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# PROJECT REQUIREMENT AND DESIGN DOCUMENT

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CSP586 – Spring 2019

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# 1. Project overview statement

The project mainly focuses on searching places and showing dashboard for nearest divvy dock stations using station's logs stored on ElasticSearch server. This project mainly uses d3.js library to plot the various charts like line chart, bar chart and stacked-bar chart. The dashboard enables the user to visualize and analyze the divvy dock stations and its details in the form of charts. The user can filter the time range while plotting the charts.

# 2. Requirement/Feature List

- **Requirements:**

1. Load yelp reviews into ElasticSearch server.
  2. Load real time divvy data into PostgreSQL database.
  3. Load divvy log into ElasticSearch server.
  4. Display found places in provides zip Code.
  5. Display bar chart of review count of found places.
  6. Display 3 nearby divvy stations of selected place.
  7. Display stacked-bar chart of available bikes and docks for found nearby stations.
  8. Display location of found divvy stations on map.
  9. Display daily and hourly average line chart for last week, month and year.
  10. Display simple moving average line chart for last one hour, 24 hours and last 7 days.
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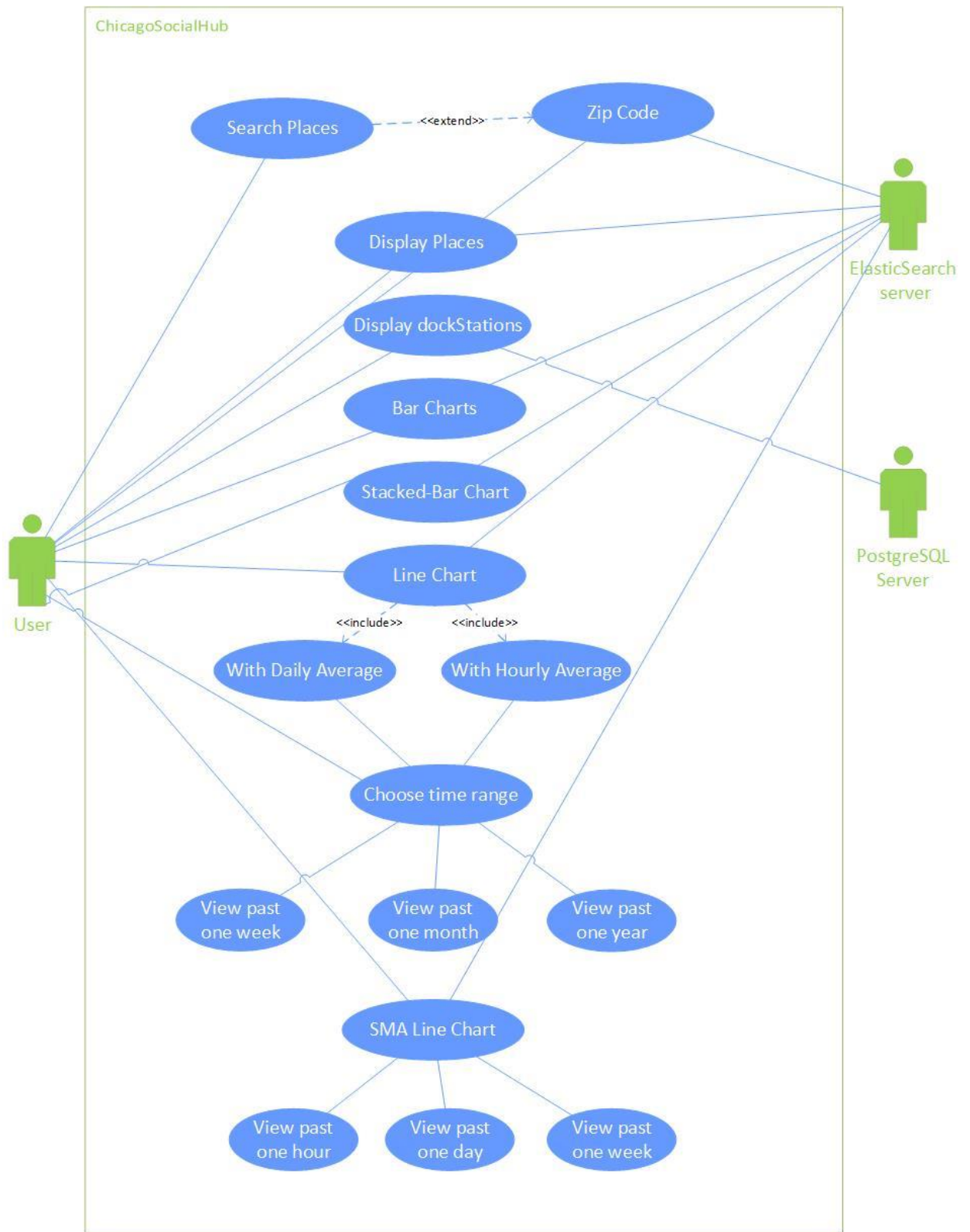
## ● **Features:**

