



Card Sorting for Website Information Architecture Report

City of Shoreline

<http://www.cityofshoreline.com>

By Mario Gomez, Manilyn Cabrera, Bella Chen, Ethan Nissley, Dini Nadzaruddin

1) Background & Objectives

A successfully designed website is one that enables users to intuitively navigate through the information on the website. Users should be able to locate what they are looking for with ease if the answers to their questions are located where they anticipate them to be located.

A well structured website organizes information in such a way that eliminates guesswork for users, as well as the frustration that comes with guesswork. This in turn promotes a positive user experience. This is why it is important to develop a well grounded information architecture, one that is backed by research. One such research method is called Card Sorting. Card sorting is a usability inspection method that is concerned with the information on the website from the end user's point of view.

What is information architecture?

“Information architecture is the practice of deciding how to arrange the parts of something to be understandable.”

- *information architecture institute* (<http://www.iainstitute.org/>)

The process of information architecture design is selecting a chunk of information from a website and organizing it in a way that make more sense to the users. In this process, pages, paths and links on the website are taken into account where these information are divided and organized to fit a certain category that is more structured. The categories are labeled using a naming convention that is easy for users to understand and relate to. Information architecture is designed based of the function of the website and with users in mind. Information architecture is an important process in helping web designers create better navigation and sitemap for a website.

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What is Card Sorting?

One method for understanding how your website will be utilized from a user's perspective is to conduct a Card Sort. Card sorting is a user-centered methodology that is inexpensive and effective.

Card sorting entails breaking down the contents of a website into topics, keywords, and/or phrases, which are then presented to participants of a test group to categorize and organize in a way that makes logical sense to them.

The result is content that is categorized from a bottom-up perspective, that is, from a user's perspective. This provides insight into how potential users will anticipate the information to be organized, and help identify problems with the site's current information architecture.

A card sort can be done on paper or through a program such as Optimal Sort.

2) Procedure & Materials

In an effort to understand how best to organize the information on The City of Shoreline's website, our team will be conducting a card sort using the program Optimal Sort. We will be assembling a group of participants for our study. They will be provided topics to categorize in the manner which makes most logical sense to them.

Card Sort topics

The City of Shoreline has approximately 400 destination pages. For our purposes, we gathered 73 topics for our test group to sort. Our topics were presented in question format, to encourage our participants to approach the exercise as though they were actual users of the site. Since the users of the site will most likely be residents of Shoreline, prospective residents of Shoreline, and people who have investments in Shoreline, our questions cover a range of topics from those related to the community, to businesses, and to governmental agencies.

Below are our questions:

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1. Where and when will the weekend farmer's market be held?
2. How do I dispose of hazardous waste?
3. Where can I find demographics on Shoreline?
4. What services are offered to senior citizens?
5. I want to make a complaint about construction work on my street.
6. How do I get involved in environmental activities in Shoreline?
7. How do I set up my utility account?
8. What art/entertainment events are going on in Shoreline?
9. What assistance does Shoreline offer low income households?
10. I need to remove a tree from my property, do I need a permit from the City?
11. There is a flooding and drainage problem on my street, who do I contact?
12. What volunteer opportunities are there in Shoreline?
13. There is a street light that is out on my street.
14. How do I contact my neighborhood association's representative?
15. Does the city offer home repair funds for low income residents?
16. Are there senior centers located in Shoreline?
17. How do I keep myself informed on the emergency in Shoreline (road closure, police reports...)?
18. Where can I find a list of hall/recreation center that I can rent for an event?
19. I want to locate parks/recreation area near where I live
20. Where can I find out about the special events that will be held around the city?
21. How do I register my daughters for seasonal camps and extra fun classes?
22. How can I register to be a vendor for the next farmers' market?
23. Where can I find information on all the transportation services available in Shoreline?
24. Where can I find information about the neighborhood council meeting?
25. Can I find digital copies of past newsletters from Shoreline?
26. Where can I find contact information on the utility service providers?
27. How do I apply for property renovation permit?
28. How can I contact the Emergency Management Coordinator of Shoreline
29. How can I prepare myself for an emergency?
30. What will I do when a power outage occur?
31. What will I do during an emergency?
32. What are hazards mitigation I need to be aware of?

