

## **FIL Project Management System**

### Implementation Report

Team: Team 4

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## 1. Introduction

The **Frugal Innovation Lab** at Santa Clara University provides opportunities for students and faculty to partner with industry clients and non-profit organizations to develop new low-cost products and technologies for emerging markets.

This project management system would be used by students, faculty members, and staff who are undertaking the initiation of a project through FIL with a field-based partner. The application will allow for team members to create timelines (with dependencies), delegate tasks to a particular member, generate and track budgets, record communications with partners, etc. The aim of this application is to assist with the execution of successful projects.

### Functionalities/Information to be queried:

- Create teams of people with specific roles (Student, Faculty Advisor, Manager, or Partner). Contact information required (e-mails hyperlinked, if possible) each team shares an account in the system.
- Project Description (Long Text) with thematic tags. Each project has a status associated with it.
- Project Desired Outcome (Short Text) – Metrics for Success
- Visual timeline of project deliverables with inputs for specific dates and the flexibility to visually scale (if timeline is 1 year long, allow to zoom/scroll to see all).
- List of tasks/deliverables, assigned to the timeline by date and delegated to a specific team member.
  - If a task has a dependency on another team mate/external partner, indicate it next to the task.
- Simple spreadsheet/grid for inputs of a basic budget, with projected and actual transaction details. (15 rows and 4 columns)
- A grid to store communications with partner. For example, their name, date, when the communication took place, a summary of the details.
- A mechanism to query the database by team and project.
  - If a team member's name is queried, a list of their tasks is displayed.
  - If a project is queried, the names of the team members, project description and current status of the project are displayed.

## **2. Project Design**

We created a desktop application fulfilling all the functionalities required by the client. The MVC model is utilized to separate front end user to back end database. We implemented the project based on this architecture in four phases:

- a) Database (Mysql)
- b) UML Diagram and entity classes
- c) Data Access Object (Service and Implementation)
- d) User Interface Design

We created an application that allows user to perform several functionalities as mentioned below. The system provides a signup page to be added into the system. User is divided into normal users within the organization (members, admin)

Admin can use the system to:

- Log In.
- View Profile
- Create new project.
- View/ Update Projects.
- View/ Add other team members in the chosen project.
- View/ Add Communication.
- View/ Add/ Edit Tasks to the members for respective projects.
- View Timeline of the project.
- Search project.
- Log Out.

Partners have less functionality than normal users. They can use the system to:

- Log In.
- View own Projects.
- Log Out.

### **3. Database**

We used MySQL database for the application. It gets updated as user makes changes in the application forms. The following are the database tables used:

\*\*\*\*\*projectinformation\*\*\*\*\*

```
create table project(  
    project_id int NOT NULL AUTO_INCREMENT,  
    project_name varchar(50),  
    project_descr varchar(255),  
    status varchar(30),  
    category varchar(30),  
    desired_outcome varchar(255),  
    start_date DATETIME,  
    end_date DATETIME,  
    PRIMARY KEY (project_id));
```

\*\*\*\*\*Budget Table\*\*\*\*\*

```
create table budget(  
    budget_id int NOT NULL AUTO_INCREMENT,  
    project_id int  
    equipment_name varchar(30),  
    link varchar(50),  
    estimated_cost varchar(50),  
    projected_cost varchar(50),  
    PRIMARY KEY (budget_id),  
    FOREIGN KEY (project_id) REFERENCES project(project_id));
```

\*\*\*\*\*TaskTable\*\*\*\*\*

```
create table task(  
    task_id int NOT NULL AUTO_INCREMENT,  
    user_id varchar(30),
```

```
project_id int,  
task_descr varchar(255),  
start_date DATETIME,  
end_date DATETIME,  
PRIMARY KEY (task_id),  
FOREIGN KEY (project_id) REFERENCES project(project_id),  
FOREIGN KEY (user_id) REFERENCES user(user_id));
```

\*\*\*\*\*UserInfo Table\*\*\*\*\*

```
create table user(
```

```
user_id varchar(30) NOT NULL,
```

```
name varchar(100),
```

```
email varchar(50),
```

```
password varchar(100),
```

```
Primary key (user_id));
```

