FLEET MANAGEMENT SYSTEM
GROUP NAME: COLLOID
TEAM 43 - DELIVERABLE 2

Specification

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Contents

1. Activity Diagrams

The purpose of this section is to draw the activity flow of Fleet Management System to describe the various dynamic aspects of the system. An activity diagram is a flowchart to represent the flow from one activity to another activity. The different activities can be described as the operation of the system. The activity diagrams are based on the requirements for the system.
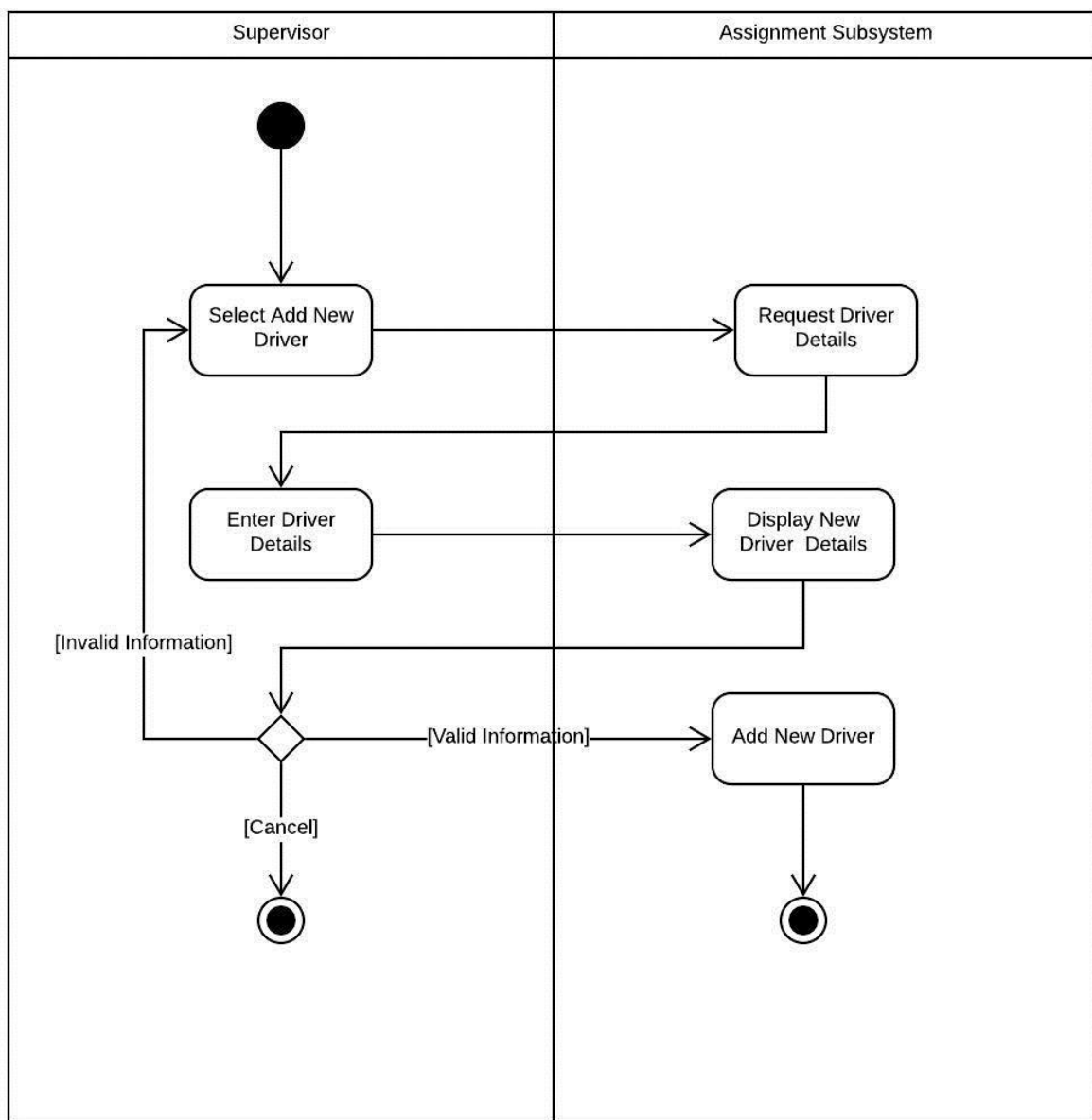
Accept Assignment
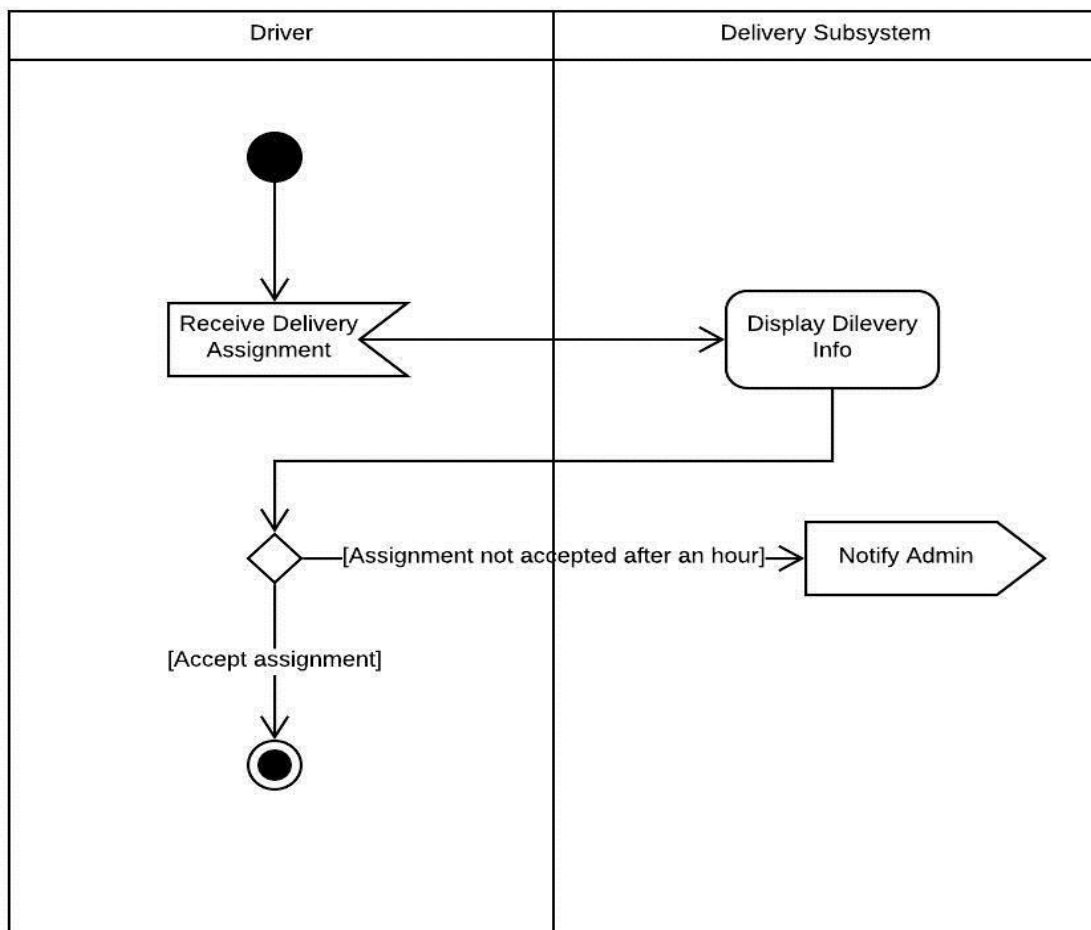
Accept Assignment Summary

