# Assignment

## Work Breakdown Structure

## Hiring Staff

* 1. Engineers (5 weeks)
  2. Tradies (4 weeks)
  3. Software engineers (5 weeks)

1. Arranging equipment
   1. Equipment requirement analysis (13 weeks)
   2. Ordering the equipment (8 weeks)
   3. Setting up the equipment (2 weeks)
2. Coding for the software (4 weeks)
3. public consultation (1 week)
4. paperwork done (2 weeks)
5. Development of code (8 weeks)
6. Building station (13 weeks)
7. Testing (2 weeks)

# Activity On Node (AON) Graph with Timing

After employing all the staff, we need to analysis what equipment are require, ordering the equipment then setting up the equipment after the equipment have arrived. Coding for the software as well as public consultation are done separately as while getting the public consultation, coding can do at the same time. After coding, the software engineers need to test and development the code while this happening, all the paperwork necessary for building bus station and after all is done, testing is done. then at the end the company can just advertise.

The reason why I didn’t put drivers in hiring staff is that I think that company can hire drivers anytime or after the testing the software as well as the working buses.

**Task Slack = LST- EST = LFT- EFT**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Activity** | **Duration** | **EST** | **EFT** | **LST** | **LFT** | **Slack Time** |
| 1.1 | 5 | 0 | 5 | 1 | 6 | 0 |
| 1.2 | 4 | 0 | 4 | 2 | 6 | 1 |
| 1.3 | 6 | 6 | 6 | 0 | 6 | 2 |
| 2.1 | 13 | 19 | 19 | 6 | 19 | 0 |
| 2.2 | 8 | 27 | 27 | 19 | 27 | 0 |
| 2.3 | 2 | 29 | 29 | 17 | 29 | 0 |
| 3 | 4 | 29 | 33 | 33 | 37 | 4 |
| 4 | 1 | 29 | 30 | 29 | 30 | 0 |
| 5 | 2 | 30 | 32 | 30 | 32 | 0 |
| 6 | 8 | 33 | 41 | 37 | 45 | 4 |
| 7 | 13 | 32 | 45 | 32 | 45 | 0 |
| 8 | 2 | 45 | 47 | 45 | 47 | 0 |

# Critical Path and Slack Time

Critical Pathway = 1.3 2.1 2.2 2.3 4 5 7 8

# Functional Requirements

**Actors**

1. Database
2. Student
3. Elderly
4. Environmentalist
5. Event organiser

**User Stories**

* As a traveller I want to able to know the bus timing so that I’m able to plan my travel beforehand.
* As a rider, I would like to have the ability to pay for my travel by phone as it is convenient and the probability of losing it is less compared to paying with card.
* To people to come to events as a organiser, I want people to come to my events so having more buses during special events would be of great help.
* As a customer, I would like to have multiple numbers of bus during games or event as during the game times many people use public transport.
* As a student, I would like to have affordable price to travel as I don’t get to work because I don’t get time to work.
* As a elderly person, I would like have affordable price for my travel and priority seat due to my age I cannot work well and can’t stand for long.
* The impact of smoke produced from multiple cars has impacted the environment. I think these impacts would decrease if we had multiple buses during events as the number of cars increase during that period.
* As a traveller, I need option for different routes as if I miss my bus, I can take different bus, I can reach my destination.
* As a traveller, I need a screen to show me the timing of the bus as it is must easier and is effective when there is change in route and timing.
* As a traveller, I need a planner providing me with the bus timing and the cost of the entire travel so that I’m able to plan accordingly. (Journey Planner)

# Use Cases

**Use Case - To be able to pay through phones**

1. **Goal** - To allow the registered user to pay for their fees through mobile phones
2. **Primary Actor** -Traveller (everyone who is using the system)
3. **Secondary Actor** - Data base
4. **Precondition** - The user must have their card register n their phones wallet
5. **Trigger** - Traveller is entering the vehicle

**Flow of Events**

1. Traveller tags on
2. Use case/system send request to database.
3. Retrieve the billing info.
4. Sending the details towards the system.

**Extensions**

1A. Traveller’s fund is insufficient.

1.the sensor denies the card and shows “card as been decline”

2. Use case ends.

3A. Data base sends corrupted data

1.Call use case report issues in the system

2.End the use case.

**Use Case – to update the timing**

1. **Goal** - To allow the fellow riders to know when the bus is arriving
2. **Primary Actor** -Traveller (everyone who is using the system)
3. **Secondary Actor** - Data base
4. **Precondition** - The user must have the app or near a station
5. **Trigger** - Traveller checks at the graphic interface

**Flow of Events**

1. Travellers checks the timing of the bus
2. Use case/system send request to database.
3. Retrieve the location and the bus route
4. Sending the details towards the system.

**Extensions**

1A. Frozen graphic interface

1. use case initiate reboot

2. Use case ends.

3A. Data base sends corrupted data

1.Call use case report issues in the system

2.End the use case.

**Use Case – to use journey planner**

1. **Goal** - To allow registered user access journey planner
2. **Primary Actor** -Traveller (everyone who is using the system)
3. **Secondary Actor** - Data base
4. **Precondition** - The user must have the app or website
5. **Trigger** - Traveller enters “Journey Planner”

**Flow of Events**

1. Travellers enter the location where they are traveling at.
2. Use case/system send request to database.
3. Retrieve the available the bus route, timing of the bus and the total cost.
4. Sending the details towards the system.

**Extensions**

1A. Invalid location

1. send message to the customer “Invalid Location”

2. Use case ends.

3A. Data base sends corrupted data

1.Call use case report issues in the system

2.End the use case.

## Use Case Diagram

Student Elderly

Traveller Data base

Organiser Environmentalist

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# Non-functional Requirement

# Usability Requirements

* Having an appropriate user interface listing the buses going through a route and their timing.
* If people are using the app, graphic user interface must be able to update given by the data base
* The system must recognise students’ card or elderly’s card and give them concession without the interference of the driver (human)
* The system must be able to update the user about the route adjustment through the app or the screen in the stations.
* The system must be able to show the total cost of the trip.

## Reliability Requirements

* The system must have a MTTF of at least three months
* The system user interface should be available 99.9%
* The systems billing feature should fail no more than 0.8%of attempts.
* The system must not make more than 1 incorrect time for the arrival of bus in every 1500 hours.

## Performance Requirements

* The system must be able to update the changes in route in the graphic interface within 5 seconds of receiving update from the central control room.
* The system must perform transaction up to 100 per second.
* The system must use/deploy no more than two buses for a specific route where the event is taking place and no more than one bus on the normal days.