**System Architecture**

For a better understanding of the system architecture of our design, we conceived a data conceptual model and a data logical model represented in the figures below.

Based on these diagrams, the detailed explanation of the tables/entities included in our diagrams is provided below:

1. **Point:**

It represents a location that can be a town, a village, a neighborhood, a city and so on.

* *Attributes:*

Point\_ID (primary key): It should be unique and not null. It enables identifying the point in a unique way, Name, Latitude, Longitude,Type

* *Functionality:*

Represents various locations such as cities, landmarks, etc. used in journeys.

It will be used to materialize the start points, stop points and destinations of various journeys.

Moreover, it will be used for the locations of the various stations of an agency.

* *Associations:*

-It is used to situate an AgencyStation.

-It is used to represent the multiple stop points of a journey.

-It is used to create the table Dictionary serving to associate points and journeys.

1. **Agency**

It represents the entity that has the ability of creating, removing, updating and deleting a journey.

* *Attributes:*

Agency\_ID (primary key)

Name

* *Functionality:*

Represents travel agencies that provide services for journeys.

Moreover, it can also represent a personal driver that offers services of journeys.

* *Associations:*

-It possesses numerous vehicles.

-It possesses various AgencyStations.

1. **Vehicle**

A vehicle is an object used for a journey. There are vehicles of various types and capacities

* *Attributes:*

Vehicle\_ID (primary key)

Type

Brand

Capacity

* *Functionality:*

Represents vehicles used for transportation in journeys (e.g., buses, trains, etc.).

* *Associations:*

-It is possessed by a single agency

-It is used for various journeys

1. **AgencyStation**

An AgencyStation is an object that belongs to an agency and it is the entity that actually offers the journey. In the case of inter urban travels it is generally the start point of the journey while in urban journeys, it will not be a fixed point and as such will be regularly updated within the database in order to determine its new position.

* *Attributes:*

Station\_ID (primary key)

Station\_Name

Agency\_ID (foreign key referencing Agency table)

Point\_ID (foreign key referencing Point table)

* *Functionality:*

It represents stations owned by agencies, located at specific points for travel services.

* *Associations*

-It belongs to a unique agency

-It is situated at a particular point

-It can offer various journeys.

1. **Journey**

It is the central object of our application given that it is the object which is been searched and so the object which is been returned.

* *Attributes:*

Journey\_ID (primary key)

Departure\_Time

Start\_Point\_ID (foreign key referencing Point table)

End\_Point\_ID (foreign key referencing Point table)

Vehicle\_ID (foreign key referencing Vehicle table)

Agency\_ID (foreign key referencing Agency table)

* *Functionality:*

Represents individual journeys or trips that occur between specific points, facilitated by an agency and a vehicle.

It can be a created, updated or deleted.

* *Associations:*

-It is offered by various agencies

-It is done by a unique vehicle

-It possesses numerous stop points

-it is used in the table Dictionary for various points.

1. **Dictionary**

It is the table which is obtained after the crawling part of our robot of research similar to the Google robot. This enables in the facilitation of the research of the journeys.

* *Attributes:*

Dictionary\_ID (primary key)

Point\_ID (foreign key referencing Point table)

Journey\_ID (foreign key referencing Journey table)

Role (It can either be: departure, arrival, stop)

* *Functionality:*

Stores mappings between points and journeys, specifying the role of each point in the journey (departure, arrival, or stop).

* *Associations:*

-It associates numerous points.

-It associates numerous journeys