

This version of the article has been accepted for publication, after peer review (when applicable) and is subject to Springer Nature's AM terms of use (<https://www.springernature.com/gp/open-research/policies/accepted-manuscript-terms>), but is not the Version of Record and does not reflect post-acceptance improvements, or any corrections. The Version of Record is available online at: <https://doi.org/10.1007/s40558-024-00310-2>.

Revisiting and exploring trust in the digital era: Conceptualization and scale development of digital trust in hospitality and tourism

Minwoo Lee, Ph.D.*

Associate Professor

Conrad N. Hilton College of Global Hospitality Leadership

University of Houston

Houston, TX

U.S.A.

mlee37@uh.edu

Seonjeong Ally Lee, Ph.D.

Associate Professor

White Lodging-J.W. Marriott, Jr. School of Hospitality and Tourism Management

Purdue University

West Lafayette, IN

U.S.A.

allylee@purdue.edu

Hyejo Hailey Shin, Ph.D.

Assistant Professor

School of Hotel and Tourism Management

The Hong Kong Polytechnic University

Kowloon, Hong Kong

hailey.shin@polyu.edu.hk

and

Miyoung Jeong, Ph.D.

Professor

School of Hotel, Restaurant, and Tourism Management

University of South Carolina

Columbia, SC

U.S.A.

International School of Economic and Administrative Sciences,

Universidad de La Sabana, Chía, Colombia.

jeongm@mailbox.sc.edu

* Corresponding Author

1
2
3
4 **Revisiting and exploring trust in the digital era: Conceptualization and scale development of digital trust in**
5
6 **hospitality and tourism**

7
8 **Abstract**
9

10 This research aims to conceptualize consumers' trust toward digital technologies in the hospitality and tourism
11 context, develop measurement scales for digital trust, validate the developed scale, and investigate the consequences
12 of digital trust. A sequential exploratory strategy was used to develop a measurement scale. An in-depth literature
13 review, thematic analyses of an unstructured survey with undisguised questions, and a focus group discussion were
14 conducted to conceptualize digital trust. Then, the scale developed from this process was assessed, refined, and
15 validated using quantitative methods. Results show that digital trust is a hierarchical construct consisting of
16 mechanical trust and relational trust. Responsiveness, legitimacy, and efficiency are components of mechanical trust,
17 whereas relational trust is composed of credibility and care. Digital trust then has significant positive impacts on
18 experience, brand trust, and continued use intention.
19
20
21
22
23
24
25
26
27

28 **Keywords:** Digital Trust; Mechanical Trust; Relational Trust; Scale Development; Scale Validation
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

1. INTRODUCTION

Since digital technologies have been available in the market, the hospitality and tourism industry has been implementing various digital technologies (e.g., mobile apps, artificial intelligence, virtual reality, Internet of Things, etc.) competitively to increase profits and enhance customer experience through service innovation and digital transformation (Cearley, 2020; Lee, 2022; Park, Lee, & Back, 2023). For example, mobile apps are one of the most frequently used and convenient technologies, and more and more hospitality and tourism firms are offering various services through Google Play and the App Store. Customers can download apps for their favorite restaurants and hotels to their smartphone or tablet to expedite ordering or booking. According to Mintel (2021), more than half of customers have engaged with service providers through mobile apps for ordering, delivery, and payment. The industry's mobile revenues have been predicted to increase to \$134 billion by 2023 from \$94 in 2019 worldwide (Klein, 2019). Moreover, digital technologies play a critical role in leading to service innovation, market disruption, trust, and customer satisfaction in hospitality and tourism businesses (Huang, Shao, & Wang, 2013; Lee, Sisson, Costa, & Bai, 2023; Sharifi-Tehrani, Bapiri, Esfandiar, & Chitsaz, 2016).

As a key strategic enabler for business success, digital technologies have been transforming how hospitality and tourism firms do businesses with customers and reinventing the digital business landscape to enhance seamless customer experiences and operational efficiencies (Lee, Ahn, Shin, Kwon, & Back, 2021; PV, 2021). In addition, consumer demand for seamless and convenient digital experiences has continuously increased (Chick, 2021). Customers' use of digital technologies has been accelerated by the COVID-19 pandemic due to their convenience, safety, and contactless nature. While the use of recent digital technologies offers many benefits including improved operational performance, efficiency, quality, and customer satisfaction (Vyas, 2022), the use of technology to facilitate interactions between service providers and customers raises critical trust issues related to privacy, security, malfunctioning, and/or other potential risks associated with network security (Wirtz et al., 2023). Prior information systems and marketing research has demonstrated that technologies play a critical role in affecting customer purchase behavior (Han, 2023) and trust (and more importantly transferring trust toward such technologies to trust toward services and businesses (e.g., Nel & Boshoff, 2017; Moin, Devlin, & McKechnie, 2023; Stewart, 2003).