\*\*\*\*\*role\*\*\*\*\*

```
create table role(
```

```
role_id int NOT NULL AUTO_INCREMENT,
```

```
user_id varchar(30),
```

```
project_id int,
```

```
role varchar(50),
```

```
FOREIGN KEY (user_id) REFERENCES user(user_id),
```

```
FOREIGN KEY (project_id) REFERENCES project(project_id),
```

```
PRIMARY KEY (role_id));
```

\*\*\*\*\*UserRole\*\*\*\*\*

```
create table userRoleTask(
```

```
id int NOT NULL AUTO_INCREMENT,
```

```
user_id varchar(30),
```

```
project_id int,
```

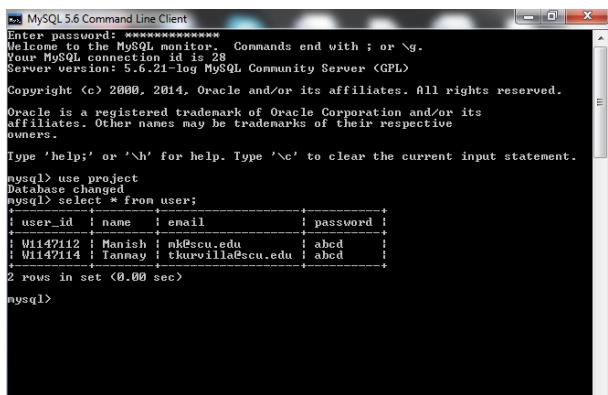
```

task_id int,
role_id int,
FOREIGN KEY (user_id) REFERENCES user(user_id)

FOREIGN KEY (project_id) REFERENCES project(project_id),
FOREIGN KEY (task_id) REFERENCES task(task_id),
FOREIGN KEY (role_id) REFERENCES role(role_id),
PRIMARY KEY (id));

```

User table:



```

MySQL 5.6 Command Line Client
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 28
Server version: 5.6.21-log MySQL Community Server (GPL)

Copyright (c) 2000, 2014, Oracle and/or its affiliates. All rights reserved.
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use project
Database changed
mysql> select * from user;
+-----+-----+-----+-----+
| user_id | name | email | password |
+-----+-----+-----+-----+
| 01147112 | Manish | mk@scu.edu | abcd |
| 01147114 | Tannay | tkusvilla@scu.edu | abcd |
+-----+-----+-----+-----+
2 rows in set <0.00 sec>

mysql>

```

Project table,task table and role table



```

MySQL 5.6 Command Line Client
mysql> select * from project;
+-----+-----+-----+-----+-----+
| project_id | project_name | project_descr | start_date | end_date | status |
+-----+-----+-----+-----+-----+
| 1 | Research | Latest Nuclear Technology Development | NULL | NULL | Complete |
| 2 | Software | New Compiler Creation | 2014-12-01 00:00:00 | 2014-12-31 00:00:00 | Complete |
| 3 | More User Friendly | More User Friendly | 2014-12-01 00:00:00 | 2014-12-31 00:00:00 | Complete |
| 4 | Mobile App | Android App | 2014-12-01 00:00:00 | 2014-12-14 00:00:00 | New |
+-----+-----+-----+-----+-----+
3 rows in set <0.00 sec>

mysql> select * from task;
+-----+-----+-----+-----+-----+
| task_id | user_id | project_id | task_descr | start_date | end_date |
+-----+-----+-----+-----+-----+
| 1 | 01147112 | 1 | Advance DB | 2014-11-23 00:00:00 | 2014-12-10 00:00:00 |
| 2 | 01147114 | 1 | Web Design | 2014-11-26 00:00:00 | 2014-12-08 00:00:00 |
| 3 | 01147114 | 2 | Design | 2014-11-23 00:00:00 | 2014-12-01 00:00:00 |
+-----+-----+-----+-----+-----+
3 rows in set <0.00 sec>

mysql> select * from role;
+-----+-----+-----+-----+
| role_id | user_id | project_id | role |
+-----+-----+-----+-----+
| 1 | 01147112 | 1 | admin |
| 2 | 01147114 | 1 | student |
+-----+-----+-----+-----+
2 rows in set <0.00 sec>

mysql> -

