FINAL PROJECT REPORT

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1. Introduction

This report illustrates the process of building a data-driven website by adopting design thinking in interaction with computational thinking. All the stages from empathizing with target users, defining the problems, ideating, prototyping and testing will be demonstrated in the report.

2. Strategy

The idea of creating a restaurant recommendation platform by myself has popped into my head many times when I search for restaurants online but can't get satisfactory results. As a foodie who considers eating as a serious part of my life, I deeply understand the importance of finding desirable restaurants to other food lovers. Therefore, I decided to create a trustworthy and helpful website where foodies can easily find what they want.

It is commonly known that restaurant recommendation must be based on location. So, I need to make it clear which city this website will mainly focus on. Since I will be in Hong Kong for one year, and it is interesting to explore this city with so many distinctive types of food, I chose Hong Kong as the target place and set the website goal as creating Hong Kong's food guide for both residents and tourists.

3. Scope

A good way to figure out what opportunities I could have is to map out the whole journey that my target users will experience in the process of reaching their destination. I have recalled what I usually do and also discussed with my foodie friends what pattern they will experience when they want to find restaurant recommendation online. Based on the collection of classic user pattern, I sketched a journey map organized by core elements and structure which clearly displayed what my website should offer and how

it could better serve the users at different stages. (See Figure 1)

	起	承	轉	合
人物	- Hong Kong residents - Hong Kong tourists	find my website and look through the information on it	try recommended restaurant and have good experience	satisfaction and trust
場景	online promotion	my website	eat in restaurant	online offline
文物	advertisement or word of mouth	website content	restaurant	onlie review word of mouth
情況	online research persona wants to find food recommendation online	persona is attracted by the recommendation and plan to try some restaurant	persona trusts my website	more visitors to my website

Figure 1. Journey Map

Beside the journey map, I also created a persona describing the need and traits of my target users based on my research of foodie group. In the persona, I used four tags to define their core characteristics which are foodie, picky, trendy and motivated. Their ages don't matter as long as they have the motto of "Life without eating good food is not worth living" and have enough motivation to try good food. Their characteristics are extracted by combining the most common and outstanding traits of ten classic foodies whom I know in my real life, which are as follows:

- *I am always planning my next meal*
- *Food is a mood-lifter to me*
- *I like to spend time searching restaurants and find attractive food to try*
- *I want to have my list of best restaurants that suit all the occasions I need*

- *I want to know what restaurant or food is hot now, and I certainly won't miss the trend*

- *I like to know what other people comment on the food as reference*

- *I take action fast as soon as I find a desirable restaurant recommendation*

- *Except for the food, I also value the experience of eating in a restaurant including environment, service and style too.*

When they pursue their goals of finding good restaurants in Hong Kong, enjoying the pleasure of eating and having a satisfactory experience when eating in a restaurant, they may encounter the following obstacles that cause frustration: having no idea of what to eat, being unable to find useful recommendation information online and finding false information. These are their main needs and pains which my website should offer an effective method to deal with. (See Figure 2)

Foodie Persona

foodie   picky   trendy   motivated

Goals
- Find good restaurants in Hong Kong
- Enjoy the pleasure of eating
- Have a satisfactory experience when eating in a restaurant

Frustrations
- Don't know what to eat
- Can't find useful recommendation information online
- Find false information

Characteristics:
- I am always planning my next meal
- Food is a mood-lifter to me
- I like to spend time searching restaurants and find attractive food to try
- I want to have my list of best restaurants that suit all the occasions I need
- I want to know what restaurant or food is hot now, and I certainly won't miss the trend
- I like to know what other people comment on the food as reference
- I take action fast as soon as I find a desirable restaurant recommendation
- Except for the food, I also value the experience of eating in a restaurant including environment, service and style too.

"Life without eating good food is not worth living."

Age: 18-70
Location: Hong Kong

Figure 2. Persona

After understanding the need of users deeply, I asked myself a question: There are many restaurant recommendation platforms out there including giants like Openrice, TripAdvisor and DianPing. What are the compelling reasons for the persona to choose my website over the others? What is the unique selling point of my service?

After a long time of deliberation based on the investigation into the existing platforms in the industry and analysis of user feedback, I positioned my website as a trustworthy and personalized restaurant guide platform to compete with the giants. Three reasons backed me up in making the decision. One is that I realized that foodies need restaurant recommendation more than just searching for already known restaurants which means that most of the time they actually don't know what to eat and try to seek inspirations online. This gives me confidence to build a website that emphasizes on recommending selected high-quality restaurants without having records of all restaurant in Hong Kong. So, it may not be smart for me to try to collect all the restaurant data to build a search-oriented website because there are already many platforms offering the service very well, and I should avoid using my weakness to compete with their edges. Instead, I should make the most of my own strengths to target accurately at solving users' pain point.

