Module #1 Compare, Design, Explain
YUHENG XIE
72864595

I. Comparison Between Two Interactive Systems

1. Fitts's Law

According to Fitts's law, pointing time depends on distance and the width of the target (Johnson Ch13). The shorter distance and larger size of the item, the quicker users can react (Johnson Ch13). Here I exam the time of reaction for users to type in search information in search after right after they enter the website of OpenTable and RESY. The distance is measured from the front of the URL bar to the front of the search bar. To be convenient, I use coefficients a and b directly from in-class assignment in week 2, where a = 120 ms, b = 230 ms. Distance and width of search bars on both websites are measured in google chrome with 100% page size showing on the SyncMaster SA850 screen in Duderstadt Center.

For OpenTable:
D = 28 cm, W = 1.8 cm
T = a + b * ID = a + b *log2(2D/W) = 1261

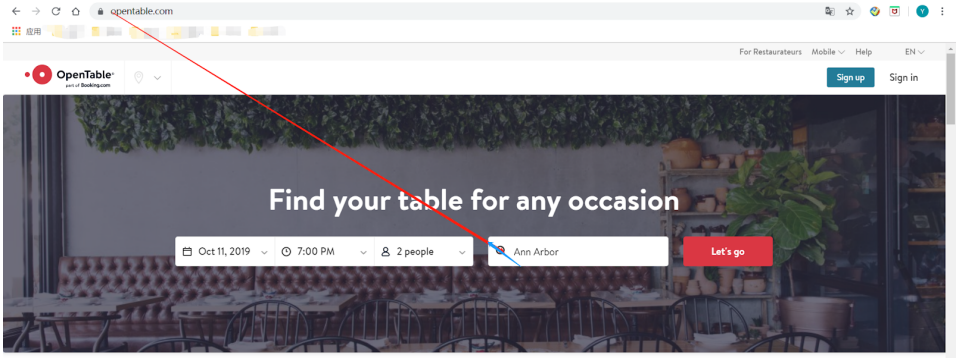

Figure 1. Distance (red) and Width (blue) for OpenTable.

For RESY:
D = 16 cm, W = 2cm
T = a + b * ID = a + b *log2(2D/W) = 1040

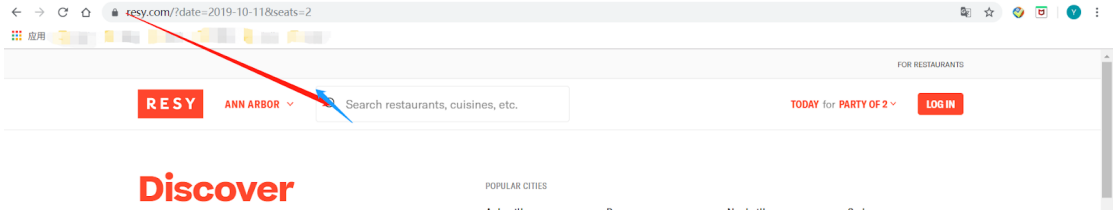

Figure 2. Distance (red) and Width (blue) for RESY.

According to the result, user need more time for reaction in OpenTable than in RESY.

2. Perception : Visual Structure

According to Gestalt principles of visual perception, our visual system is “optimized to perceive structure” because by doing this, we can “make sense of objects and events quickly” (Johnson). When navigating websites, people do not scrutinize screens carefully (Johnson). They tend to scan quickly and to find accurately what they want . This is a typical top-down process. As a result, “the more structured and terse the presentation of information, the more quickly and easily people can scan and comprehend it” (Johnson).

Both OpenTable and RESY have applied this technique professionally on their websites. On the front page of OpenTable, the blank space separates popular restaurants and top cuisines to show two horizontal structure of information presentation. Several square boxes containing information and pictures are placed horizontally. It shows that these horizontal structures falls into the same category. For RESY, it has both horizontal structure and vertical structure. On the front page, RESY has three columns of information showing climbing restaurants, top rated restaurant and new on Resy restaurants. It also has one row of information showing restaurants that are available tonight. Both OpenTable and RESY use visual structure techniques to classify different information and improve the efficiency for people when navigating websites.