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33. Is there any Emergency Management in the area?
34. How can I contact Shoreline police, fire, or medical department for an emergency?
35. How can I be alerted if there's any emergency around the area?
36. How can I contact a Customer Response Team?
37. Who to contact during power outage?
38. Is there any Emergency Operation Center at Shoreline?
39. Is there any relocation or evacuation site during an emergency?
40. How can I volunteer or help during an emergency at Shoreline?
41. How can I prepare for an extreme weather?
42. Does a Shoreline have an emergency plans?
43. What is the success rate for small business in the City of Shoreline ?
44. What are the phone numbers and contacts for information about business ?
45. Where do I find listings for commercial properties ?
46. Where do I apply a business permit ?
47. Does the City of Shoreline have a long term development plan ?
48. Are there any tax incentives to move my business from Seattle to Shoreline ?
49. Is there a City of Shoreline Chamber of Business ?
50. Does the City of Shoreline has an annual trade show or local business show ?
51. Is there a local newsletter to inform people about new businesses in the area ?
52. Are there any financial reports available to the public ?
53. What is the unemployment rate for the City of Shoreline ?
54. What is the average income for single family in the City of Shoreline ?
55. What is the average price per square foot for commercial properties ?
56. Are there any initiatives to attract businesses ?
57. Is there a way to schedule an inspection online>
58. Where can I find a list of public bids?
59. where can I see the city financial report for Q3 for 2016?
60. What is the address and hours of city hall?
61. Where can I request public records?
62. Where can I access the city budget?
63. Where can I find a list of city ordinances?
64. How do I register to vote?
65. How to find legal assistance?

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66. How can I view city council meetings?
67. Where can I access public documents?
68. Who are my city council members?
69. Where can I find information on property taxes in Shoreline?
70. How can I contact city council?
71. How do I find quick and interesting information about the City of Shoreline?
72 . How do I find job openings in the city?
73. Where is the map of the city?

Participants

The participants in our card sorting activity are from a group of students in the ITC298 class. These students are not familiar with the website and they are not part of this group. Each participant is assigned to perform tasks like grouping, arranging and labeling the provided topics based on their expected categories. The result from this activity will give us a new information to help improve the City of Shoreline's website.