Another reason for me to position my website trustworthy is that foodies care about the authentic information because it will frustrate or even infuriate them if they are tricked by false information. This is actually an area where giant websites are likely to underperform due to the profit pressures. For example, Openrice, the most popular platform in Hong Kong, was accused by users of unfairly hiding negative comments to maintain the interests of cooperative restaurants. Since my website is of small size, it is easier for me to manage and it will only provide authentic information that is helpful to users.

In terms of being personalized, according to my research, most platforms offer restaurant information mainly based on food categories. This can't satisfy users

because they want to have unique experiences and feel that they are deeply understood. To solve this problem, I decided to provide not only basic restaurant information but also more personalized recommendations such as restaurant collections of the latest trend, of places or food that are suitable for the upcoming festivals, of restaurants that particularly suits specific occasions. Users can be inspired by these collections and conduct as many further explorations as they wish.

4. Structure

- **Site map**

In order to establish the information architecture of my website, I have created a site map to better organize the content. (See Figure 3)
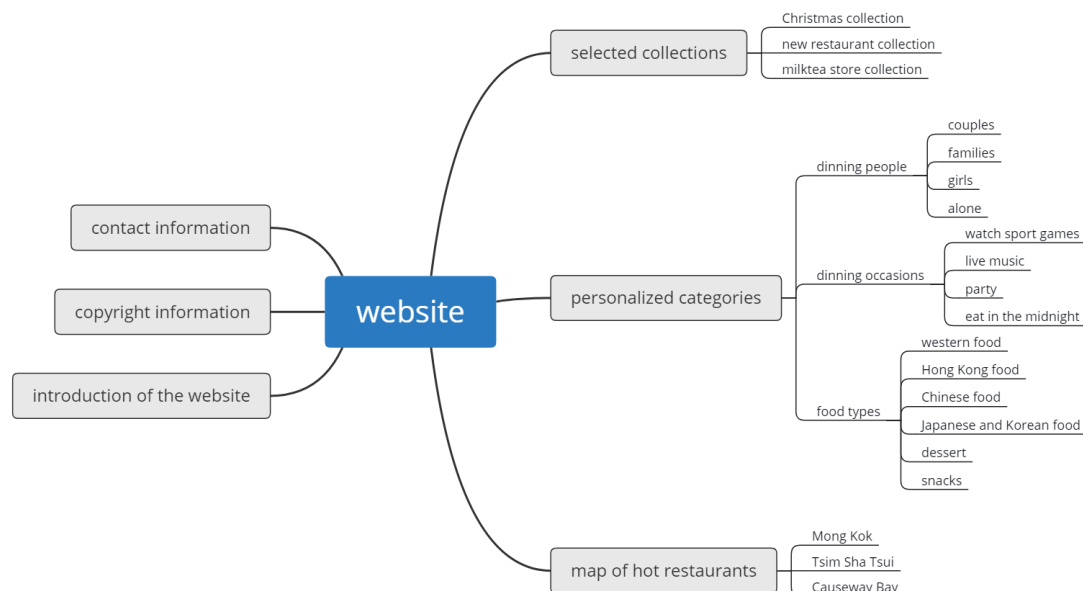

