VIETNAM NATIONAL UNIVERSITY - HO CHI MINH CITY
UNIVERSITY OF TECHNOLOGY
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SOFTWARE ENGINEERING

GROUP NAME: Do something bro

URBAN WASTE COLLECTION AID - UWC 2.0

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1. Introduction

Urban waste management is one of several significant problems faced by many countries in the world and thus considered one of the important points to be improved in Sustainable Development Goal (SDG) 11: sustainable cities and communities and SDG 6: clean water and sanitation. Particular attention is given to developing countries that continue to prioritize development and economic growth. In urban context, solid waste management is costly and ineffective. Improvement of waste collection and management is emphasized by governments and organizations for positive impacts on cities, societies and environments

2. Requirement elicitation

2.1. Task 2.1

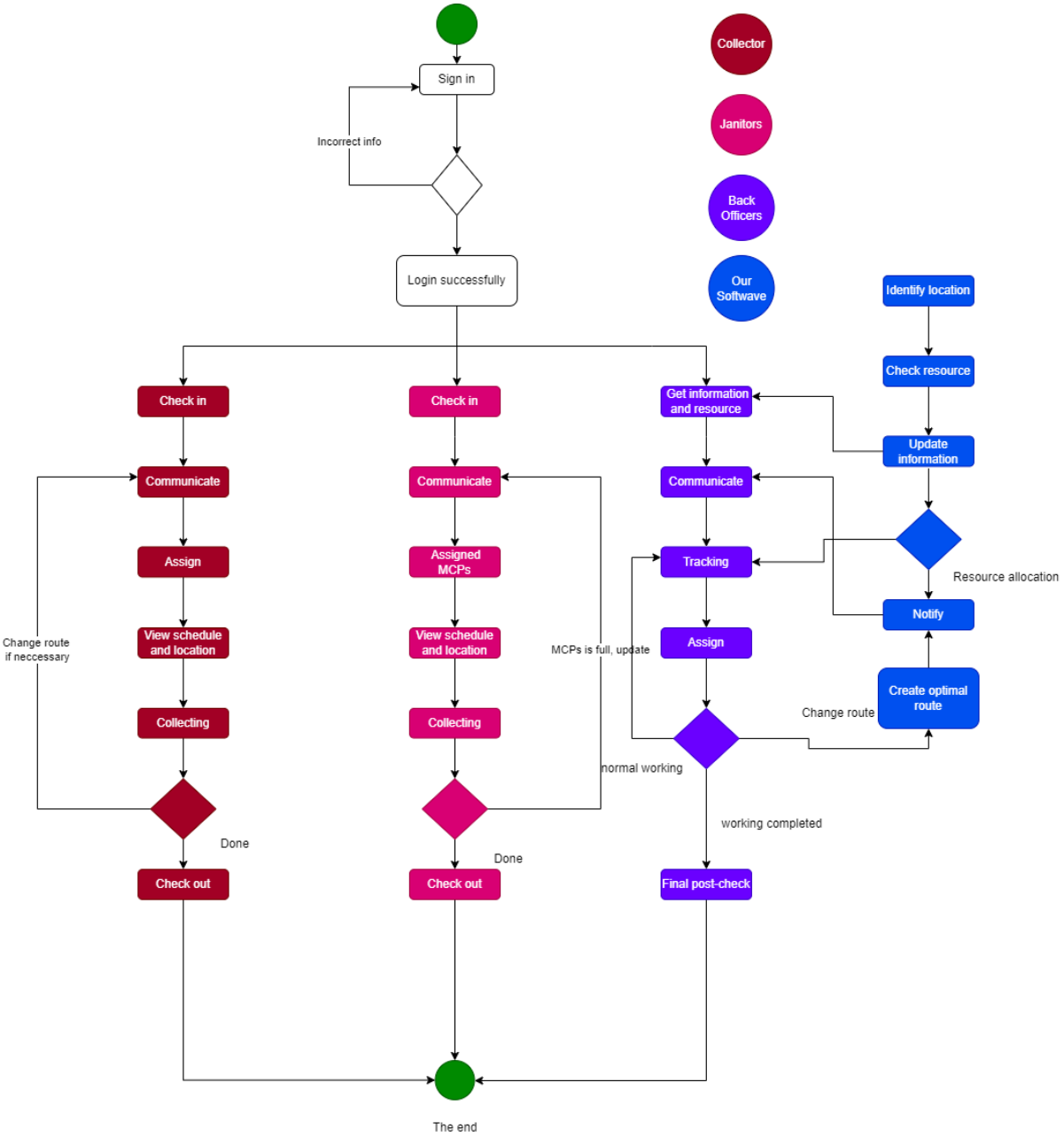

Figure 1: Activity diagram

When accessing the application, the user needs to log in and be classified immediately after logging in. The system will check information about the number of employees who are ready to work, update the status of the vehicle, the location of the MCP points, and then send the information to the Office for viewing. Next, the platform will generate optimal routes.

