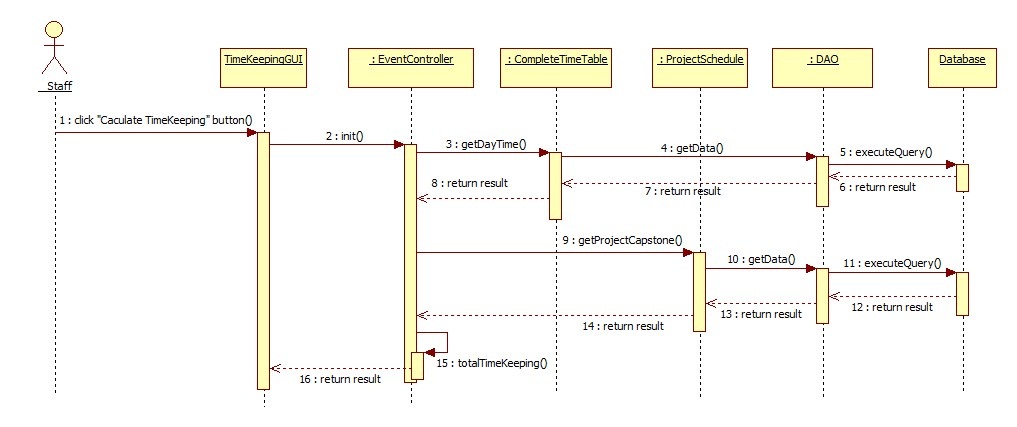


Figure : Sequence Diagram <Staff>Calculate Timekeeping

#### <Staff>Suggest Room

**Summary:** This diagram shows how staff suggest room for classes

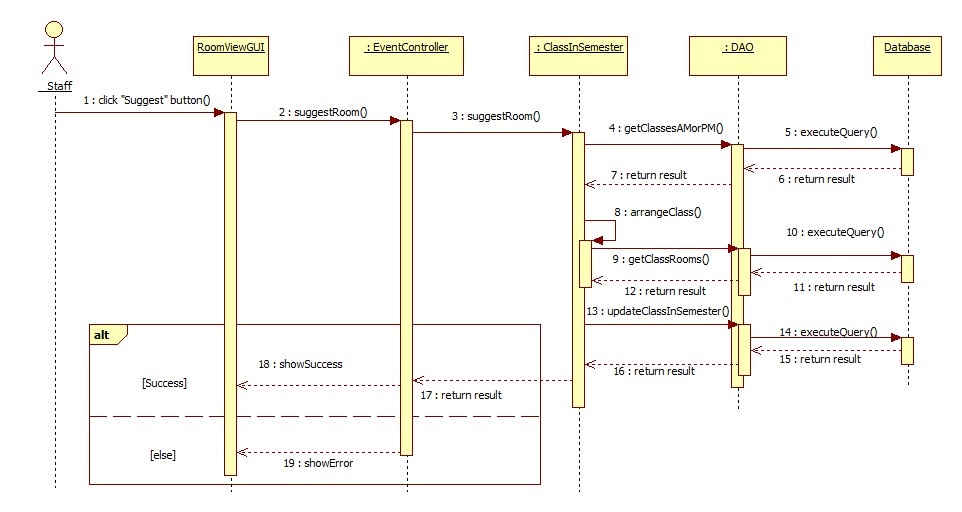


Figure : Sequence Diagram <Staff>Suggest Room

#### <Staff>Export Room Usage Schedule

**Summary:** This diagram shows how staff export room usage schedule to excel file

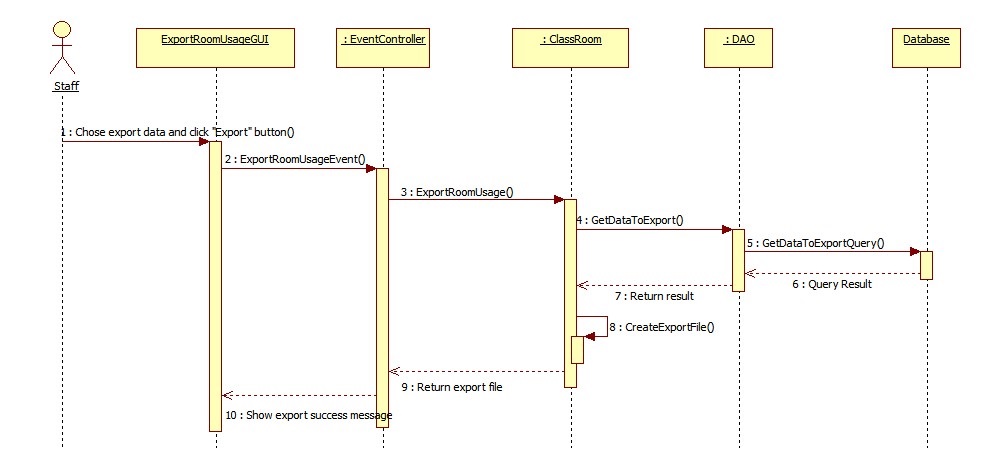


Figure : Sequence Diagram <Staff>Export Room Usage Schedule

#### <Staff>Send Mail (Time Keeping)

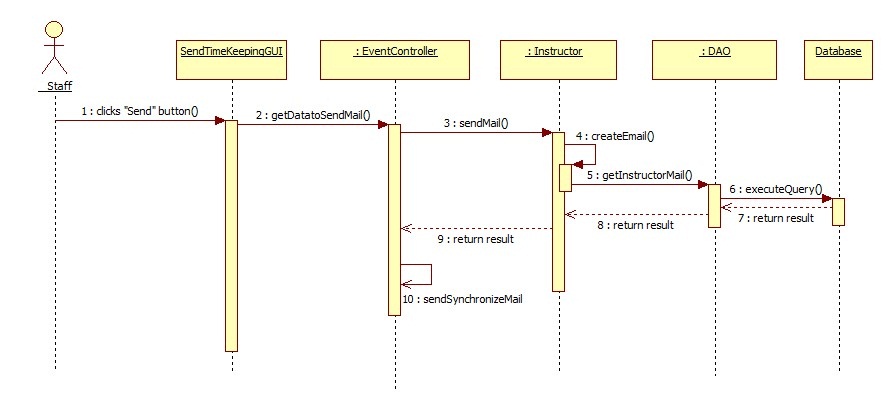
**Summary:** This diagram shows how staff send timekeeping to instructor mail ****

Figure : Sequence Diagram <Staff>Send Mail (Time Keeping)

## User Interface Design

### Guest Interface Design

#### Login



Figure : Login

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Username | Fill username | No | Yes | Textbox | String | N/A |
| 2 | Password | Fill password | No | Yes | Password | String | N/A |
| 3 | Remember Me | Choose remember username and password mode | No | No | Checkbox | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 4 | Login | Log-in into the system | N/A | Navigate to main window |

### Staff Interface Design

#### Create New Semester

##### Create New Semester Step 1

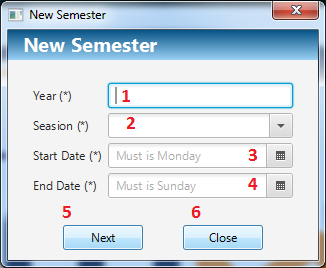
****

Figure : Create New Semester Step 1

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field  Name | Description | Read  only | Mandatory | Control  Type | Data  Type | Length |
| 1 | Year | Fill username | No | Yes | Textbox | Integer | 4 |
| 2 | Season | Fill password | No | Yes | Combo box | String | N/A |
| 3 | Start Date | Pick start date | No | Yes | Date Picker | Date | N/A |
| 4 | End Date | Pick end date | No | Yes | Date Picker | Date | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 5 | Next | Go to next step to create new semester | N/A | Navigate to create new semester step 2 |
| 6 | Close | Click to close window | N/A | Close this window |

##### Create New Semester Step 2

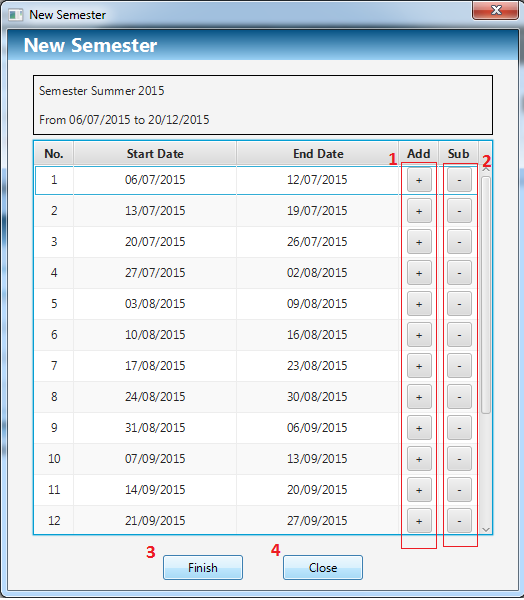


Figure : Create New Semester Step 2

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 1 | Add | Increase start date and end date of this week as well as the week after it | N/A | Increase start date and end date of this week as well as the week after it |
| 2 | Sub | Decrease start date and end date of this week as well as the week before it | N/A | Decrease start date and end date of this week as well as the week before it |
| 3 | Finish | Add new semester into system | N/A | Create new semester, Choice this and close the window |
| 4 | Close | Click to close window | N/A | Close this window |

#### Chose Semester

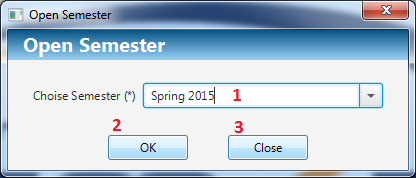


Figure : Chose Semester

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Choice Semester | Choose semester want to process | No | Yes | Combo box | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 2 | Open | Open semester to process | N/A | Open this semester to process and close this window |
| 3 | Close | Click to close window | N/A | Close this window |

#### Import Plan Semester

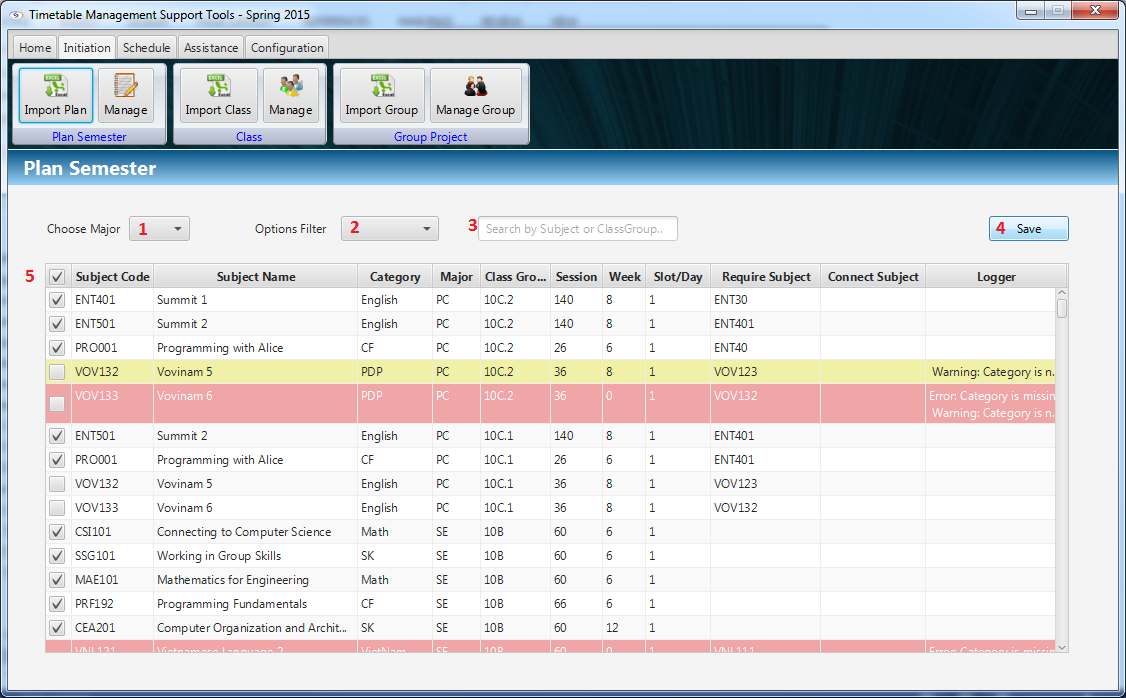


Figure : Import Plan Semester

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Major | Filter data by major | No | No | Combo box | String | N/A |
| 2 | Options | Filter data by other options: Warning, Error and Over 6 Subjects | No | No | Combo box | String | N/A |
| 3 | Filter field | Filter data by subject or class group | No | No | Textbox | String | N/A |
| 5 | Check all | Check all row of table | No | No | Checkbox | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 4 | Save | Save selected data from imported data | N/A | Save selected plan into system. |

