Service Design for Experience in Forest Therapy: A Case study in Xitou Nature Education Area

Abstract: Forest therapy is a way of connecting with nature to promote physical and mental health. With 60% of its land covered in forest, Taiwan is an ideal prospect for such a program. However, most forest therapy services are ill-developed and unsustainable in Taiwan. To address this issue, we first conducted semi-structured interviews of administrators and customers in Xitou Nature Education Area, a forest area with great potential for forest therapy in Taiwan, to explore the context and existing problems. Second, we applied service design to produce a revamped forest therapy program that involved the integration of co-creation workshop and service bricolage. Finally, based on user experience in desirability and feasibility of our concepts, we design new service strategies for forest therapy in Xitou. In academics, the results explore the benefits of using service design in forest therapy. In practice, the results will raise health awareness for forest therapy in Taiwan.

Keywords: forest therapy; service design; service bricolage

1. Introduction

Taiwan is facing a new society composed of intensified urbanization and ageing. Studies have shown that the senior population is set to increase from 16% in 2020 to 30.2% in 2040 (National Development Council, 2020). The elderly related diseases, such as neurosis, depression, anxiety, metabolic problems, and various cardiovascular disease, also increased. In 2017, hypertension patients accounted for 17% of the adult population, of which 54.1% were elderly (Ministry of Health and Welfare, 2017). There is an increased awareness of maintaining health in the elderly. In addition, the same awareness influences the whole population. Regular exercise was performed in Taiwan’s population from 18.8% in 2006 to 33.6% in 2019 (Sports Administration, 2019).

"Forest Therapy" is a way to promote health through the forest environment. 60% of Taiwan is occupied by forests, including low, medium and high altitude terrains, making it a country with great potential for forest therapy. Forest therapy enhances service experience, promotes health, and creates forest parks for industrial development and economic benefits (Ohe et al., 2017). "Taiwan Forest Health Association" was established with Forest Bureau in
According to the reports from Forest Bureau, the number of people visiting the forest recreation area (also known as forest park) increased by an average of 6% per year from 2012 to 2018. However, the forest area that could provide forest therapy services was less than 50% (Forestry Bureau, 2017). Currently, Taiwan has 18 National Forest Recreation Areas under the Bureau, but none have a well-developed forest therapy service. Therefore, people in Taiwan have limited access to forest therapy.

One of the 18 forest recreation areas, Xitou Nature Education Park, was established in 1970 and was part of National Taiwan University. The park contained rich resources in forest and health education research and a high number of visitors and was profitable initially. However, due to the national Long-Term Care Welfare policy for the elderly, their demand for visiting forest parks has increased. Consequently, forest parks faced heavy economic burdens, inadequate human resources, and constrained available resources. As a result, the total revenue showed negative growth since 2019, with the quality of customer service in Xitou Nature Education Park also declining (National Taiwan University Experimental Forest Annual, 2014-2019). To overcome these problems, we should consider making full use of local resources using service design, taking Xitou's forest therapy as an example.

This research aims to improve the current situation of forest therapy services in Xitou. The objectives of this study are (1) to understand the problems faced by Xitou in terms of practising forest therapy; (2) to evaluate and integrate our design of forest therapy services with customers and managers; (3) to construct forest therapy services in Xitou and raise health awareness for forest therapy in Taiwan.

2. Literature review and related work

Based on our objectives, we first introduced the specific aim of forest therapy. Then, we reviewed literature reports on Service Design and Service Bricolage and applied both methods to construct a revamp forest therapy in Xitou. Finally, to establish and evaluate a better forest therapy service system in Taiwan.

