Identifying the Combinations of Perceived Value and User Features for Enhancing Continuance of Theme Park Apps: A fsQCA Approach

Completed Research Paper

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Abstract

Drawing on perceived value theory, this study applies a fuzzy-set qualitative comparative analysis (fsQCA) to examine how different combinations of sub-dimensions of perceived value (including functional, convenience, hedonic, and social value), together with user features (smartphone use habit and travel frequency to theme parks) motivate users to continue using a theme park app from a configurational approach. Further, the functional value was proposed to include five components: real-time information, map navigation, online order, virtual queue, and recommended routes. By analyzing empirical data collected via an online survey in China (N = 347), this study found six different configurations of causal conditions for inducing continuance usage. Particularly, online order and perceived convenience value are found to be core conditions reinforcing continuance usage in combination with different peripheral conditions. This study contributes to the literature by offering new insights into IS continuance from a configuration perspective in a theme park app context.

Keywords: Continuance, theme park app, fuzzy-set qualitative comparative analysis (fsQCA), perceived value

Introduction

Mobile applications (apps) have become increasingly important in the theme park industry, and an increasing number of theme park operators, such as Disney World, and Legoland, have developed their mobile apps to enhance the visitor experience and improve park operations. A theme park is a special travel space where landscaping, buildings, and attractions are designed based on definite theme(s) (Milman 1988; Milman 1991). Therefore, a theme park app could be a guest-facing mobile app specifically for visitors to a particular theme park or theme park chain (Fang et al. 2017; Li 2021). Such an app typically provides a variety of park-specific functions or features, such as real-time information, in-park map, and online reservations for food, drinking, or even purchasing, to enhance visitor experience. Due to the COVID-19 pandemic, theme park apps have experienced an increase in popularity, and many theme parks have decided to limit the number of visitors to keep social distancing and reduce crowding by offering contactless services (Attractions.io 2020). Consequently, many visitors have turned to theme park apps to assist them in managing their booking, visiting, playing, and eating in theme parks safely and efficiently. However, like other mobile apps, theme park apps face a great challenge for successful implementation: the low level of continuance usage of individual users. According to a Statistics report in 2021, only 20% of users keep using travel apps after three months of their first-time use, and the average annual retention rate of travel apps

is merely 6% (Statistica 2021). Continuance intention has been highlighted as important for the long-term success of implementing an information system, as users' continued use can help IS service providers reduce costs and increase profitability (Bhattacherjee 2001). Even if many visitors may visit a theme park only once, by encouraging visitors to continue using the app as a communication and interaction channel, park operators can provide personalized offers, promotions, and exclusive content or rewards to foster a sense of loyalty and attract them to revisit the park in the future. Thus, what can facilitate individual users' continuance intention of theme park apps must be examined.

Prior studies have widely researched the continuance usage intention of mobile tourism-related apps from different theoretical perspectives, but theme park apps have been largely ignored thus far. One factor setting theme park apps apart from other travel apps is their focus on service. Unlike travel apps that offer general services related to planning and organizing trips to various destinations (e.g., flights, accommodations, and transportation), a theme park app is dedicated to enhancing the experience of visitors within a specific theme park via providing park-specific services tailored to the park environment, such as real-time park information, in-park map, online order, virtual queue, and recommended routes (Omnico 2019). A general travel app typically does not offer these park-specific functions. Given the unique service focuses of theme park apps, the motivation beyond continuance intention might differ from other tourism-related apps.

Additionally, past studies on tourism-related apps have examined continuance intention from the perspectives of functional and hedonic value. For instance, perceived usefulness and ease of use as two common functional value, and enjoyment as a hedonic value, have been found to positively affect users' continuance intention of a travel app (Choi et al. 2019; Coves-Martinez et al. 2023; Zhou et al. 2022). However, these studies mainly examined the functional value from a general perspective, and few studies have studied the impacts of a specific benefit that a theme park app offers on users' continuance intention, such as the benefits of obtaining real-time informational notifications, park map, and virtual queue. The knowledge of how the benefits of using these specific features influence users' continuance intention of a theme park app is still limited.

Also, in addition to functional and hedonic value, other types of benefits, such as convenience and social benefits, have been largely ignored in prior literature on travel apps, particularly in the context of theme park apps. In fact, many theme park apps are designed to provide visitors with a more convenient and efficient way to visit parks and a channel to communicate with other visitors and service advisors. It is still unclear whether and how these two types of benefits can influence users' continuance intention of a theme park app. Moreover, users' features, such as IS use experience (Venkatesh et al. 2012), have been found to influence continuance intention as a moderator, but users' travel experience has been largely ignored. In fact, users' travel experience might influence their continuance intention of a theme park app. For instance, experienced tourists may likely continue their app use to obtain benefits, such as reducing the queuing time. Thus, further investigations are required to examine the influences of user features on the continuance intention of a theme park app, including users' smartphone use experience and travel experience.

Furthermore, existing research on continuance intention of tourism-relevant mobile apps has mainly employed the dominant variance-based approach, such as regression analysis (RA) and structural equation modeling (SEM), to study the symmetric linear relationships between motivators and continuance intention. Such research focuses on the net effect of different predictors of continuance intention and may not fully explain the complexity of joint effects of multiple predictors of continuance intention of a theme park app, such as various perceived benefits and user features. The relationships between predictors and continuance intention of a theme park app may be asymmetric. Different combinations of predictors may lead to users' continued usage of an app. It is needed to consider configurational techniques as an alternative approach to investigate the continuance intention of a theme park app, such as the fuzzy-set qualitative comparative analysis (fsQCA), which presumes that the associations between independent and dependent variables are asymmetric, and the combinations of different predictors can lead to a same consequence (Liu et al. 2017; Pappas and Woodside 2021).