1. User can find place and its details using address or zip code.
  2. User can find 3 nearest divvy stations to the selected place on map.
  3. User can have information about each dock station like available bikes and docks at that station.
  4. User can see various charts like line chart, bar chart and stacked-bar chart.
  5. User can filter line chart by time range like last one hour, 24 hours, 7 days, month and year.
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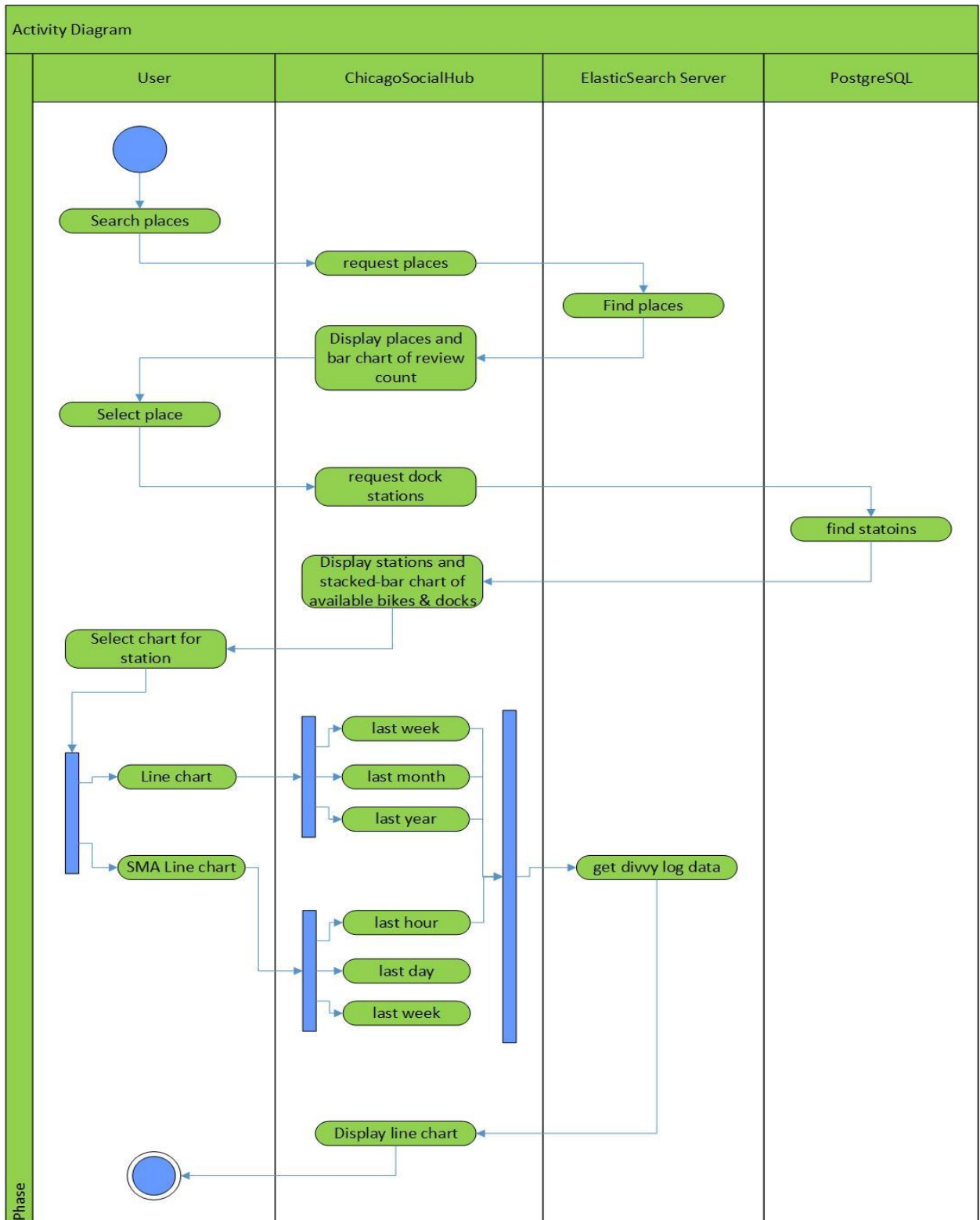
### 3. Use cases and Use Case diagram

#### Use Cases:

ACTOR	USE CASE	DESCRIPTION
User	Search places	User searches places using place name, address and zip Code.
	View nearest divvy dock stations	User can see nearest 3 divvy dock stations based on place selection.
	View dashboard to get real-time charts	User can see bar chart, stacked-bar chart and line chart
ElasticSearch Server	Searches places for user	Receives place name, address and zip code to return places.
	Searches divvy data logs for charts	Return divvy logs depending on time-range provided by user for selected dock station
PostgreSQL Server	Searches divvy dock stations	Returns 3 nearby dock stations of selected place.

