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Perceived Technology Affordance and Value of Hotel Mobile Apps: A Comparison of Hoteliers and Customers

Abstract

While there is abundant knowledge about the antecedents and outcomes of hotel mobile app adoption, research has rarely looked into users' actual use experience with these apps. Guided by service-dominant logic, technology affordance theory, and cognitive mapping, this study investigates and compares hoteliers' and customers' perceptions of branded hotel mobile apps. Data was collected through semi-structured interviews with managers and customers based on the same pool of focal hotel mobile apps. The findings unearth noticeable differences between the two groups' understanding of using hotel mobile apps for stay personalization. This is mainly attributed to customers' uncertainties during use, the relative importance of their needs, and their different interpretations of personalized experience. The findings demonstrate the mechanism underlying the interpretation of technological functions which human beings act upon to create value. They provide practical implications for hoteliers to understand why and how users may or may not perceive the app value as expected.

Keywords: Hotel Mobile App, Technology Affordance, Cognitive Mapping, Value Proposition, Value-in-use

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1. Introduction

Mobile platforms have become one of the most popular booking channels for travel products and services (Murphy, Chen, & Cossutta, 2016). Accordingly, hoteliers have devoted significant investment into developing their own mobile applications (apps), hoping to boost direct bookings and minimize commission fees to third parties (e.g., Stangl, Inversini, & Schegg, 2016; Terry, Lorden, & Creamer, 2016). To attract higher app usage, hoteliers have moved beyond providing basic functions, such as room reservation, to more advanced services. For example, Marriott's "Anything Else?" mobile service enables customers to chat with hotel associates in real-time (Tode, 2015); Hilton's HHonors mobile app embeds a digital key customers can use to unlock hotel rooms (Hilton Worldwide, 2015); InterContinental Hotels Group allows customers to check-in, check-out, and make service requests via the IHG mobile app (InterContinental Hotels Group, 2015).

While ample studies have investigated hotel mobile app functions and associated outcomes such as customer satisfaction (e.g., Chen, Hsu, & Wu, 2012; Fong, Lam, & Law, 2017; Morosan & DeFranco, 2016c; Ozturk, Bilgihan, Nusair, & Okumus, 2016a; Ozturk, Nusair, Okumus, & Hua, 2016b; Wang, Xiang, Law, & Ki, 2016), little research has been done to explore customers' actual use process and how it shapes customers' perceived values of the app. As a result, it is remained unknown about the process in which hotel guests derive some values from their actual usage of the hotel app.

How do hotel guests develop their perceived values towards the hotel app? What are the differences between the perceived values by hotel guests and the designed values by hoteliers? Answering these questions requires an understanding of customers' use experience. According to service-dominant (S-D) logic (Vargo & Lusch, 2004), customers' value-in-use differs from service providers' value propositions. In other words, while hoteliers embed their value propositions in hotel mobile app design, customer use determines whether these value

propositions can be materialized. This notion that individuals understand and approach a technology differently is grounded in technology affordance theory (Gaver, 1991; Leonardi, 2011). Depending on users' specific characteristics, goals and context of use, they hold different perceptions of a technology's usefulness and how they can interact with it (Leonardi, 2012; Norman, 2007). In this sense, the value of a technology is determined by how users perceive the technology and use it to achieve their goals, rather than embedded in the physical artifact (Svensson & Grönroos, 2008; Vargo & Lusch, 2004).

To connect hotel app functions with customers' value-in-use, this study investigates customers' use experience and the underlying reasoning behind their use. To provide a complete picture and richer insights, both hoteliers' and customers' perceptions of the apps' affordances and value are integrated. We investigate hoteliers' underlying reasoning and expectations behind the design of mobile app functions as well as customers' interpretations of their use and perceived value. Compared to previous studies, we take a different perspective to examine technology effectiveness by investigating how various hotel mobile app functions enable customers to receive the value proposed by hoteliers. Guided by S-D logic and technology affordance theory, this study adopts a qualitative research design that incorporates both hoteliers' service design and customers' use experience.