2.1 Forest therapy

Forest therapy, also known as "Forest bathing" or "Forest Healing" (Lee, Yu & Chen, 2018), is defined as a way of connecting with nature to promote physical and mental health (Association of Nature and Forest Therapy, 2021). It could be interpreted broadly as a natural remedy to promote health through the elements of the forest. Forest therapy contains four elements: environment, activity, individual, and consistency, to achieve relaxing and comfortable physical and mental effects (Iwao, 2006). Developing a good forest therapy consists of four steps: evaluate participants, formulate goals, specific executive methods, and post-executive evaluations (Iwao, 2006, 2013).
Forest therapy began in Germany in the nineteenth century. Japan is the country with the earliest and best-developed forest therapy in Asia. By 2018, Japan had 63 well-developed forest therapy bases with a qualified certification system cooperating with medical care. The Health Farm FuFu Yamanashi, one of the most popular in Japan, is one such example of a thriving forest therapy model which features abundant health literature, well-described online services and professional guidance. Taiwan developed forest therapy in 2016 (Taiwan Forest Health Association, 2017). However, it is currently not yet well established. Experience from Foreign countries is not sufficient to aid Taiwan’s situation. We believe local knowledge is necessary for development (Yu, Yuan, Tsai & Choiu, 2015).

2.2 Service Design

Service design is an interdisciplinary approach that combines different methods and tools from various disciplines (Schneider & Stickdorn, 2011). It is an approach to design services that balances the needs of the customer and business, aiming to create seamless and quality service experiences (Miller, 2015). Service design as a practice generally results in the design of systems and processes to provide a holistic service to the user (Schneider & Stickdorn, 2011). It helps organizations see their services from a customer perspective (Miller, 2015). Service design is designed for experiences that happen over time and across different touchpoints (Clatworthy, 2011).

The new service design innovations are integrated through six channels: physical people, physical product, physical environment, digital people, digital products, and digital environment (Tang, 2019). Furthermore, Tang et al. introduced the "Three Diamond Design Process" in service design (Tang, 2019). This process includes demand recognition, design iteration, and service verification. The intersection of the three processes includes integrating affinity diagrams of customer needs, the development of conceptual scenarios, and testing in reality (Tang, 2019).

2.3 Service bricolage

Service bricolage aims to solve the constraints faced in the process of innovation. Entrepreneurial bricolage provides new perspectives, discusses the topic of innovation in disadvantages, helps enterprises activate peripheral resources, and turns resistance into assistance. It uses the existing resources to construct physical and cultural resources to practice new service concepts (Hsiao, 2019). The core value of innovation is to reorganize limited resources to relieve constraints (Hsiao, Ou & Yun, 2017). Service bricolage could be helpful for Xitou Nature Education Park, which has limited funds and human resources.

The methods of service bricolage seek to reconstruct physical resources by re-assembling the few or insufficient resources and finding new applications to relieve constraints. These methods include "making use of resources at hand", "making-do with resources", "recombining resources" (Hsiao, 2019; Baker & Nelson, 2005), and "role transformation" (Hsiao, Ou & Chen, 2014). The purpose of resource transformation is to change and create
people's new understanding of the value of resources and bring out cultural values (Hsiao, 2019). In role transformation, background knowledge from each role could be interdisciplinary exchanged through the different participating roles (Hsiao, 2019).

3. Method

This section describes the case and its design process.

3.1 The Case: Xitou

For forest therapy design, this study selected Xitou Nature Education Park in Nantou County. Xitou is rich in natural resources. The park is famous for its fresh air, abundant woodland and tree species, complete trail systems (Riverside trail, Giant tree trail, Ginkgo trail, and University gulley trail), variety of wooden house lodging, and various vegetation types. These unique characteristics provide good experiences and attractions, making Xitou Nature Education Park an excellent place for forest therapy.

Using the three-diamond design process of service design (Tang, 2019) as the research framework, we aim to improve the current situation of Xitou forest therapy (Figure 1). Firstly, we conducted semi-structured interviews of administrators and customers in Xitou Nature Education Area to explore the context and existing issues. We then segmented our customers (Figure 2) and applied Affinity Diagram (Plain, 2007) to organize and summarize the findings.

Secondly, we used a Co-create design workshop to create service design concepts. We then applied the concept and service design methods to produce revamped forest therapy services that involved the integration of service bricolage and transformed local resources. Thirdly, we used Kano two-dimensional quality model analysis (Kano et al., 1984) to understand the satisfaction of Xitou customers with the quality of forest therapy concepts. Furthermore, we studied the feasibility of these concepts from service providers.

Finally, from a macro perspective view on the case study, we examined the design process of Xitou forest therapy. We studied the results, benefits, and limitations by comparing with Japan’s successful case, Health Farm FuFu Yamanashi (FuFu Yamanashi, 2021), and the value brought to the viewpoints of forest therapy in Xitou.
4. Case study

This section presents the case study in terms of the three-diamond design process.