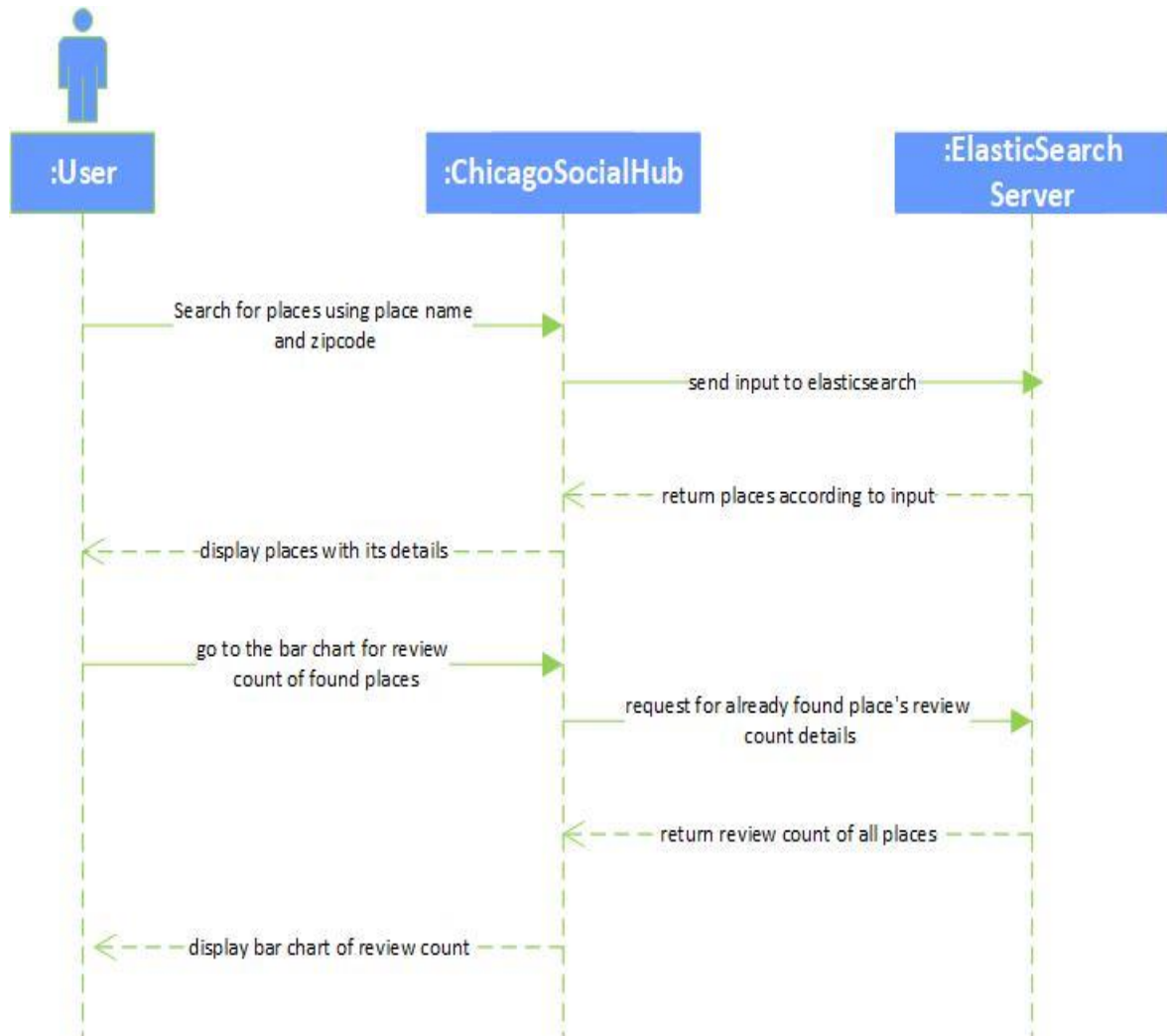


## 4. Activity Diagram

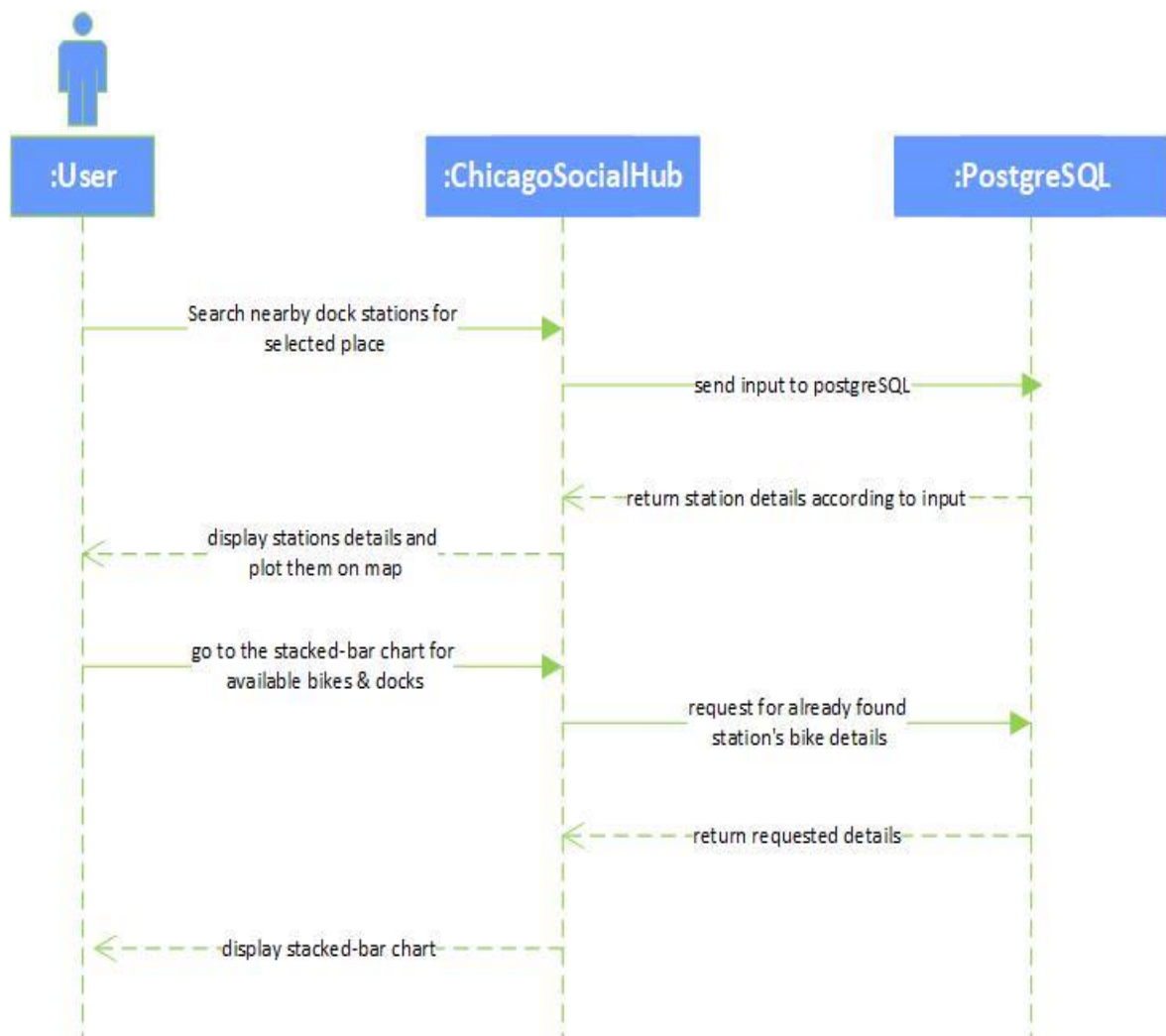