In a digital business environment, consumers' trust in technology is essential to mitigate these potential issues and challenges and to build sustainable relationships and strong brand attachment (Bidmon, 2017; Huaman-

1
2
3
4 Ramirez & Merunka, 2019). More importantly, building trust in technology-driven services and applications is
5
6 believed to help hospitality and tourism brands attract and retain customers (Li, Teng, & Chen, 2020), which enables
7
8 them gain a strong position and competence in the competitive digital business landscape (Treat, 2021). Consumers'
9
10 trust toward brand is based on prior experiences and accumulated interactions over time in the customer-brand
11
12 journey and refers to the consumer's experiential process of learning and perceiving over time (Husain, Paul, &
13
14 Koles, 2022).

15
16 Although consumers' perceptions, expectations, trust, and service experience toward innovative and
17
18 emerging technologies have been rapidly changed over time (Almeida, Santos, & Monteiro, 2020; Bonfanti, Vigolo,
19
20 & Yfantidou, 2021; Lee, 2021; Pratono, 2021), prior technology research relies on the concept and measurement of
21
22 trust and does not reflect such a new nature of trust in the digital era. Moreover, trust has been widely examined in
23
24 the technology context in the past decades, but there are still several new and under-researched areas that should be
25
26 explored to extend rapidly emerging digital trends and technology advancement (Benbasat, Gefen, & Pavlou, 2010;
27
28 Kohn et al., 2021; Han, 2023; Ye, Hofacker, Peloza, & Allen, 2020). More importantly, we need to have a better
29
30 understanding and new perspectives of trust by integrating digital cues and brand (Sundararajan, 2019; Han, 2023).
31
32 However, there has been a scant scholarly effort to revisit trust technology-driven services and products by
33
34 considering novel aspects (e.g., brand, digital cues, scales, etc.) in the digital transformation era within the
35
36 hospitality and tourism context.

37
38
39 As digital technologies become more prevalent in today's hospitality and tourism business environment and
40
41 interest in digital trust rises, hospitality and tourism researchers and practitioners need to identify whether and how
42
43 their digital technologies enhance the customer experience and trust toward their brand. In particular, consumers'
44
45 trust toward recent technology-driven services is based on complex mechanisms such as what technologies they use,
46
47 who provides those services, what relationships exist between consumers and service providers (Mazzella,
48
49 Sundararajan, d'Espous, & Möhlmann, 2016; McKnight, Choudhury, & Kacmar, 2002). When using services in the
50
51 digital environment, consumers' trust can be significantly influenced by a mechanism that reliably and predictably
52
53 delivers a predefined output (i.e., mechanical trust) and social norms and agreements built in the relationships
54
55 among customers, mobile platforms, and service providers (i.e., brand trust), formulating digital trust (Dobrygowski
56
57 and Hoffman, 2019).

1
2
3
4 hospitality service quality perceptions, which then influenced customer satisfaction, customer loyalty, and customer
5 intentions within the borders of Eastern Providence in Saudi Arabia. Customer trust has been extensively studied in
6 hospitality and tourism contexts due to its positive outcomes. Prior trust research in the hospitality and tourism
7 context identified outcomes of trust and the mediating role of trust. Liao et al. (2019), for instance, identified the
8 importance of trust in enhancing hotel customers' purchase intentions and word-of-mouth intentions. Their study
9 also identified the role of brand loyalty that can strengthen the effects of trust on customers' purchase and word-of-
10 mouth behaviors. Li, Teng, and Chen (2020) investigated the mediating role of customer trust in the relationship
11 between customer engagement and brand loyalty by applying social exchange theory. In the context of tourism, Liu
12 et al. (2019) developed a scale for tourists' feelings of trust toward destinations, and Han and Hyun (2015) examined
13 how consumers' trust mediated the relationship between perceived medical service quality and intention to revisit.

