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

Software Engineering

Capstone Project
Urban waste collection aid - UWC 2.0

Advisor: Dr. Truong Tuan Anh
Student: Huynh Thanh Tung - 2052781
Trinh Hoai Thanh - 2053427
Đang Cong Khanh - 2053105
Ha Tan Khanh Nam - 2052603
Tran Thanh Son - 2053405

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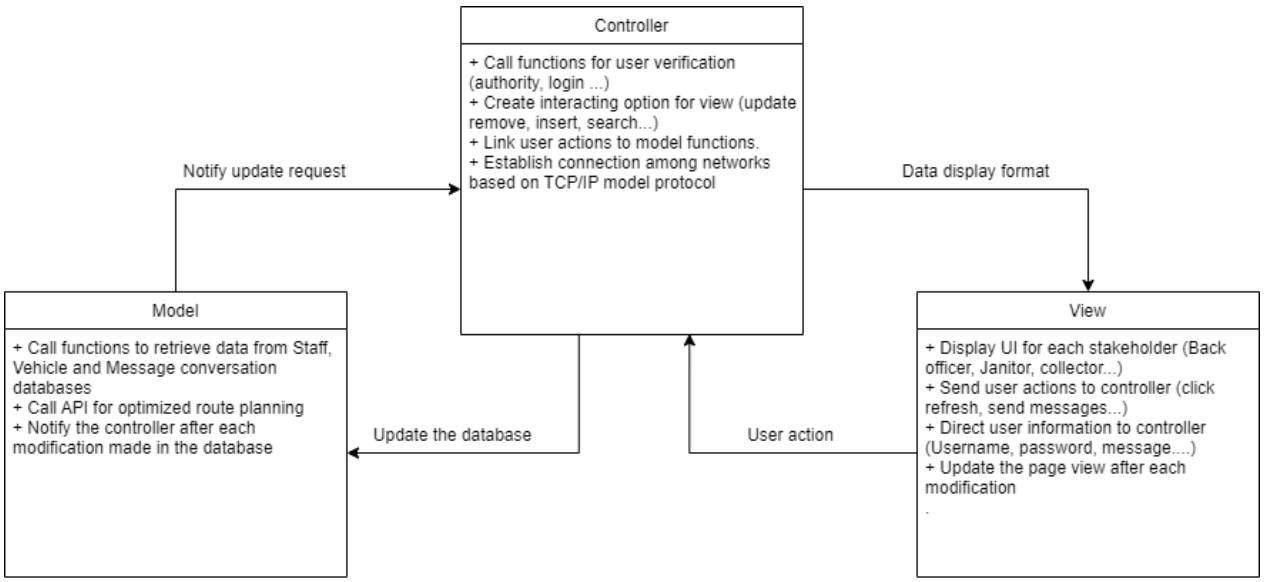
1 Task 3: Architecture design

1.1 Describe an architectural approach you will use to implement the desired system. How many modules you plan for the whole WMC 2.0 system? Briefly describe input, output and function of each module

- Architectural approach:
  - Our system is a transaction processing system, which is mainly based on handling users' requests in getting an information or updating an information from a database (for example: janitors and collectors want to have their work calendar and information about their tasks, back officers want to update the calendar or MCPs states, as well as adding or removing information about staffs and facilities . . .)
  - The user will interact with an interface, with different action options depending on the role of that user (Manage, Update or view only. . .)
  - The application will be web-based which allows communication among users through Internet connection.
  - Because of the mentioned reasons, we decided to use the MVC (Model-view-controller) pattern for the architectural design.



- MVC description
  1. Model
     - Have methods/functions to access and retrieve information about staff and vehicle
     - Be able to call an API specialized in creating optimized routes from given vehicles and MCPs locations.
     - Whenever a change is made in the model database, it will send a request to the controller to refresh the page.
  2. Controller
     - Show responding UI based on user's action
     - Call functions in the model for CRUD task (update calendar, get staff information, delete a task,...)
     - Handle user verification and authority:
       * Login verification
       * Determine which category the user can modify/see (Janitor and collector cannot modify the work calendar)
     - Response user request/action
  3. View
     - Provide a responding interface for each stakeholder
     - Receive user input data (username, password, . . .) and actions (click button, refresh page,...)
     - Parse data to controller to call function
- Module details
  - We categorize our modules based on the use case, so there are 5 modules in total for our desired system.

Name	Communication module
Functionality	Provide an environment for communicating between staffs and back officers
Relation	Database: Access previous messages
Input	Communication request (send message)
Output	The request is successfully executed (message is delivered to the receiver)

Table 1: Communication module

Name	Information management module
Functionality	Get, assign, update or remove information about staffs and facilities
Relation	Database: Access the database for retrieving and updating information
Input	A user's command/action
Output	Requested data displayed and/or some updates on the database

Table 2: Information management module

Name	Work calendar management module
Functionality	Get, assign, update or remove information in staffs' work calendar Check in and check out task for staffs to keep track of progress
Relation	Database: Access the database for retrieving and updating information Task assignment module: Assigning and updating work calendar is a result of Task assignment module
Input	A user's command or a request from Task assignment module
Output	Requested data displayed and/or some updates on the database

Table 3: Work calendar management module

Name	Task assignment module
Functionality	Receive assignment request from back officers and generate appropriate task for staffs based on current state of facilities Notify the staffs when some updates happen
Relation	Information management module: task assignment needs information about the staffs and facilities
Input	Request of assigning a task to a staff
Output	A task is generated and scheduled in the work calendar

Table 4: Task assignment module

Name	Interface utility
Functionality	Language switching (Vietnamese - English)
Relation	Database: Access language mapping table
Input	Request of switching language
Output	Language changed

Table 5: Interface utility

1.2 Draw an implementation diagram for Task Assignment module