#### Import Class

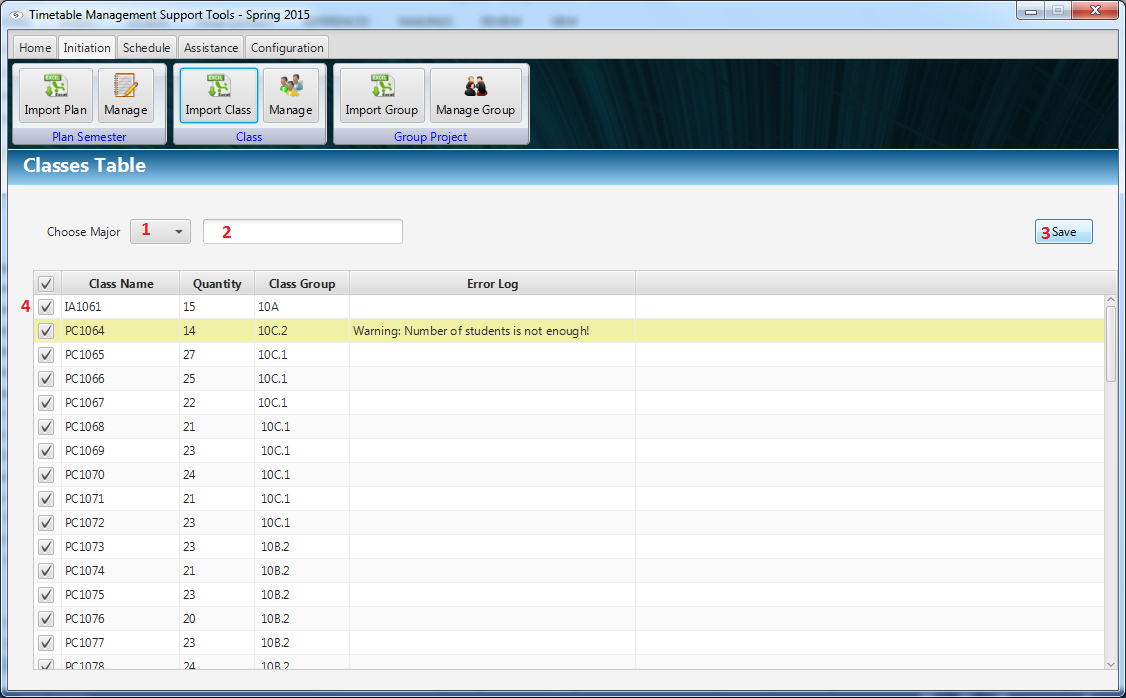


Figure : Import Plan Semester

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Major | Filter imported data by major | No | No | Combo box | String | N/A |
| 2 | Filter field | Filter data by class or class group | No | No | Textbox | String | N/A |
| 4 | Check all | Check all row of table | No | No | Checkbox | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 3 | Save | Save selected data from imported data | N/A | Save selected class into system. |

#### Suggest Temporary Timetable

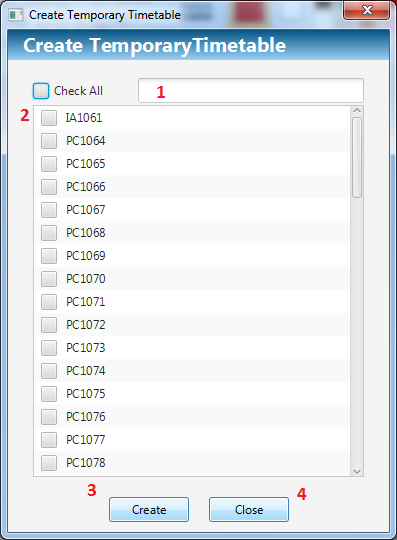


Figure : Suggest Temporary Timetable

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Search | Fill search text | No | No | Textbox | String | N/A |
| 2 | Class Check List | Check class for create | No | Yes | Check List View | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 3 | Create | Go to next step to create Temporary Timetable | N/A | Navigate to View Temporary Timetable |
| 4 | Close | Click to close window | N/A | Close this window |

#### Manage Temporary Timetable

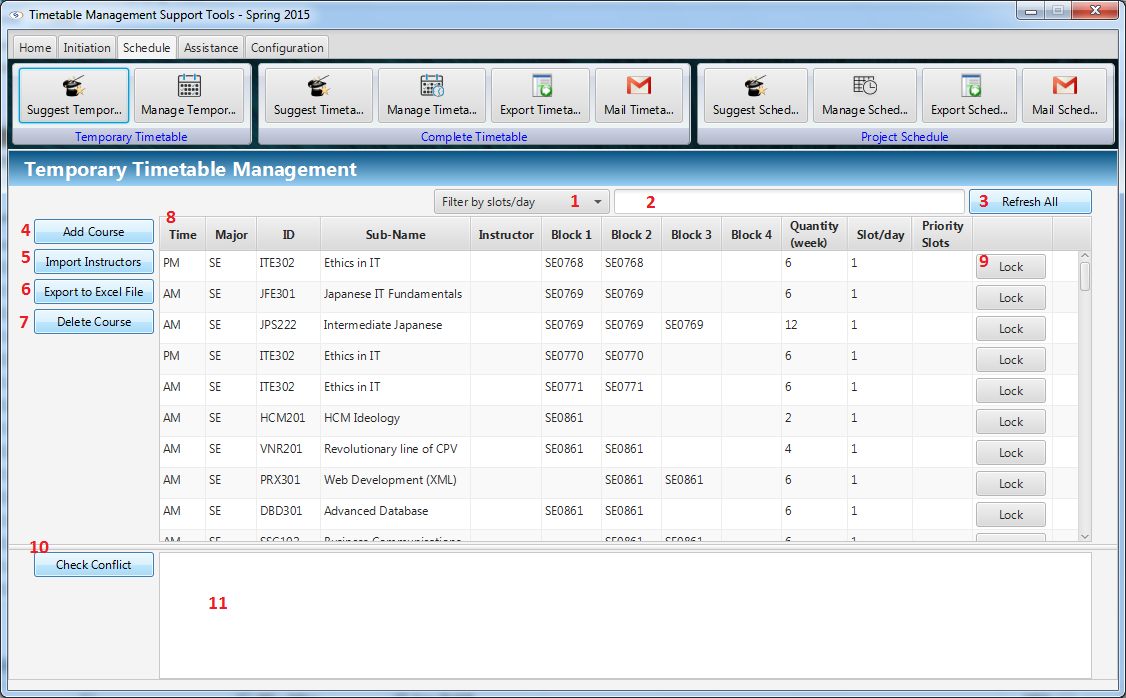


Figure : Manage Temporary Timetable

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Filter | Filter data by slot per date. | Yes | No | Combo Box | String | N/A |
| 2 | Search | Fill search text. | No | No | Text Box | String | N/A |
| 8 | View Table | Display temporary timetable. | Yes | Yes | Table View | String, Integer | N/A |
| 11 | Conflict List View | Display conflict | Yes | No | List View | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 3 | Refresh All | Refresh Filter and Search to show all data of temporary timetable. | N/A | Refresh data presenting on Table View. |
| 4 | Add Course | Go to next step to add new course into temporary timetable | N/A | Open to Add New Course window. |
| 5 | Import Instructors | Go to next step to import instructor list. | N/A | Open File Choosers window to import instructors. |
| 6 | Export To Excel File | Go to next step to export temporary timetable to excel file. | N/A | Open to Export Temporary Timetable window. |
| 7 | Delete Course | Go to next step to delete course which is presented by specific selected row in Table View. | N/A | Show confirm message |
| 9 | Lock | Lock the row contains it to prevent double click (Double click to start Edit Course function). | N/A | Lock the container row. |
| 10 | Check Conflict | Check conflict temporary timetable data. | N/A | Show conflicts in Conflict List View |

#### Add course

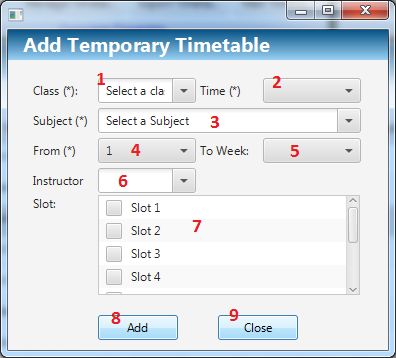


Figure : Add course

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Class | Select class to add | No | Yes | Combo Box | String | N/A |
| 2 | Time | Select AM or PM | No | Yes | Combo Box | String | N/A |
| 3 | Subject | Select Subject to add | No | Yes | Combo Box | String | N/A |
| 4 | From Week | Select Start Week | No | Yes | Combo Box | Integer | N/A |
| 5 | End Week | Display End Week associated with selected End Week and Subject | Yes | Yes | Combo Box | Integer | N/A |
| 6 | Instructor | Select Instructor to add | No | No | Combo Box | String | N/A |
| 7 | Slot List View | Check the priority slots if need. | No | No | Check List View | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 8 | Add | Add new course into system | N/A | Add new course into system and close window |
| 9 | Close | Click to close window | N/A | Close this window |

#### Edit Temporary Timetable

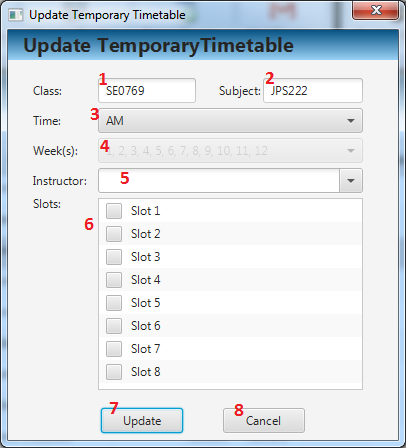
****

Figure : Edit Temporary Timetable

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Class | Select class to edit | No | Yes | Combo Box | String | N/A |
| 2 | Time | Select AM or PM | No | Yes | Combo Box | String | N/A |
| 3 | Subject | Select Subject to edit | No | Yes | Combo Box | String | N/A |
| 4 | From Week | Select assigned weeks | No | Yes | Combo Box | Integer | N/A |
| 5 | Instructor | Select Instructor to edit. | No | No | Combo Box | String | N/A |
| 6 | Slot List View | Check the priority slots if need. | No | No | Check List View | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 7 | Edit | Click to go to next step to edit course | N/A | New course is add to temporary timetable |
| 8 | Cancel | Click to cancel and close window | N/A | Close this window |