Figure 3. Site Map

- **User Flow**

Having mapped out all the content of my website, I started to think about the route that user follows in this platform. Thus, I made a user flow diagram to facilitate the design of my navigation. (See Figure 4)
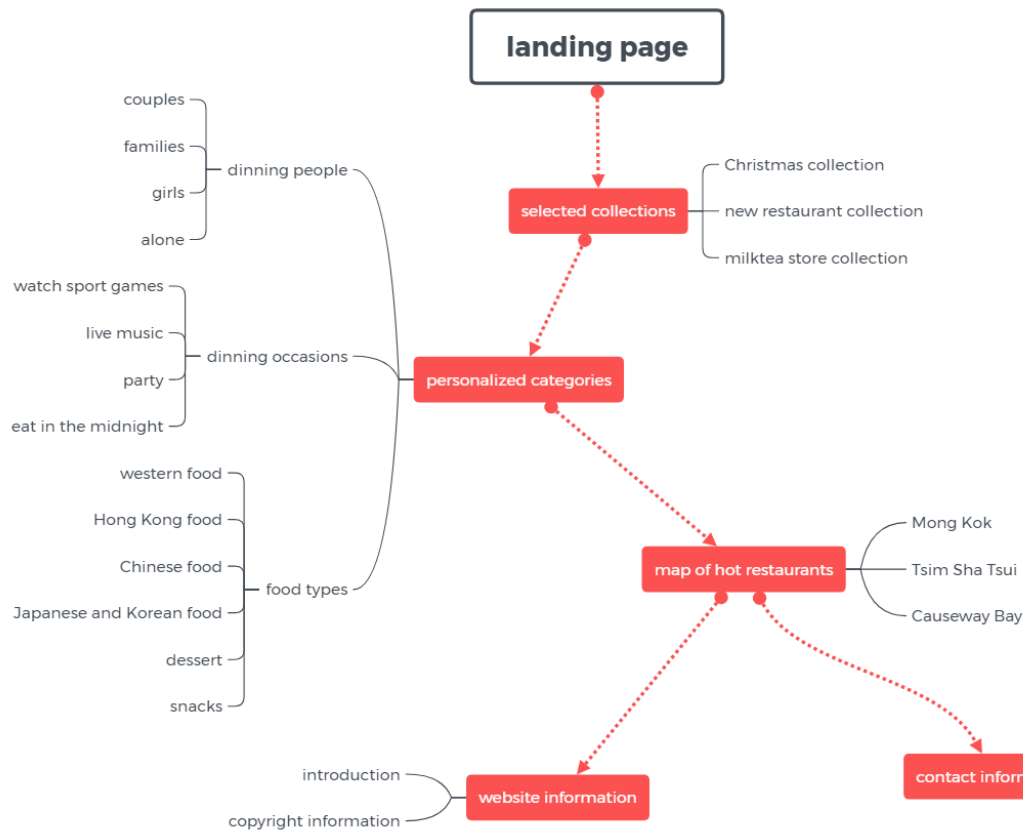
Figure 4. User Flow

- **Navigation**

In the user flow, I placed the content of contact information and website information in the last step of user path because I think it is not the core value this website offers. So, in order not to distract user from the most important services, I decided to put these two parts in the footer. Thus, I finally developed my navigation structure of four parts. (See Figure 5)
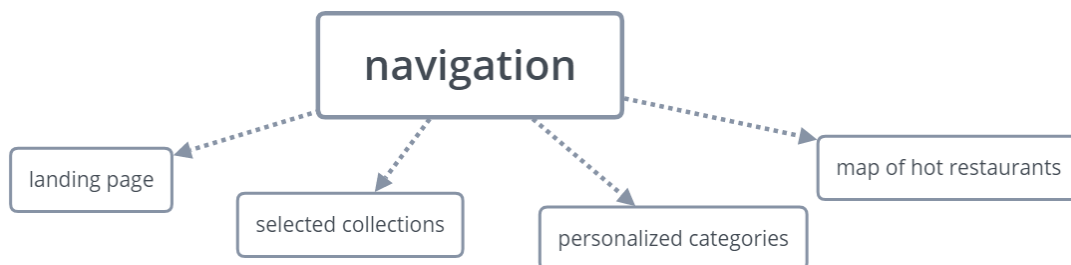

Figure 5. Navigation

- **Labelling**

In order to do the labelling in a sensible way, for each section I combined a provocative and inviting title to attract users with a clear short introduction to ensure readability. I tested this part by interviewing users whether they understand the labelling easily, and they all gave me positive responses. (See Figure 6)

Figure 6. Labelling

- **Taxonomies**

To leverage the data tailored to different user need, I used multiple taxonomies by tagging content with metadata, so that users can have different sorts of content based on the assumed taxonomies. For example, I have restaurant records with multiple tags such as their locations, food types, prices and so on. Based on these tags I can create different groups to satisfy users' differentiated needs. Below is a screen capture of the restaurant records stored in Airtable. (See Figure 7) You can also view more details at my Airtable *https://airtable.com/tblesDg607uXDQSGf/viwWVXvpAK665ezPk*.

地點	餐廳類型	價位區間	評分
銅鑼灣	日本菜　甜品　糖水　西	$101-200	4
尖沙咀	多國菜　甜品　糖水　西	$51-100	4.5
尖沙咀	日本菜　串燒　居酒屋	$401-800	4.5
旺角	日本菜　壽司　刺身　居	$101-200	3.5
尖沙咀	台灣菜　火鍋	$201-400	4.5
尖沙咀	日本菜　壽司　刺身	$101-200	4.5
銅鑼灣	泰國菜　海鮮　烤肉	$101-200	4.5
尖沙咀	日本菜	$101-200	4
旺角	滬菜 (上海)　中菜館	$51-100	4
旺角	日本菜　鐵板燒	$101-200	4

