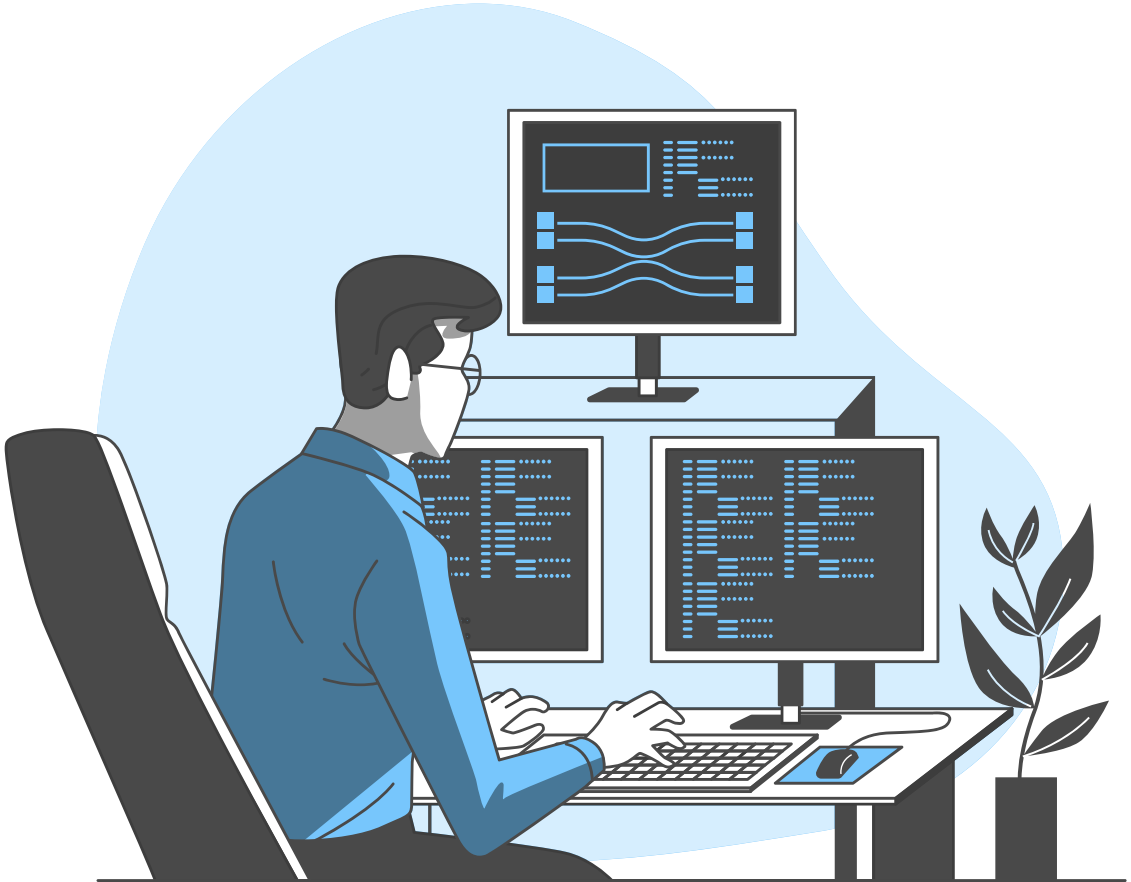

UWC 2

Bùi Quốc Minh Quân
Nguyễn Hải Đăng
Nguyễn Mạnh Đan
Nguyễn Hà Trọng Hiếu

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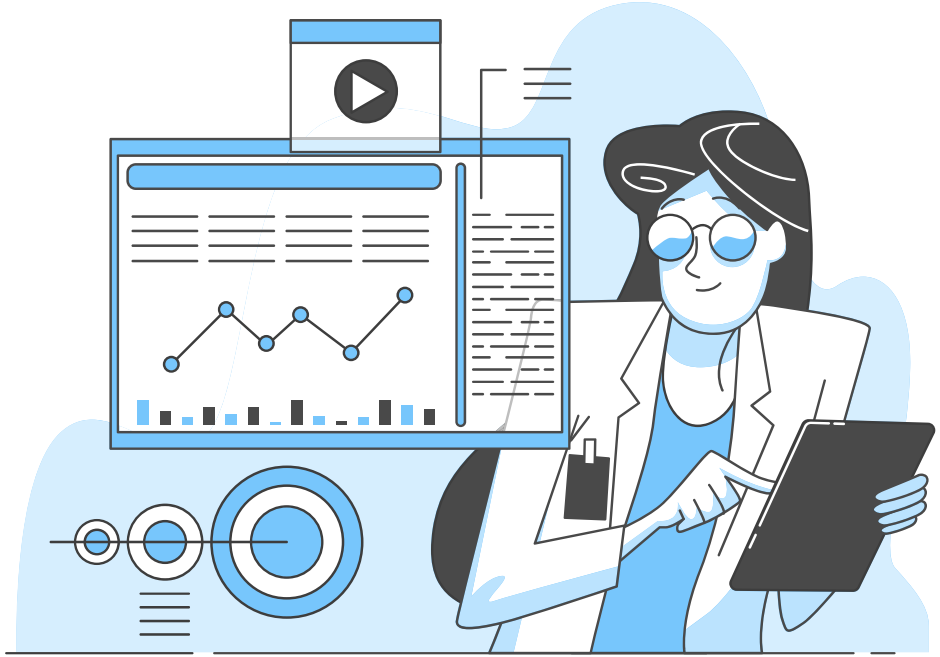


REQUIREMENT ELICITAION

1.1 CONTEXT AND STAKEHOLDERS

Urban waste management has been of the most notable problems of the world.

In an attempt to solve this problem and achieve Sustainable Development Goal (SDG), improvement on waste collection and management must be made.

The relevant stakeholders in this project include:

- The back officers
- The collectors
- The janitors

Their current need is that they require an information management system through which they can communicate and coordinate with one another.

1.1 CONTEXT & STAKEHOLDERS

Benefits for the stakeholders:

☞ Back officers: provides the capability to create calendar, coordinate front collectors, janitors and assign tasks. Assists vehicle planning activity.

☞ Collectors: provides information of all MCP to drive through and the predetermined route.

☞ Janitors: provides information about location of MCP, to which they can deliver garbage to after collection

1.2 FUNCTIONAL REQUIREMENTS FOR BACK OFFICER

01 Have an overview of janitors and collectors, their work calendar

02 Have an overview of vehicles and their technical details

03 Have an overview of all MCPs and information about their capacity

1.2 FUNCTIONAL REQUIREMENTS FOR BACK OFFICER

04 Assign vehicles to collectors

05 Assign janitors to MCPs

06 Create a route for each collector. Assigned route is optimized in term of fuel consumption and travel distance.

07 Able to send message to collectors and janitors

1.2 FUNCTIONAL REQUIREMENTS FOR COLLECTOR & JANITOR

01 Have an overview of their work calendar

02 Have a detail view of their task on a daily and weekly basic. All important information should be displayed in one view

03 Able to communicate with collectors, other janitors and back officers. Messages should be communicated in a real-time manner with delay less than 1 second.

04 Check in / check out task every day

05 Notified about the MCPs if they are fully loaded

1.2 NON-FUNCTIONAL REQUIREMENTS

01 Have an overview of their work calendar

02 Have a detail view of their task on a daily and weekly basic. All important information should be displayed in one view

03 Able to communicate with collectors, other janitors and back officers. Messages should be communicated in a real-time manner with delay less than 1 second.

