ĐẠI HỌC QUỐC GIA THÀNH PHỐ HỒ CHÍ MINH
TRƯỜNG ĐẠI HỌC BÁCH KHOA
KHOA KHOA HỌC & KỸ THUẬT MÁY TÍNH

SOFTWARE ENGINEERING

Report

TASK 1:
Requirement Elicitation

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1   Identify the context of this project.

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 contexts, 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   Who are relevant stakeholders?

- Organization that provides professional waste management services; people and organizations having an interest in waste management, and participating in activities related to that (residents, manufacturers, office workers, garbage collectors and others who are engaged in some waste management activity).

3   What are their current needs?

- They want to develop an information management system called UWC 2.0 in order to improve the efficiency of garbage collection.

- Goodwill communication between team members is needed for better efficiency.

- The status of MCPs should be monitored and updated regularly.

- Database processing with a large number of MCPs.

4   What could be their current problem?

- Landfills do not have a mechanism to update the amount of garbage at each dump and do not have a suitable plan for treatment and do not notify Janitors in time.

- When Back Officers change their work schedule or travel route, Collectors and Janitors may not be aware (lack of functional notification).

- The parties are not linked with each other, the state of the MCP is not known, leading to no route optimization, the route and the time to go through the MCP are not optimized.

- The number of MCPs is increased, requiring flexible operation of Janitors and Collectors.
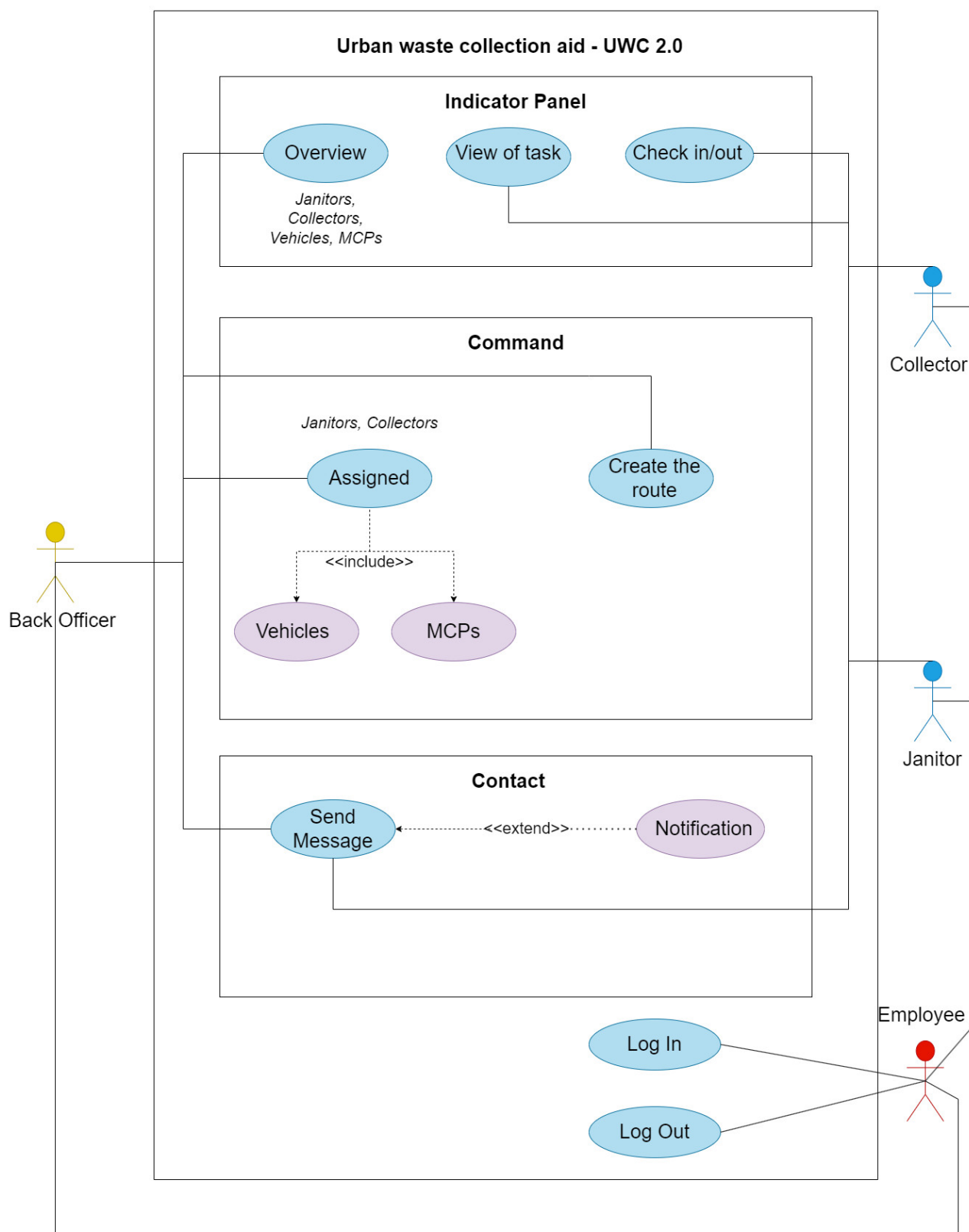
5   In your opinion, what benefits UWC 2.0 will be for each stakeholder?

- For External stakeholders (government, organizations, investigator,...):
  - reduced environmental liability for their business
  - boost their business' image for being environmentally aware
  - raised staff morale and environmental awareness
  - systematic control of their individual waste issues
  - increased business opportunities - many large companies and government organisations won't work with a business that doesn't have an environmental management system.

- For Internal stakeholders
  - Back officers
    * follow the work of Collectors and Janitors.