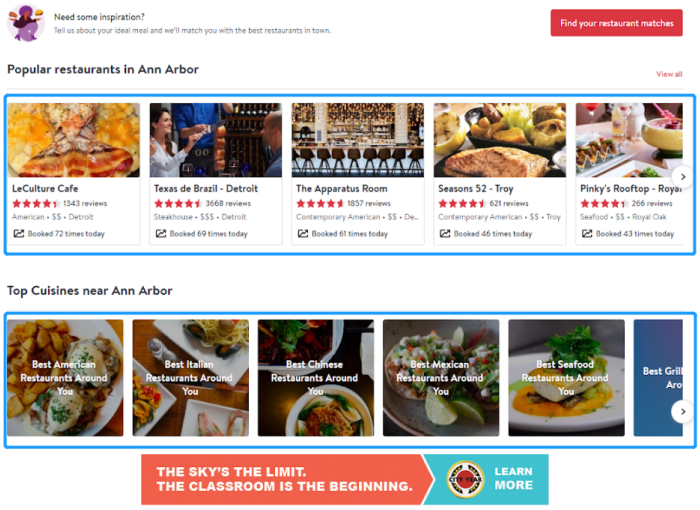

Figure 3. Visual Structure on OpenTable’s Front Page (blue boxes).

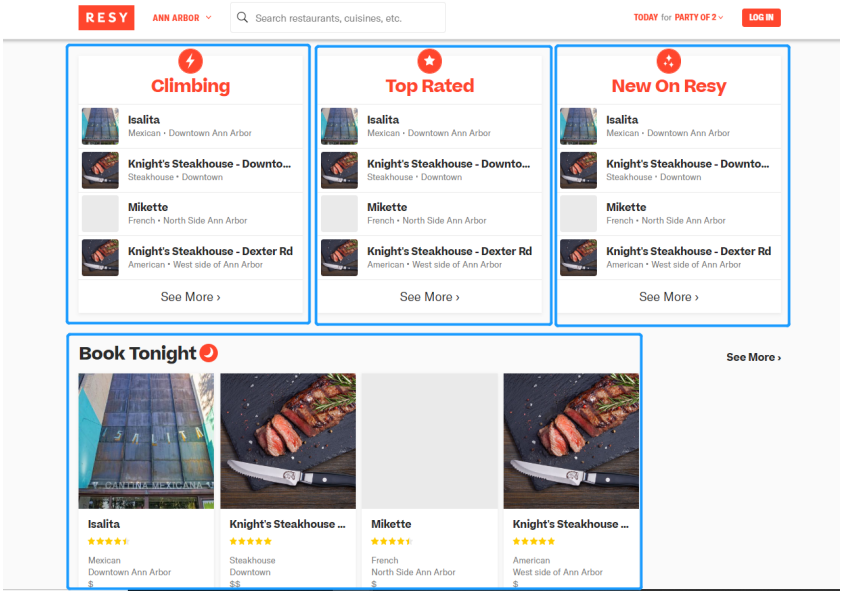

Figure 4. Visual Structure on RESY's Front Page (blue boxes)

Both OpenTable and RESY applied visual hierarchy technique to show the restaurant information. They break "the information into distinct sections, and breaks large sections into subsections." They all use bold words to distinguish each section and show the hierarchy structure. For example, both websites use bold and extreme large size of words to address names of restaurants. Words sizes then reduce for photos, menu and other information. Names of restaurants are presented the most strongly to show the high-level of information.