To address the above-mentioned research gap, this study aims to employ fsQCA to further the understanding of the configurations of different conditions (perceived value and user features) predicting users' continuance intention of theme park apps, with empirical data collected via an online survey in China (N=347). Specifically, based on perceived value theory, four different dimensions of perceived value, including functional, convenience, hedonic, and social value, are proposed to affect continuance intention, together with two user features (smartphone use habit and travel frequency to theme parks). Further,

functional value is assumed to compromise five factors based on apps' specific functions (including real-time information, map navigation, online order, virtual queue, and recommended routes). The fsQCA is used to scrutinize the different configurations among these predictors that lead to high-level continuance intention. By so doing, this study advances the understanding of the continuance intention of theme park apps from the configuration perspective via the fsQCA approach and by unveiling the complex combinations of conditions of perceived value and user features in predicting continuance intention.

The rest of this article is organized as follows: the factors influencing individual users' continuance intention of travel apps and perceived value are discussed in the literature review. Then, the research method is presented, including data measures, data collection, and data analysis in fsQCA approach. Afterward, the results are reported and discussed. Finally, the theoretical contribution and practical implications are elaborated, following a discussion of research limitations and future research directions.

Literature Review

Predictors of Continuance Intention of Mobile Apps Related to Tourism

Continuance intention of an IS is a behavioral outcome that only can occur after the initial adoption, and has been argued as crucial for the long-term success of implementing the IS (Bhattacherjee 2001). Many studies have employed different theories to explain and predict continuance intention of an IS based on the SEM approach, such as Expectation-Confirmation Theory (ECT) (Bhattacherjee 2001), IS Success Model (DeLone and McLean 1992), Perceived value (Zeithaml 1988), Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1977), Technology Acceptance Model (TAM) (Davis 1989), Theory of Planned Behavior (TPB) (Ajzen 1991), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003).

Prior research has utilized the theories mentioned above to examine individuals' continuance intention of mobile apps related to tourism, and many factors have been identified to influence users' continuance intention. For instance, drawing on the TPB, TAM, and motivation theory, Zhou et al. (2022) found that perceived usefulness, ease of use, and enjoyment positively affect users' intention to continue their use of travel apps. Based on UTAUT, Coves-Martinez et al. (2023) discovered that continuance use of travel apps is influenced by satisfaction, which is affected by perceived usefulness, hedonism, electronic Word-of-Mouth, and relative advantages. From the perspective of IS Success Model, Liu et al. (2023) found that users' perceived usefulness directly affects their continuance intention, while perceived trust, enjoyment, and risk affect continuance intention via satisfaction.

Although these studies have provided empirical evidence alluding to diverse predictors of continuance intention of mobile apps relevant to tourism, they also have their limitations in explaining individuals' continuance intention of theme park apps. Theme park apps have their unique characteristics: they offer park-specific functions to develop a focused and immersive experience that caters specifically to the needs and expectations of visitors. For instance, these apps aim to help reduce the friction caused by the crowd in theme parks, such as long wait times, which are more noticeable than in other tourism contexts (e.g., museums or natural landscapes). Few studies have explored the influence of theme park apps' specific functions (e.g., real-time information or virtual queue) on continuance intention. Additionally, these studies mainly focus on the net effect of a single predictor on continuance of a travel app but pay less attention to the combined effect of the different motivators; thus, they may not be able to interpret the combined effects of various predictors on the outcome of continuance intention. Moreover, individuals' continued usage of a theme park app stems from an inherent desire to satisfy their various needs when visiting a park, not only for solving practical problems during the visit, but also for enjoyment, social interaction, or is rooted in their personal characteristics (e.g., smartphone use habit and travel frequency to theme parks). Little research has considered the interplay of various motivators and user personal characteristics in explaining continuance intention from a configurational perspective. Thus, it requires further research to investigate whether the relationships among motivators, user features, and continuance intention are asymmetric and how different motivators and user characteristics can lead to continuance intention of a theme park app jointly from the configurational perspective.

Perceived Value in Theme Park App Use

The theory of perceived value has been extensively used by scholars to examine continuance intention of an IS. The theory describes how individuals perceive the value of a product or service based on their overall assessment of benefits and costs (Zeithaml 1988). Many studies theorized perceived value as a multi-dimension concept and classified it into different sub-dimensions from different perspectives. For instance, based on the motivation perspective, perceived value is categorized into utilitarian and hedonic value (Park and Park 2009). From a goal orientation, perceived value includes economic, social, hedonic, and altruistic sub-dimensions (Holbrook 2006). In the IS field, through examining IS use in various contexts, the dimensionality of perceived value has been further expanded. For instance, Lee et al. (2014) delineated perceived value as four types, including experiential, social, information, and transaction value in the context of Facebook usage. Li et al. (2018) classified perceived value as information, technology, hedonic, and social values in the context of WeChat.

Following the advances in the theorization of perceived value, some researchers have studied mobile app usage in tourism from the value perspective. For instance, Choi et al. (2019) proposed two main types of the perceived value of travel app use: functional value (i.e., perceived functional benefits, ease of use, and financial benefits) and hedonic value (i.e., enjoyment), and suggested that these two value types are important for improving users' continuance intentions. Likewise, Ho et al. (2021) found that both utilitarian and hedonic value positively affect users' perceptions in terms of performance expectancy, effort expectancy, social influence, and facilitating conditions, which are motivators of the adoption of tour itineraries offered by a smart travel app. However, few studies have focused on the specific context of theme park apps.