14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

Prior trust research has also investigated the importance of trust in different consumption contexts, including website, intermediaries, social media, etc. The importance of trust has been investigated in the website context of the hospitality and tourism industry. For instance, Sharifi-Tehrani et al. (2017) identified the importance of e-trust that positively influenced e-performance of the travel website along with e-quality, e-loyalty and e-satisfaction. Baki (2020) also identified the antecedents of consumers' trust in online hotel booking websites. The effect of online review content on customer trust in a sharing economy platform (Airbnb) has been explored (Cheng, Fu, Sun, Bilgihan, & Okumus, 2019). In addition, Qingyun, Xun, and Zhuohao (2009) investigated the importance of trust in intermediaries as it directly influenced customers' booking intentions. They identified brand-related (e.g., hotel reputation), website-related (e.g., perceived usefulness), and consumer-related (e.g., internet skills) factors as antecedents of trust in intermediaries in the context of hotel booking websites. Based on the commitment–trust theory, Li and Chang (2016) further examined the effect of social media customer trust on behavioral intention through commitment to hospitality and tourism social media.

As digital technology has become ubiquitous in the hospitality and tourism industry, researchers have started investigating the role of trust in online settings. For instance, Huang, Shao, and Wang (2013) identified factors that influenced trust and outcomes of trust in the online setting. They investigated how various factors related to hotel internet word-of-mouth (e.g., openness, authority, interests, usefulness, etc.) influenced consumers' trust, which then influenced customers' behavior intentions represented by customers' purchase and recommendation

1
2
3
4 intentions. Recently, Hao and Chon (2021) found that customers' experience with contactless services increased
5 customer equity, thereby generating trust. Although studies have investigated how customer trust affects intention to
6 use various digital technologies and data in the hospitality and tourism context (e.g., Kaushik, Agrawal, & Rahman,
7 2015), most studies have focused on consumers' trust in brands, rather than a specific technology. Accordingly,
8 understanding of how customer trust in a particular technology affects their experience with the technology and trust
9 in the brand has been limited. The importance of specific context is advocated in prior research. Baki (2023), for
10 instance, emphasized the importance of target market selection in better understanding customer behavior.

11
12 Even though prior research has started to investigate the role of digital trust, there were no consensus to
13 measure the digital trust. Previous studies have either conceptually investigated digital trust or examined digital trust
14 as measured by customer trust or brand trust rather than digital trust reflected in digital technologies. Table 1
15 describes prior digital trust research by explaining how digital trust has been investigated in a business context and a
16 hospitality and tourism context. As technologies have become a part of a brand's products/services, understanding
17 consumers' trust in technology is more important than ever. It is, therefore, important to develop a comprehensive
18 definition of trust toward digital technologies (i.e., digital trust) and a set of measurement scales for digital trust in
19 the hospitality and tourism context.

20
21 [Table 1]

22 23 **2.2. Conceptualization of Digital Trust**

24
25 Customers are increasingly exposed to the digital environment through their devices as they engage in business
26 transactions with service providers including restaurants and hotels. A reliable and trustworthy digital environment
27 is a fundamental foundation not only for customers to be constantly connected to service providers but also for
28 service providers to enhance operational efficiencies and customer loyalty. Trust refers to "expectations held by the
29 consumers that the service provider is dependable and can be relied on to deliver on its promises" (Sirdeshmukh,
30 Singh, & Sabol, 2002, p. 17). Based on this customer-centric trust, digital trust explains how much customers can
31 rely on the ability of the digital technologies in this study. Trust is essential in building the customer-service
32 provider relationship (Luo & Zhang, 2016), lowering perceived uncertainty (Pavlou, Liang, & Xue, 2007), and
33 developing emotional relationship with a service provider (Wang et al., 2014). Digital trust not only captures the
34 digital technology's functional reliability but also explains its relational responsibility. As trust serves as an

1
2
3
4 important role in various contexts, including hotel website (Huang et al., 2013; Qingyun et al., 2009), tourism
5
6 website (Sharifi-Tehrani et al., 2017), and sharing economy (Cheng, Fu, Sun, Bilgihan, & Okumus, 2019), this study
7
8 predicts the significant role of digital trust in the context of the digital technology.
9

