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

SOFTWARE ENGINEERING (CO3001)

Assignment - Urban waste collection aid - UWC 2.0

Task 1

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Member list & Workload

Task 1

No.	Fullname	Student ID	Tasks
1	Nguyen Tien Phat	2011797	Use-case diagram
2	Pham Thi Hong Hieu	2020025	Introduction
3	Nguyen Hoang Quang Khanh	2013458	Use-case diagram
4	Nguyen Tuan Kiet	2013577	Use-case diagram
5	Nguyen Trung Nghia	2010448	Requirements
6	Duong Thai Thinh	2014589	Template latex

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1 TASK 1

1.1 Introduction

1.1.1 The domain context of Urban waste management in Vietnam

Integration of solid waste management services provides a means of improving aesthetics, reducing environmental degradation, and enhancing public health and welfare throughout the country.

In Vietnam, urban solid waste (USW) has become increasingly complex due to a variety of reasons as the increasing quantity, changing composition of USW, rising public awareness, and municipal administration policies among different cities and surrounding communities. There is not currently an efficient management system in place for facilities such as storage, collection, transfer, transportation, and disposal of USW. Against this backdrop, this project assignment attempts to build an information management system of USW addressing a variety of aspects such as the quantity of USW generation, operational management, fuels, and human resource, as well as the financial aspect.

Assuming that Organization X is contracted to develop an information management system called UWC 2.0 in order to improve the efficiency of garbage collection of Service provider Y.

Organisation A can be:

- Government: community citizens, government offices, schools, street and public facility cleaning services
- Service providers: Restaurants, hotels, store
- Industrial: offices, cafeteria

UWM 2.0 covered the management process of handling domestic solid waste, which means these types of waste are excluded: wastewater, hazardous waste, and industrial waste.

1.1.2 Stakeholder and their needs

Stakeholder	**Expectations**
Back officers	Modify the schedule, view statistics, track the progress of the garbage collection process, 24/7 support, monitoring tools
Collector	View work calendar (day/week), check-in/out tasks, communication tools, route tracking
Janitor	View work calendar (day/week), work schedule (cleaning route in their workplace/deadline to complete), check-in/out tasks, communication tools
IT team	Clear requirement from the organization/head of service provider/project manager, the users use the system following the manual and report bugs

1.1.3 The benefits of UWC2.0 for each stakeholder

Stakeholder	Expectations
Back officers	The facility, labor, and fuel costs can be estimated and optimized with high accuracy. Reducing the communication time among stakeholders shorten the total time to complete a garbage collection cycle. As a consequence, the workload of back officers will be reduced.
Collector	UWC 2.0 provides the estimation of how much garbage is in a spot and the corresponding collecting time. Thus it helps to avoid the work overload for collectors.
Janitor	The well-defined list of tasks with checklist functions improves the efficiency of cleaning. They can quickly ask for support through communication tools.
IT team	Clear requirement from the organization/head of service provider /project manager, the users use the system following the manual and report bugs

1.2 Functional and non-functional requirements

1.2.1 Functional requirements

Back Officers (BO):

- Have an overview of janitors and collectors, their work calendar
- Assign tasks to janitors and collectors
- Have an overview of vehicles and their technical details (weight, capacity, fuel consumptions, 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. The assigned route is optimized in terms of fuel consumption and travel distance.
- Be able to send messages to collectors and janitors.

Employee (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.
- Update route information.
- Be notified about the MCPs if they are fully loaded.
- Be able to send requests to be absent or to change shifts.

- Send status information of vehicles assigned to them daily.

IT Team:

- Clarify stakeholder requirements for system functionality.
- Can use the product as Back Office, Collectors and Janitors.
- Receive notifications about status, feature updates, or system upgrades.
- Can report errors to Dev during use.

Developers:

- Have an overview and be in charge of all system functions.
- Be able to turn on, off, reset the system.
- Be able to communicate with collectors, janitors and back officers.
- Upgrade system features.
- Create a new account.
- Get notified of bugs and fix them.

1.2.2 Non-functional requirements

Performance requirements:

- Data of each MCP should be updated every 15 minutes, at least 95% of the total operation time of the system.
- Messages are forwarded in real-time with a maximum 1-second delay.
- The response time is under 1 second per action/interaction.