```

## Budget table, communication table

```
MySQL 5.6 Command Line Client

mysql> select * from budget;
+-----+-----+-----+-----+
| budget_id | project_id | equipment_name | link | estimate |
|-----+-----+-----+-----+
| 1 | 600 | Apache Server | www.google.com/Apache | 550 |
| 2 | 1 | Orcale Database | www.oracle.com/database | 300 |
| 3 | 500 | Emulation Device | google.com | 2000 |
| 4 | 1000 | | | |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

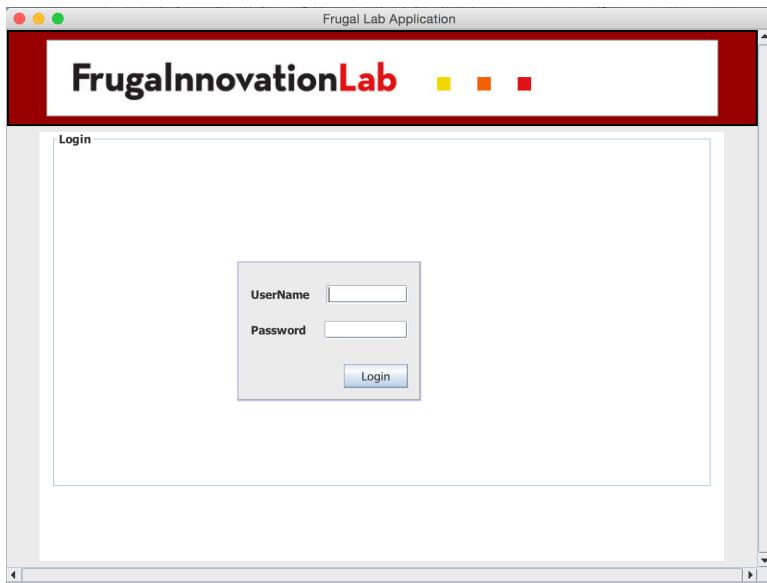
mysql> select * from communication;
+-----+-----+-----+-----+
| id | sender_id | subject | receiver_id | message_body |
|-----+-----+-----+-----+
| 1 | V1147114 | Testing | V1147112 | Hello Manish |
| 2 | V1147114 | Meeting Invite | V1147112 | Can we meet tomorrow at 10AM? |
| 2014-12-05 00:00:00 |
| 3 | V1147112 | Meeting Invite | V1147114 | Lets meet tomorrow at 10AM |
| 2014-12-06 00:00:00 |
| 4 | V1147112 | Lunch | V1147114 | Ready for Lunch? |
| 2014-12-06 00:00:00 |
| 5 | V1147114 | I am really busy now | V1147112 | I am really busy now |
| 2014-12-06 00:00:00 |
| 9 | V1147112 | Vegas Trip | V1147114 | Are you Ready? |
| 2014-12-06 00:00:00 |
| 10 | V1147114 | Re-Vegas Trip | V1147112 | Yes, Manish! Lets plan it in e |
| mail. |
| 14 | V1147114 | Project Update | V1147112 | Hi Manish, |
| How much is remaining in your project? | 2014-12-06 00:00:00 |
| 15 | V1147114 | Hello | V1147112 | Hi, |
| How are you | 2014-12-06 00:00:00 |
+-----+-----+-----+-----+
9 rows in set (0.06 sec)

mysql>
```

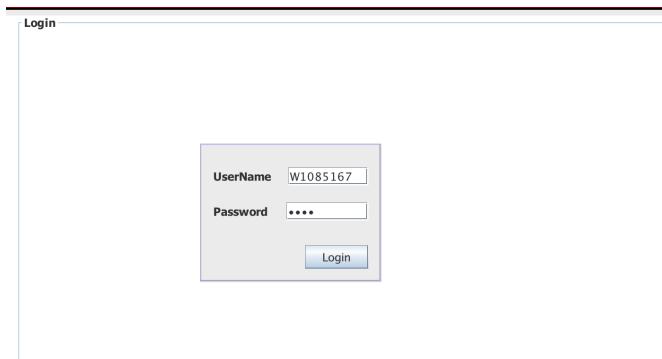
#### **4. Implementation**

The application allows user to all required functionalities. The mapping helps to distinguish between different roles and provide functionalities accordingly. Members are not allowed to access the information of other users. Only main admin can do that. Also only admin can create and edit the projects and related information. Admin has right to create new users to the system and edit their information.