#### Export Temporary Timetable



Figure : Export Temporary Timetable

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Url Text Box | Display url path | No | Yes | Text Box | String | N/A |
| 2 | Search | Input search text | No | No | Text Box | String | N/A |
| 3 | Category | Seleck Major to export | No | Yes | Check List View | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 4 | Browse | Click to choose URL path | N/A | URL path is show in URL path text box |
| 5 | Export | Click to export to excel file | N/A | Temporary Timetable is export. |
| 6 | Cancel | Click to cancel and close window | N/A | Close this window |

#### Suggest Complete Timetable

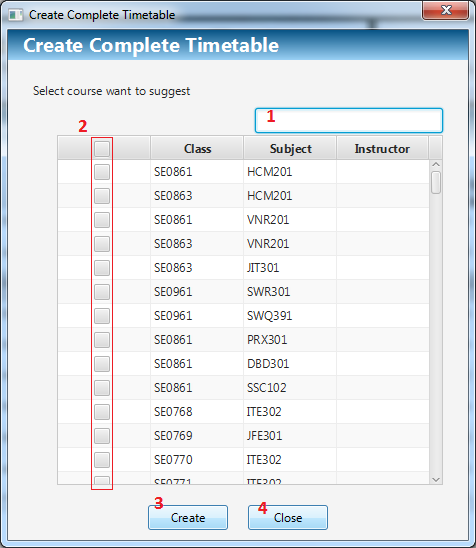


Figure : Suggest Complete Timetable

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Filter | Fill filter | No | No | Textbox | String | N/A |
| 2 | N/A | Choice the course want to suggest complete timetable | No | Yes | Checklist View | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 3 | Create | Suggest complete timetable | N/A | Suggest complete timetable for selected course and close window |
| 4 | Close | Click to close window | N/A | Close this window |

#### Manage Complete Timetable

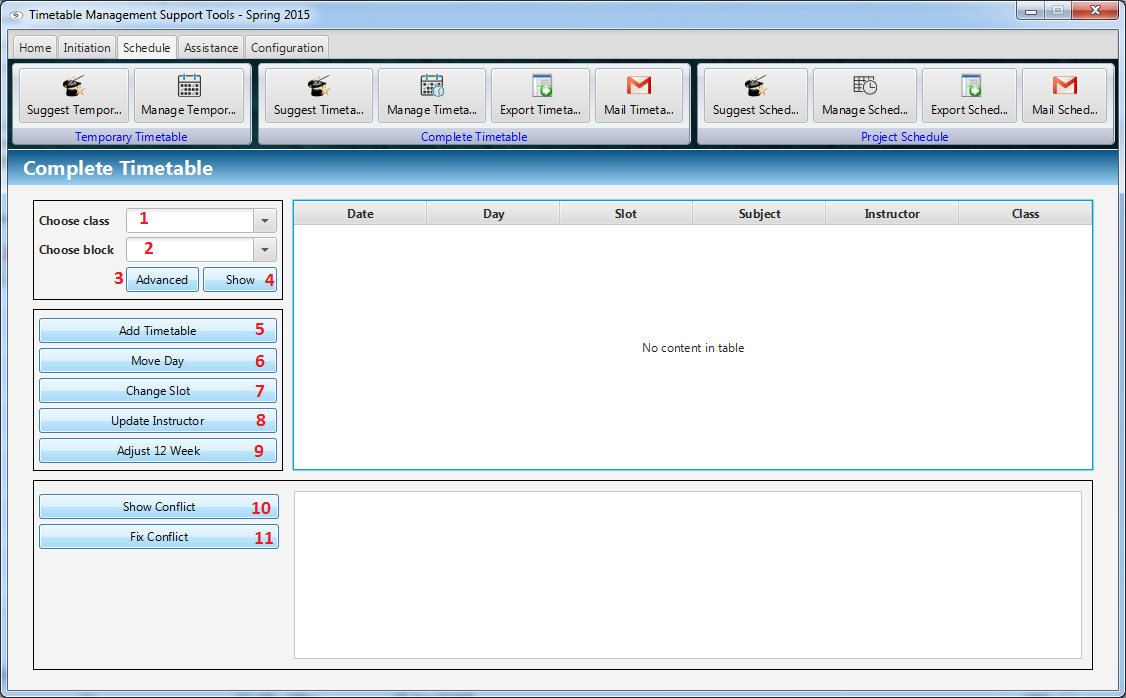


Figure : Manage Complete Timetable

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Choose class | Choice the class want to view complete timetable | No | No | Combo box | String | N/A |
| 2 | Choose block | Choice the block want to view complete timetable | No | Yes | Combo box | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 3 | Advanced | Open search advanced window | N/A | Open search advanced window |
| 4 | Show | Show complete timetable in table view | N/A | Show complete timetable in table view |
| 5 | Add timetable | Open add timetable window | N/A | Open add timetable window |
| 6 | Move Day | Open move day window | N/A | Open move day window |
| 7 | Change Slot | Open change slot window | N/A | Open change slot window |
| 8 | Update Instructor | Open update instructor window | N/A | Open update instructor window |
| 9 | Adjust 12 Weeks | Open adjust 12 weeks window | N/A | Open adjust 12 weeks window |
| 10 | Show Conflict | Show conflict in list view | N/A | Show conflict in list view |
| 11 | Fix Conflict | Depending on conflict type, system open window to fix conflict | N/A | Depending on conflict type, system open window to fix conflict |

#### Add Complete Timetable

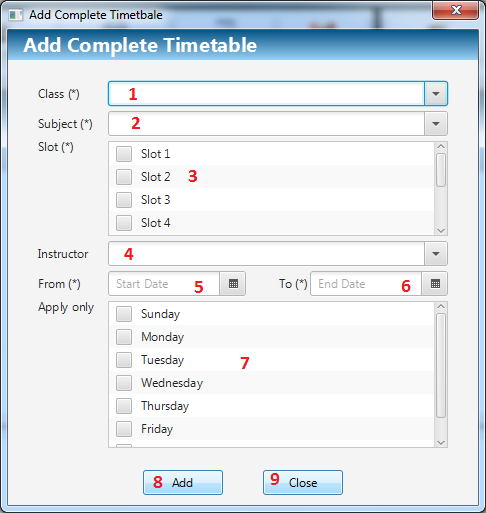


Figure : Add Complete Timetable

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Class | Choice the class | No | Yes | Combo box | String | N/A |
| 2 | Subject | Choice the subject | No | Yes | Combo box | String | N/A |
| 3 | Slot | Choice the slot | No | Yes | Checklist View | Boolean | N/A |
| 4 | Instructor | Choice the instructor | No | No | Combo box | String | N/A |
| 5 | Start Date | Pick start date | No | Yes | Date Picker | Date | N/A |
| 6 | End Date | Pick end date | No | Yes | Date Picker | Date | N/A |
| 7 | Apply only | Choice apply only day in week | No | No | Checklist View | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 8 | Add | Add new complete timetable | N/A | Add new complete timetable and close this window |
| 9 | Close | Click to close window | N/A | Close this window |

#### Change Slot

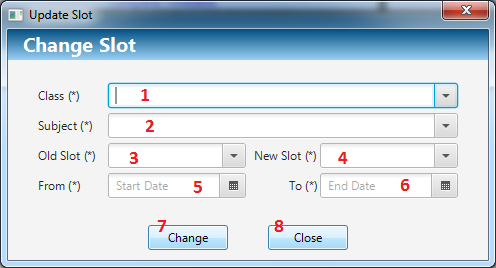


Figure : Change Slot

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Class | Choice the class | No | Yes | Combo box | String | N/A |
| 2 | Subject | Choice the subject | No | Yes | Combo box | String | N/A |
| 3 | Old Slot | Choice the old slot | No | Yes | Combo box | Integer | N/A |
| 4 | New Slot | Choice the new slot | No | Yes | Combo box | Integer | N/A |
| 5 | Start Date | Pick start date | No | Yes | Date Picker | Date | N/A |
| 6 | End Date | Pick end date | No | Yes | Date Picker | Date | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 7 | Change | Change slot of complete timetable from old slot to new slot in start date to end date | N/A | Change slot of complete timetable from old slot to new slot in start date to end date and close this window |
| 8 | Close | Click to close window | N/A | Close this window |

#### Update Instructor

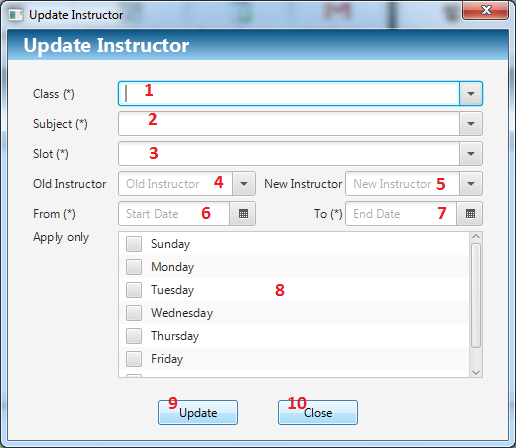


Figure : Update Instructor

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Class | Choice the class | No | Yes | Combo box | String | N/A |
| 2 | Subject | Choice the subject | No | Yes | Combo box | String | N/A |
| 3 | Slot | Choice the slot | No | Yes | Combo box | Integer | N/A |
| 4 | Old Instructor | Choice the old instructor | No | No | Combo box | String | N/A |
| 5 | New Instructor | Choice the new instructor | No | No | Combo box | String | N/A |
| 6 | Start Date | Pick start date | No | Yes | Date Picker | Date | N/A |
| 7 | End Date | Pick end date | No | Yes | Date Picker | Date | N/A |
| 8 | Apply only | Choice apply only day in week | No | No | Checklist View | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 9 | Update | Update instructor from old instructor to new instructor | N/A | Update instructor from old instructor to new instructor and close window |
| 10 | Close | Click to close window | N/A | Close this window |

#### Move Date

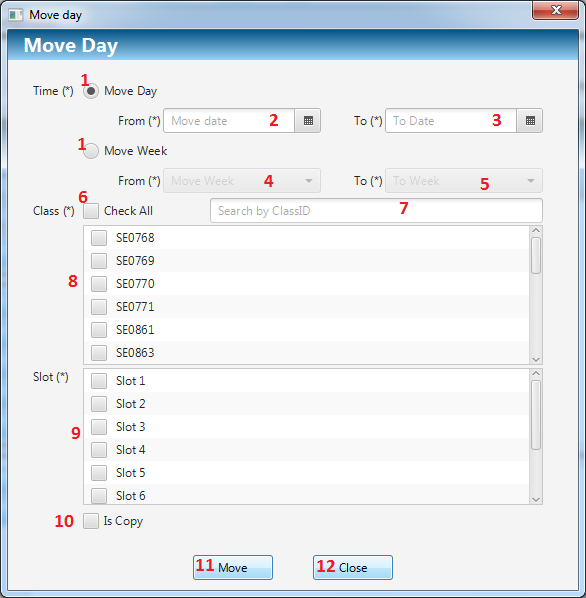


Figure : Move Date

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Time | Choice move mode | No | Yes | Radio button | String | N/A |
| 2 | Start Date | Pick start date | No | Yes | Date Picker | Date | N/A |
| 3 | End Date | Pick end date | No | Yes | Date Picker | Date | N/A |
| 4 | Start Week | Choice start week | No | Yes | Combo box | Integer | N/A |
| 5 | End Week | Choice end week | No | Yes | Combo box | Integer | N/A |
| 6 | Check All | Check all/Uncheck all class | No | No | Date Picker | Date | N/A |
| 7 | Filter | Fill filter to filter data | No | No | Textbox | String | N/A |
| 8 | Class | Choice class | No | Yes | Checklist View | Boolean | N/A |
| 9 | Slot | Choice slot | No | Yes | Checklist View | Boolean | N/A |
| 10 | Is copy | Choice is copy mode | No | No | Checkbox | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 11 | Move | Move complete timetable from start date to end date as well as start week to end week | N/A | Move complete timetable and close this window |
| 12 | Close | Click to close window | N/A | Close this window |