04 Check in / check out task every day

05 Notified about the MCPs if they are fully loaded

1.2 NON-FUNCTIONAL REQUIREMENTS

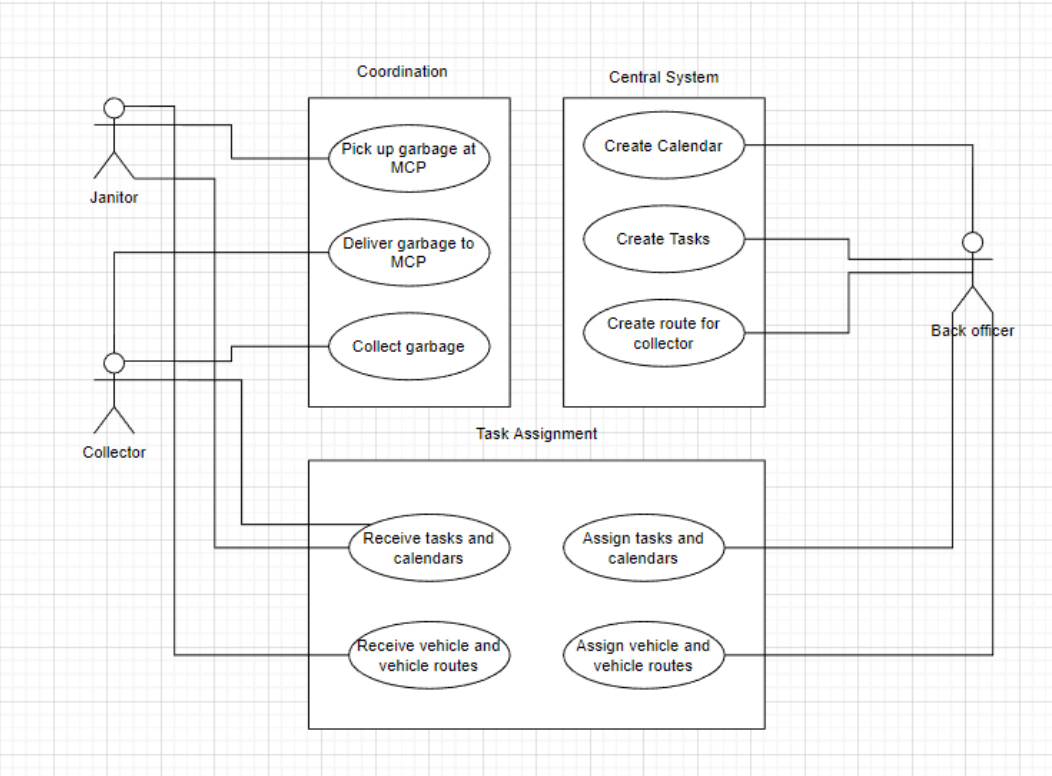
01 UWC 2.0 is expected to import and to use the existing data from UWC 1.0

02 UWC 2.0 must be inter-operable with the UWC 1.0 as much as possible

03 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

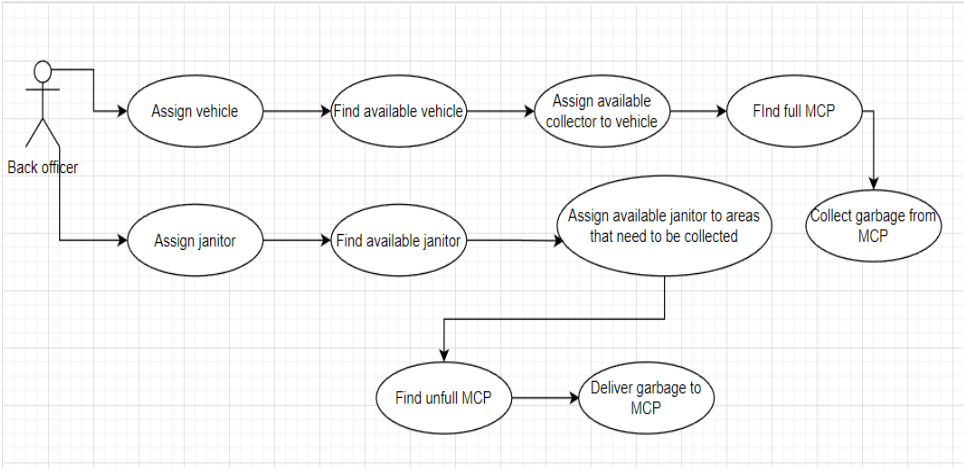
04 UWC 2.0 system interfaces should be in Vietnamese, with an opportunity to switch to English in the future

