

CyberZone Software Solutions



Project: **Software System for Sri Lanka Railway Department**

Assignment no.1: Project Documentation Milestone1

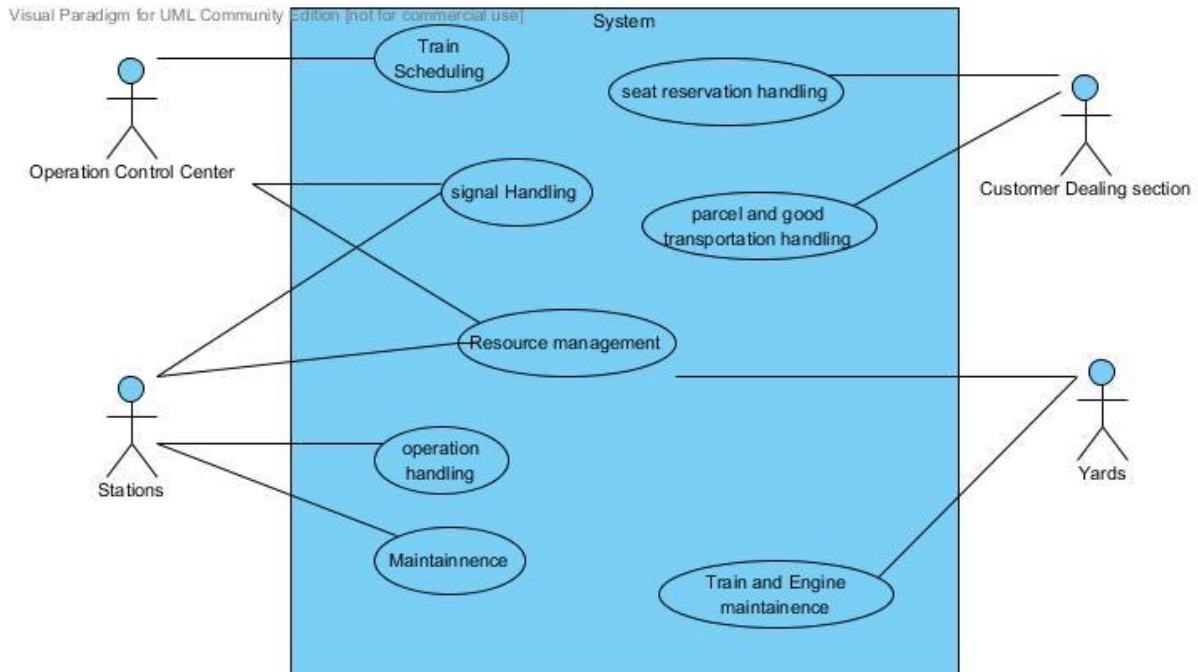
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100409M	Premathunga,D.D.R.C.
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Chapter1: Initial Software requirements Specification

Our client is Sri Lanka Railway Department and they handle thousands of serious transactions daily. Following diagram displays their main requirements from the system and the people who are going to interact with the system.



So we divided our clients business into four different sections and allocated the main responsibilities of each section as follows

Operations and controlling

- Client need to handle their day to day time tables and schedule them by considering the current conditions of the tracks and the engines.
- They need to handle signals in an efficient way.
- Allocate resources to the train like engines and wagons.
- Allocate officers to the each train like drivers, guardsetc.
- Providing fuel and other necessary requirements for a run the train.

Dealing with the customer

- Client wants to manage various type of goods transport like fuel mails and parcels.
- Manage ticketing and handle the reservations of the seats.
- Provide the information about any time table and give the necessary calculations to the customers if they required.

Station & Rail Tracks

- Each station has to keep track of the status and conditions of the engines, wagons, tracks and the signal lights.
- Client need to handle their signal light system in very reliable way.

Train maintains

- Client wants to maintain their conditions of the trains and they want to check out details of each and every train at any time.
- Client wants to coordinate yards and stations each other and handles the operations of the yard.

Chapter2: Initial software development project plan

Firstly we tried to understand the project roles that we are going to act according to the abilities of each member.

Index	Name	Responsibility
100029X	Amarasinghe, M.A.D.M.P.	Team Leader
100346P	Muramudalige, S.R.	Project Designer
100409M	Premathunga, D.D.R.C.	System Tester
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Then as an initial step to our project we developed a vision for our project. We used the requirements we understood up to now to develop this vision. So after getting our system they should get the primary benefits as

- Ability to handle their whole processes easily and efficiently. So it will help them to increase their profits and they will be able to use their resources efficiently.

Our objectives are

- Giving a fast and reliable system to Railway Department so that they can give a competitive service to the people with other transportation Medias with their limited resources. Help our client with to give a better service to general public.

Our system is capable of handling

- Customer dealing
- Train maintenance and allocating resources
- Scheduling and time table management
- Signal handling
- Station and rail track controlling and etc.

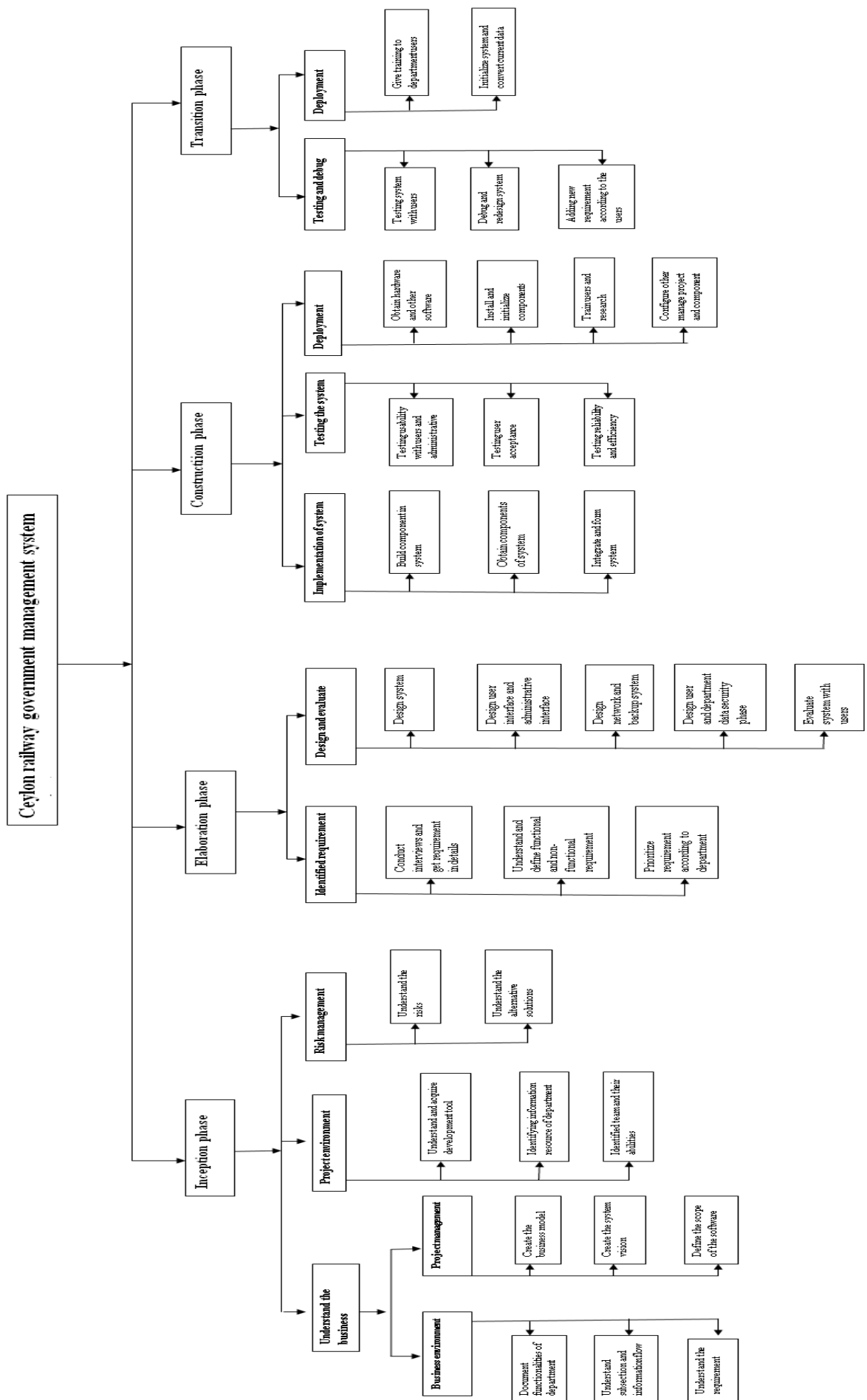
Then we had to identify the scope of our system.

- From this project we are going to replace the current system of communication between stations and operation control system. So it will include a replacement of signal handling method also because then we can efficiently launch our system.
- We are going to make a new efficient system to handle seat reservation and parcel transportation.
- And we are going to change the way of keeping records about each and every train and engine so that they can efficiently access them and get information as they need. It will also help the maintenance process.

So to interact with our system it will have interfaces at stations, reservation counters, yards, operation control center and etc. Our system must also have the functionality to override the software functionalities manually in the case of emergency.

