# Semantic Interoperability

Semantic interoperability issue describes ambiguous data exchange in between many different applications. For an example assume in an organization, sales department maintains different value pairs to store customer data and marketing department maintains different keys to store same customer data. In this case maintaining consistency would not be possible. Also, two department will face serious issue when exchanging data in-between them. Also, it is difficult to identify the meaning of the keys by other people except the actual developer who developed the system.

Same problem can be exist on the given two API results. For an example, first API uses “lon” key for longitude. And second API uses “longitude” name. Check the following ambiguous.

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| --- | --- |
| API 1 | API 2 |
| "icon":"03n" | "icon":"https:\/\/www.prevision-meteo.ch\/style\/images\/icon\/pluie-faible.png" |
| "longitude":"6.6337000" | "lon":145.77,"lat":-16.92 |
| "sunrise":1485720272 | sunrise":"08:00” |
| "country":"AU" | "country":"Suisse" |
| "tmp":3, “pressure”:10212 | temp":300.15,"pressure":1007 |
| "wnd\_dir":"SO", "wnd\_spd":36 | "wind":{"speed":3.6,"deg":160} |

This above table shows that, how the same information were represented with different keys and different format. Icon in API 1 uses just name of the image. API2 uses full uri to the image location. API 1 uses string for longitude. And API 2 uses floating number for longitude value. Also short key name “lon”. API 1 Uses Time stamp to indicate sunrise and sunset. API 2 uses time format HH:MM. For country API 1 uses Two letter country code (ISO 3166-1 ALPHA-2) and API 2 uses full name of the country. It is possible to get confuse with AU with Austria and Australia. For temperature key, API 1 uses “tmp” as the key and API 2 uses “temp”. For wind direction, API 1 uses Short letter standard (Ex: N, NE, SW), but API 2 uses degree of the direction. API one uses separate key for wind direction and speed. API 2 uses one object with two properties. Also key names are different.

So, people who never work with this data will never know different between each key value pairs. In this case it requires additional man power and resources to merge or interchange, exchange data between different applications. So, proper explanation is required to handle this situation.

Sometime applications will crashes when this issue is not properly handled. So it is highly concerned to conclude with a solution for this problem.

Possible solution is writing json schema document for both API results. So, Json schema document will describe the Json object well. So, when it necessary, developer can simply read the document to get detail view of the result data. For an example he can able to understand data formats which are used in this API results, what data should passed (Ex: Epoch Time Stamp), the description of the key and so on. This solution helps to reduce ambiguous in data exchange and solve problem of interoperability issue. Also other standard and protocols are followed by many organizations to uniform the data exchange and to increase the interoperable ability of the application in order to increase the consistently, efficiency and durability.