## 5. Sequence Diagrams

- Search places and view bar chart

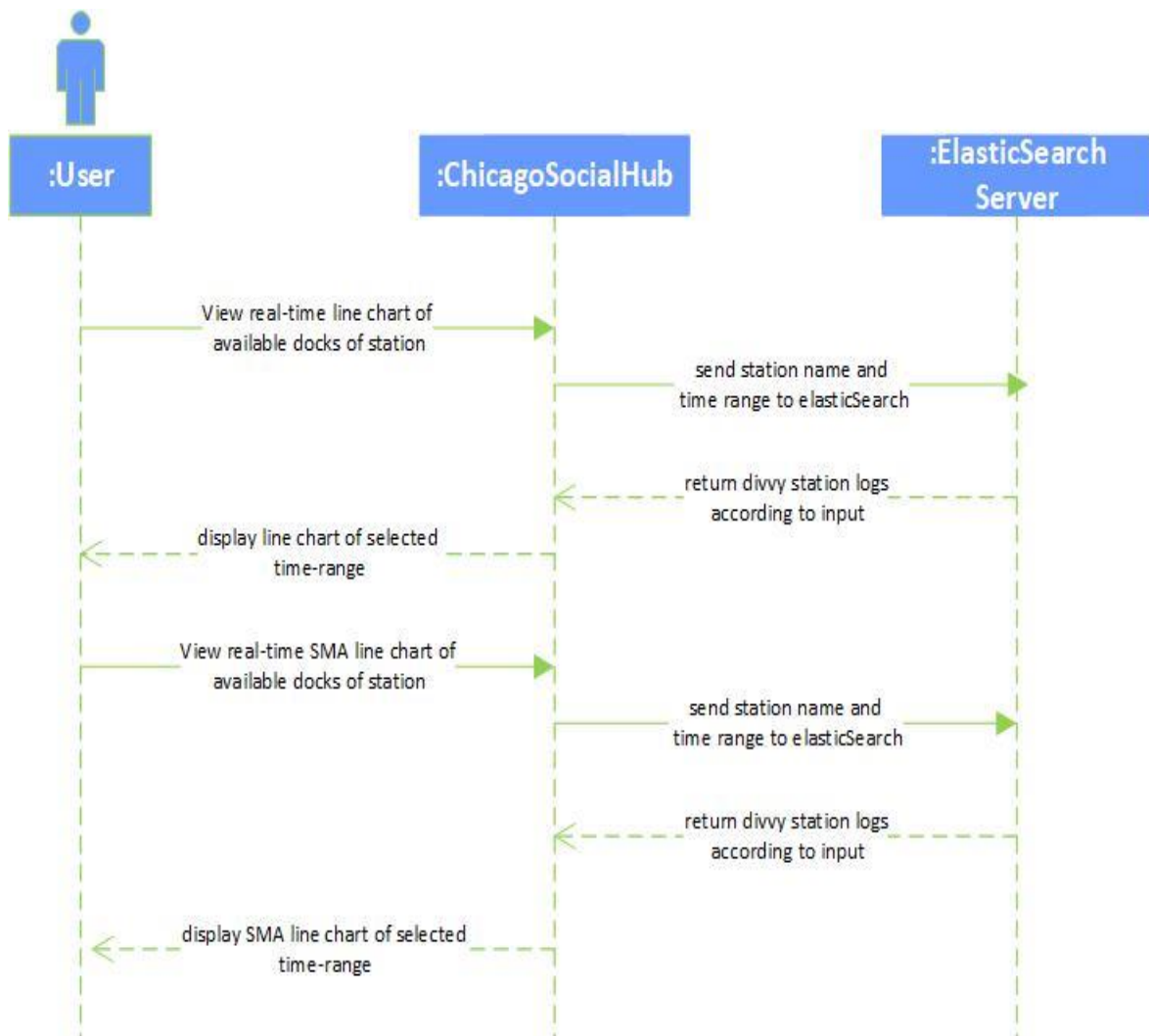