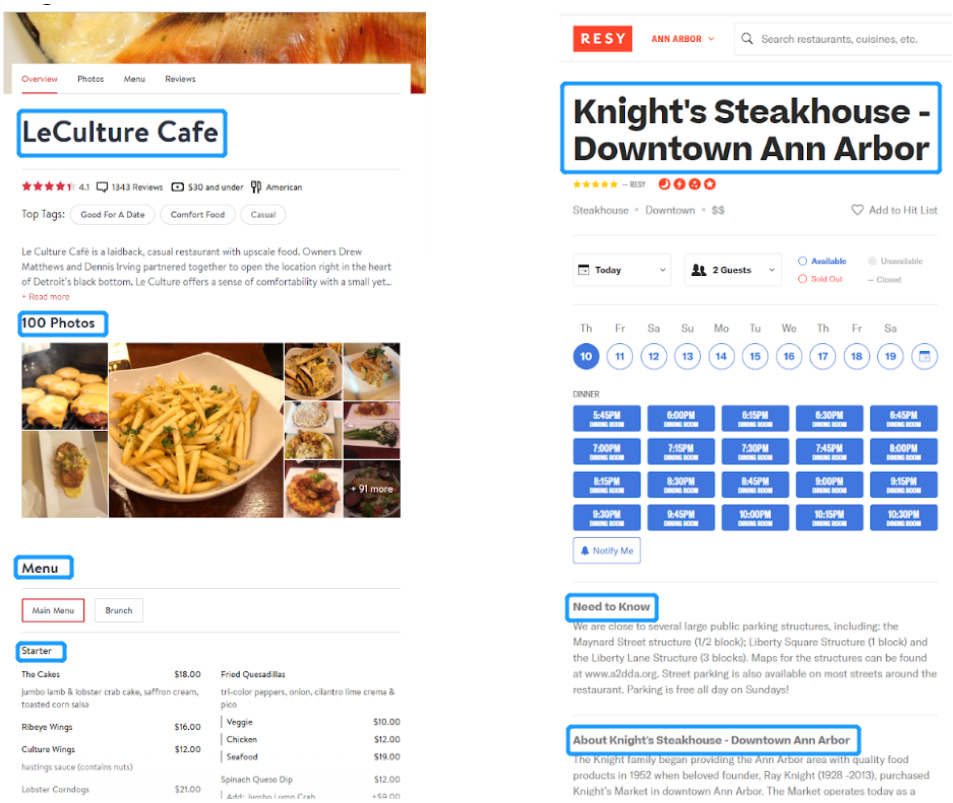

Figure 5. Hierarchy structure for OpenTable(Left) and RESY(Right).

3. Attention : Top-down Processing

The goal for customers to use OpenTable or RESY is to book a restaurant on a certain day. The common process for a user to book a restaurant is that he/she first enter some key information and then conduct searching to find if this restaurant meet his/her requirement. Information entered can be location, food, data or number of people. This is a typical top-down process for people navigating on the website.

Designers should "make the structure of the search field as apparent to the user as possible and consistent with the user's knowledge" (Lee). Both OpenTable and RESY satisfy this requirement in terms of top-down processing. Both of these websites place the search bar at the top of pages together with places to select location, data and number of people. For a website, which the visual space is organized, "people tend to search from top to bottom and left to right" (Lee). Placing the search bar at the top of the page matches people's navigating behaviors. It enables people to quickly find the place to input their requirements and conduct searching. It is also consistent with users' knowledge which is based on their past experiences. As we use searching tools like google, the search bar is always located at the top area of the page. We accept and are used to this kind of setting. As a result, we would automatically focus our eyes on the top area of the page to look for the search bar.

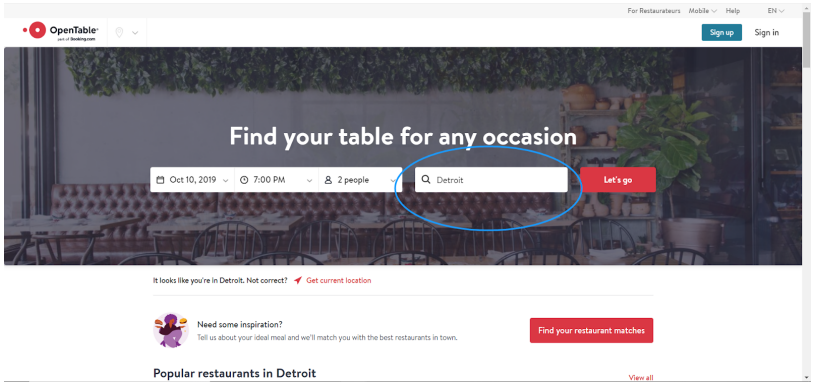

Figure 6. Location of Search Bar on the page of OpenTable.