Figure 7. Taxonomies with Tags

5. Skeleton

To ensure the concept of my website was in the right direction, I made low-fidelity wireframes of each page to help me have a clearer idea of the interface design. Here are some of the wireframes as examples. (See Figure 8 to 12)
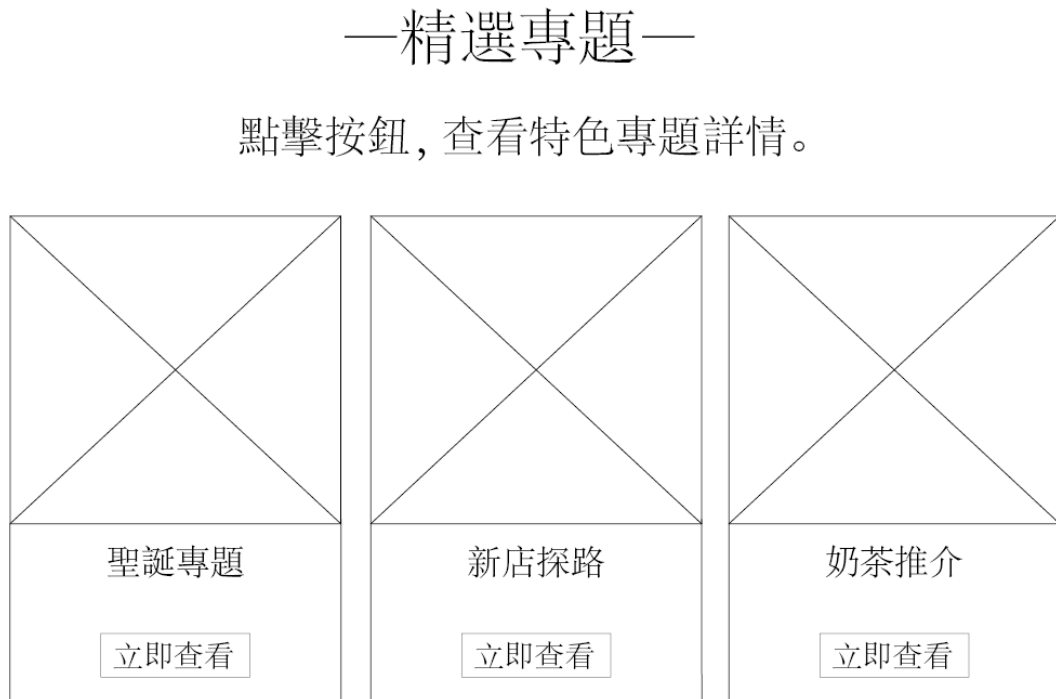
Figure 8. Wireframe — Main Page

一精選專題一

點擊按鈕，查看特色專題詳情。

聖誕專題	新店探路	奶茶推介
立即查看	立即查看	立即查看

Figure 9. Wireframe — Selected Collections

―個性化推薦―

根據你的需要推薦優質餐廳，並提供餐廳對比信息

| 用餐者 | 用餐場景 | 美食類型 |

情侶戀人

家人孩子

閨蜜好友

獨享美食

Figure 10. Wireframe — Personalized Categories – Dining People
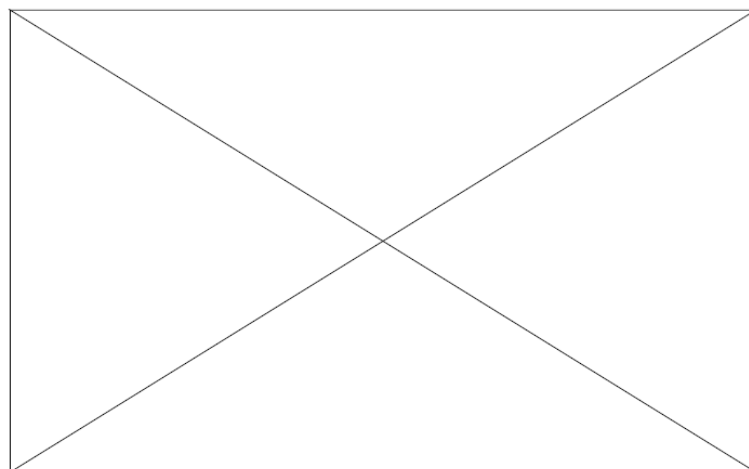
―美食地圖―

查看「食趣推薦」餐廳集中分佈的熱門地區

點擊查看

Figure 11. Wireframe — Map of Hot Restaurants

關於食趣 　　　　　　　　　　食趣

食趣源自對美食的熱　　　　　　食趣精選
愛，對食物的不將就
亦是對生活的不將就。　　　　　個性推薦
Julie 希望能給熱愛美
食的朋友整合出有用　　　　　　美食地圖
的信息，一起從食物
的靈魂中享受歡愉和　　　　　　聯係作者
感動。

Figure 12. Wireframe — Footer

6. Qualitative Test with Low Fidelity Wireframes and Paper Prototype

After I made all the wireframes, I wanted to know if my design would work well for users and if there were big issues in terms of usability. So, I chose an easy way to validate my design by printing out the wireframes I had created and inviting five of my foodie friends who were perfect representations of my target users to do the usability test on paper prototypes.