* follow the capacity of burial site MCPs.
* improve the management of tasks and vehicles .
* improved communication between team members.
* better route optimization.

– Collectors and Janitors:

* follow daily and weekly work schedule.
* communicating with Collectors, other Janitors and Back Officers.
* be informed about the status of MCPs when they are full.
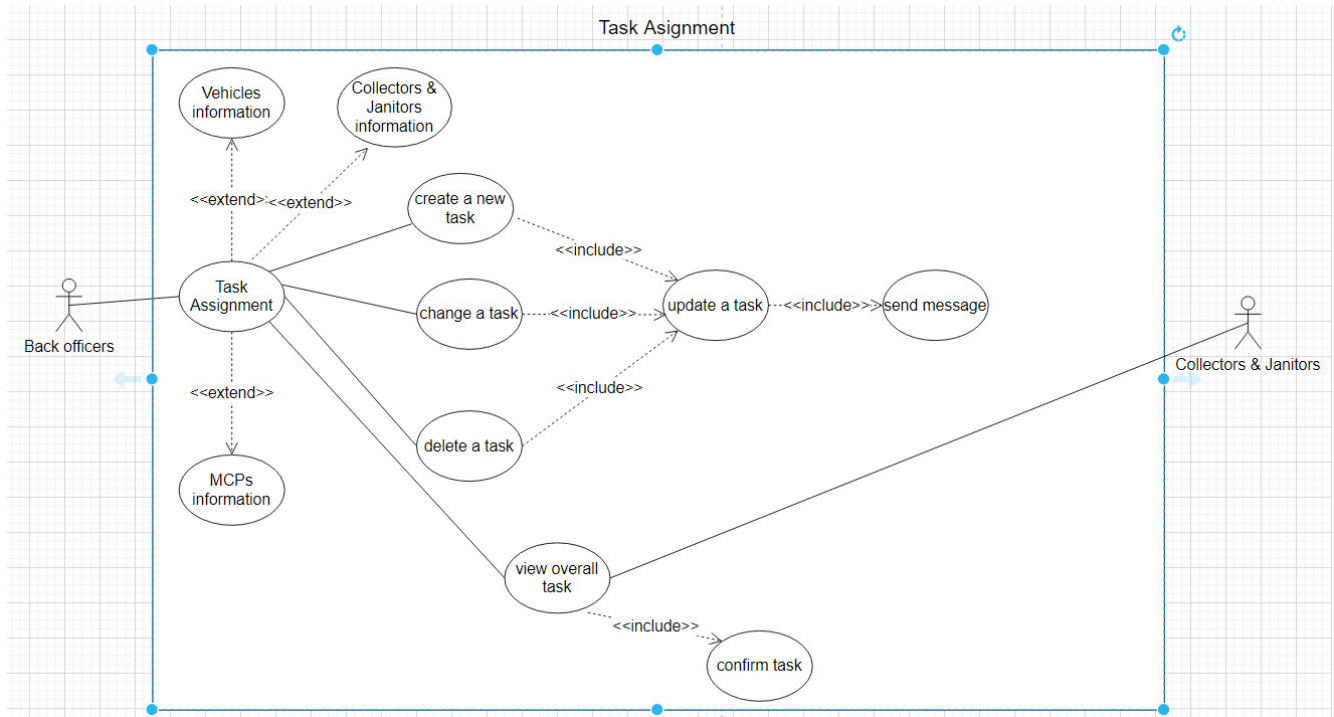* be able to check personal information.
* daily check-in/check-out.

6 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:

– Back officers to:

* Have an overview of janitors and collectors, their work calendar
* 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. Information should be updated from MCPs every 15 minutes with the availability of at least 95% of their operating time.
* Assign vehicles to janitors and collectors
* Assign janitors and collectors to MCPs (task)

– Collectors and janitors to:

* Have an overview of their work calendar
* Have a detailed view of their task on a daily and weekly basic. All important information should be displayed in one view (without scrolling down).
* Be able to communicate with collectors, other janitors and back officers. The messages should be communicated in a real-time manner with delay less than 1 second.
* Check in / check out task every day
* Be notified about the MCPs if they are fully loaded

* Non-functional requirements:

– UWC 2.0 is expected to import and to use the existing data from UWC 1.0.
– Task Management can be inter-operable with the UWC 1.0.
– The system should be able to handle real-time data from at least 1000 MCPs at the moment and 10.000 MCPs in five years.
– UWC 2.0 system interfaces should be in Vietnamese, with an opportunity to switch to English in the future.

* Use-case diagram for the whole system:

Urban waste collection aid - UWC 2.0

Indicator Panel

Overview

View of task

Check in/out

Janitors, Collectors, Vehicles, MCPs

Command

Janitors, Collectors

Assigned

Create the route

<<include>>

Vehicles

MCPs

Contact

Send Message

<<extend>>

Notification

Log In

Log Out

Collector

Janitor

Employee

Back Officer

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

- Use-case diagram for Task assignment module:

• Describe the use-case using a table format

Use-case name	Task Assignment
Actor	Back officers
Description	Back officers make a calendar to assign task for collectors and janitors
Precondition	Back officers have to log in Information of: • MCPs • Collectors and janitors • Vehicles
Normal flow	1. Back officers create a new task 2. The system update the new task 3. The system will send notification to collectors and janitors 4. Collectors and janitors view the task and confirm it. 5. If collectors and janitors confirm that task, the system will be updated, else come back to step 1.
Exception	1. Back officers push the "delete" button but there has not been a task yet.
Alternative flows	1. Change a task • Back officers change a task • The system update the task • The system will send notification to collectors and janitor • Collectors and janitors view the task and confirm it. 2. Delete a task • Back officers delete a task • The system update. • The system will send notification to collectors and janitors.