Based on prior studies, this research delineates the perceived value of theme park apps into four sub-dimensions: perceived functional value (including real-time information, map navigation, virtual queue, online order, and recommended routes), perceived convenience value, perceived hedonic value, and perceived social value. Specifically, perceived functional value refers to users' perceived functions that a theme park app provides to a user in achieving specific goals or solving problems (Choi et al. 2019). The perceived functional value comprises five factors highly related to the theme park app's specific functions: real-time information, map navigation, virtual queue, online order, and recommended routes. Indeed, prior studies have tried to identify the main functions of travel apps. For instance, Kennedy-Eden and Gretzel (2012) identified seven main functions of travel apps: entertainment, information, mobile marketing, navigation, security, social engagement, and transactions. And other researchers explored appropriateness of functions and identified some suitable functions for a travel app, such as location-based navigation, recommendation, and informational guides (Chen and Tsai 2019; Ricci 2010). A recent report on theme park apps demonstrated that visitors' most wanted functions include real-time information, online order, map navigation, virtual queue, and recommendations (Omnico 2019). Drawing on these prior studies, we proposed that five functions (i.e., real-time information, map navigation, online order, virtual queue, and recommended routes) can fit well into the context of theme park apps and represent functional value in theme park app usage. Specifically, the value of real-time information refers to the benefits of acquiring timely and helpful information from a theme park app. Such information comprises real-time notifications about attractions, on-site events, and shows in parks. The value of map navigation means the benefits of reaching the destination efficiently and safely via a location-aware and interactive in-park map. The value of online order refers to the benefits of booking entrance tickets, hotels, or restaurants; and buying premier tickets or other products ahead to save time. The value of virtual queue refers to the benefits of avoiding crowds via queueing virtually for rides or shows. The value of recommended routes means the benefits of reducing the stress of decision-making, avoiding unnecessary walking, saving energy, and improving overall efficiency by following the routes suggested by the app.

Of the other three dimensions, perceived convenience value refers to user perceptions of the efficiency that a theme park app provides to a user in saving time or reducing effort during visiting a park (Souiden et al. 2019). Past research has found that convenience positively influences users' continuance intention of tourism mobile apps (Fakfare et al. 2023; Xu et al. 2019). This also applies to theme park apps since these apps can offer various functions to help visitors save time and effort, making the trip more convenient and efficient for visitors in the parks. Thus, convenience is assumed to be an important value of using a theme park app and can affect users' continuance intention in our studied context.

Perceived hedonic value refers to the fun, enjoyment, or even excitement that users perceive that they can get from using a theme park app (Choi et al. 2019; Li et al. 2018). Prior literature has also identified hedonic value, such as enjoyment, as a motivator for continuance intention of various IS, such as travel apps (Zhou et al. 2022), hotel booking apps (Vayghan et al. 2022), online shopping (Liu et al. 2020), and social apps (Akdim et al. 2022). Adhering to these past studies, we hence posit hedonic value is a predictor of continuance intention of a theme park app in this study.

Perceived social value refers to user perceptions of the social benefits to be gained from interacting with others via the theme park app (Li et al. 2018). Social value has also been found to influence users' continuance in diverse IS contexts, such as social media (Li et al. 2018), microblogging services (Yang et al. 2018), and omnichannel (Chang and Geng 2022). The same is true for theme park apps, as these apps also offer interaction functions, such as chat, for users to communicate with other visitors or customer services. Thus, social value is proposed as a predictor of continuance intention in the context of theme park apps.

Moreover, user features have also been argued to be crucial for influencing continuance regarding mobile apps, together with perceived value. For instance, via the fsQCA approach, Li et al. (2018) found that user features, including use frequency and gender, can exert combined effects on continuance of WeChat together with different combinations of perceived value. Similarly, Choi et al. (2019) suggested that user experience and familiarity with the app and travel purpose can act as moderators to influence the impacts of perceived value on continuance intention of travel apps. Therefore, user features must be considered when studying the effects of perceived value on continuance intention of theme park apps. This study includes two user features, including user experience regarding an IS (measured by smartphone use habit) and user experience regarding traveling (measured by travel frequency to theme parks), to test their combined effects with perceived value on continuance intention.

Method

Data measures

We adopted well-established and validated instruments from prior studies to measure all constructs included in this study. All measurement items were further revised to fit the context of theme park apps. Specifically, the measurement items for real-time information, map navigation, online order, virtual queue, and recommended routes, were adapted from Cenfetelli et al. (2008) and Liu et al. (2020). The items of continuance intention, convenience value, and smartphone use habit were adopted from Bhattacherjee (2001), Souiden et al. (2019), and Venkatesh et al. (2012), respectively. The measurement items for hedonic value and social value were taken from Kim et al. (2019). The travel frequency to theme parks was measured by the annual visiting times. The seven-point Likert scale (from "1 = strongly disagree" to "7 = strongly agree") was used in this study.

The questionnaire was developed in English since all items were adapted from studies published in international journals and then translated into Chinese by the first author who is fluent in both English and Chinese. Two other IS experts who are fluent in these two languages checked both versions of the questionnaire. A pilot study was carried out among 30 Chinese theme park app users. According to their feedback, several statements have been modified and reordered to improve coherence and cohesion.

Data collection

The link to the final questionnaire was developed via Wenjuanxing, which is a popular crowdsourcing platform in China and has been widely used for research participant recruitment. The link was initially distributed in theme park fan groups on social media, such as Weibo, then they were asked to share the link with other theme park visitors they knew. The target participants are theme park app users; thereby, to ensure that the required respondents have had certain use experience, two screening questions were used: "Have you used a theme park app when you visited a theme park before", and if so, "what is the name of the app". Only those who chose yes to the first question and offered the name of the app they had used can proceed to the following questions. Two attention check questions were implemented to make sure every respondent has truly attentive. Each respondent who completed the questionnaire received a red pocket with random money from RMB 0.1 to 2 for thanking their participation.