#### Delete Complete Timetable

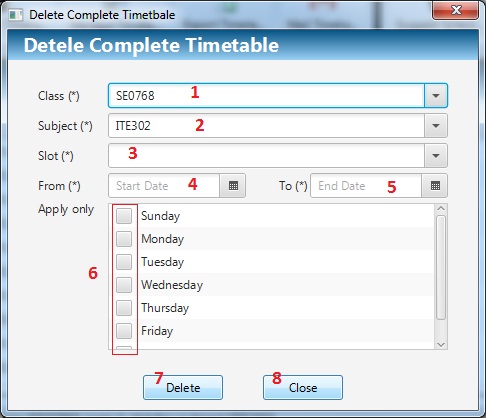


Figure : Delete Complete Timetable

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Class | Choice the class | No | Yes | Combo box | String | N/A |
| 2 | Subject | Choice the subject | No | Yes | Combo box | String | N/A |
| 3 | Slot | Choice the slot | No | Yes | Combo box | Integer | N/A |
| 4 | Start Date | Pick start date | No | Yes | Date Picker | Date | N/A |
| 5 | End Date | Pick end date | No | Yes | Date Picker | Date | N/A |
| 6 | Apply only | Choice apply only day in week | No | No | Checklist View | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Function | Description | Validation | Outcome |
| 7 | Delete | Delete complete timetable which satisfy conditions | N/A | Delete complete timetable which satisfy conditions and close window |
| 8 | Close | Click to close window | N/A | Close this window |

#### Adjust 12 Weeks

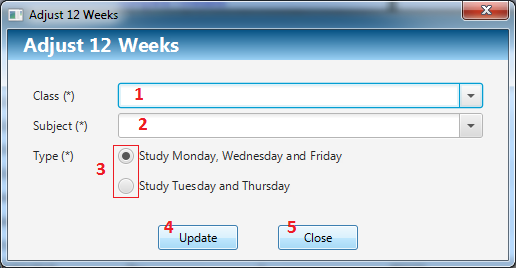


Figure : Adjust 12 Weeks

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **8** | **Close** | **Click to close window** | **N/A** | **Close this window** | **8** | **Close** | **Click to close window** |
| 1 | Class | Choice the class | No | Yes | Combo box | String | N/A |
| 2 | Subject | Choice the subject | No | Yes | Combo box | String | N/A |
| 3 | Type | Choice adjust type | No | Yes | Radio button | Integer | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 4 | Update | Adjust complete timetable for subject 12 weeks | N/A | Adjust complete timetable and close window |
| 5 | Close | Click to close window | N/A | Close this window |

#### Export Complete Timetable

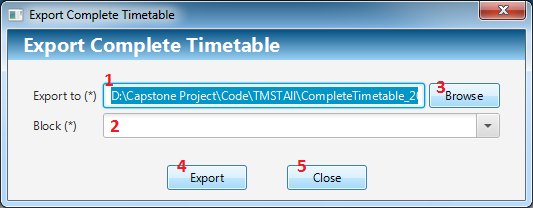


Figure : Export Complete Timetable

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Export to | File path | Yes | Yes | Textbox | String | N/A |
| 2 | Block | Choice the block | No | Yes | Combo box | Integer | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 3 | Browse | Open file chooser window | N/A | Open file chooser window |
| 4 | Export | Export complete timetable to file path | N/A | Export complete timetable and close window |
| 5 | Close | Click to close window | N/A | Close this window |

#### Send Mail (Complete Timetable)

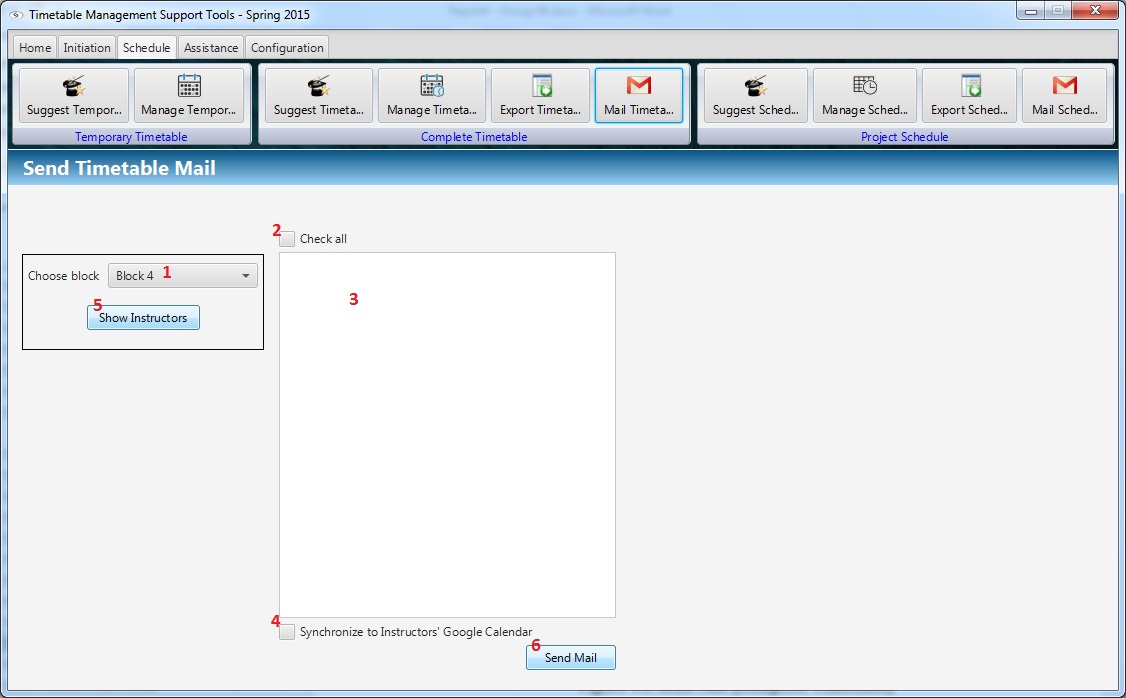


Figure : Send Mail (Complete Timetable)

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Block | Choice the block | No | Yes | Combo box | String | N/A |
| 2 | Check all | Check all instructor in list view | No | No | Check box | Boolean | N/A |
| 3 | List Instructors | View instructors in a block | No | No | Checklist View | String | N/A |
| 4 | Synchronize | Synchronize timetable with Google Calendar | No | No | Check box | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Function | Description | Validation | Outcome |
| 5 | Show Instructors | Show instructors have class in block. | N/A | Show instructors have class in block and checked |
| 6 | Send Mail | Send timetable to instructor’s mail. | N/A | Send timetable to instructor’s mail. Synchronize with Google Calendar if Synchronize check box is selected. |

#### Import Project Group

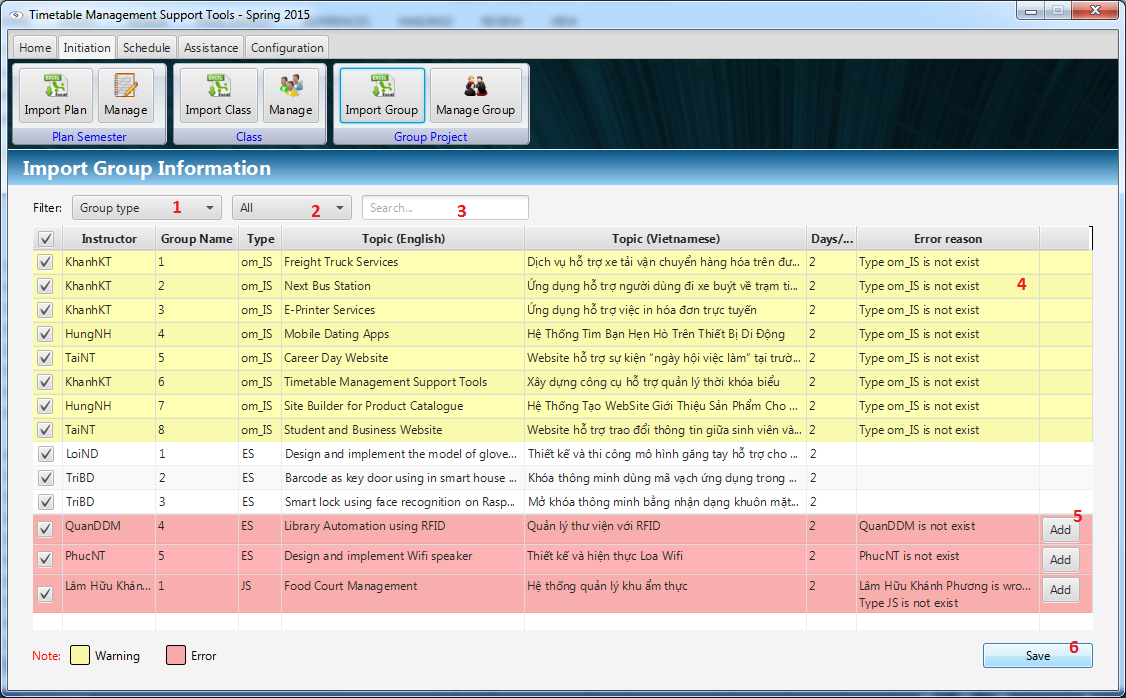


Figure : Import Project Group

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Group Type | Filter by group type | No | No | Combo box | String | N/A |
| 2 | Error | Filter by error row or warning row | No | No | Combo box | String | N/A |
| 3 | Search | Filter by input text | No | No | Text Field | String | N/A |
| 4 | View data | Display parsed data from excel. | Yes | No | Table View | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Function | Description | Validation | Outcome |
| 5 | Add instructor | Add information of an instructor. | N/A | Add information of an instructor if this instructor is not exist in system |
| 6 | Save | Save data from table view to system. | N/A | Save data from table view to system. |