Before the test, I explained to my friends that the purpose was to test my website instead of their behavior, so there was no need for them to be nervous. I also informed them in advance that I would record their behavior during the process, but it was only for my personal use of examining the issues afterwards. In addition, I encouraged them to think aloud no matter what came to their mind to help me better understand the usability.

After all the necessary information was delivered to them, I started the test by letting them go through my website while I was posting previously prepared questions at different stages. (See Figure 13)

Stage	Questions	Subjects				
		1	2	3	4	5
Homepage	What do you think this website is about?	food recommendation	introduce food	food recommendation	about good food	food
Selected Collections	In what sequence does user check different collections?	from left to right	from left to right	from left to right	only clicked milktea collection	from left to right
Footer	Does user know where to find contact information?	y	y	y	y	y
After Browsing All Pages	What do you think is the best part of this website?	restaurant category by people	website is clearly organized	restaurant category by people	milktea store collection	useful categories
	What could be improved?	fonts are too big	more collections	add sign-up function	add more interesting categories	it is okay now
	Is the function of each part clear?	y	y	y	y	y

Figure 13. Questions and Feedback

As is shown in Figure 13, subjects gave different feedback on the design and service of my website. According to the test, the website function was clear to users. The skeleton and content were reasonable too. Generally, all the information could be found by users in the way I had planned. However, users also pointed out some issues. One was that the fonts were too big and they were hurting the aesthetic attraction. I adopted this suggestion and resized the fonts in the surface design. Also, two subjects wished to have more collections on the website. But I couldn't find enough records for additional categories in a short time. So, I had to put this suggestion aside for now. Another suggestion was to add the function of signing up which was also my idea, but for now it couldn't be realized due to my limited capability and time. In summary, the paper prototyping usability tests helped me refine my design to better carry out the surface creation.

7. Surface

After I went through all the important preparatory steps of setting goals, analyzing users, arranging the information and content of my website, making wireframes and conducting paper prototyping usability tests, I could finally get down to the business of

establishing this platform.

- **Qualitative Five Second Test**

In the process of developing my website, I studied many interesting Bootstrap templates to seek inspirations and also looked into other food guide websites as reference. When I was designing the homepage, it puzzled me which picture to use as a background picture because there were many options of attractive images. To help me make the decision, I conducted 5-second tests to another group of foodie friends to see which one attracted them most. With the help of the tests, at last I chose a satisfactory picture as the homepage background. (See Figure 14)

- **Surface Screenshots**

After a hard but worthy time of coding, I finally designed a website that well delivered the functions and had a fresh and vibrant style which matched the spirit of enthusiastic foodies. The following are five screenshots displaying what my website looks like on PC, but the website is also responsive on other device after being tested many times. For more details, you may browse the website https://juieyxyx.github.io/ on any device. (See Figure 14 to 18)