1.2 SYSTEM USE-CASE DIAGRAM



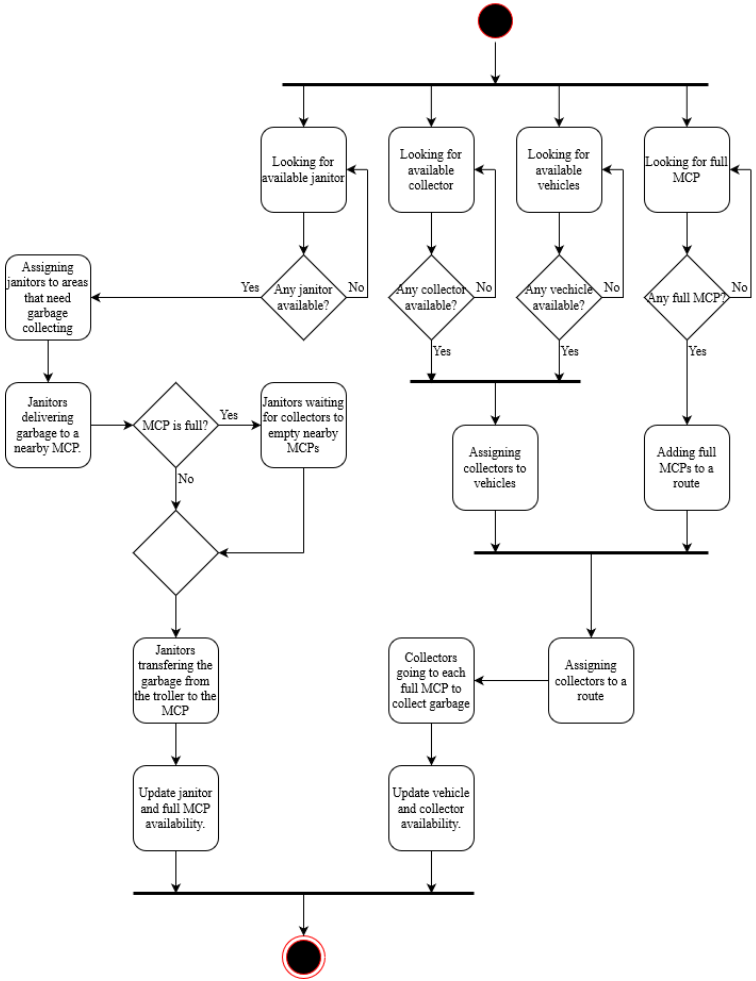
1.2 TASK ASSIGNMENT MODULE USE-CASE DIAGRAM

Use case	Description
Name	Task Assignment
Actors	Back officer , collector, janitor
Pre-condition	Collector, janitor, vehicle must be available
Post-condition	All MCPs' garbage is collected
Basic path	1. This use case starts when the back officer assign vehicle to the collector and assign janitor to areas which need garbage-collecting . 2. Find MCPs. 3. All MCPs' garbage is collected by the collector.
Alternative path	At step 2 of the basic path, if the MCP is full , assign collector to collect garbage.
Exceptional path	At step 2 of the basic path, if the MCP is unfull , assign janitor to deliver garbage to that MCP.



