A Design of Smart Travel Based on City User Experience

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Abstract. Tourism as a typical service industry, which is directly related to the level of quality of service the long-term development of tourism. Perfect service system and high-quality service quality can not only affect the number of tourists and tourism revenue, such as the dominant value, better able to improve the city's reputation and resident people's quality of life. This paper is designed for the study of smart travel of city, first the status of the Nanjing tourism conducted a comprehensive investigation to the theory of service design and user experience as the core, in order to improve tourism services in Nanjing system, through scientific and systematic survey methods(heuristic evaluation, expert interviews , shadow tracking, fixed-point observation, etc.) and advanced and effective analytical methods (affinity diagram , customer behavior maps, etc.), to explore Nanjing Tourism service system inadequate for the service provided by the foreigners . We found foreign tourist pain points and analyzed them and ultimately derived directional insights for improvement.

Keywords: City User Experience, Smart Travel, User Research, Service Design.

1 Introduction

Income growth and technological development is changing the behavior of the travel. Diverse forms of travel are available, and a lot of technological supports are possible before traveling, during, and after. Tourism is travel for recreational, leisure, or business goals, usually of a limited duration. The World Tourism Organizations defines tourists as people "traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes."[1] Smart travel doesn't only focus on the role of technology. It also focuses on the role of user sides. Travel providers have to service effectively, efficiently, and emotionally to the traveler. Travelers interact with travel providers and travel resources (Fig. 1).

Travel resources are nature, cultural sites, facilities, exhibition center, and industry sites. Travel providers are government agencies, enterprises, and organizations. Travel resources and travel providers' services don't only used by travelers, also used by resident people, so called citizen. So if we design travel resources and services, we have to consider travelers and resident people at the same time. In our research users include travelers and resident people. City includes travel resources and travel providers. Model of user city interaction (UCI) is shown Figure 2.



Fig. 1. Traveler's interaction model with travel resources and travel providers



Fig. 2. User-city interaction model

2 Design Characteristics of Smart Travel

Smart travel means travelers travel more efficiently and effectively, and satisfactorily. Travel providers are government agencies, companies, and individual. They provide a variety of services at many levels. So it is not easy to evaluate quality of service in system view or city view. User side evaluation is more acceptable. The following are characteristics of smart travel.

• Total user experience design

ISO 9241-210 defines user experience as "a person's perceptions and responses that result from the use or anticipated use of a product, system or service"[2]. Total means we have to consider the experience from beginning to end. We have not only to consider the experience of a specific time. The value of total experience is not just sum of experience of touch points. First experience and last experience more impact to the user. Best or worst experience highly impact to the user. Before traveling, travelers get the information about destination and reserve transportations, accommodations, facilities. During traveling, travelers experience about accommodation, food, transportation, sightseeing, shopping and entertainment. After traveling, travelers share the experience of the travels and buy local products with internet.

• Effective use of technology

Intelligent cities refer to physical environments in which information and communication technologies and sensor systems disappear as they become embedded into physical objects and the surroundings in which we live, travel, and work [3]. A lot of technology is used in city infrastructure for helping traveling. There are two kinds of technology. One is based on back side system and the other is based on front side system. Back side system is infrastructure on the city. Front side system is touched by users. Traveler's accessibility and connectivity to the internet and network is most critical point in front side system.

Sustainable Service Design

Sustainable design is the philosophy of designing physical objects, the built environment, services to comply with the principles of social, economic, and ecological sustainability [4]. Business sustainability and environmental sustainability are necessary conditions for sustaining travel services. If there is no business sustainability, it is difficult to sustain travel services. Service system design and operation design have to be well designed. Environmental sustainability is important in a world where resources are scarce. Designers have to design systematically to keep natural resources and to reduce individual's ecological footprint.

3 Design Activities for Smart Travel

Understanding, design, and launching are basic activities in design processes of smart travel. Understanding stage, users, providers, and travel resources should be well defined. User includes citizen as well as traveler. Providers include government agencies, companies and non-profit organizations. Travel resources are historical



Fig. 3. Attractive, functional, and must-be elements in Kano model



Interface

Fig. 4. Interaction model between user and city

something, relaxation something, and living resources. Designers have to understand these resources are attractive, functional, and must-be factors based on Kano model [5]. Figure 3 show the three categories in travel resources.

In design stage, service blueprint, service architecture, and service interaction have to be designed. Communication strategies also have to be planned (Figure 4)

In launch stage, we have to evaluate the service system and also plan the operation

4 Case Study: Nanjing Culture City

Nanjing is the capital of Jiangsu province in China and has a prominent place in Chinese history and culture, having been the capital of China on six dynasties. Cultural tourism has been defined as the movement of persons to cultural attractions away from their normal place of residence, with the intention to gather new information and experiences to satisfy their cultural needs [6]. In this study we define the users by four types as shown Figure 5. We focused on foreigners (A, C types) but also considered domestic people (B, D types).

	Foreigner	Domestic People
Residents	A type	B type
Non- Residents	C type	D type

Fig. 5. 4 types of users for Nanjing research



Fig. 6. A spatial and time framework in Nanjing

Nanjing has rich historical resources. In order to understanding the resources, designers use time and space framework. Nanjing was investigated the historical places with mapping the spatial information. (Figure 6)

Service providers include government agencies, companies, and non-profit organizations. Three entities and relations for smart travel are shown figure 7. Users have 6 categories of tasks about food, accommodation, sightseeing, shopping, and entertainment between users and travel resources.



Fig. 7. Relations between three travel entities

In order to improve travel services in Nanjing through qualitative and systematic research methods (heuristic evaluation, expert interview, shadow tracking, fixed-point observation, etc.) and advanced and effective analytical methods (affinity diagram, customer behavior maps, etc.) are researched (Figure 8)



Fig. 8. A research map for Nanjing travel improvement

User study is considered their total lifecycle; before travel, during, and after. (Figure 9) Before traveling travelers focus get the information and reserve transportation and accommodation. During traveling travelers are doing 6 categories of tasks. Travelers showed different behavior between independent and associated travel.



Fig. 9. User's activities in travel lifecycle

After analyzing the user data, expert opinions, and desk research data, we found strength and weakness in Nanjing travel services. We had creative, design and critique workshops to improve travel service system in Nanjing. We suggested solutions based on attractive factor and must-be factors.(Figure 10) We suggested many experience based solutions for attractive resources. We also designed detail scenarios and user experience.



Fig. 10. Solution directions in Nanjing travel

5 Conclusion

Users, Providers, and Resources have to understand at the same time in design of smart travel. Smart travel based on considering total user experience design, using proper technology, targeting sustainable situation. We researched a rich culture city, Nanjing. Before traveling, travelers get the information about destination and reserve transportations, accommodations, facilities. During traveling, travelers experience about accommodation, food, transportation, sightseeing, shopping and entertainment. After traveling, travelers share the experience of the travels and buy local products with internet. We found a lot of insights to improvement travel service system in Nanjing.

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