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The User Experience Research of Theme Park APP

A Case Study of Shanghai Disney Resort*

Xiaowen Hu
School of Management
Northwest Minzu University
Lanzhou, China

Shengpeng Wang
School of Management
Northwest Minzu University
Lanzhou, China

Yi Li
School of Management
Northwest Minzu University
Lanzhou, China

***Abstract*—With the development of internet techniques and adoption of mobile devices, touristic APPs becomes more and more popular, yet few research focused on tourists' on-site experience and perception with these APPs. Data was collected through online reviews in Apple's store. Word frequency analysis and sentiment analysis were applied to identify the most mentioned issues and overall emotion of SDR APP. The findings unearth time management is the key point to improve tourists' experiences while basic functions of APP cause negative perception of APP. Practical implications for government, operators and theme park managers are provided to create more value from tourism related APPs.**

Keywords: Shanghai Disney Resort APP, word frequency analysis, sentiment analysis, user experience

I. INTRODUCTION

With the increasing development of internet techniques and rapid adoption of mobile technology, smartphone users have enabled users to read, search and negotiate daily, which led to a radical social transformation (Ofcom, 2019). Compared with other industries, the adoption of mobile telephone and its apps are more ubiquitous in tourism industry(Dickinson et.al, 2014). These mobile devices and apps have been utilized for various purposes to significantly affect tourists' experience and potential purchase behavior as well as fundamental relationship between time- and-place-related travel patterns(Dickinson, Ghali, Cherrett, Speed, Davies, & Norgate, 2014; Ghaderi, Hatamifar, & Ghahramani, 2019; Wang & Fesenmaier, 2013). As a salient part of comprehensive experience, utilization of tourism-related apps may influence the whole tourists' experience. Nevertheless, few current studies explore the touristic user experience of apps. Given the rapid adoption and growing universality of associated apps along with mobile technology, there is a need to explore the experience of tourism-related apps.

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II. LITERATURE REVIEW

A. Apps use experience

Patients' experiences of using real-time application becomes popular in medication monitoring industry(Broglia, E., Millings, A., & Barkham, M. 2017; Olalla, J., de Lomas, J. M. G., et.al. & Stachowski, J. P.,2019; Lindgreen, P., Lomborg, K., & Clausen, L.,2018; Donald, A., Cizer, H., Finnegan, N., Collin-Histed, T., Hughes, D. A., & Davies, E. H. ,2019).Methods include in–depth analysis and two-arm nonrandomized design to observe patients' acceptability of related mobile app and their well-being. Some studies highlight the significance of this mobile health technology (e.g.Choet.al., 2019; Donald, A., et.al., 2019), while some trial reviews no significant differences (Olalla, J.et.al.2019).

B. App use in tourism

Tourism industry has the nature of complexity (Faulkner & Russell, 1997; Zahra & Ryan, 2007) and at least four major sectors are included in this domain: hotels, restaurants, transportation and destinations/attractions (Deuschl, D,2006), and some studies have investigated in research areas of hotels, restaurants and transportation(e.g. Wang, D., Xiang, Z., Law, R., & Ki, T. P. ,2016; Sun, Z., Wang, Y., Zhou, H., Jiao, J., & Overstreet, R. E.,2019; Guptaet.al., 2007; Ozturk et.al, 2016; Yang & Leung, 2018).

As a significant component of tourism attraction, the sustainability of cultural heritage in tourism attracts some researchers' attention. Some augmented Reality Tourism Systems are developed via a smartphone-based platform to enhance tourists' experiences and protection of heritage (e.g. Gomez-Oliva et.al., 2019; Shihet.al., 2019; Suet.al., 2019).

However, on-site touristic experiences with the use of technology still need more research (Kirova & Vo Thanh,

2019). With mixed research methods including an ethnographic approach, leisure experience narratives, and phenomenological interviews, Kirova and Vo Thanh revealed the key role played by smartphone that tourists' experience can be enhanced through hedonic and relational use of app in theme park.

Despite the meaningful contribution of these studies, little research identifies the touristic related app use by user generated contents. To narrow this gap, our study aims to understand the tourists' perception of smartphone apps and their emotions.

III. METHOD

A. Background

As a world-famous company providing tourism products for theme parks, Disney opened its Shanghai Disney Resort (SDR) on 16th, June, 2016 to welcome customers. As the second largest theme park in China, the tickets of SDR were sold out in just a few hours after being available online (Zacks, 2016).Due to its wide popularity in China, more and more tourists visit SDR, which induces a crowd problem (La Jolla, 2017).Therefore, analysis of the tourists' perception by collecting reviews of the SDR app will provide an appropriate data source.

B. Big data

User-generated content (UGC), which is also called Big Data, has the nature of volume, velocity, variety, variability and volatility (Power, 2015), and increasing attention has been attracted by more and more researchers and business operators (Miahet.al., 2017). Compared to traditional research methods (e.g., questionnaire surveys and interviews), its comprehensive and effective characters provide a better approach to explore some important issues in tourism related research including tourist perception and emotion (Liu et.al., 2019).

