**Requirements Specification**

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# Product Overview

The web application will provide real-time public transport information to the commuters of Dublin. It will provide information for the transport services of Dublin Bus, Irish Rail, Luas and Dublin Bikes. First, commuters can plan their journey by entering their start and end location on the maps page. Then the information will be provided on the best route and which type of transport will be the most efficient. The user can then visit the other pages of the web application to get real-time timetable information for whichever mode of transport that the map suggested for them. The system will use a separate API for each service to show the active, real-time data about the specific mode of transport that they wish to commute on.

There will also be a contact page which will enable users to contact us if they have any query regarding the web application. They will be able to fill out a web-form to submit a query or they will be able to view the company’s name, address and phone details. There will also be links to the company’s various social media platforms for people to access news and announcements from the company.

# Use Case Design

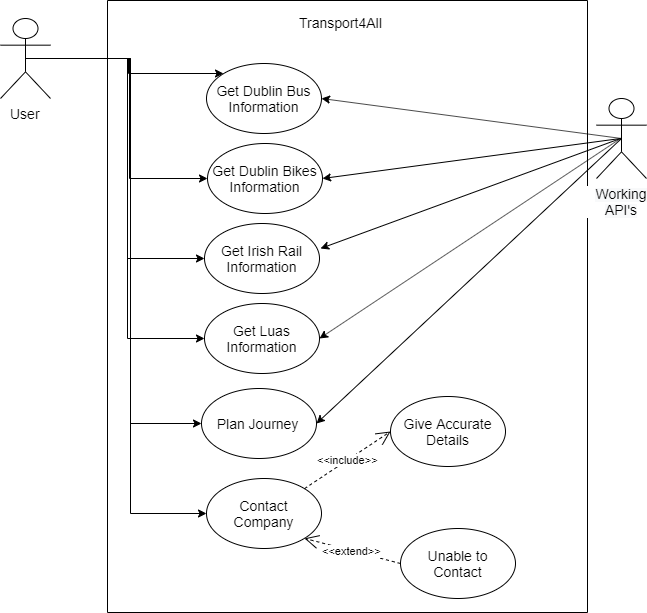


Figure 01

Figure 01 shows an overall view of the use cases that an end user will use the web application for. Each use case is explained on an individual basis on the following pages.

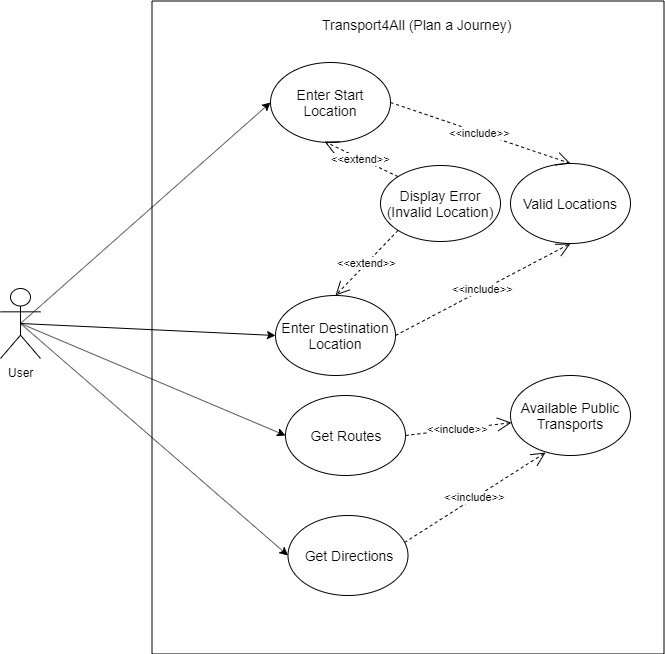


Figure 02

**Use Case 01:** Plan a Journey

**Actor:** End User

As shown in Figure 02. The user visits the home page of the web application. They click on the maps link in the navigation bar. They then arrive at the journey planning page. The user then enters the starting point of their journey and the destination point in the available text-fields and presses the search button.

