

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

We decided to choose the MVC approach for the architecture of UWC 2.0.

**Description:**

- Model: In our management application, the model object contains an array of MCP objects with all the information(data) needed for the app; an array of vehicles and also an array of janitors and collectors.
- View: We have 3 main views corresponding to 3 different roles in the system: Back Officer, Collector and Janitor.
  - + The Back Officer View will have the general work calendar view, vehicle list view, vehicle view, MCP list view, route creating view, janitor/collector list view and their respective views.
  - + The Collector View will contain the work calendar view, the assigned-vehicle view and route view, in the route view, we will see a list of MCPs in the corresponding route.
  - + The Janitor View will contain the work calendar view, the assigned-MCP view.
- Controller: We have 3 controllers corresponding to 3 different roles in the system: Back Officer, Collector and Janitor. Controller will get change requests from the view then get update requests from the model.
  - + The back officer can send request from Back Officer View for checking the status of vehicles, availability of janitors and collectors; assigning vehicle to collector, MCP(s) to collector and janitor.
  - + The collector can send requests from Collector view to check in/check out, communicate with other collectors, janitors and back officers.
  - + The janitor can send requests from the Janitor view to check in/check out, communicate with collectors, other janitors and back officers.

**Advantages:**

- MVC has the feature of scalability that in turn helps the growth of application as there would be more routes, more MCPs to be collected.
- Using MVC, the application becomes more understandable. It is important for the back office to efficiently use the system.

- The extending and testing of applications is easier. It is because the system is constantly in use so that we should be able to have a fast and efficient test so that we could fix the system as soon as possible and get it in use.

### **Disadvantages:**

- It may not be suitable for small applications which have an adverse effect on the application's performance and design.

### **Number of modules:**

There will be a total of 5 modules for the whole system:

- **Vehicle assignment module:**  
The input will be an available vehicle and the chosen collector, the output will be the assignment of that vehicle to that specific collector. The vehicle and collector are now no longer available.
- **MCP assignment module:**  
The input will be an available MCP, a chosen collector or janitor, the output will be the assignment of that MCP to that specific worker.
- **Route assignment module:**  
The input will be a route, a chosen collector or janitor, the output will be the assignment of that route to that specific worker.
- **Route planning module:**  
The input will be a list of chosen MCPs to form a route, the output of the module will be a complete route that will later be assigned to an available collector.
- **Communication module:**  
The input will be the message from the sender, the output will be the changing state of the communication line from both sender and receiver.

### **3.2: Draw an implementation diagram for Task Assignment module:**

<https://drive.google.com/file/d/1dTljGlonFrtgpoQAuX3RMfv-NSPRixSu/view?usp=sharing>