

6.831 HW2 Submission

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Heuristic Evaluation of Nzuri. Website: <http://web.mit.edu/srumbly/Public/nzuri/>

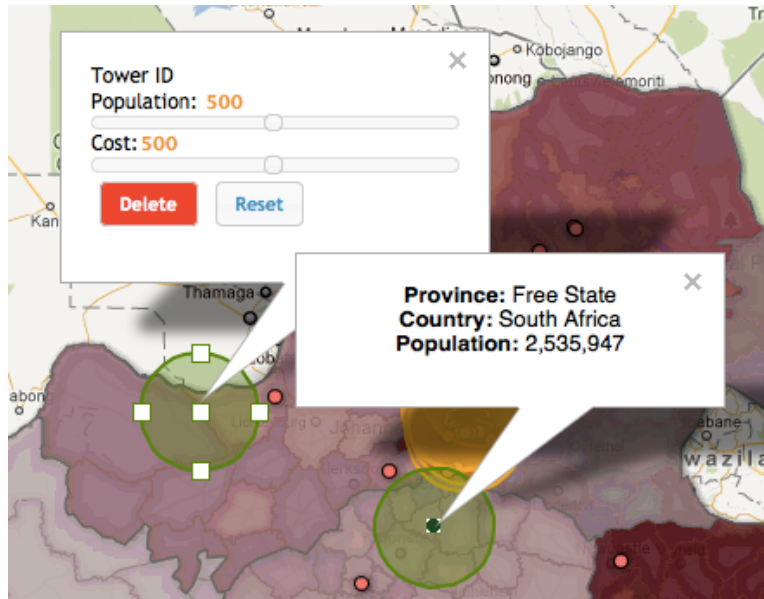
I. Good designs

1. Google Maps usage.
 - **Severity:** *Good*.
 - **Heuristic(s):** Consistency and Standards (Nielsen).
 - **Description:** It is good to see that Nzuri's UI is consistent with the layout of Google Maps with the important information and controls in the left pane and the map on the right pane of the webpage (with the right pane dominating the screen). This way, the analysts and contractors already familiar with how Google Maps works will be able to quickly learn the functionality of this interface.
 2. Direct manipulation of information.
 - **Severity:** *Good*.
 - **Heuristic(s):** Affordance (Norman).
 - **Description:** The system allows users to interact with the underlying data through the Google Map embedded in the page. This is good because maps give an affordance of direct manipulation to the user. Thus, interacting with this system becomes visual and easy to understand (even for a first-time user).
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II. Heuristic Evaluation Issues

3. Controls for the "Wifi Tower" markers are not displayed when the markers are initially placed on the map.
 - **Severity:** Catastrophic.
 - **Heuristic(s):** Visibility of system status (Nielsen); Consistency and Standards (Nielsen).
 - **Description:** The first time a user places a marker for a new tower on the map, the marker displays information (in a pop-up box) from the dataset on the map. However, once the user closes this pop-up box and clicks on the marker again, then s/he will see another pop-up box containing sliders and buttons (delete and reset). This is misleading because users do not know that they can edit the wifi tower marker until they click on the marker twice.
 - **Screenshot(s):** I placed a marker on the map, followed by another one at "Free State". I then clicked on the 1st marker again and obtained the controls for the

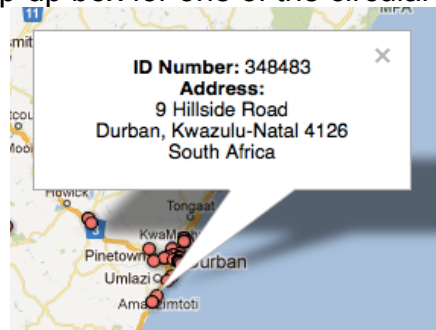
marker as shown below.



- **Recommendation:** One solution would be to put the “editing controls” (sliders and buttons) into the first pop-up box when the marker is initially placed on the map. An alternate solution could be to let the user know that s/he must click on the tower twice to make changes to it.

4. The markers that look like little red dots are not described.

- **Severity:** Catastrophic.
- **Heuristic(s):** Consistency and Standards (Nielsen).
- **Description:** The markers that look like little red dots neither have corresponding controls in the left pane of the page nor do they have meaningful identifiers in their pop-up boxes. Thus the UI of the system does not clearly describe what they are. They look like they belong to some dataset and thus may be important for the end users (analysts or contractors).
- **Screenshot(s):** A pop-up box for one of the circular markers.