The most efficient route is then highlighted and displayed on the map area of the page. The user can then see which mode of travel is recommended, for example Bus or train. The user can also see which stop or station they should go to. Now depending on which mode of transport is recommended to them they can visit the relevant page to find the time of the next bus tram or train.

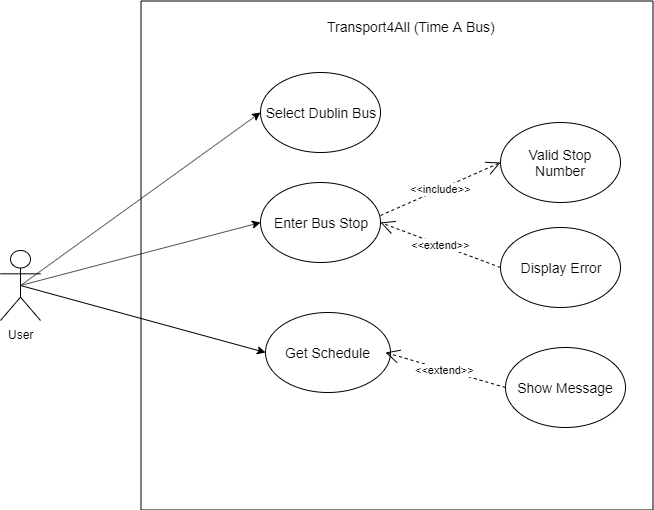


Figure 03

**Use Case 02:** Time A Bus

**Actor:** End User

As shown in figure 03. The user visits the Dublin Bus page of the website by clicking the Dublin Bus link on the navigation bar. The user types the stop number that they got from the Journey planner page into the text-field area labelled “Enter Stop Number”. They then click the search button and real-time information will be displayed for the busses that are due to stop there within the next hour. In the event of a disruption to the service which could prevent or delay the bus schedule then a message will be displayed to explain this.

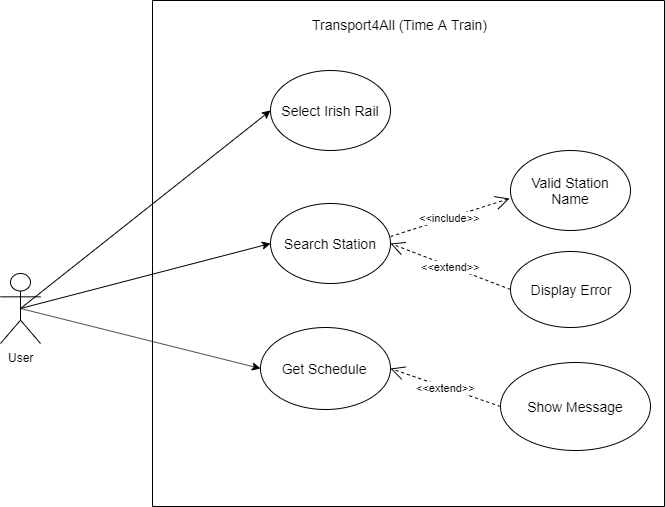


Figure 04

**Use Case 03:** Time A Train

**Actor:** End User

As shown in figure 04. The user visits the Irish Rail page of the web application. They have their station information which they have received from the journey planner page. The user then types the station name into the text-field labelled “Enter Station Name” and clicks the search button. The real-time information for trains stopping at the selected station within the next hour is displayed. In the event of a disruption to the service which could prevent or delay the train schedule then a message will be displayed to explain this.

