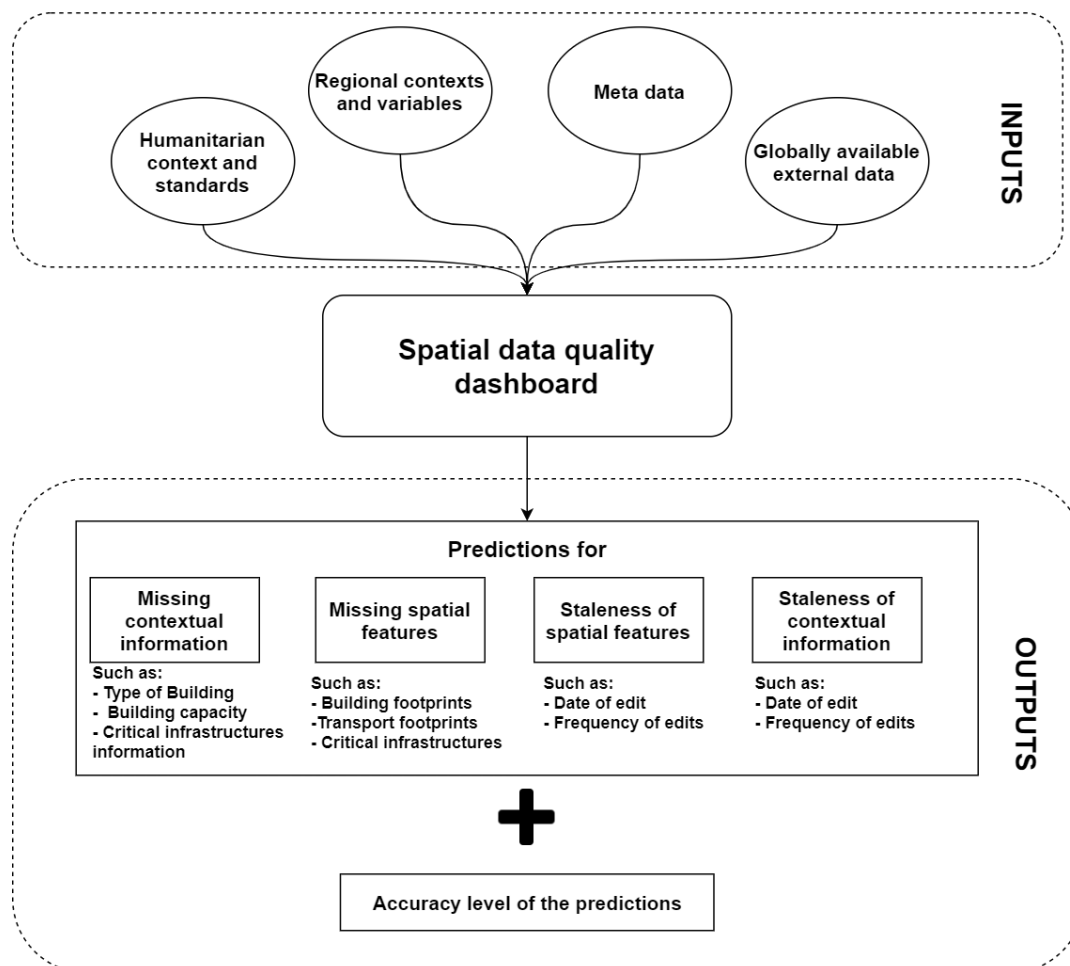


# Dashboard to monitor spatial data quality compliance of OpenStreetMap for *humanitarian action*.

## Introduction & Research gap

Ever read a paper about OSM completeness or quality of OSM?. Ever wonder why there are still studies going on in this aspect? The main reason is that most of the studies are not transferable and sometimes unscalable (**See: Pourabdollah, 2013; M. Yagoub 2017; Amin Mobasheri 2018**). This causes numerous problems in the field of humanitarian action because it can lead to delays in producing the much needed spatial data and eventually results in over or underestimation of the action needed on the ground.

Regional uncertainty can be determined by defining various contextual factors that are related to a certain geographical region. There exists research about different quality assessment which uses comparison with high quality external sources such national mapping services (**Seto, 2020**). These external sources are often not of high quality in developing countries. For this reason there should be an approach to assess the data quality in OSM that ensures equity for regional and international geographical contexts. So, there is a need for methods to visualise the state of OSM which doesn't take the "one size fits all" approach to assess the quality of the mapped area globally. It should take contextual variables into account with respect to geographical area and this should also reduce "semantic noise".



**Figure 1:** The proposal for the dashboard here would input several quantitative and qualitative variables. These variables then will be assessed with an automated approach to get the prediction that eventually be visualised in the dashboard as an output.

