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Service and system oriented design exploration on healthy diets and sustainable food systems in China

Lin, Zijun and Sevaldson, Birger

Service and Systems Oriented Design Exploration on Healthy Diets and Sustainable Food Systems in China

Zijun Lin[1,2], Birger Sevaldson[1]

[1]Institute of Design, The Oslo School of Architecture and Design;

[2]Department of Design, Politecnico di Milano

Abstract

Nowadays, China's food system faces significant challenges in the context of rapid urbanization, population growth, dietary transition and climate change. Current dietary patterns are threatening both human health and environmental sustainability. This paper takes the case study of the design project "Panacea Food Lab", which illustrates an approach and practice of combining Service Design, Systems Oriented Design, and Co-creation to explore healthy diets and food system sustainability in a complex context. It aims to design interventions to facilitate the transition to healthy and sustainable diets in young Chinese consumers. The project provides a comprehensive service, including food innovation workshops and online services, by combining the offerings from the various stakeholders. This paper showcases the implementation of utilizing Systems Oriented Design methods to form a holistic understanding of a complex system and explore the potential systemic impact. The importance of long-term goals in a design project is also highlighted. Furthermore, combining systemic thinking with the Service Design and Co-creation approaches is significantly beneficial to proposing services and solutions for complex systems.

Keywords: *System Oriented Design, Service Design, Behavior change, Healthy and sustainable food systems, Social and culture*

Introduction

Nowadays, China's food system faces significant challenges that threaten both human health and environmental sustainability. The food system is a complex web of activities involving different actors from the production to consumption of food. The awareness and need to shift to more sustainable food systems is increasing (Afshin et al., 2019; EAT-Lancet Commission, 2019; Willett et al., 2019). However, the transition to healthy and sustainable diets goes beyond nutrition and environment as to include economic, socio-cultural, and political dimensions, which showcase the complexity (FAO, n.d.).

Traditional Chinese food culture has emphasized health, but nowadays, China has one of the unhealthiest diets in the world (Afshin et al., 2019). Although China's young consumer group values health issues, their dietary behaviors are unhealthy. This is mainly due to the various pressures they are facing from work and life, as well as an inadequate understanding of healthy diets, which lead to unhealthy dietary choices.

This project explores current China's food system in a systemic way and understands the young Chinese consumers in this context. Based on the insights, it takes the case study of the design project "Panacea Food Lab" to illustrate an approach and practice of combining Service Design, Systems Oriented Design, and Co-creation to cope with complex dietary issues.

The project aims to design systemic interventions to facilitate the transition to healthy and sustainable diets in young Chinese consumers, which is the key to a systemic reformation of sustainable food systems in China (Si & Scott, 2019).

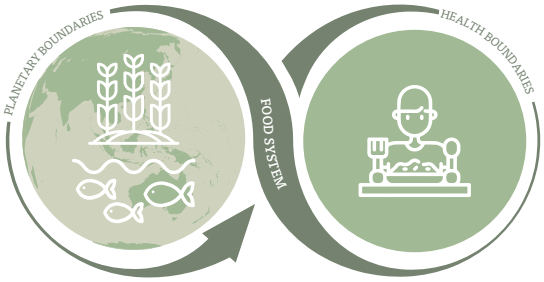


Figure 1. Food forms an inextricable link between human health and environmental sustainability.

"Food is the single strongest lever to optimize human health and environmental sustainability on Earth.

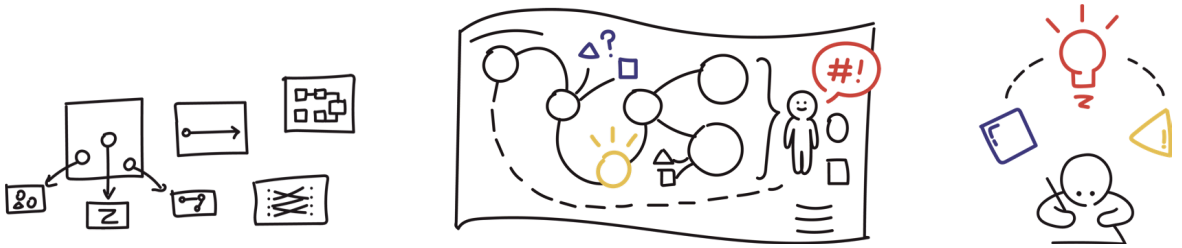
Two 'end-points' of the global food system: final consumption (healthy diets) and production (sustainable food production) have significant impact human health and environmental sustainability."

- Summary Report of the EAT-Lancet Commission on Food, Planet, Health. 2019

This paper concludes with reflections and discussions on the approach, practices, and the systemic impact of the case.

Design Approach

The topics of food in service design or social innovation has been well explored. Service design has demonstrated its potential as an essential approach in promoting food network innovation. Jun Li (2012) studies the service design for the food network innovation, especially the community support agriculture in China, and proposes the design strategy to build a food net and promote a healthy and sustainable food system transition for both consumers and farmers. Taiwan's social innovation platform 5% uses participatory action research to identify key activities in sustainable agriculture, combine with useful service design tools, to facilitate multi-disciplinary ideation among different stakeholders effectively (Yang & Sung, 2016). Besides, systemic thinking is valued by policymakers and social innovation organization. In the Farm to Fork Strategy, one of the core parts of the EU's Green Deal policy, aims to address the challenges and accelerate the transition to sustainable food systems by taking the systemic approach (European Commission, 2019, 2020).



Understand the system *Define where to intervene in the system* *Design the intervention*

Figure 2. Service and Systems Oriented Design approach.

In order to understand the existing food system, food culture, and users in China in a more holistic way, this project is developed combining Service Design and Systems Oriented Design approaches (Figure 2). By using these design approaches, it was possible to have a more vibrant picture of the politics, economics, social, and cultural aspects of Chinese youth's dietary patterns.

Service Design

Service design has become an essential strategic approach to social innovation. It puts the human at the center, utilizes a holistic approach to understand the system, helps co-create with different actors in the system, connects their needs, emphasizes experiences, supports value creation for organizations and reduces delivery gaps (Allen, Reichheld, Hamilton, & Markey, 2005; Mager & Sung, 2011; Yang & Sung, 2016).