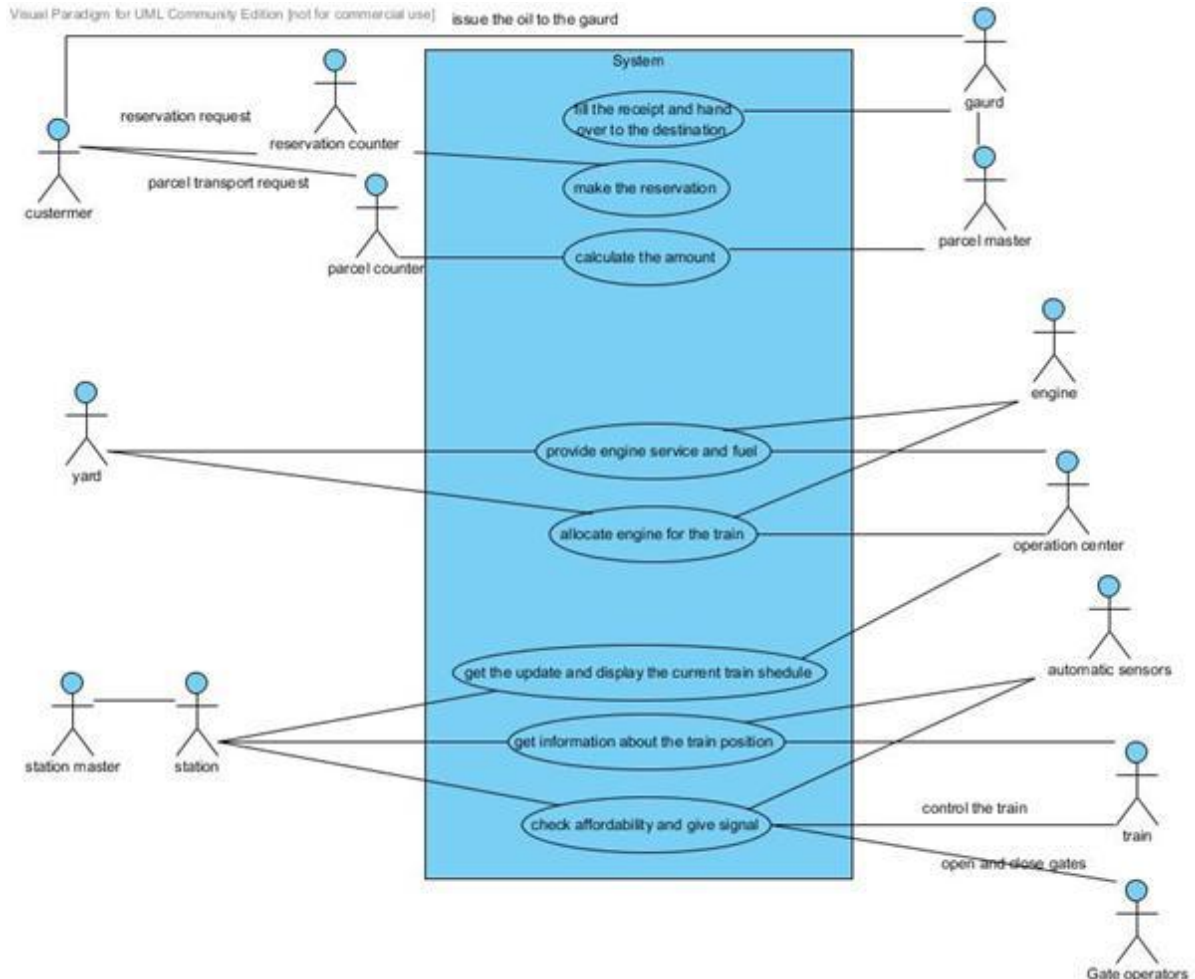
We estimated 350 person hours for this project with the maximum contribution of each team member.

So we decided to breakdown the project as follows.



Chapter3: Business model based software requirements analysis

At the main sections like Operation controlling, Customer dealing, Stations and Rail Tracks, Signaling, Train maintenance and resource allocation we can see the following functionalities mainly with interaction to each other.



Chapter4: Domain model based software requirements analysis

We have chosen 3 sub-domains for this project. They are

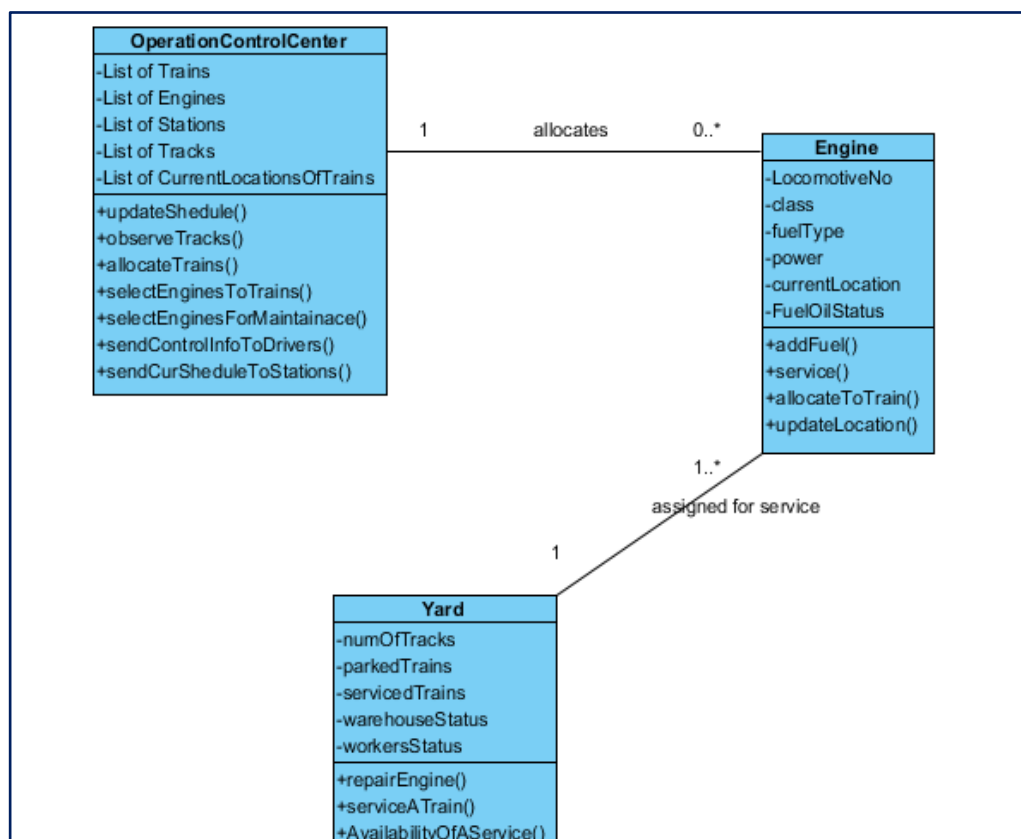
1. Operation Control and Maintenance
2. Stations and Tracks
3. Parcels and Reservation Control

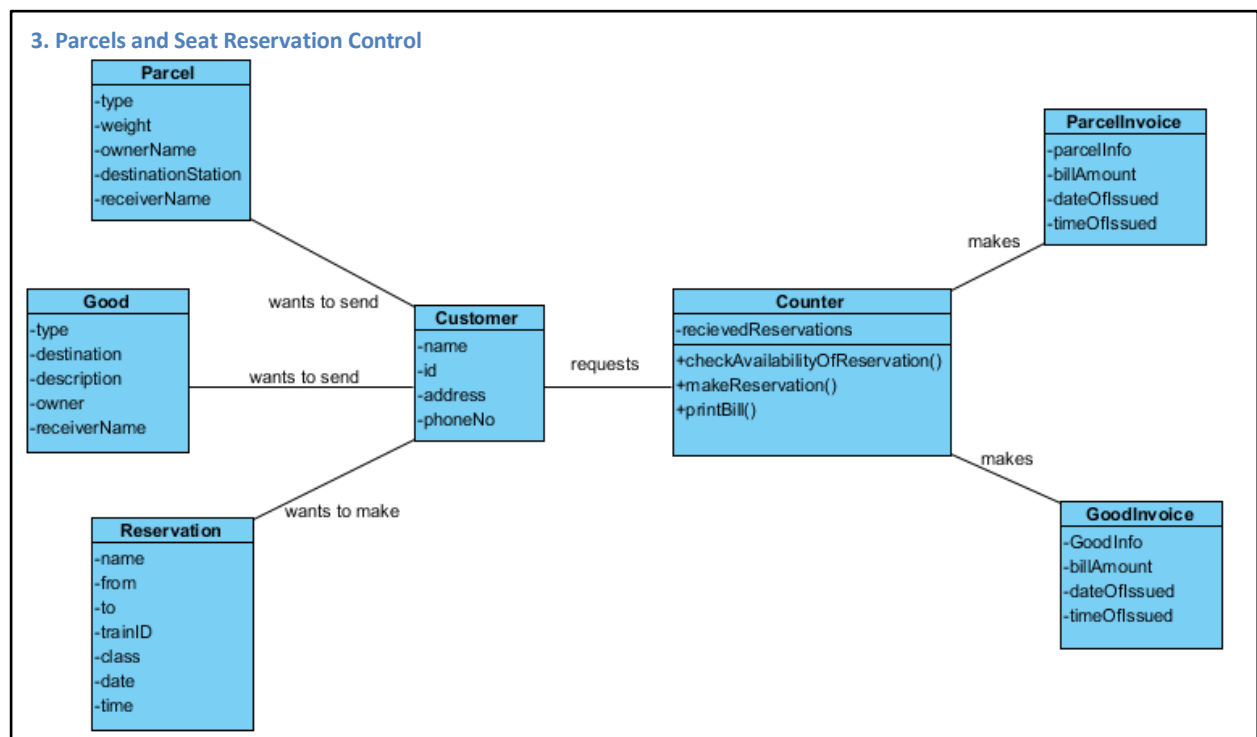
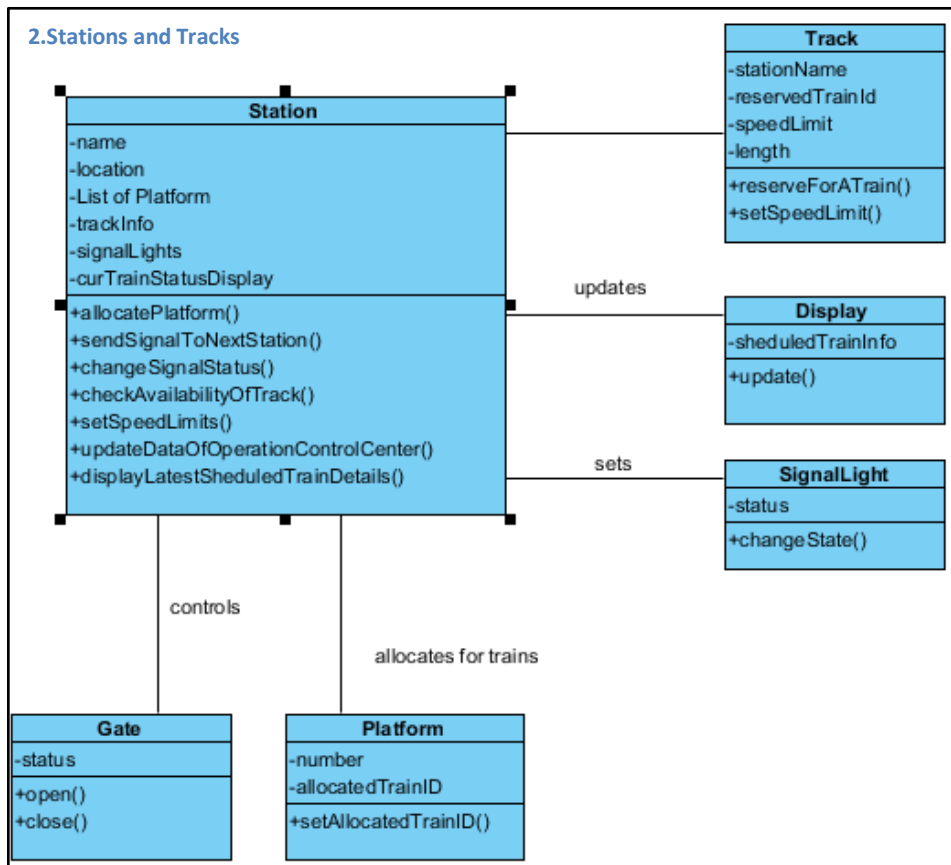
The two sections, Operation Control Center and Maintenance sections usually interacts much when working because Operation Control need to know the exact information(current conditions) about a particular engine before allocating it. And also after each journey the engine should be checked. After each checking they have to update the status of their databases of Engines.