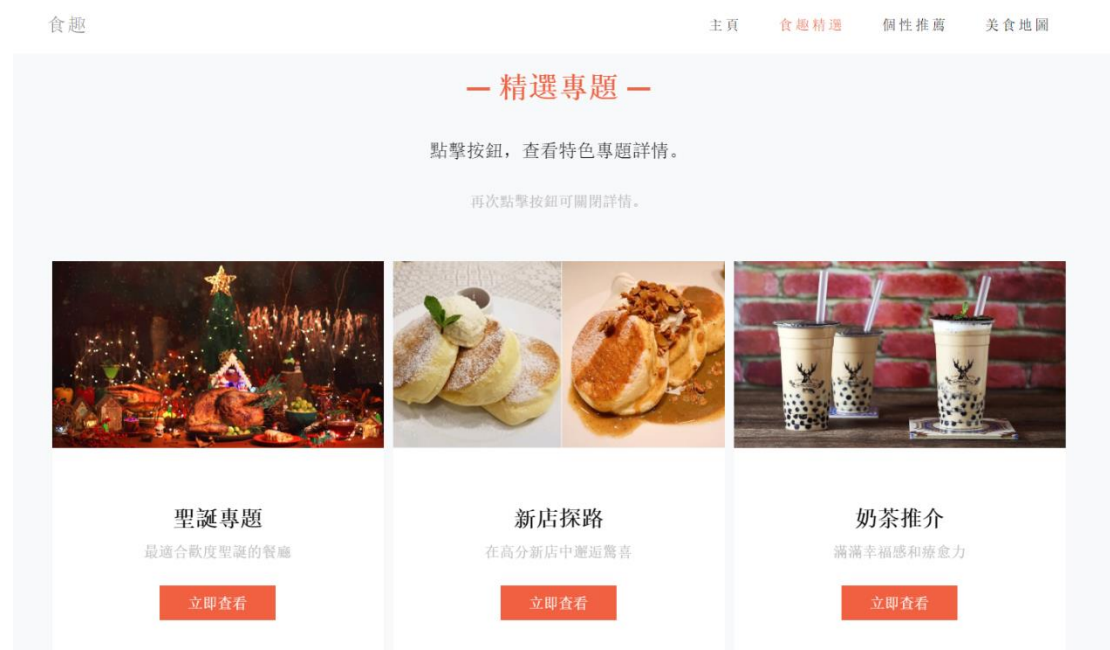*Figure 14. Website Surface — Homepage*

Figure 15. Website Surface — Selected Collections

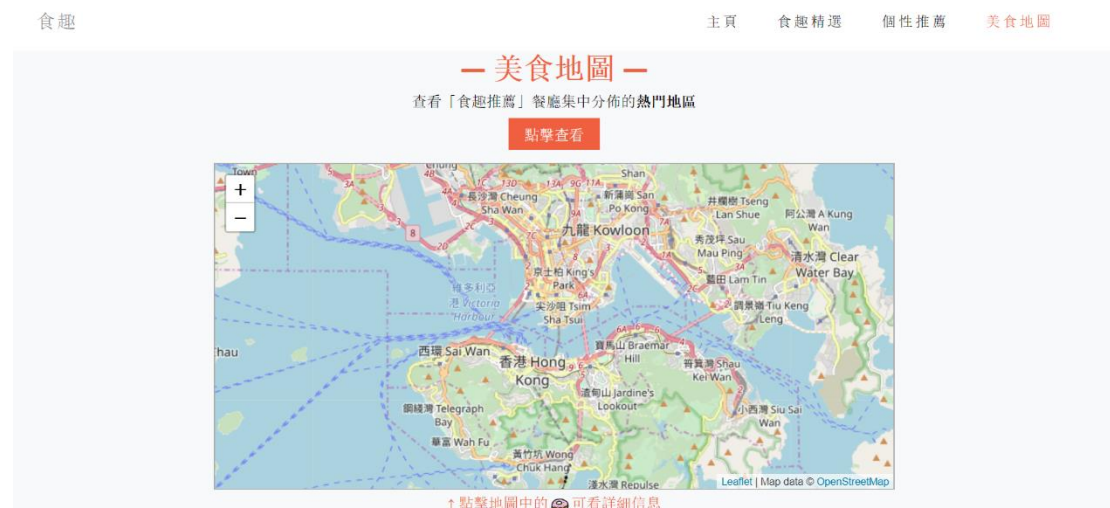*Figure 16 Website Surface — Personalized Categories*

Figure 17. Website Surface — Map of Hot Restaurants

Figure 18. Website Surface — Footer

8. Quantitative A/B Testing

To understand which version of content attracts users most, I conducted A/B testing with the tool of Google Optimize. In the new version, I changed the font size on the homepage by making it more notable. I also replaced the inviting introduction on "Personalized Categories" page by a sentence that clearly and concisely told users what this function was about. (See Figure 19)