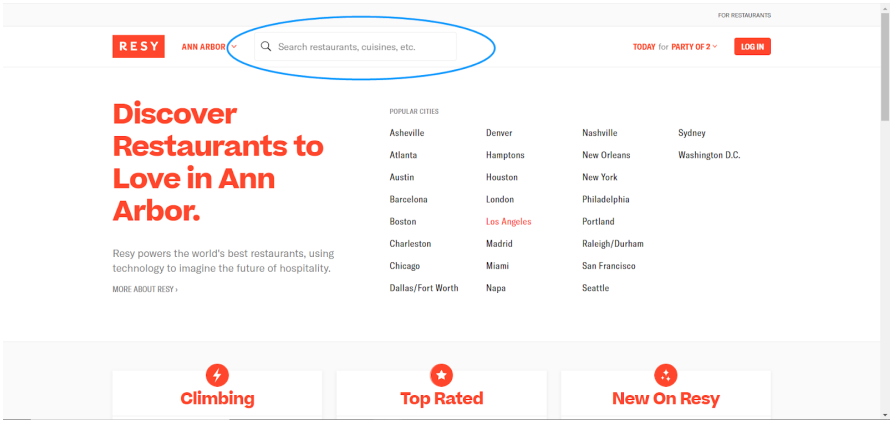

Figure 7. Location of Search Bar on the page of RESY.

4. Memory : Working Memory

Working memory is limited and volatile (Johnson). “If items in working memory don’t get combined and rehearsed”, these memories can easily be lost (Johnson). This situation is usually happened when people conduct searching. The key information they input is contained in the working memory. According to Broadbent’s theory, people can only store 3-5 (average 4) different items in their working memory (Johnson). Unfortunately, these 3-5 items can be easily replaced during the searching process. As a result, minimizing load on working memory is required for web designs. Both websites for OpenTable and RESY have structures to accomplish this goal.

For OpenTable, as customers go to the page of a certain restaurant, The item of “make a reservation” is always kept on the top of the page while people browsing the information of the restaurant. The item is shown in the following picture within the blue box. It keeps reminding people to make a restaurant reservation rather than just browsing the information of restaurant and forget the ultimate goal. The information that people input is constantly shown on the box to remind them the party size, the date and the time. It is also convenient and allows people to input reservation requirements without going back to the top of the page.