Stations and Tracks domain usually contains a large database of Stations and Tracks around the country so it is easier if it is considered as a separate domain. The other sections interact with this sub-system to update their status.

Parcels and Reservation Control can be easily considered as a separate domain because it usually doesn't much dependent by the technical details of the system. It is mainly consists of financial activities.

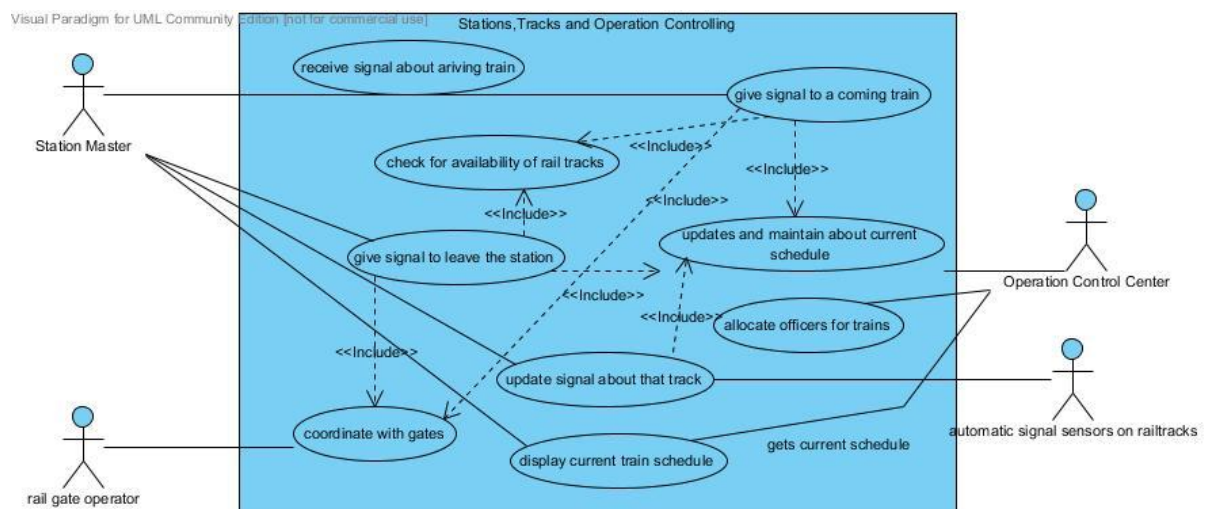
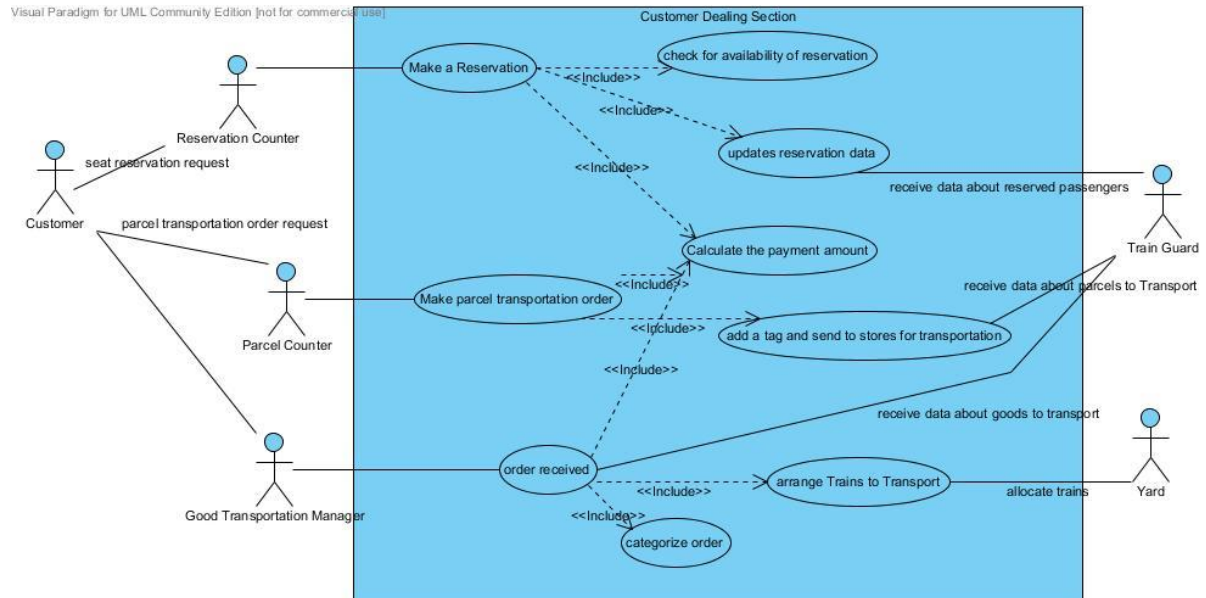
1.Operation Control and Maintenance

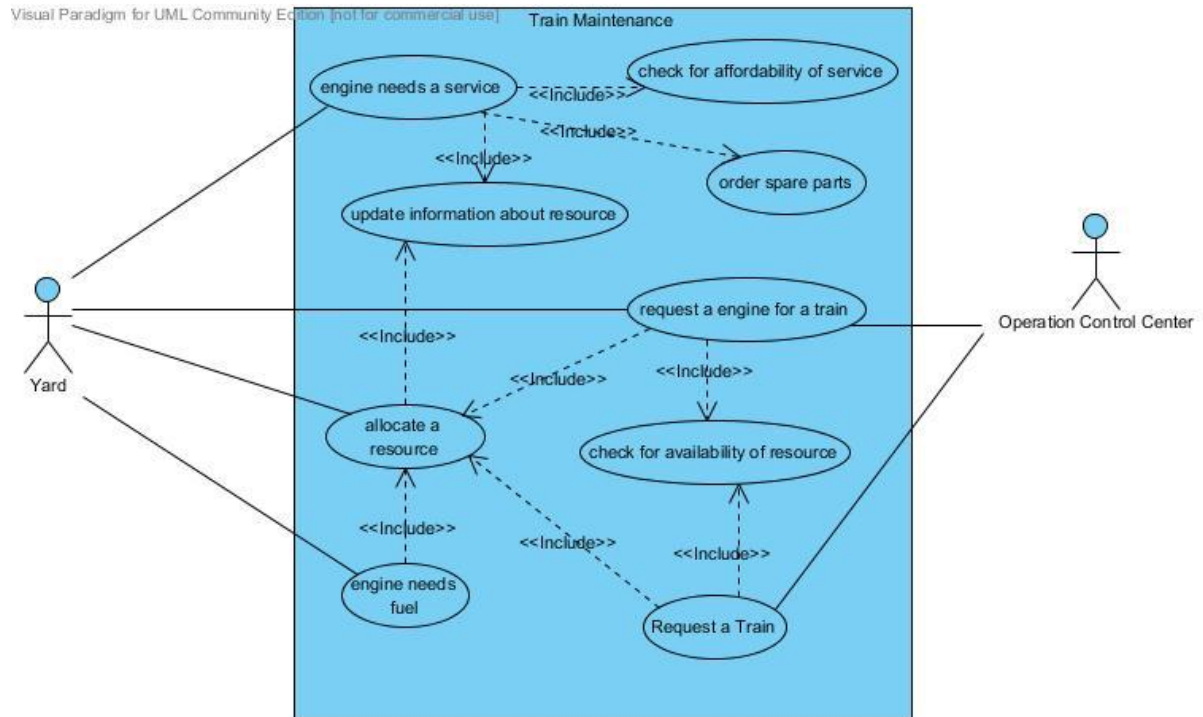




Chapter5: Detailed software requirements specification

Then for each sub sections we modeled a detailed level of requirement modeling with the automation boundary included.