##### **1) Login Page:**



**For new users: click on “Login”, it will redirect to profile page:**



## 2) Profile Page

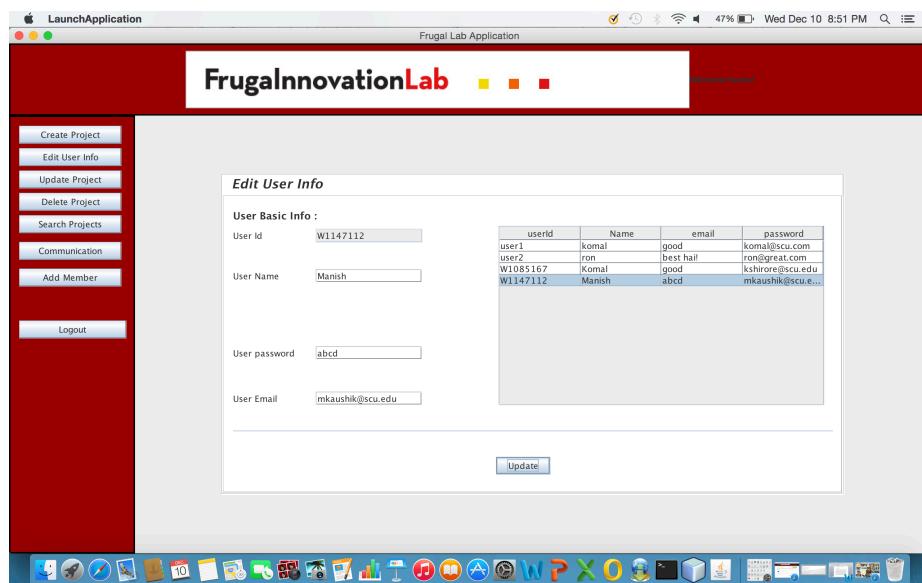


This Profile page is linked to logged in user and names of all projects of logged in user all displayed on the page. On the left side of every page, there is the navigation menu. You can access different sections on every page within this button display menu system.

## 3) User Information:

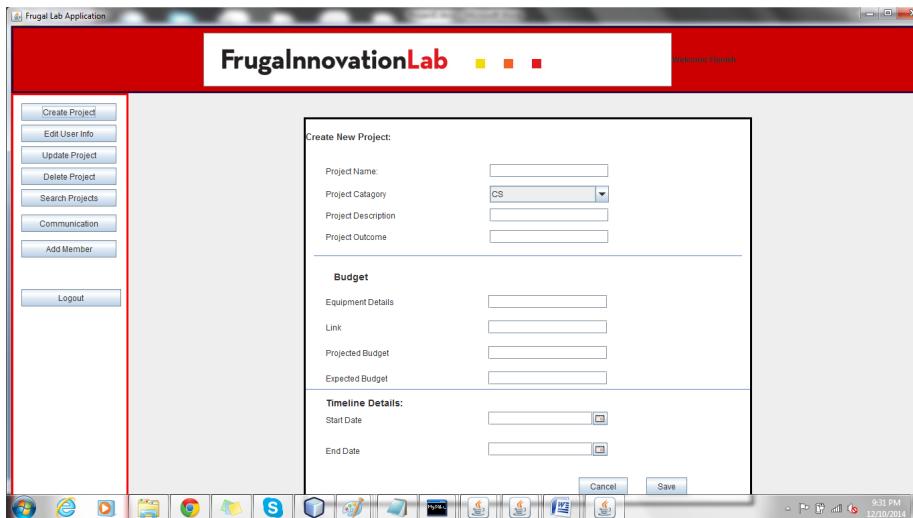
You can edit your personal information using editUserInfo button.

It displays a panel using card layout which contains all personal information of that user. It also provides access to edit it's personal information.



#### 4) Create a Project:

The button click “Create Project” navigates user to create a new project. The logged in user will be added to the new project automatically and updates it in database.