There were four sections in this online survey. The first section was informed consent, which includes the research aim, method, data storage, privacy protection, and researchers' contact information. Only if the respondent agrees with this consent can they start to answer the questionnaire. The second section was composed of screening questions which were used to ensure the respondents had theme park app usage experiences. The third section was personal background information, including age, gender, education, mobile app usage habits, frequency of visit a theme park annually, etc. The final section asked the subjects to report their experiences and feelings about using theme park apps.

The survey ran in December 2021 for two weeks, and 361 responses were collected, 14 of which were identified as invalid and deleted from the dataset as these respondents chose the same answer to all questions. Thus, 347 valid responses were analyzed in this study. Of the 347 respondents, 47% were male, 52.4% were female, and 0.6% were unwilling to disclose. Regarding the age groups, 54.8% of respondents were falling in the 26 to 35 years old age interval, 24.8% were under 25 years old, and 20.5% were above 36 years old. Regarding education, 75.5% of respondents obtained a bachelor or above degree, 14.4% and 10.4% achieved high school or below, and associate degree, respectively. Finally, 97.7% of respondents had a theme park visit experience yearly. Table 1 shows the basic profiles of respondents.

Measure	Items	Frequency	Percentage (%)
Gender	Male	163	47.0
	Female	182	52.4
	Unwilling to disclose	2	0.6
Age	18-25	86	24.8
	26-35	190	54.8
	36-45	67	19.3
	46-55	4	1.2
Education	High school or below	35	10.1
	Associate	50	14.4
	Bachelor	211	60.8
	Master or above	51	14.7
The number of visit a theme park annually	0	8	2.3
	1	132	38.0
	2	139	40.1
	3 or above	68	19.6

Table 1. The demographics of survey participants

The common method bias, reliability, and validity analysis

We used the Harmon one-factor test to detect possible common method bias (CMB). The results showed that the variance explained by the first factor was only 42.54%, which did not exceed the 50% threshold (Podsakoff et al. 2003). Additionally, we used the full collinearity test suggested by Kock and Lynn (2012) to test the collinearity, and the results showed all values of variance inflation factors (VIFs) range from 1.413 to 3.244, lower than the suggested cutoff value of 3.3 (Kock and Lynn 2012). Therefore, we contend that CMB may not be a serious problem in this study.

Before the fsQCA approach, we used the partial least square (PLS) algorithm to assess the reliability and validity of constructs, and discriminant validity of the measurement items. Five items (SV3, SV4, MN1, VQ3, and SH2) were deleted because their factor loading values were lower than 0.7. As shown in Table 2, other items' factor loading values were higher than 0.7. The values of Cronbach's alpha (CA) and Composite Reliability (CR) were higher than 0.7 and 0.7, respectively, indicating that reliability was supported in this

study (Fornell and Larcker 1981). The results of the average variance extracted (AVE) were greater than 0.5, suggesting good convergent validity (Fornell and Larcker 1981). Regarding the discriminant validity, as presented in Table 3, the square root of the AVEs for each construct was higher than the correlations between the latent variable and the other variables (Chin 1998). Also, as presented in Table 4, the item loadings were higher on their intended construct than on other constructs. Furthermore, the values of the heterotrait–monotrait ratio (HTMT) were lower than 0.90 (see Table 5), which is an acceptable threshold for discriminant validity (Henseler et al. 2015). Thus, the discriminant validity was supported in this study.

Constructs	Items	Loadings	CA	CR	AVE
Continuance intention (CI)	CI1	0.894	0.875	0.875	0.800
	CI2	0.875			
	CI3	0.914			
Convenience value (CV)	CV1	0.761	0.892	0.893	0.650
	CV2	0.762			
	CV3	0.843			
	CV4	0.808			
	CV5	0.823			
	CV6	0.834			
Hedonic value (HV)	HV1	0.857	0.869	0.876	0.792
	HV2	0.897			
	HV3	0.915			
Social value (SV)	SV1	0.944	0.891	0.898	0.902
	SV2	0.955			
Real-time information (RI)	RI1	0.803	0.839	0.845	0.675
	RI2	0.786			
	RI3	0.851			
	RI4	0.844			
Map navigation (MA)	MN2	0.849	0.702	0.723	0.769
	MN3	0.904			
Online order (OO)	OO1	0.906	0.901	0.901	0.835
	OO2	0.910			
	OO3	0.925			
Virtual queue (VQ)	VQ1	0.959	0.908	0.910	0.916
	VQ2	0.954			
Recommended routes (RR)	RR1	0.878	0.855	0.863	0.776
	RR2	0.842			
	RR3	0.922			
Smartphone use habit (SH)	SH1	0.887	0.709	0.711	0.775
	SH3	0.874			

Table 2. Reliability and Convergent Validity

	CI	CV	HV	SV	RI	MN	OO	VQ	RR	SH
CI	0.894									
CV	0.719	0.806								
HV	0.709	0.757	0.890							
SV	0.501	0.524	0.678	0.950						
RI	0.540	0.649	0.627	0.405	0.822					
MN	0.577	0.685	0.627	0.415	0.668	0.877				
OO	0.524	0.634	0.594	0.538	0.420	0.517	0.914			
VQ	0.498	0.555	0.592	0.613	0.400	0.525	0.727	0.957		
RR	0.600	0.728	0.632	0.556	0.529	0.579	0.767	0.667	0.881	
SH	0.260	0.321	0.259	0.014	0.361	0.255	0.154	0.022	0.184	0.880