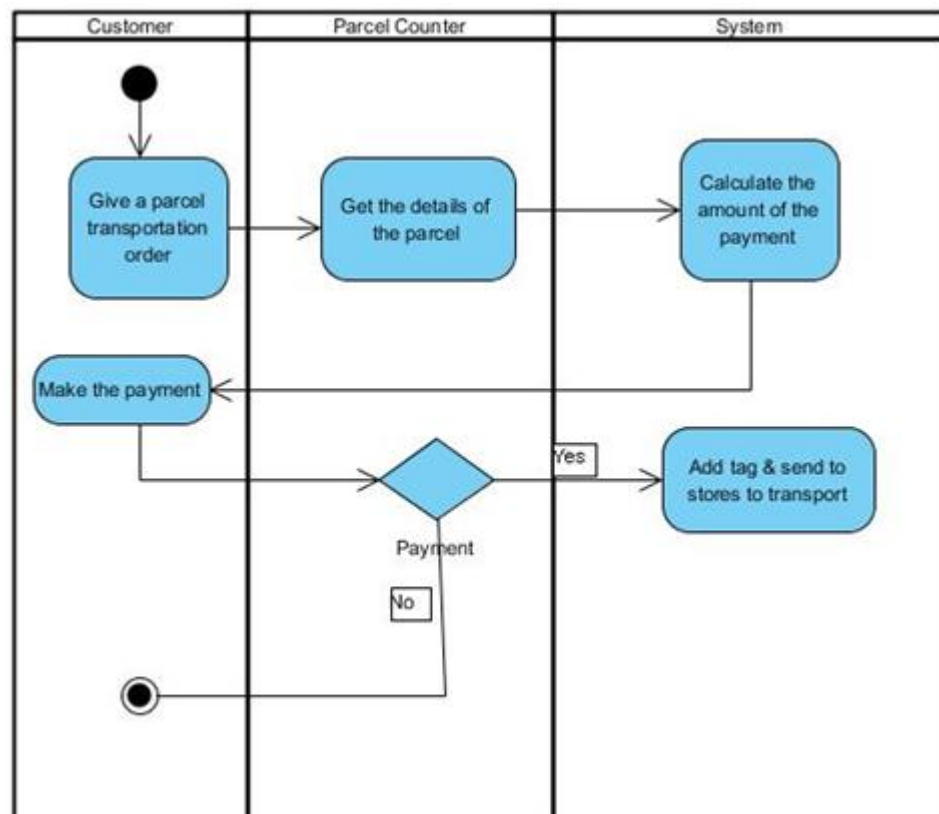
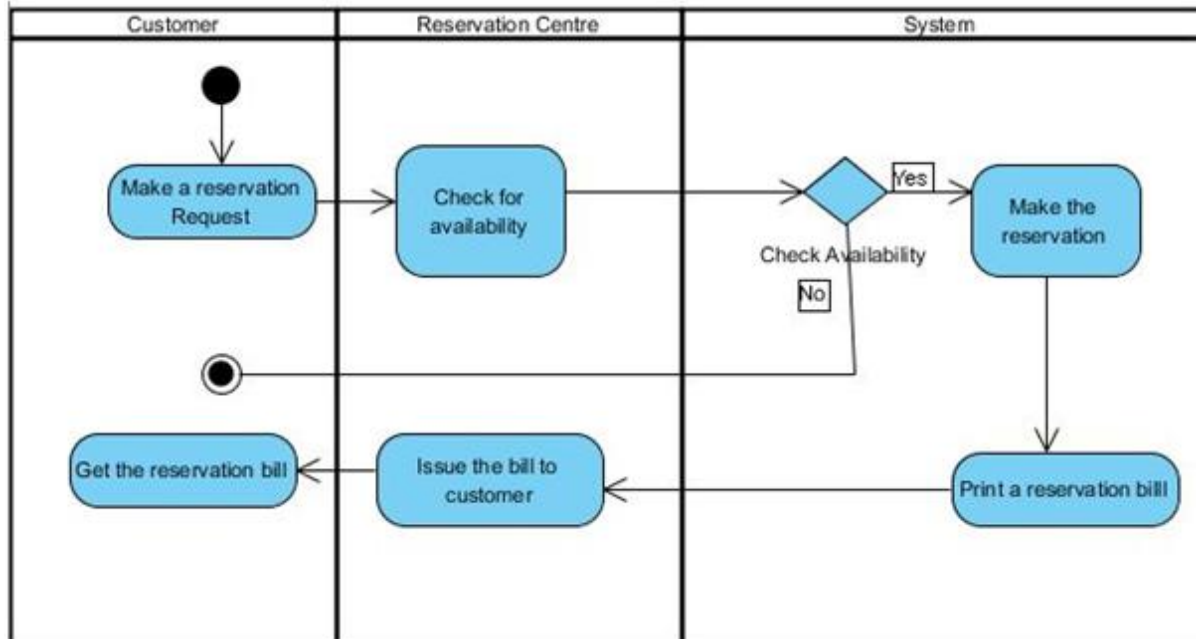


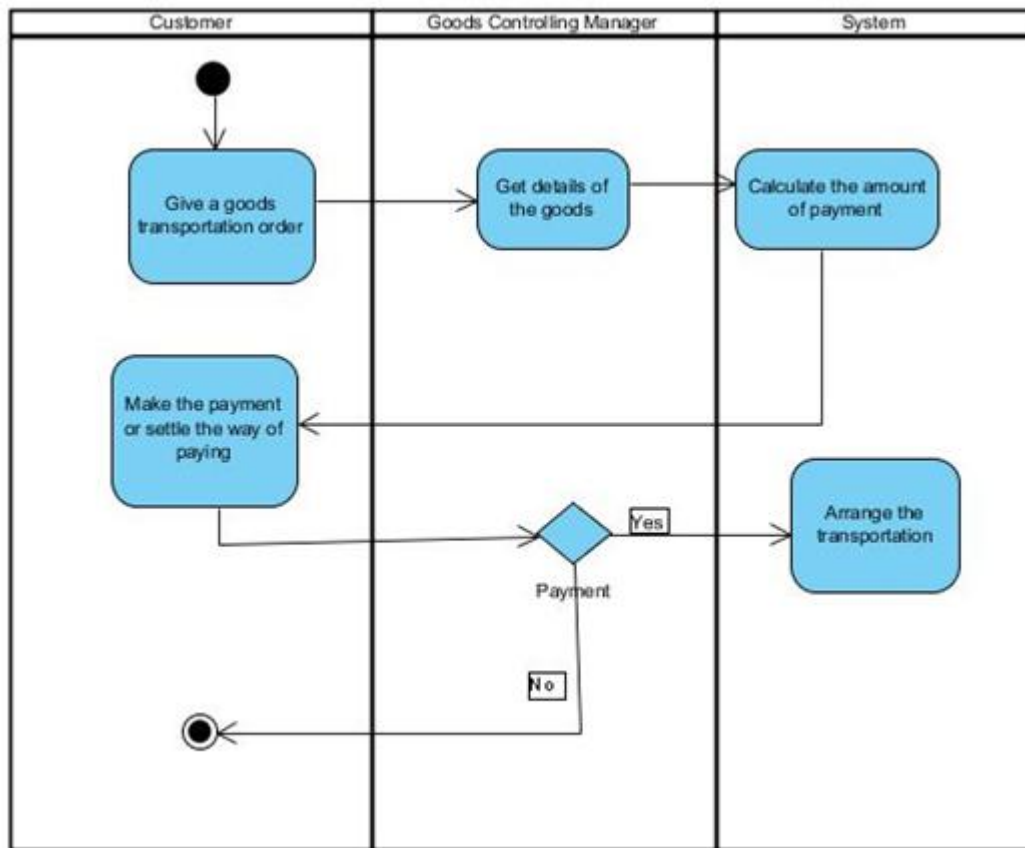


Furthermore they need this system to be very much reliable as a non functional requirement. Because a small defect in system may cause to a huge loss. So we understood the communication method between these points must be a very much reliable so that probability of a defect is very low. And also the system must be very secured.

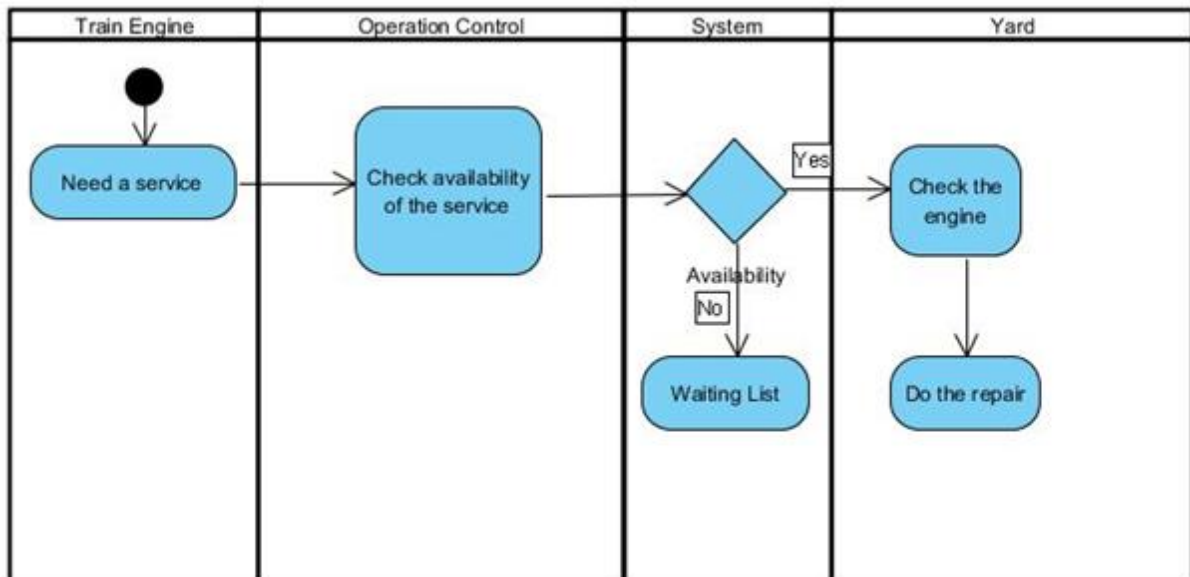
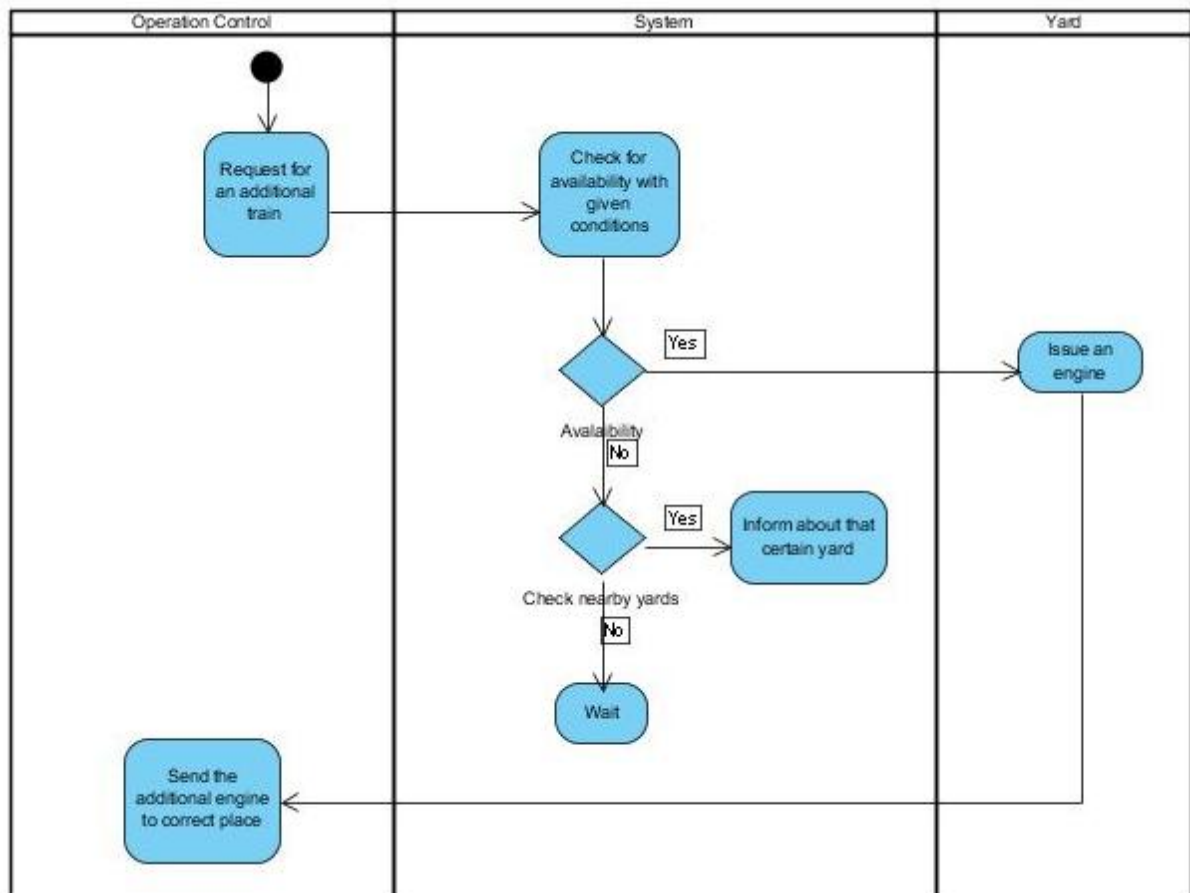
For each of those requirements we developed work flow diagrams as follows.