As hoteliers are still seeking ways to improve their branded mobile apps (McMillin, 2017; Ting, 2017b), it is necessary to understand how customers actually perceive and use these apps. This study supplements previous studies in hotel mobile apps which have paid limited attention to customers' use experience and focused heavily on customers' adoption or intention to use (e.g., Fong et al., 2017; Kim, Mirusmonov, & Lee, 2010; Kim, 2016; Morosan, 2015; Morosan & DeFranco, 2016b, 2016c; Ozturk et al., 2016a; Ozturk et al., 2016b). Through empirical evidence of customers' use experience, the findings from this study delineate the structure and links between hotel mobile app functions and value-in-use.

Practical implications are provided for the (re)design of hotel mobile apps and associated business processes. The main findings are triangulated using a set of online customer reviews collected from Trip Advisor.

This paper is structured as follows. Following a review on previous studies of hotel mobile apps, the theoretical foundation that guides the research design is discussed. Developed upon the theoretical framework, the research design and methodology section explains how the cognitive mapping method is applied to bridge app functions and customer perceived value to provide a holistic view of the phenomenon. After comparing hoteliers' and customers' mental models, the findings discuss the identified gaps between the two parties.

2. Literature Review

2.1 Previous Studies of Hotel Mobile Apps

There are two main streams of studies in hotel mobile apps research. First, a group of studies has focused on summarizing and evaluating hotel mobile app functions. In general, hotel mobile app functions have brought higher user convenience and efficiency to a variety of tasks (Chen et al., 2012; Ozturk et al., 2016a; Ozturk et al., 2016b; Wang et al., 2016). In addition, location- and communication-based in-app services have been found to be favorable to customers who can customize and personalize their own experiences (Chen, Murphy, & Knecht et al., 2016; Verma, Stock, & McCarthy, 2012). These innovative services provide fun, pleasure and enjoyment to customers (Morosan & DeFranco, 2016b; Ozturk et al., 2016b). Second, another group of scholars has focused on identifying the factors that affect user adoption of hotel mobile apps. For example, Morosan and DeFranco (2015) found that customers' perceived benefits, perceived risk, positive emotions and system trust affect their willingness to disclose personal information via hotel apps. In other studies, they identified that extra factors such as customer habits and social influences also affect customer intention to use hotel mobile apps (Morosan & DeFranco, 2016a, 2016b). Ozturk and colleagues

(2016a) investigated the factors influencing customer adoption of mobile hotel booking. They found that customers' perceived ease of use, convenience and compatibility affect their intention to book through hotel mobile apps.

By 2017, hotel mobile apps had been widely adopted by over 90% of hotel index brands (L2 Insight Report, 2017), and 70% of hotel loyalty members had downloaded a branded hotel mobile app (Ting, 2017a). Given widespread adoption and use of hotel mobile apps, more research questions should be asked, especially those related to the post-adoption stage. What is the customer's use process and what affects their perceived value from different app functions? Does the design of existing hotel mobile apps enable customers to perceive the value expected by hoteliers? In sum, these previous studies have suggested a pool of factors that influence customers' intention to use mobile services; and a pool of indicators that can be used to evaluate app performances. There is a lack of connection between functions and the outcome variables. Little is known about how customers actually use the various app functions, and how such process affects their perceptions and evaluations.

2.2 The Lens of Sociomateriality and Technology Affordance Theory

The lens of sociomateriality explains technology use by shedding light on the important roles of both human intentions and technology features (Leonardi, 2011, 2012; Orlikowski, 2010). Instead of considering certain effects as produced by the technology itself, sociomateriality reminds us that it is human actions and intelligence that shape technologies into the ways that we want. Individual users' unique characteristics, goals, and usage contexts affect how they perceive the usefulness of technology and the ways they can interact with it (i.e., perceived technology affordances) (Faraj & Azad, 2012; Majchrzak & Markus, 2012). The affordances perceived by individuals then determine how they interact with the technology to achieve their goals (Norman, 2007). Thus, sociomateriality and technology affordance theory suggest that the use of hotel mobile apps is dependent on users' perceived

affordances of app functions and their context-based interactions with apps. However, while hoteliers incorporate their assumptions about customers' perceived affordances of hotel mobile apps into service design, it is unknown whether customer use aligns with these assumptions.