Diet is a fundamental behavior in people's lives, and it is influenced by different factors. Consumer behavior varies according to personal preferences, cultural and social trends, and the channels and information provided by different actors. Because of these factors, the service design approach was used to understand the user's dietary perception, consumer behavior, eating experience, and other relevant factors.

Systems Oriented Design

The SOD approach emphasizes that the complexity does not derive from one actor or object in the system; instead, it derives from interconnectedness. In this way, it is possible to combine ethical issues with sustainability, economy, technology, social, cultural, and commercial aspects to discover how to intervene in social issues systemically (Sevaldson, 2013). Therefore, this project incorporated the SOD approach to better understand the Chinese food system's context. By using different mapping, evaluating, and validating techniques, it was possible to analyze the interconnectedness between the various stakeholders, sectors, and areas linked to the food system.

After having a systemic understanding of the existing food system, the project continued to explore and design for potential intervention points. The systemic impact of the design proposal was kept in consideration during the design process, aiming to create interventions with systemic and positive systemic impacts on the food system.

Case study: Panacea Food Lab

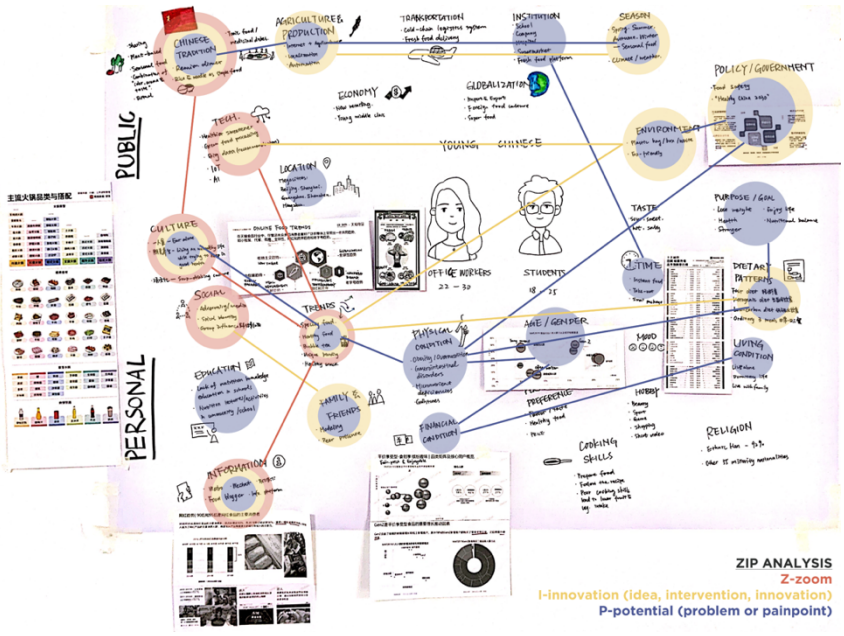
Research and fieldwork: understanding end-users and the food systems

China's food system was studied by fieldwork and secondary research from internet resources. The design research methods were used to conduct the on-field research study to understand the end-users and the socio-cultural environment around them. Then, to holistically understanding different aspects of the system, stakeholders from different fields (such as catering, retail, scientific research, medical care, education, etc.) were interviewed.

Figure 3. Field research, co-creation workshops and experts' interviews in China.

- **Gigamapping and ZIP analysis**

  To better understand the food environment around the target user group, the project used Gigamapping (Sevaldson, 2011) to analyze the gathered data and tried to explore the food system and different factors that might affect the dietary choice and food consumption behaviors of young Chinese. Further, the ZIP analysis (Sevaldson, 2016a) was used to develop Gigamaps and find potential areas for interventions, innovations, and ideas. For example, in this map (Figure 4), the factors from public and personal sides, including cross-cutting factors such as culture, were mapped.



For ZIP analysis:

The Zoom-points (red) indicate that these areas need more research and knowledge for further mapping.

The Innovation-points (yellow) indicate that there are possible interventions or some ideas for innovation among these factors.

The Potential-points (blue) indicate the problems or pain points in these areas.

Figure 4. Gigamapping and ZIP analysis.

After several Gigamapping and ZIP analysis sessions, the following parts were paid attention: Chinese tradition, culture, social impact, trends, information source, education, etc. These parts

have more interconnections and effects in the ZIP points, and there are many possibilities for exploring and innovating from the perspective of service design.

- **Gigamapping and ZIP analysis**

  To better understand this complex system from a holistic perspective, a framework of the food system(HLPE, 2017) was re-illustrated. This framework shows the interconnections and impacts between different sectors.