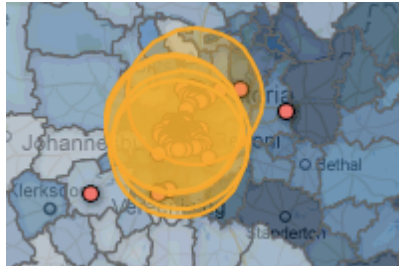
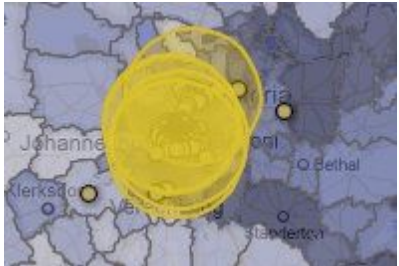


- **Recommendation:** Explain what these markers mean.

5. Red-Green color overlap.

- **Severity:** Catastrophic.
- **Heuristic(s):** Color blindness (Tognazzini).

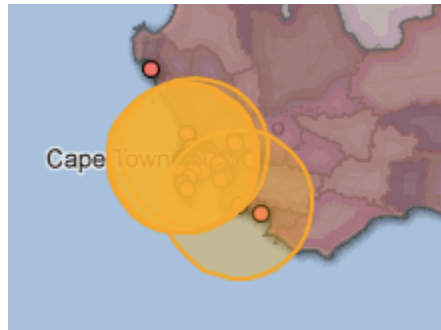
- **Description:** The system uses green markers (for new wifi towers) on a red overlay (when Population dataset is selected) and yellow markers (for existing wifi towers) on a blue overlay (when Rainfall dataset is selected). The color-blind users (suffering from either protanopia or deuteranopia) will have difficulty in seeing the green marker clearly (the yellow ones are not that problematic). This is especially problematic when there are overlapping new wifi tower markers because of which the “handle” at the center of the markers are covered.
- **Screenshot(s):** Shown below are the results of how the makers appear for color-blind users (tool from vischeck.com)

Category	As seen by normal users	As seen by color-blind users
Green maker (new wifi towers) on red overlay (Population dataset)		
Yellow marker (existing wifi towers) on blue overlay (Rainfall dataset)		

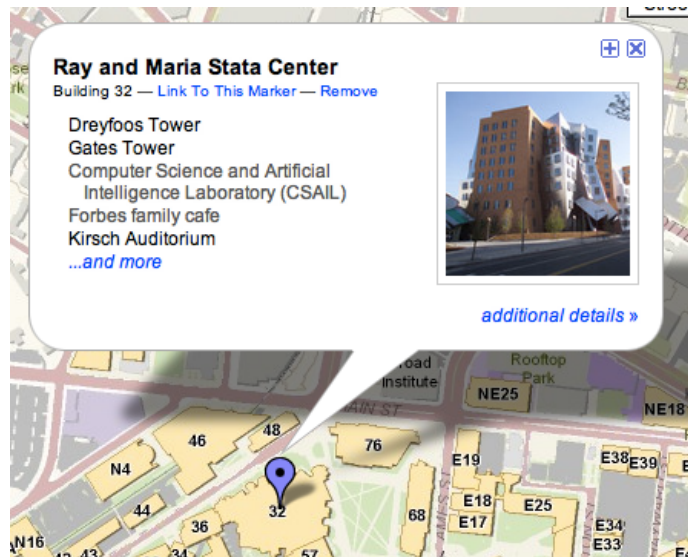
- **Recommendation:** Use a different color for the new wifi tower markers.

6. Difficulty in clicking on overlapping wifi tower markers.

- **Severity:** Catastrophic.
- **Heuristic(s):** User control and freedom (Nielsen).
- **Description:** It is difficult to click on the markers for existing wifi towers because they overlap with each other. The only way a user can currently access the pop-up box of (and thus, information about) the marker is by clicking on the non-overlapping regions of the markers. When s/he clicks on the overlapping regions, only the pop-up box of the top-most marker is displayed.
- **Screenshot(s):** As seen below there are multiple overlapping wifi tower markers making it difficult to click on the ones underneath the circles.