The driver will get a notification on the mobile application that says that he has a delivery to do. He then views the delivery and has accepts the assignment. If he does not accept within an hour of receiving the notification, the system sends a notification to the admin who will then take necessary action.
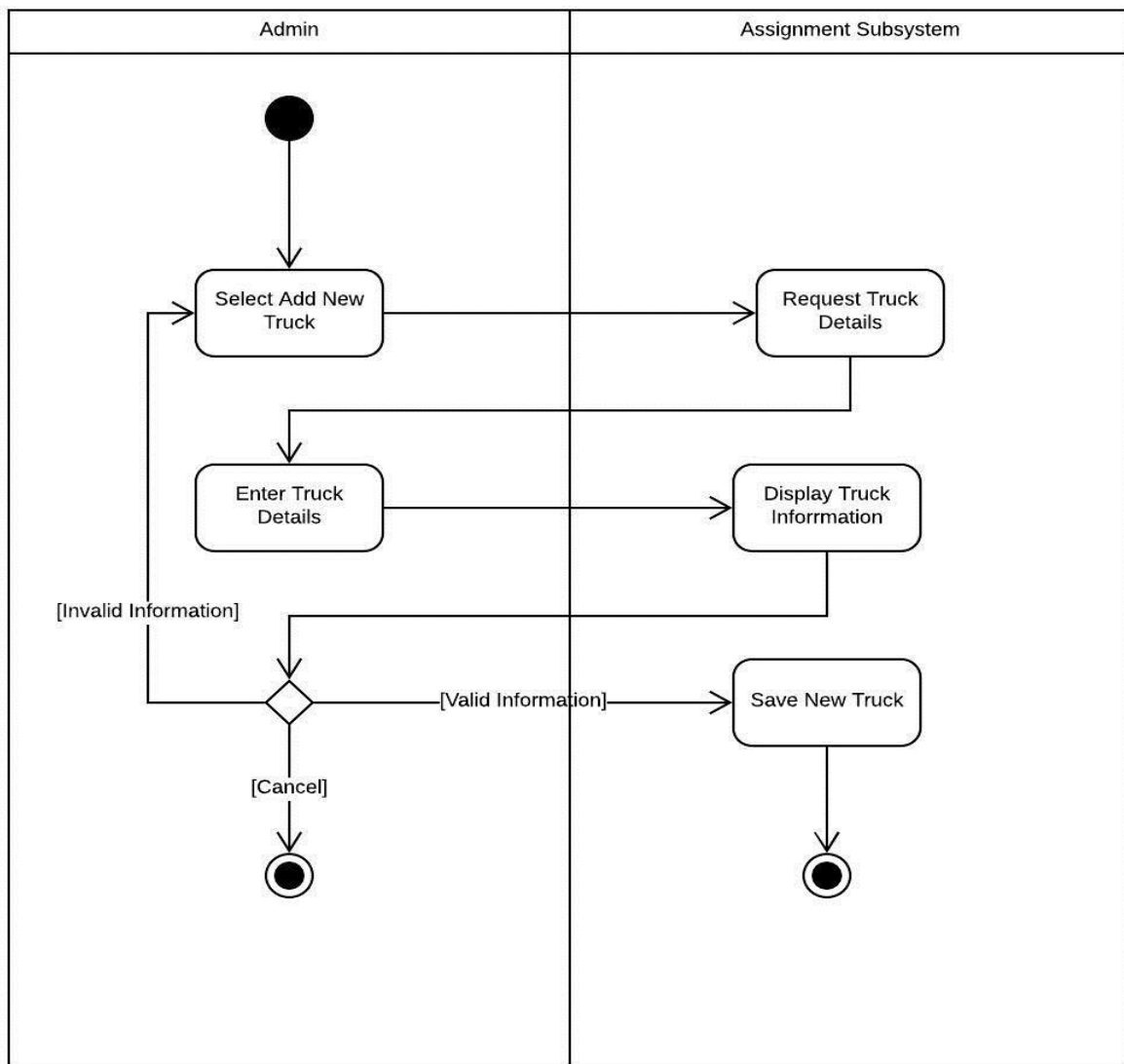
Add driver

Add Driver Summary

The supervisor chooses to add a driver to the system. He then enters details of the new driver as requested by the system. Once the supervisor is done entering the details, the system will display the information so that the supervisor can confirm that the information he entered was correct or not. If the information is valid, the system adds the new driver else if it is invalid the supervisor retries to enter the information. The supervisor can also cancel this action if necessary.

Add Truck

Add Truck Summary

The admin chooses to add a truck to the system. He then enters details of the new truck as requested by the system. Once the admin is done entering the details, the system will display the information so that the supervisor can confirm that the information he entered was correct or not. If the information is valid, the system adds the new truck else if it is invalid the admin retries to enter the information. The admin can also cancel this action if necessary.
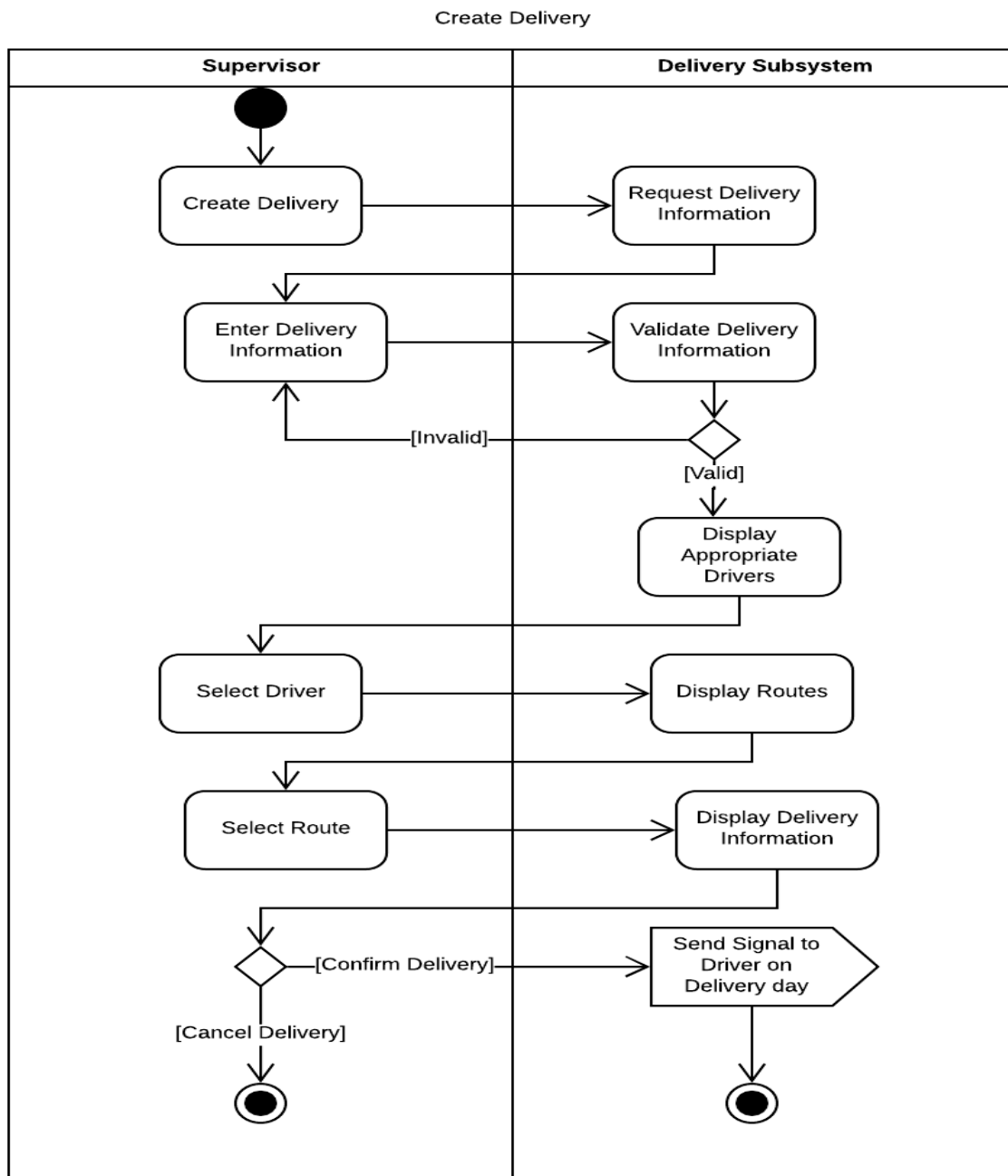
Create Delivery

Create Delivery Summary

The supervisor chooses to create a delivery. The system then requests the route start, route finish (destination), material, mass of material and date of delivery. The system then validates the information entered and if incorrect, it requests the information to be entered again. If the information is correct, the system will display a list of recommended drivers according to drivers who will be on a trip near there and timeline of the deliveries. The supervisor then selects the driver and the system displays best routes. The supervisor then selects a route from the provided routes and then the system displays the delivery information. If the supervisor confirms the delivery, the system will send a notification to the driver on the day of the delivery. If the delivery is not confirmed, it will be cancelled.