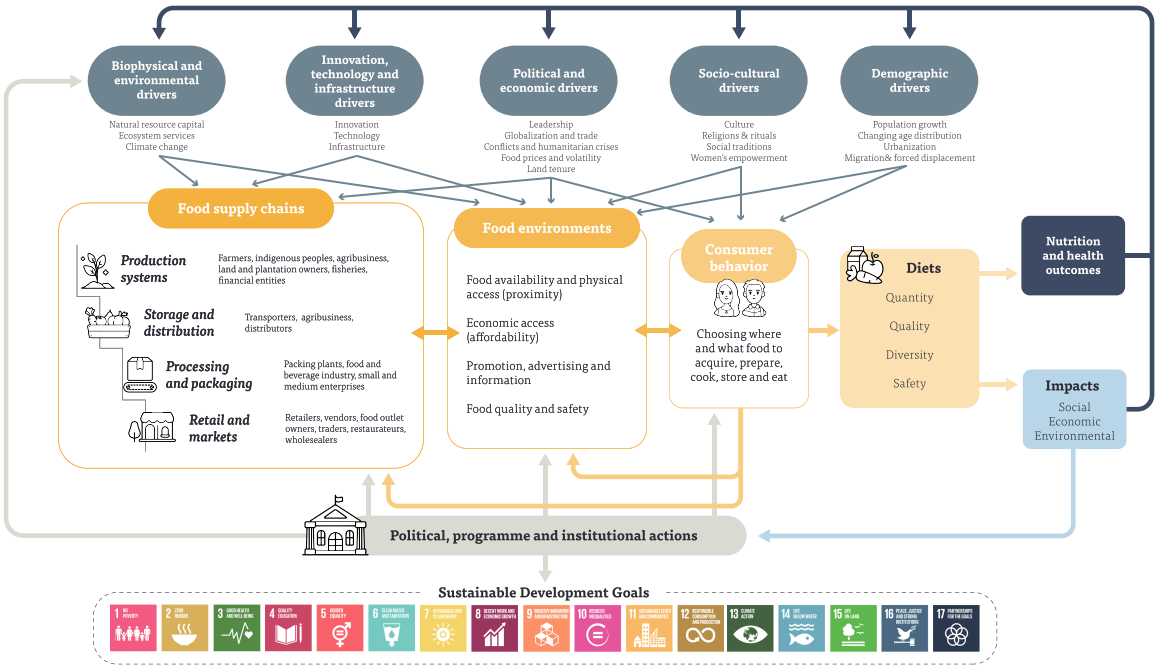


Figure 5. The framework of food systems for diets and nutrition, HLPE, 2017.

Systemic analysis and synthesis: identifying intervention areas

After the systemic analysis of the target user group, China's current food system, and the group's social environment from different perspectives lead to four findings and corresponding opportunity areas. The first three were analyzed from the individual level, food system level, and social context level. The fourth finding is the impact and opportunity that emerged from the current COVID-19 situation.

1. Individual level

Finding: Although young Chinese value health and diet and show a willingness to improve their dietary behaviors, they lack the proper dietary perceptions and knowledge to guide the appropriate eating behaviors.

According to the 2020 China's Health Insights Report (Figure 6), people highly value the significance of a balanced diet for health. Still, many people are not satisfied with their current diet and health status and have tried different ways to improve dietary behavior. However, many young people lack basic nutrition knowledge and have misconceptions about healthy diets. It is not only that these improper perceptions and behaviors do not solve their current health issues, but they may also actually lead to a greater amount of negative outcomes.

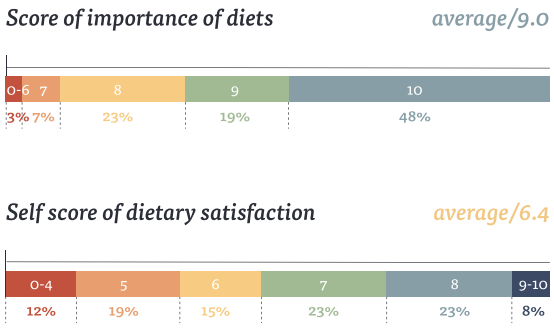


Figure 6. Healthy diet score, 2020 China's Health Insights, Dr. Dingxiang.

For example, maintaining a healthy lifestyle is always a popular topic in China, where it is known as "Yangsheng". The poor health conditions have led young people to consider using traditional "Yangsheng" methods to stay healthy. By balancing modern life indulgences with traditional health tips, a new concept called "Punk Yangsheng (Punk Health)", has been gradually catching on among young Chinese. It is about squeezing "healthy tricks" into the day to make up for other unhealthy habits, reflecting their desire to stay healthy without making too much effort (Danni, 2018).

2. Food system level

Finding: Consumers' behavior can influence the food system through their demand for food.

Food system is a complex and interconnected web. The food supply chain, food consumption environments, and consumer behaviors, as the main process of the food system, are the most essential parts. Interventions in any one of these areas can have systemic effects on the rest parts.

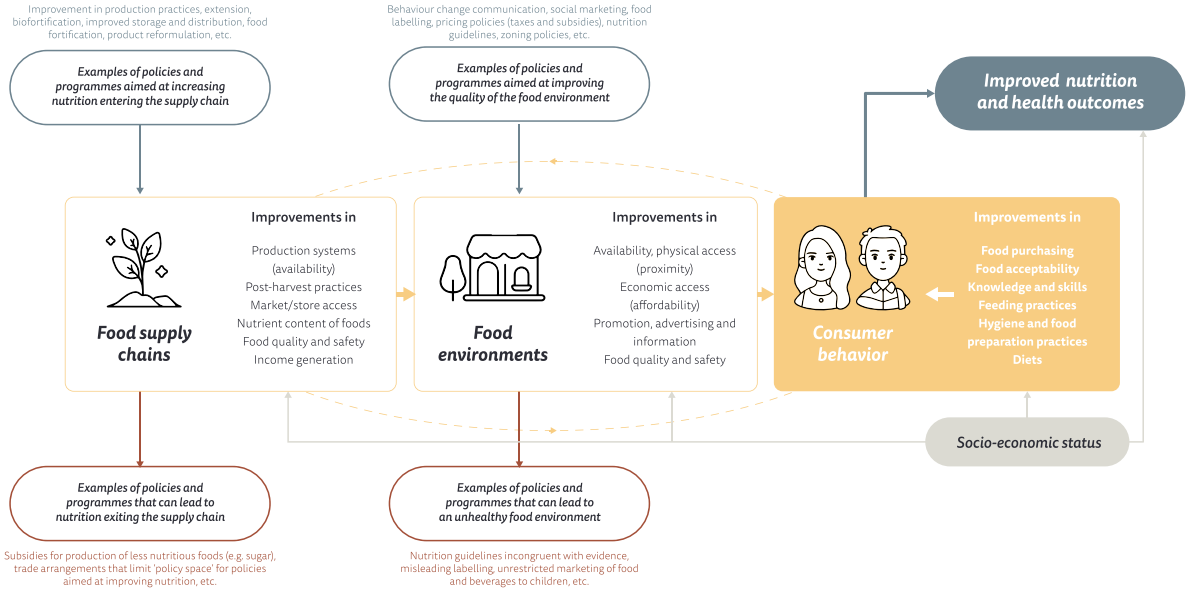


Figure 7. Improved food systems for better and healthier diets, HLPE, 2017.