Tools

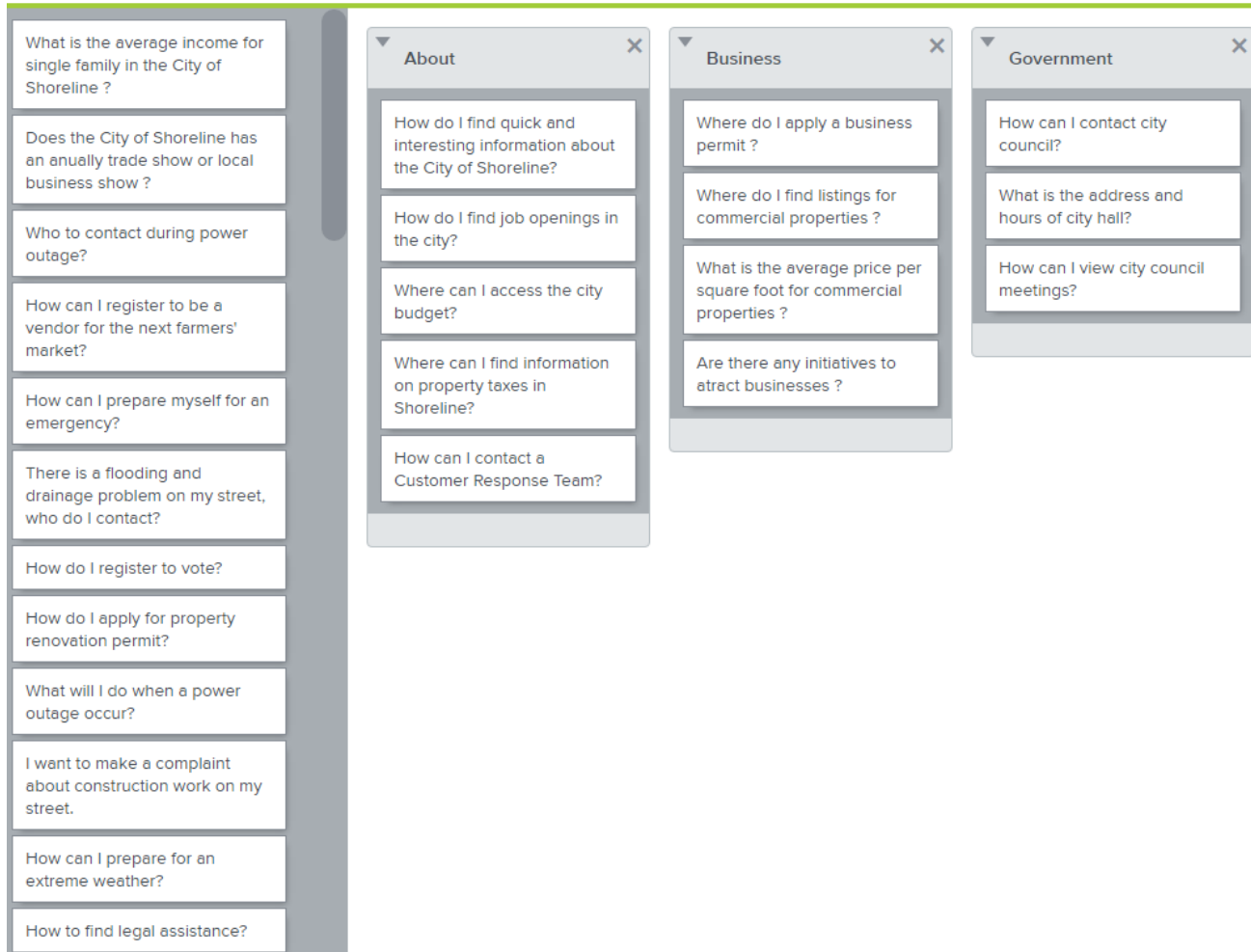
Optimal Sort displays information or tasks that the participants will need to find and or complete. Optimal Sort allows to participants organize this information together into as many distinct logical categories as they see fit. Participants give each of these categories meaningful labels. The analysis that follows helps us make sense of the card sorting results. Those conducting the experiment can now more easily determine the site structure that makes the most sense given the participants' perspectives.

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3) Findings & Results

Similarity Matrix

The similarity matrix is a graphical representation of pair combinations. This shows the relationship between each pair of cards which grouped together by the participants. The result is determined by different shades of blue in the boxes, the darker the blue indicates the higher percentage which the cards are often grouped together. This also sorted the same cards into cluster down the right edge, based on the number of participants paired them together.