Liability requirements:

- The system must have high availability during working hours (8:00 - 18:00, Monday to Sunday).
- The system's downtime during working hours should be less than 5 seconds.

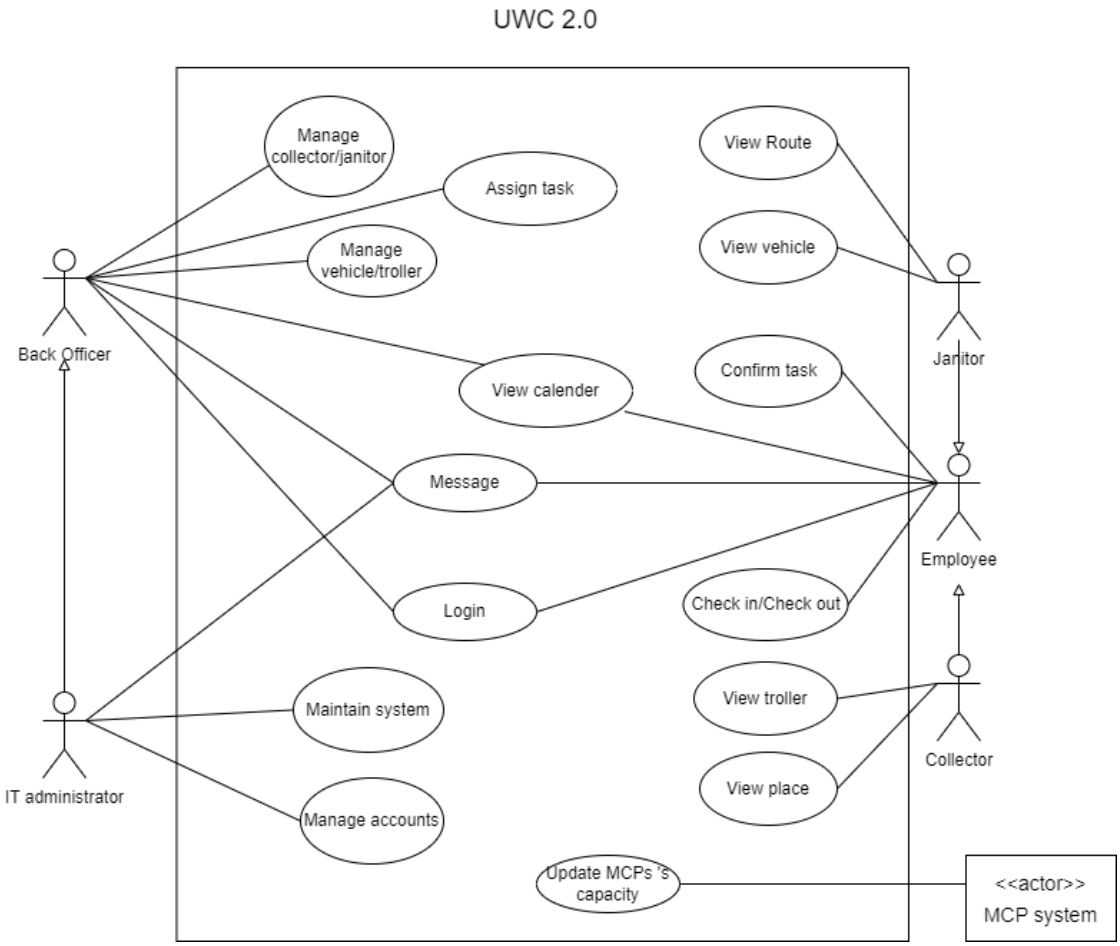
Requirements of software architecture:

- All tasks of collectors and janitors in a day or a week will be displayed on the same page.
- The interface of UWM 2.0 is responsive for smartphones, tablets, and desktops with several corresponding screen resolutions.