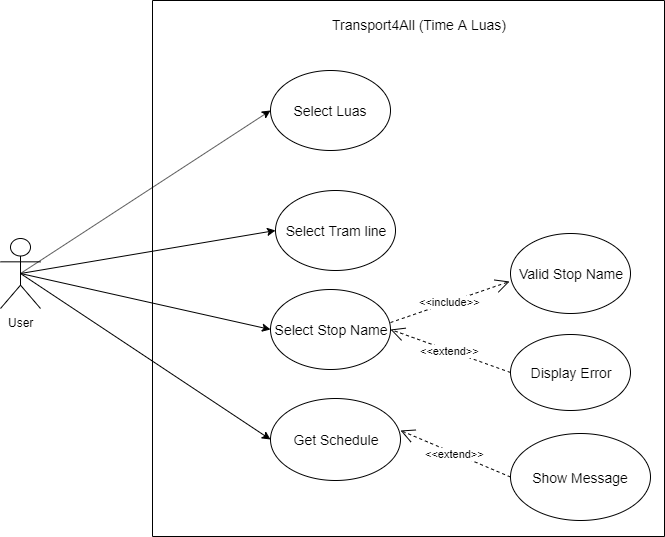


Figure 05

**Use Case 04:** Time A Luas

**Actor:** End User

As shown in figure 05. The user visits the Luas page of the web application. They are presented with two drop-down menus. The user then clicks the top menu labelled “Select Luas Line” and selects either the red or green line. The user then clicks the second drop-down menu labelled “Select Luas Stop”. The user then simply selects the stop that they want from the drop-down menu. The Real-time information for trams stopping at that stop within the next hour is displayed. In the event of a disruption to the service which could prevent or delay the tram schedule then a message will be displayed to explain this.

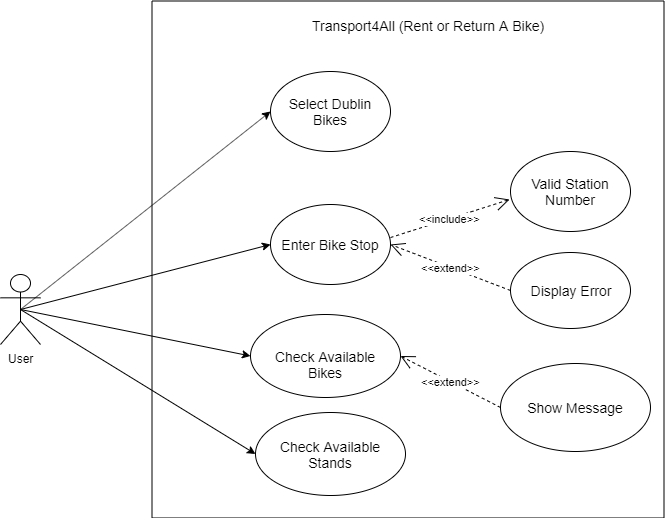


Figure 06

**Use Case 05:** Borrow a Bike

**Actor:** End User

As shown in Figure 06. The user clicks the Dublin Bikes link on the Navigation bar and lands on the Dublin Bikes Page. They enter their stop number into the search bar provided and click search. Real-time information is then displayed for the stop which shows the number of available bikes (if any) at that station. In the event of a disruption to the service which could prevent or delay the user from borrowing a bike then a message will be displayed to explain this.

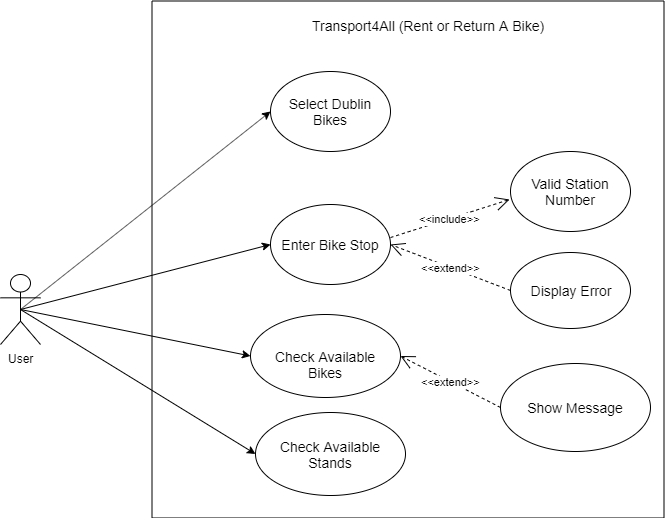


Figure 07

**Use Case 06:** Return a Bike

**Actor:** End User

As shown in Figure 07. The user clicks the Dublin Bikes link on the Navigation bar and lands on the Dublin Bikes Page. They enter their stop number into the search bar provided and click search. Real-time information is then displayed for the stop which shows the amount of available locking stations (if any) at that station. In the event of a disruption to the service which could prevent or delay the user from returning a bike then a message will be displayed to explain this.

