UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program
Student Research Report

Mapping the Potential of Public Space

Annie Fang

University of British Columbia

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MAPPING THE POTENTIAL OF PUBLIC SPACE

ABSTRACT

In 2015, a group of geography students worked on the Social Mapping Project with Campus and Community Planning and SEEDS to research the physical, environmental, social, historical, and potential uses of public spaces around UBC. The Mapping the Potential of Public Space project is an interactive map that visually represents the attributes of the public spaces described by the UBC SEEDS Social Mapping Project. The purpose of this interactive map is to help further the process of realizing the social potential of public spaces on campus.

INTRODUCTION

As the students in the previous Social Mapping Project explained, "Social spaces are made social through the presence of individuals (Antkiw, 2015)." Our perception of these spaces, is shaped by our own interactions with the space itself. When we interact with a space, our perceptions collectively create a narrative about that space - a narrative that is shared and understood by the community that uses it. As the community continues to use that social space, these narratives are consequently reinforced. Similarly, social spaces can be designed to reshape our perceptions. Thus, the narratives of social spaces are dynamic and constantly evolving as we redesign them. Design is fundamental for cultivating human social interaction and community.

The purpose of this project, is to create an interactive map that displays the physical, environmental, social, historical, and recommended programming data of social spaces at UBC from the Social Mapping Project. This data provides insight into how the narrative of these spaces is defined by the community. This map will function as a resource that displays the possible uses of social spaces, so that the social potential of these spaces can be later realized. Furthermore, this project aims to provide a channel to the public community for further contribution. This tool will provide insight into narratives as they continually evolve, grow, and gain complexity as social spaces are redesigned over time.

WORKING WITH A COMMUNITY PARTNER

This student project was created in collaboration with the Social, Ecological, and Economic Development Studies program (SEEDS) as well as UBC Campus and Community Planning. Following the goals of my community partners, my objective was to create a plan of the functionalities of the final map to present at the community partner meeting.

During the meeting, I proposed that I create an interactive map that could display all of the social spaces and their programming recommendations as clickable points on the map. The social spaces layer and programming layer could be toggled on and off in the legend. The physical, environmental, social, and historical descriptions of these spaces would be displayed in an infowindow or pop-up. I planned to add a search function, to allow the map user to search different features. This map would allow the map user to more easily view the potential uses and programming recommendations of each social space. In addition, we discussed the possibility of creating a map with public contributors, similar to Wikipedia. Working towards creating a public source, people could contribute their own photos and experiences with the space. This could function as a potentially great source of data collection that could lend itself to future programming recommendations. To extend the longevity of the project, the map could be continually updated with attribute data. However, at the time of the meeting, I had to express that creating a map that allowed public contributors went beyond what I had learned in class and my own skillset. As a result, we identified the final objectives of my project. In GIS, I would create a shapefile database with attributes and point. This data would be moved onto Carto to create an interactive map, and the shapefiles could then be built upon in future projects.

Overall, my involvement with this project has provided me with valuable experience on working with community partners. Working with a community partner has allowed me to develop valuable workplace skills. Though this project, I learned how prepare information for a real client situation given precise constraints. During our meetings, I was able to identify the main objectives and limitations of the project. To meet the needs of the client, I was also able to find a way to create an interactive map that allows public contributors to add and edit features, in the later stages of my project. In fact, working with client objectives continually inspired me to find creative ways to get around a problem or limitation. By troubleshooting and problem solving, I was able to improve on and learn new skills using ArcMap, Excel, Carto Builder, and Google Maps. Most importantly, I learned how to synthesize different types of data drawing from many sources, including matrix data from the report, KML files, and information from community partners.

DATA PROCESSING: *ACQUIRE, PARSE, FILTER, MINE*

According Ben Fry's Visualization Pipeline, Fry proposes seven stages that must be met in order to successfully repackage data in a structured and coherent manner that effectively communicates desired information to the map user. The Seven Stages of Visualizing Data proposed by Fry consists of a Data Processing stage that includes Acquiring, Parsing, Filtering, and Mining data; and a Visualization Process describing how the data is Represented, Refined, and Interacted with (Fry, 2007). In the discussion of my methodology, I will follow this framework to describe how I created the final interactive map.

According to Tufte, complex ideas should be communicated with clarity, precision, and efficiency (Tufte, 1983). Thus, my objective was to create a map that conveyed the vast layers of information to the user in a concise manner. Creating an intuitive product required a complicated planning process, data processing and visualization, and prototyping stage.