Dealing with the customer

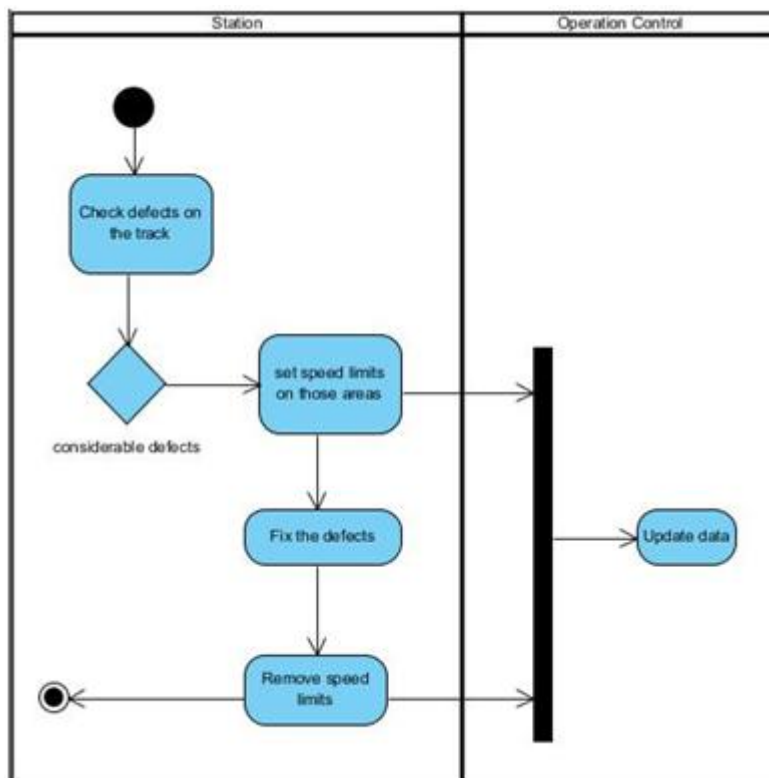
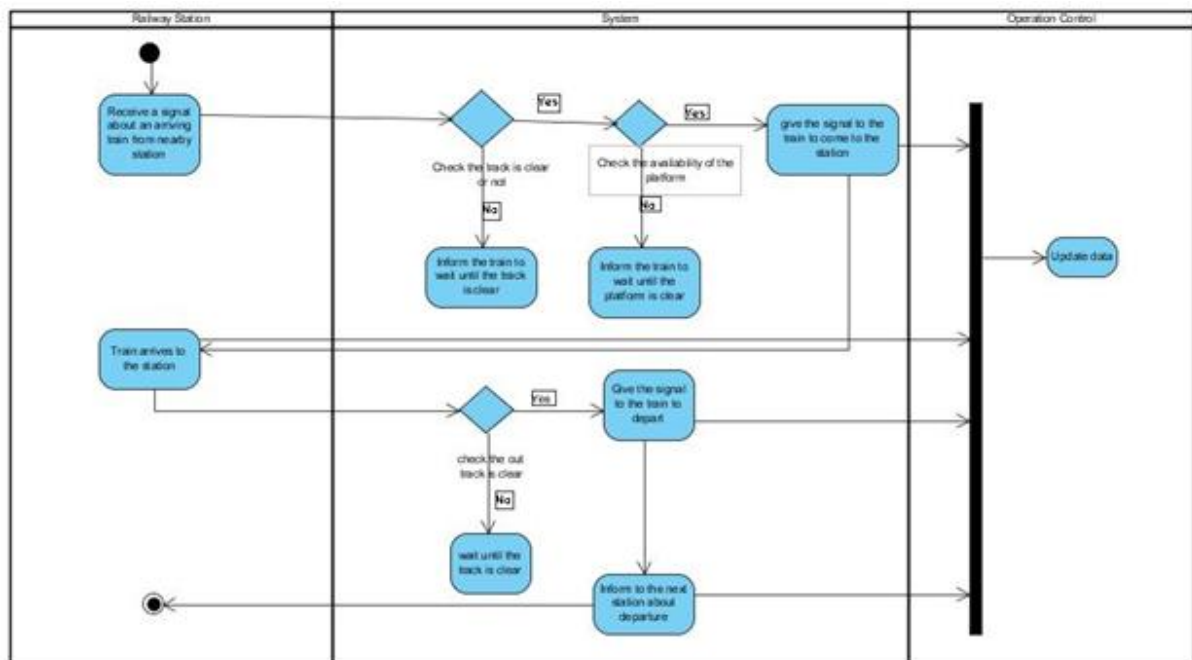


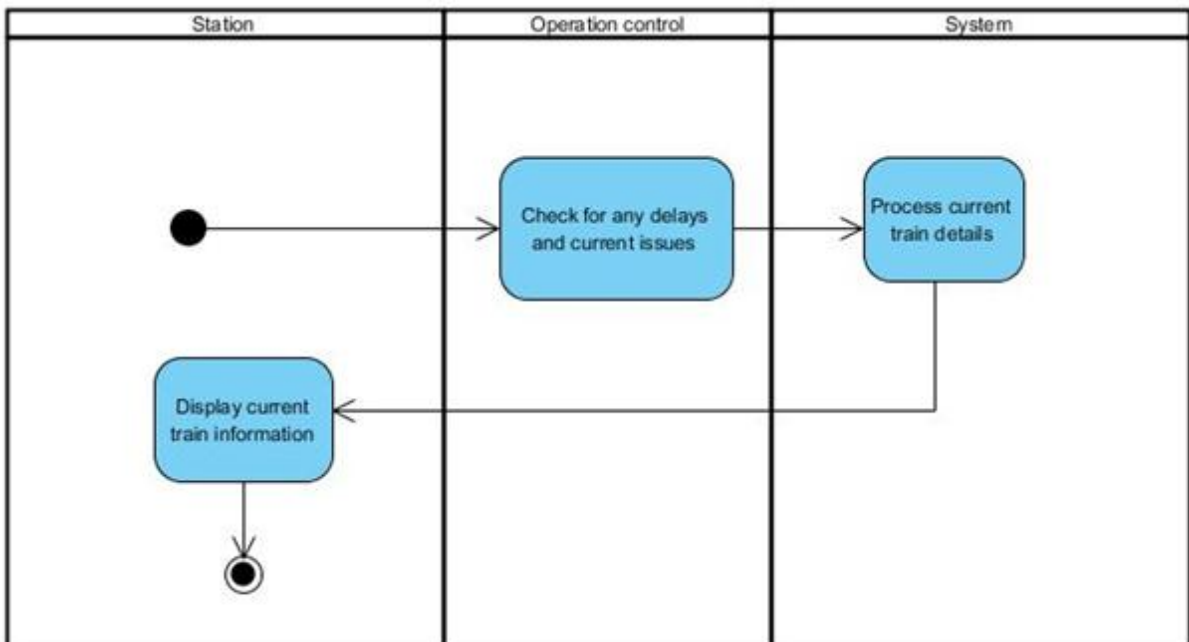
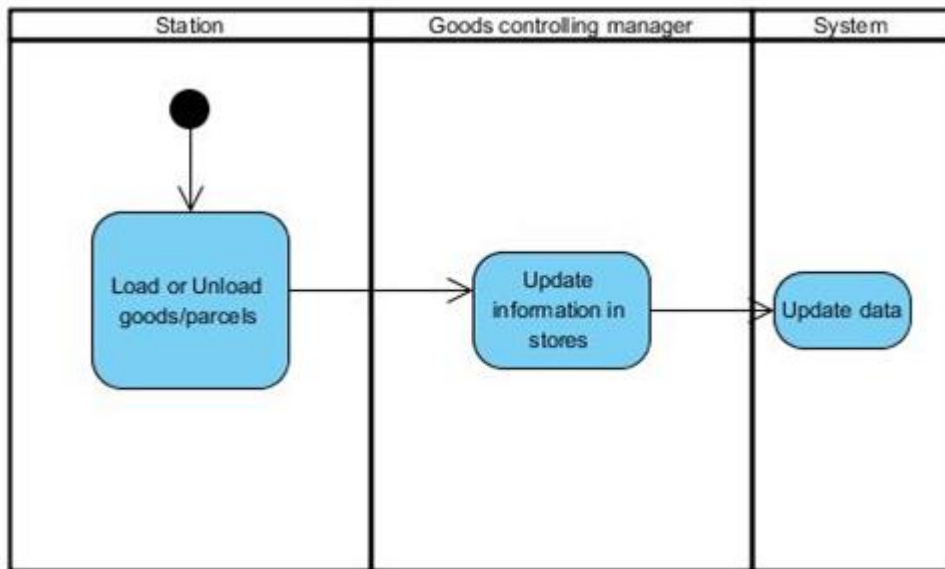