2.3 Value Propositions and Value-in-use

Customer perceived value has been studied since the 1990s, but understanding it has long been a challenge due to its diverse meanings and definitions in different contexts (Parasuraman, 1997; Wikstrom & Normann, 1994; Woodruff & Gardial, 1996). Rooted in equity theory and price-based studies, customer perceived value was originally a product-oriented concept, emphasizing consumers' perceived trade-off between what is received and sacrificed (Dodds & Monroe, 1985; Zeithaml, 1988). Gradually, scholars realize that elements such as customer-firm relationship, post-purchase behaviors and customer goals should also be incorporated as important factors that explain customer perceived value (Lai, 1995; Ravald & Grönroos, 1996; Woodruff, 1997). Lastly, the definition developed by Holbrook (1999) further enriches the customer value concept by incorporating some key characteristics that have been overlooked such as interactivity, relativism, affectivity, and the consumption experience. Based on the evolution of customer perceived value, one can clearly see how the emphasis has moved from product-oriented to relationship-oriented and finally to customer-driven, which stresses the consumer's role in value creation.

If value is determined by consumers based on their perception and consumption experience, it is not embedded in the product or service offering but emerges in the use process (Svensson & Grönroos, 2008). This has been further clarified by the S-D logic introduced by Vargo and Lusch (2004), who distinguish the difference between service providers' value propositions and consumers' value-in-use. As value is always determined phenomenologically by consumers, the service provider can only provide value propositions

126 associated with promises made to customers. Thus, since value is not predetermined but
127 emerges in use, scholars have termed customers' perceived value as "value-in-use"
128 (Ballantyne & Varey, 2006; Frow & Payne, 2008; Kowalkowski, 2011; Lusch, Vargo, &
129 O'Brien, 2007; Vargo & Lusch, 2008). Given that little is known about customers' use
130 experience with hotel mobile apps, and the lack of united view on value propositions and
131 value-in-use, this study further understands both concepts by incorporating the perspectives
132 of service providers and customers.

133 **3. Research Design and Methodology**

134 The authors of this study situate themselves as pragmatic social researchers who
135 embrace flexibility for the purpose of creative discovery (Ritchie & Lewis, 2003).
136 Understanding hoteliers' reasoning behind the app design and how customers use the app
137 requires research approaches that can obtain deep insights through eliciting human
138 interpretations of their perceptions and behaviors. Hence, interpretivism research paradigm
139 and qualitative research approach are adopted to explore customers' actual use process and
140 hoteliers' logical reasoning behind their app design. Interpretivists create knowledge based
141 on humans' interpretations and understanding of their "lived experiences" in the social world
142 (Denzin, 2000). Specifically, to connect technology functions with value, the cognitive
143 mapping method is applied to analyze the mental models of participants with attention to
144 their understanding of the environment, the reasons for their actions, and the resulting value
145 they perceived from these actions (Axelrod, 1976; Rosenhead & Mingers, 2001). Cognitive
146 maps have been recognized as particularly useful in identifying the key aspects of and
147 inconsistencies in a given problem based on clues obtained from individuals' perceptions
148 (Eden, 1991; Eden & Ackermann, 2004). In the tourism and hospitality literature, cognitive
149 maps have been used to analyze individuals' mental models to reveal their key perceptions,

considerations, value outcomes, and other complexities (Costa & Teare, 2000; Farsari, Butler, & Szivas, 2010; Xiang & Formica, 2007).

A conceptual framework (Figure 1) was developed based on the research goal, and hoteliers' and customers' perceptions are investigated separately. In terms of hoteliers, the focus is on understanding their expectations of customers' use and perceived value of current mobile app designs. On the customers' side, their use and interpretation of app functions, motivation for using them, and resulting benefits are the focus. By comparing the two groups, the research design aims to explain how these two groups' perceptions are congruent/incongruent with each other, and the reasons behind their cognitive thinking.