10 According to the trust-building model (McKnight, Choudhury, & Kacmar, 2002), consumers' trust in
11 digital setting is not only affected by the digital technologies but also service providers (e.g., vendor). It implies that,
12
13 trust in the digital era can be formed by the trust mechanism of triadic relationships among customers, digital
14
15 technology, and service providers (Mazzella, Sundararajan, d'Espous, & Möhlmann, 2016). Formulating the triadic
16
17 relationships among these three key players, digital trust can make service providers' brands more attractive and
18
19 help them retain customers by offering new products and services and positioning themselves well within their
20
21 larger value chain of products and services (Lewrén, Murdoch, & Johnson, 2014; Li & Tsai, 2022). Thus,
22
23 customers' brand recognition and brand preference can be strengthened by how they view digital platforms and
24
25 service providers in the current digital market. Dobryowski and Hoffman (2019) argued that mechanical trust and
26
27 relational trust are two major components that can shape digital trust. Mechanical trust refers to a mechanism that
28
29 reliably and predictably delivers a predefined output. As far as mechanical trust is acceptable in the digital
30
31 environment, customers are willing to use systems (e.g., mobile apps, websites, etc.) because they can always get
32
33 reliable and predictable outputs. Relational trust, on the other hand, relates to social norms and agreements built in
34
35 the relationships among customers, mobile platforms, and service providers to ensure the promise and value of
36
37 digital technologies to improve outcomes.
38
39

40 Expanding the concept of these two digital trust dimensions (Dobryowski & Hoffman, 2019), the present
41 study considers mechanical trust from the perspectives of technical aspects of digital technology and relational trust
42
43 from the perspectives of both customers and service providers (or brands) toward digital technology. In line with
44
45 this view, digital trust is defined as customer's trust in a brand's digital technology and their trust in the
46
47 functional/mechanical services provided by digital technology in this study. In particular, digital trust can be further
48
49 divided into mechanical trust and relational trust according to the object of customer trust in the current study. Prior
50
51 trust research has explored the role of trust in digital technology and identified four sub-dimensions of trust in the
52
53 information systems and data management context (e.g., Snijkers, 2004): competence, openness, care, and
54
55
56
57
58
59
60
61
62
63
64
65

1
2
3
4 reliability¹. Both competence and openness are related to the technical aspects of digital trust (i.e., mechanical trust),
5
6 while care and reliability are related to the relational aspects (i.e., relational trust). Competence and openness refer to
7
8 the organization's ability to process and access digital information efficiently and safely. Care focuses on
9
10 collaboration and sharing common goals and interests between customers and service providers, while reliability
11
12 refers to consistency between what the service provider says and what it actually does, strengthening the trusting
13
14 relationship between customers and service providers.

15 16 **3. DIGITAL TRUST SCALE DEVELOPMENT**

17 18 **3.1. Overview of Scale Development Procedures**

19
20 The methodology for this research was guided by a sequential exploratory strategy, beginning with qualitative
21
22 inquiry, and then validating the findings with quantitative inquiry (Creswell & Creswell, 2017). Grounded in this
23
24 strategy, this research followed the procedures suggested by Churchill (1979) and Netemeyer, Bearden, and Sharma
25
26 (2003) to increase the rigorousness of the scale. The qualitative stage (i.e., Section 3) involved an in-depth literature
27
28 review followed by an unstructured survey with undisguised open-ended questions and a focus group discussion.

29
30 The data from the qualitative inquiry were used to develop measurement items, and then two pilot tests were
31
32 performed to refine the scale. Finally, the scale was assessed and validated using quantitative data (i.e., Section 4).

33
34 Figure 1 illustrates the scale development procedures.

35
36 [Figure 1]

37 38 39 40 41 **3.2. Domain Specification and Measurement Development**

42
43 Previous research (e.g., Gefen & Straub, 2004) has suggested that customer trust is generated when the customer is
44
45 confident about the product/service provider's ability to provide a quality product/service with integrity. However,
46
47 with the introduction of technological mediums, such as e-commerce, more actors have become involved in the
48
49 consumer journey. Accordingly, the objects of customer trust include the product/service provider and the digital
50
51 platform or channel (Komiak & Benbasat, 2004). Restaurants were set as the study context for several reasons. First,
52
53 restaurants have been the leader of the hospitality and tourism industry in adopting digital technologies. Second,

54
55
56
57
58 ¹ These four dimensions are discussed further for the digital trust construct' scale development in the methodology
59
60 section.