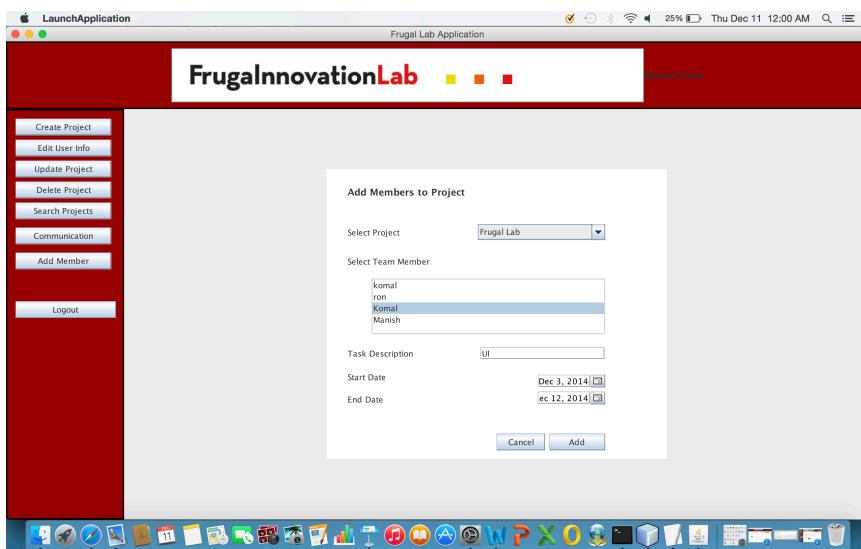


Admin can add detailed information of the project including: budget details and timeline of the project.

#### 5) Add Member and Task Information:

This function allows user to assign member to respective project. User can select the project name from dropdown menu of project names. The respective details are updated in task tables.

Admin can chose as many users as possible and assign task to them.



## 6) Edit Project Button:

The project can be edited by click the “Edit” button, which updates the information of respective information.

The screenshot shows the 'Edit Project Info' page of the FrugalInnovationLab application. On the left, there is a sidebar with buttons for 'Create Project', 'Edit User Info', 'Update Project', 'Delete Project', 'Search Projects', 'Communication', and 'Add Member'. Below these is a 'Logout' button. The main area has tabs for 'Basic Details', 'Timeline Details', and 'Budget Details'. Under 'Basic Details', fields include Project Id (15), Project Name (java), Project Category (CS), Project Status (New), and Project Outcome (C++). Under 'Timeline Details', fields include Start Date (00:00:00 PDT 2014) and End Date (00:00:00 PST 2014). Under 'Budget Details', fields include Equipment Name (MAC), Estimated Cost (1000), and Projected Cost (900). An 'Equipment Link' field contains apple.com. At the bottom is an 'Update' button. Below the form is a 'Project Info' table with columns: projectId, projectName, projectDescr, status, category, desiredOutco..., start, endDate, equipmentName, estimatedCost, projectedCost. The table shows two rows: one for project id 15 (java, CS, New, C++, MAC, 1000, 900) and one for project id 16 (DAA, BioO, New, CS, InProgress, MAC, 70, 50). The application title 'Frugal Lab Application' is at the top, and the OS X dock is visible at the bottom.