C. Data collection and processing

The main data source in our research is online customers' reviews of Shanghai Disney APP, which is available on Apple's app store. By collecting data manually, there are a total of 1089 online reviews in the three years since the APP was developed from 2016 to 2018. After screening out all the reviews, we culled some unrelated data, and the total number of final sample data available is 626. The samples of online review on SDR review from Apple's store are as shown in "Table I".

TABLE I. SAMPLE OF ONLINE REVIEW ON SDR REVIEW FROM APPLE'S STORE

#	online review content
1	Rely on this app，we can know all the queue time to know where you go next. It was very useful.
2	I want to create a new account, but why can't I receive my mobile phone verification code? I don't know why, I have tried it several times and uninstalled and reinstalled it, but it didn't work. But I need to get a quick license from this app ,so How do I play in SDR?
3	I Can't register now. It's hard for you to register. I hope to solve it soon.
4	Wish everyone a magical day.
5	It really helps to arrange a queue waiting time reasonably.
6	Why can't I register for an account?
7	Can I book a ticket on this app? Why can't I find reservation information?
8	Awesome!It includes real-time queuing information, maps of the park. The best thing is that you can directly get free fast passes, which are convenient. Tickets can also be purchased directly. Give it a like.
9	This software is pretty good because it will show instantly how long to queue, which is very instructive for visiting SDR.

In our research, we apply word frequency analysis and sentiment analysis. Word frequency analysis(WFA) is a significant research method to analyze and reveal important words in bibliometrics (Liu, Y., Wang, Y., & Li, M.,2017). The basic principle of WFA is to determine the hotspots and their changing trends by analyzing the frequency of the words appearing in the text. The online reviews of SDR app were collected and ROST Content Mining software was applied to analyze word frequency to show the tourists' real perception of Shanghai Disneyland APP and their touristic experiences when they visit the SDR.

Emotion is an important aspect of human beings, and understanding and analysis of emotion is critical in data mining (Cambria, 2016). This method shows users' various emotional perception of the SDR APP, which is helpful to market prediction and marketing implication.

IV. DATA ANALYSIS

A. Word frequency analysis (WFA)

"Table II" shows high-frequency words. First, analyze the part of the speech of high-frequency feature words. Nouns mainly include 'time', 'software', 'projects' , 'paradise', 'functions', etc., with the largest number, accounting for 38.6 % of the total; the number of verbs are second, within 35.7 % of the total, mainly including 'queue', 'register', 'wait', 'help', etc., which show users' use of the Shanghai Disneyland APP Activities and behavioral characteristics; adjectives include the feeling of the app when tourists travel, including 'convenient', 'practical', 'fun', 'detailed', accounting for 24.3 % of the total.

From the 10 most frequently used words, "time" is the word most frequently mentioned by tourists, reflecting the most important function of the SDR app. To make better use of time and improve efficiency is the biggest perception of SDR APP, which enhances tourists' positive experiences. As

a kind of " software ", the nature of Shanghai Disneyland APP is a vocabulary mentioned by many users; the third-ranked adjective 'convenience' and the eighth-ranked adjective 'practical' is the precise satisfied evaluation of the app and the overall experience of the user using the app; 'queue' and 'project' shows the crowed problem of SDR that profoundly impact on tourists, and these two words also reflect that this APP relatively solves a part of the queuing problem; the fifth-high-frequency word is 'register'. It is the biggest problem that users encounter when using the Shanghai Disneyland APP. From the collected comments, users of this APP sometimes cannot receive the verification code when registering an account and the single registration method makes users dissatisfied. The words " expecting " and " playing " can reveal that the appearance of the APP, to some extent, led to more passion for the tourists' coming visit experience.

TABLE II. PART OF HIGH-FREQUENCY WORDS OF ONLINE REVIEW OF SDR APP

#	words	frequency	#	words	frequency
1	time	137	23	connection	16
2	Software	86	24	account	15
3	Queue	80	25	facility	15
4	Register	68	26	question	14
5	Item	59	27	version	14
6	Paradise	54	28	open	14
7	Practical	49	29	service	13
8	Function	40	30	fast	13
9	Look forward to	39	31	set	13
10	Play	38	32	invalid	13
11	Mobile	37	33	interface	13
12	Map	34	34	accurate	13
13	Shanghai	31	35	reasonable	13
14	Verify	31	36	tickets	12
15	Required	31	37	happy	12
16	Wait	26	38	mailbox	12
17	Help	25	39	timely	12
18	Disney	25	40	park	11
19	Fun	23	41	position	10
20	Place	22	42	attraction	10
21	Application	20	43	garden	10
22	Arrange	19	44	choice	10
23	tips	18	45	pass	10
24	character	18	46	special	9
25	create	17	47	pleasure	9
26	friend	17	48	super	9
27	junk	17	49	artifact	9
28	essential	16	50	prepared	9

B. Sentiment analysis

Sentiment analysis is the process of analysis, processing, deduction, and inference on certain text. Table 3 shows sentiment analysis of online reviews of the SDR app. Among all the comments of SDR APP, 60.86% were positive, while 16.93% was negative.