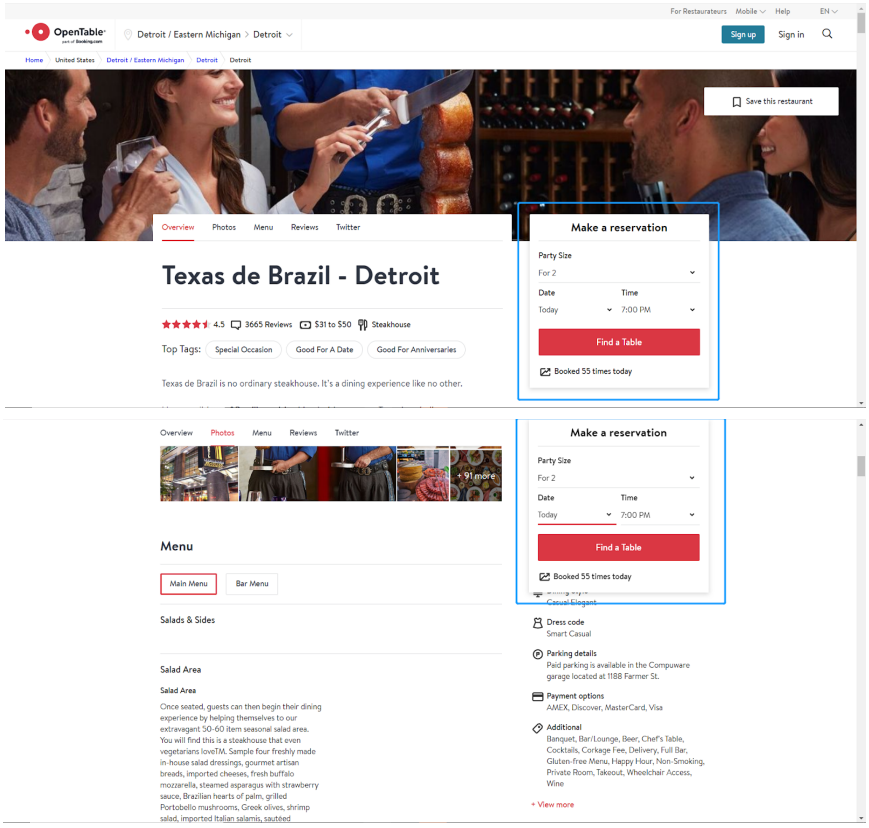

Figure 8. Fixed “Make a reservation” item when rolling down (shown in blue boxes).

For RESY, a bar of information is stick on the top of all pages (the front page and restaurant pages). The bar contains the logo of RESY, the location, the searching place, date, number of people and the login button. This bar of information is very useful to remind people of what they are searching for as they browse the website for the restaurant results. It helps people to recall the location of the restaurant, eating date and number of people while navigating the website.

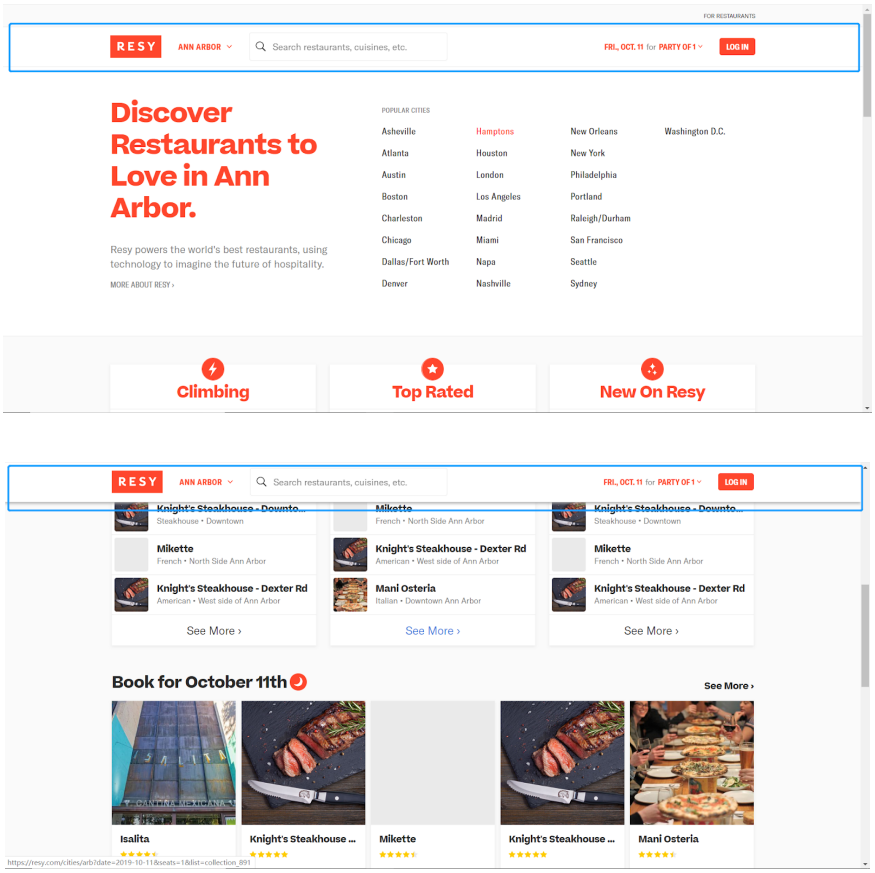

Figure 9. Fixed bar on the top when rolling down (shown in blue boxes).

II. Design a System

I use some elements from OpenTable and RESY to design my website. The front page contains the search bar and other information input bars including location, cuisine, date, time and guests. In the lower part of the page, recommend restaurants are shown to attract users' attention.