*** Please insert Figure 1 here ***

3.1 Data Collection

To analyze human interpretations, data was collected through semi-structured interviews, which have been widely used in cognitive mapping studies due to their flexibility and openness (Costa & Teare, 2000; Farsari et al., 2010; Farsari, Butler, & Szivas, 2011). The interviews incorporate the laddering technique to elicit higher order concepts that provide deeper insights to explain the reasons behind individuals' thoughts and behaviors (Miles & Rowe, 2004). The interviews were conducted between November 2016 and April 2017, with participants selected from three leading international hotel chain companies. The names of the focal companies and their apps are not revealed to protect the confidentiality of participants. Each company has approximately 5,000 properties across 100 countries and territories worldwide; at least 70 million members registered in its loyalty program; and at least one million number of app installs. Hotel managers at both the property and corporate levels participated. Customers who had used the focal hotel mobile apps within the previous 6 months were recruited. The participants were recruited mainly through convenience sampling (i.e., recommendation by acquaintances and cold email/message invitations) due to

the difficulty to identify and reach them. Following the theoretical framework (Figure 1), the main interview questions for hotel managers included: (1) What are the current functions in the hotel mobile app? (2) How do customers use these functions? (3) What are the benefits of these functions for the customers? (4) How are these benefits delivered to the customers? (5) Why are these benefits important for the customers? For the customers, the interview questions focused on: (1) What functions in the hotel mobile app did you use? (2) How did you use these functions? (3) What are the benefits that you gained from these functions? (4) How did you gain these benefits from using the app functions? (5) Why are these benefits important for you? The profile of all participants is presented in Table 1. The stage of data collection ended when the data appeared to be saturated. A second dataset was collected to triangulate the findings from the interviews and cognitive mapping. Online customers reviews were collected from TripAdvisor based on the same pool of hotel companies. These reviews were recorded manually through keyword searches. The final sample contains 1,000 online customer reviews written in 2016.

*** Please insert Table 1 here ***

3.2 Data Analysis — Constructing Cognitive Maps

A cognitive mapping computer software program (Decision Explorer 3.4) and detailed guidelines provided by Ackermann et al. (1992), Brightman (2002), Eden (2004), and Eden and Ackermann (2004) were adopted to analyze the interview transcripts and construct the cognitive maps. The analysis includes two main stages: sketching individual maps and combining individual maps into an aggregate map. Before the mapping began, the researchers first coded the interview transcripts to obtain a general understanding of the participants' narrative. Based on each interview transcript, meaningful phrases were extracted and entered into the Decision Explorer software as concepts (nodes), which consist of a range of elements depending on the study context and purpose (Reger, 1990). Based on its content

and associated antecedents and consequences, each concept was linked with other related concepts, resulting in a completed network of nodes representing the affordances and value of the hotel mobile apps perceived by each interviewee.

*** Please insert Figure 2 here ***

Figure 2 provides an example of cognitive map construction. The initial concepts or nodes are placed at the bottom, from which the path is developed to the top. The number preceding each node does not carry special meaning and is only for facilitating reading. The construction of each cognitive map starts from developing individual paths (upper part, Figure 2). An interviewee recalled her experience of making a special service request (node 1) through an instant messaging function in the hotel mobile apps (node 2). She perceived it as an extra communication (node 3) through which she can receive instant responses (node 4) from the hotel. Based on these perceived affordances, she used the function to communicate her special needs to the hotel (node 5). As a result, the benefit she perceived from the function was personal communication with the hotel (node 6) and being recognized as an individual customer (node 7). The logic applied in combining paths of individual participants (lower part, Figure 2) is comparable to developing individual paths. Common themes and patterns are merged so the final map reflects the general perceptions and behaviors of the participants. For example, based on the interview with another participant, node 8 is merged into the path because the in-app service menu is another way of making service requests. While the interviewee also perceived it as an extra communication channel, she had a different use experience because her request was not well-handled by the hotel (node 4, second phrase). As a result, she was dissatisfied (node 9) and might not use the function again during future stays (node 10). The link between nodes 1 and 2 is a “connotative” link without arrowheads; this indicates association but not a causal relationship between two nodes. The ellipsis between the first and second phrases in node 4 indicates the contrast between the first

and second phrase. Although a contrasting phrase is not always mandatory, its presence is encouraged by previous research as it helps simplify the final model and makes it easier to read. The negative sign next to the arrow between node 4 and 9 represents a negative relationship. This means the second phrase of the concept at the tail of the arrow (being ignored) explains the first phrase of the concept at the arrowhead (dissatisfaction).