Delete driver
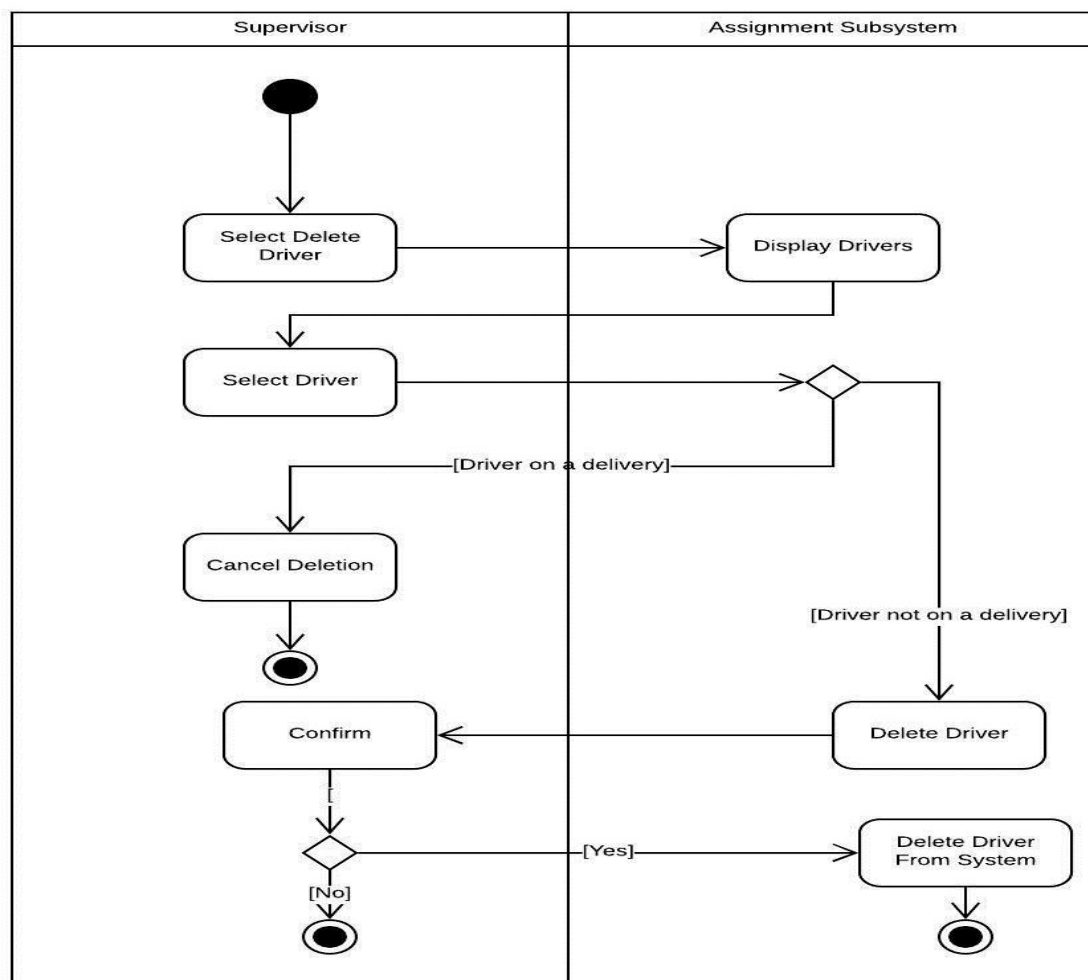
Delete Driver Summary

The supervisor chooses to delete a driver from the system. The system will then display the list of drivers currently on the system. The supervisor will select the specific driver and if the driver is currently on a delivery, it will cancel the delete action. If the driver is not on a delivery, the system will allow the supervisor to confirm by entering a password that the delete action should occur. If the supervisor confirms by entering his password then the driver will be delete else the action will be cancelled.

Delete Truck

Delete Truck Summary

The admin chooses to delete a truck from the system. The system will then display the list of trucks currently on the system. The supervisor will select the specific driver and if the driver is currently on a delivery, it will cancel the delete action. If the driver is not on a delivery, the system will allow the admin to confirm the delete action. If the supervisor confirms by entering his password then the driver will be delete else the action will be cancelled.

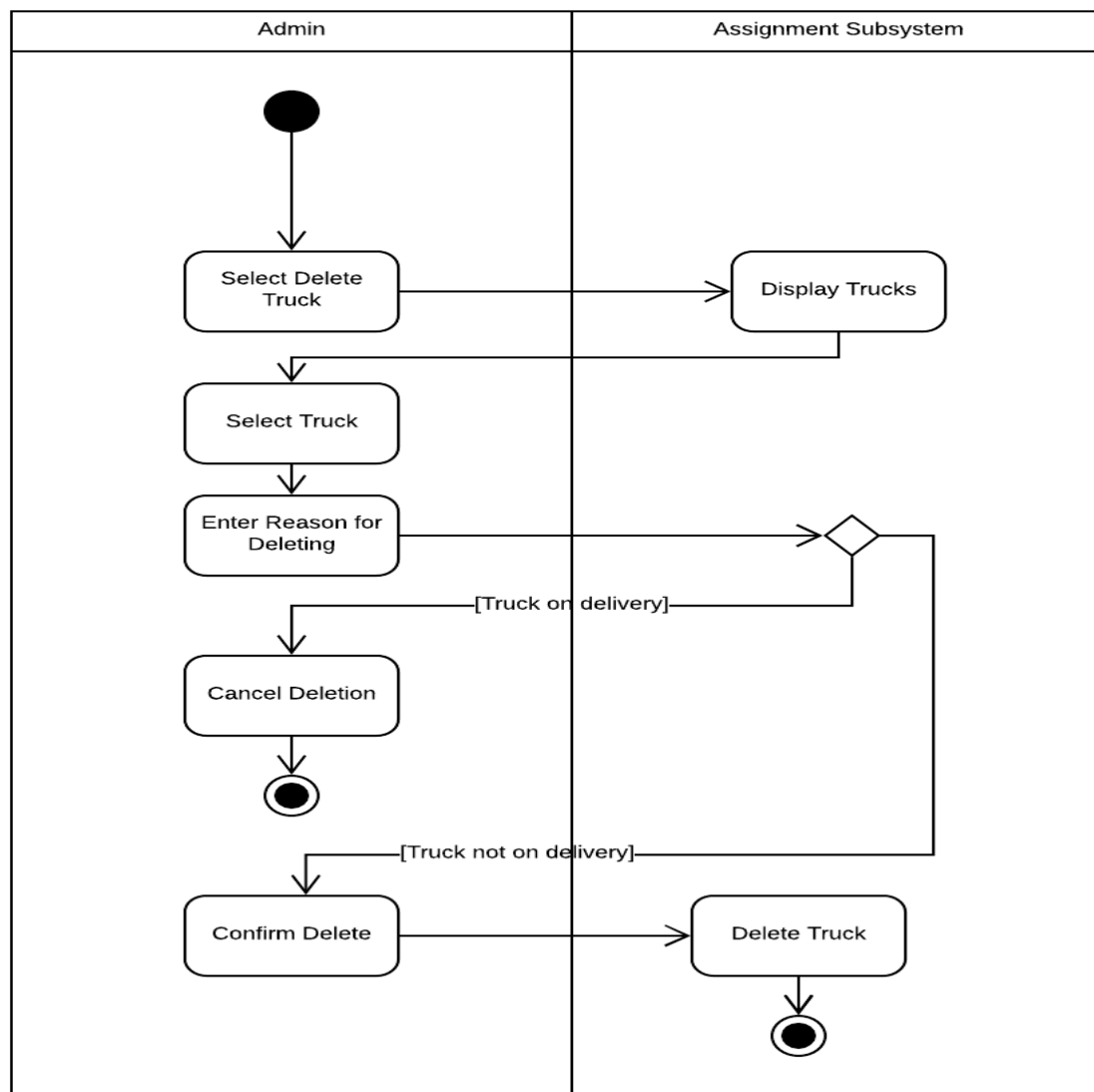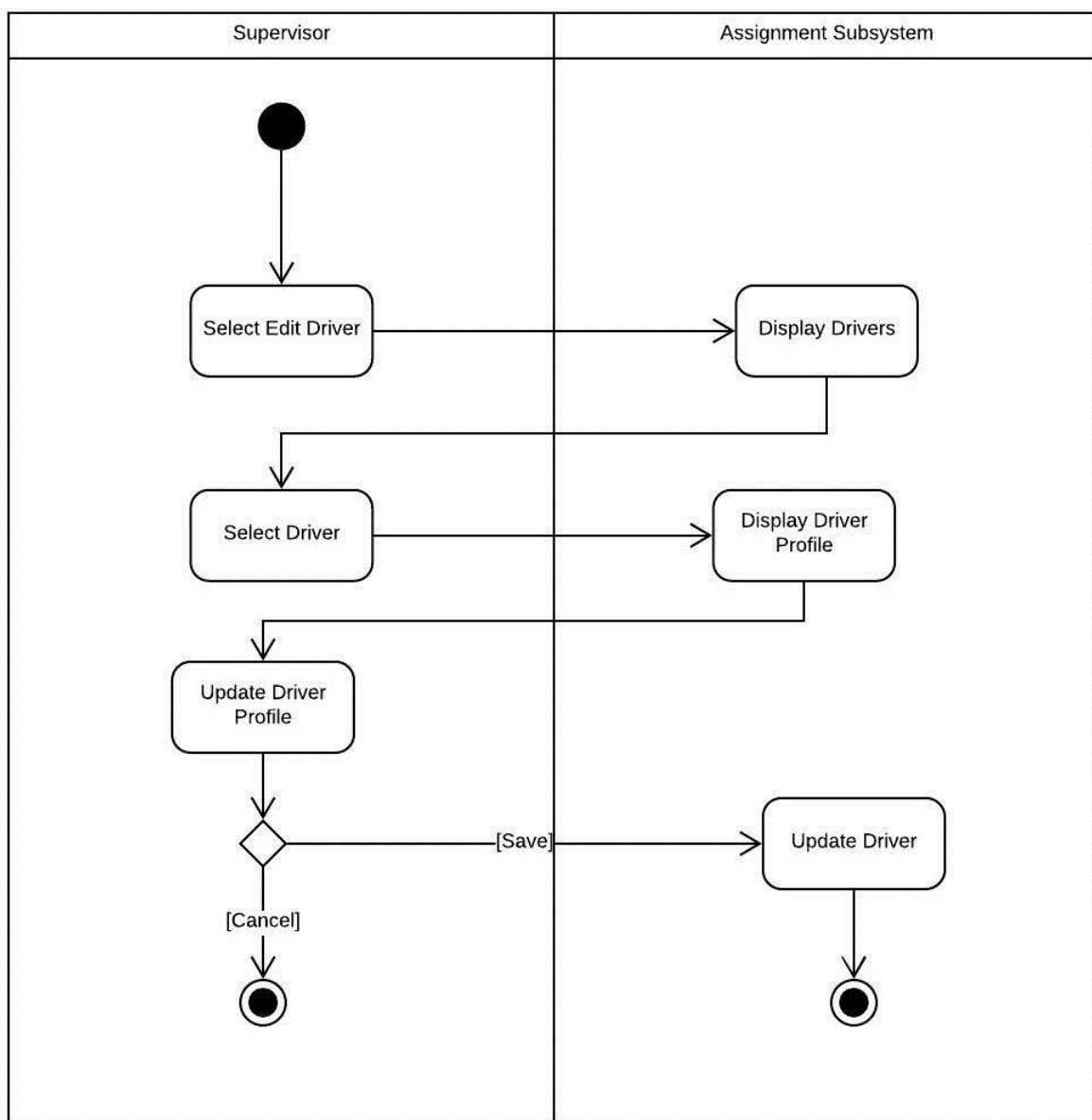Edit Driver

Edit Driver Summary

The supervisor chooses to edit a driver from the system. The system will then display the list of drivers currently on the system. The supervisor will select the specific driver and the system will display the driver's details. The supervisor can then save these changes or cancel the edit action.