#### Manage Project Group

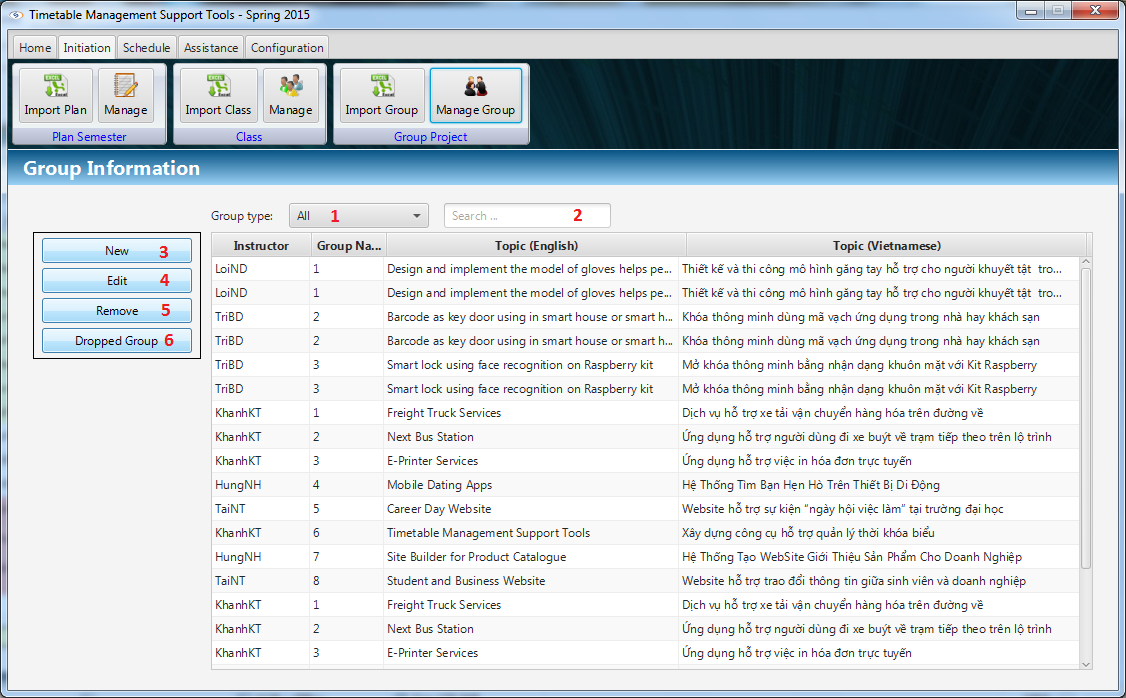


Figure : Manage Project Group

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Group Type | Filter by group type | No | No | Combo box | String | N/A |
| 2 | Search | Filter by input text | No | No | Text Field | String | N/A |
| 3 | View data | Display information of each group on table view | Yes | No | Table View | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Function | Description | Validation | Outcome |
| 4 | New | Add new group | N/A | Add new group to system and show on table view. |
| 5 | Edit | Update new information of selected group. | N/A | Update new information of selected group. |
| 6 | Remove | Remove selected group on table view. | N/A | Remove selected group on table view. |
| 7 | Dropped Group | Set date drop for group has been dropped. | N/A | Set date drop for group has been dropped and remove schedules after date drop. |

#### Suggest Project Schedule

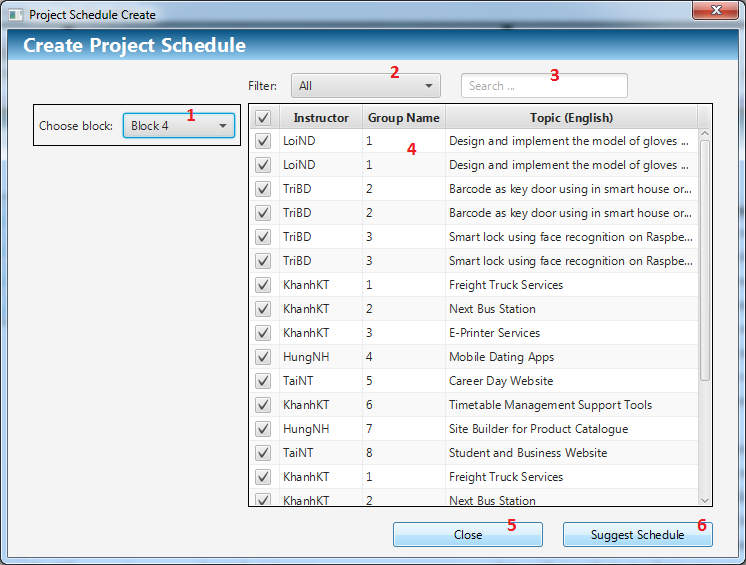


Figure : Suggest Project Schedule

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Block | Choice the block | No | Yes | Combo box | String | N/A |
| 2 | Group Type | Filter by group type | No | No | Combo box | String | N/A |
| 3 | Search | Filter by input text | No | No | Text Field | String | N/A |
| 4 | View data | Display list groups of that semester with checkbox. | Yes | Yes | Table View | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Function | Description | Validation | Outcome |
| 5 | Close | Click to close window | N/A | Close this window. |
| 6 | Suggest Schedule | Suggest schedule. | N/A | Suggest schedule for selected groups and close window. |

#### Manage Project Schedule

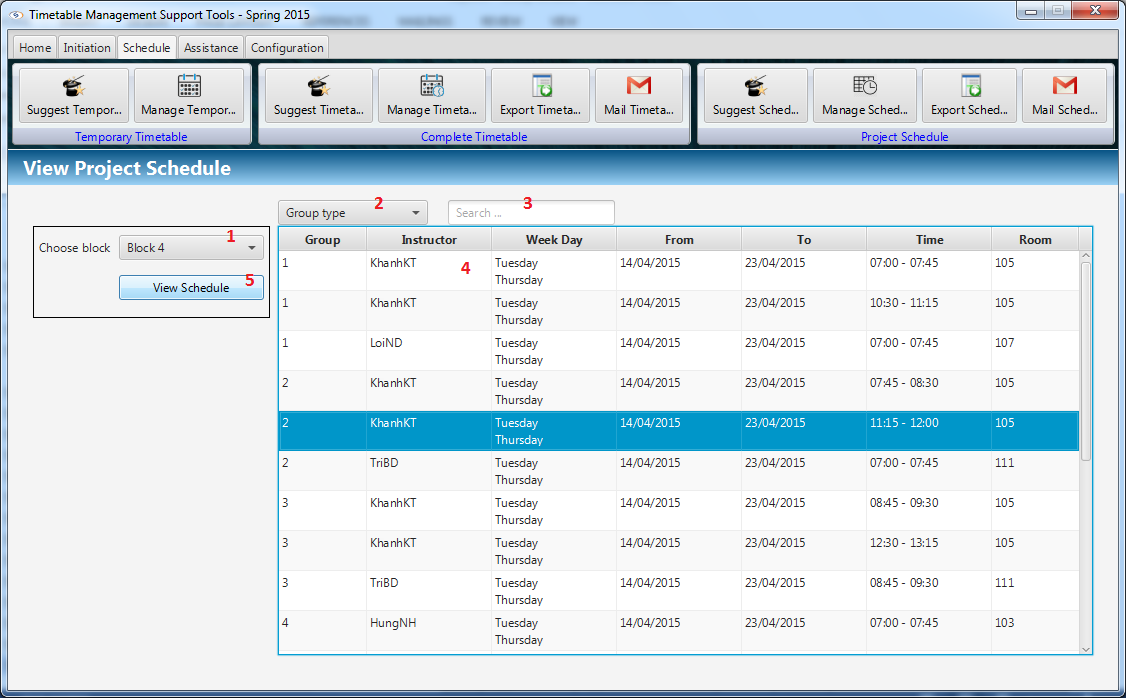


Figure : Manage Project Schedule

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Block | Choice the block | No | Yes | Combo box | String | N/A |
| 2 | Group Type | Filter by group type | No | No | Combo box | String | N/A |
| 3 | Search | Filter by input text | No | No | Text Field | String | N/A |
| 4 | View data | Display schedule of each group. | Yes | No | Table View | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Function | Description | Validation | Outcome |
| 5 | View Schedule | Show project schedule on table view. | N/A | Show project schedule on table view. |

#### Send mail (Project Schedule)

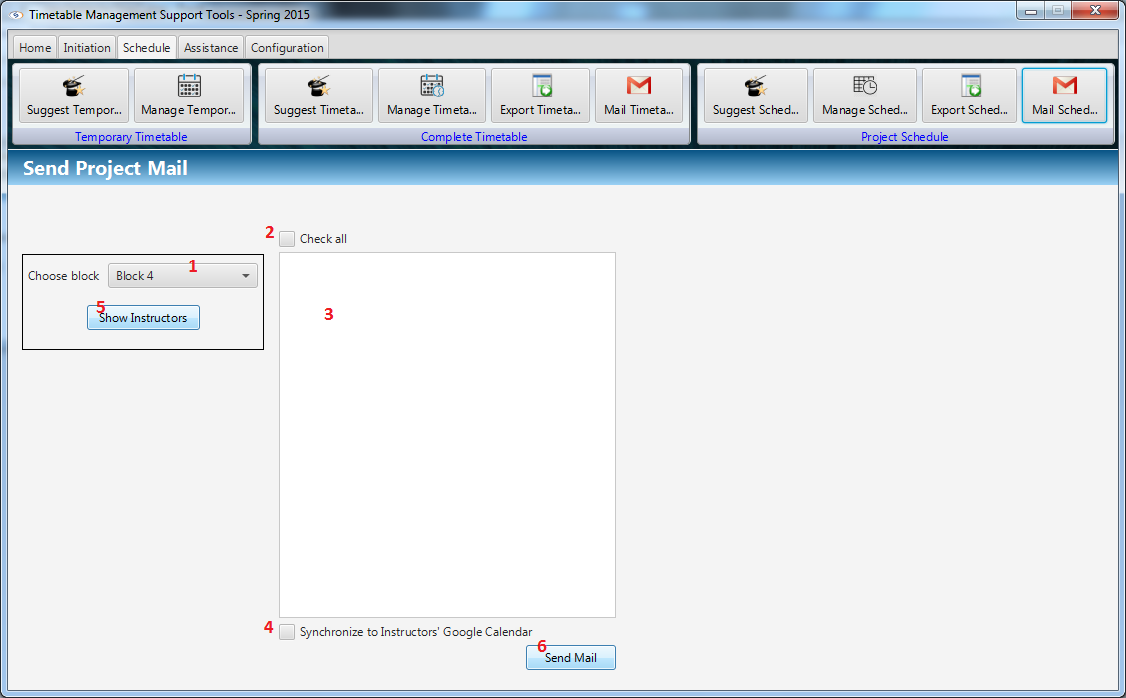


Figure : Send mail (Project Schedule)

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Block | Choice the block | No | Yes | Combo box | String | N/A |
| 2 | Check all | Check all instructor in list view | No | No | Check box | Boolean | N/A |
| 3 | List Instructors | View instructors in a block | No | No | Checklist View | String | N/A |
| 4 | Synchronize | Synchronize schedule with Google Calendar | No | No | Check box | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Function | Description | Validation | Outcome |
| 5 | Show Instructors | Show instructors have class in block. | N/A | Show instructors have class in block and checked |
| 6 | Send Mail | Send timetable to instructor’s mail. | N/A | Send schedule to instructor’s mail. Synchronize with Google Calendar if Synchronize check box is selected. |

#### Export Project Schedule

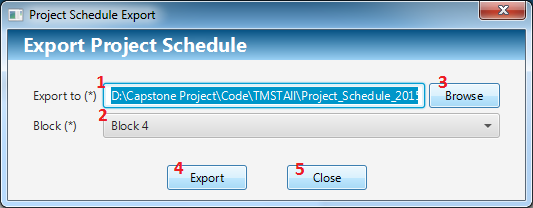


Figure : Export Project Schedule

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | File Path | View location of file to export | Yes | Yes | Text Field | String | N/A |
| 2 | Block | Choice the block | No | Yes | Combo box | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Function | Description | Validation | Outcome |
| 3 | Browse | Open save dialog to choose location to save file. | N/A | Open save dialog to choose location to save file. View file path on text field File Path. |
| 4 | Export | Export data to excel file. | N/A | Export data to excel file on file path. |
| 5 | Close | Click to close window | N/A | Close this window. |