After checking the information, the office staff will assign tasks to each employee. Once the task is assigned, the software will update the worker's location information, the estimated time to complete the task, and update the status of the MCPs. When it is almost full, the system will send a notification to the Office and the collectors.

In case of unexpected problems, collectors, cleaning staff and office staff can communicate with each other through the software. In addition, the platform will examine the possibilities and make various suggestions to change the route. In addition, Office staff can use the software to send notifications to workers to notify about route changes, increase and decrease in work.

Collectors and cleaners can use the app to check in/out, transfer jobs, view schedules and locations. At the end of working hours, the collector and the cleaning staff can exchange and finish the job. Thereby, Office staff can check the final resource and update for the next working session.

2.2. Task 2.2

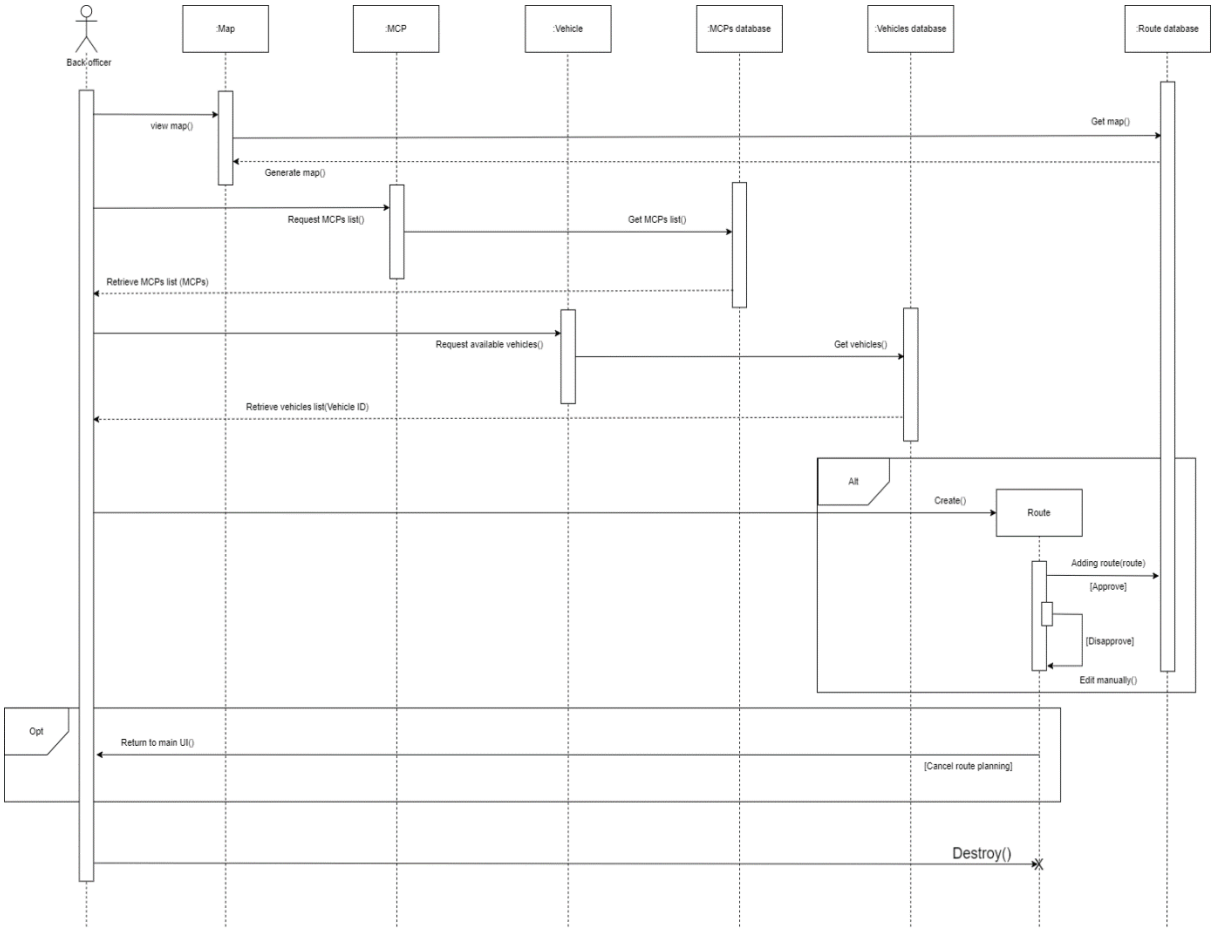

Figure 2:Sequence diagram for route planning task

This section describe **Conceptual solution** for route planning task and its sequence diagram.