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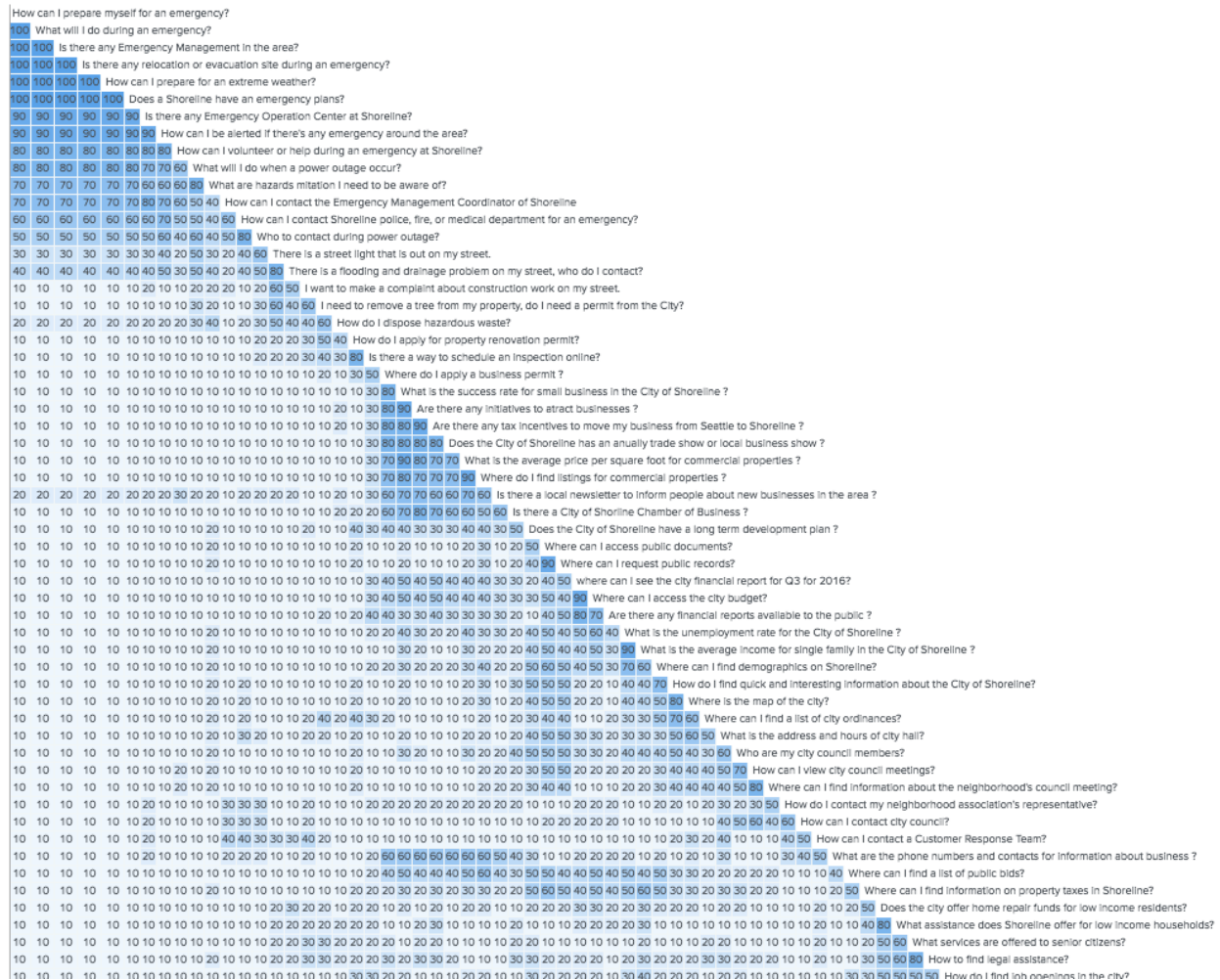
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Analysis of the Similarity Matrix

Below is an overview screenshot of the Similarity Matrix.



As expected, topics that were clearly related to one another had a high percentage of participants who agreed with the pairing. For example, topics such as “Is there an emergency management in the area,” “Is there a relocation and evacuation site during an emergency,” and “How can I prepare for extreme weather” were categorized together by 100% of our participants. This tells our team that from a bottom-up perspective, these topics are related.

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How can I prepare myself for an emergency?

100	What will I do during an emergency?						
100	100	Is there any Emergency Management in the area?					
100	100	100	Is there any relocation or evacuation site during an emergency?				
100	100	100	100	How can I prepare for an extreme weather?			
100	100	100	100	100	Does a Shoreline have an emergency plans?		

Topics that were not paired together 100% of the time, but still received a high percentage of relevancy were examined by our team more closely to determine if the pairing was reasonable.

For example, 80% of our participants paired “How can I be alerted if there’s an emergency in the area?” with “How can I volunteer or help during an emergency at Shoreline?” Clearly these two topics are related, and considering the fact that 80% of our participants agreed, it was determined by our team that the association between the two is valid.

90	90	90	90	90	90	90	How can I be alerted if there's any emergency around the area?				
80	80	80	80	80	80	80	80	How can I volunteer or help during an emergency at Shoreline?			
80	80	80	80	80	80	70	70	60	What will I do when a power outage occur?		
70	70	70	70	70	70	60	60	60	80	What are hazards mitigation I need to be aware of?	