The construction of cognitive paths continues until all distinguishable concepts have been located. Individuals' maps were sequentially aggregated into a single model in which similar or overlapping concepts were merged (Eden & Ackermann, 2004). This process required repeated scrutiny of each path's logic and overlapping concepts to avoid inconsistences and overly complex connections. The Decision Explorer software was particularly useful during this step, as it enables the movement and organization of concepts across individual maps. The aggregated maps, presented in a hierarchical means-end structure for hotel managers and customers, are presented in Figure 3 and Figure 4 respectively. While the trustworthiness of qualitative research relies on the researchers' critical reflection on their interpretations (Denzin & Lincoln, 2011), the completed maps are presented to facilitate readers' understanding of the underlying map logic and construction. Additionally, member checks were also employed wherein interview participants were randomly invited to check the aggregated map and validate the researchers' interpretations. The final map versions were adjusted after collecting this feedback.

4. Findings

This section compares and describes hoteliers' and customers' cognitive paths from actions to value outcomes. Both groups focus on discussing four main app functions: room reservation, information, online check-in/out and room access, and service requests. The

examples of interview quotations are provided as supplemental information available to readers via an online website.

*** Please insert Figure 3 here ***

*** Please insert Figure 4 here ***

4.1 Room Reservation Function

Based on the hoteliers' map (Figure 3), the in-app room reservation function (node 1) is designed for customers to make direct bookings (node 5) and receive relevant booking notifications (node 4) at all times and places (node 12). Hoteliers expected such convenience and efficiency (node 31) to make travel easier for customers (node 22), who would be more delighted and comfortable (node 55). By joining the hotel's membership program (node 2), customers can book and receive messages regardless of time and location, so they can avoid making long distance phone calls (node 13), and they can access exclusive benefits (node 15) such as points redemption and special offers (node 16), which yield monetary benefits for customers (node 20). Additionally, hoteliers embed a room customization element (node 3) in the reservation function for customers to specify their personal preferences (node 6) such as bed type, room type and location. Customers can personalize their stay based on their personal needs and preferences rather than standardized ones (node 9) (Example of Quotations 1). Hoteliers respond by checking customer preferences on a daily basis (node 8) and sharing customer information among sister properties (node 7). As a result, hoteliers expected that customers would perceive a personalized stay experience (node 63) as their individual needs and wants are incorporated into the service offering (node 59). On the customers' map (Figure 4), their use of the function matches hoteliers' expectations to a large extent. However, there is a noticeable difference. In the room customization function (node 81), customers consider room preferences (node 85) as basic rather than "personal"

arrangements (node 88) (Example of Quotations 2). They perceive convenience and efficiency (node 93) but not personalized experience, and they see affordances of the room reservation function as basic requirements of a chain hotel.

4.2 In-App Information

In the hoteliers' map (Figure 3), the in-app information function (node 23) is designed to provide customers a range of information related to their stay and travel activities (e.g., hotel information, customer profile and transaction activities) (node 25). Hoteliers expect that customers can access all important information through a single platform (node 28) anytime, anywhere (node 12), without having to search somewhere else. Thus, hoteliers hope to bring further convenience (node 31) to the customers who would then have less troubles (node 22) and worries when travelling (node 55). When customers can rely on in-app information throughout their trip, they can also save cost (node 20) from making long distance phone calls (node 13). Another important aspect of providing in-app information is to push customized contents based on customers' personal interests (node 27). Hoteliers aim to engage customers by feeding them information based on their interests and needs (node 59) so they can personalize their experiences (node 63) (Example of Quotations 3). In comparison, while the customers' map (Figure 4) shows that the affordances of the in-app information lead to an easier, less-troubled travel experience and monetary benefits, as expected by hoteliers, a prominent cognitive gap was discovered in the fact that the majority of customer participants were not aware that the in-app information had been customized based on their personal interests (Example of Quotations 4).