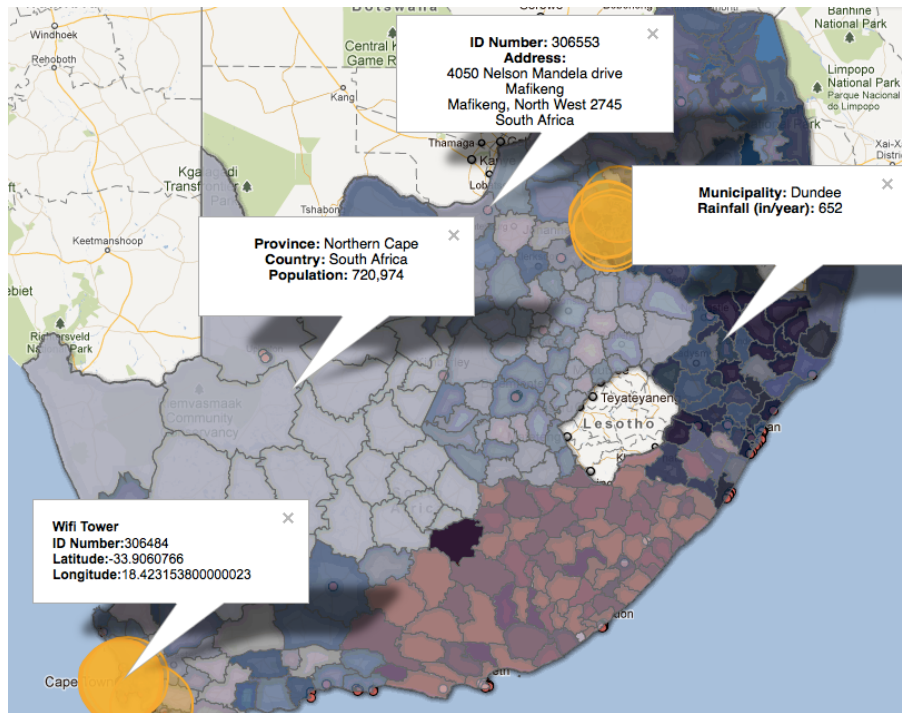
- **Recommendation:** Instead of showing overlapping markers, the system can show one circle at the intersection and use MIT's way of displaying information for markers in whereis.mit.edu. whereis.mit.edu shows a list of rooms in a building in a single pop-up and this seems to be a good way of displaying a lot of information for any marker on a map. A screenshot showing Stata Center from whereis.mit.edu is shown below.



7. Different datasets have different geographical granularities in the pop-up boxes
 - **Severity:** Major.
 - **Heuristic(s):** Consistency and Standards (Nielsen).
 - **Description:** There is an inconsistency with representing the location of the data in the datasets on the map. This heuristic evaluation is focused on the Rainfall and Population datasets and not on other data (e.g., existing wifi towers). The data from the Rainfall datasets are shown at a "Municipality" level, while those from the Population datasets are shown at a "Province and Country" level.
 - **Screenshot(s):** I clicked on (approximately) the same location near the "Riemvasmaak Community conservancy" when the two datasets were overlaid on the map. However, they both show the locations differently as seen below.



- **Recommendation:** To ensure consistent labeling, it will be good to display all the three levels of granularity for both datasets (Google Maps API can be used to gather this information, if necessary).
8. Different markers show inconsistently different location information.
- **Severity:** Major
 - **Heuristic(s):** Consistency and standards (Nielsen).
 - **Description:** Continuing from the previous heuristic evaluation and as the following screenshot shows, different data are shown with different location granularities. The markers for the datasets indicate the location by “Province/ Country” pair and “Municipality”, while the wifi towers have the latitude/longitude information and the red dots have the complete postal address.
 - **Screenshot(s):** The following screenshot shows pop-up boxes obtained when I clicked on multiple places on the map.



- **Recommendation:** As mentioned in Heuristic Evaluation #7, display consistent levels of granularity for the location information. Also, it may be good to automatically close the opened pop-up boxes before opening new ones.