The association becomes a little bit more abstract when we evaluate topics that were paired together by 60% of our participants. For example, 60% of our participants paired “Where do I apply for a business permit?” with “Is there a local newspaper to inform people about new businesses in the area?” While both inquiries are about businesses, one is for starting up a business, the other is for advertising a business. However, it was determined by our team that the relevancy is there, and that the grouping of these two topics is warranted.

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Where do I apply a business permit ?

80	What is the success rate for small business in the City of Shoreline ?									
80	90	Are there any initiatives to attract businesses ?								
80	80	90	Are there any tax incentives to move my business from Seattle to Shoreline ?							
80	80	80	80	Does the City of Shoreline has an annually trade show or local business show ?						
70	90	80	70	70	What is the average price per square foot for commercial properties ?					
70	80	70	70	70	90	Where do I find listings for commercial properties ?				
60	70	70	60	60	70	60	Is there a local newsletter to inform people about new businesses in the area ?			

After careful evaluation of the similarity matrix, our team determined that any topic paired together by more than 60% of our participants would be considered valid.

This means topics that were paired together by only 40% of our participants such as “How can I register to be a vendor for the next farmer’s market” and “How do I get involved in environmental activities in Shoreline?” would be disregarded.

50	How do I register my daughters for seasonal camps and extra fun classes?									
40	30	How can I register to be a vendor for the next farmers' market?								
40	20	40	How do I get involved in environmental activities in Shoreline?							

It goes without saying then, that topics paired together by only 10% of our participants such as “How can I view city council meetings?” and “Does the city offer home repair funds for low income residents?” would also be disregarded.

60	Who are my city council members?										
50	70	How can I view city council meetings?									
40	50	80	Where can I find information about the neighborhood's council meeting?								
30	20	30	50	How do I contact my neighborhood association's representative?							
40	50	60	40	60	How can I contact city council?						
40	10	10	10	40	50	How can I contact a Customer Response Team?					
30	10	10	10	30	40	50	What are the phone numbers and contacts for information about business ?				
20	20	20	20	10	10	10	40	Where can I find a list of public bids?			
30	30	20	20	10	10	10	20	50	Where can I find information on property taxes in Shoreline?		
20	20	10	10	10	10	20	10	20	50	Does the city offer home repair funds for low income residents?	
10	10	10	10	10	10	20	10	10	40	80	What assistance does Shoreline offer for low income households?

The similarity matrix revealed to our team that from a bottom-up perspective, there are many topics that stand isolated from all other topics. But that at the very least, the below list of topics should be grouped together.

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- Emergency, Power outage, Police and Fire Department, and Extreme weather.
- Businesses, Tax incentives, Trade shows, and Commercial properties.
- Public records and City budget
- Parks, Events, and Farmer's market.
- Low-income residents, Legal assistance, and Senior Citizens

Dendrogram

The Dendrogram displays a set of information established from the categories that were developed by the participants and their arrangement of the cards. The results of this data can be seen by those conducting the card sorting experiment once all participants have submitted their tests. This method of data analysis makes it easy to visualize relations among the categories.

Results from the card sorting survey generated two different dendrograms where one is called Actual Agreement Method or Skeptical Method and another one is called Best Merge Method. The first method is based on factual relationships, hence it often shows better results. For small number of participants however, The Best Merge Method will be the best method to use. According to optimalsort.com, this method makes assumptions about larger clusters based on individual pair relationships.

The picture below shows the Best Merge Method dendrogram. The list of each individual cards or questions are listed with its own graph line. When there are relationships between two cards or more, the lines will merge to create branching lines and eventually the line will get thicker as it moves closer to the right of the dendrogram. Connecting branches that are closer to the left have higher level of relationship compared to the ones closer to the right.