TABLE III. SENTIMENT ANALYSIS OF HIGH-FREQUENCY WORDS

Positive emotions	381 Articles 60.86%
Neutral emotions	139 Articles 22.20%
Negative emotions	106 Articles 16.93%
The statistical results of the positive emotion segmentation are as follows:	
Fair (0-10) Moderate (10-20) Height (above 20)	194 Articles 30.99% 109 Articles 17.41% 78 items 12.46%
The statistical results of the negative emotion segmentation are as follows:	
Fair (-10-0) Moderate (-20—10) Height (below -20)	88 Articles 14.06% 12 1.92% 5 bars 0.80%

As "Table III" shows, the number of general positive emotions in overall positive emotions is higher than the other two parts, accounting for 30.99%. For example, "the waiting time can be arranged reasonably; ok, you must go to Disney"; "the waiting time for each item is accurate." Similarly, according to statistics of negative emotions, the number of general negative emotions is higher than other parts, accounting for 14.06%. Comments such as "The overall is not bad, but the last time I played Flying Leap Horizon showed 120 minutes in line but I waited there three hours"; "This APP keeps crashing unexpectedly. What's going on?"; "Why is this app (supplied for Chinese tourists) designed in English?" These results show that its function does efficiently meets tourists' demand of time management and enhance visitors' touristic experiences. However, the biggest shortcomings of APP are problems such as quitting unexpectedly, difficulty in registration, and insufficient user-friendly interface and interaction, which causes negative experiences during travel in SDR.

V. CONCLUSION

The biggest overall image perception of the Shanghai Disneyland APP by users is high-frequency words such as "time", "convenience", and "practical", so that they can get map guidance for the app, save time, improve play efficiency, and be useful for travel strategies The evaluation of the certification and other evaluations; on the other hand, the overall image perception is high-frequency words such as "registration" and "verification". The biggest problem in obtaining the APP is that it cannot receive the verification code and cannot register.

From the results of sentiment analysis, users still have a positive attitude toward Shanghai Disneyland APP software and relatively negative attitudes. For the developers of the Shanghai Disneyland APP, the advantages of the APP in the eyes of users should be maintained and improved. Meanwhile, developers should pay close attention to every negative comment and try to solve the problem existing in the APP.

From the analysis of online reviews commented on by tourists, map navigation and display of waiting time for various amusement facilities are the special features of the

SDR APP, but the difficulty in registration and logging in is the biggest problem in the utilization of its APP. Based on users' feedback, a more complete development of the Shanghai Disney App should be promoted to maximize the revenue of Shanghai Disneyland.

A. Account registration difficulties

At the national level, mobile Internet technology should be developed to increase mobile communication capacity and increase mobile Internet transmission rates. Wireless network coverage of various scenic spots and theme parks in China needs to be significantly improved to provide free WiFi, so that functions of navigation, query, booking and other activities will be applied more conveniently.

At APP operator level, more registration methods should be involved, such as mailbox registration, WeChat registration, and direct login by using other famous website accounts. The website administer system needs to be improved to improve customer service quality in order to reply to doubts and give guidance. Then the frequency of communication between operators and tourists will be higher and it helps to imply marketing tactics and gain trust.

B. App interaction

It is needed to keep the balance between rich mobile functionality and a streamlined interface, streamline the content page and pop-up card-like presentations of unnecessary information, and use navigation settings to organize or recognize overly detailed information to show brief information.

Virtual community entrance navigation needs to be set to allow users to enter the community in real time to participate in interactions, such as reviews, travel notes, quizzes, companions, etc. to open up a new model for user interaction.

C. Other problems

It is important to add the function of emergency message notification to prevent tourists from missing important events. Every facility in the SDR does not have an impressive introduction and cannot be understood literally. It is recommended to add videos or more pictures or people's comments so that tourists can easily understand each recreation facility, so it is more convenient for tourists to decide whether to play or not. In addition, it is necessary to add a complaint suggestion function so that users can reflect the problems in the park in a timely and effective way. Meanwhile, the timely number of visitors per day in SDR can be displayed in the APP during peak hours, so tourists can go somewhere else to steer clear of rush hours.

Although this APP was developed for public use in 2016, its publicity effort was not enough. Therefore, the majority of tourists knew little about the SDR APP or even did not know that SDR APP. Meanwhile, more distributions of the download of SDR APP are still needed. Major mobile phone communication operators and APP stores of various mobile phone manufacturers can be utilized. Make full use of popular public platforms such as forums, Weibo, WeChat and Official Account, and to official websites for marketing promotion.

D. Limitation and further research

As the Shanghai Disney Resort is still in the booming stage, and new products may frequently appear and the version of APP is updated quickly, so there may be a limitation when collecting data. In addition, the evaluation of APP quality performance relies heavily on some indicators including compatible adaptation rate, activation time, CPU usage, and memory usage. Therefore, some negative reviews published online may be caused by insufficient performance of some tourists' smartphones, instead of the SDR APP itself. Moreover, our research is based on the data collected online reviews of SDR APP. Some other data may be used to identify more problems with touristic APPs.

Future research may consider some other data sources and research methods to gain further insights about this area. Moreover, more special professional talents should be cultivated to promote tourists' and users' experience.

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