Figure 7 illustrates how food supply chains interface with food environments and the potential impact pathways that orient consumers towards improved diets and nutrition. The main improvement pathway is enabling consumers to purchase more nutritious and sustainable foods. Entry points to raise awareness among the different actors in the value chain also stimulate demand for nutritious foods.

Therefore, the improvement in the consumer behavior can create a bottom-up impact on the whole food system. In other words, facilitating collective change to healthier and more sustainable consumer behavior can open a pathway towards more sustainable food systems.

Consumer behavior here indicates food-related choices and activities made by people. Consumer behavior is determined by the various individual, interpersonal factors, and the existing food environment, which includes personal and collective determinants of consumer food choices, including prices, income, knowledge and skills, time, and social and cultural norms.

> *"Consumers can shape the food supply through their behavior and demand for specific foods. Demand-side interventions focus on awareness, behavioral change, willingness to pay, knowledge transfer and empowerment to increase demand for nutritious foods and thereby improve dietary patterns."*
>
> *- Food and Agriculture Organization, HLPE, 2017*

It is worth noting that lack of knowledge and information is one of the critical factors limiting consumer access to nutritious foods. This point meets the opportunity area at the individual level and is also related to the third opportunity, food education, which will be explained later.

3. Social context level

Finding: Food education plays an important role in cultivating perceptions and behaviors, but this generation of young people in China has barely received food education during their school days.

Food Education is defined as the "acquisition of knowledge about food and nutrition, as well as the ability to make appropriate decisions through practical experience with food, with the aim of developing people's ability to live on a healthy diet" (MAFF, 2016).

Many countries (mainly developed ones) have recognized the importance of food education. For example, in Japan and South Korea, governments actively promote food education and the retention of traditional food culture to empower students in making proper choices regarding health and food sustainability. Besides, facilitating a cultural shift in people's perceptions about food stimulates local economic growth and protects local farming through large-scale collaboration between the involved stakeholders (Lee, Popkin, & Kim, 2002; Meagher, 2017).

However, this generation of young people in China has barely received food education at school. And many of them do not have enough opportunities to choose their preferred food when they are in school. As a result, when they are relatively economically independent and able to decide on their own food choices, many will choose and consume food based on their "self-satisfaction" as the first priority.

Furthermore, the lack of food education leads to a lack of understanding of the relationship between humans, food, and nature. Many people simply see food as a commodity, not knowing how their choices affect their health and environmental sustainability. Also, Chinese traditional food culture is extensive and profound, but many young people only scratch the surface. The essence of positive and healthy traditional food culture has not been well inherited.

In the future, China's education system needs to increasingly integrate food education as a core element of their national curricula and their school food and health policies. However, the target user group in this project missed out on getting food education in school. Therefore, educating them about healthy and sustainable diets in a way that relates to them is a new challenge.

4. Impact of current COVID-19 situation

Finding: Due to the COVID-19 situation, almost everyone has to stay at home, and cook for themselves.

In 2020, the COVID-19 outbreak had a massive impact on people's lives. This situation not only brought many problems, but it also has created some new opportunities.

Firstly, people have had some changes in their ideas and behaviors of food consumption. They are becoming more rational about consumption and thinking more inward about its value. From the perspective of food consumption, the situation facilitated Chinese consumers to value their health on a new level. It not only makes people realize the importance of healthy diets and promotes the consumption of healthy food, but it also develops a trend and habit of cooking at home.

In addition, due to the social distancing policy, almost everyone was required to stay at home. As an effect the catering industry and take-out food have taken a huge hit. However, the situation also gives people a chance to start cooking at home.

Given the findings described above, the project defines the intervention areas in the consumer behavior section of the food system, aims to intervene from a bottom-up perspective and combines the social and cultural characteristics of young Chinese consumers:

- In healthy diets: Get young Chinese to know more about their eating habits, help them to build the right perception about healthy diets, and take the first step of behavior change.
- In food system sustainability: Build the connection between humans, food, and the environment, to convey the concept of a sustainable lifestyle.

The framework of behavior changing steps

In order to drive a shift in consumer behavior towards healthier and more sustainable practices, the project is theoretically based on the Transtheoretical Model of Health Behavior Change. This model is used to assesses a person's readiness to act on a new healthy behavior (Prochaska & Velicer, 1997).
Based on the Transtheoretical Model of Behavior Change, combing food education with it, the dietary perception and behavior changing were divided into three steps: Knowing, thinking and taking action (Figure 8), as the framework of the service solution.

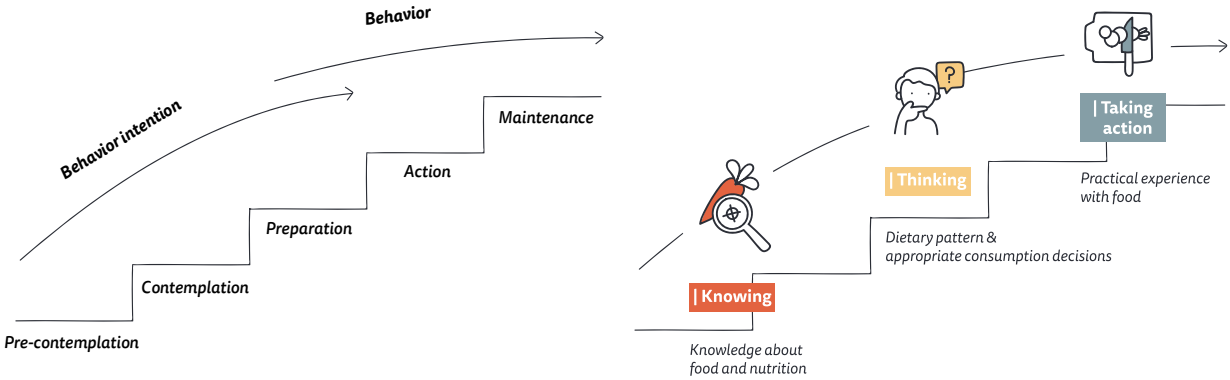


Figure 8. The transtheoretical model of health behavior change (left) and The framework of dietary perception and behavior changing steps (right).