4.3 Self-Check-In/Out and Room Access Functions

According to the hotel managers (Figure 3), the self-check-in/out and room access functions (node 18) are designed for customers to make prior arrangements (e.g., arrange early check-in; confirm check-in time) (node 14) and avoid human interactions if preferred

(node 19). Not only can customers speed up their check-in/out process (node 33) and obtain higher-self-control (node 11), hotels also have more time to prepare customers' stays before their arrival. Hoteliers believe such efficiency (node 31) would smooth customers' travel process (node 22) and reduce their uncertainties and worries (node 55). By giving customers higher self-control, hoteliers also aim to empower customers to decide the ways they want to complete different tasks (node 35) so as to personalize their experiences (node 58). Thus, hoteliers expected such action potentials to lead to personalized customer experience (node 63) with customers' needs and wants met at an individual level (node 59) (Example of Quotation 5). This is especially important for millennial customers who prefer to exert greater control over their stays. Hoteliers hope these innovative services (node 60) can attract the future generation and give customers a sense of membership recognition (node 64). On the other hand, customers also used the self-check-in/out and room access functions (node 102) to make pre-trip arrangements (node 138) and avoid human contact (node 104). While such higher self-control (node 91) resulted in their perceived greater convenience, efficiency (node 93), and a more seamless (node 94) and less stressful travel experience (node 139), the majority of customer participants did not relate self-service with personalization but simply with completing tasks by themselves (Example of Quotations 6 and 7). They also did not mention a perception of higher status compared to non-member customers from using this function.

4.4 Service Request Functions

According to the hoteliers (Figure 3), service requests can be made through the apps in two ways (node 36): from a pre-designed menu (node 37) and from "open-ended" channels (node 38) through either a one-way "open" text box or two-way instant chat/messaging. When customer needs emerge (node 61), these extra communication channels (node 39) are designed to help customers avoid face-to-face communications (node 19) and make special

arrangements before their arrival (node 14). Hoteliers believe such design can further facilitate communications with customers (node 33) and give customers higher control (node 11) to decide how they want to interact with hotels (node 35). These extra communication channels are also designed for customers to request anything they might need (node 40) instantly and in real-time (node 42) throughout their stay. As customers can directly (node 5) and ubiquitously (node 12) communicate with hotels without having to use traditional ways (node 13), hoteliers believe such design empowers customers to personalize their experiences (node 58) by allowing them to choose their preferred way to interact with hotels (node 35). Thus, beyond convenience, efficiency (node 31), an easier travel process (node 22) and monetary benefits (node 20), hoteliers believe the function can help meet individual customers' needs and wants (node 59), which yields a more personalized stay experience (node 63) (Example of Quotations 8). When customers' stays are personalized based on their special requests, hoteliers expected customers would feel more engaged (node 55), surprised (node 62) and privileged (node 64), plus a sense of novelty (node 60).

In Figure 4, customer participants also used the service menu (node 107) and open channels (node 108) to make service requests (node 106). However, the majority of customers did not perceive they could make any desired request. Instead, customers' use of the service request functions is highly dependent on their trip purpose and personal characteristics (node 109). The majority of them experienced hesitations for various reasons when attempting to make service requests through the app (node 112). Some perceived the service items as basic and limited (node 110) (Example of Quotations 9); some were uncertain about their potential needs during a hotel stay (node 115) (Example of Quotations 10); some were unsure about the scope of hotel services (node 114) (Example of Quotations 11); some worried the hotel might not pay attention to requests placed through the app (node 113) (Example of Quotations 12). For customers who experienced no hesitations, their use of

348 the service request functions is partially consistent with hoteliers' expectations. However,
349 whether they perceived personalized service from the use of this function (node 121) is
350 dependent on the importance of their communications (node 120) (Example of Quotations
351 13). Customers are delighted (node 139) and impressed (node 124) when receiving
352 personalized service. They perceived themselves as more important customers (node 126)
353 having a more special and memorable experience (node 140).