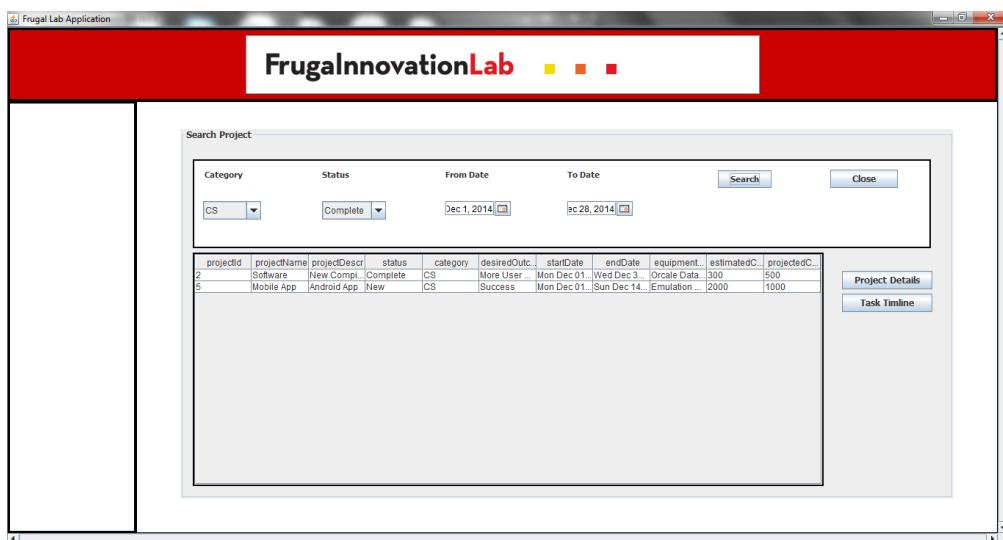
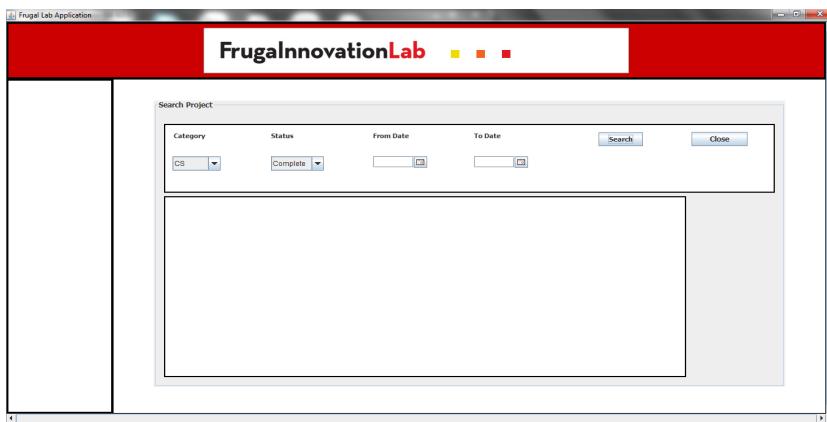
## 7) Edit Users Information Button:

User can edit and update the information of member and task. Only admin has access to this information click.

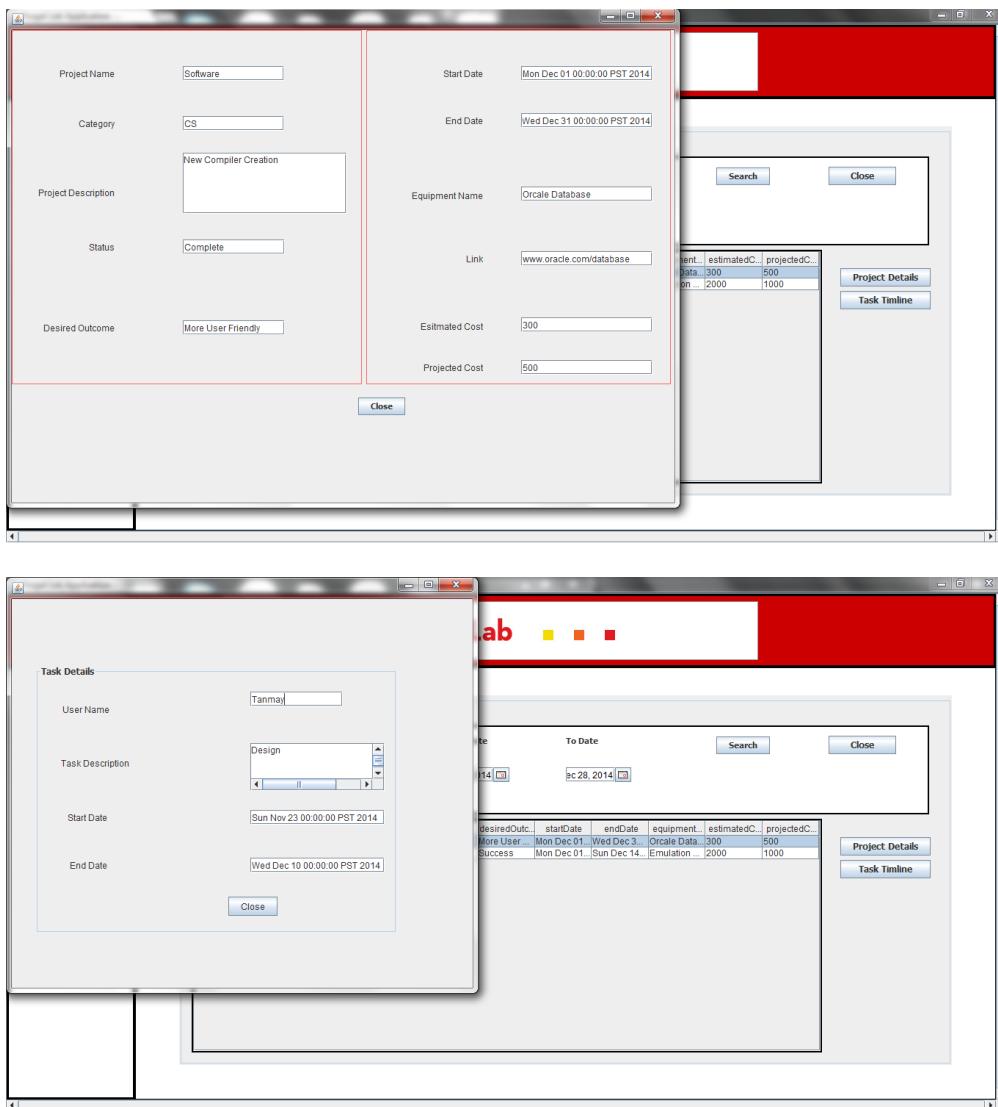
Here user can select existing users from table and edit their information.