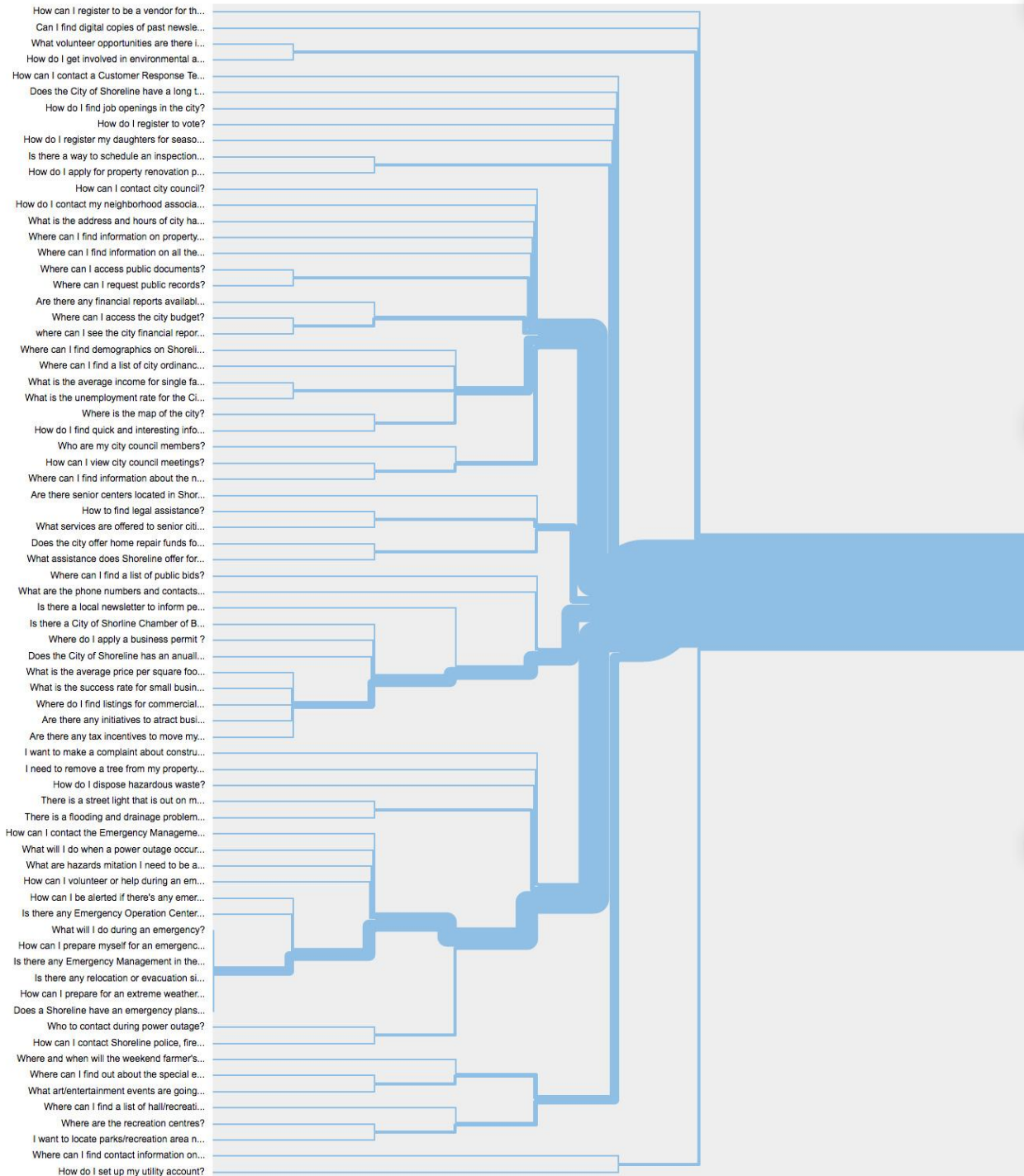
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Analysis of Dendrogram