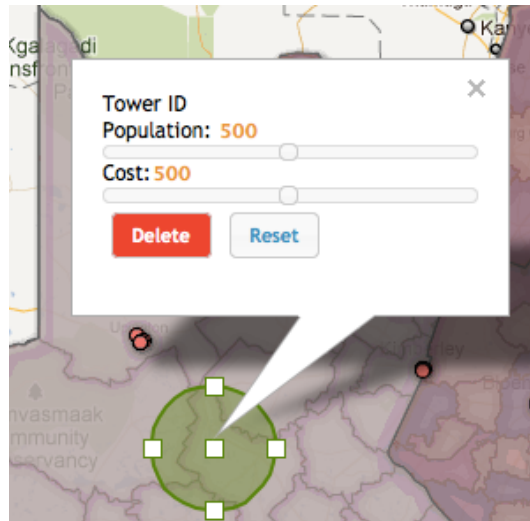
9. Problem with multiple controls (and data) for markers of new wifi towers.

- **Severity:** Major.
- **Heuristic(s):** Visibility of system status (Nielsen); Error prevention (Nielsen).
- **Description:** There are two sets of controls to manipulate the population and cost for the new “wifi tower” markers. There are common controls on the left pane (under “Additions”). However, each new “wifi tower” marker on the map has its own set of controls for population and cost. A new user in the system would have difficulty in identifying how these two controls interact with each other. Also, would (or, should) these markers automatically inherit the population value (in the slider) from the underlying Population dataset?
- **Screenshot(s):** One set of controls for the collection of “additional wifi tower” markers is shown below. This one seems to be for all such markers on the map.



The second set of controls for the additional wifi tower markers is shown below.

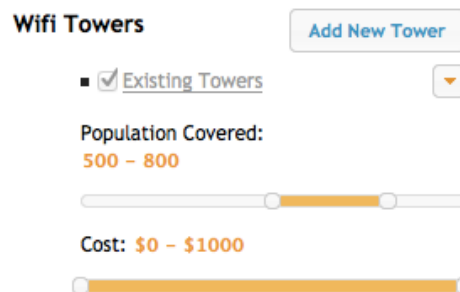
This one seems to be specifically for its corresponding marker.



- **Recommendation:** A short description near the controls describing what is being populated into the pop-up box of the marker will be helpful.

10. “Existing Towers” selection control does not match real-world expectations.

- **Severity:** Major.
- **Heuristic(s):** Consistency and Standards (Nielsen).
- **Description:** Though the “Existing Towers” selection control is grayed-out, the corresponding sliders are still active. This is inconsistent with the real-world mental model of users because they would expect the sliders to be deactivated when the main control is deactivated.
- **Screenshot(s):** The active sliders for the “Existing Towers” control are shown below. I updated the population slider to contain the range 500-800.



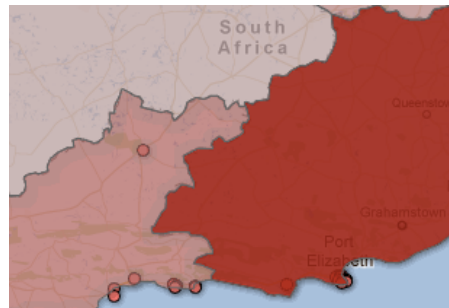
- **Recommendation:** The sliders should be deactivated as well.

11. The coloring scheme of the data sets is not very intuitive.

- **Severity:** Major.
- **Heuristic(s):** Visibility of system status (Nielsen).
- **Description:** It is clear that the blue overlays are for the Rainfall dataset and the red ones for the Population dataset. However, what do the various shades of red and blue mean? In other words, what is the range of values for each level of

saturation for the color scheme of a dataset?

