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SOFTWARE ENGINEERING (CO3001)

Project (Semester 222)

Urban waste collection - UWC 2.0

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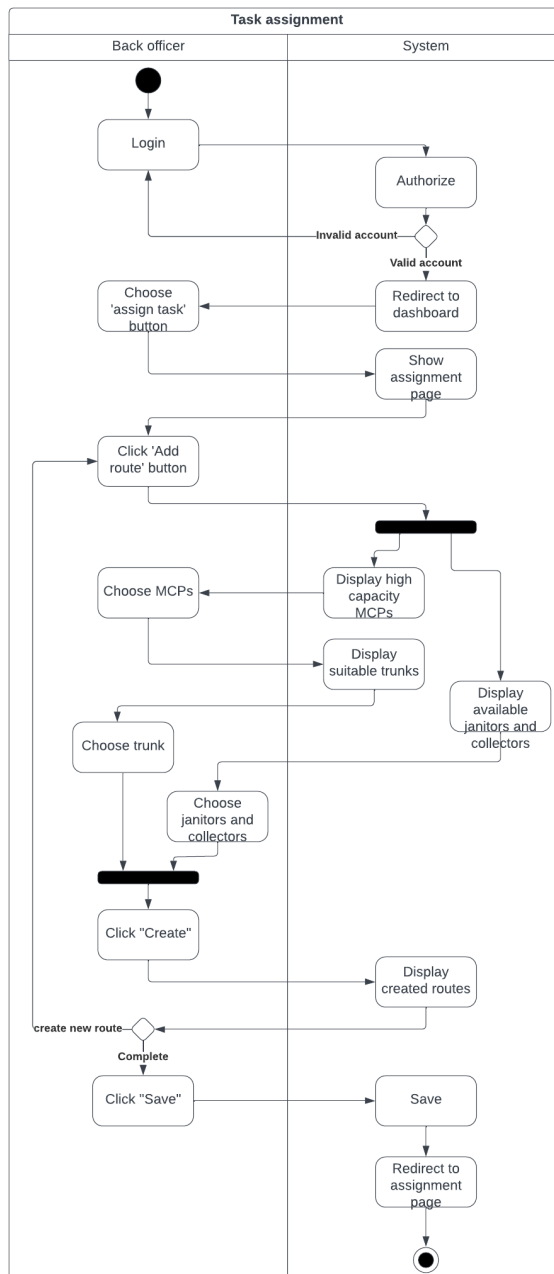
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1 TASK 2: SYSTEM MODELING

1.1 Activity diagram business process in Task Assignment module

1.1.1 Activity Diagram: Assign Task



Description for the diagram Assign Task:

The figure is an activity diagram for the Task Assignment module. It is shown using a business perspective via interaction between a back officer and the system. The activity start at login page. After user login successfully, the system will redirect to dashboard. Here, there are some tasks, and user choose 'assign task'. Then the system will redirect the user to assignment page and show the map including high capacity MCPs. Also, there are available janitors and collectors in this page. The next step is that user choose MCPs which they want to create new route. And the system will suggest some routes created by algorithm of system. Then, user can choose one of below routes, and choose janitors and collectors for this route. Finally, user click 'create' button and system will save it as a temporary route. And the system will display that temporary routes. Here, user have 2 options, one is that continuing creating multi new route, and the other is completing creating process. New routes only save to database when at this step, user choose 'save' button. And system will redirect user to assignment page.