Further design process

Co-design workshop: After defining the specific intervention areas, users and stakeholders were invited to online co-creation sessions again. These sessions further explored ideas on young Chinese consumers' behavior, food education, and opportunities under the pandemic situation. Then we generated several concepts, from individual intervention to changes in the food consumption environment.

Evaluation: A Systems Oriented Design method, Impact and Threshold Analysis (Sevaldson, 2016b), was used to evaluate the potential, feasibility, and systemic impact of different ideas. By analyzing the system Interventions/innovations of Systemic impact, Thresholds, Synergies, Counter the effects (unwanted and counter-intuitive effects) and Resilience. Three potential directions to develop further: Food innovation workshop, Dietary management tools/services and the Eco-food platform were selected as potential directions for further development.

Prototyping and validation: To figure out which idea has a more positive impact on both users and stakeholders, we quickly prototyped three landing pages and showed them to people to get some first impressions and feedback. Most respondents mentioned that it would be nice to combine two or all of these directions to have a comprehensive service. Therefore, based on the mentioned opportunity areas, feedback, and the framework of changing behavior, the project decided to focus on the food innovation workshop. Also, it extracted some of the compelling parts from the other two directions, integrated them into the workshop concept, and developed the final proposal.

Service concept

The final outcome of the project is a service concept called Panacea Food Lab. It is a platform targeted at young Chinese consumers that provides a hands-on educational food experience. The platform aims to build a healthy dietary perception in a defined group of consumers, to further push the behavior change, and finally help to form an overall healthy and sustainable lifestyle.

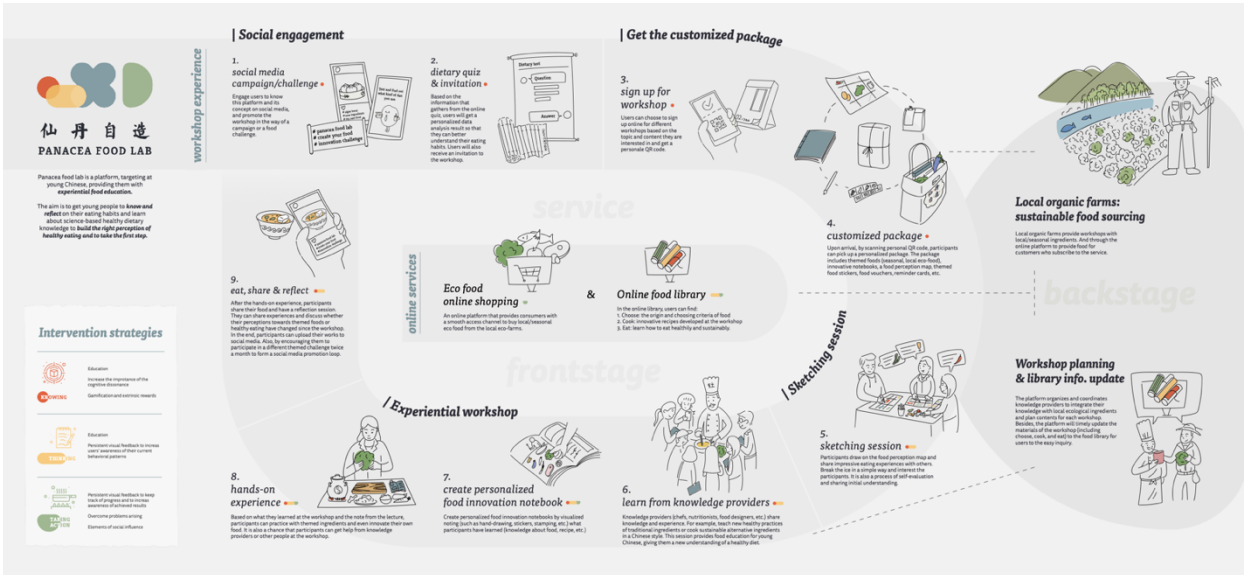


Figure 9. Journey map of the Panacea Food Lab.

Stakeholders

The implementation of Panacea Food Lab is based on the participation of various stakeholders, like food-related social organization, knowledge providers, and local organic farms.

These stakeholders are already working on sharing dietary information and delivering sustainable food to consumers. The food-related social organization is currently conducting some talks and publicity events, which are also some food education implementations. However, the stakeholder's target audiences are mostly primary school students (activities are organized by schools) or young middle-class housewives (who are more concerned about food safety and health). This means the Generation Z consumers, who missed food education at school, are being left out again.

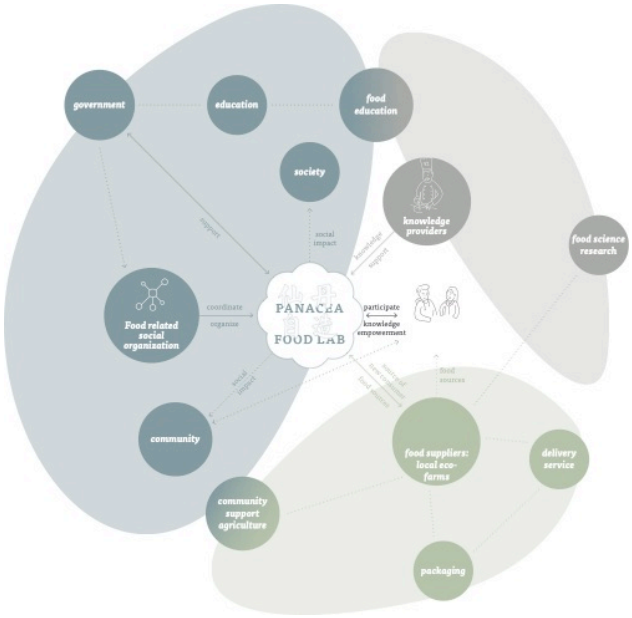


Figure 10. Stakeholder map.