End Trip

Driver	System

- Unload Materials
- Click End Trip Button

[Has another assignment]

[No Assignment]

Notify Driver to go to Head Office

Send Assignment Signal
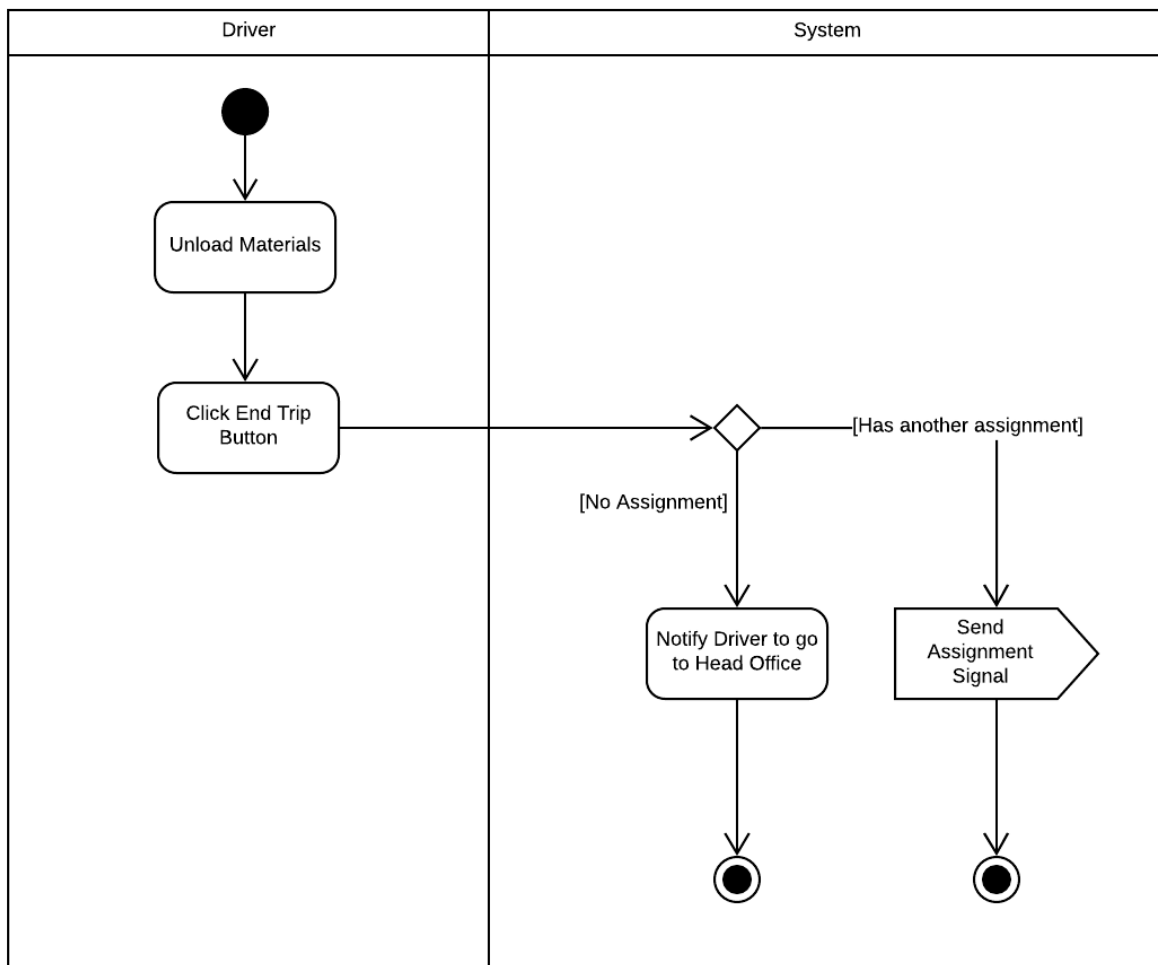
End Trip Summary

The driver arrives at the destination and unloads the material. The driver then ends the trip and if there is another assignment, he then receives the signal. If there is no other assignment, the system notifies the driver to head back to the head office.

Start Trip

Start Trip Summary

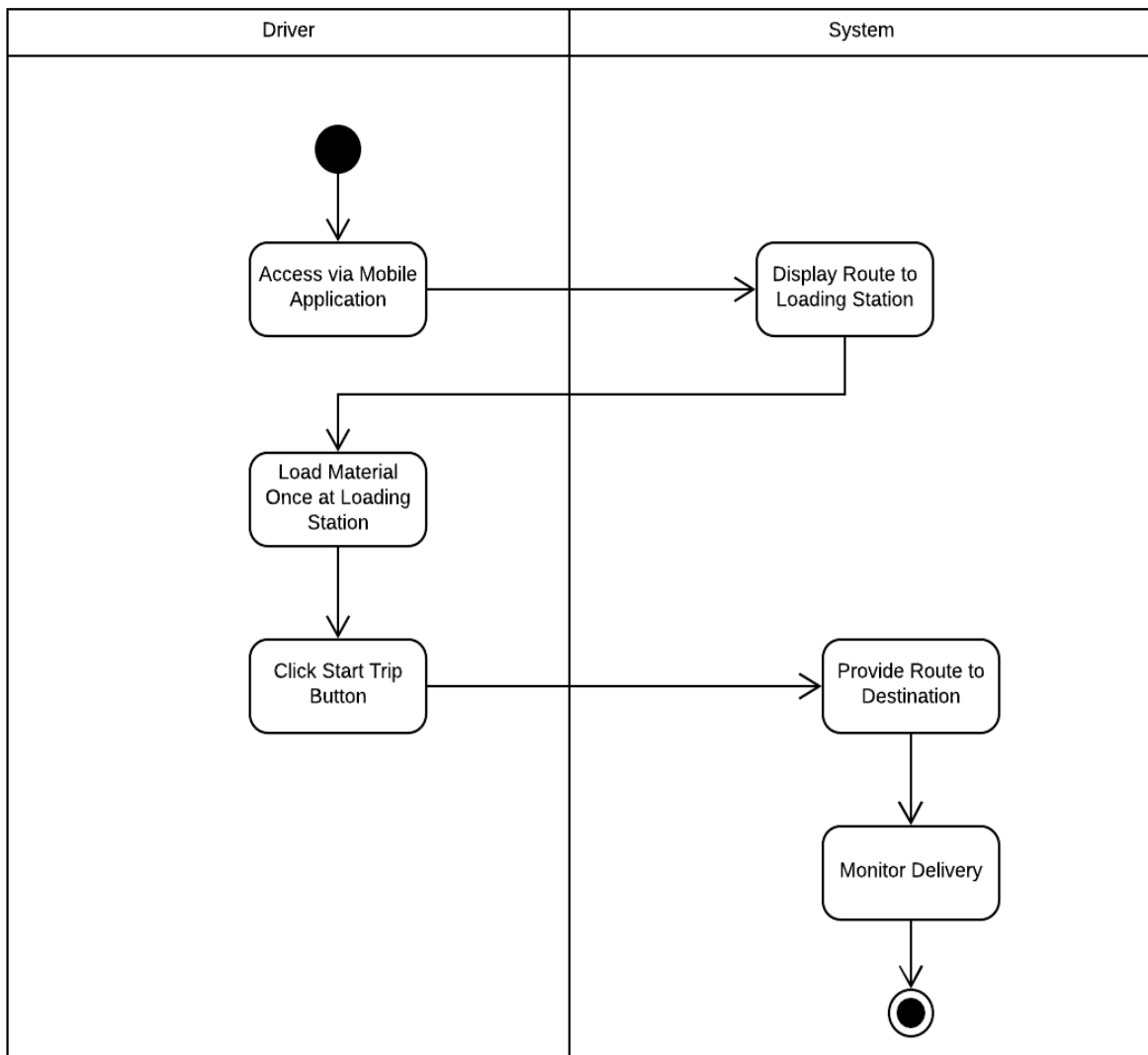The driver accesses the system via the mobile application which will provide the route to the loading station where he will load the material to be delivered. Once loading has been done, he will click the start trip button. The system will then provide a route to the destination and monitoring of the truck will begin.
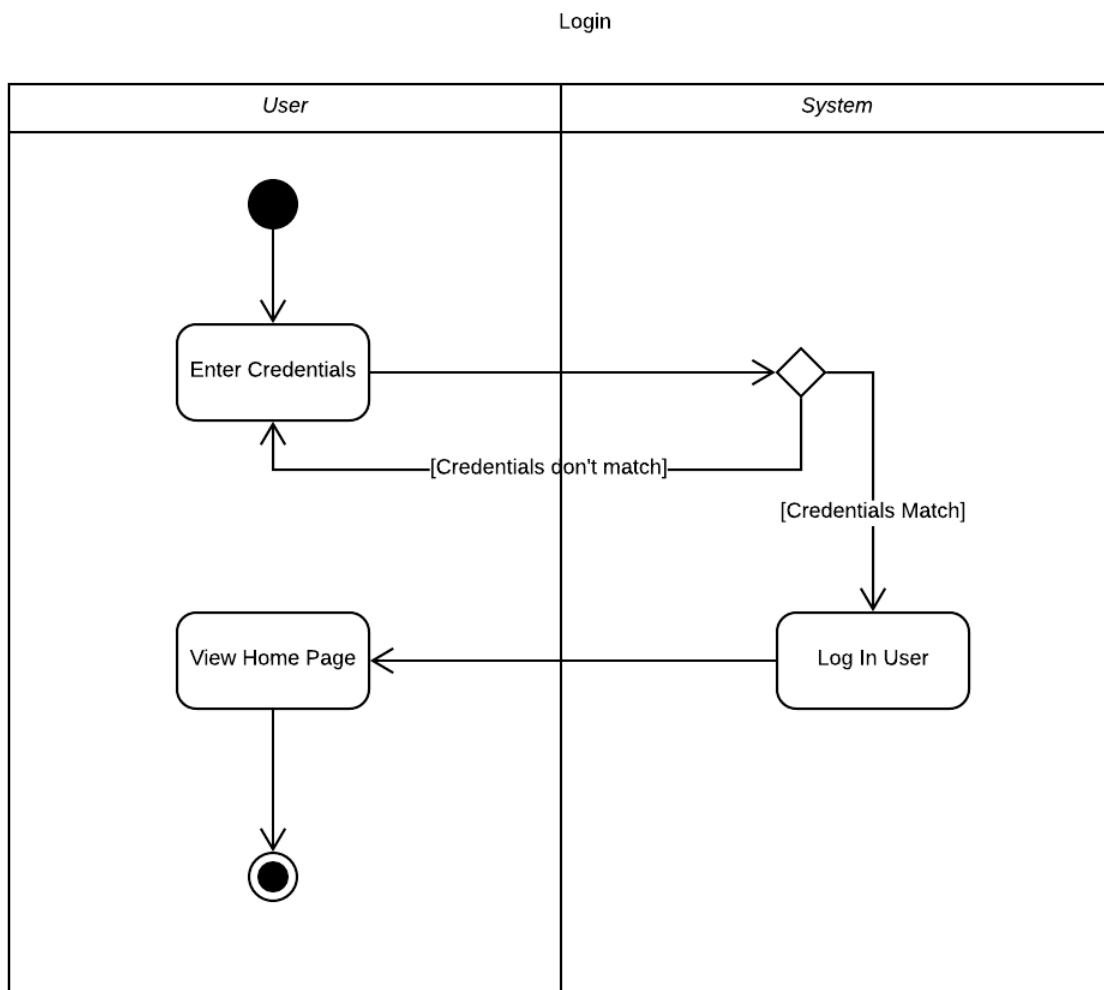
Login