4.1 Demand recognition

Observation of current forest therapy in Xitou shows that Xitou only incorporated health inspections and explanations. Most of the available forest therapy activities were confined indoors, and the characteristic resources of Xitou, such as outdoor nurseries, meadow and arboretum, were not fully utilized. The altitude of Xitou ranged from 1,100 to 1,780 m above sea level. It has four main forest trails (University Pond Trail, Giant Tree Trail, Phoenix Mountain Ridge Trail, and Hiking Trail to Astronomical Observatory) surrounded by various plant species such as cherry blossoms, ginkgo, bamboo, cedar, conifer, and cypress. Also, particular animal and insect species appeared in different seasons, such as fireflies in May to June. However, the current forest therapy programme does not fully explore these trails and explore these species.

We conducted semi-structured interviews with administrators to understand the problems of the development of forest therapy in Xitou. The following excerpts from the interviews nicely summarized the situations faced by Xitou forest park.

- “There are too many elderly people in Xitou, and we need to target them. However, they are not willing to spend money. Therefore, we have difficulty in making money.”
- “The instructions can only work through official documents, which are time-consuming and ineffective.”
- “Insufficient funds are allocating to promote forest therapy from the supervisor.”
- “The basic researches are too complicated for the customers. They cannot understand the value of forest therapy.”
The forest therapy program in Xitou faced the problems of unidentified end-users, absence of internal communication, difficulty in resources integration, and inability to apply the knowledge of forest therapy to customers.

To solve the financial difficulty of Xitou, most of the indoor space and equipment, such as cabins, shops, and restaurants in Xitou, are entrusted to outside manufacturers. External stakeholders and outside manufacturers consequently controlled these resources. Unfortunately, the administrators have poor interaction with external stakeholders. Thus, administrators had to restrain limited resources programs for forest therapy.

### 4.1.1 End-user identification

To understand the end-user for forest therapy, we interviewed 28 Xitou customers. The results are shown in Table 1. They were predominately younger than 65 years old, female, living in the Northern part of Taiwan, and visiting Xitou less than four times a year.

**Table 1. Characteristic of interviewed Xitou customers**

<table>
<thead>
<tr>
<th>Age range</th>
<th>Under 65 years old (n=16)</th>
<th>Over 65 years old (n=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern part</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Middle part</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Southern part</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Frequency of visiting Xitou</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 4 times a month</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Less than 4 times a year</td>
<td>11</td>
<td>4</td>
</tr>
</tbody>
</table>

According to the customers’ behaviours, lengths of stay in Xitou and the quality of accommodation, these customers were segmented into four types: Hedonic, Relaxed, Stingy, and Actuarial, as shown in Figure 2.
From Figure 2, we proposed our end users of forest therapy as the Hedonic and Relaxed types. These two types of customers are more willing to consume and could recognize the value of forest therapy. They prefer high-quality service. However, they cannot provide valuable feedback for the forest therapy due to infrequent visits to Xitou. Thus, we decided to collect feedback from the Stingy and Actuarial types. They visited Xitou more frequently and, therefore, will be able to provide effective feedback that could help the development of forest therapy in Xitou.

Next, we used the Affinity Diagram to organize and summarize the feedback from the Stingy and Actuarial types of customers.

Below are the transcripts:

- "I come here for my asthma. However, I also want to gain more health in general." (Health improvement)
- "Looking forward to applying more knowledge about nature from forest therapy." (Application of health concepts)
- "I like Xitou in the early morning and after three in the afternoon when there are very few visitors. I love to enjoy the quiet atmosphere." (Avoid crowd time)
- "The first aid equipment should be more available because many people fainted in Xitou." (Emergent service suggestion)
● "I will bring walking sticks and mountain climbing shoes to prevent falls" (Safety equipment-recommendation)

● “Forest therapy can be related to plants, sports, and animals." (Learning new knowledge)

● “I decided different trails based on the weather. I will choose the riverside trail on rainy days because I can hear the sound of water." (Different feeling of walking)

● "I will specifically choose walking trails so that it can stimulate my heart, my sweat gland, and my lung to achieve the purpose of the exercise." (Personal suggestion)

● "I like alone, spending time for leisure. Being alone is the same ability as being in a group." (Alone and group ability)

This research summarized the experience from the Stingy and Actuarial customers and provided suggestions to establish high-quality Xitou forest therapy for the Hedonic and Relaxed types of customers.