In response to this, the Panacea Food Lab platform combines service providers' existing resources, services, and stakeholders' offerings and implement service solution through the food-related social organization's network. Not only can it provide comprehensive and targeted experiences to the new leading consumer group and expand healthy and sustainable impact, but it can also act as an opportunity to explore the practice of food education in the future.

Service system map and service offerings

The service provides a comprehensive service, including food innovation workshops and online services, by combining the offerings from the aforementioned stakeholders (Figure 11).

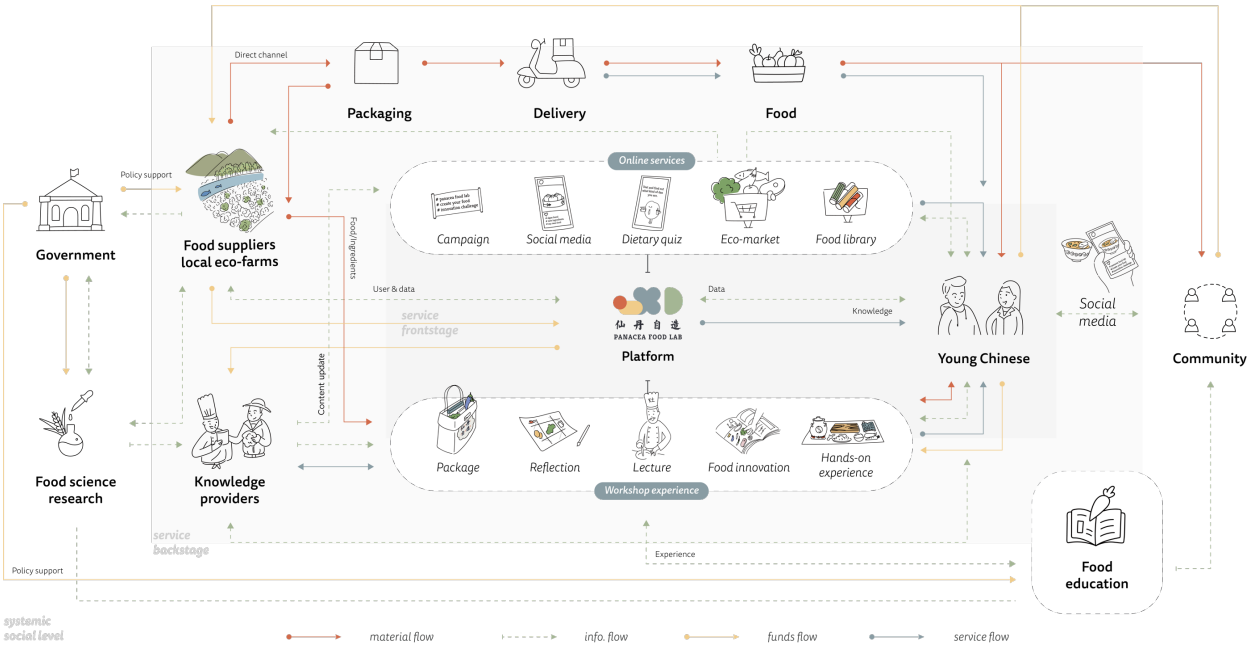


Figure 11. Service system map of the Panacea Food Lab.

The brand image combines the symbols of "Chinese traditional culture" - the myth of panacea, kitchen god and Buddha's hands - with "a science-based diet" – laboratory - to convey the right perception of healthy and sustainable diets.

As mentioned before, when it comes to healthy diets, the young Chinese generation has stereotypes like "just vegetable," "tasteless," and "monotonous and boring". It leads to their lack of interest in knowing healthy eating and even turn to so-called instant Punk Health food, which seems fast and magical like a panacea.

Besides, young people know and identify with traditional Chinese myths. These familiar terms engage them, and they quickly get the idea. Therefore, combining the traditional and modern elements, as well as conventional immortals and science, could convey a positive image and message of the topic.

The food innovation workshop is the core of the service. With knowledge empowerment and hands-on experience, it guides consumers toward building a scientific and healthy dietary perception under an appealing visual context of traditional Chinese culture. Meanwhile, the workshop connects humans, food, and the environment, conveying the idea of a sustainable lifestyle.

- Social Engagement

  Promote the food innovation workshop in the way of a campaign or a food challenge. Engage users on social media and gather their dietary information through online quizzes. Based on the

quiz results, users will get a dietary profile with personalized data analysis so that they can better understand their eating habits.

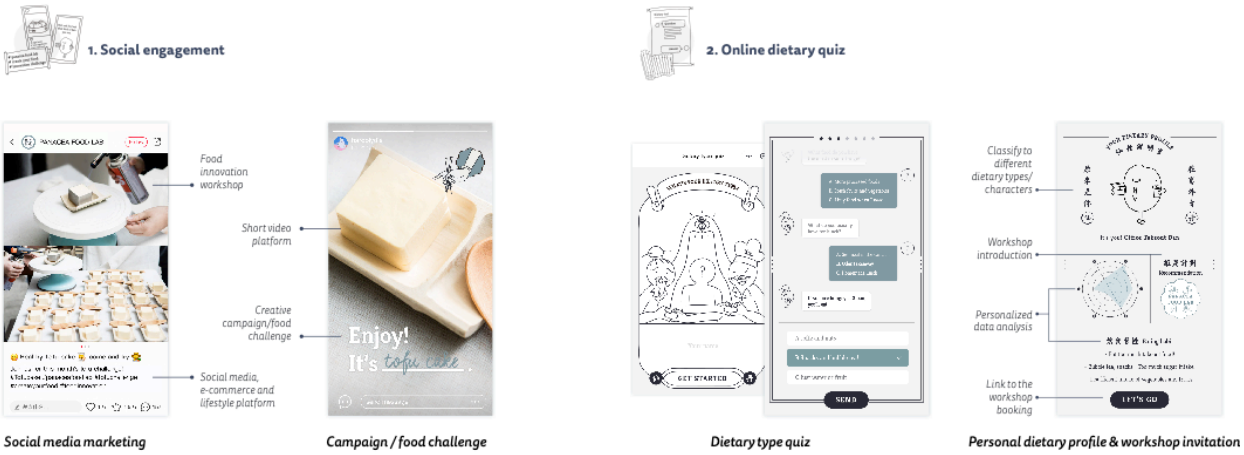


Figure 12. Social media demo pages (left, related pictures source: ChiTofu), Dietary quiz demo pages (right).