Login Summary

User enters credentials and the system matches credentials with users in database if credentials match a user, the user is logged in and appropriate page is displayed. If credentials do not match user must retry to login.
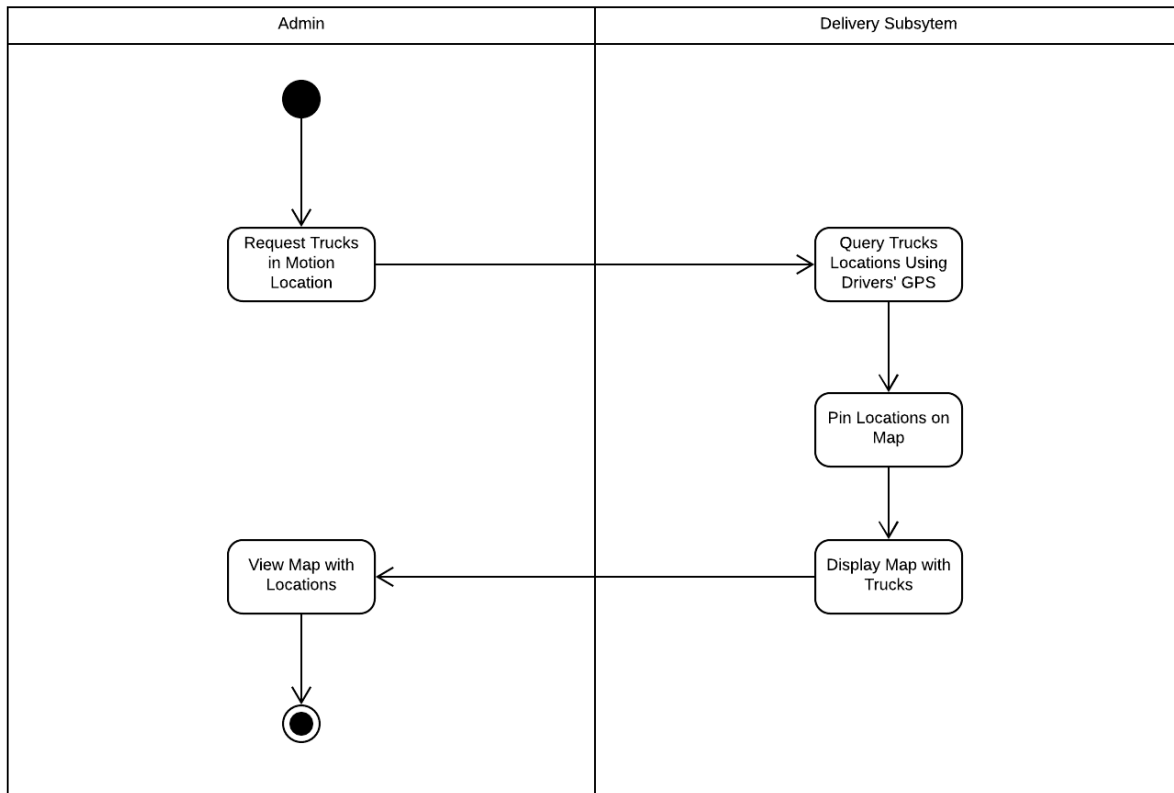
Monitor Trucks Summary

The admin requests to view the location of the trucks currently in motion. The system then does a query for the locations of the trucks using the drivers' GPS. It then pins the locations on the map and displays this map with trucks on it to the admin.

Data Handler	Delivery Subsytem

```
        ●
        │
        ▼
  ┌──────────┐              ┌──────────┐
  │ View Past│─────────────▶│ Show Past│
  │ Deliveries│             │ Deliveries│
  └──────────┘              └──────────┘
        │                         │
        ▼                         │
       ◇──────[Sort Deliveries]───┘
        │                         │
        │                         ▼
        │                   ┌──────────┐
        │─[Organise         │Generate and│
        │  Deliveries]─────▶│View Reports│
        │                   └──────────┘
        ▼
  ┌──────────┐
  │View and/ or│
  │Save reports│
  └──────────┘
        │
        ▼
        ◉
```
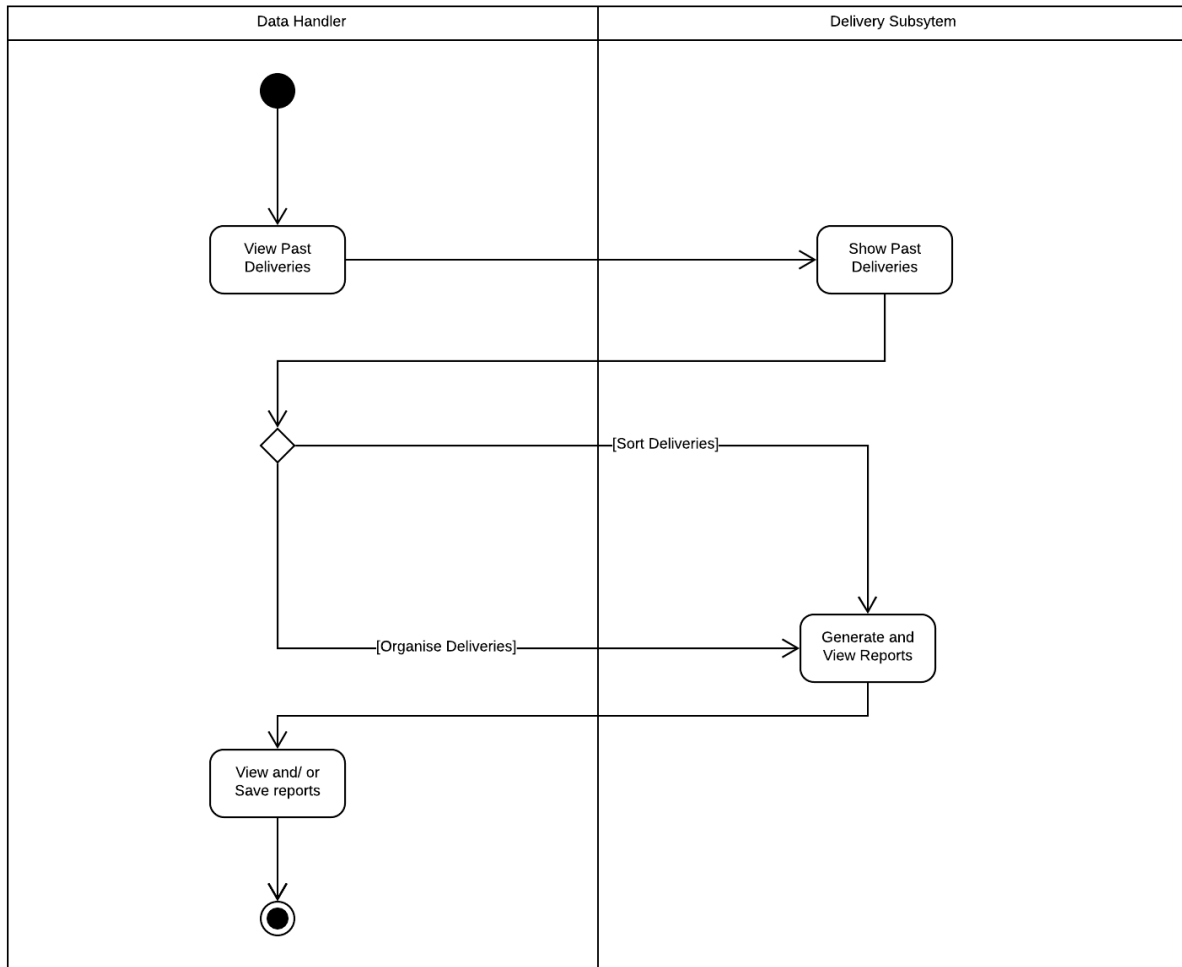
Generate Reports Summary