In conclusion, the development in Xitou forest therapy could be improved by: (1) providing physical examination and regimen for being healthy. (2) avoiding crowded periods. (3) adding trails, food and medical services. (4) proposing attractive forests activities with new knowledge. (5) includes five senses (sight-seeing, smelling, hearing, tasting, touching) of walking trails based on seasons and climates. (6) including sweating training with safety equipment. (7) providing different service choices to individuals and groups.

4.1.2 Service Optimization

By integrating the above interview results from the customers’ experience and the administrators’ difficulties, we used user-centred design thinking to develop five service strategies to optimize forest therapy in Xitou.

The five service strategies are:

(1) Incorporate "Health Concept" and provide more health education to internal employees.

(2) Transform and reuse the natural resources to arrange different schedules of activities.

(3) Proposes activities containing ecological knowledge of animals and plants, with nature interaction, activities with five-sense experience, physical exercise specific to different seasons and climates.

(4) Provide individualized activities.
(5) Be effective in internal and external communication.

4.2 Design iteration

We first held a co-create design workshop with experts to apply these five service strategies to Xitou forest therapy. Then, used service bricolage to transform local resources to propose appropriate forest therapy concepts.

4.2.1 Co-creation workshop

We invited cardiologists, forest researchers, Xitou Park staff, and horticultural therapists to develop a "Health concept" for Xitou forest therapy based on the five service strategies in our co-creation design workshop. The activities of the workshop are shown in figure 3.

![Co-creation workshop](image)

**Figure 3. Co-creation workshop**

In the co-creation workshop, the fifth strategy was found too complicated to solve because of poor forest therapy management systems and an ineffective internal policy delivery system in Xitou.

Theoretically, co-creation is intended to be made with users of the service. However, we did not run the workshops with potential or actual users because forest therapy is a new concept in Taiwan, and we do not have users with enough knowledge of the idea of forest therapy.

The final version of the Health concepts of this workshop was summarized as in table 2.

<table>
<thead>
<tr>
<th>Table. 2 Health Concepts for Xitou Forest Therapy</th>
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<tbody>
<tr>
<td>Health Dimension</td>
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<tr>
<td>Activity Dimension</td>
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<tr>
<td>Manpower Organization</td>
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</tbody>
</table>
4.2.2 Service bricolage

To include these health concepts, we use service bricolage by searching appropriate resources to design new service strategies in Xitou Forest therapy. The large area of forest in Xitou provide abundant potential resources for forest therapy. However, with insufficient funds and shortages of manpower, these resources in Xitou cannot be fully utilized. We analysed the nature of the available resources. Next, we converted inferior resources and developed superior resources in Xitou for forest therapy using service bricolage.

We use service bricolage to include these health concepts by searching appropriate resources to design new service strategies in Xitou Forest therapy. The large forest area in Xitou provides abundant potential resources for forest therapy. However, with insufficient funds and shortages of human resources, these resources in Xitou cannot be fully utilised. We analysed the nature of the available resources. Next, we converted insufficient resources and developed superior resources in Xitou for forest therapy using service bricolage.

We applied service bricolage to develop our concepts. They were first, marking the use of resources at hand. We used the available vacant area in Xitou to develop forest therapy. Second, making-do with resources. We emphasised using materials from the natural environment for the activities. Third, recombining resources. We cooperated sensory experiences into healthy concepts. In addition, we invited the regular visiting customer to be our forest therapy assistants by using the role transformation of service bricolage. We also proposed a digital platform to arrange forest therapy services, analyse health data, and notify customised courses.

Finally, we integrated forest therapy concepts and proposed six forest therapy programs that included different forms of health experience. The six forest therapy programs are Smart Health Station, Seasonal Cuisine, Cabin in the Forest, Forest Activities, Forest Mall, and Volunteer Training Course. In the Forest activity, we further expanded it into Trail Experience, Night Tour, Seasonal Activity, Forest Dance, Art Gallery, Castle Concert, Herbal Experience, and Fresh Done Kitchen, as shown in table 4, figure 3&4.