Table 3. Discriminant validity: Fornell–Larcker criterion

	CI	CV	HV	SV	RI	MN	OO	VQ	RR	SH
CI1	**0.894**	0.637	0.638	0.451	0.493	0.445	0.462	0.436	0.532	0.244
CI2	**0.875**	0.633	0.623	0.469	0.477	0.533	0.459	0.465	0.538	0.185
CI3	**0.914**	0.658	0.641	0.425	0.479	0.569	0.485	0.435	0.540	0.269
CV1	0.567	**0.761**	0.559	0.354	0.507	0.488	0.557	0.437	0.599	0.321
CV2	0.538	**0.762**	0.586	0.411	0.520	0.566	0.458	0.359	0.555	0.254
CV3	0.589	**0.843**	0.651	0.471	0.552	0.576	0.522	0.484	0.567	0.281
CV4	0.576	**0.808**	0.607	0.374	0.534	0.550	0.449	0.424	0.582	0.289
CV5	0.608	**0.823**	0.618	0.442	0.547	0.522	0.501	0.486	0.600	0.215
CV6	0.594	**0.834**	0.638	0.476	0.481	0.611	0.574	0.486	0.613	0.196
HV1	0.565	0.590	**0.857**	0.657	0.511	0.461	0.518	0.582	0.523	0.161
HV2	0.655	0.715	**0.897**	0.558	0.581	0.618	0.527	0.513	0.573	0.266
HV3	0.666	0.708	**0.915**	0.605	0.579	0.583	0.541	0.497	0.588	0.255
SV1	0.450	0.471	0.630	**0.944**	0.365	0.373	0.503	0.570	0.526	0.007
SV2	0.498	0.522	0.657	**0.955**	0.403	0.413	0.518	0.593	0.529	0.031
RI1	0.402	0.484	0.499	0.317	**0.803**	0.461	0.315	0.311	0.368	0.314
RI2	0.417	0.515	0.483	0.245	**0.786**	0.528	0.329	0.300	0.395	0.342
RI3	0.462	0.573	0.527	0.329	**0.851**	0.613	0.399	0.356	0.478	0.284
RI4	0.485	0.556	0.549	0.427	**0.844**	0.581	0.335	0.345	0.487	0.256
MN2	0.449	0.550	0.485	0.288	0.587	**0.849**	0.372	0.397	0.415	0.242
MN3	0.554	0.644	0.604	0.427	0.587	**0.904**	0.522	0.515	0.585	0.209
OO1	0.484	0.575	0.546	0.517	0.363	0.411	**0.906**	0.668	0.731	0.143
OO2	0.485	0.582	0.532	0.462	0.423	0.516	**0.910**	0.656	0.699	0.146
OO3	0.467	0.579	0.550	0.495	0.366	0.491	**0.925**	0.668	0.671	0.132
VQ1	0.490	0.552	0.572	0.576	0.408	0.497	0.696	**0.959**	0.661	0.043
VQ2	0.463	0.510	0.562	0.598	0.357	0.509	0.695	**0.954**	0.615	0.003
RR1	0.509	0.624	0.558	0.487	0.465	0.431	0.676	0.570	**0.878**	0.181

RR2	0.495	0.628	0.534	0.470	0.457	0.519	0.613	0.550	**0.842**	0.152
RR3	0.578	0.670	0.577	0.511	0.478	0.575	0.733	0.640	**0.922**	0.156
SH1	0.235	0.288	0.230	0.011	0.350	0.220	0.139	0.015	0.181	**0.887**
SH3	0.223	0.277	0.225	0.013	0.283	0.229	0.132	0.023	0.143	**0.874**

Table 4. Discriminant validity: Cross loadings

	CI	CV	HV	SV	RI	MN	OO	VQ	RR	SH
CI										
CV	0.814									
HV	0.810	0.856								
SV	0.566	0.586	0.774							
RI	0.628	0.749	0.731	0.463						
MN	0.729	0.861	0.789	0.514	0.867					
OO	0.590	0.707	0.672	0.600	0.482	0.640				
VQ	0.559	0.615	0.671	0.681	0.456	0.650	0.803			
RR	0.692	0.833	0.732	0.636	0.621	0.733	0.871	0.755		
SH	0.330	0.405	0.325	0.029	0.470	0.364	0.192	0.039	0.236	

Table 5. Discriminant validity: Heterotrait–monotrait ratio (HTMT)

Data analysis

There are three main steps in the fsQCA data analysis procedure (Liu et al. 2017; Pappas and Woodside 2021). Firstly, calibration of the data. The original measure scale of functional value, convenience value, social value, hedonic value, smartphone use habit, travel frequency to theme parks, and continuance intention were calibrated into a fuzzy-set, from 0 (full non-membership) to 1 (full membership). In this study, a percentile method was used to complete the calibration procedure. The percentiles 95% was used as the full-set membership breakpoint, 50% was used as the cross-cover breakpoint, and 5% was used as the full-set non-membership breakpoint. Then, these values were converted into a fuzzy score from 0 to 1 with the algorithm of fsQCA. Additionally, to ensure no cases were removed from the fuzzy set, an extra 0.001 was added to each case where its membership value was 0.5.

Secondly, a necessary conditions analysis was conducted to determine if any factors were necessary to produce the outcome. The users' continuance intention was considered as the outcome variable, and the perceived functional (real-time information, map navigation, online order, virtual queue, and recommended routes), convenience, social, and hedonic values, travel frequency to theme parks, and smartphone use habits, were considered as antecedents affecting the users' continuance intention combinedly. According to the output of necessary condition analysis, no independent variables have a consistency score exceeding 0.9 (Ragin 2009); thus, there is no necessary condition for users' continuance intention.