354 *** Please insert Table 2 here ***

355 ***4.5 Summary of Comparison***

356 A comparison of hoteliers' and customers' perceptions of the hotel mobile apps
357 reveals both similarities and differences between the two groups. The different types of value
358 that emerged were further categorized to facilitate better illustration and comparison. Based
359 on the findings, the value outcomes are grouped based on the dimensions and definitions of
360 consumption value developed by Sheth, Newman, and Gross (1991) and Sweeney and Soutar
361 (2001). The definition of personalization follows S-D logic interpretation, which suggests
362 that personalization is achieved by understanding and satisfying customers' idiosyncratic
363 needs and wants (Prahalad & Ramaswamy, 2004a; Vargo & Lusch, 2004). Personalization is
364 thus a unique form of consumption value that involves benefits beyond basic functional value
365 (Ranjan & Read, 2016).

366 A comparison of hoteliers' expectations and customer use unearths noticeable
367 differences between the two groups' perceptions, centering on their understanding of using
368 the hotel mobile apps for personalization. While hoteliers expect the four main app functions
369 to deliver more personalized customer experiences, the majority of customer participants: (1)
370 perceived the room preferences as too "basic" and "general" to be considered personal; (2)
371 could not perceive that in-app information was personalized based on their interests; (3)
372 perceived they were completing tasks by themsevles and did not relate self-serving with

personalization; and (4) hesitated to use the service request functions and perceived value differently depending on the nature of their communications. In sum, customer participants mainly perceived functional and emotional value from the apps, and only perceived the value of personalization in highly specific circumstances. Such gaps are attributable to the different affordances customers perceived from app functions.

4.6 Online Review Content Analysis

The resulting textual data collected from TripAdvisor is comprised mostly of short reviews rather than comprehensive narratives. Users tend to share information on the functions or the benefits of the apps rather than reporting their overall use experience in detail. The results of the online review analysis, conducted using Nvivo 11, are presented in Table 3. The percentages reflect the number of times a certain affordance or type of value was mentioned. Not every review contains such information, as some users simply mention the name of a function or complain about the apps. New information emerges as the sample size enlarges. As shown in Table 3, value types reported by users were slightly different from those that emerged from the interviews. In the online reviews, users mentioned the value of personalization not only from service request functions but room reservation and other self-service functions. The keywords/examples of value at the bottom of Table 3 display further details on users' app perceptions. Examples 4, 5, and 6 provide the original quotations from users who related their use of app functions to a unique or special consumption experience (i.e., value of personalization).

The analysis results are congruent with the cognitive mapping analysis in three ways. First, although online reviewers perceive the personalization value of several app functions as the hoteliers intended, the percentages of these reported values are extremely low. Further investigation of the original quotations (Table 3, examples of value 4, 5, and 6) reveals that such value is perceived under highly specific circumstances, which echoes the findings from

the cognitive mapping analysis. Second, the value outcomes mentioned in most of the reviews belong to the group of functional value, which is also consistent with the cognitive mapping analysis. Users like the apps mainly because they are able to prepare, save time, and travel more easily. Third, while the open service request functions show great potential in allowing customers to make personal and special requests, they are mentioned in only about 5.8% of total reviews. This validates the results of the cognitive mapping analysis, which indicate that customers are either not motivated or experience concerns when making open service requests. The online review analysis and cognitive mapping analysis supplement each other and provide an enhanced understanding of customers' use and perceptions of hotel mobile apps.

*** Please insert Table 3 here ***

5. Conclusion and Discussion

This study investigated and compared hoteliers' and customers' perceptions of branded hotel mobile apps. Through empirical evidence on customer use experience, the findings reveal how and why users may not perceive certain values proposed by hoteliers. Instead of measuring customers' perceptions, this study focused on the processes that lead to value-in-use. The findings from this study supplement the literature on hotel mobile apps, which is dominated by studies that focus on either pre-adoption or post-usage evaluation. By delineating the underlying reasoning behind hoteliers' service design and customers' interpretation of app function use, the findings unearth noticeable gaps between the two groups' perceptions of hotel mobile apps. Both hoteliers and customers perceive hotel mobile apps as facilitating travel to some extent, but the two groups perceive different personalization potential in these apps. Specifically, customer participants only perceive the value of personalization in a few special circumstances, whereas hoteliers expect a personalized experience to be delivered by uses of hotel mobile apps. In addition, bridging

the gap between technological functions and values with technology affordances, this study's cognitive mapping analysis demonstrates the mechanism underlying the interpretation of technological functions which human beings act upon to create value. This explains how customers' underlying cognitive thinking regarding a technological function influences its value-in-use. Based on qualitative research, this study's findings yield more contextual details, which complement those of previous hotel mobile app studies, which have usually examined the phenomenon quantitatively.