1
2
3
4 there are two objects customers develop their trust toward, one being the digital technology itself and the other being
5
6 the brand providing services via digital technologies. Among different types of digital technologies, this research
7
8 focuses on a restaurant brand's mobile app because it is the most commonly available and used technology in the
9
10 hospitality and tourism context (Shin et al., 2024).

11 12 *3.2.1. Unstructured Survey*

13
14 After a thorough review of the literature, an unstructured survey with undisguised open-ended questions was
15
16 conducted to more accurately understand general customers' perceptions of digital trust. In total, 238 complete
17
18 surveys were collected in March and April 2021. A series of thematic analyses were performed to discover the
19
20 salient factors that made up digital trust. Consistent with the literature review, the thematic analysis of the
21
22 unstructured survey suggested that digital trust has two dimensions, mechanical trust and relational trust.
23
24 Specifically, words representing mechanical trust, such as connectivity, seamlessness, efficiency, effectiveness,
25
26 legitimacy, privacy, security, convenience, and user-friendliness, appeared frequently in the responses. Relational
27
28 trust was represented by words such as credibility, accountability, caring, genuineness, and friendliness. As the
29
30 findings from the literature review and unstructured survey were analogous, a focus group discussion protocol was
31
32 developed based on these themes.

33 34 *3.2.2. Focus Group Discussion*

35
36 Although the literature review and thematic analysis of the answers to the open-ended questions suggested the
37
38 potential dimensions and components of digital trust, a focus group discussion was conducted to increase the
39
40 comprehensiveness and accuracy of the digital trust concept. Following McNamara (2009) and Turner (2010), a
41
42 discussion protocol was developed to extract the discussants' perceptions of restaurant mobile apps. Discussion
43
44 questions included: "What types of digital technologies in restaurants have you used?", "What are the reasons for
45
46 you to use restaurant mobile apps?", "Can you share your experiences with restaurant mobile apps". Based on the
47
48 discussants' answer, the moderator asked further questions. Snowball sampling was used to recruit potential
49
50 discussants, while controlling for the discussants' sociodemographic information (e.g., gender, age, education level,
51
52 etc.). More specifically, to ensure the representativeness of the participants, screening was performed when
53
54 obtaining their consent forms. A focus group discussion with five participants took place for approximately one
55
56 hour. The five discussants were selected as they were familiar with restaurant mobile apps. In terms of gender, three
57
58

1
2
3
4 of the five discussants were female and the remaining two were male. The discussants' ages ranged from their early
5
6 20s to their late 50s, and their educational background ranged from high school to graduate school. Discussions were
7
8 recorded and transcribed for subsequent analysis.
9

10 To identify salient themes from the discussion, multiple coding (e.g., in vivo, emotion, process, value, and
11
12 versus coding) was conducted (Saldaña, 2021). To ensure the reliability and validity of the coding, only one type of
13
14 coding was performed at a time. The results were cross-validated by three researchers with expertise in hospitality
15
16 and tourism technology to ensure sufficient content and face validities. The results of focus group discussions
17
18 supported the conclusion that mechanical trust and relational trust were the two main dimensions of digital trust.
19
20 Specifically, five major themes emerged as components of mechanical trust: responsiveness, legitimacy, efficiency,
21
22 functionality, and cost effectiveness. In the relational trust dimension, credibility, care, and commitment were the
23
24 salient themes. As the identified themes were consistent with the literature review and open-ended survey, digital
25
26 trust was developed as a hierarchical construct comprising two second-order constructs (mechanical trust and
27
28 relational trust) and eight first-order constructs (responsiveness, legitimacy, efficiency, functionality, cost
29
30 effectiveness, credibility, care, and commitment). Figure 2 depicts the focus group discussion process.
31

32
33 [Figure 2]

34 35 *3.2.3. Item Generation*

36 Following the suggestion of Netemeyer et al. (2003), an initial item pool for digital trust that included more than a
37
38 sufficient number of items was built. Developing enough items for each first-order construct was especially critical
39
40 due to the hierarchical nature of the digital trust construct. Therefore, 52 items were developed for the first-order
41
42 constructs of digital trust. Then, four researchers reviewed the developed items for readability, face validity, and
43
44 content validity. After iterative review, the initial item pool contained 49 items, with each first-order construct
45
46 containing at least five items.
47

48 49 **3.3. Initial Item Refinement**

50 Before assessing the initial item pool, two pilot tests were conducted to evaluate the readability of the items. A total
51
52 of 109 complete and usable responses were collected for the first pilot test and 310 for the second pilot test.

