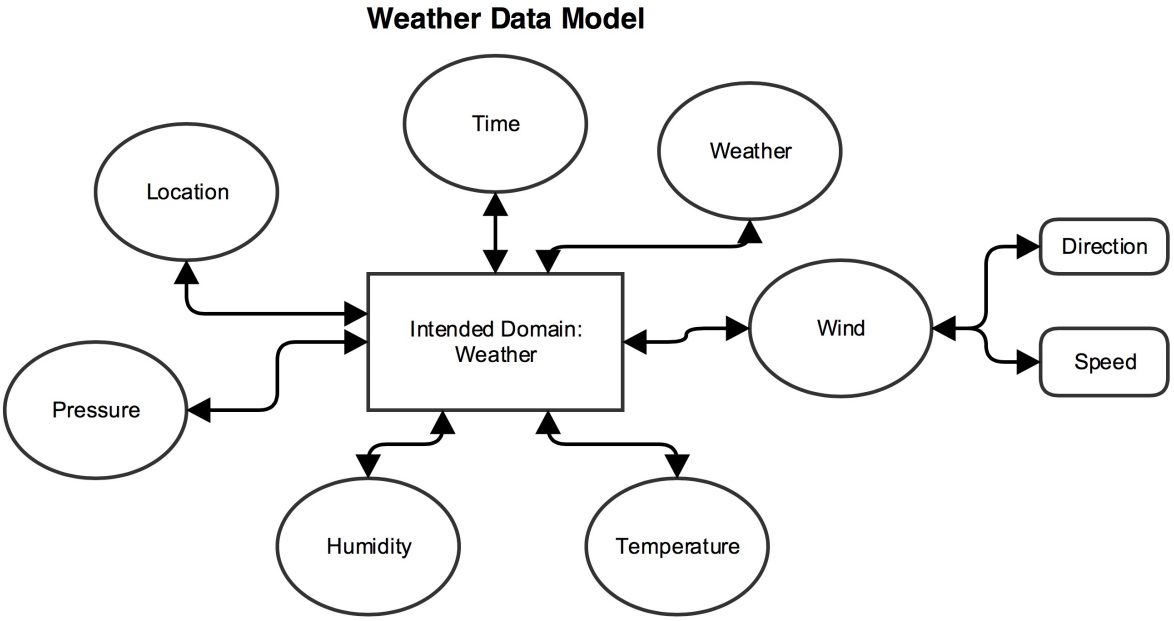
Description

1. Intended domain: weather

Our design is intended to provide interactive data visualization for weather information. It extracts data from given sources, and displays various forms of data visualization.

Our design is not limited to the weather domain. The framework and data plugin APIs are generally generic, and should be able to be applied to other domains with a little work expected. Domains with tabular data should be strongly supported.

2. Data model:



3. Tool capabilities:

This framework is designed for weather data visualization. It is able to manipulate and visualize data related to weather, including but not limited to temperature, pressure, humidity, wind direction and power.

Main functionalities include but is not limited to:

1. allow data extraction from multiple sources (such as local files and third party APIs);
2. process single set of data as well as comparison between multiple data sets;
3. process data with various combinations of multiple functions, such as filter & sort;

4. display various appropriate visualizations on the data simultaneously, such as pie chart, dot chart, and line chart;
5. allows zooming and interactions with a selected visualization;
6. allows flexible combinations of data sources and visualizations;

Our design is aimed to be generic as possible. It does not only apply to the weather domain. With only a little additional work, our framework can be used to realize data visualization in other domains. Domains with tabular data are especially well fitted.

4. Plugin interface:

```
public interface DataPlugin {

        public DataSet process(String path);
        public void onRegister(Framework framework);

}

public interface DisplayPlugin {

        public boolean isAvailable(DataSet data);
        public Panel display(DataSet data);
        public void onRegister(Framework framework);

}
```

5. Constraints:

- Client need to be familiar with their source data, and should be able to write plugins that convert the data correctly to fit into our internal data type.
- Display plugins need to have a method “isAvailable(data)” which determines whether the extracted data can be displayed.
- Display plugins should display scalable visualizations, so that the user can click and zoom a particular visualization.
- Our framework currently does not support dynamic data sets. All data has to be read from existing files/APIs/webpages. User will have to re-extract from the sources when new data are available.