Operation in yards

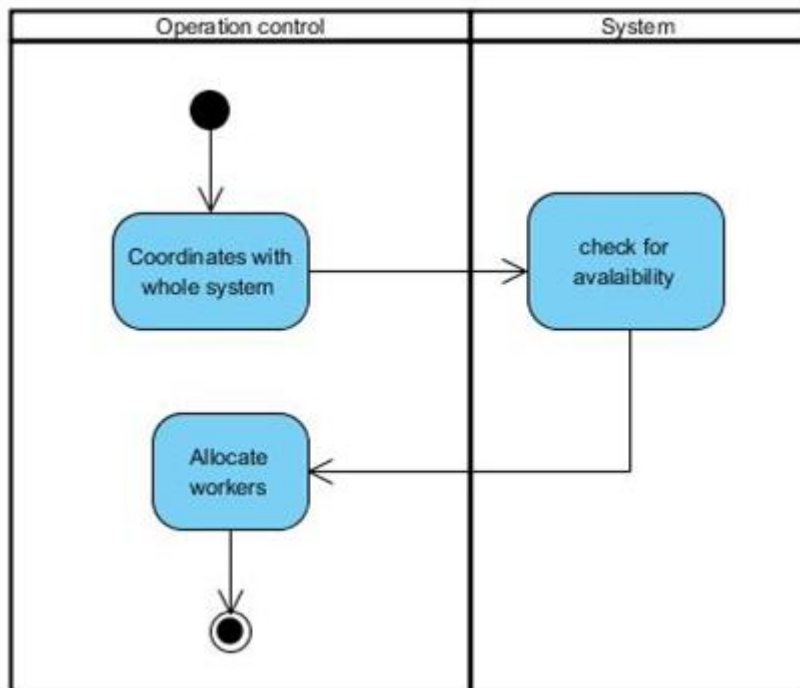


Operations in railway stations



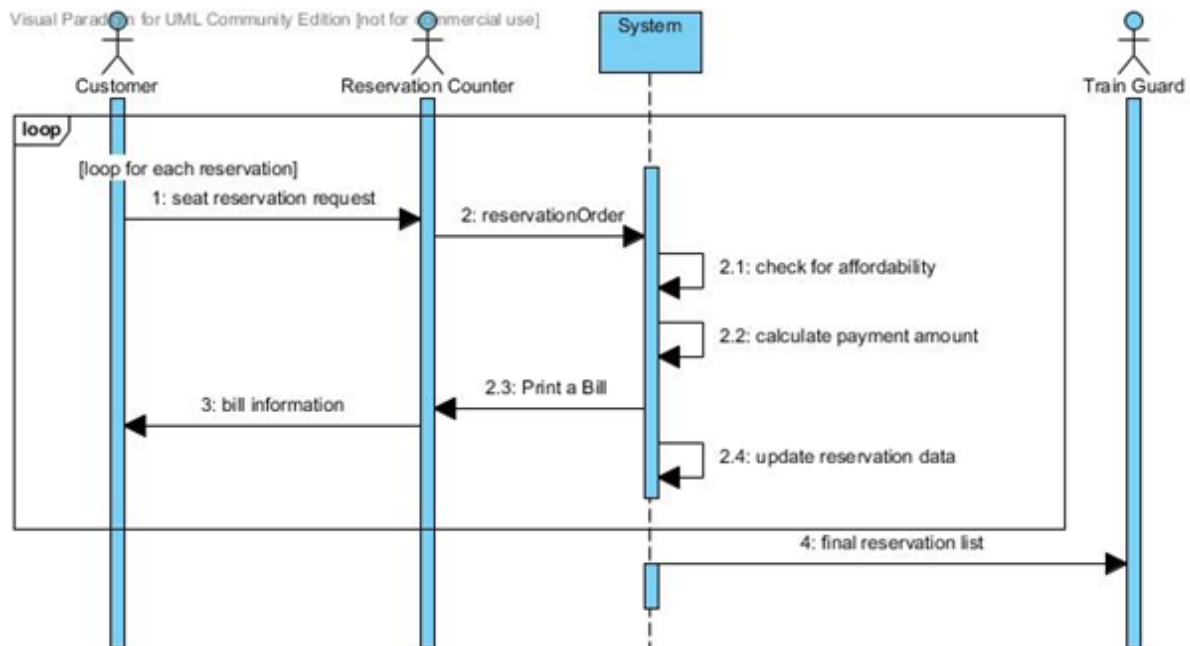


Central Operations controlling section

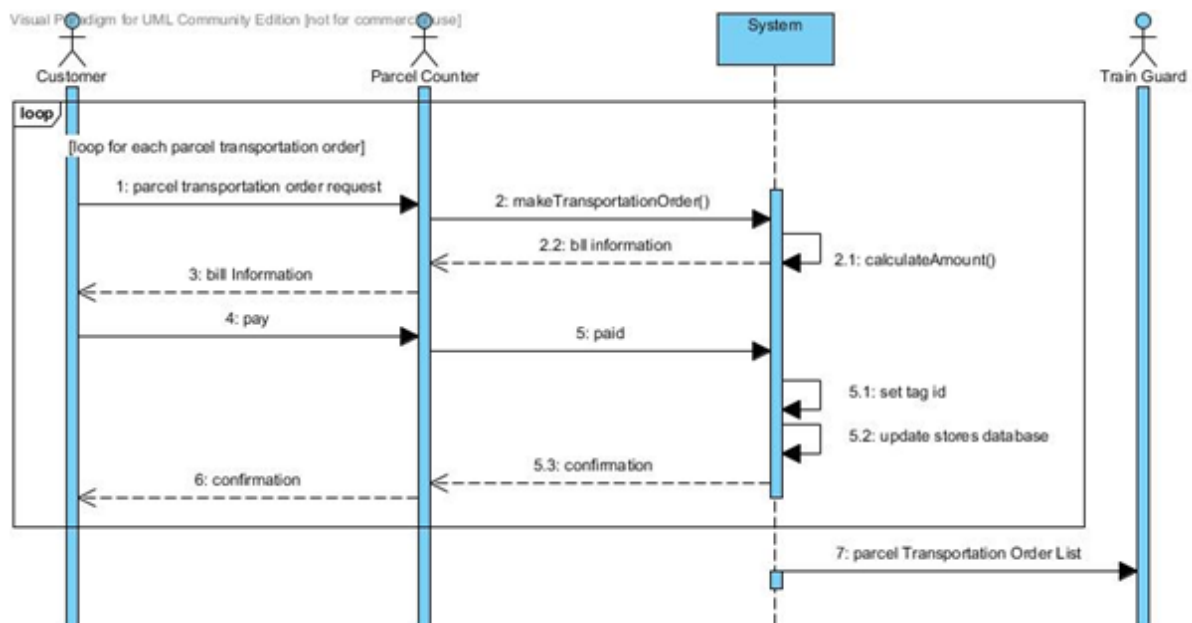


Sequence diagrams to represent the information flow

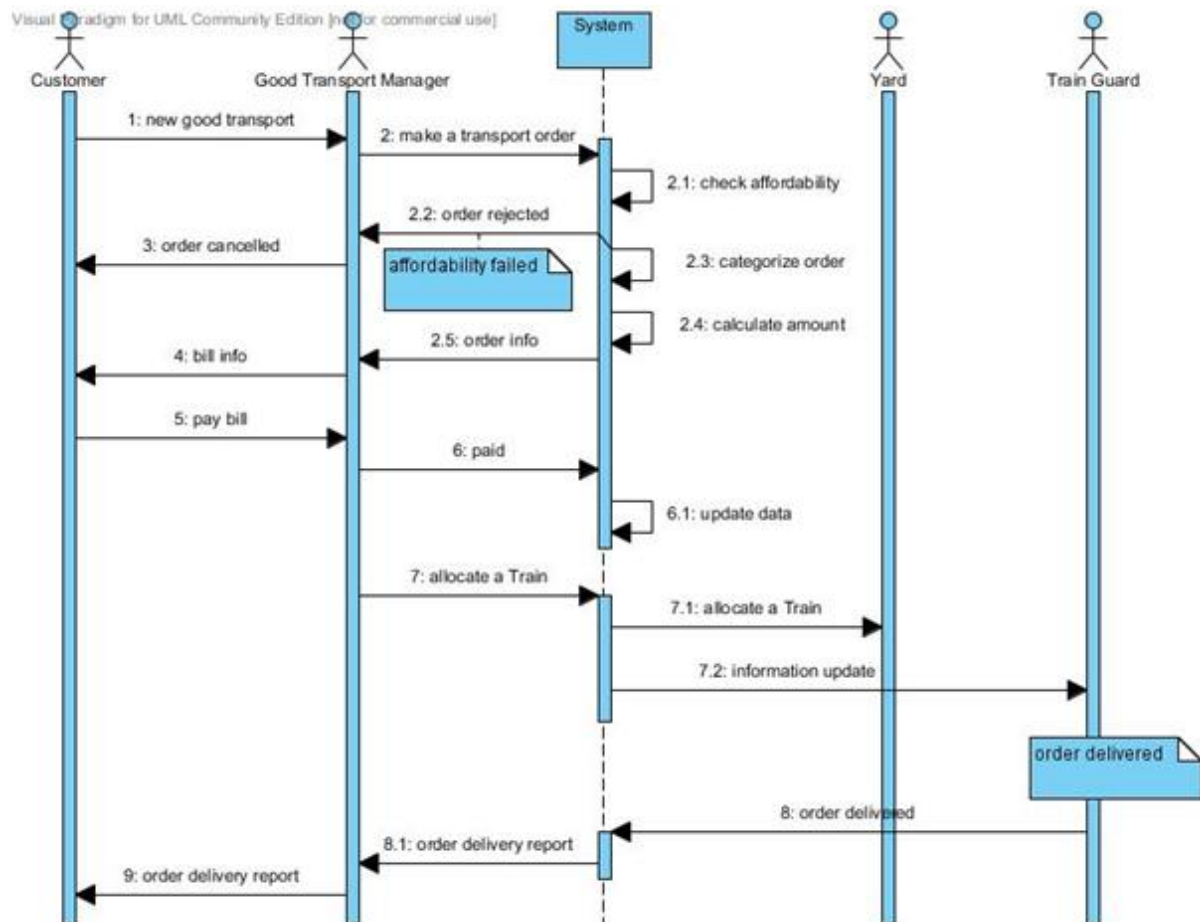
Seat Reservation sequence



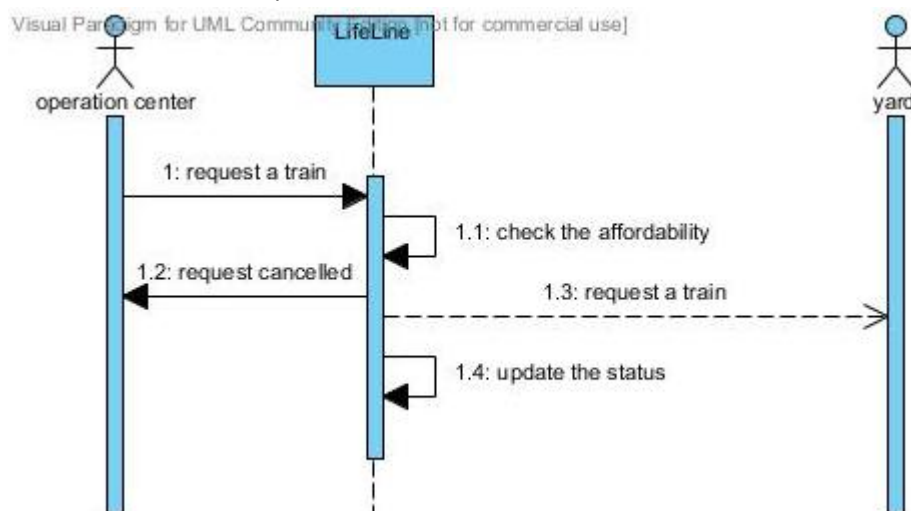
Parcel Transportation order sequence

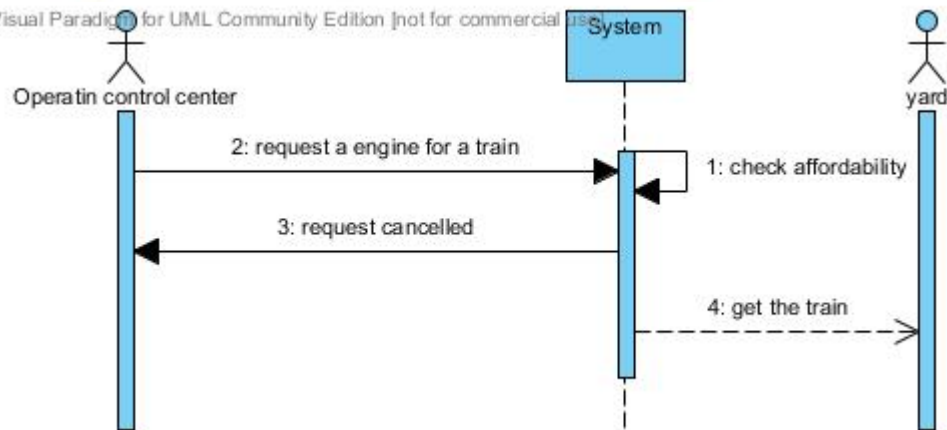
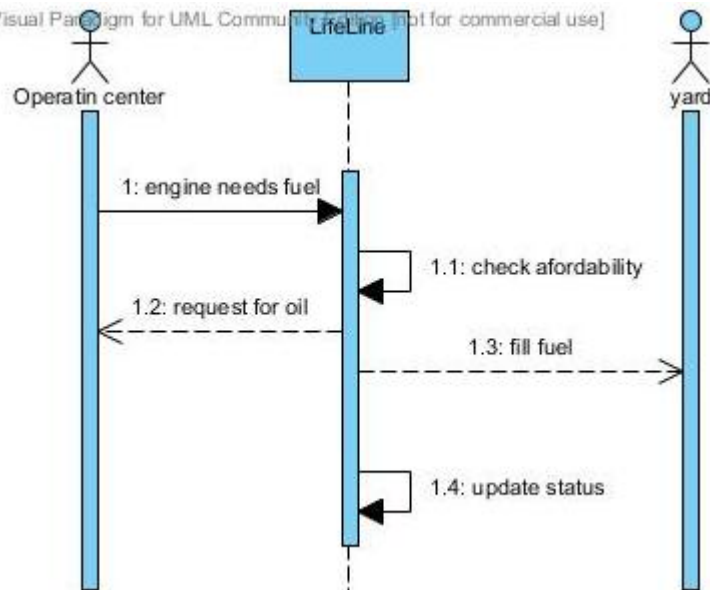