#### Calculate Timekeeping

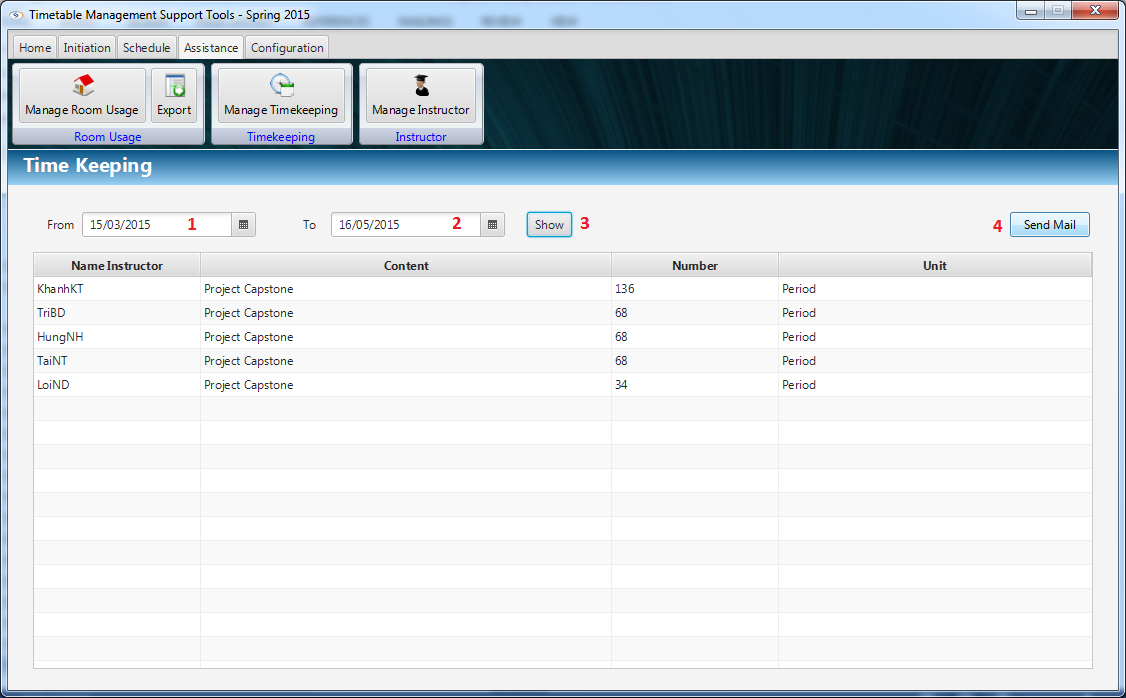


Figure : Calculate Timekeeping

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | From Date | Start time of timekeeping for calculating. | No | Yes | Date Picker | Date | N/A |
| 2 | To Date | End time of timekeeping for calculating. | No | Yes | Date Picker | Date | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 3 | Show | Calculate the timekeeping with values from date pickers. | N/A | Data will be shown in table |
| 4 | Send Mail | Send timekeeping mail to instructors | N/A | Navigate to Send Mail Dialog |

#### Send Timekeeping

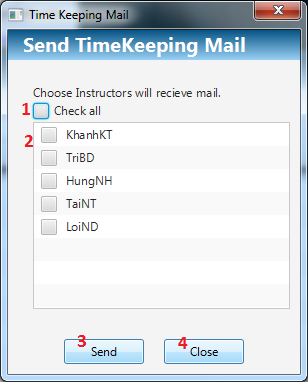


Figure : Send Timekeeping

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Check all | Select all instructor | No | Yes | Checkbox | Boolean | N/A |
| 2 | Instructor | Select who will received timekeeping mail | No | Yes | Checklist View | Boolean | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 3 | Send | Send timekeeping mail to instructors | N/A | Windows will be closed |
| 4 | Close | Close the windows | N/A | Windows will be closed |

#### View Room Usage

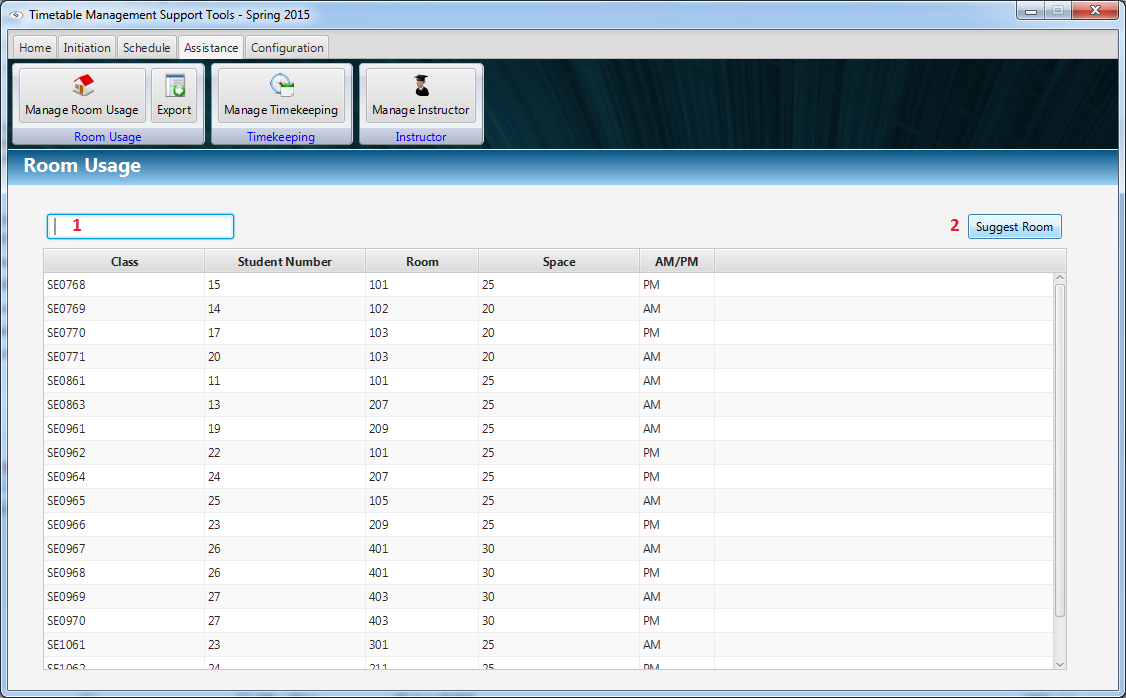


Figure : View Room Usage

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Filter field | Filter data by rooms or classes | No | No | Textbox | String | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 2 | Suggest Room | Suggest rooms for user | N/A | Result of suggestion was shown |

#### Export Room Usage



Figure : Export Room Usage

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field**  **Name** | **Description** | **Read**  **only** | **Mandatory** | **Control**  **Type** | **Data**  **Type** | **Length** |
| 1 | Export to | Location to export room usage excel file | Yes | Yes | Textbox | String | N/A |
| 3 | From Date | Start time of room usage for export. | No | Yes | Date Picker | Date | N/A |
| 4 | To Date | End time of room usage for export. | No | Yes | Date Picker | Date | N/A |

**Buttons**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 2 | Browse | Suggest rooms for user | N/A | Open file chooser window |
| 5 | Export | Export excel file | N/A | Export file to specific location |
| 6 | Close | Close the windows | N/A | Windows will be closed |

## Database Design

### Logical Diagram

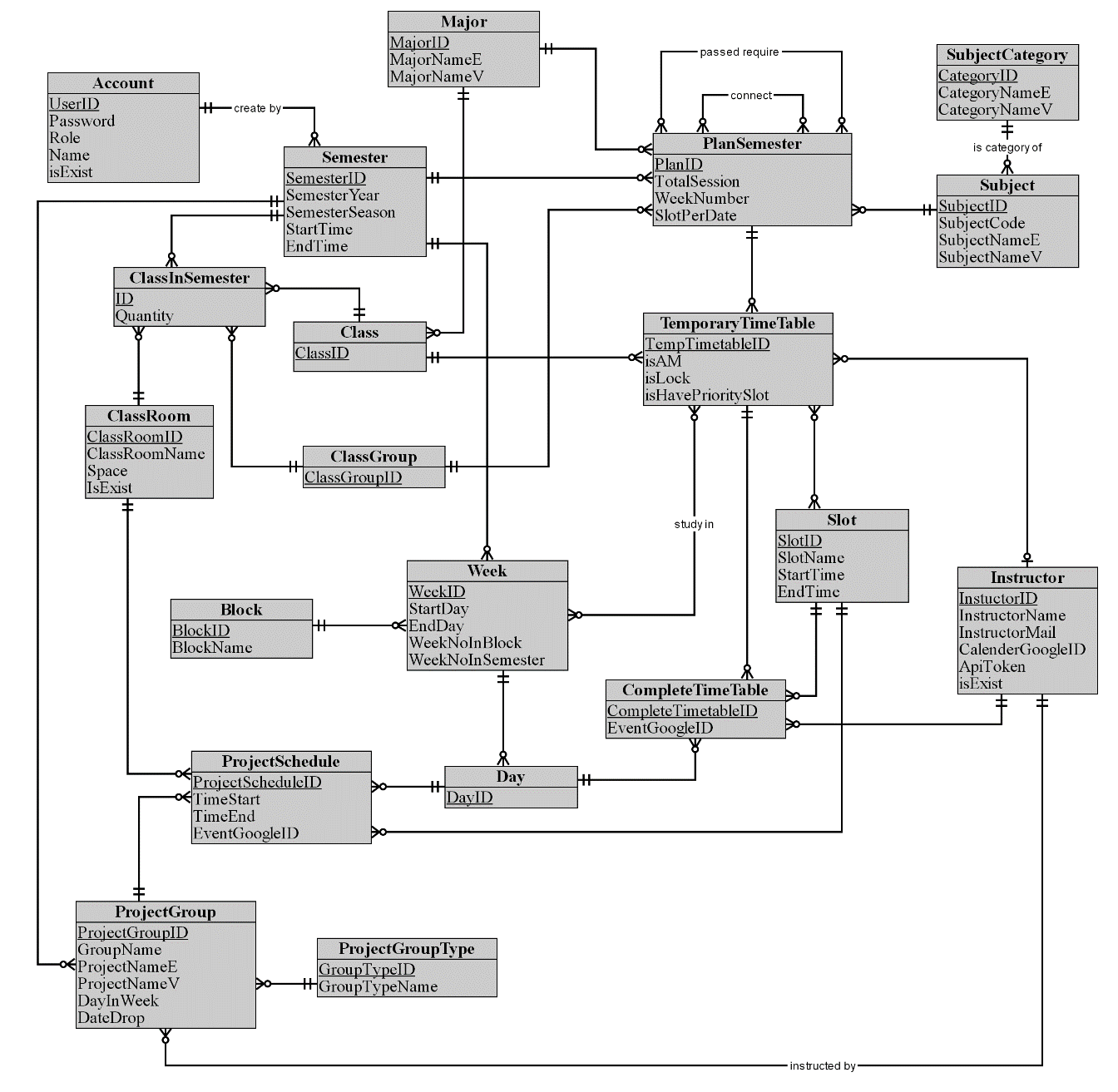


Figure : Logical Diagram

### Data Dictionary

|  |  |
| --- | --- |
| **Entity dictionary** | |
| **Entity Name** | **Description** |
| Account | Describe all user of the system. Each user has only one account. |
| Semester | Describe the semesters of FPT University, each semester at FPT University is about 4 months. |
| ClassRoom | Describe the rooms of FPT University which can be used for teaching. |
| Class | Describe the classes in FPT University. Each class is a set of students who have same courses. |
| ClassInSemester | Describe the specific class in a specific semester. |
| ClassGroup | Describe the sets of class in FPT University have the same plan in a semester. |
| Major | Describe the sets of class in FPT University have the same major. |
| Slot | Describe the slot in FPT University. Each slot is 90 minutes. |
| Day | Describe the official day in FPT University’s curriculum. Each day has 8 slots. |
| Week | Describe the week in FPT University’s curriculum. |
| Block | Describe the sets of weeks defined by FPT University. |
| Subject | Describe all available subject in FPT University. |
| SubjectCategory | Describe the sets of Subject. |
| PlanSemester | Describe the specific subjects which are available for each class group in a specific semester. Each semester has many plan semesters. |
| Instructor | Describe all instructors in FPT University. |
| CompletedTimetable | Describe the timetable in FPT University. Each timetable is about a set of answers for these question: which class has which subjects, teaching by who (instructor), at which specific period? |
| TemporaryTimetable | Describe the timetable in a brief description way. |
| ProjectGroup | Describe the set of students who is doing Capstone Project and Graduation Thesis. |
| ProjectGroupType | Describe the type of project group. |
| ProjectSchedule | Describe the time for meeting of project groups with their Instructor. |