*** Please insert Table 4 here ***

Consistent with previous research, this study found that customers primarily enjoy the functional benefits of hotel mobile apps (Adukaite, Reimann, Marchiori, & Cantoni, 2013; Chen et al., 2012; Chen et al., 2016; Wang et al., 2016). The findings also echo previous studies regarding the potential of mobile technologies for customer experience personalization (Morosan, 2015; Neuhofer, Buhalis, & Ladkin, 2013). Additionally, this study contributes new insights in hotel mobile apps research. First, using a different theoretical stance and combining hoteliers' and customers' perspective with the application of the cognitive mapping method, this study explores customers' use process and identifies the reasons that lead to certain outcomes. The findings demonstrate how the cognitive discrepancies between the two parties can affect the effectiveness of a technology. Second, the noticeable differences between hoteliers' and customers' perceptions imply customers' perceived personalization value as an important factor to consider when evaluating hotel mobile app services. Although hoteliers intend to empower customers to personalize their own experiences through providing mobile app services, customers do not necessarily react favorably due to various reasons (e.g., their uncertainties during use, the relative importance of their needs, and different interpretation of personalized experience). As scholars have emphasized that success in designing affordances into a tool is based on understanding the

448 use context (Karat, Karat & Ukelson, 2000), the empirical evidence contributes knowledge
449 regarding how better systems can be designed in this specific context. The findings
450 supplement other studies which have focused on the user pre-adoption stage and omitted
451 factors that might arise during actual use.

452 This study provides a number of practical implications for hoteliers. They can
453 potentially narrow the gaps between their expectations and customers' perceptions to
454 maximize the potential of hotel mobile app services. First, as users do not necessarily
455 perceive the value of hotel mobile apps even if they adopt the technology, understanding the
456 context of app usage and integrating such contextual factors into app design is important for
457 maximizing value-in-use. This is consistent with scholars' emphasis on considering context
458 when studying travelers' use of technologies (Lamsfus, Wang, Alzua-Sorzabal, & Xiang,
459 2015). Second, the majority of the customer respondents failed to perceive the value of
460 personalization from the use of hotel mobile apps, suggesting that hoteliers should examine
461 the extent to which their current hotel mobile apps can deliver personalization value. In fact,
462 scholars have pointed out the limitation of using pre-designed service to personalize guest
463 experience, which "involves more than a company's a la carte menu" (Chathoth, Altinay,
464 Harrington, Okumus, & Chan, 2013, p. 10). Regarding customers' perception of the self-
465 check-in/out and room access functions, S-D logic has also explained that customers' role in
466 consuming self-services is relatively passive, which contrasts with the active consumers who
467 get to personalize their own experiences through interacting with the service provider
468 (Chathoth et al., 2013). Lastly, the findings imply that customers may need more guidance
469 when a new technological service is introduced. This is consistent with the S-D logic
470 literature, which emphasizes the importance of conducting effective dialogue with and
471 providing sufficient resources to customers to facilitate their value creation process (Prahalad

& Ramaswamy, 2004a; Vargo, Maglio, & Akaka, 2008). Hoteliers may consider providing customers with more clues and information to better guide customer expectations.

6. Limitations and Future Research

This study adopted a qualitative research approach, which is constrained for generalization purposes. However, as the objective of this study is to demonstrate the construction of process and understand human perceptions and experiences, this limitation does not impair the study's contribution (i.e., bridging technology functions and value-in-use through the cognitive mapping technique and technology affordance theory). The study's findings should be interpreted cautiously, as the data was collected from a single area and a particular customer group. Future research may consider quantifying the findings from this study or conducting a similar study in a different cultural context to gain further insights about the phenomenon. In addition, as this study found customers have different interpretations of personalized experience, future research may develop approaches to measure and better understand customers' perceived value of personalization.

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