The data handler requests past deliveries and the system displays the past deliveries. The data handler chooses to see the deliveries organized or sorted by drivers, trucks, and delivery region or delivery date. Graphs are generated from requested deliveries in requested formatting to be viewed or saved.

2. Class Diagram

The purpose of this section is to show the structure of the system through showing the system's classes, attributes, operations and relationships among the object that will be used. It will also show visibility within the system and what object will access what. The class diagrams will be the building block of the object-oriented model that the Fleet Management System will use. The goal is to visually show the system to enable a better understanding of the system.
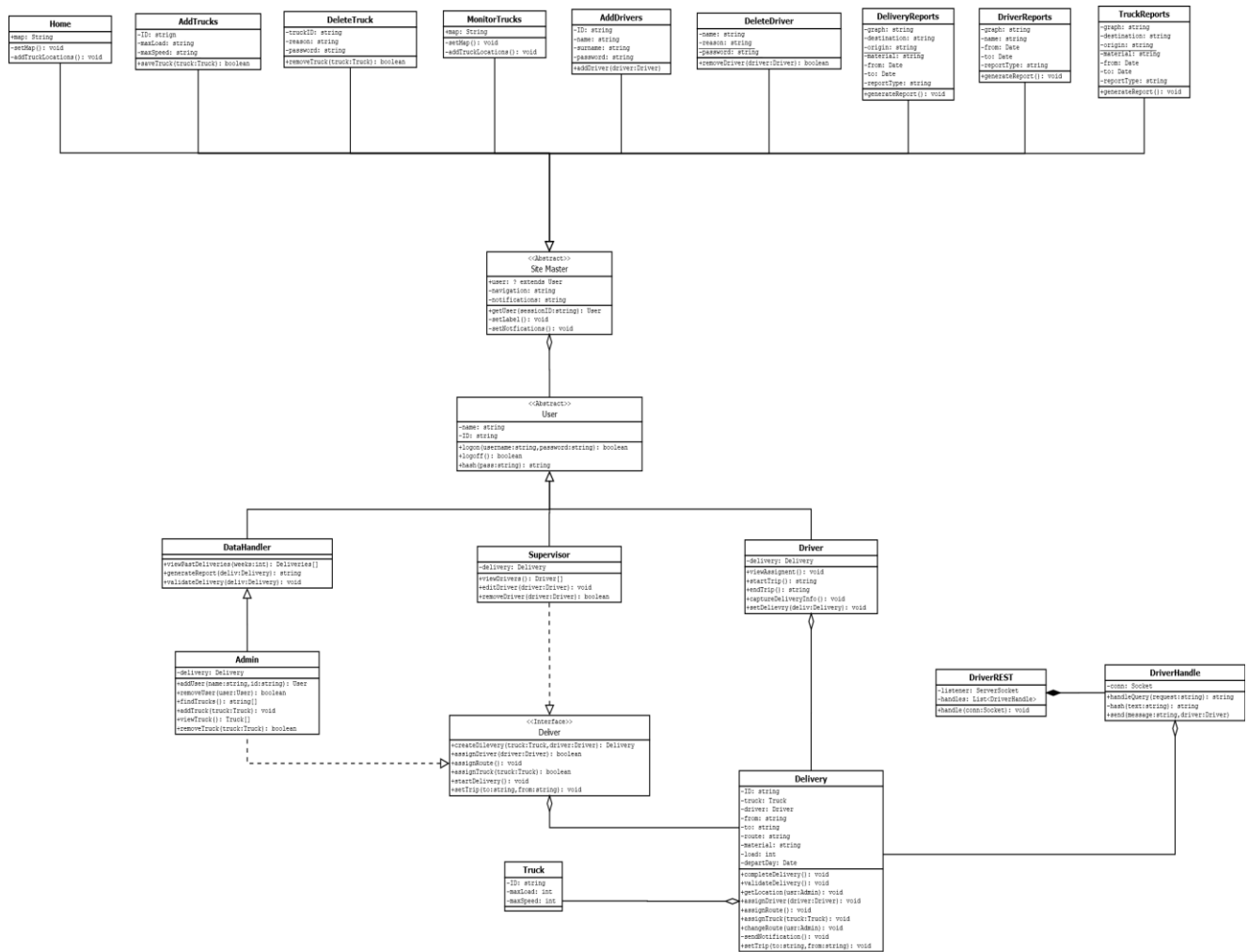

*Appendix C for non-pixelated class diagram

3. Prototype Interface

The purpose of this section is to provide an iterative mockup of the user interface. It will enable Colloid to explore problems that will arise with the stakeholders. It will communicate the user interface designs and provide a foundation which the system will be built on. It will model the requirements into a visual aspect of the system through showing the users and help to develop consistency.

3.1 Login
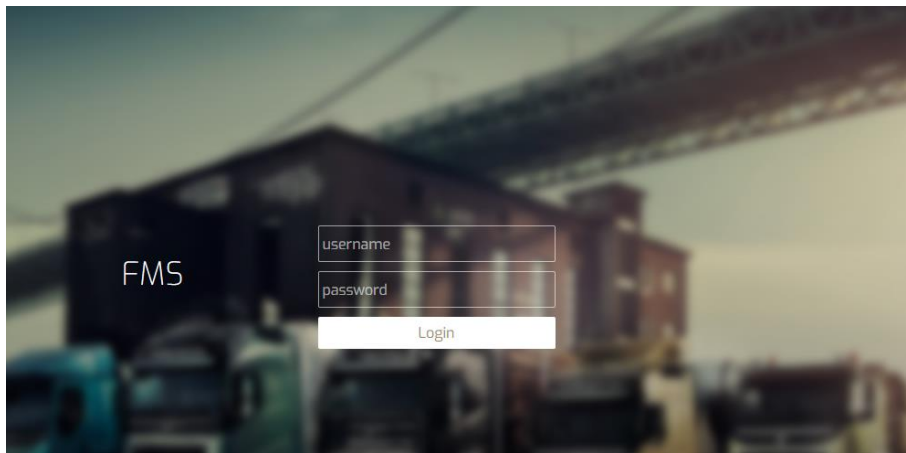
Login Description:

The login page allows different stakeholders to access different portions of the system. There is an admin, data handler and supervisor who has access to this login page. A username and password will be provided to them and they will use that to access it. Depending on the position, this will take one to the main site which contains pages that depend on the work that one is doing in the company.

3.2 Home Page

Home Page Description:

The home page allows the user to access system after logging on. This is the admin home page which shows every portion of the site. Here they can navigate through monitor trucks, drivers, users, data reports and graph reports. There is a map in the center of the site which will allow the user to view the trucks currently on the road by showing pin of the various trucks including the trucks at home. Each truck will have a unique color given to it to make the monitoring of the trucks easier and the color will be the pin color. There is a notifications side bar which will produce real time alerts that consist of trips that have ended, problems that are happening (such as a driver driving too fast) and trips that have started.

3.3 Monitor Trucks

NEW ERA COMMERCE

- Home
- Trucks
  - Monitor
  - Add Truck
  - Delete Truck
- Drivers
- Users
- Reports

Notifications

Driver A is due finish delivery in 10 min

Driver R is due finish delivery in 10 min

Driver B has completed his delivery

Driver C has completed his delivery

Trucks – Monitor Description

The trucks menu tab opens sub tabs that are monitor, add truck and delete truck. This menu tab does not go anywhere but opens the other sub menus. This menu tab is only accessible to the admin. Once the admin has decided what they want to do with the trucks, the system then opens the sub menu page in accordance. In this case, monitor has been selected which displays a map as well. This map will only display pins of trucks currently moving and unlike the home page map, one will be allowed to get more details about the various trucks by clicking on the color pin for the map.