- Search stations and view stacked-bar chart

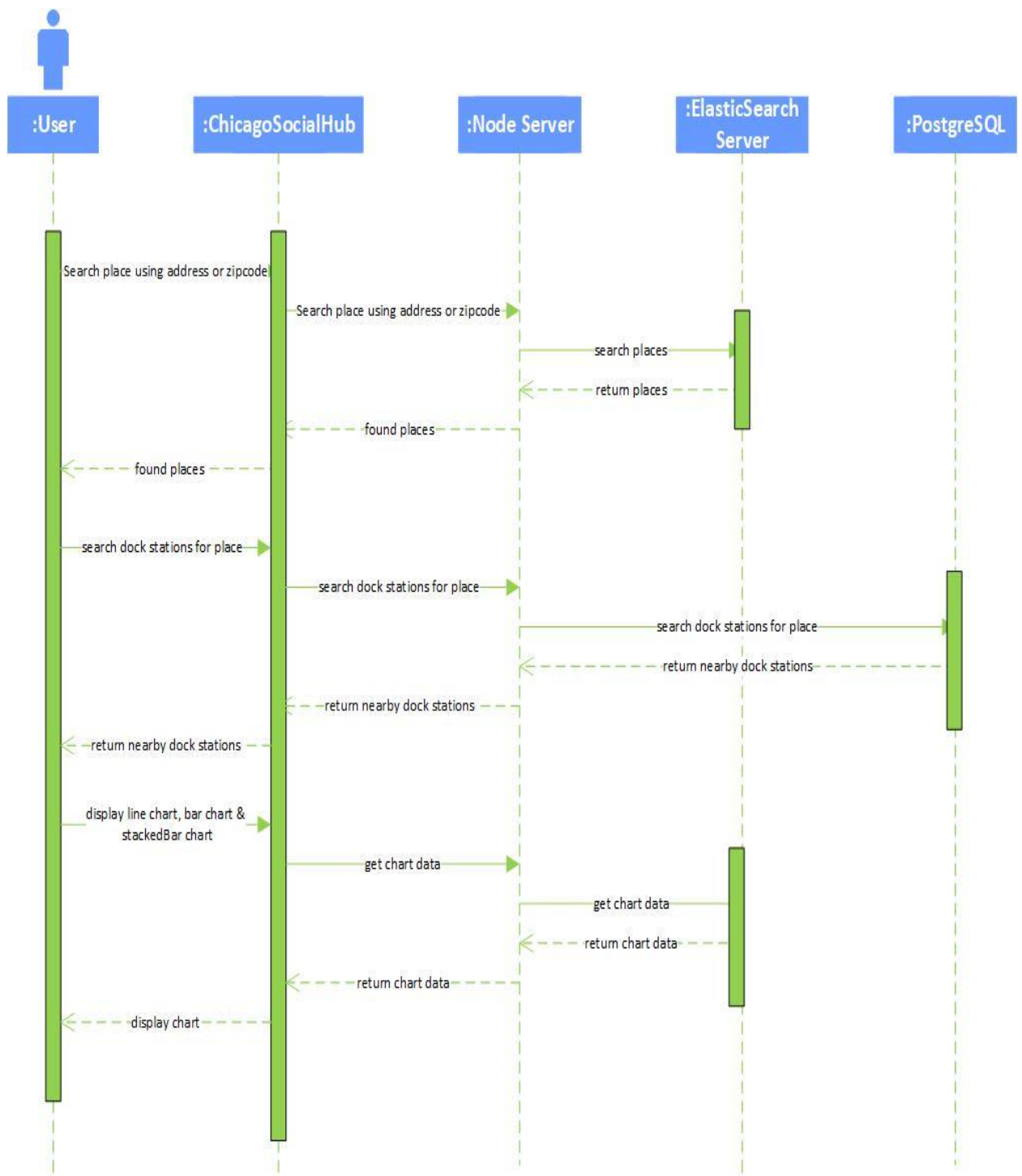