SYSTEM MODELLING

2.1 BUSSINESS PROCESS IN TASK ASSIGNMENT MODULE

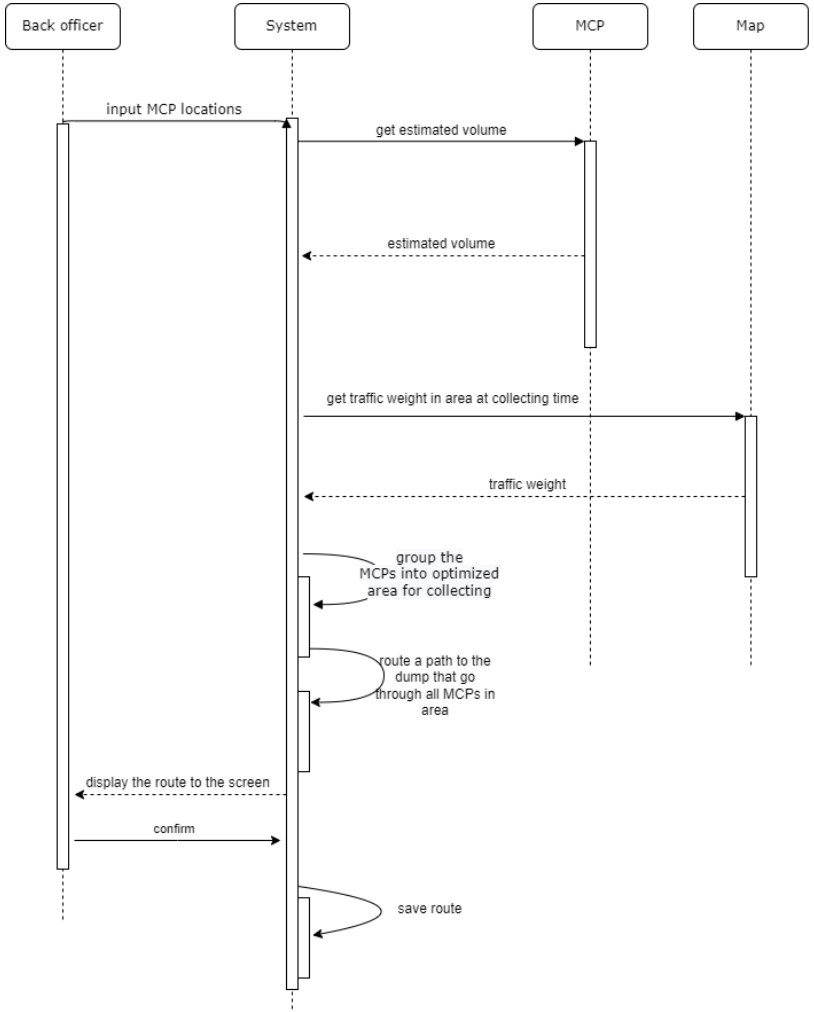


2.2 A CONCEPTUAL SOLUTION FOR THE ROUTE PLAIING

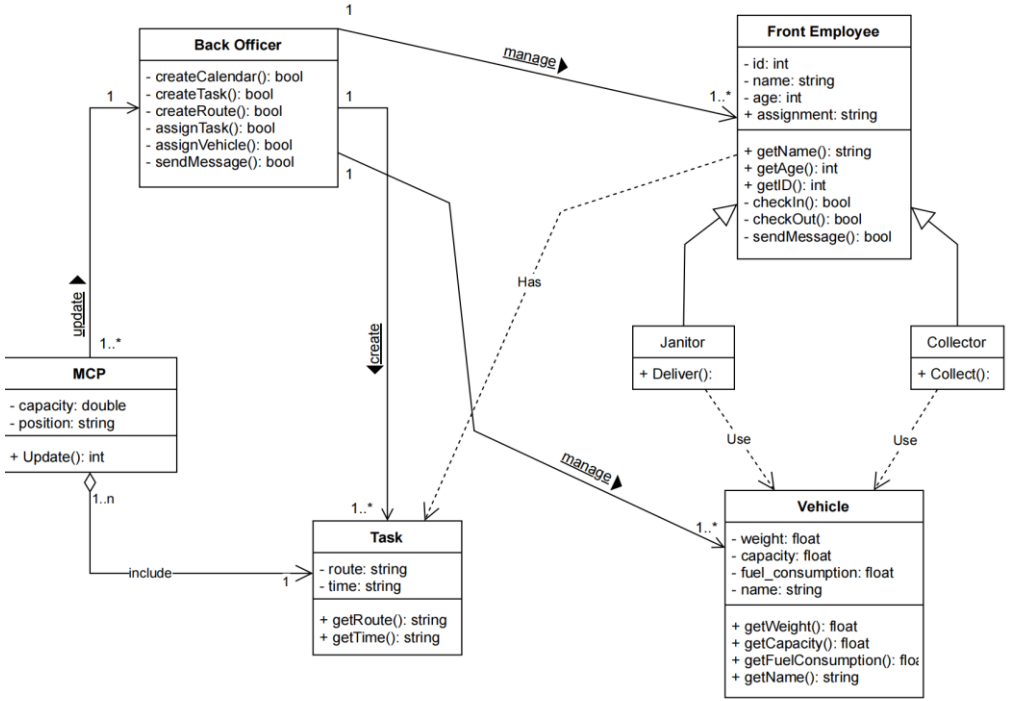
Objectives:
- Minimize the number of vehicles used and travel time.
- Balance the workload between vehicles.