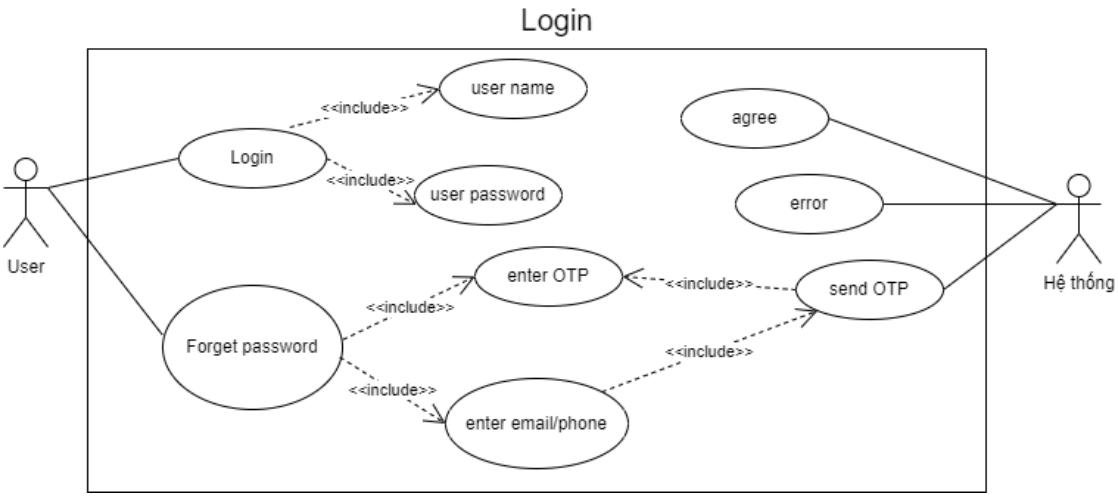
Environmental requirements:

- The software must respect the privacy of the employee's personal information.
- The software must conform to laws and standard regulations in the workplace.

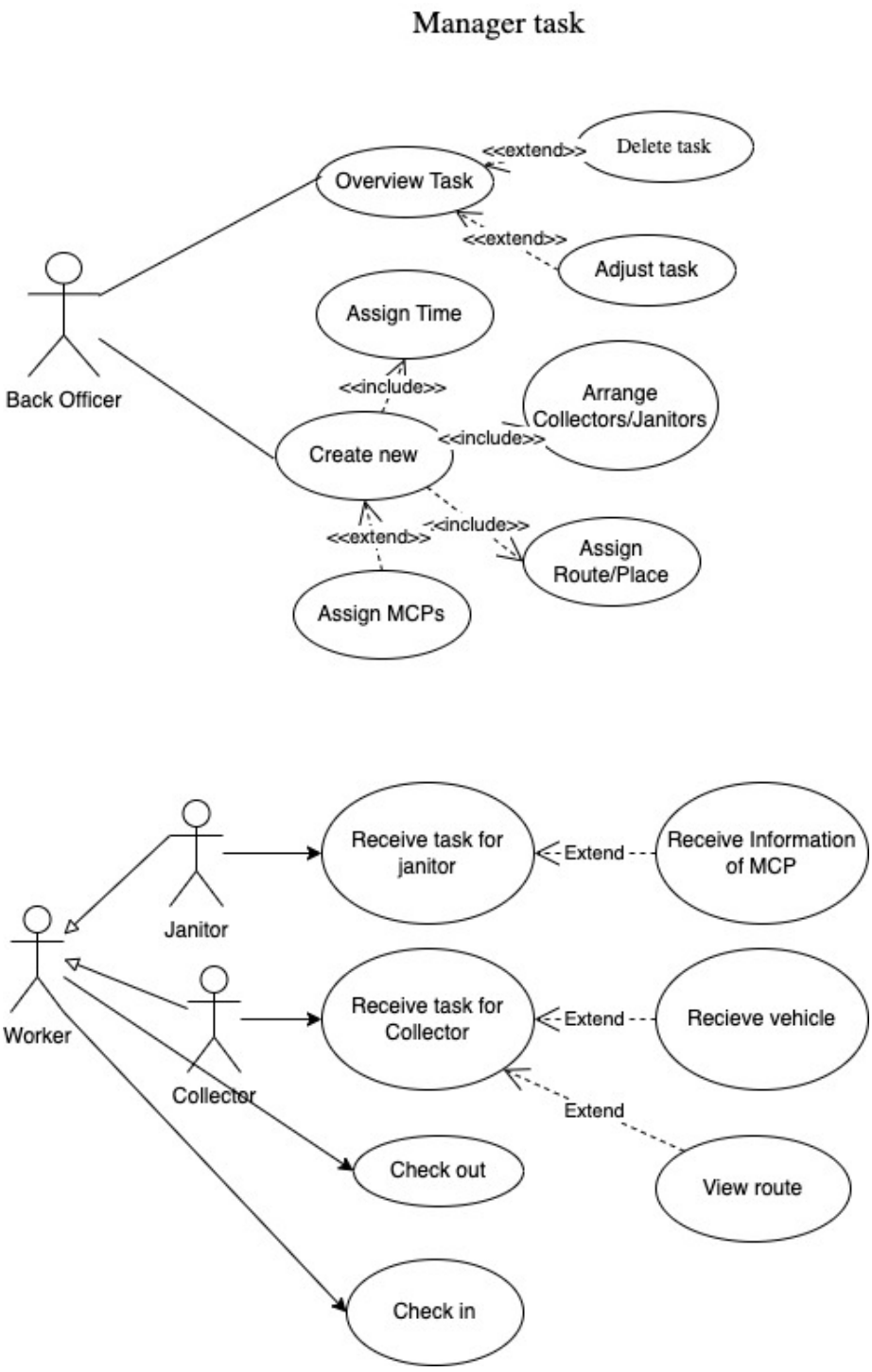
System use-case diagram:



1.3 Use-case diagram



Use-case ID	U1
Use-case name	Create new
Use-case overview	Create tasks for collector/janitor
Actor	Back officer
Preconditions	User login successfully User must be a back officer and has right to access the system
Trigger	Click "Create new task" button in overview page
Steps	1. Back officer click "Create new task" button. 2. The system display a form. 3. Back officer completes the form (include: choose employee, tool, route or place, time,...) 4. Back officer click "submit" button. 5. The system confirm and return home.
Alternate flow	At step 4: 4.1. The system alert "Conflict" (time, place or route, employee,...) 4.2. Back officer repair again.
Post Condition	Task updation into the database Notification send to employee
Exception flow	System alert error: - Choose one employee with more than 8h/day. - Choose vehicle/troller but nothing is available. Network error


Manager task
Delete task
<<extend>>
Overview Task
<<extend>>
Adjust task
Assign Time
<<include>>
Arrange
Collectors/Janitors
Back Officer
Create new
<<include>>
<<extend>>
<<include>>
Assign
Route/Place
Assign MCPs
Janitor
Receive task for
janitor
Extend
Receive Information
of MCP
Worker
Collector
Receive task for
Collector
Extend
Recieve vehicle
Extend
Check out
View route
Check in

Use-case ID	U2
Use-case name	Change task
Use-case overview	Change tasks for collector/janitor
Actor	Back officer
Preconditions	- User login successfully - User must be a back officer and has right to access the system
Trigger	Click "Adjust task" button at the row of overview table
Steps	1. Back officer click "Change task" button. 2. The system display a form. 3. Back officer adjust the form 4. Back officer click "submit" button. 5. The system confirm and return overview table.
Alternate flow	At step 4: 4.1. The system alert "Conflict" (time, place or route, employee,...) 4.2. Back officer repair again.
Post Condition	Task updation into the database Notification send to employee
Exception flow	System alert error: - Choose one employee with more than 8h/day. - Choose vehicle/troller but nothing is available. Network error

Use-case ID	U3
Use-case name	Delete task
Use-case overview	Delete a task from the the system
Actor	Back officer
Preconditions	- User login successfully - User must be a back officer and has the right to access the system
Trigger	Click icon "garbage bin" button at the row of overview table
Steps	1. Back officer click icon "garbage bin" button 2. The system display a alert "are you sure?" 3. Back officer agree. 4. The system remove this task and return overview table.
Alternate flow	No
Post Condition	Task remove out of the database Notification send to employee
Exception flow	System alert error: - Choose one employee with more than 8h/day. - Choose vehicle/troller but nothing is available. Network error

2 Bibliography