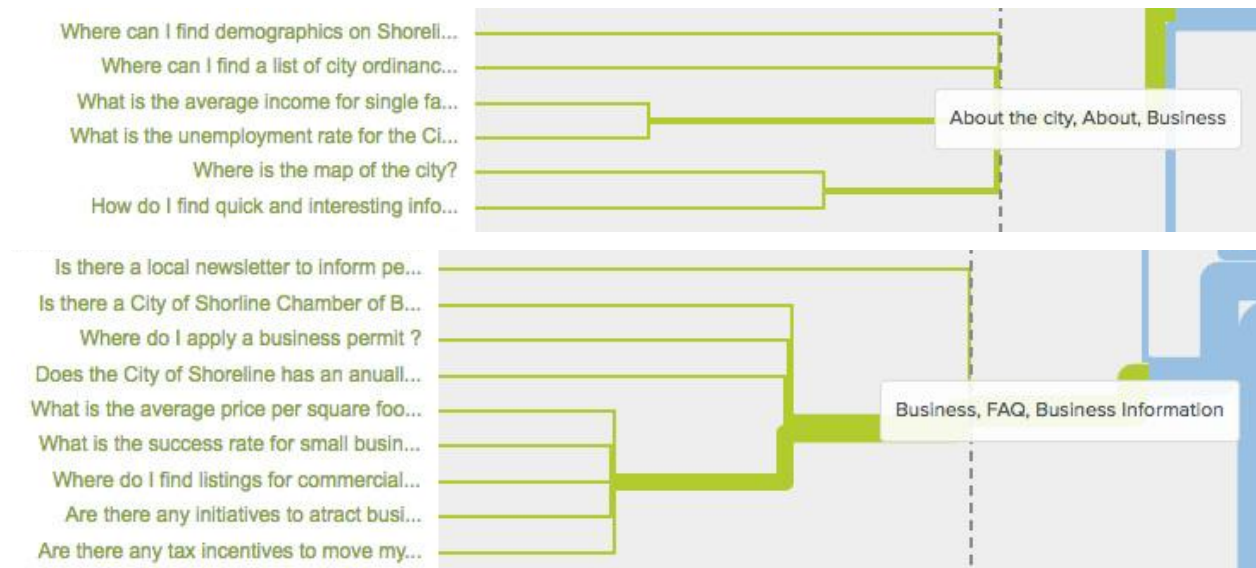
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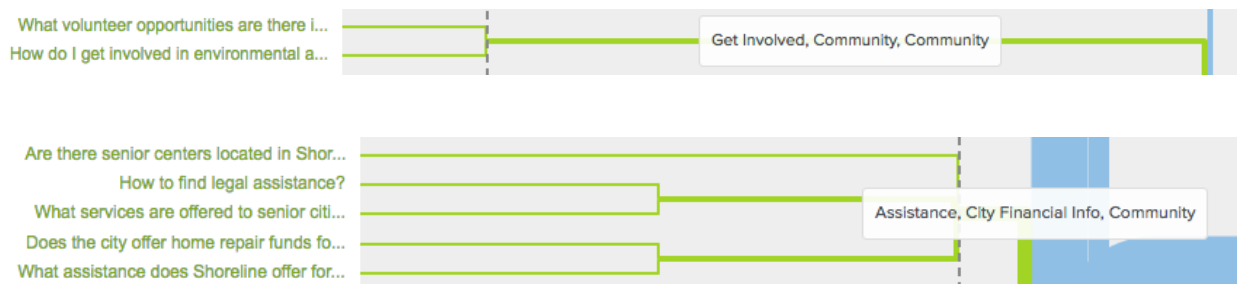
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These two different graphs portrayed the connection between each topic with one another. The results concluded that 70% participants have grouped these topics together into relevant categories such as business and about.



The first dendrogram shows the highest level of relationship between two questions. 90% of participants have grouped these items together in the same category. The most used category for this instance is 'community'.

The following dendrogram shows correlation between different branches. Based on our analysis, 70% of participants agreed that these questions belong to these major categories: Community and Assistance.