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Figure 08

**Use Case 07:** Contact The Company

**Actor:** End User

As shown in Figure 08. The user selects the Contact page from the navigation bar and lands on that page. The user can then enter their information into the labelled text-fields and send them to the company by clicking the submit button. Or if they choose to phone or write by snail-mail or email then they can use the company’s information which is also displayed.

# Technical Specification

We plan to use the appropriate technologies to deliver our goal. This section describes the IT Platform/ Technologies to be used in the project:

**Programming languages and frameworks:**

**JavaScript**: will be used to build the web application and implement the custom client-side scripts. We plan to use JavaScript functions such as pop ups and changing of images (jQuery) to HTML pages and make it interactive.

**XML:** will be used to pull real time data for Irish Rail, we plan to handle this data by fetching and reading it using XML parsing and XML Schema and to display XML content about desired locations for users.

**PHP**: will be used to create dynamic contents with the database, this will include the creation of the contact page, getting the information from API and storing API information for Irish Rail, Bus, Bike, Luas and Maps on the Database.

**HTML**: is planned to be used to create the structure of the web pages in combination with CSS for presentation and Styling the webpages in parallel with JavaScript for interactivity and dynamic content.

**Bootstrap**: will be used to design the web application to create layouts and responsive web pages by using HTML and CSS constructed design templates for, buttons, forms, tables, navigation, images carousels, etc.

**JSON:** We planned to parse the JSON format data using jQuery and PHP and display the content for appropriate locations of the two services (buses and bike).

**Databases:**

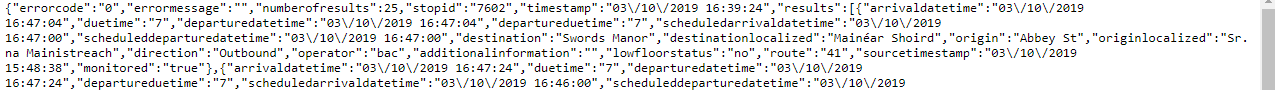
**MySQL**: will be used for Database design and development, we will create, manage and validate MySQL database and users using PhpMyAdmin. The database will be used to store information about APIs used in the project and store contact information.

**APIs**:

The API is planned to be used to get real time information of Buses, Luas, Irish Rail and Bikes. In the following section, a list of names and links of the APIs used in the projects and how this data is going to be used and processed:

**Dublin bus:**

Link: [https://data.smartdublin.ie/cgibin/rtpi/realtimebusinformation?stopid=”7602”&format=json](https://data.smartdublin.ie/cgibin/rtpi/realtimebusinformation?stopid=)