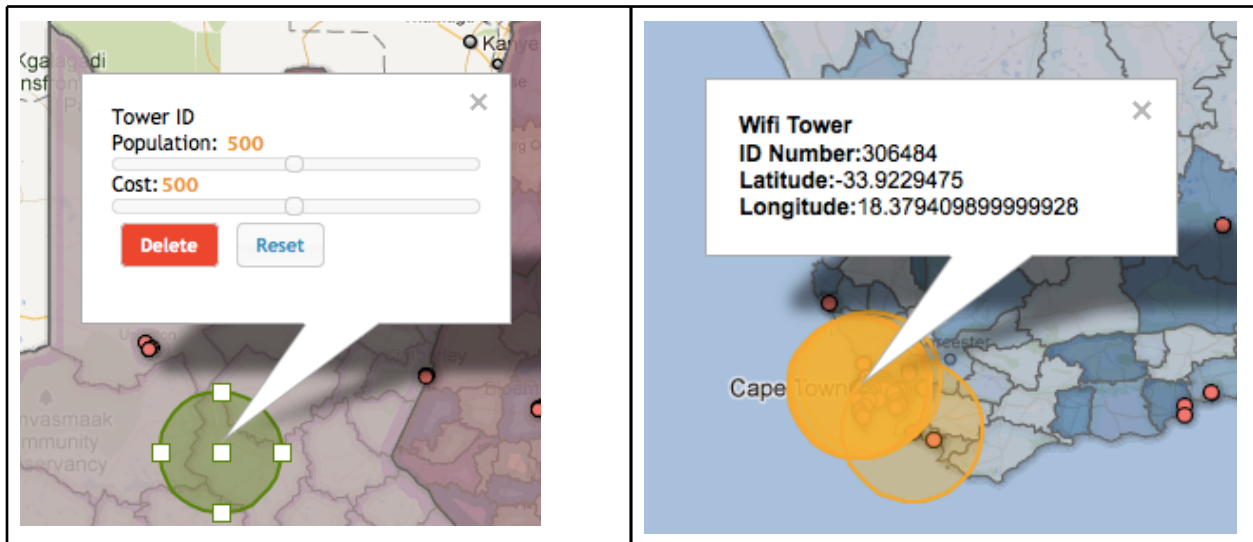
- **Screenshot(s):** Showing the different saturations for 3 places in the Population dataset.



- **Recommendation:** A legend explaining the coloring scheme of overlays would be helpful.

12. Tower IDs are neither consistently labeled, nor are editable.

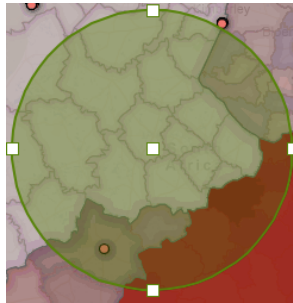
- **Severity:** Minor.
- **Heuristic(s):** Consistency and standards (Nielsen).
- **Description:** The pop-up boxes of new wifi tower markers contain an entry for “Tower ID” that identifies the towers. However, for existing towers, each tower has a label called “ID#” which looks like a system variable. These identifiers for the towers are not consistently labeled. Also, the “Tower ID” for new towers are neither displayed nor are editable by the user.
- **Screenshot(s):** The left screenshot shows the pop-up box for a new wifi tower marker while the one on the right shows a pop-up box for an existing wifi tower.



- **Recommendation:** Maintain consistency while labeling the tower ids, and either pre-populate the tower id or allow the user to enter the value.

13. Significance of stretching markers.

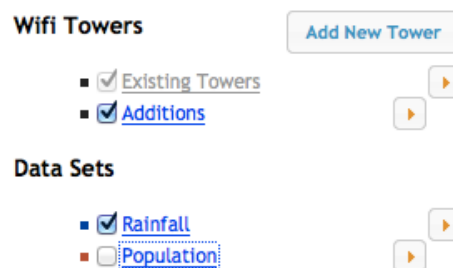
- **Severity:** Minor.
- **Heuristic(s):** Visibility of system status (Nielsen).
- **Description:** Each wifi tower marker is associated with one province and country pair, but the markers give an affordance to expand them endlessly (even spanning over multiple countries). Since each marker is associated with one province and country, what would a marker stretched across multiple provinces/countries mean?
- **Screenshot(s):** Example of a marker expanded to cover multiple provinces/countries.



- **Recommendation:** Spanning across multiple countries can be prevented by properly controlling the amount of the marker expansion. On the other hand, if the user is allowed to span across countries, the pop-up box can be filled with the names of all countries currently covered by the marker.

14. The controls labeled “Addition”, “Population” and “Cost” give a false perceived affordance of a hyperlink.

- **Severity:** Minor.
- **Heuristic(s):** Consistency and Standards (Nielsen); Affordance (Norman).
- **Description:** The labeled controls “Additions”, “Population” and “Cost” give a perceived affordance of a hyperlink. However, clicking on them does not redirect the user to a new page. Additionally, clicking on “Additions” does not accomplish anything with that click (clicking on “Population” and “Cost” removes or adds that dataset as an overlay on the map).
- **Screenshot(s):** Screenshot of controls that are shown using hyperlinks.



- **Recommendation:** Remove the appearance of a hyperlink on these labels.