For customers with walking disabilities, we could build more pavilions, tables and chairs and provide more transportation facilities in the forest trails during forest therapy.

<table>
<thead>
<tr>
<th>Table. 4 forest therapy concepts using service bricolage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category of experience</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Forest Therapy Program</td>
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<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Forest Activities</td>
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</tbody>
</table>

The Smart Health Station is a novel concept. We will set up health examination stations in each Forest Trail of Xitou. Customers could use Mobile App to record their instant blood pressure, heart rate, blood oxygen, and body temperature while walking on the trail. With a digital platform, every customer could receive the distance, slope, time, and calories data that he or she spent. Furthermore, when customers revisit Xitou, they can obtain their previous data for comparison and know how much improvement or deterioration in their health.
4.3 Service Verification

First, we used online questionnaires to survey customers’ preferences. Next, we interviewed the administrator to understand their difficulty in developing the concept of forest therapy.

4.3.1 Characteristics of our survey customer

We sent questionnaires to potential customers who have visited Xitou before but have never experienced forest therapy. Three hundred sixty-two valid questionnaires were returned. These customers were mainly 40-59 years old (66.9%), female (57.1%), working as a businessperson (26.3%), medical service (18.6%), or service industry (16.2%). They lived mainly in the northern part of Taiwan (87.6%). More than half of them were graduated from university (57.4%). Most of them were healthy without physical illness (65.1%). Many visited Xitou less than once a year (84.7%). They preferred a two-day trip to Xitou (62.3%).

4.3.2 Customer preference survey

We analysed the customer preference for items of the Forest Therapy Program. The customers’ top three items were willing to pay for were Cabin in the Forest, Forest Activities, and Seasonal Cuisine, as shown in figure 6.

![Figure 3. Result of willingness to pay for forest therapy program items from 362 questionnaires.](image)

We studied the customers’ satisfaction with forest therapy using Kano two-dimensional Quality model analysis. The result shows that Cabin in the Forest, Forest Activities, and Seasonal Cuisine were “Attractive Quality Service”, as shown in table 5. Thus, these results represent that the forest therapy program should provide these three items to improve customer satisfaction.

![Table 5. Kano Analysis of Customers’ Satisfaction for forest therapy program](image)
In the forest activities, most customers preferred the items of natural activity, including Trail Experience, Night Tour, and Seasonal Activity, as shown in figure 7.

![Figure 6. Customers’ preferences for forest activities](image)

Furthermore, we divided the customers according to the frequency in visiting Xitou into high frequency (more than once a year, 55 people) and low frequency (less than once a year, 307 people) customers. There were no differences between frequency and no frequency customers in forest therapy programs and forest activities.

### 4.3.3 Administrator Evaluation Survey

This study invited four Xitou forest administrators to evaluate each item's difficulty in goal achievement. The results showed that the most feasible was Forest Therapy Mall, followed by Forest Activity. Smart Health Station, Seasonal Cuisine, and Cabin in the Forest were equally challenging. The item with the most anticipated benefits was Smart Health Station, Seasonal Cuisine, and Cabin in the Forest, as shown in Table 3.
There were significant variations in the results of evaluation among the four administrators. The manager believed that most items were feasible, yet the team leader, officers A and B, disagreed, as shown in Table 3.

The administrators also reported that the three items, Cabin in the Forest, Seasonal Cuisine and Forest Mall, were outsourced. Both Cabin in the Forest and Seasonal Cuisine have high anticipated benefits but less feasibility. It is difficult for administrators to operate these two items for forest therapy programs because they were not signed in previous contrast. The Forest Mall was most feasible but with low anticipated benefits because the products were not attractive. Forest activities were highly feasible but with low anticipated benefits. In contrast, Smart Health Station was less feasible but with high anticipated benefits. Lastly, Volunteer Training Course was the least feasible and lowest anticipated benefit.