The screenshot shows the 'Edit User Info' page of the FrugalInnovationLab application. The sidebar is identical to the previous screenshot. The main area has a 'User Basic Info' section with fields for User Id (W1147112), User Name (Manish), User password (abcd), and User Email (mkaushik@scu.edu). To the right is a table titled 'EditProjectTask' showing user details: userId, Name, email, and password. The table includes entries for user1 (komal, good, komal@scu.com), user2 (ron, best hall, ron@real.com), W1085167 (Komal, good, kshiroe@scu.edu), and W1147112 (Manish, abcd, mkaushik@scu.edu). At the bottom is an 'Update' button. The application title 'Frugal Lab Application' is at the top, and the OS X dock is visible at the bottom.

**8) Search:** Users can search using the search button.



Project Details click navigates to new page containing information of all details of the projects.

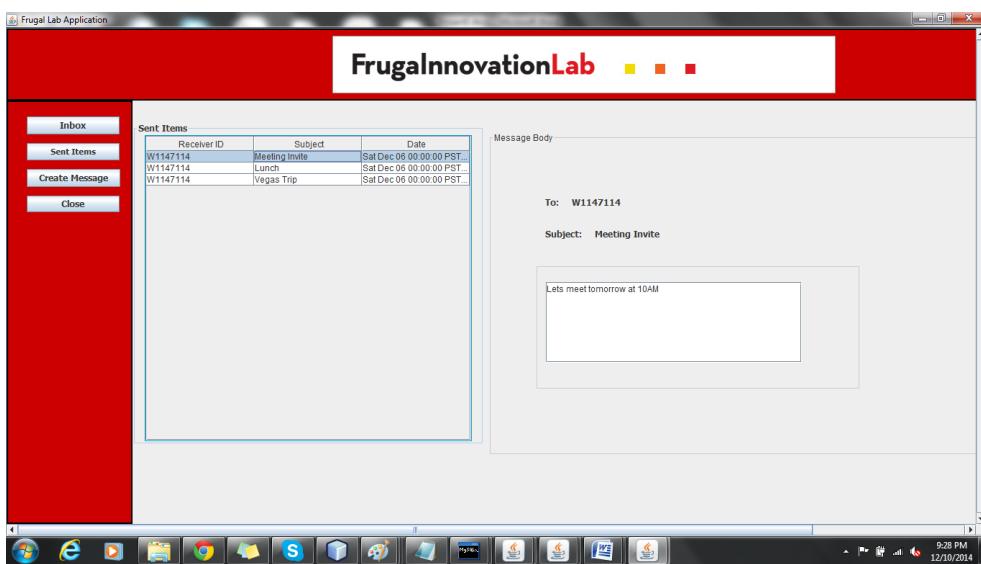
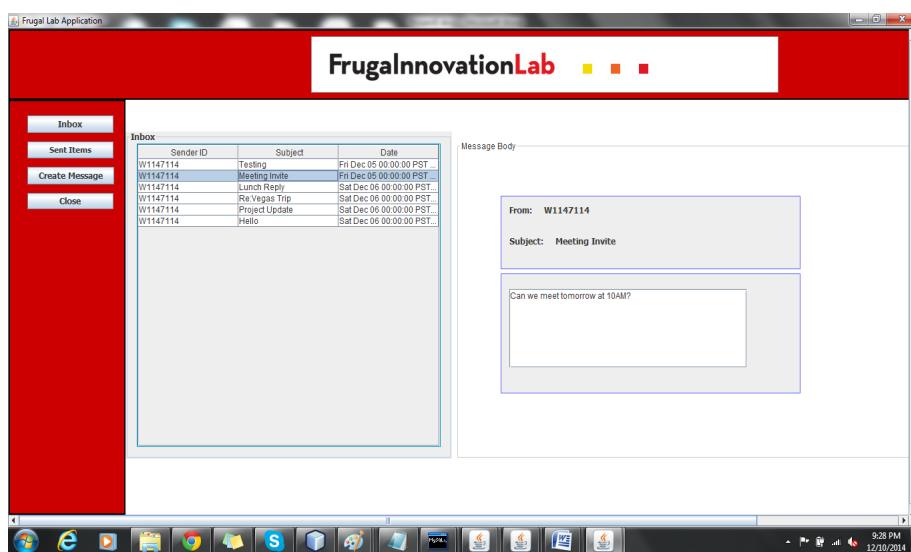
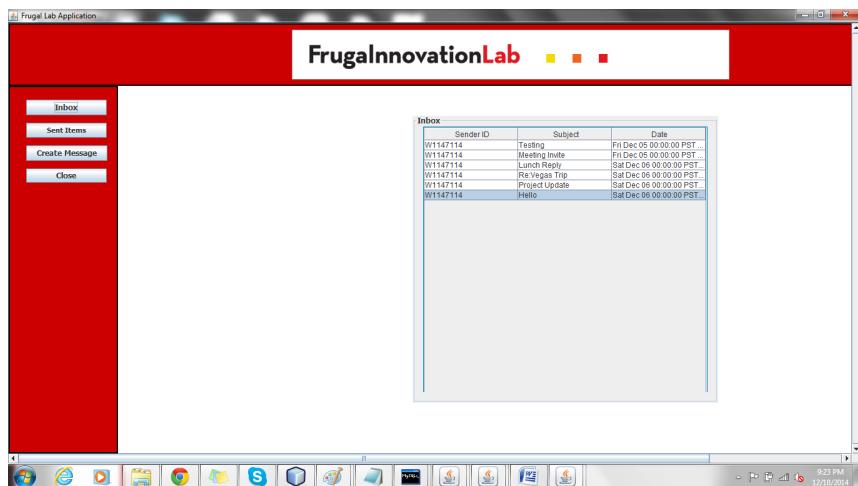


Timeline feature gives access to see all timeline details.

## 9) Communication:

It allows user to access inbox and sent emails information.

Users can interact with each other using communication feature.



## **5. Conclusion:**

The goal of implementing our desktop application using was achieved by this project. The app is user-friendly and it has features, which help the user in the rapid development of their projects.