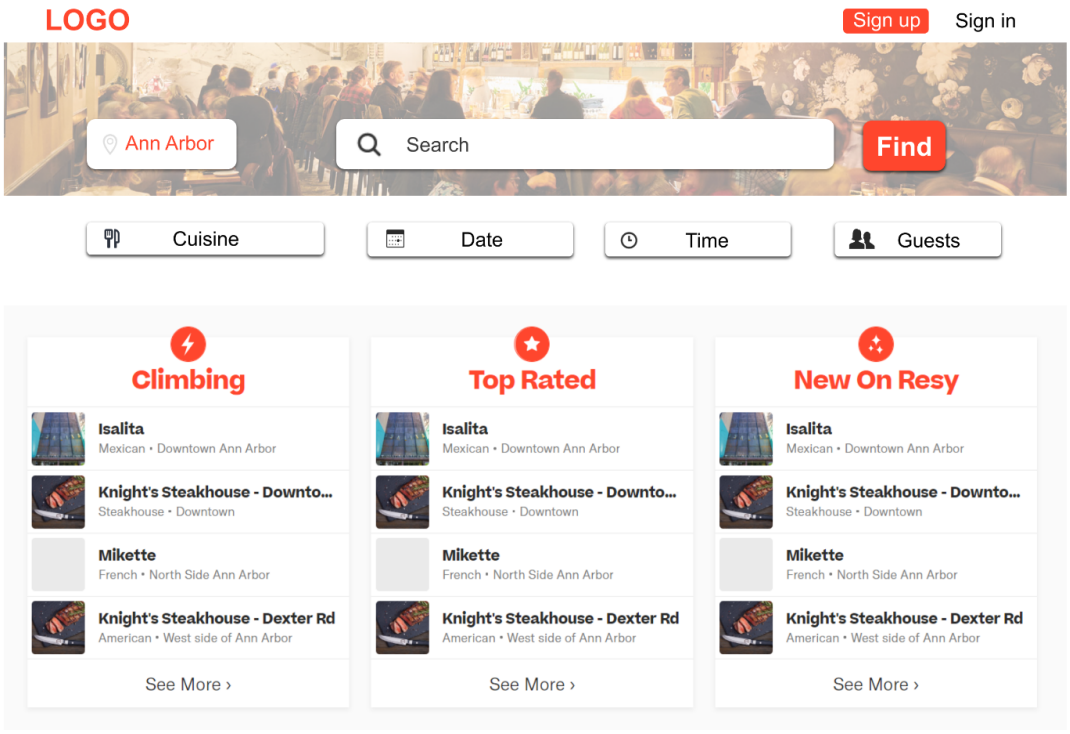

Figure 10. Front Page of the Website.

Users are able to input different requirements to get desired results. People can choose multiple cuisine to narrow down the search range. Users can select different date, time and number of guests to find the available restaurants.