Constraints:
- Vehicle and MCP capacity.
- Vehicle travel time.

Solution:
- Based on the MCP locations, the system divides the map into different areas where MCPs are relatively close to each other.
- Then the system will form an optimal route connecting all full MCPs in that area that will take the least amount of traveling.

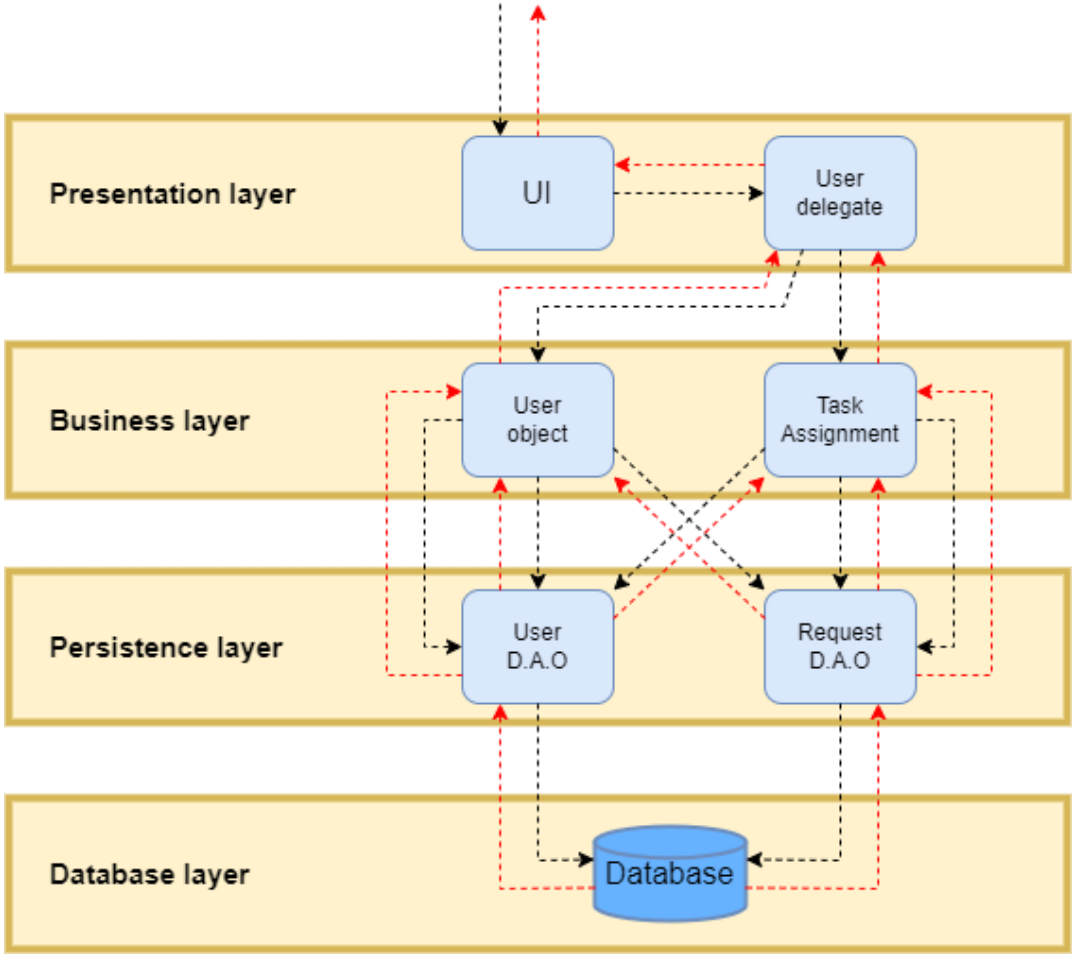


2.3 CLASS DIAGRAM FOR TASK ASSIGNMENT MODULE

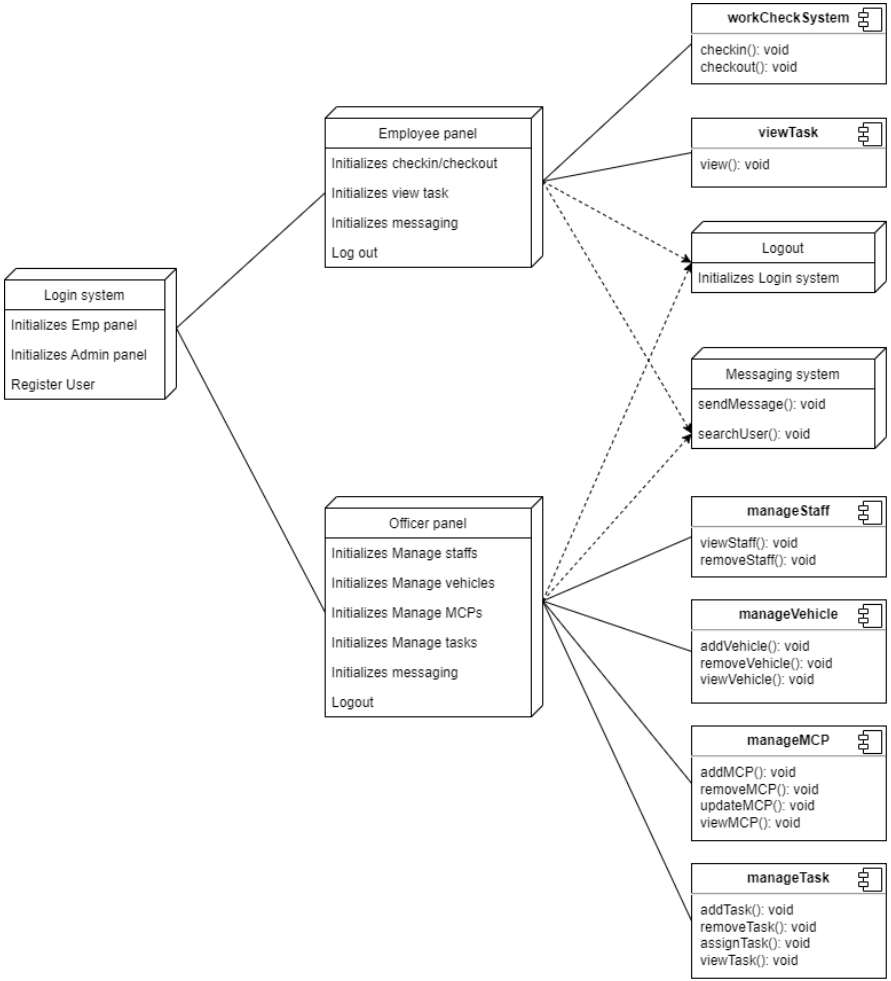


ARCHITECTURE DESIGN

3.1 SYSTEM ARCHITECTURE



3.2 DEPLOYMENT DIAGRAM



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THANK YOU FOR YOUR ATTENTION