Table : Entity Data Dictionary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity name** | **Attributes** | **Description** | **Domain** | **Null** |
| Account | UserID {PK} | Account username | String, length: 50 | No |
| Password | Account password | String, length: 50 | No |
| Role | Unique identifier of a role (1: Admin, 2: Staff) | Integer | No |
| Name | Account username | Unicode String, length: 50 | No |
| isExist | Account status | Boolean | No |
| Semester | SemesterID {PK} | Unique identifier of a semester, auto increment | Integer | No |
| SemesterYear | Semester Year | Integer | No |
| SemesterSeason | Semester Season (Spring, Summer, Fall) | String, length: 30 | No |
| StartTime | The start date of semester | Date | No |
| EndTime | The end date of semester | Date | No |
| SubjectCategory | CategoryID {PK} | Unique identifier of a subject category | String, length: 10 | No |
| CategoryNameE | Subject category in English | String, length: 50 | No |
| CategoryNameV | Subject category in Vietnamese | Unicode String, length: 50 | No |
| Subject | SubjectCode {PK} | Unique identifier of a subject | String, length: 50 | No |
| SubjectNameE | Subject in Vietnamese | String, length: 100 | No |
| SubjectNameV | Subject in Vietnamese | Unicode String, length: 100 | No |
| PlanSemester | PlanID {PK} | Unique identifier of a plan, auto  increment | Integer | No |
| TotalSession | Total session of this plan | Integer | No |
| WeekNumber | Week number of plan in semester | Integer | No |
| SlotPerDate | Number of slot per date of plan | Integer | No |
| Major | MajorID {PK} | Unique identifier of a major, auto  increment | Unicode String, length: 10 | No |
| MajorNameE | Major in English | String, length: 100 | No |
| MajorNameV | Major in Vietnamese | Unicode String, length: 100 | No |
| ClassGroup | ClassGroupID {PK} | Unique identifier of a class group | String, length: 20 | No |
| Class | ClassID {PK} | Name of class, unique identifier | String, length: 10 | No |
| ClassInSemester | ID {PK} | Unique identifier, auto  increment | Integer | No |
| Quantity | Number of student of class in this semester | Integer | No |
| ClassRoom | ClassRoomID {PK} | Unique identifier of a classroom, auto  increment | Integer | No |
| ClassRoomName | Name of classroom | Unicode String, length: 30 | No |
| Space | Room space | Integer | No |
| IsExist | Classroom status | Boolean | No |
| TemporaryTimeTable | TempTimetableID {PK} | Unique identifier of a course, auto  Increment | Integer | No |
| isAM | Identity the course study in AM or PM | Boolean | No |
| isLock | Identity if the course is locked. If the course is lock, no action affect it. | Boolean | No |
| isHavePrioritySlot | Identity if the course have priority slot. | Boolean | No |
| Slot | SlotID {PK} | Unique identifier of a slot | Integer | No |
| SlotName | Slot name | String, length: 10 | No |
| StartTime | Start time of the slot | Time, length: 7 | No |
| EndTime | End time of the slot | Time, length: 7 | No |
| Instructor | InstuctorID {PK} | Unique identifier of an instructor | String, length: 30 | No |
| InstructorName | Name of instructor | Unicode String, length: 50 | No |
| InstructorMail | Mail of instructor | String, length: 100 | No |
| CalenderGoogleID | Calendar ID in Google calendar | String, length: 100 | Yes |
| ApiToken | Access token to synchronize Google calendar | String, length: 100 | Yes |
| isExist | Instructor status | Boolean | No |
| Block | BlockID {PK} | Unique identifier of a block | Integer | No |
| BlockName | Block name | String, length: 10 | No |
| Week | WeekID {PK} | Unique identifier of a week, auto  increment | Integer | No |
| StartDay | The start date of this week | Date | No |
| EndDay | The end date of this week | Date | No |
| WeekNoInBlock | Ordinal numbers of week in a block | Integer | No |
| WeekNoInSemester | Ordinal numbers of week in the semester | Integer | No |
| Day | DayID {PK} | Unique identifier of a date | Date | No |
| CompleteTimeTable | CompleteTimetableID {PK} | Unique identifier of a complete timetable, auto  increment | Integer | No |
| EventGoogleID | The Google event ID in Google calendar | String, length: 100 | Yes |
| ProjectGroupType | GroupTypeID {PK} | Unique identifier of a project group type | String, length: 5 | No |
| GroupTypeName | Group type name | String, length: 30 | No |
| ProjectGroup | ProjectGroupID {PK} | Unique identifier of a group, auto  increment | Integer | No |
| GroupName | Name of group | Unicode String, length: 30 | No |
| ProjectNameE | Project topic in English | String, length: 200 | No |
| ProjectNameV | Project topic in Vietnamese | Unicode String, length: 200 | No |
| DayInWeek | Number of date per week which instructor has meeting with students | Integer | No |
| DateDrop | The drop date of the group | Date | Yes |
| ProjectSchedule | ProjectScheduleID {PK} | Unique identifier of a projects schedule, auto  increment | Integer | No |
| TimeStart | The start time of meeting | Time, length: 7 | No |
| TimeEnd | The end time of meeting | Time, length: 7 | No |
| EventGoogleID | The Google event ID in Google calendar | String, length: 100 | Yes |