- One MCP should have a certain amount of trash to be ready for pick up. Therefore, the lists of MCPs that are sent to the Back Officers should only contain MCPs that are ready. Route created by the app required to be optimized in term of fuel consumption and travel distance.
- Vehicle must have sufficient fuel, not broken, and can operate normally.
- The MCP full pattern (how long it usually take for an MCP to be filled) should be understood to perform route planning according.

In this feature:

First off, the back officer will receive a map of the working area generated by the app.

Sencondly, the back officer will send a request to a system in order for the system to choose which MCPs are ready to be picked up and make a list, then send it to the back officer.

Next off, the Back officer send another request to view the available vehicles, the system will send the list including available vehicles to the Back officer.

Lastly, The system will automatically make a route, and wait for the back officer to approve, If the back officer doesn't like the route he can destroy it and the system will make a new one instead.

2.3. Task 2.3

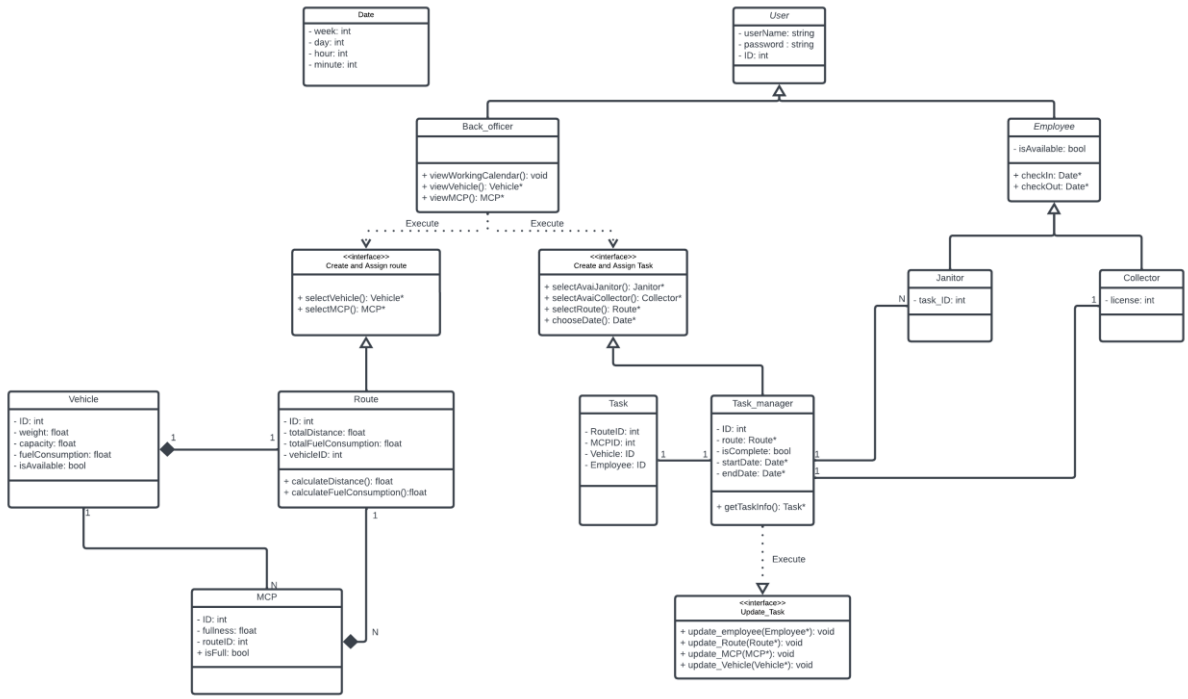

Figure 3: Class diagram for Task Assignment Module

Link for clearer class diagram image: https://lucid.app/lucidchart/6a0c6cad-8e95-43cd-9b24-4a6773fe8f1e/edit?invitationId=inv_1fa76002-ea18-4fb7-8aae-f48e17a590bf