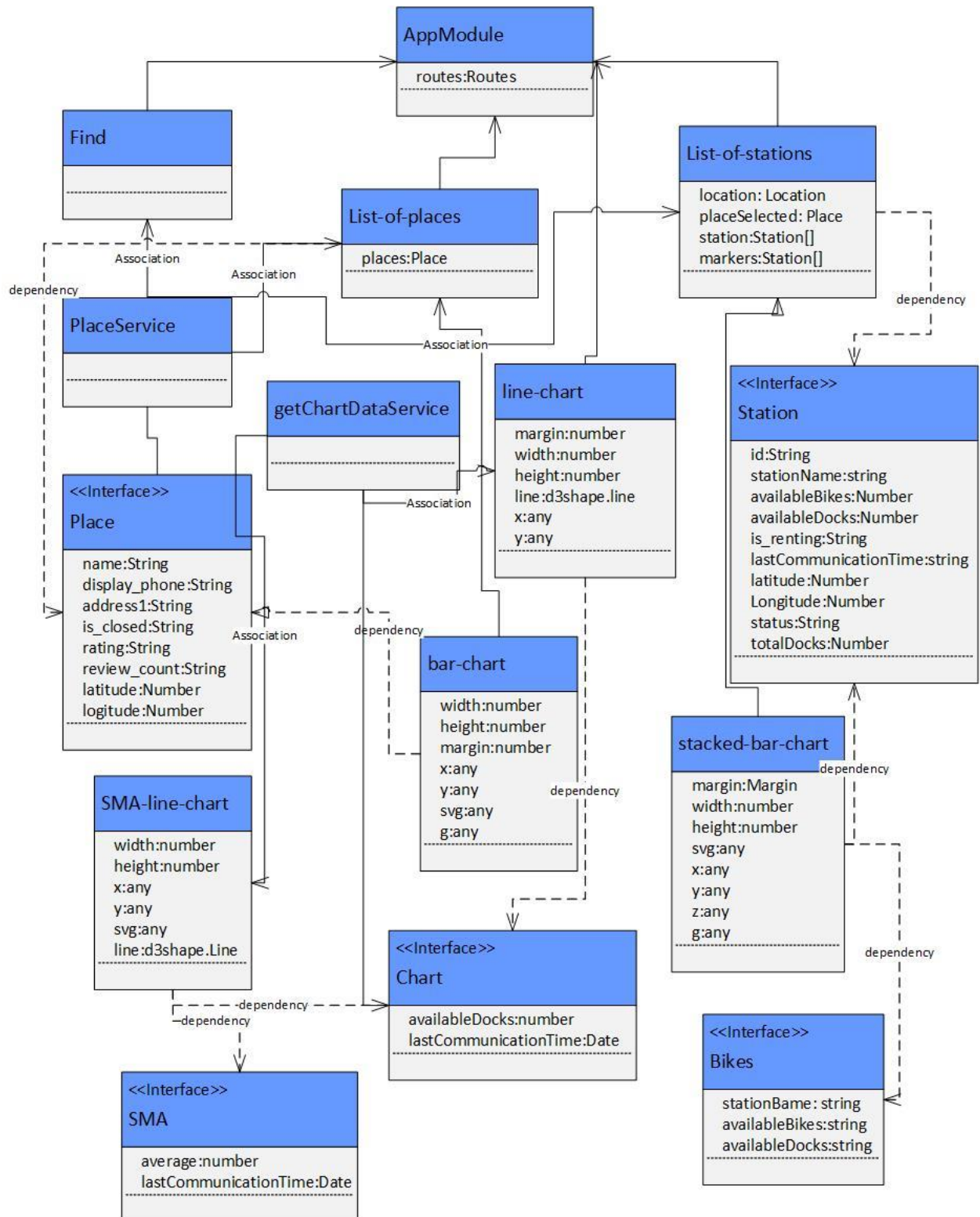
- View real time line chart and SMA line chart