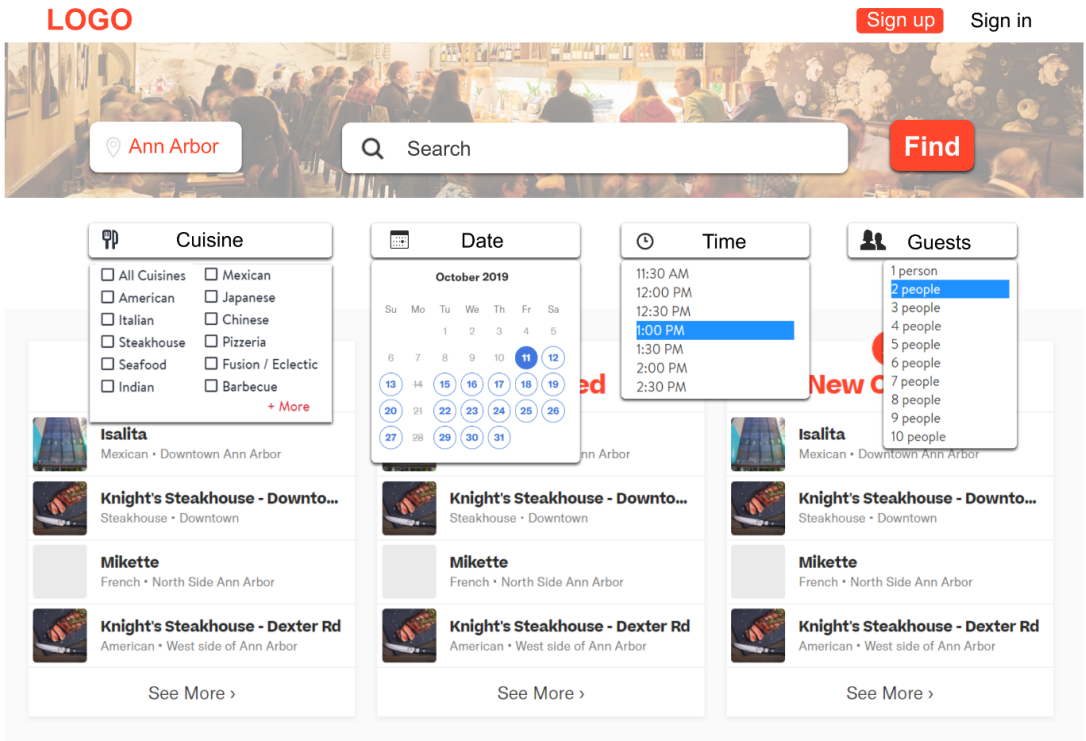

Figure 11. Requirements that users input.

Search requirements of cuisine, date, time and guests are shown constantly on the

information bar to remind users of their choices. Search results are shown in the lower part of the part with four restaurants in a row. Users can adjust the ranking of results based on their preference of popularity, distance, rate or price. If they want to see the location of these restaurants, users can click the map button to view the map.

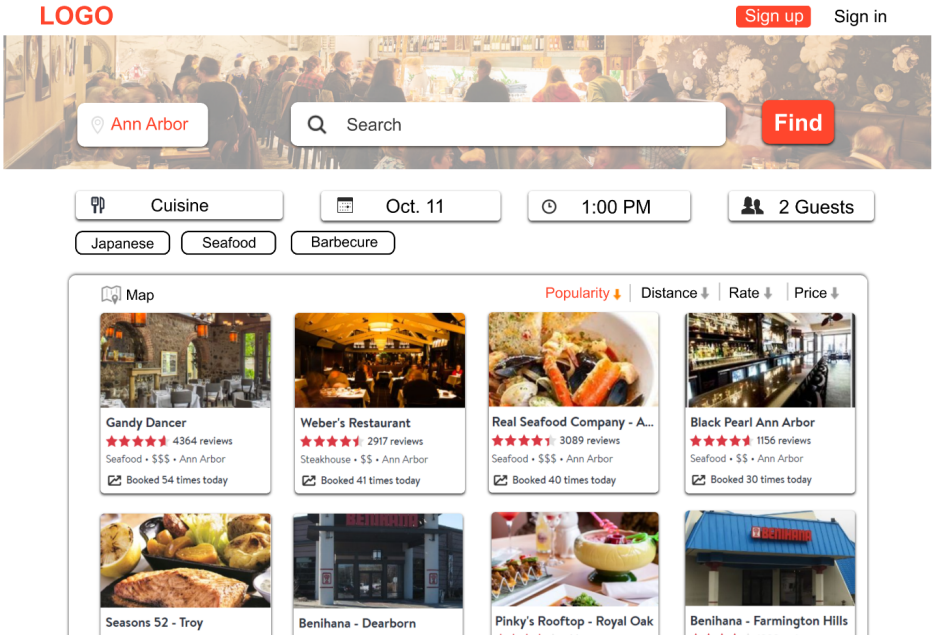

Figure 12. Search Result Page.

III. Explain the Rationale

1. Goals

Comparing with these two websites, OpenTable has a clearer and better organized page showing search results of matched restaurants. However, half of the front page of OpenTable is filled with areas, restaurant numbers and pictures of different cities around the globe. This organization of information is redundant and useless for most customers who aim to find restaurants in their current locations. RESY has a well designed front page, which provides ranking of restaurants and recommend them to customers. However, it has a poor search result page. It automatically shows the map of restaurants, which is not people's common expectancy. Many people do not consider the location as their priority factor, and thus do not like the map to show up in the first place. It is also inconvenient to add features for searching, which is a bad user experience.