1.1.2 Activity Diagram: View Assign Task

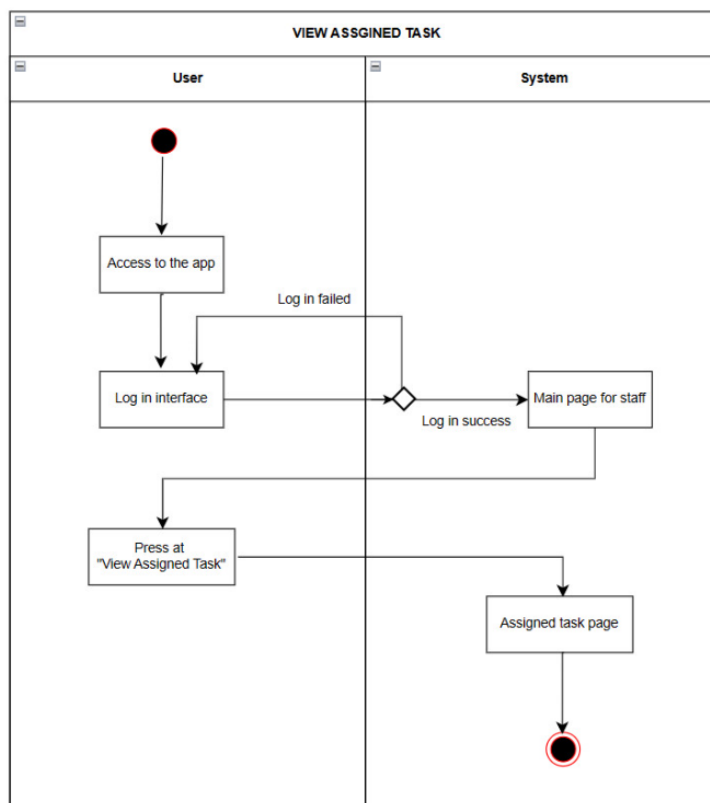


Diagram description

Firstly, Janitor or Collector access to the app and log in to main page by ID has been signed up before. Then system will open the Main page interface, if sign in successfully. After that, user click at "View assign task" in the toolbar, the To-do tasks will appear. User can look up more information of each task, e.g: deadline, MCPs, equipment, used vehicle,.. in this frame also.

1.2 Sequence diagram to visualize process assign vehicles to janitors and collectors.

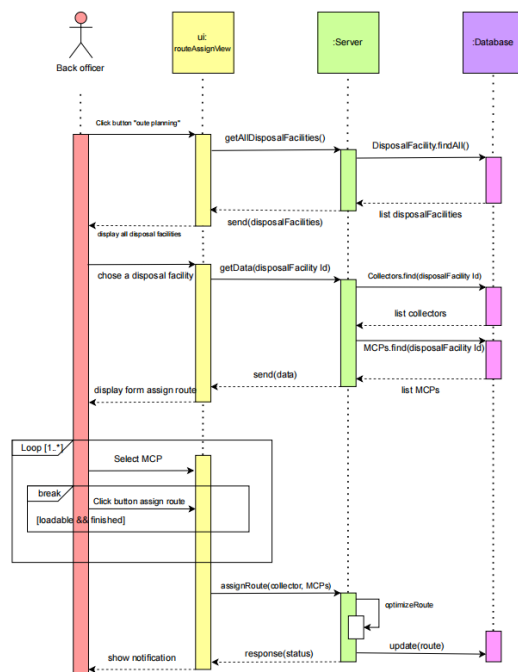
Assumptions:

- Each Disposal facility will process waste from MCPs in a certain area, and each MCP will be managed by only 1 Disposal facility.
- Each Collector will be assigned to control 1 vehicle and work at a Disposal facility (according to Task Assignment). Vehicles stay in the parking lots right at the Disposal facilities.
- When planning a route, the Back officer will assign a route to a collector including the MCPs that need to be collected under the management of that Disposal facility.
- The selection of MCPs should satisfy the condition that the total amount of waste to be treated does not exceed the load of the collection truck.
- The planned route will start from the Disposal facility where the Collector works and must go through all the assigned MCPs, eventually returning to the Disposal facility. Routes through MCPs need to be optimized for distance and fuel.

Assumptions about path optimization:

We will find all possible cycles by using a backtracking algorithm, then select the cycles containing the required points and from there choose the cycle with the shortest path.

Sequence Diagram



Link: <https://drive.google.com/file/d/1k2TM-5EYyB1mlpsBEPYh75OE3H5RRUj5/view?usp=sharing>

Description for the Diagram



- At the main interface of the Back officer, when selecting the route planning, the system conducts data retrieval and returns to a list of Disposal facilities being managed.
- The system asks the Back officer to choose one of the Disposal facilities and perform data retrieval to get the Collector's and MCP's information on that Disposal facility and send the data back to the interface a form for the route planning task. road.
- The back officer selects a collector and multiple MCPs and sends the data to the system. The selection of MCPs must satisfy the condition that the total weight of garbage to be handled in those MCPs must match the tonnage of that Collector's means of transport, otherwise, the Back officer needs to re-select.
- The system processes the information to find the best route and update the data in the system.
- Finally, the system displays a message that the route has been successfully created.

1.3 Class Diagram

Because the class diagram is presented slightly complicated so we push it in the [Link](#).

1.4 Develop MVP 1 as user interfaces

The figma for the MVP at this [Link](#).