

HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY
FACULTY OF COMPUTER SCIENCE AND ENGINEERING



Software Engineering

Capstone Project

Urban waste collection aid - UWC 2.0

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1 Task 1. Requirement elicitation

1.1 Identify the context of this project. Who are relevant stakeholders? What are their current needs? What could be their current problem? In your opinion, what benefits UWC 2.0 will be for each stakeholder?

- The context of this project:
Require an application providing management and communication ability between employees inside Service provider Y in order to improve garbage collection ability of the organisation. The first application UWC 1.0 has been released, but it still emerges some problems with the management procedure and task distribution. Therefore, the upgraded version of this application is proposed called UWC 2.0 aiming to overcome the last version limitations and installed with extended features.
- Relevant stakeholders:
Back officers, collectors, janitors, developer team.
- Current needs of stakeholders:
 1. Back officers
 - Be able to see information about employees work schedule, organisation's vehicles status, and current capacity of MCPs.
 - Assign tasks and communicate with employees.
 - Have rights to choose routes for collecting vehicles and assign any available vehicle to any route.
 2. Collectors and janitors
 - Load new tasks as soon as they are assigned to them.
 - Be able to checkin/checkout tasks.
 - Communicate with other employees or back officers.
 - Alerted if any MCP is full.
 3. Developer team
 - Develop UWC 2.0.
 - Fix any problem occurs.
- Current problems of stakeholders:
 1. Back officers:
 - Cannot appropriately assign the routes to collectors and janitors. (the route is not currently available,
 - Determine the workload between staff (unfair work distribution).
 - System can not synchronise data among devices.
 2. Collectors and janitors:
 - Can not communicate with their back officer.
 - Can not see the task and the calendar in an orderly way.
- Benefits of UWC 2.0 for each stakeholder:
 1. Back officers:
 - Have a clearer overview about employees and vehicles.
 - Chosen route is automatically optimised in case of fuel consumption.
 2. Collectors and janitors:
 - Have a clearer overview of tasks assigned to them.
 - Notice if any MCP is full.

1.2 Describe all functional and non-functional requirements that can be inferred from the project description. Draw a use-case diagram for the whole system

- Functional requirements:

1. Back officers:

- Have an overview of janitors and collectors, their work calendar.
- Have an overview of vehicles and their technical details (weight, capacity, fuel consumption, etc).
- Have an overview of all MCPs and information about their capacity.
- Assign vehicles to janitors and collectors.
- Assign janitors and collectors to MCPs (task).
- Create a route for each collector. Assigned route is optimised in terms of fuel consumption and travel distance.
- Be able to send messages to collectors and janitors.

2. Collectors and janitors:

- Have an overview of their work calendar.
- Have a detailed view of their task on a daily and weekly basis.
- Be able to communicate with collectors, other janitors and back officers.
- Check in / check out tasks every day.
- Be notified about the MCPs if they are fully loaded.

- Non functional requirements:

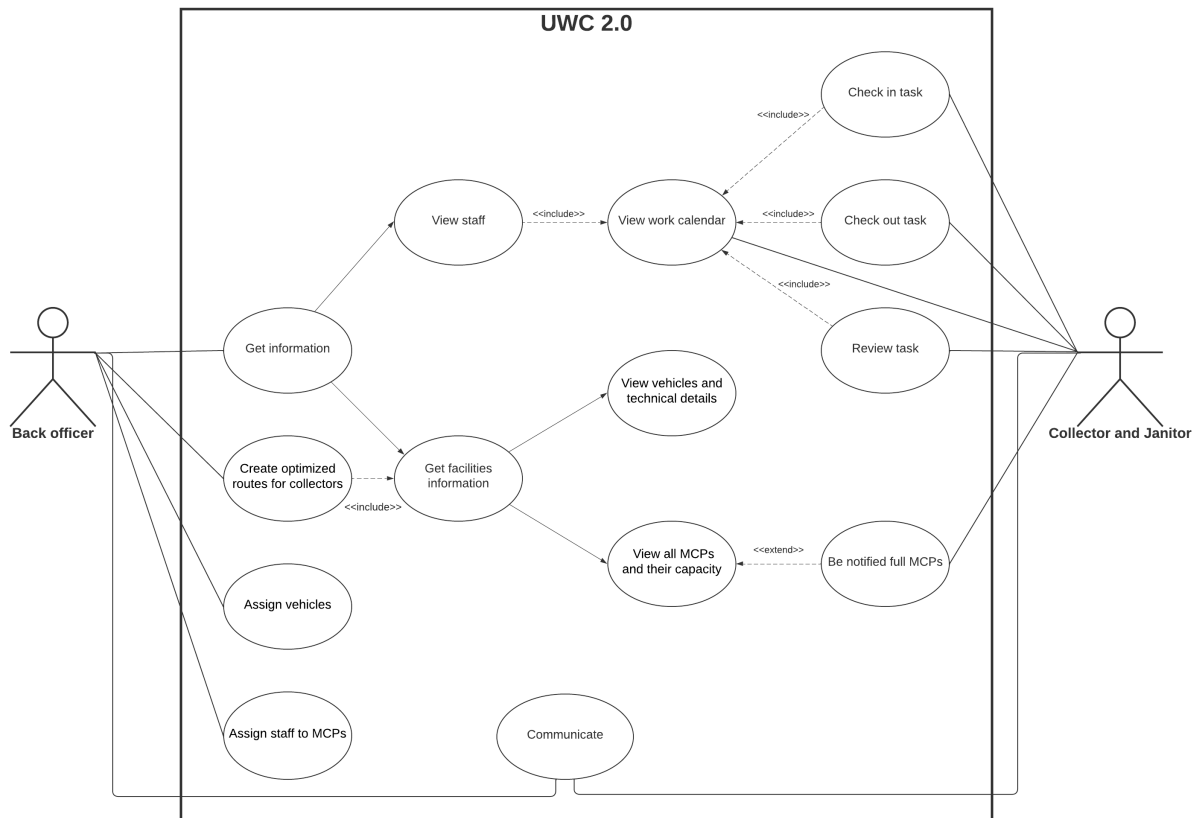
1. Back officers:

- Information should be updated from MCPs every 15 minutes with the availability of at least 95% of their operating time.

2. Collectors and janitors:

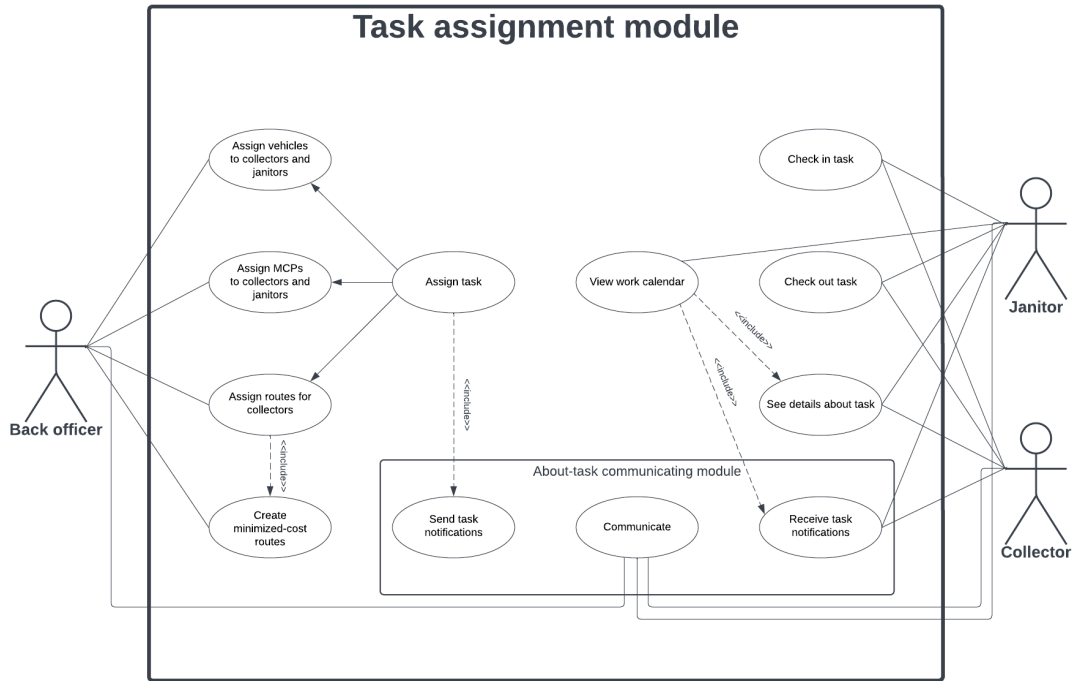
- All important information should be displayed in one view (without scrolling down).
- The messages should be communicated in a real-time manner with delay less than 1 second.

- Use-case diagram for the system:



1.3 For the Task assignment module, draw its use-case diagram and describe the use-case using a table format

1. Use-case diagram for the task assignment module:



2. Table format

Name:	Task assignment
Primary actor:	Back officers
Secondary actor:	Collectors, janitors
Description:	Back officer manages the task and time check in and out of the staff. Communication among staffs.
Trigger:	When back officers assign tasks to collectors and janitors.
Preconditions:	There is at least one free collector or janitor
Postconditions:	The collectors and janitors are assigned with appropriate tasks
Normal flow:	<ol style="list-style-type: none">1. The back officer assigns tasks for staff.2. The back officer assigns vehicles to staff.3. The system automatically creates the optimised route.4. The back officer assigns the optimised route for the staff member.5. The system sends a message (notification) to the janitors and collectors.6. Staff receive the notification.7. Staff checks the work calendar for the updated task.8. Staff members view detailed tasks.9. Staff can communicate with others via the message system.10. Janitors and collectors check-in to do assigned jobs11. After completing or finishing the work shift, the staff checks out.12. End task assignment module.
Alternative flow:	Alternative 1, after step 9: Staff can give feedback about the assigned tasks; back officers can re-assign the task if staff is unable to handle the given task.
Exception:	<ol style="list-style-type: none">1. Exception 1, at step 2: If there is no usable vehicle left: Notify the back officer.2. Exception 2, after step 10: If a staff fail to check-in in 10 minutes: Notify the staff and the back officer.3. Exception 3, at step 11: The staff closes the UWC 2.0, but there is still a task that is not checked out; the system will alert the user and prevent the staff from closing the application.