As a result, I aim to improve the accuracy of search results in order to let people find restaurants that matches their needs most. On the other hand, I aim to increase the speed of finding restaurant and save time for people. Overall, the goal of my design is to

"Enable customers to accurately and quickly find restaurants they want."

2. Sources

Fitts's Law
As I have mentioned in part I, the shorter distance and large items result in quicker reaction (Johnson).

Pop-out Effect
Color Perception
Designers use bright color and large size icons to attract attention from users.

Feature Detection
"The pop-out effect works really well when manipulating one of the sets of characteristics" (Johnson). In my design, I use large circle icons with bright orange color to attract users attention on high-ranking restaurants on the front page.

Visual Search
I use the visual hierarchy structure together with grouping method to design the website. Theory about visual search is already mentioned in part I.

Bottom-up Processing
Bottom-up processing is applied to attract customers attention. If designers want to emphasize something and arouse users attention, pop-out effects and salience are usually applied to achieve bottom-up processing. In my design, bright color and large icons are used on the front page for high-ranking restaurants, so that to attract users to choose these recommended ones.

Top-down Processing
Top-down processing rely on knowledge and expectations (Lee). It is driven by cognition. As a result, designers should follow the common behaviors of users to organize and contract the website.

Short Term Memory
The capacity for working memory (i.e. short term memory) is small. As a result, designers should put effort to reduce the workload on users working memory (Johnson). I have already mentioned this theory in part I.

3. Walkthrough

On the front page (Fig.10), there are mainly two parts. The upper part contains all the elements that are needed for customers to input information and requirements. On the top of the page is the logo and login button. The background picture visually shows that this website is related to restaurants. According to Fitts's law, larger objects and shorter distance result in faster reactions (Johnson). However, extreme large size of items would ruin the page organization. If placing search bar at the very top, users would probably neglect it. The trade-off I made is to place the search bar on the middle-up of the page in relative large size. It enables users to easily point on these items and begin their search. Four selection button of food type, data, time and

number of people is right below the background picture. Usually people use the top-down process for restaurant search. This means that people first enter their requirements and then look for results to select their desired restaurants. As a result, places for users to input requirements need to locate on the upper part of the page to meet people's navigation habit, which is scanning "from top to bottom and left to right" on an organized page (Lee). This organization would enable people to quickly find what they need and input their requirements.

The bottom part of the front page is similar to what RESY has (Fig.10). It has three columns showing the weekly rank of climbing restaurant, top rated restaurant and new restaurant. Visual structure and pop-out effect is used here to better organize elements. Users can easily distinguish three different columns and find the restaurants they are interested in. Title of climbing, top rated and new are bold words with large size and bright color. Round icons with bright color form contradiction with the overall rectangle organization of the page. It accomplish the goal of attracting users' attention to show restaurants that they may be interested in.

As users input their requirements and conduct search, the bottom part which initially contains three columns of rank would change to a rank of search results (Fig.12). Each square contains information for one restaurant, and there are four restaurants in a row. Visual structure theory is used here to organize search results into one group. Users can freely change the rank based on the popularity, average cost, star, location, etc. These options are located on the top of search results, and results would automatically alter based on users preferences. Adding these filters for result selection improve the accuracy of the search result and enable users to find restaurants that they want accurately. According to working memory theory, designers should reduce the workload for working memory (Johnson Ch7). To solve this problem, requirements of food type, data, time and number of people, which users input would be constantly shown on the top part of the page to remind users of their options (Fig.12).

Overall, this system would Enable customers to both accurately and quickly find restaurants they want.

Reference

Johnson, J. (2014). Designing with the mind in mind: simple guide to understanding user interface design guidelines, second edition. 2nd ed. Burlington, MA: Morgan Kaufmann.

Lee, J. D., Wickens, C. D., Liu, Y., & Ng Boyle, L. (2017). In *Designing for People: An Introduction to Human Factors Engineering 3rd Edition*. CreateSpace.

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Resy. [Screenshot]. Retrieved from https://resy.com/?date=2019-10-11&seats=2