Table 3. Feasibility and anticipated benefit analysis for forest therapy programs

<table>
<thead>
<tr>
<th>Forest Therapy Program</th>
<th>Manager</th>
<th>Team Leader</th>
<th>Officer A</th>
<th>Officer B</th>
<th>Average</th>
<th>Feasibility Ranking</th>
<th>Anticipated Benefit Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Health Station</td>
<td>Feasibility: 1</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3.25</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Anticipated Benefit: 2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.25</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Forest Activities</td>
<td>Feasibility: 1.75</td>
<td>2.38</td>
<td>3.25</td>
<td>1.75</td>
<td>2.28</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Anticipated Benefit: 1.62</td>
<td>1.88</td>
<td>1.18</td>
<td>2.25</td>
<td>1.72</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Seasonal Cuisine</td>
<td>Feasibility: 2</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>3.25</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Anticipated Benefit: 1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1.25</td>
<td>1</td>
</tr>
<tr>
<td>Cabin in the Forest</td>
<td>Feasibility: 1</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>3.25</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Anticipated Benefit: 1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1.25</td>
<td>1</td>
</tr>
<tr>
<td>Forest Mall</td>
<td>Feasibility: 2</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>2.5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anticipated Benefit: 1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1.5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Volunteer Training Course</td>
<td>Feasibility: 2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4.25</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anticipated Benefit: 2</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>2.75</td>
<td>6</td>
</tr>
</tbody>
</table>

* The lower the number, the easier to improve
# Forest Activities is calculated as the average of eight activities

From the result of forest therapy activities, the most feasible item was Night Tour, followed by Forest Dance, Trail Experience, Art Gallery, Seasonal Activity was equally tricky. In addition, the item with the most anticipated benefits was Forest Dance, Trail Experience, and Art Gallery, as shown in Table 4.

Table 4. Feasibility and anticipated benefit analysis for forest activities
4.3.4 Resolution of forest therapy program in Xitou

The park administrator outsourced the restaurants and cabins, the most popular items in the forest therapy program. They should re-establish their cooperation with the stakeholders, resign their contracts, and provide full use of these items for the forest therapy program. Forest activities showed high customers preference, with high feasibility but low profits. Xitou should rebuild its strategy: aiming at customers who are willing to pay and design high-quality natural forest activities, such as Trail Experiences, combined with high-cost services. We suggest Forest Mall could include fresh local products and agriculture with health appeal to increase the profit. In addition, the results show that the Smart Health Station is not well known to customers, so more promotion is needed to attract customers. Also, we found that The Volunteers Training Courses were in-attractive. We could provide a bonus reward system to encourage volunteer participants.

5. Discussion

This section discusses the benefits of using service design and the value of service bricolage in developing our forest therapy service.

5.1 Service design could be used to improve forest therapy service

Service design could help Xitou develop and establish forest therapy service strategies in the following directions.
1. Identify the right customers
In the past, the park administrators often focused on forest therapy infrequent visiting customers. These customers were not willing to pay, and therefore Xitou had financial difficulty. We suggested that the administrator needs to re-target the end-user who are willing to pay by service design. According to service research, the end-user should be those who visited Xitou infrequently, mainly live in North Taiwan, with business, medical and service industry backgrounds, and prefer high-quality forest therapy services.

2. Create a user-centre design service
Based on user-centred design thinking, we studied feedback from the customers' preference using semi-constructive interviews and a "Health concept" co-creation workshop. The forest therapy concepts are designed as shown in figures 3 and 4. Cabin in the Forest, Seasonal Cuisine, and Forest Activities were the top three items in the forest therapy programs. In addition, Trail Experience, Seasonal Activity, and Night Tour in the forest activities were the top three. Therefore, we propose that forest therapy services include the aforementioned activities and programs to fulfil the users' expectations. In addition, the administrators could collaborate with medical institutions to provide recommendations of the type of services that would be best suited to the users based on their medical reports.

3. Focus on establishing cooperation with stakeholders
Xitou administrators outsourced their accommodation, shops, and restaurants due to a shortage of human resources and insufficient funds. The subsequent low profits, limited resource utilisation, and inflexible reservation of accommodation resulted in difficulty arranging forest therapy programs. To establish an effective forest therapy, cooperation with the stakeholders is crucial in service design. The administrators should clarify their business interests with stakeholders and re-establish new contracts with their stakeholders to develop forest therapy services.