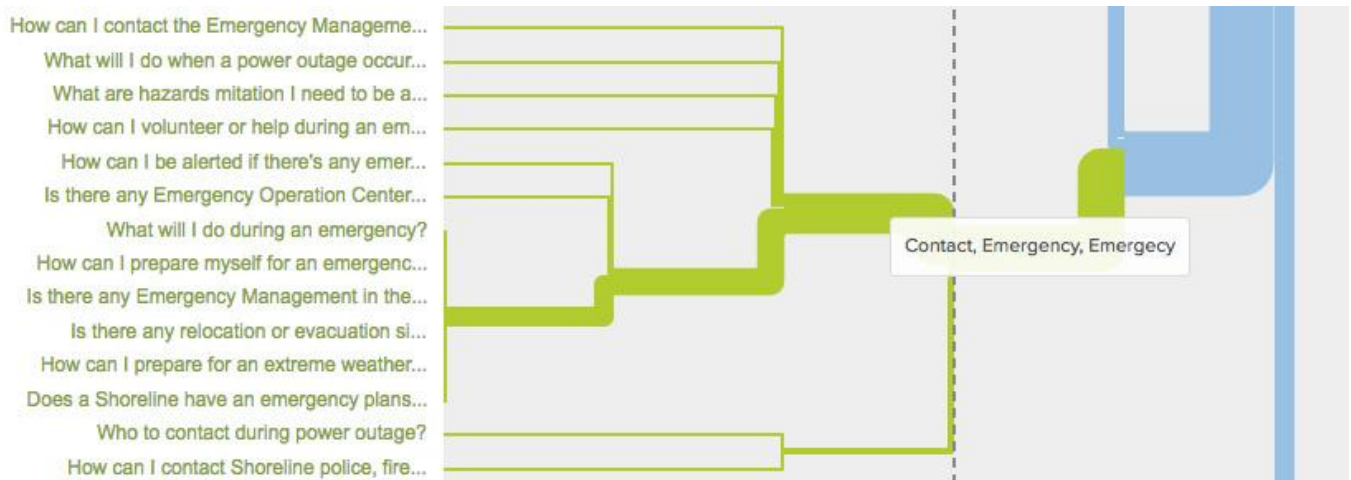
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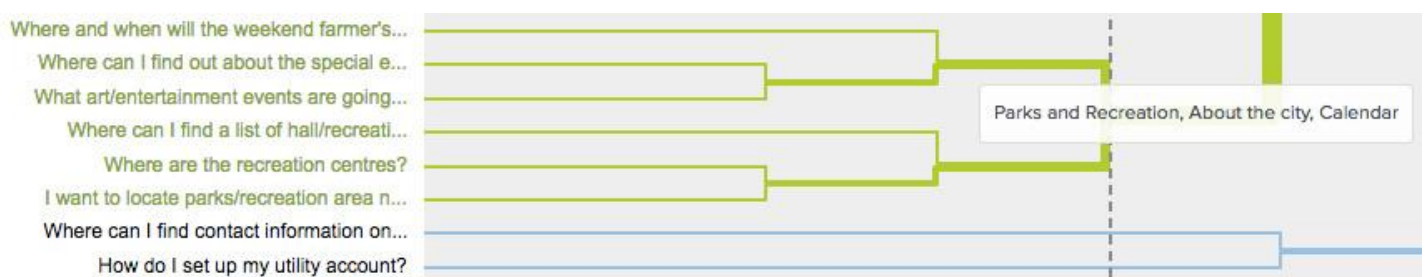
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From the dendrogram graph below, our team noticed that questions concerning emergency were categorised into its own category (labeled 'emergency'). 70% of participants narrowed down these questions into two main categories; emergency and contact. However, a big chunk of these questions seem to belong in one category, which is emergency.



The following dendrogram portrayed the similar connections made by 60% of the total participants. The connections are broken down into two major categories: Parks & Recreation and About.



The dendrogram is helpful for our team to put together the information architecture for the website. We were able to visualize the structure of the website by looking at the categories as top-level and sub-level navigation, and this will help determine where the categories would reside in.

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4) Conclusion & Recommendations

By combining the Dendrograms, Similarity Matrix, and Participant-centric Analysis we were able to identify certain patterns that gave us a better understanding of the keywords that will eventually be populated with submenu pages when redesigning the menu(s) on the website.

We found that while some pairings are easily categorised, some may be more difficult. Based on the pairings and connections from the dendrogram, below is the top navigation that we recommend for the City of Shoreline. The following page shows a sitemap for restructuring the content of the website.

- About / FAQ
- Business
- Community / Get Involved
- Utility services
- Complaints & Requests / Assistance
- Emergency
- Parks & Recreation
- Calendar
- Contact

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