15. Placing/moving markers for new towers on the map.

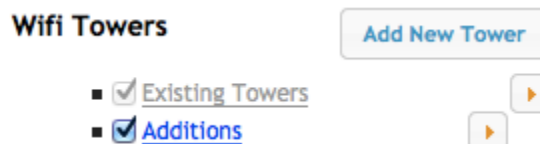
- **Severity:** Minor.
- **Heuristic(s):** User control and freedom (Nielsen); Recognition rather than recall (Nielsen).
- **Description:** There is currently no feedback about the location over which the marker is being placed. Thus, a user placing a marker has to already identify the location on the map. This forces the user to recall the location information, instead of the UI assisting in recalling the same information.
- **Recommendation:** A tooltip can be used to display the latitude/longitude information or a more granular label of the place when cursor hovers over that location. An alternative would be to allow users to move the marker after placing it on the map (and updating the municipality/rainfall information in the pop-up box).

16. Supplementary information is not available for the controls in the system.

- **Severity:** Minor.
- **Heuristic(s):** Visibility of system status (Nielsen).
- **Description:** There is currently no informative text to explain the button controls on the left pane of the system. Specifically, “Overlay” and “Intersect” seem ambiguous to a first-time user, but seem to be important controls.
- **Recommendation:** Tooltips with a brief explanation of the functionality of the controls will be helpful.

17. Inconsistent labeling for “Wifi Towers” controls.

- **Severity:** Cosmetic.
- **Heuristic(s):** Consistency and Standards (Nielsen)
- **Description:** One of the labels for controlling “Wifi Towers” called “Additions” (and not “Additional Towers”) while the other one is called “Existing Towers”.
- **Screenshot(s):** Screenshot showing the labeling of the controls for Wifi Towers.



- **Recommendation:** Make the labels consistent.

18. Buttons are not aligned

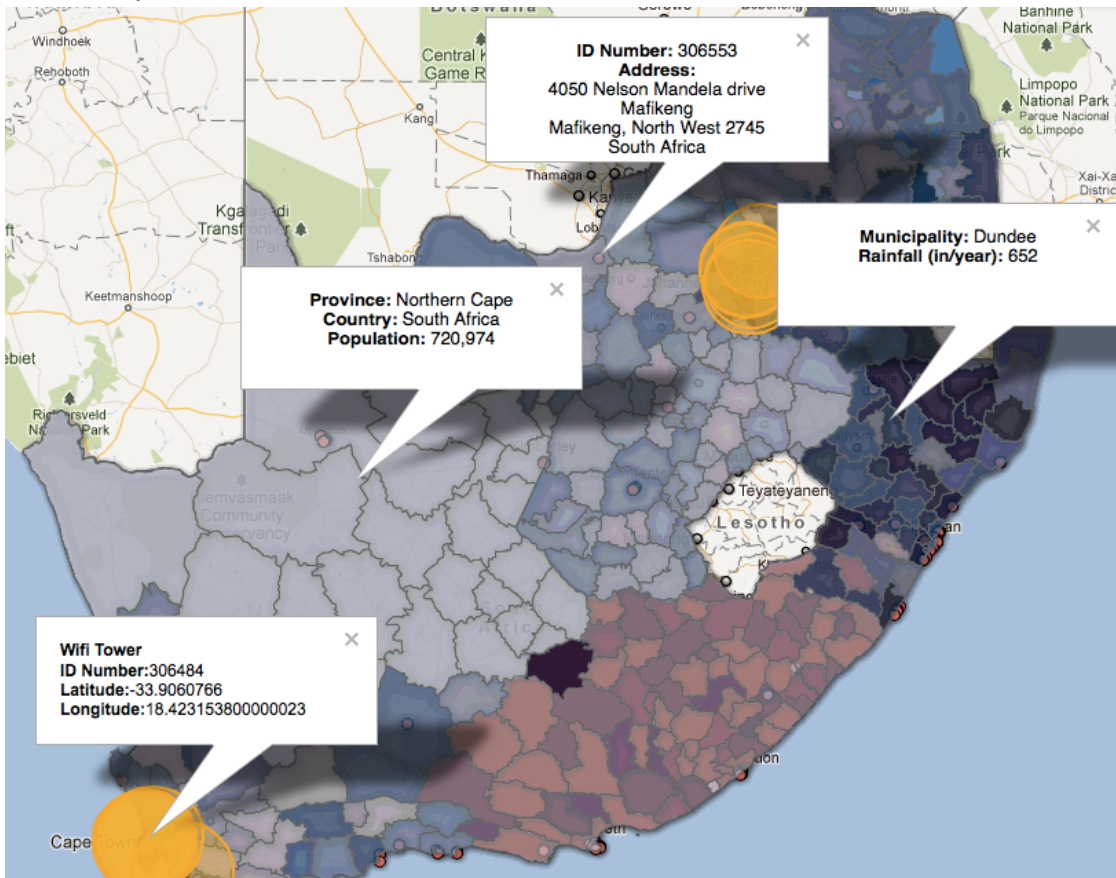
- **Severity:** Cosmetic.
- **Heuristic(s):** Consistency and standards (Nielsen); Aesthetic and minimalist design (Nielsen).
- **Description:** The little buttons (containing arrows pointing to the right) are not aligned consistently for the two sets of controls -- Wifi Towers and Datasets. This