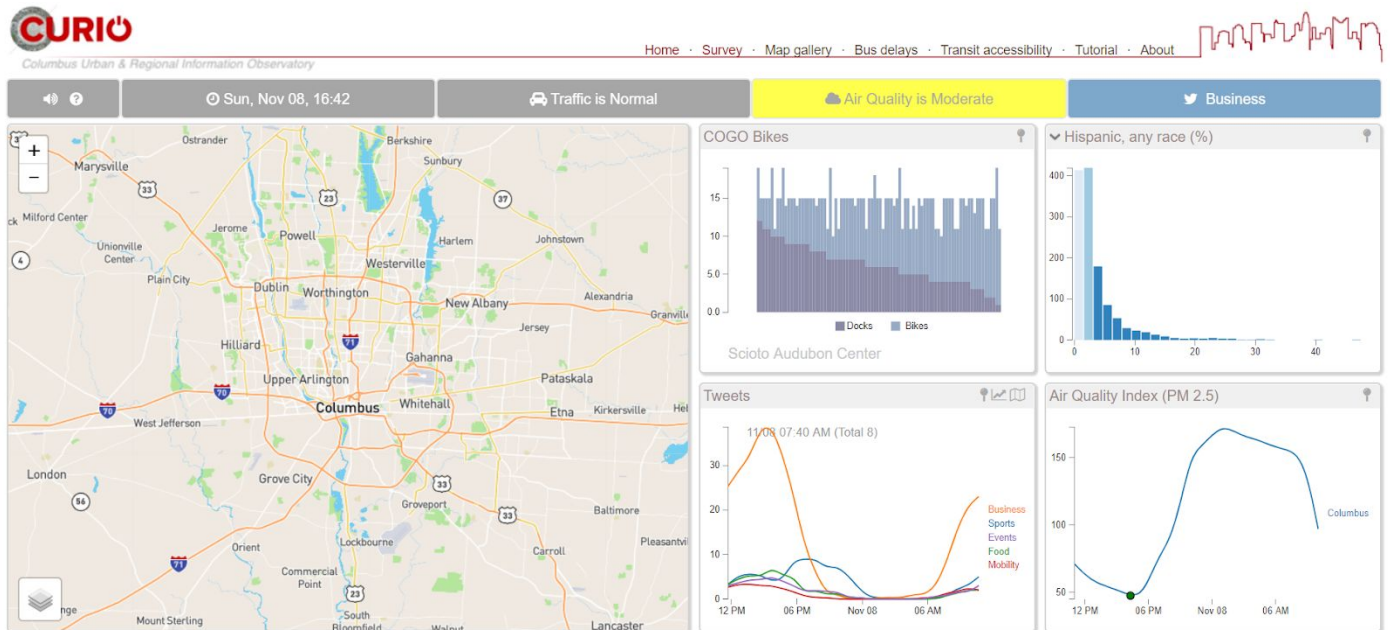
# Future paths for spatial data quality

This study proposal includes the development of a dashboard that can estimate the quality status of OpenStreetMap with a certain level of accuracy and confidence level of the estimation. Quality status means the prediction of missing spatial and non spatial information and temporal resolution of metadata. The proposed study for spatial data quality can give insight to people involved in humanitarian action and can benefit by visualising in the dashboard where they can improve, produce and should monitor data. **Figure 1** shows the proposed inputs and expected outputs.

## What will it look like ?

Tools such as Keep right (keepright.at), Osmose (osmose.openstreetmap.fr) and Map Roulette (maproulette.org) are state-of-the-art tools to assess the quality and mistakes/errors in OSM. The proposed tool will not only address completeness of OSM but also spatio-temporal dimensions of spatial quality, adaptability to other regions and will also give inference to meta-data. Furthermore, it will also provide better knowledge extraction for the users to support decision-making.

The proposed research will be like CURIO dashboard (see figure 2) which has a menu style dashboard pattern. This platform represents the spatial-temporal information like realtime bike availability, air quality and tweets. The proposed dashboard will be an analytical dashboard with updating and visualising of OSM quality with GUI outputs depending on lens of the area users are viewing and as shown in **figure 1**.



**Figure 2:** CURIO is a web application that brings together spatio-temporal information about Columbus and the surrounding region from a variety of sources and presents the information to the user in intuitive and insightful ways.

## In a nutshell this study will include...

1. Taxonomy of spatial and non-spatial information required for specific humanitarian action/response with respect to different regional contexts and user requirements.
2. Temporal requirements of spatial and non-spatial information for specific humanitarian action/response with respect to different regional contexts.
3. Development of relationships between the globally available external spatial data sources and the quality of OpenStreetMap.
4. Development methods to monitor and visualise the quality of OpenStreetMap both intrinsically and extrinsically.
5. Influence of the size of the geographical area of dashboard focus (the size of the 'lens').
6. Discussion and implementation of effective geo-spatial dashboard style, layout pattern and design features for user-centric design-support tool.
7. Methods to reduce the semantic noise in visualisation of OSM quality.