Thirdly, a sufficiency conditions analysis was applied to examine what conditions or combinations would cause the output sufficiently. Before completing the truth table algorithm, the frequency cut off value and raw consistency threshold must be specified. A truth table was constructed with a list of all possible combinations of conditions for the same outcome of the continuance intention of a theme park app. If the number of conditions is k, there will be 2^k configurations. As our research had ten causal conditions, the truth table consisted of 1024 possible combinations. To reduce the truth table and identify sufficient conditions for continuance intention, following the guidance of Ragin (2009), the frequency cut off value was set to 3 as in this study the sample size was 347, greater than 150, and the raw consistency threshold

was set to 0.80 to ensure the stability of the set relation. In addition, the Proportional Reduction in Inconsistency (PRI) consistency threshold was set to 0.75 to avoid concurrent subset relations of configurations in both outcome and absence of outcome situations. After applying the Quine-McCluskey algorithm, three sets of solutions were provided: complex, parsimonious, and intermediate. In this research, the parsimonious and intermediate solutions were used to explain the combined effects of the configurations in enhancing users' continuance intention of theme park apps.

Results

As shown in Table 6, the results reveal six sufficient configurations. Based on the equifinality of different core conditions (Fiss 2011; Pappas and Woodside 2021), we further identified two first-order equifinality solutions (i.e., S1 and S2) and their second-order solutions (e.g., S1a, S1b, S1c; S2a, S2b, and S2c).

Configuration	Solutions					
	S1			S2		
	S1a	S1b	S1c	S2a	S2b	S2c
Functional value						
Real-time information	●	●	●	●	●	
Map navigation	●	●	●	●	●	●
Virtual queue	●	●	●	●	●	●
Online order	⬤	⬤	⬤	⬤		⬤
Recommended routes	●	●	●		●	●
Convenience value	⬤	⬤	⬤	⬤	●	⬤
Social value		●	⊗	●	●	●
Hedonic value	●	●		●	●	●
Travel frequency to theme parks	⊗		●	●	●	●
Smartphone use habit			●	●	●	●
Raw coverage	0.446	0.589	0.207	0.329	0.332	0.336
Unique coverage	0.021	0.071	0.010	0.001	0.004	0.008
Consistency	0.974	0.980	0.978	0.985	0.990	0.990
Overall solution coverage	0.636					
Overall solution consistency	0.970					

Table 6. Solutions of fsQCA Method

Note: black circles (●) indicate the presence of a condition, the large circle means core condition, the small circle means peripheral condition; the circles with "×" (⊗) indicate the absence of condition, the small circle means peripheral condition; the blank spaces indicate "don't care" situation.

Specifically, S1a, S1b, and S1c could be one solution group because they share the same core and peripheral perceived functional value conditions. To be more specific, S1a shows high users' continuance intention can be attained by the combination of the presence of all perceived functional values (i.e., real-time information, map navigation, virtual queue, online order, and recommended routes), perceived convenience value, and perceived hedonic value, with the absent of users' travel frequency to theme parks. The value of online order function and perceived convenience value are core conditions in this solution. S1b shows high users' continuance intention can be attained by combination of all perceived values, including functional values, convenience value, social value, and hedonic value, in which the perceived functional value of online order and perceived convenience value are core conditions, and others are peripheral conditions. It does not matter how often individuals visit theme parks or whether they use mobile phones as a daily habit. S1c indicates high users' continuance intention can be attained by combining the presence of perceived functional value, perceived convenience value, travel frequency to theme parks, and smartphone use habit

with the absence of perceived social value. The perceived functional value of online order and perceived convenience value are core conditions, the left factors are peripheral conditions, and the presence or absence of perceived hedonic value is not a matter.

Furthermore, S2a, S2b, and S2c could be the second solution group because high users' continuance attention could be attained by the presence of three perceived values (convenience value, social value, hedonic value), and two user features (travel frequency to theme parks and smartphone use habit). To be more precise, S2a indicates that high users' continuance intention could be obtained by combining peripheral conditions of real-time information, map navigation, and virtual queue; perceived social value; perceived hedonic value; travel frequency; mobile phone use habit; and core conditions of online order, and perceived convenience value. S2b indicates high users' continuance intention could be achieved by which all perceived values and personal characteristics are present as peripheral conditions except that online order is not announced. S2c shows the combination of all factors except real-time information could produce a high-level user continuance intention, and perceived online order functional value and perceived convenience value are the core conditions.

The overall solution coverage of 0.636 illustrates to what extent the six solutions could explain the dataset. Therefore, the six solutions account for about 63.6% of the membership in the high users' continuance intention, which shows the solution formula has a satisfied explanatory power. The overall solution consistency of 0.97 exceeds the threshold of 0.75, which is also good for fsQCA research (Pappas and Woodside 2021). The raw coverage varies from 0.207 to 0.589 in these six solutions, indicating different configuration levels in different combinations to achieve high users' continuance intention. In this research, S1b is the most sufficient solution, which explains 58.9% of the high-level users' continuance intention by combining three different values. The unique coverage values range from 0.001 to 0.071, which indicates the unique contribution of each sufficient solution, and shows S1b has the highest unique coverage value among these six solutions. Therefore, S1b could be the most sufficient combination of all these factors to contribute to the high users' continuance intention.

Discussion

This study aimed to explore how perceived value and user features combine to predict continuance intention of a theme park app. Six combinations of causal conditions were identified, indicating that no single conditions are necessary for producing users' continuance intention. The interplay of perceived value and user features jointly shapes the users' continuance intention.