Table : Detail Data Dictionary

## Algorithms

### Suggest Temporary Timetable

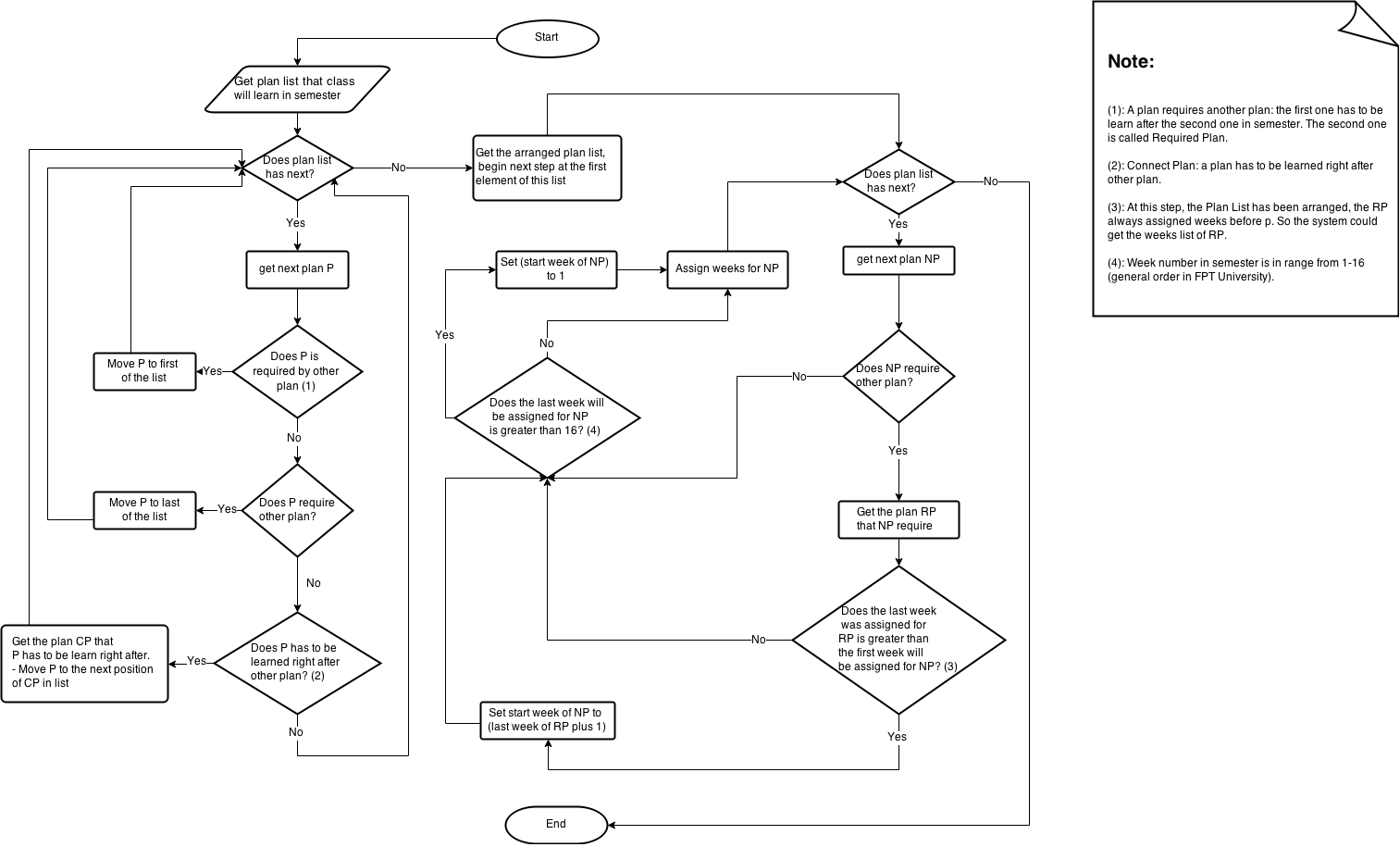


Figure : Suggest Temporary Timetable

### Suggest Complete Timetable

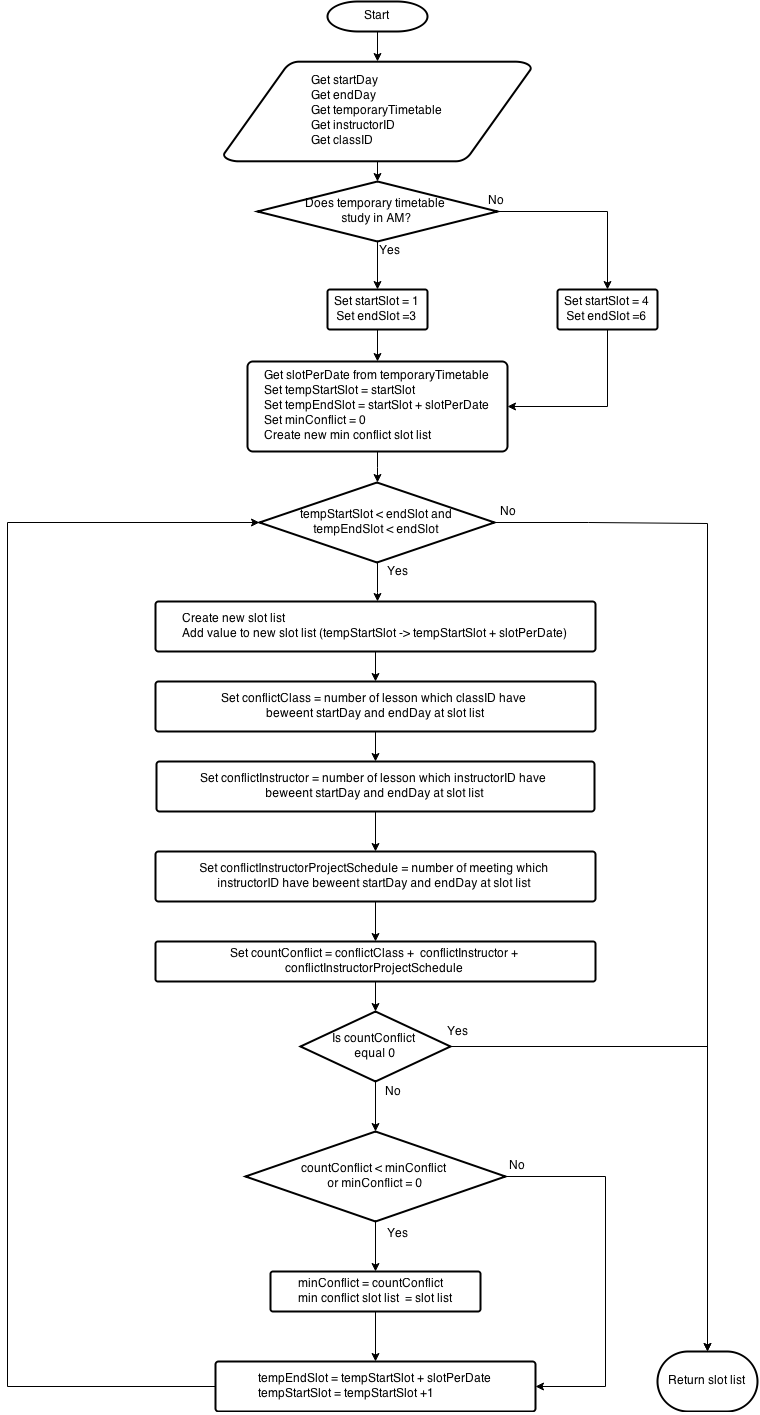


Figure : Suggest Complete Timetable

### Choose Slot

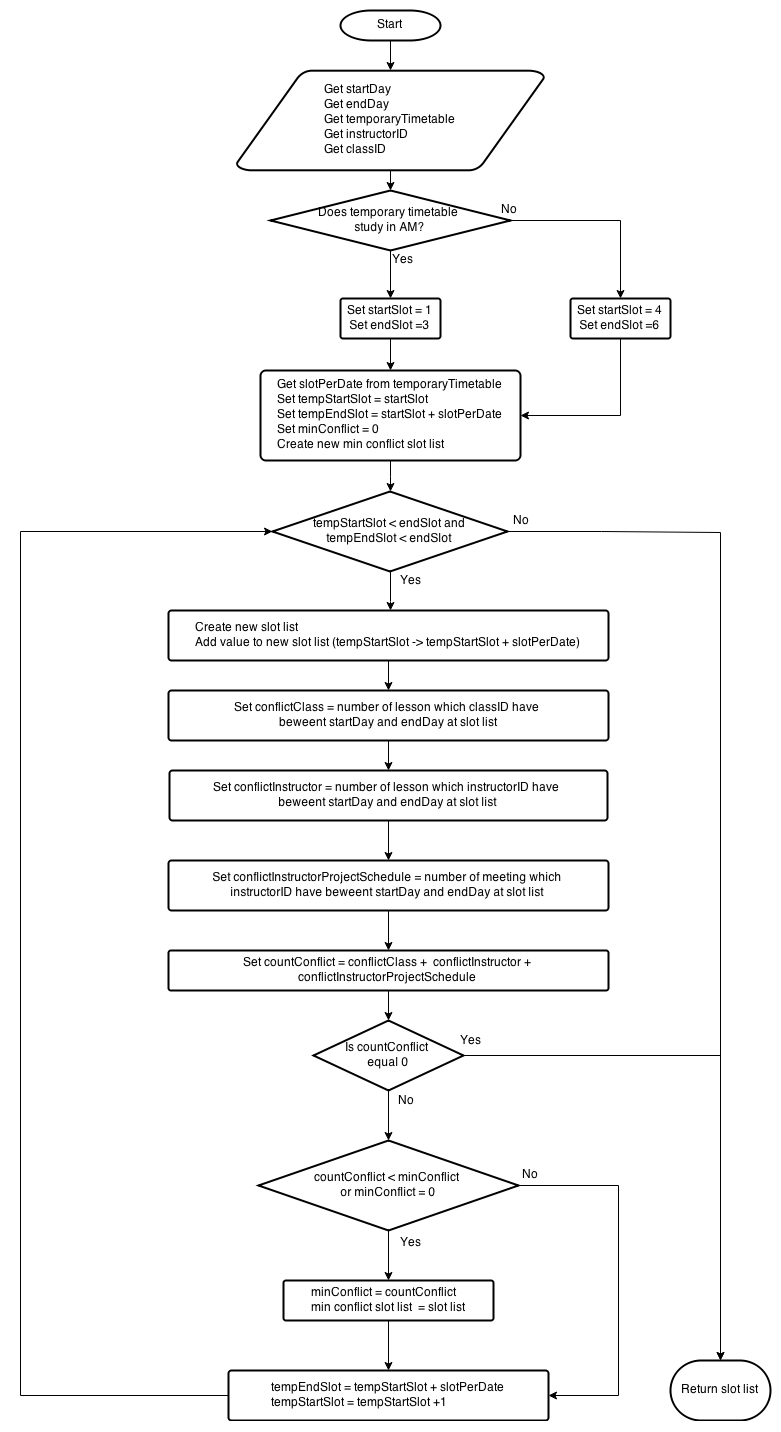


Figure : Choose Slot

### Suggest Room

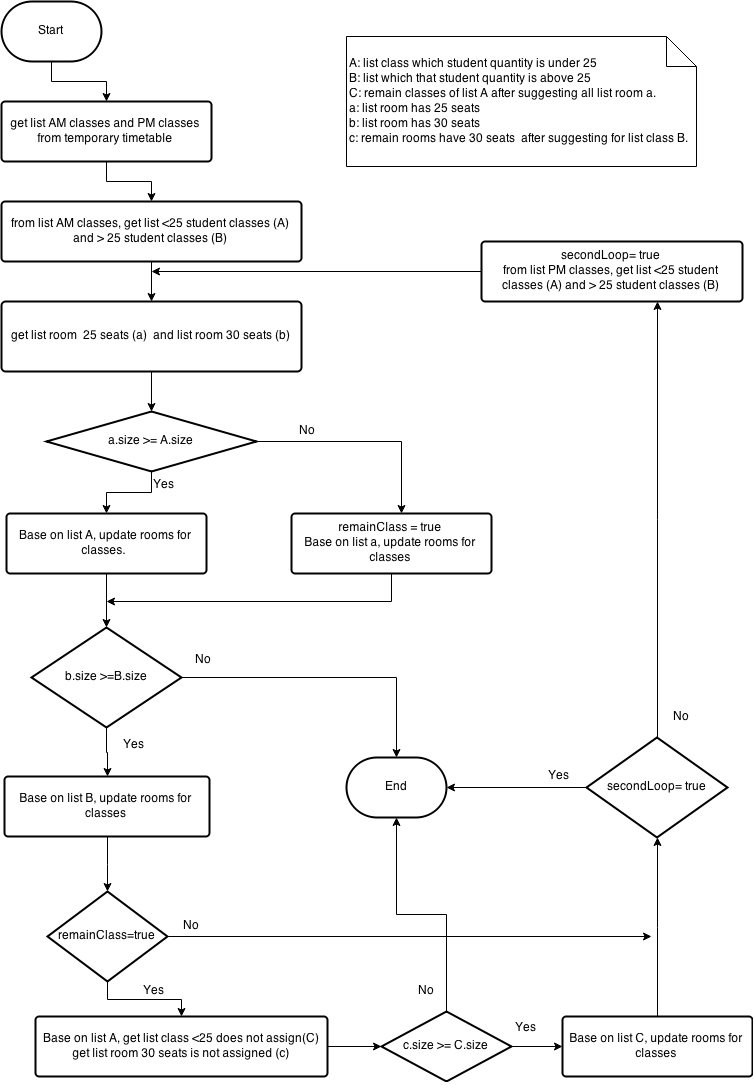


Figure : Suggest Room

### Suggest Guide Project Schedule

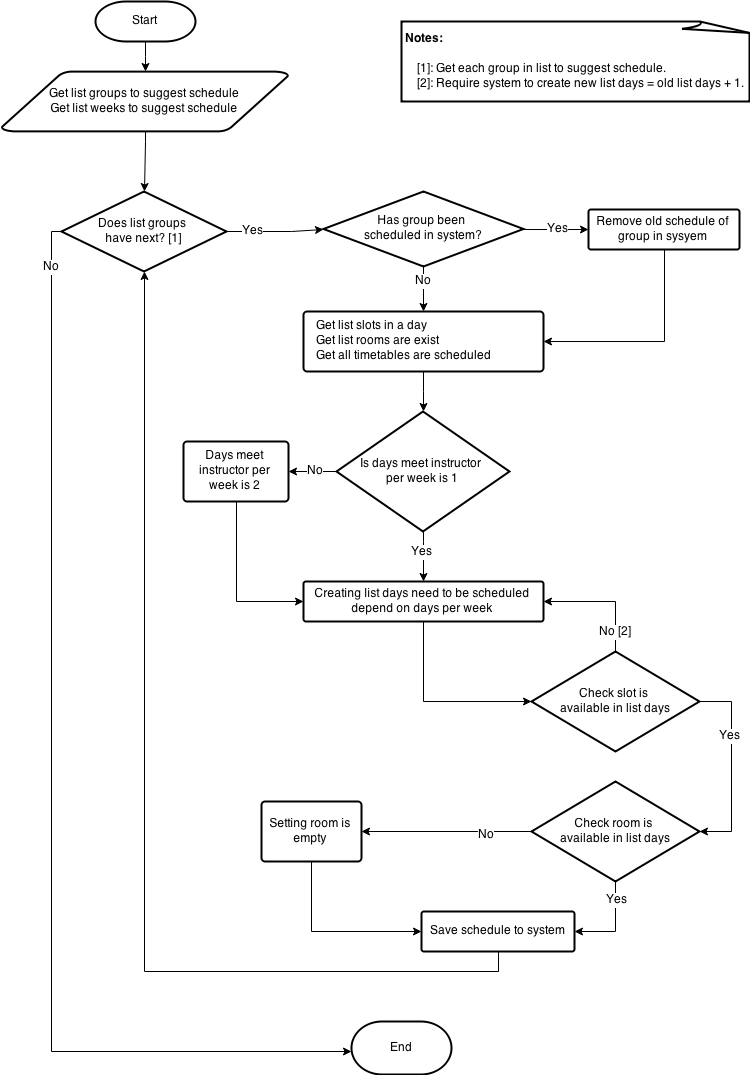


Figure : Suggest Guide Project Schedule