Figure 19. A/B versions

After running the experiment for nine days, I have collected some data that could help me decide which version to choose. As is shown in the report, version B has attracted users to view more pages and had more sessions. Besides, it performed better in average session duration too. It also outperformed version A in terms of conversion rates of my goals including staying on the website for more than three minutes, viewing at least four pages and clicking at least one button on my website. Therefore, I chose version B due to the overall better performance. (See Figure 20 to 22)
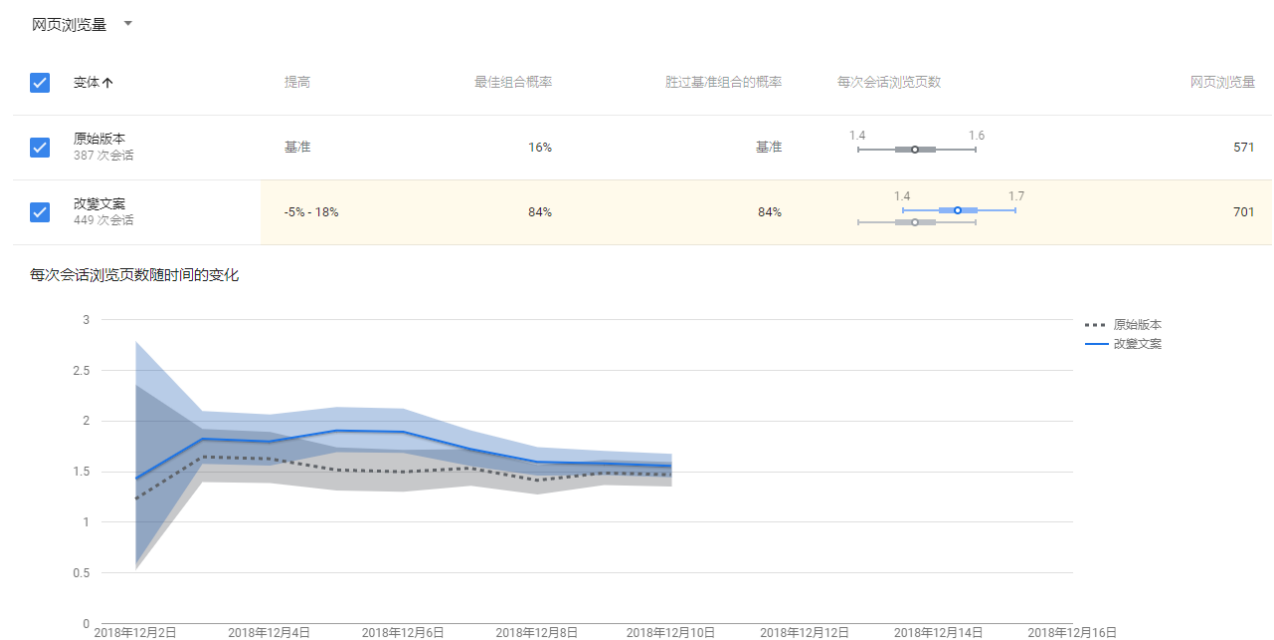
Figure 20. Comparison based on viewed pages

变体	实验会话数 ↓	每次会话浏览页数	平均会话时长
● 原始版本	387	1.48	00:01:36
● 改變文案	449	1.56	00:02:27

Figure 21. Comparison based on experiment sessions and average session duration

变体	实验会话数 ↓	目标转化率	STAY FOR 3 MINUTES（目标 1 的转化率）	浏览不包括footer在内的所有页面（目标 2 的转化率）	1次Click事件（目标 3 的转化率）
● 原始版本	387	29.46%	10.08%	1.55%	17.83%
● 改變文案	449	31.40%	10.69%	1.78%	18.93%

Figure 22. Comparison based on conversion rates of goals

9. Dashboard

Dashboard is a straightforward way to demonstrate how my website has performed by analyzing the metrics. Therefore, I have created a dashboard containing seven metrics that I consider most important in measuring the performance. In terms of session number which reflects how attractive this website has been, my website has performed better than my expectation with 914 sessions created in ten days. However, the average

session duration is not satisfactory enough which confuses me. But shortly I have found the possible reason in another set of metrics — the average loading time of the website is 13.64 seconds which is unbearably long for users. Besides, most users are from mainland China where they have slower speed of internet when opening overseas websites. So, they must have lost patience when loading the pages and it explains the frustrating number of average session duration.

Among all the tagged events, the most rated single event is clicking the button to see Christmas collection of restaurants. This reminds me of the importance of content that is closely related to the upcoming big event or ongoing trend in new media content creation.

Another parameter I care very much is the channels. Since I have promoted my website by posting URL with UTM codes on many social media platforms such as Wechat, Douban, Zhihu and so on, I am eager to view the effect. The result turns out to be quite satisfactory, with Wechat and Douban being the top two channels. This outcome has inspired me to value social media more in the future. (See Figure 23)