Specifically, perceived functional (online order) and convenience value are core conditions (S1) for the continuance intention of theme park apps and play a critical role in motivating continuance intention. S1 showed that both perceived online order and convenience value were core conditions and must present together to enhance continuance intention when combined with other peripheral conditions. This finding suggests that a high level of online order and perceived convenience value during the use of a theme park app can improve users' continuance intention by satisfying their need for other theme park functions (i.e., real-time information, map navigation, virtual queue, and recommended routes), and emotional pleasure; even if they did not visit a park frequently, they did intend to keep their use of the app, regardless of perceived social value and smartphone use habit (S1a). In other cases, when users perceived a high level of functional, convenience, hedonic, and social value, regardless of their personal characteristics, they tended to sustain their app use (S1b). If the users were experienced visitors of a theme park and heavy users of mobile phones, when they perceived high values in terms of functions and convenience, even though perceived social value was not provided, they were willing to continue their use of the app, regardless of the perceived hedonic value (S1c). This finding depicts that perceived functional and convenience values are inextricably related, which focuses on satisfying the users' practical needs instead of social presence and enjoyment.

Indeed, the most annoying pain points of visiting a theme park are the crowd and waiting times (Milman et al. 2020). If a theme park app can assist visitors in saving time and effort, and avoiding the crowd, they are likely to feel the app is convenient for them, and eventually keep their usage of the app. Meanwhile, food and shopping service is an important part of the theme park experience (Milman et al. 2020). If a theme park app allows visitors to buy food, drink, or souvenirs online, they will likely continue using the app. Thus,

the perceived convenience and functional value of online order are core sufficient conditions for motivating users to continue their app use, together with other peripheral conditions.

In Solution 2, not all perceived functional value factors mattered when other conditions were present. Specifically, if users visited a park frequently and used smartphones habitually, and they perceived high levels of convenience, hedonic and social values of using the app, the combination of different functional values differed: when real-time information was sufficient, the condition of recommended routes did not matter (S2a). On the contrary, when recommended routes were sufficient, the condition of real-time information was of no importance (S2c). In S2b, there was no core condition, if users were experienced visitors of theme parks and used smartphones habitually, when they perceived high levels of convenience, hedonic, and social value, as well as a high level of functional value in terms of real-time information, map navigation, virtual queue, and recommended routes, they were likely to sustain the app use, regardless of the functional value of online order. This might be because in S2, users are experienced visitors to theme parks and get used to using smartphones in their daily lives. They are expertise in updating the information of events and crowds by using different app functions and adapting their visiting plan to avoid the crowds and reduce waiting times, such as making their own decisions based on the updated information rather than following a generally suggested route by the app (S2a), buying their food or other items when there are fewer people in restaurants or shops rather than using online order function (S2b), or choosing the recommended tour itineraries rather than constantly checking the real-time information via apps (S2c). In addition, in these three solutions of S2, a mutual substitution effect exists among real-time information, online order, and recommended routes in users' perceived functional value, which reveals an exchangeable and flexible relationship in achieving theme park app users' high continuance intention. Thus, users can choose different strategies for using app functions based on their expertise and prior experience in travel and app use. Suppose they perceive an app can offer convenience, hedonic, and social value, together with different combinations of functional values. In that case, they will likely continue using the theme park app. Overall, these diverse solutions indicate that users' high continuance intention of theme park apps can be triggered by different combined conditions of perceived value and user features.

Conclusion

Theoretical contribution

This study contributes to prior literature in the following ways. First, this study contributes to IS continuance by deriving distinct configurations of causal conditions that lead to continuance intention from the configurational interplay of perceived value and user features in the specific context of theme park apps. Unlike prior literature focusing on the net effect of predictors of continuance intention based on SEM or RA approach, this study used fsQCA method to explore the combinations of causal conditions that lead to continuance intention in examining the joint effect of different dimensions of perceived value and user features, which help unveil the complex reality of continuance intention of a theme park app. This study found six solutions that lead to continuance intention, offering additional insights into IS continuance literature from a configuration perspective and supplementing the variance-based view of the net effects of motivators of continuance intention.

Second, this study contributes to previous literature on perceived value by disentangling the sub-dimensions, including perceived functional, convenience, hedonic, and social value. Unlike prior studies focusing on two main types of perceived value (i.e., functional and hedonic value) of travel apps (Choi et al. 2019; Ho et al. 2021), this study included perceived convenience and social value. We found that perceived convenience value as a core condition, and perceived social value as a peripheral condition, combined with other conditions, are important to enhance users' continuance intention, indicating that the proposed four dimensions in this study fit well into the context of theme park apps. Additionally, the functional value was further classified into five main types, including real-time information, map navigation, virtual queue, online order, and recommended routes, which are the specific service focuses of theme park apps that differentiate them from other general travel apps. Our results show that online order is a core condition, and the other four types (real-time information, map navigation, virtual queue, and recommended routes) of perceived functional value are peripheral conditions. These findings indicated that unique service focuses and park-specific functions should be paid attention to the design of a theme park app to improve user continuance intention, in addition to the general functions found in other travel apps.

The third contribution of this study lies in the examination of user features. The roles of users' IS use habits have been widely recognized in IS continuance research (Venkatesh et al. 2003; Venkatesh et al. 2012), but users' travel frequency has been overlooked. Our results show that both habits exist in four of six solutions (S1c, S2a, S2b, and S2c) and act as peripheral conditions, indicating that both travel frequency to theme parks and smartphone use habit can influence continuance intention when associated with perceived value. These findings imply that continuance intention of a theme park app is a complex phenomenon where user-specific features do matter.