As this project is a continuation of a previous SEEDS project, I first reviewed the report and determined how the information should be organized and visualized. To create an effective visual graphic that efficiently conveyed an immense amount of data, I had to order to the data by creating a logical structure. According to Cairo, "Before you think about style, you must think about structure (Cairo, 2012)." A structure represents raw data in a more meaningful way, presenting it in a form where patterns can be identified by the map user. Structured information when presented in a familiar form, is given meaning when our minds try to process and interpret it. According to Cairo, "the role of an information architect is to anticipate this process and generate order before people's brains to try to do it on their own (Cairo, 2012)."

To create this interactive map, data was acquired from the Mapping Social Spaces report and from UBCGeodata on github. The matrix data that contained all the physical, social, environmental, historical, and recommendation attributes were obtained from the Mapping Social Spaces report. The “mapped spaces” and “programming map” data from the same report was used to build the polygons for the interactive map. However, as some of the social spaces in the report were incorrectly named, the “ubcv_outdoorplaces” dataset from UBCGeodata on github had to be used to find the original names of these spaces. Each programming recommendation was sorted into the following categories: Art, Athletics, Drainage Issue, First Nations, Food, Lighting, Markets and Booths, Music, Rain Cover, Seating, and Student Services and Clubs.

Sorting the programming recommendations into categories allowed the creation of a more simplified legend on the final map. In addition, each programming recommendation was associated with a location name to allow the map user to easily identify which public space the recommendation belonged to.

In ArcMap, the layers “Areas” and “Spaces” were created from on the “mapped spaces” data, and the “Programming” layer was created based on the “programming map” data. However, many location names on the matrix were either incorrect or too long, thus the “ubcv_outdoorplaces” dataset was used as a cross reference, giving the spaces a more meaningful name. Shortening the names ensured that they would appear more aesthetically appealing in the popup windows and widgets on the final map. All the physical, environmental, social, historical, and recommendation attributes on the matrix were transcribed from bulletpoint form to fully written sentences to add aesthetic value to the descriptions on the final map. After joining all the tables in ArcMap, the “Areas”, “Spaces”, and “Programming” layers were exported as GeoJSON files to be imported into Carto Builder.

VISUALIZATION PROCESS: *REPRESENT, REFINE, INTERACT*

Drawing upon Cairo’s discussions on cognition, understanding how the human brain perceives visual information is useful during the design decision making process (Cairo, 2012). The human mind is talented in detecting patterns. The mind is particularly effective at noticing shade and shape differences, proximity, similarities, and connectedness of visual information. For example, two polygons, each exhibiting differences in shades, would be detected by a human mind to have a hierarchal distinction. On the interactive map, there are 3 layers: Programming, Spaces, and Areas. The “Programming” layer has been sorted by “Programming Type”, and assigned with different color values. The “Spaces” layer has been symbolized as black, to contrast the colorful polygons found in the “Programming” layer. The “Areas” layer has been colored very lightly and is largely transparent. This was done to prevent attention from being redirected from other more important map features, and to show the roads underneath. I decided to keep the areas layer on the map, in the event that a map user wanted to refer to the original Social Mapping report. All layers can be toggled on and off on the legend, to control the visibility of information.

A pop-up window feature has been added to provide information on location names and programming types. To attain basic information about the names of the spaces or programming types, a user can hover the mouse over the objects to view the pop-up. Clicking on the objects will show more detailed descriptions about the locations. According to Cairo, “the visual brain is a device evolved to detect patterns (Cairo, 2012).” Therefore, the pop-up windows for spaces and programming features were colored consistently to create such patterns. The space pop-ups were colored black to match the color of the space polygons, and the programming pop-ups were colored grey and white to contrast the black pop-up. This contrast would highlight the feature the map user clicked on, making it easier for the user to use.

Names and descriptions were edited to ensure consistent use of naming and language was used throughout the map. For example, upon editing the physical, environmental, social, and historical descriptions, the social spaces were referred to in these descriptions as “Spaces”. The word “Space” was consistently used in the legend, widgets, and pop-ups.