What also impresses me deeply is that 83.1% of users surfed my websites on mobile phones. Although I always see from the news that Chinese people tend to choose to go online on mobile device over other device, it is my first time to view the striking percentage on my own website. I realized that I should keep this in mind and always consider the effect of internet product on mobile end in my future work. (See Figure 23)
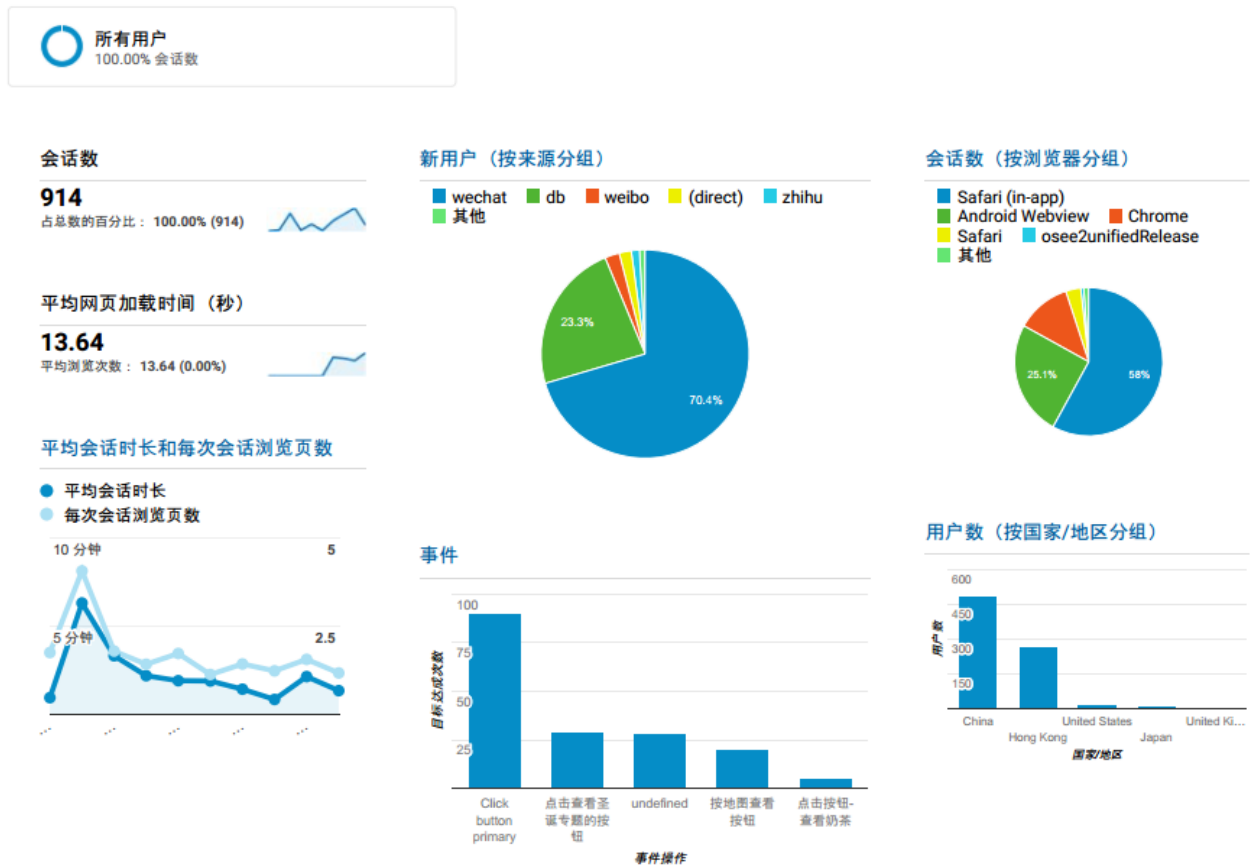
所有用户
100.00% 会话数

会话数
914
占总数的百分比：100.00% (914)

平均网页加载时间（秒）
13.64
平均浏览次数：13.64 (0.00%)

平均会话时长和每次会话浏览页数
● 平均会话时长
● 每次会话浏览页数

10 分钟   5

5 分钟   2.5

新用户（按来源分组）
■ wechat ■ db ■ weibo ■ (direct) ■ zhihu
■ 其他

23.3%

70.4%

事件

100
75
50
25

目标达成次数

Click button primary | 点击查看圣诞专题的按钮 | undefined | 按地图查看按钮 | 点击按钮-查看奶茶

事件操作

会话数（按浏览器分组）
■ Safari (in-app)
■ Android Webview ■ Chrome
■ Safari ■ osee2unifiedRelease
■ 其他

25.1% 58%

用户数（按国家/地区分组）

600
450
300
150

用户数

China | Hong Kong | United States | Japan | United Ki...

国家/地区

Figure 23. Dashboard

10. Conclusion

It was a precious and fruitful experience for me to develop a data-driven website by myself. Throughout the process I gained deeper understanding of the principles of product development from the perspectives of design thinking and computational thinking. Lessons learned from this project will become a valuable source for my future career, and I will bear them in mind to pursue further progress.