Real World Data Filtering Scenario

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This ***data filtering*** application makes use of time of day, user location, noise frequencies, network strength, and access to measure 'Space Ambience' of an area - that is, how optimal a space is to be situated in. Aside from the measured environmental variables, there are reviews and ratings in relation to the experience of using the space to study. The second scenario describes the visual representation of the metrics for users. This will require real time updates to the database as well as the devices used to send the information automatically.

Users should be able to view a space and/or specific area of a space, with the metrics retrieved from the recorded measurements of the public ambience. Database connectivity should be accessed remotely rather than locally on a single device. Aside from static data like operating hours, and furniture in space, data regarding Wi-Fi and cellular data strength or noise level should be updated frequently to provide a mostly accurate representation of the 'Space Ambience Rating' at the space. Users should be able to interact with the website without confusion and find a space that would fit their criteria needs.

Scenario: Database Updates, Website and Database Connection, and Space Ambience Analytics

The user will be able to view a list of spaces from different locations that show a visual representation of the data used to measure the space's ambience, utilizing their location or a pre-loaded list of Spaces. The visuals shown will be clear, with all elements providing the correct measurements. The user should be able to view the space's information in detail as well as specific areas in the space, depending if there is more than one area for the space. The information should be automatically collected and updated frequently in a matter that is convenient to the user. The app should pull data at least every five to ten minutes to account for ever changing situations such as students going to class. Smaller measurements such as those which occur less than 5 minutes are non-essential as a small change over a short period of time does not accurately represent what the data will look like long term.

In terms of connecting to the database, it should be accessed by the clients devices, and the measuring devices remotely. Aside from the website's functionality of being able to access the database on any device, the tools used to measure the environment need to accurately send their data to the database in order to keep the room information up to date. The data being sent remotely will be reflected in the visuals and numeric values in the detailed section of a space. This data update will be reflected in the user-interface of the website as well as in the database, accounting for the changes in the Space Ambience Rating, which includes the Ambience (Sound) Level, Headcount Network and Coverage Levels.

The devices used will either be Arduino, or Raspberry Pis, alongside sensors to measure audio and Wi-Fi. The audio software Reaper will be used with its spectrum analysis feature to analyze the audio data retrieved from an area.

In terms of application and website use, the user is able to navigate the website and interact with its features in a concise and clear manner so that they are able to see, find and evaluate whether a certain Spaces suits their needs to do work. The GUI will accurately display the information that has been collected from the user and as well as the information that has been pulled from the databases. The user can also find it relatively simple to send updates about their experience within a space either using their local device or the aforementioned Arduino or Raspberry Pis. Another critical aspect of website and application use is the ability to have the user be able to provide feedback regarding their experience with the application and suggestions for the UI that will be considered for a future release.

Figure 1 - Diagram of Raspberry Pi Data Collection & Database Updates