Labels of spaces were removed on this map to increase visibility, as the text made the map look cluttered. Instead, the location name was added into every single pop-up box for the features in the Spaces and Programming layer. To view this location, the map user could hover their mouse over the location in order to find the name. However, since many of the programming polygons covered the spaces polygons, users might find difficulty in utilizing the hover pop up feature to display the names of these locations. Thus, the location name was also added into the programming layer pop-ups. By adding this feature, the map user could quickly identify which space the programming feature belonged to. Furthermore, a search function has been added to allow the map user to easily search by space or programming type.

As my aim for this interactive map was to present a large amount of information in the clearest way possible, I added widgets as a way to reorganize the data. These widgets added a layer of complexity and increased the usability of this map.

On the right-hand side of the map, two widgets have been added to allow the map user to sort the information by "Spaces" or by "Programming Type". The names listed in these widgets will change per the current map view. By clicking on a location in the "Spaces", everything on the map will disappear except for the objects associated with that space. The spaces widget allows the map user to search and select one or multiple social spaces, to view the space and it's associated programming recommendations. By clicking on a programming type in the "Programming Recommendations" widget, all objects on the map will disappear except for the objects associated with that programming type. The programming widget allows the map user to search and select one or multiple programming types, to view the programming polygons and all the spaces that contain this programming type.

To create these widgets, data was restructured in the "Programming" and "Spaces" layers to conduct an analysis. The analysis function enables filtering by data columns in different layers, by selecting key columns in each layer that contain matching data. By filtering the layers, this ensured that whenever a space or programming type is clicked in the widget, everything associated with that attribute will not disappear. For example by clicking on "Rain Cover" on the programming widget, all information except for the locations and programming related to "Rain cover", on the map would disappear. Without the filter, everything on the map except for rain cover would disappear including the social spaces themselves. This makes it more difficult for some map users to identify where locations are on the map.

PROTOTYPING

My aim was to create an interactive map that was intuitive enough for the public to use. Drawing upon the User Centered Design theory (Roth, 2015), I focused on gathering feedback throughout the entire data processing and visualization process, to reduce the amount of time the map user spent trying to understand the functionalities of the map. According to Roth, "a user-centered approach often saves project resources rather than wastes them, as it is more costly to make fundamental changes to the interactive map after it has been deployed than during the earlier stages of conceptual design and prototyping (Roth, 2015)." To gather feedback, I sent the map to several friends and colleagues and asked them to explore the map, providing no verbal explanation. In general, I found that the majority of feedback questions were focused on specific map features that my test users found confusing. These questions were the most helpful because they indicated the changes that needed to be made to increase the accessibility and user-friendliness of the map. Moreover, some of the feedback inspired the creation of fundamental features on the interactive map. The prototyping process inspired several ideas, including editing the descriptions, to restructuring the data for widgets, and creating a more intuitive search bar.

LIMITATIONS

There were several limitations that should be noted in the consideration of this project. The most significant limitation is the map's inability to host public additions. While this feature is not available on Carto, it could allow members of the public to edit public spaces. As the feature is available on Google Maps, I have created a second interactive map on Google Maps, that would allow public collaborators to contribute and edit features. This version of the map also includes all the attribute and recommended use descriptions that can be found on the Carto Builder version of the map. However, this map does not include many of the interactive features that can be found on the Carto map that may be useful for future analysis of the potential uses of public spaces.

Further limitations involve limitations on Carto Builder functionality. For example, an introduction window or floating windows could not be produced on this map. An introduction window would be useful to welcome map users and provide a brief tutorial on how to use the map. Another limitation, was the inability to color pop-ups by programming type. To solve this, every programming type in the programming layer would have to be divided into new layers containing the subgroups. However, it is better that the layer is not separated into separated layers.

CONCLUDING REMARKS

The completion of both the Carto interactive map and the Google map can connect users with a medium that allows them to explore the narratives within urban spaces. Moreover, with enabled public contribution, the Google maps can further facilitate the growth of the narratives in a communal setting. Where individuals continually contribute to the development of specific spaces, dynamic narratives will reflect these contributions as they continue to evolve. Additionally, both maps may be used as a tool to help UBC Campus and Community Planning to realize the full social potential of urban spaces.

ONLINE LINKS

Mapping the Potential of Public Space Blog Site:

http://blogs.ubc.ca/anniefang/cartography/mapping-potential-public-space/

Mapping the Potential of Public Space Interactive Carto Map:

https://goo.gl/TvBHQm

Collaborative Google Map:

https://goo.gl/DNHxmy

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