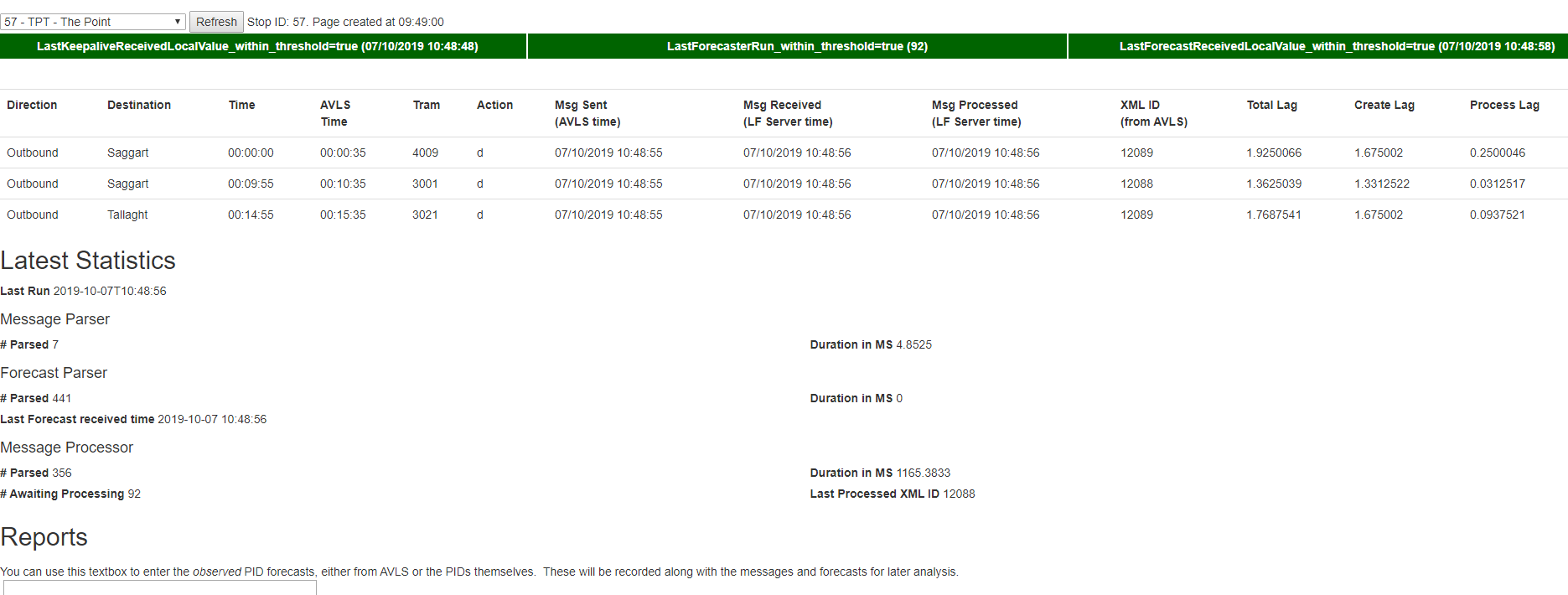
(Smartdublin.ie 2019)

**Description**:

We planned to use the Json format of the data coming back using the above API, we will parse this Data using jQuery and PHP. The expected data will provide real time information about the buses depending on Stop number.

**Luas:**

Link: <http://luasforecasts.rpa.ie/analysis/view.aspx?id=57>



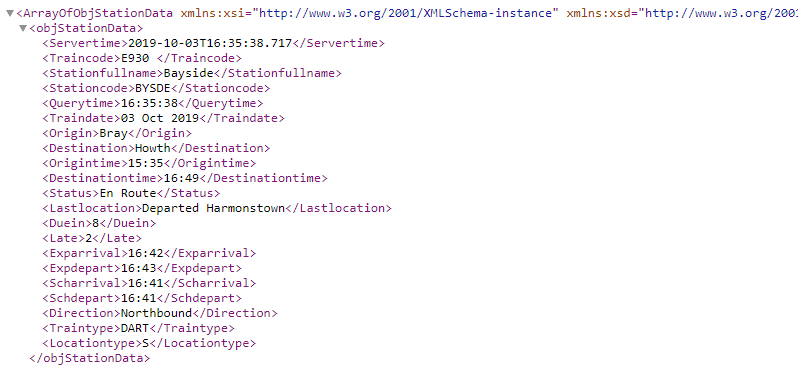
([luasforecasts.rpa.i](http://luasforecasts.rpa.ie/analysis/view.aspx?id=57) 2019)

**Description:**

We planned to use ASPX (Active Server Page Extended file) to download required files from the server, the browser will display the page for the users containing information about the direction, destination, time and LUAS stop number

**Irish Rail:**

Link: [http://api.irishrail.ie/realtime/realtime.asmx/getStationDataByNameXML?StationDesc=”Bayside](http://api.irishrail.ie/realtime/realtime.asmx/getStationDataByNameXML?StationDesc=)”



(I[rishrail](http://api.irishrail.ie/realtime/realtime.asmx/getStationDataByNameXML?StationDesc=).ie 2019)

**Description**:

The Data coming back from the above API is in XML format, we are planning to parse the XML data by using Xml parsing and XML Schema. the expected data will provide the Real Time information for the Irish Rail.