This project management system could be used by all members including students, staff and faculty. Equal rights are provided to all members who are undertaking the initiation of a project through FIL with a field-based partner. The application can allow admin to create timelines (with dependencies), delegate tasks to a particular member, generate and track budgets, record communications with partners, etc. The aim of this application is to assist with the execution of successful projects and provide all information of the task.

This report focused on the features, implementation details and design decisions involved in the application.

## **6. Each team member's contribution to the project**

### **a. Activity Diagram/ Use Case:**

Komal: Use Case Diagram, Class Diagram

Manish: Sequence Diagram, Boundary and Control Classes

Robin: Activity Diagram, Entity Classes.

### **b. Project Contribution:**

Komal: UI of the Project, Create Project, Add Members and Task information, Budget

Manish Kaushik: Role of the Members, Login Page, Search and Communication, TimeLine.

Lu: Edit Project, Edit Members Information and Task associated.

## **7. Future Implementation:**

In the future, it could be extended to support more functionality to user. We are planning to add “**Propose Project**” function, which allows client to propose project. Staff and students can see the details of proposed projects and approach the client through communication based developed system.

We tried to implement all required functions required by the lab.

## **8. References**

1. JPA EclipseLink. Retrieved from - <https://eclipse.org/eclipselink/jpa.php>

2. GitHub: <https://github.com/>