Description:

- Task management provides relevant information for monitoring data within the system. Tasks are allocated to janitors and collectors who are given start and end dates for their assigned tasks.
- Each task is linked to a route that collectors follow to reach the MCPs. Routes are determined by calculating the most efficient path based on the MCPs and vehicles involved. Only one collector drives one vehicle on a route.
- Employees and vehicles have a boolean attribute that indicates their availability, and they may not be associated with any tasks or routes, as shown in the diagram with a 0..1 relationship.
- Back officers update task information in Task management when changes are made to the employees, MCPs, or vehicles involved.
- Several janitors may be assigned to one task, but only one collector may be assigned to one task.

2.4. Task 2.4

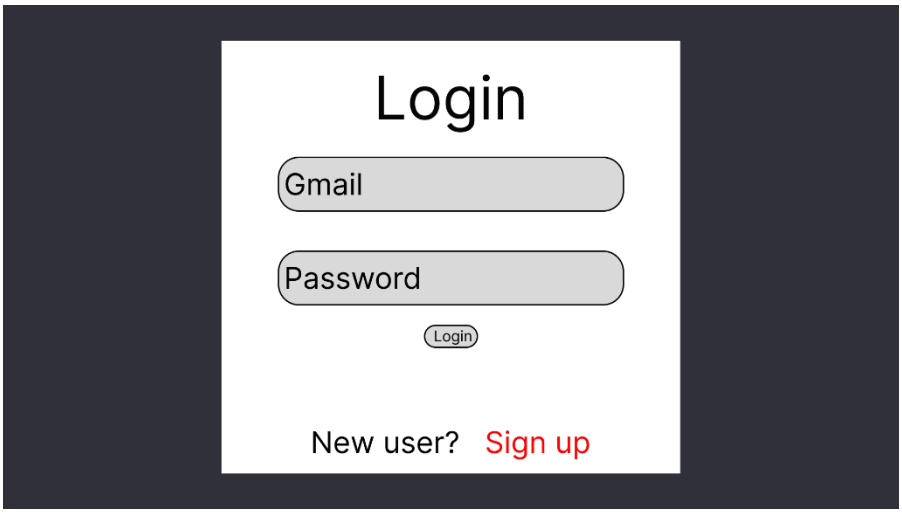

Figure 4: Login page

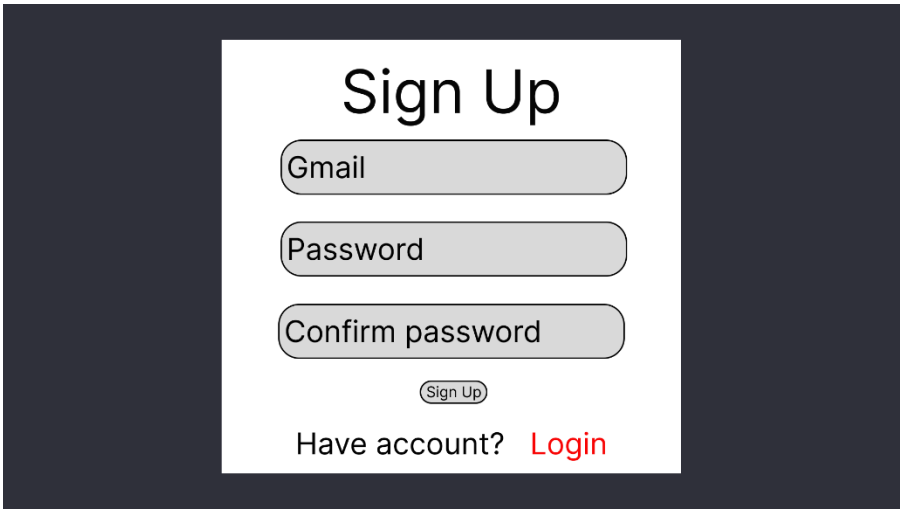

Figure 5: Sign Up page

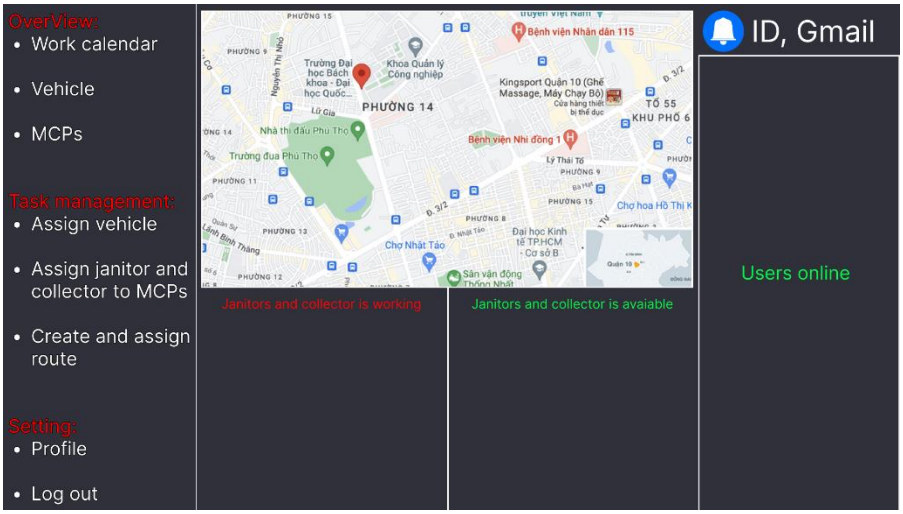

Figure 6: Homepage

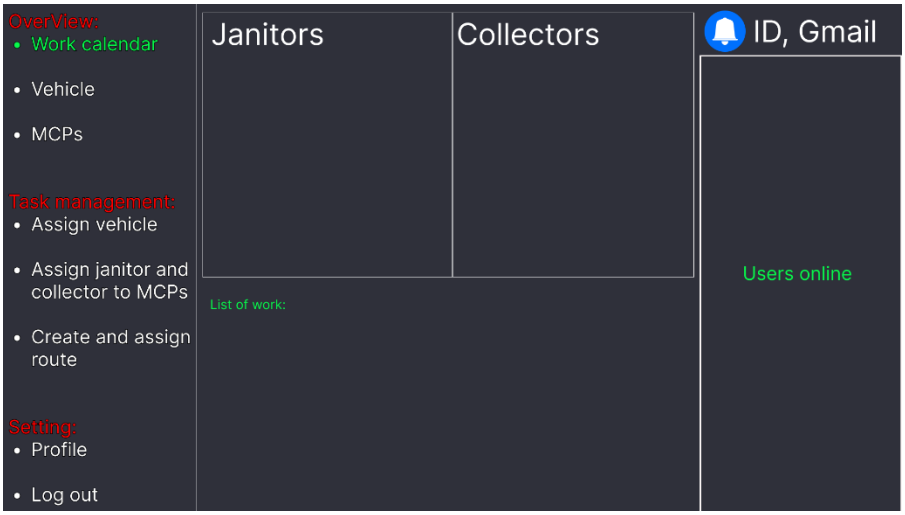

Figure 7: View Calendar

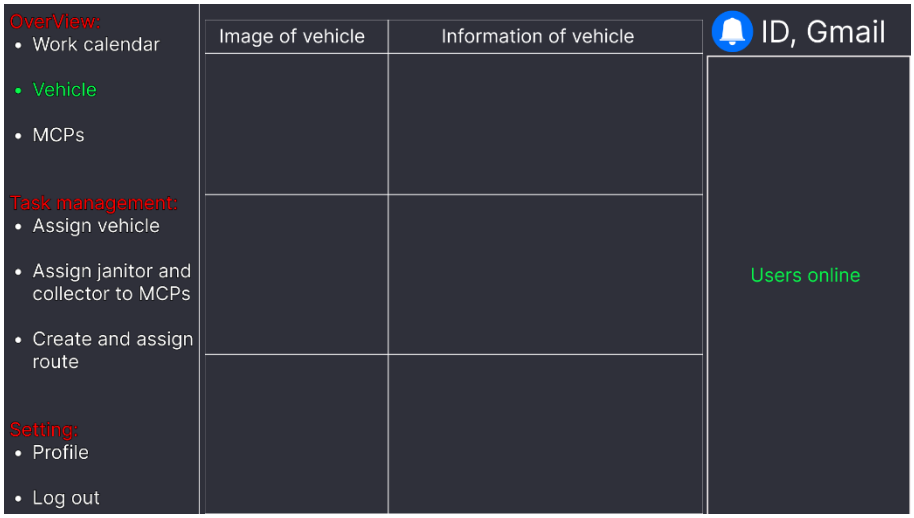

Figure 8: View Vehicle

Figure 9: View MCPs