4. Emphasise effective internal communication
From semi-structured interviews with administrators, we found feedback that highlighted poor communication within the organisation due to an ineffective management system. By service design, we suggested that the administrators strengthen their internal communication, understand and develop health knowledge in forest therapy services, and provide health knowledge courses to their employees.

5. Establish digital service channels
We proposed digital channel services to solve the problem of human resources shortage. Through service design, well connected multi-channel services could provide better experiences to the customers (Tang, 2019). The digital platform could provide advertisements, appointments, and remote forest therapist certification training to attract and increase participants. It could also reduce the financial burden. In addition, customers' health results can be integrated and tracked with long-term health benefits.

5.2 Increase the value of forest therapy services with service bricolage

The case study showed that Xitou forest parks should use local resources to revamp forest therapy services. The service design process shows that strategies of forest therapy can be developed effectively by using the following service bricolage to re-assemble and transform natural resources. They are as follows:

1. Making use of resources at Xitou. Use locally available resources smartly, not for the best, but for the right. Enhance the characteristic scenic spot in Xitou, find reusable spaces, and develop them into unique locations for forest therapy.

2. Making-do with the natural forest resources. By re-assembling the natural environmental resources, the idle space is used for forest therapy; the branches and leaves of nature are used as props for sensory experience.

3. Recombining resources of Xitou to the new experiences. With abundant natural resources in Xitou, Forest therapy could strengthen various sensory experiences with forest elements and increase interaction between people and nature.

4. Via role transformation, frequent visiting (mostly are elderly) customers who are good in social skills could be trained as volunteers to promote forest therapy services.

We use service bricolage to assist the administrator in re-establishing new forest therapy service concepts. We make full use of the pre-existing forest resources and help the public to understand forest therapy. These enhancements will raise health awareness for forest therapy in Taiwan.

5.3 Constraints of our forest therapy services

To explore the constraints of our forest therapy service, we used Health Farm FuFu Yamanashi (FuFu Yamanashi, 2021) as an iconic example for comparison. We focused on the differences between these two services on public or private enterprise, outsource or self-run management, and enterprise objectives.

Firstly, FuFu is operated by a private, professional enterprise with defined target customers and customised but diversified service packages in luxury facilities and secluded forests. In
contrast, Xitou is a National University operated unit with social responsibilities, such as education and promoting community development. Therefore, Xitou forest therapy services should accommodate all customers, and the forest belongs to the public. The entrance ticket is low due to the national policy of welfare. Secondly, FuFu closely cooperates with experts and stakeholders in a constructive quotient system. Xitou outsourced its accommodation and restaurant resources due to financial shortage and human resources. We suggested that Xitou design new agreements with stakeholders for forest therapy services. However, the document application is complicated and time-consuming. Lastly, FuFu is led by a health management organisation with nature and health. Education and recreational development are the priority goals in Xitou, while the development of forest therapy is the second. These cause great difficulty in running forest therapy services in Xitou.

To overcome these constraints causing financial difficulty in running forest therapy, Xitou could increase entrance tickets after establishing more attractive programs. Also, charge higher with some forest therapy services. Next, Xitou administrators should learn to make good agreements with stakeholders to profit. Finally, Xitou administrators could cooperate with education, government and health units to invite more visitors and make profits.

6. Conclusion

Our research is the first to use service design to develop forest therapy services. Through service design, we identified the issues for the forest park, identified the right customers, and created user-centred design services for forest therapy. Combined with service bricolage that transforms existing resources into design concepts, these concepts could establish and maximise the characteristics of local forest therapy under limited resources. Service bricolage developed forest therapy service by making the use of resources at forest areas, making-do with the natural resources, recombining resources for the new experiences, and transforming the customers as promoters for forest therapy service. Also, we emphasise the importance of internal and external communication from the service design view. We constructed a comprehensive forest therapy service to promote physical and mental health awareness by incorporating the digital channel concept of service design.

We can develop a holistic forest therapy service using service design and bricolage. In the future, we need to overcome the constraints of Xitou. We expect Xitou Nature Education Park to be a sustainable paradigm of forest therapy services in Taiwan.

6. References


Taiwan Forest Health Association (2017). 林務局森林療癒之發展策略暨行動計畫案 [Development strategy and action plan for forest therapy of Forestry Bureau]. Unpublished documentation.