Good transportation order sequence

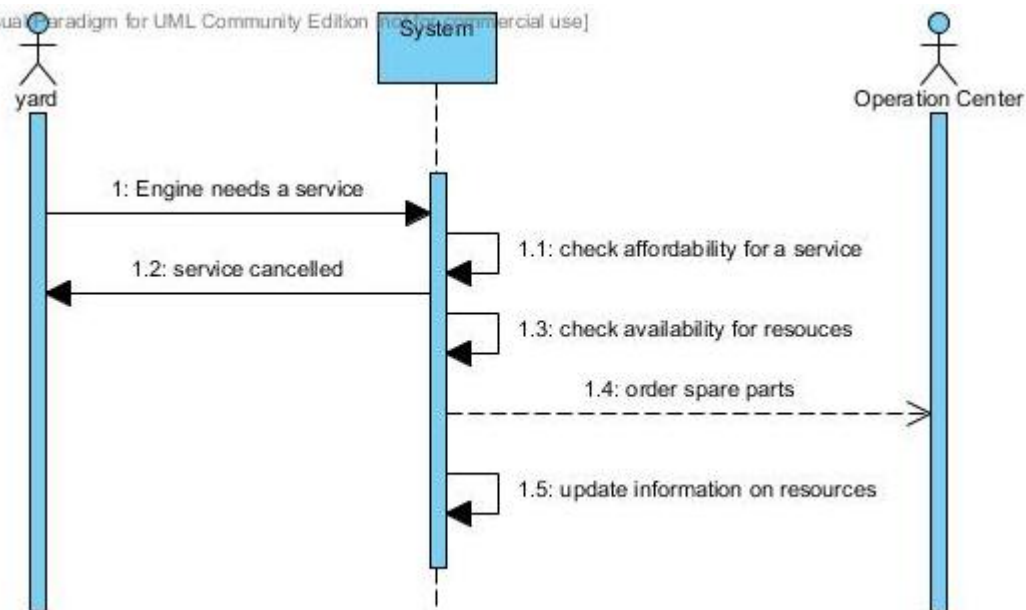


Resource allocation sequences

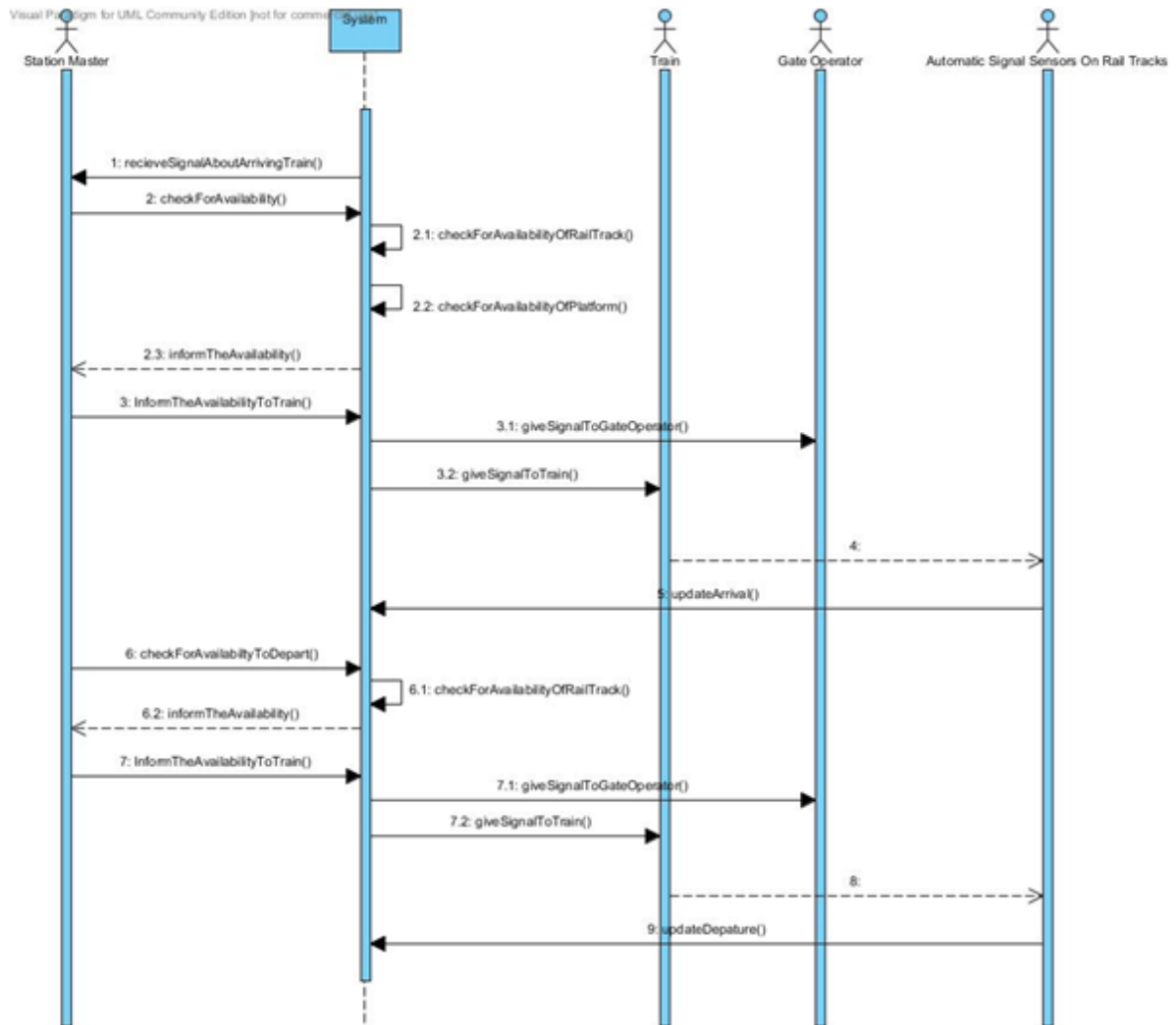




Service supply sequence

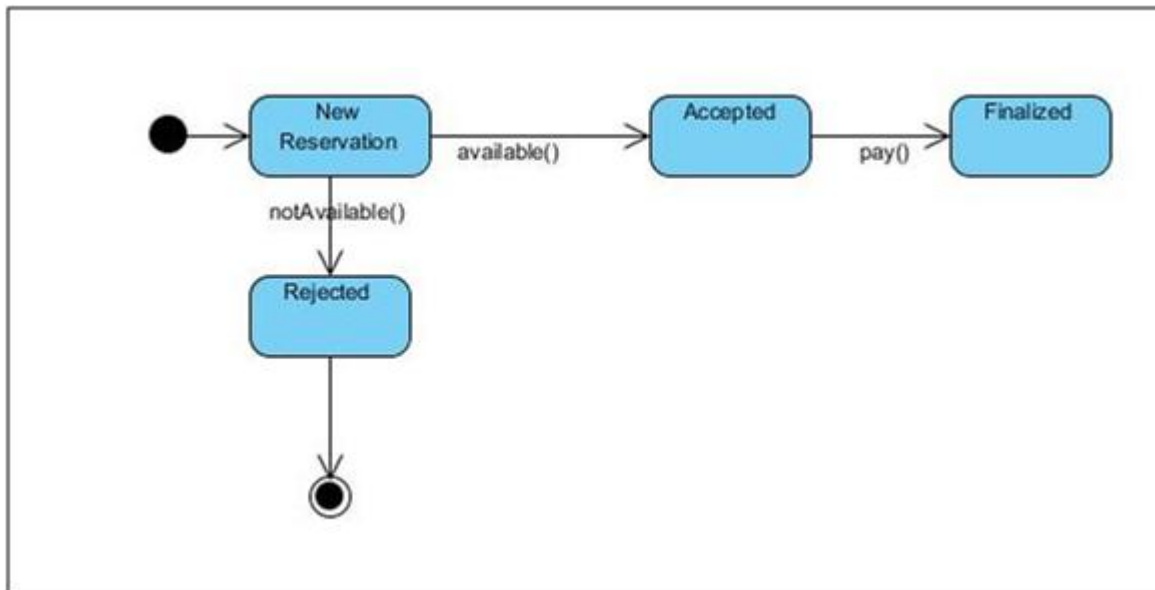


Train and signal handling sequence in the station

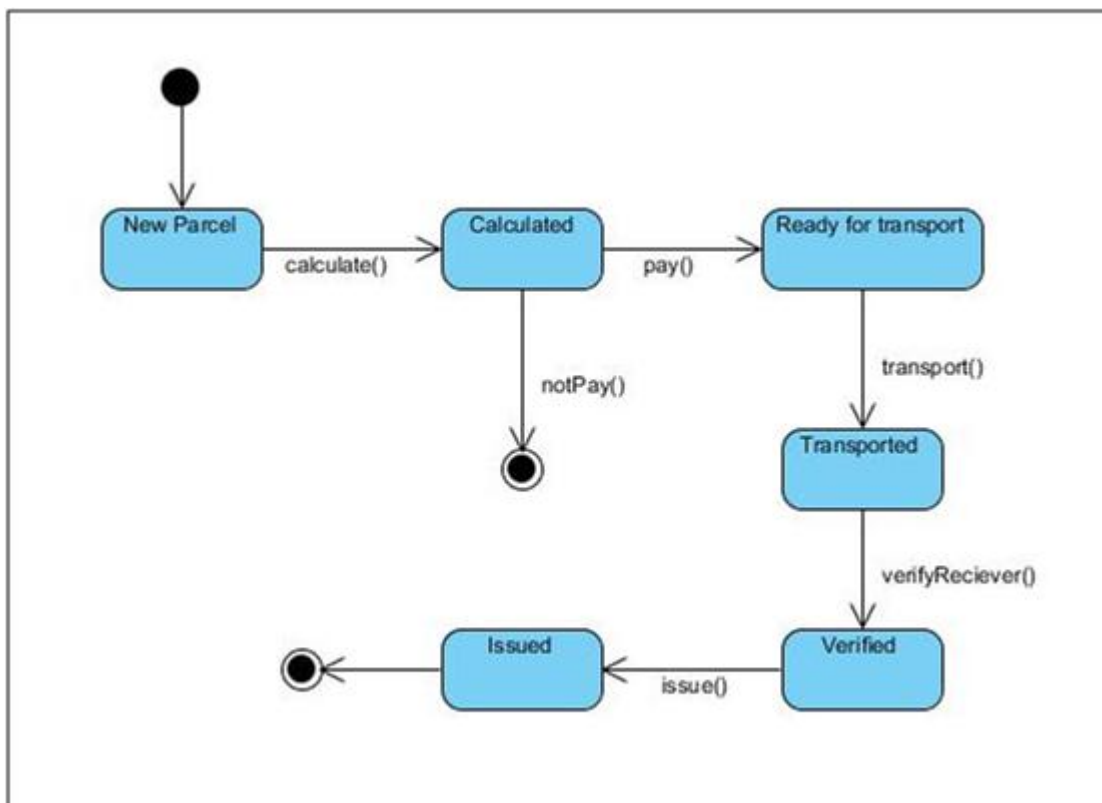


State Charts

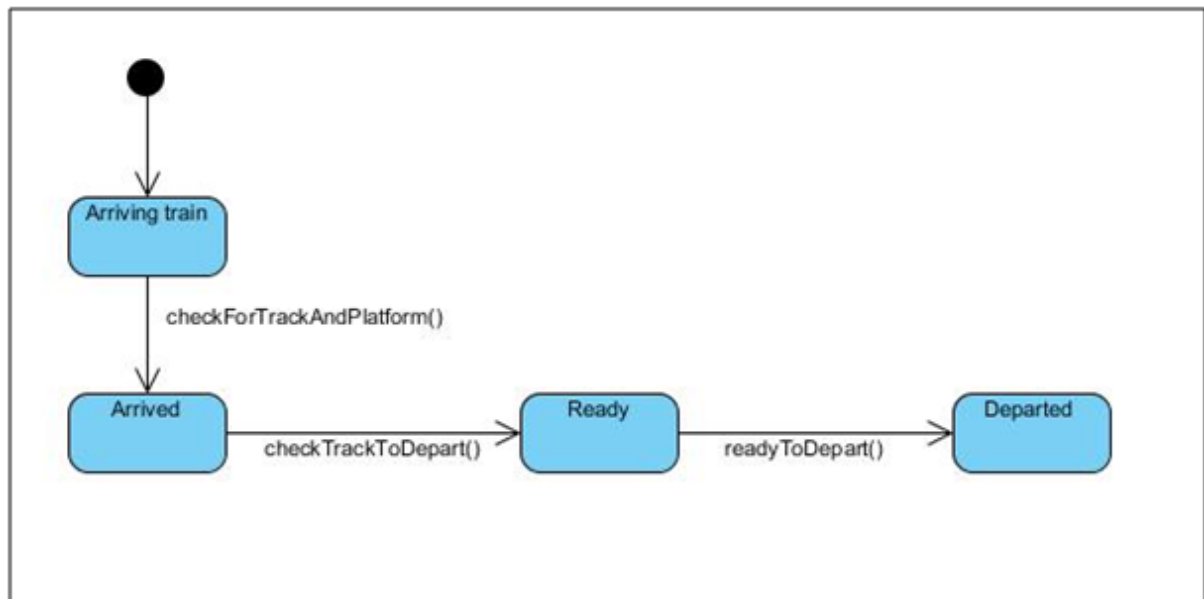
The flow of states of a Seat Reservation



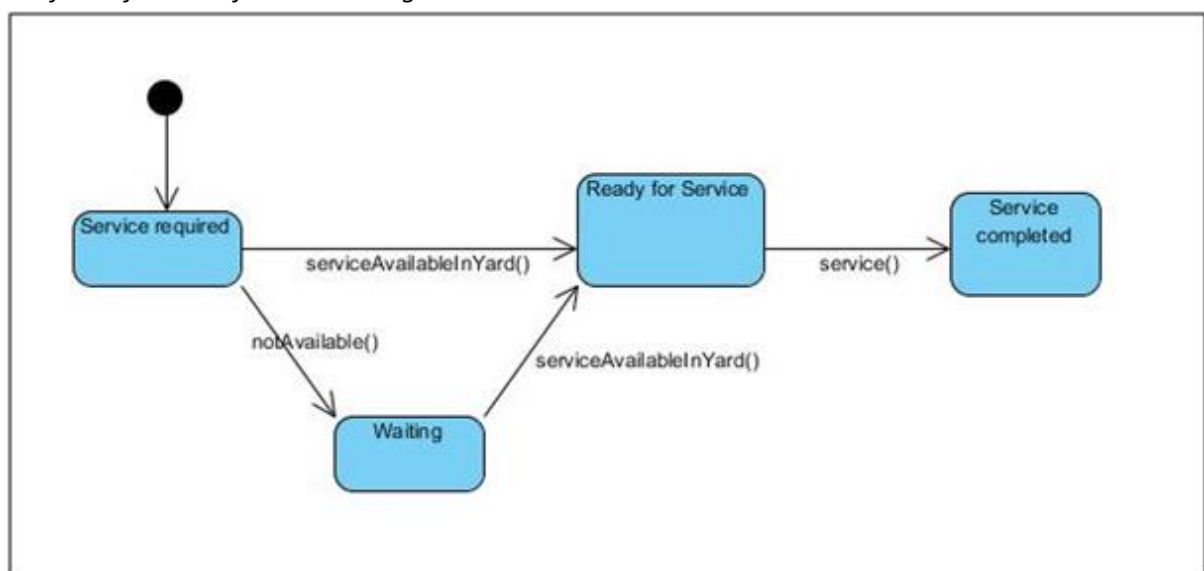
The flow of states of a Parcel Transportation Order



The flow of states of a Train between an arrival and departure



The flow of states of a Train during maintenance



Annex:

Activity	Percentage Contribution				
	100029X	100346P	100409M	100563D	100577A
Understanding requirements	20	25	15	20	20
understanding sub systems and information flow	30	15	10	15	30
create the business model	10	35	10	10	35
create the system vision	15	30	10	15	30
understand the scope of project	15	30	10	15	30
understand and acquire development tools	30	10	30	10	10
project documentation	10	10	10	10	60
identifying information resource of department	10	35	10	35	10
identifying team and their abilities	35	10	10	10	35
understand the risk	40	15	15	15	15
determine the alternative solutions	40	15	15	10	10
interview conducting	0	0	0	50	50
understanding functional, non functional requirements	35	30	0	25	10
priorities requirements	30	30	10	15	15