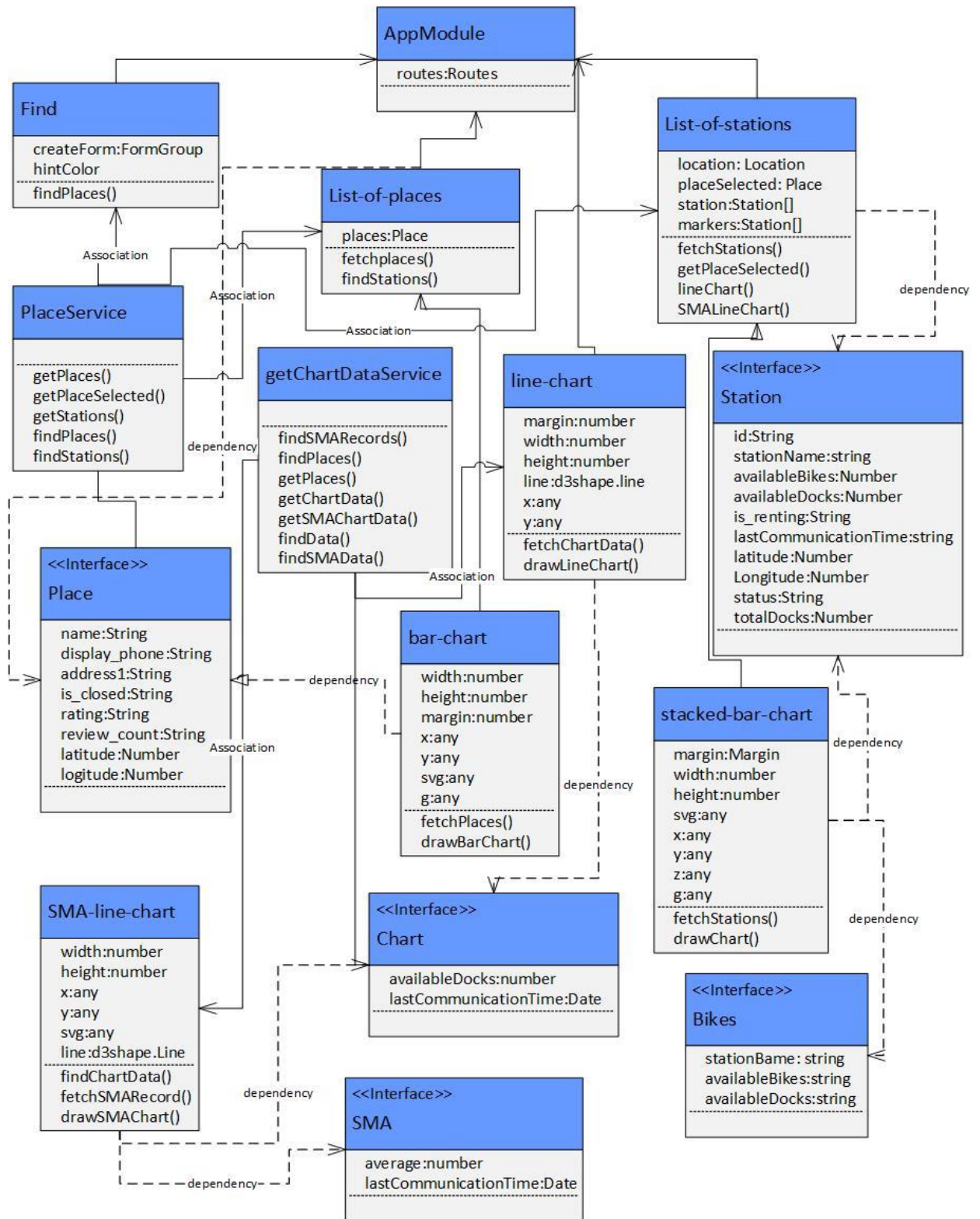
- Entire system's sequence diagram



## 6. Domain Model Class Diagram



## 7. Design Model Class Diagram

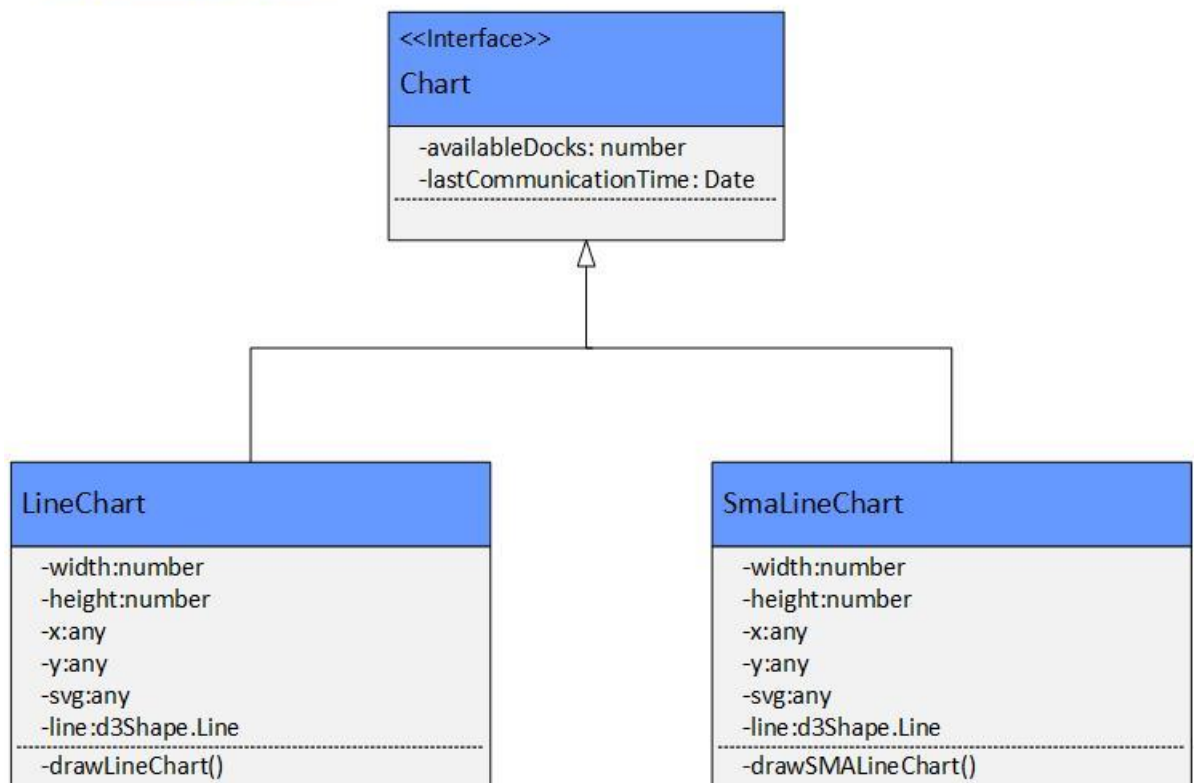


## 8. Documentation and class diagrams for design patterns used

### ● Factory Method Design Pattern:

- The Factory method design pattern is creational pattern which helps creating an object, but let subclasses decide which class to instantiate. Factory method lets a class defer instantiation to subclasses.
- In, Factory pattern, we create object without exposing the creation logic to the client and refer to newly created object using a common interface.
- In our System, for example, 'LineChartComponent' and 'SmaLineChartComponent' uses the same 'Chart' interface.

Factory Method Design Pattern



- **Strategy Design Pattern:**

- Strategy design pattern is behavioral type desing pattern which allows user to choose the next step at runtime.
- In our system, for example, user can have choice of selecting different types of line charts i.e. normal line chart or simple moving average line chart using 'Chart interface'.