Practical implications

This study offers some practical suggestions for theme park operators to improve users' continuance intention of theme park apps. First, this study's findings on the joint effect of user perceived value and user features on users' continuance intention suggest that theme park operators should be aware of the combined effect of different types of perceived value and user features in leading to high continuance intention and develop diverse strategies for improve users' continued usage of the app. Changing one condition alone may not be adequate to enhance continuance intention. Specifically, this study's findings indicate that the perceived functional (online order) and convenience value are core conditions when combined with other perceived functional (real-time information, map navigation, virtual queue, and recommended routes), hedonic, and social value. Thereby, theme park operators should offer a guest-facing app with systemic functions, especially an effective online order function. Additionally, the convenient nature of the theme park app should be highlighted when the dedicated app was designed and developed. For example, the online order function should guarantee most of the services and products in the theme park can be ordered by effectively introducing and tracking information and offering online contactless payment channels. With such a function, visitors' experience could be greatly enhanced by booking an entrance ticket, a table at a restaurant, or a seat for a show in advance. Once visitors perceive the value of each function and their needs are satisfied, the theme park app could play a role in retaining visitors by motivating them to use the theme park app continuously. Moreover, the perceived functional value is not the only aspect theme park operators should make an effort to achieve. The operators should also make the app effortless and effective for their users; once the users perceive the convenience value of the app, users are likely to obtain a streamlined visit via the support of the specific app and the continuance intention of the app will be stimulated.

Additionally, perceived hedonic and social value have been found to be peripheral conditions, suggesting the app should be enjoyable to use and offer social interaction functions for users to communicate with others. Theme parks could include short videos or small games in their apps, such as the highlights of each attraction or event, the chips of themed animation, and the dedicated theme games to improve the feelings of fun of the theme park apps. Otherwise, providing instant communication channels in the theme park app is also helpful; the visitors might wish to chat with the theme park customer service, their friends who are curious about the theme park trip, or other fans in the online theme park community. With different needs being satisfied, the users' continuance intention of the theme park app will be motivated.

Finally, as S2 shows that users who visit theme parks frequently and use smartphones habitually can use app functional features in different combinations, we suggest enabling or disenabling these features by adding turn-on/off buttons in the app. Thus, users can select and combine different functions based on their personal needs to avoid unnecessary disturbance of complex functions and mobile storage room occupancy. For instance, if visitors want to follow a recommended route in the park other than checking event notifications all the time, they can choose to turn off the real-time information function in the app. In addition, offering privilege merchandise, loyalty incentives, and extra secret exploration to those frequent theme park visitors via the app could make them feel unique, encourage them to interact with the app, and increase the probability to continue using it. That is to say, personalized experience in theme park apps can also incentive the frequent and habitual users' continuance intention of theme park apps.

Limitations and Future Research Direction

This study has limitations that could be addressed in future research. First, this study focuses on the specific context of theme park apps whereby the predictors of continuance intention and the nature of other IS could differ. Thus, this study's findings may not be generalizable to other IS contexts, and future research could compare the role of identified predictors of continuance intention in different contexts. Second, only four

dimensions of perceived value (functional, convenience, hedonic, and social value) and two user features were examined in this study. Other dimensions or related factors identified in prior studies, such as financial value, age, and gender, could be included and tested in future research. Third, the data of this study were gathered only in China, and future studies should consider replicating this study across other countries to detect the potential cultural difference.

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Appendix. The measurement items

Construct	Measurement items	Reference
Continuance intention (CI)	– I intend to continue using theme park app rather than discontinue its use, when I visit the theme park next time. – My intentions are to continue using theme park app than use any alternative means, when I visit the theme park next time. – If I could, I would like to continue my use of theme park app, when I visit the theme park next time.	(Bhattacherjee 2001)
Convenience value (CV)	Using theme park apps would – help me to make my visit in a convenient way. – not make my visit a hassle. – help me to make my visit without any extra effort. – help me to use my time wisely. – help me not to waste time when visiting a theme park. – enable me to make my visit quickly.	(Souiden et al. 2019)
Hedonic value (HV)	– Theme park app is fun to use. – The actual process of theme park app is pleasant. – Using theme park app is enjoyable.	(Kim et al. 2019)
Social value (SV)	– Using the theme park app enables me to create interpersonal relationships with other users. – Using the theme park app enables me to maintain a personal connection with other users. – Using the theme park app enables me to make new friends. – Using the theme park app enables me to enhance my relationship with others.	
Real-time information (RI)	– During the on-site visit, this theme park app provides detailed and timely information about the events/attractions in the park. – During the on-site visit, this theme park app provides a comprehensive list of the events/attractions in the park. – During the on-site visit, this theme park app provides real-time information on a large number of attributes for each of the events/attractions featured. – During the on-site visit, the information provided by this theme park app is up to date.	(Cenfetelli et al. 2008; Liu et al. 2020)
Map navigation (MA)	– During the on-site visit, the theme park app helps me avoid being lost with a map. – During the on-site visit, the theme park app provides the necessary map to guide my visit in the theme park.	

	– During the on-site visit, the theme park app helps me find the way to an attraction with a map navigation.	
Online order (OO)	– During the on-site visit, the theme park app allows me to place orders for different products online, such as food, drink, tickets, and merchandise. – During the on-site visit, the theme park app provides the necessary functions to order various products, such as food, drink, tickets, and merchandise. – During the on-site visit, the theme park app allows me to order products online.	
Virtual queue (VQ)	– During the on-site visit, the theme park app allows me to queue online. – During the on-site visit, the theme park provides the necessary functions to queue virtually. – During the on-site visit, the theme park allows me to queue for attractions online.	
Recommended routes (RR)	When I was in the theme park, – the theme park app offered me suggestions regarding visiting schedules in the theme park. – the theme park app provided the necessary functions to help me develop or choose a visit plan for the theme park. – the theme park app recommended me a list of visiting routes.	
Smartphone use habit (SH)	– The use of smartphone has become a habit for me. – I am addicted to using smartphone. – I must use smartphone.	(Venkatesh et al. 2012)