- Get the customized package

  Users can choose to sign up online for different workshops based on the topic and content they are interested in. After that, users who sign up for the workshop will receive a customized theme package (Figure 13). The package includes themed foods* (seasonal**, local eco-food), innovative notebooks, a food perception map, themed food stickers, food vouchers, reminder cards, etc.

  ** Themed foods are provided by CSA's (community support agriculture) local organic farms.*
  *** According to the lunar-solar terms, the workshop will be held twice a month, 24 times a year, to make users learn about seasonal food. Seasonal foods are provided according to the lunar-solar terms.*

Figure 13. Contents of the customized package.

- Sketching session

  The sketching session is a practical discussion that participants could think and reflect on their perception of food. The Food perception map (Figure 14) is a template that participants will be asked to draw their impressions or experience of different kinds of food, such as joy food, healthy/unhealthy food, sustainable food, trendy food, etc. Then they can create their own "perfect" food, which is healthy, can make them feel happy, and suit them best. After drawing, they will share and discuss impressive eating experiences with each other. This is also a process of self-evaluation and sharing initial understanding.

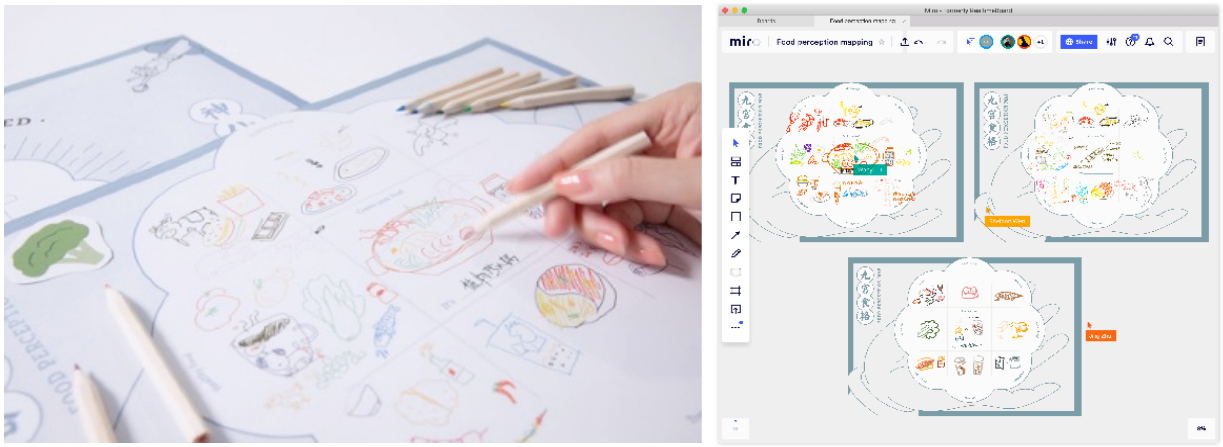


Figure 14. Food perception map (left) and online sketching workshop on MIRO (right).

- Lecture and experiential session

  Physical experience makes a real change. Therefore, providing an experiential session for participants to learn and practice can be a key component for sparking transformations. Knowledge providers share knowledge and experience about healthy diets in the lecture and experiential session. For example, the providers can share new healthy ways of cooking traditional ingredients or cook sustainable alternative ingredients in a Chinese style.

  Food innovation notebook set (Figure 15) is used for noting ideas at workshops. With different templates, participants can note their thoughts and create their personal guidebook by visualized noting (such as hand-drawing, stickers, etc.) what they have learned (knowledge about food, recipe, etc.) Based on what they learned at the workshop and their notes from the lecture, participants can practice with themed ingredients and even innovate their own food. Through this process, participants can access and use foods from local farms and learn about the positive environmental impact of using these foods. After the hands-on experience, participants share their dishes and experience. In the end, participants can upload their works to social media. This encouraging them to participate in the different themed challenges twice a month to form a social media promotion loop.

Figure 15. Stickers and recipe page (left), collection map (right up) and achievement page (right bottom).

The online part of Panacea Food Lab makes the service more accessible and potentially more influential. It includes an online eco-food market that sells sustainable food and ingredients, a food library where users review and share multimedia and interactive food knowledge, and a management tool for users to search and book workshops effortlessly (Figure 16).

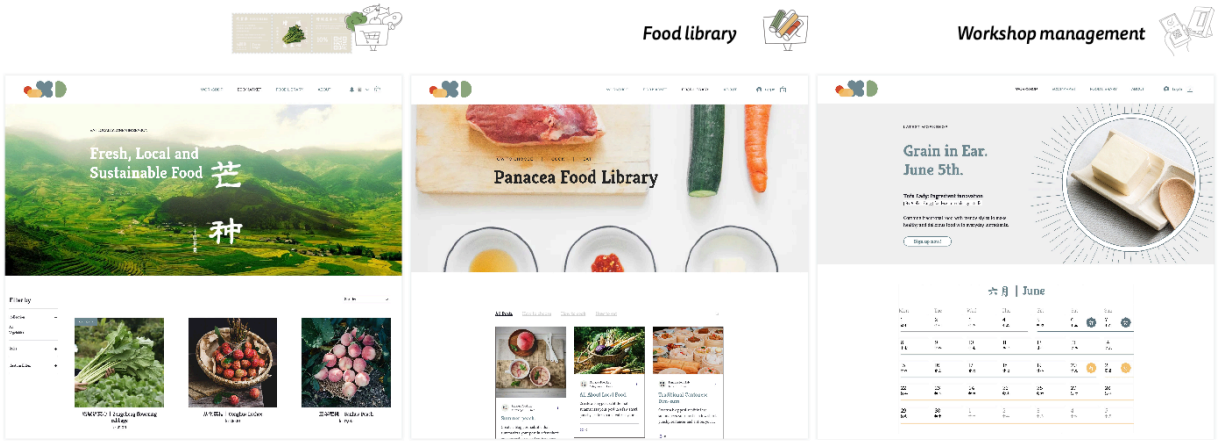


Figure 16. Eco-food market demo page (left), Food library demo page (middle, related pictures source: The French Cuisse Food Blog), Workshop management demo page (right, related pictures source: ChiTofu).