**Dublin Bikes**

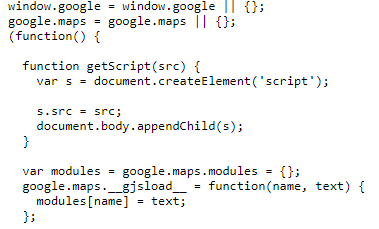
Link: [https://api.jcdecaux.com/vls/v1/stations/”50”?contract=dublin&apiKey=71ad3cfc15ee4188cb493ea4977da1dd242e94dd](https://api.jcdecaux.com/vls/v1/stations/)

Description:

Our plan is to use APIs that publish data in JSON format to provide client with real time information about where the Dublin bike stans are located and to display the name and location of the station.



**Maps:**

Link: [https://maps.googleapis.com/maps/api/js?key=AIzaSyD7zNEt23CKPUWiptnydkHbf6n\_RmXvqnU&callback=initMap](https://maps.googleapis.com/maps/api/js?key=AIzaSyD7zNEt23CKPUWiptnydkHbf6n_RmXvqnU&callback=initMap)

([maps.googleapis.com](https://maps.googleapis.com/maps/api/js?key=AIzaSyD7zNEt23CKPUWiptnydkHbf6n_RmXvqnU&callback=initMap) 2019)

**Description**:

We are planning to use google Maps by using the API key to authenticate requests and display desired depiction on the map for our clients.

Users will be able to search and navigate the map to see the location of bikes, check direction of the Irish Rail, route of the Luas and buses.

We planned to use IF-ELSE statement to calculate and compare the routes and display the best routes for the users on the map.

# Deployment Strategy

We will deploy our web application on the free webhosting platform [www.000webhost.com](http://www.000webhost.com/). Once we sign up, we will receive a default website name of transport4all.000webhostapp.com. This will enable us to immediately start to build the website and upload and transfer files and images into the application directories.

There are two ways to upload files to 000webhost. FTP-File transfer protocol on port 21. By default, websites created on 000webhost has FTP disabled for security reasons, but we could activate it in the settings if we choose. Instead we will use the Web File Manager to upload our files.

From the 000webhost control panels easy to use interface we can also manage our MySQL database and create, access or change the password. We can also configure and set up the PHP version. We will also set up the email and email forwarders at this point from the same control panel.

We will also receive 10gb of bandwidth and 1gb of free space which will be more than enough to get us started. There is also a 99.9% uptime guarantee.

**Bibliography:**

Data.smartdublin.ie. (2019). [online] Available at:

[https://data.smartdublin.ie/cgibin/rtpi/realtimebusinformation?stopid=”7602”&format](https://data.smartdublin.ie/cgibin/rtpi/realtimebusinformation?stopid=)

[Accessed 8 Oct. 2019]

Luasforecasts.rpa.ie. (2019). [online] Available at: <http://luasforecasts.rpa.ie/analysis/view.aspx?id=57>

[Accessed 8 Oct. 2019].

Api.irishrail.ie. (2019). [online] Available at: [http://api.irishrail.ie/realtime/realtime.asmx/getStationDataByNameXML?StationDesc=”Bayside](http://api.irishrail.ie/realtime/realtime.asmx/getStationDataByNameXML?StationDesc=)”

[Accessed 8 Oct. 2019].

Anon, (2019). [online] Available at:

https://api.jcdecaux.com/vls/v1/stations/”50”?contract=dublin&apiKey=71ad3cfc15ee4188cb493ea4977da1dd242e94dd

[Accessed 8 Oct. 2019].

Available at:

<https://maps.googleapis.com/maps/api/js?key=AIzaSyD7zNEt23CKPUWiptnydkHbf6n_RmXvqnU&callback=initMap>

[Accessed 9 Oct. 2019].