3.4 Add Trucks

NEW ERA COMMERCE

- Home
- **Trucks**
  - Monitor
  - **Add Truck**
  - Delete Truck
- Drivers
- Users
- Reports

Add Truck

Truck Plate

Max load

Max Speed

Add Truck

Notifications

Driver A is due finish delivery in 10 min

Driver R is due finish delivery in 10 min

Driver B has completed his delivery

Driver C has completed his delivery

Trucks – Add Truck Description:

The add trucks sub menu tab takes the admin to the adding a truck page. This page can only be accessed by the admin. This page will have a form that the admin will fill in to add a new truck to the system. It will request a truck plate which is the number plate and the user will fill in the textbox. The maximum load and maximum speed of the truck will also be requested and they will be filled in a textbox that only allows numeric input. Once all fields have been filled in, the admin will click add truck to add the new truck to the system. If all fields are filled in correctly then the admin will get a message stating that it is a success else the admin will get an appropriate error message.

3.5 Delete Truck

Trucks – Delete Truck Description:

The delete trucks sub menu tab takes the user to the deleting a truck page. This page can only be accessed by the admin. This page will have a form that the admin will fill in to delete a truck from the system. It will request a truck plate which is the number plate and the user will fill in the textbox. It will also provide a dropdown that allows the admin to select a reason for deleting, if none of the choices are why they are deleting then they can click other. The admin password will also be requested to make sure that the truck is deleted by the admin and to confirm this action. The admin can then click the delete truck button which will begin deleting the truck from the system. If the password is incorrect or the other fields are not correct then the system will notify the admin about that through displaying an error message else the system will provide a success message after deleting the truck.

3.6 Add Driver

Drivers – Add Driver Description:

The add drivers sub menu tab takes the user to the adding a driver page. This page can only be accessed by the admin and the supervisor. This page will have a form that the user will fill in to add a new driver to the system. It will request a name, surname and ID number of the driver and the user will fill in the textboxes. The ID textbox will have a set number of characters that need to be entered (13 because all the drivers are be South African). Once all fields have been filled in, the user will click add driver to add the new driver to the system. If all fields are filled in correctly then the user will get a message stating that it is a success else the user will get an appropriate error message.

3.8 Delete Driver

<u>Drivers – Delete Driver Description:</u>

The delete driver sub menu tab takes the user to the deleting a driver page. This page can only be accessed by the admin and the supervisor. This page will have a form that the user will fill in to delete a driver from the system. It will request the driver's name which will be through a dropdown that allows the user to select the driver based on a name and surname. It will also provide a dropdown that allows the user to select a reason for deleting, if none of the choices are why they are deleting then they can click other. The user password will also be requested to make sure that the driver is deleted by either the admin or supervisor and to confirm this action. The user can then click the delete driver button which will begin deleting the driver from the system. If the password is incorrect or the other fields are not correct then the system will notify the user about that through displaying an error message else the system will provide a success message after deleting the driver.

3.9 Add User

Users – Add User Description:

The add user sub menu tab takes the admin to the adding a user page. This page can only be accessed by the admin. This page will have a form that the admin will fill in to add a new user to the system. It will request a name, surname and ID number and the user will fill in the textbox. The ID textbox will have a set number of characters that need to be entered (13 because all the employees are South African). The admin will also have to select the type of user by clicking on the drop-down list and selecting the user type. Once all fields have been filled in, the admin will click add user to add the new user to the system. If all fields are filled in correctly then the admin will get a message stating that it is a success else the admin will get an appropriate error message.

3.10 Delete User

NEW ERA COMMERCE

- Home
- Trucks
- Drivers
- Users
    - Add User
    - Delete User
- Reports

Delete User

Name

Reason

Admin Password

Delete User

Notifications

Driver R is due finish delivery in 10 min

Driver B has completed his delivery

Driver C has completed his delivery

Driver P is due finish delivery in 10 min

Users – Delete User Description:

The delete user sub menu tab takes the admin to the deleting a user page. This page can only be accessed by the admin. This page will have a form that the admin will fill in to delete a user from the system. It will request the user's name which will be through a dropdown that allows the admin to select the user based on a name and surname. It will also provide a dropdown that allows the admin to select a reason for deleting, if none of the choices are why they are deleting then they can click other. The admin password will also be requested to make sure that the driver is deleted by the admin and to confirm this action. The admin can then click the delete user button which will begin deleting the user from the system. If the password is incorrect or the other fields are not correct then the system will notify the user about that through displaying an error message else the system will provide a success message after deleting the user.

3.11 Truck Reports

Reports –Truck Reports Description:

The truck reports sub menu tab takes the user to the reports for a truck page. This page can only be accessed by the admin and the data handler. This page will have a form that the user will fill in to generate a report from the system. It will request the user to select a truck number plate from a dropdown menu. The date will also be required, it will be both from when till when the user wants the report to be on. It will be a calendar where the user can select a day or type on the drop-down to calendar box. The user will also have to select the report type which can be a graph or table. The report generated will go on the blue area and the user can export it by clicking the export report button. This will allow the user to download the table as an excel sheet or the graph.

3.12 Driver Reports

Reports –Driver Reports Description:

The driver reports sub menu tab takes the user to the reports for the drivers page. This page can only be accessed by the admin and the data handler. This page will have a form that the user will fill in to generate a report from the system. It will request the user to select a driver's name from a dropdown menu. The date will also be required, it will be both from when till when the user wants the report to be on. It will be a calendar where the user can select a day or type on the drop-down to calendar box. The user will also have to select the report type which can be a graph or table. The report generated will go on the blue area and the user can export it by clicking the export report button. This will allow the user to download the table as an excel sheet or the graph.

3.13 Delivery Reports

Reports – Delivery Reports Description:

The delivery reports sub menu tab takes the user to the reports for the deliveries page. This page can only be accessed by the admin and the data handler. This page will have a form that the user will fill in to generate a report from the system. It will request the user to fill in a destination and origin for which they want the delivery report for. If they leave that blank, the system will generate a report for every delivery made despite where it was from or to. The system will request a material to be chosen but the default will be none. If the user leaves it as none then the system will generate a report that shows all deliveries despite the material that was being delivered. The date will be required, it will be both from when till when the user wants the report to be on. It will be a calendar where the user can select a day or type on the drop-down to calendar box. The user will also have to select the report type which can be a graph or table. The report generated will go on the blue area and the user can export it by clicking the export report button. This will allow the user to download the table as an excel sheet or the graph.

Mobile Application Login Description:

The login page on the mobile application allows the drivers to log on to the mobile application. A username and password will be provided to them and they will use that to access it.

3.15 Mobile Application – Accept Notification

Mobile Application – Driver Accept Assignment Description:

The driver will receive a notification on their mobile device that a delivery has been assigned to them. They will open the mobile app and view the delivery information. They can then click the accept assignment button. If they close the mobile application without accepting the assignment, when they open the application again then this page will be the only thing displaying. Failure to accept the assignment within an hour will result in the admin being notified of this and the admin can handle it accordingly.

Mobile Application – Driver Start Trip Description:

Once the driver has accepted an assignment, the screen with the start trip button will be shown. The route to where they will load the material will be shown in the area above the start trip button. Once the drivers are done loading the material, they will be able to start the trip to get the route to the unloading station.

3.17 Mobile Application – End Trip
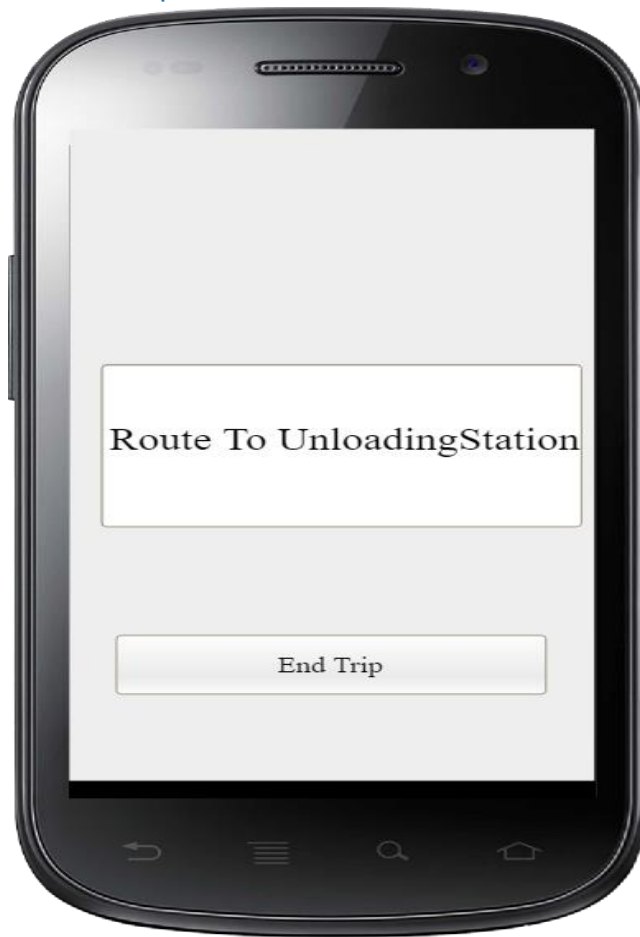
Mobile Application – Driver End Trip Description:

Once the driver has started the trip, the screen with the end trip button will be shown. The route to where he will unload the material will be shown in the area above the end trip button. Once the drivers are done unloading the material, they will be able to end the trip by clicking the end trip button.