Three Horizon's Framework

Three Horizon's Framework is a futures-oriented approach, relating drivers and trends-based futures analysis to emerging issues. It enables policy or strategy implications of futures to be identified. And it links futures work to processes of change. The Three Horizons model shows three conditions of the same system, over time, against its level of viability in its changing external environment (Curry & Hodgson, 2008). With the Three Horizons Model, this project discussed the future scenarios, impact, and value proposition of Panacea Food Lab in three levels: individual, collective/community, and system.

1st Horizon: It represents the existing solutions for the challenges of dietary patterns and food systems. Today, in China, the solutions for a healthy eating issue is mainly individual-oriented by providing products

and services through technological approaches. Such as digital diet management tools, dietary replacement products, etc.

2nd Horizon: The Panacea Food Lab aims to play a role in this transition phase, help to facilitate a shift on the dietary perception and behavior at the collective level, and improve the target user group's health issues.

3rd Horizon: food education was placed in this phase to discuss the systemic impact of the service concept. Except for having a healthy effect on human health and a sustainable impact on the market and food system, Panacea Food Lab and its experience on food education are expected to promote the exploration and development of food education practices in the education system.

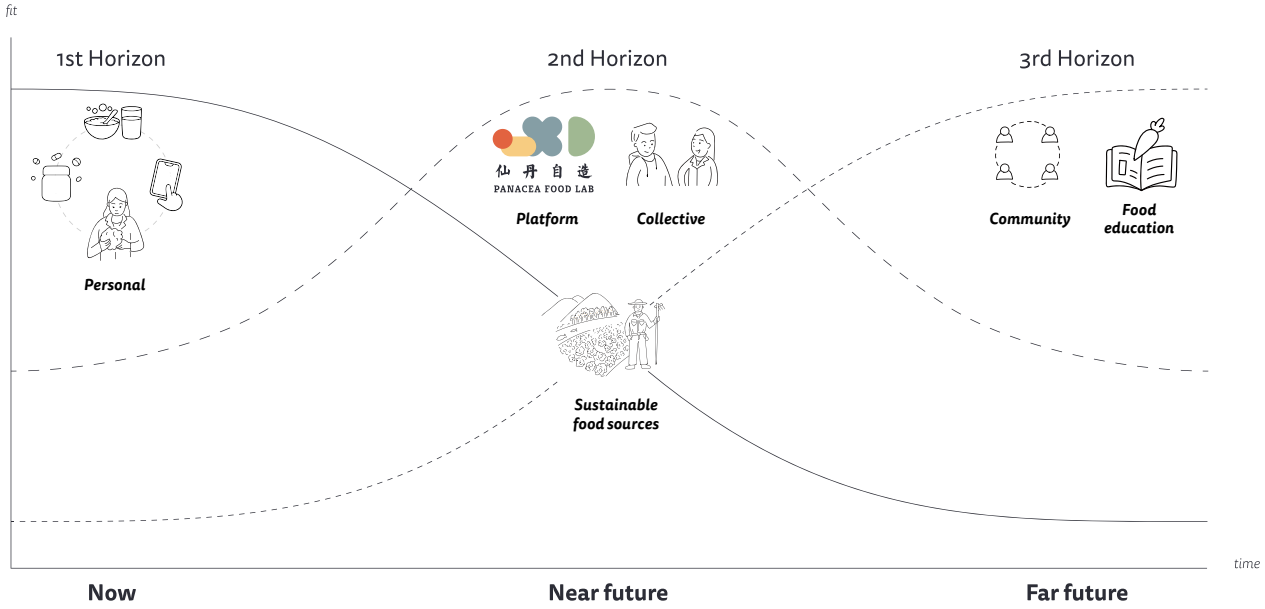


Figure 17. The value proposition in three horizons model.

Discussion

This project takes a systemic study of the current food system and consumers in China intervenes from a bottom-up perspective and combines young Chinese consumers' social and cultural characteristics to suggest the design proposal. In this design process, we have the following reflection and discussion.

Firstly, utilizing the systemic design approach and having a holistic perspective. The challenges of our time are getting more complicated. As designers, we cannot just have one solution-oriented design approach, and it is impossible to propose a solution that solves every problem. However, we can have a systemic perspective when coping with challenges, utilize the power of design to explore the potential interventions, and mobilize different actors to create a systemic impact. In other words, the design solution can be just a small entry point. But the role of the design solution in the system and the driving effect of its interconnection with other actors can have a more significant systemic impact.

Besides, utilizing the systemic design approach may help designers better understand sustainability. This kind of sustainability not only refers to environmental sustainability, but also includes sustainable development such as consumption, human health and development, public perception, and so on. This

sustainability is a long-term goal at a comprehensive level. Looking back at this case's design process, it is noticed that systemic design thinking can help people take a longer view of the problem and provide a long-term goal instead of just focus on solving the current issue. We realized that this solution might not provide an immediate response, and in today's business-driven society, it is a great challenge to engage different actors. But we believe the most reasonable, comprehensive, and sustainable approach is that users have positive impacts on the market, and the market returns to improve the sustainability of the consumption environment. The whole system has a virtuous loop and balance, and actors jointly attempt to achieve long-term goals.

Last but not least, embracing cultural characteristics. Healthy and sustainable eating is one of the hottest issues globally, and there are many successful cases. But mechanically copying other projects might not work well in the local context. In this project, socio-cultural characteristics have always been emphasized. Not only the most apparent brand image, but almost every part is also designed based on the socio-cultural context, and then the designs were brought back to the system. The combination of culture and design can make the content more acceptable to the public, help people communicate better, and make them realize the long-term but essential value.

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