diminishes the aesthetic appeal of the left pane.

- **Recommendation:** Align the buttons properly.

19. The pop-up box contents are not uniformly aligned

- **Severity:** Cosmetic.
- **Heuristic(s):** Consistency and standards (Nielsen); Aesthetic and minimalist design (Nielsen).
- **Description:** The text in the pop-up boxes (for datasets and markers) are not uniformly aligned. The text in the pop-up boxes of datasets and red circular markers are center-aligned, while that of the wifi towers are left-aligned. Also, centering the postal address in the red-circular marker makes it difficult to be read quickly.
- **Screenshot(s):** Screenshot displaying the alignment of various pop-up boxes on the map.



- **Recommendation:** Uniformly align the text in the pop-up boxes.

20. Icons for the Wifi Towers seem to be inconsistent.

- **Severity:** Cosmetic.
- **Heuristic(s):** Consistency and Standards (Nielsen).
- **Description:** The icons beside the datasets correctly show the color of the

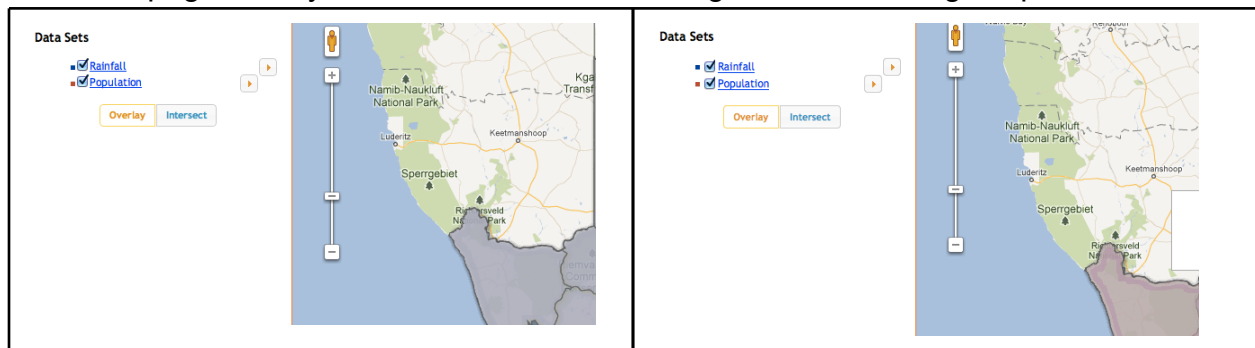
overlay used on the map (blue for Rainfall and red for Population). However, both Existing and New Wifi Towers have a black icon next to them, while their markers are yellow and green, respectively.

- **Recommendation:** Update the icons of the to reflect the actual colors.
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III. Code fixes

1. When users unselect “rainfall” or “population” options, that data set is removed from the map, however, once they select those options again, the original map is not overlaid with the corresponding datasets. This problem depends on the browser that is used by the users. Only the “Rainfall” option appears to have this problem in Firefox, while both options suffer from this problem in Chrome.

The first screenshot shows the state of the system after the “Rainfall” option was unselected and then reselected. The second screenshot shows the state of the system when the page initially loads and after de-selecting and re-selecting “Population”.



2. A user can expand the marker for new wifi towers, however, once expanded, the marker does not display its information in a pop-up box.

3. It would be good to implement a confirmation dialog box for delete/reset button.