4. Appendix

A. Delivery Subsystem Use Case

Delivery System

Accept assignment

start trip

<<Includes>>

Manage trip

Extension Points
End trip

<<Extends>>

end trip

Driver

Login

View past deliveries

Data Handler

Generate reports

Monitor trucks

Admin
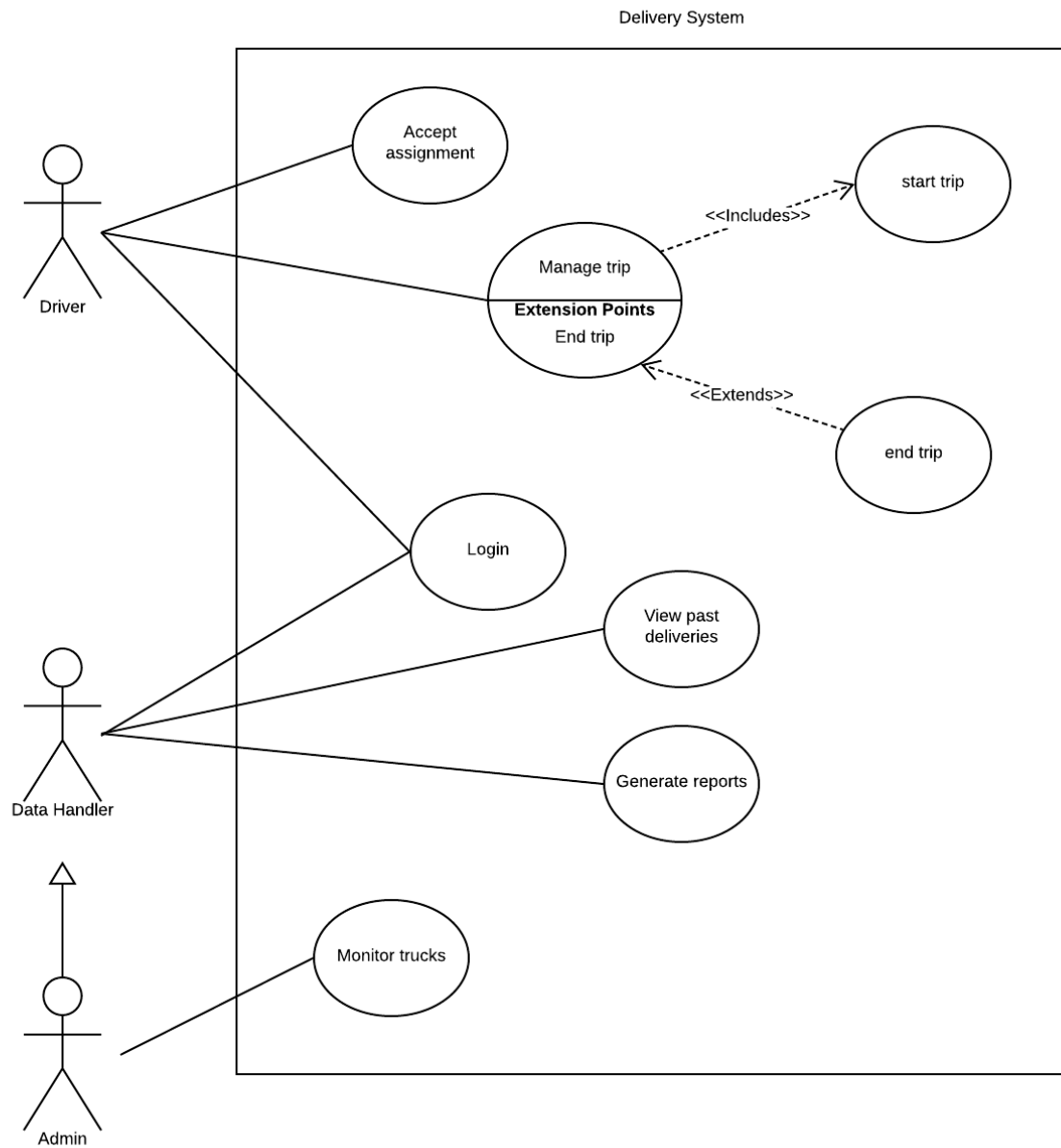
B. Plagiarism Declaration

Informatics 3 Year Project

Academy of Computer Science and Software Engineering

Plagiarism Declaration

| Deliverable # | 1 | Team # | 43 | Supervisor | Mr HJC Van der Westhuizen |
| Team Name | COLLOID | | | | |

1. Plagiarism is to present someone else's ideas as our own.
2. Where material created by other people has been used (either from a printed or digital source) this has been carefully acknowledged and referenced. We have used the appropriate style for citation and referencing. Every contribution to this deliverable has been acknowledged through citation and reference.
3. We know that plagiarism is wrong.
   3.1. We understand what plagiarism is and are aware of the University's policy in this regard.
   3.2. We know that we would plagiarise if we do not give credit to our sources, or if we copy any part of a book, article, or Internet source without proper citation.
   3.3. We know that even if we only change the copied work slightly, we still plagiarise when using someone else's work without proper citation.
   3.4. We declare that we have created our own work throughout this deliverable and we have credited all ideas we have gained from other people's work.
4. We declare that this deliverable is our own original work.
5. We have not allowed, and will not allow, anyone to copy our work with the intention of passing it off as his or her own work.

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Full Name _Mbali Mavuso_
Student # _216016565_
Date _07/03/2018_
Member 1

Signature _Doto_
Full Name _Changiski Nbundu_
Student # _216010091_
Date _02-03-2018_
Member 2

Signature _T. Taliwe_
Full Name _Trina Taliwe_
Student # _216000615_
Date _02-03-2018_
Member 3

Signature
Full Name _MP. Motuba_
Student # _201302881_
Date _04-03-2018_
Member 4

C. Class Diagram

Home
- map: string
- setMap(): void
- addTruckLocations(): void

AddTrucks
- ID: string
- maxLoad: string
- maxSpeed: string
- saveTruck(truck:Truck): boolean

DeleteTruck
- truckID: string
- reason: string
- password: string
- removeTruck(truck:Truck): boolean

MonitorTrucks
- map: String
- setMap(): void
- addTruckLocations(): void

AddDrivers
- ID: string
- name: string
- surname: string
- password: string
- addDriver(driver:Driver)

DeleteDriver
- name: string
- reason: string
- password: string
- removeDriver(driver:Driver): boolean

DeliveryReports
- graph: string
- destination: string
- origin: string
- material: string
- from: Date
- to: Date
- reportType: string
- generateReport(): void

DriverReports
- graph: string
- name: string
- from: Date
- to: Date
- reportType: string
- generateReport(): void

TruckReports
- graph: string
- destination: string
- origin: string
- material: string
- from: Date
- to: Date
- reportType: string
- generateReport(): void

<<Abstract>>
Site Master
- user: ? extends User
- navigation: string
- notifications: string
- getUser(sessionID:string): User
- setLabel(): void
- setNotifications(): void

<<Abstract>>
User
- name: string
- ID: string
- logon(username:string,password:string): boolean
- logoff(): boolean
- hash(pass:string): string

DataHandler
- viewPastDeliveries(weeks:int): Deliveries[]
- generateReport(deliv:Delivery): void
- validateDelivery(deliv:Delivery): void

Supervisor
- delivery: Delivery
- viewDrivers(): Driver[]
- editDriver(driver:Driver): void
- removeDriver(driver:Driver): boolean

Driver
- delivery: Delivery
- viewAssignment(): void
- startTrip(): string
- endTrip(): string
- captureDeliveryInfo(): void
- setDelivery(deliv:Delivery): void

Admin
- delivery: Delivery
- addUser(name:string,id:string): User
- removeUser(user:User): boolean
- findTruck(): string[]
- addTruck(truck:Truck): void
- viewTruck(): Truck[]
- removeTruck(truck:Truck): boolean

<<Interface>>
Deliver
- createDelivery(truck:Truck,driver:Driver): Delivery
- assignDriver(driver:Driver): boolean
- assignRoute(): void
- assignTruck(truck:Truck): boolean
- startDelivery(): void
- setTrip(to:string,from:string): void

DriverREST
- listener: ServerSocket
- handle: List<DriverHandle>
- handle(conn:Socket): void

DriverHandle
- conn: Socket
- handleQuery(request:string): string
- hash(text:string): string
- send(message:string,driver:Driver)

Delivery
- ID: string
- orderNum: string
- truck: Truck
- driver: Driver
- from: string
- to: string
- route: string
- materials: string
- load: int
- departDay: Date
- completeDelivery(): void
- validateDelivery(): void
- getLocation(user:Admin): void
- assignDriver(driver:Driver): void
- assignRoute(): void
- assignTruck(truck:Truck): void
- changeRoute(usr:Admin): void
- sendNotification(): void
- setTrip(to:string,from:string): void

Truck
- ID: string
- maxLoad: int
- maxSpeed: int