53 Exploratory factor analyses (EFAs) were conducted to investigate the factor structure of digital trust and the
54
55 respondents' overall evaluations of the developed items were synthesized. After two pilot tests, some first-order
56
57

1
2
3
4 constructs were combined, some were dropped, and some items were modified. Eventually, digital trust was
5
6 conceptualized as a third-order construct with two second-order dimensions (i.e., mechanical trust, relational trust)
7
8 and seven first-order components: responsiveness, legitimacy, efficiency, functionality, credibility, care, and
9
10 commitment. After the initial appraisal, the number of items for digital trust was 35, and there were at least four
11
12 items for each first-order construct.

14 **3.4. Measurement Assessment**

16 *3.4.1. Data Collection and Analysis*

18 An online survey developed on Qualtrics was used. Respondents were recruited through an online survey recruiting
19
20 company because their panels are demographically diverse and data collection is quick and inexpensive
21
22 (Buhrmester, Kwang, & Gosling, 2011). A total of 197 complete and usable responses were collected from June 10,
23
24 2021, to June 30, 2021. The socio-demographic information of the respondents is summarized in Table 2. The
25
26 survey had five sections. The first section included a description of the research followed by a consent form, and a
27
28 quality commitment item. The second section contained questions asking the respondents about their use of
29
30 restaurant mobile apps, such as frequency, brands, and purposes. To ensure the representativeness of the sample, the
31
32 second section included several screening questions. For example, respondents who indicated that they used third-
33
34 party applications such as UberEats were directed outside the survey. The measurement items for digital trust were
35
36 included in the third section. The measurement items for the potential consequences of digital trust were included in
37
38 the fourth section. Items about the respondents' socio-demographic information were included in the final section.

40
41 All constructs were measured with multiple items on either a 7-point Likert scale or a semantic differential
42
43 scale. Four items were used to measure responsiveness and legitimacy, respectively. Five items were used to
44
45 measure efficiency. Functionality was measured with seven items. Credibility, care, and commitment were measured
46
47 with five items each. The potential consequences of digital trust were measured with items adopted from literature.
48
49 Four items adopted from Lee, Lee, Jeong, and Oh (2020) were used to measure experience. Brand trust was
50
51 measured with four items from Chaudhuri and Holbrook (2001). Three items from Lee (2018) were used to measure
52
53 customers' continued use intention. Attention check items were placed in the middle of the survey to ascertain the
54
55 data quality.

1
2
3
4 First, the descriptive statistics were examined. Then, the distribution of the data was assessed to ensure the
5
6 normality assumption was met. Once the normality of the distribution was confirmed, EFAs and principal
7
8 component analysis (PCA), very simple structure, and parallel analysis were performed to examine the underlying
9
10 factor structure of digital trust (Bandalos, 2018). The literature on scale development (e.g., Hinkin, Tracey, & Enz,
11
12 1997) suggests performing EFA followed by confirmatory factor analysis (CFA) to test the significance of the
13
14 developed scale. Thus, CFA was conducted after confirming the factor structure through EFA according to the
15
16 literature.

17
18 [Table 2]

19 20 *3.4.2. Factor Structure Investigation*

21
22 The results of the EFA, PCA, and parallel analysis identified five first-order factors and the very simple structure
23
24 results indicated two second-order constructs. Thus, an EFA with Promax rotation was performed to drop the items
25
26 with high cross-loadings or factor loadings of less than .4. When running the EFA, only one item was eliminated at a
27
28 time. During the iterative EFA process, one component of mechanical trust (functionality) and one component of
29
30 relational trust (commitment) were dropped as a result of high cross-loadings or low loadings. Furthermore, one
31
32 item was eliminated from each of efficiency and credibility. Thus, as shown in Tables 3 and 4, the overall EFA
33
34 results indicated that digital trust was a third-order construct comprising two second-order dimensions (mechanical
35
36 trust and relational trust). Mechanical trust had three components (responsiveness, legitimacy, and efficiency) and
37
38 relational trust had two components (credibility and care), measured across 21 items.

39
40 [Tables 3 & 4]

41 42 *3.4.3. Confirmatory Factor Analysis*

43
44 CFA was performed to confirm that the retained items were adequate. The model fit indices showed that the
45
46 measurement model had a good fit ($\chi^2/df=2.46$, CFI=.92, TLI=.90, RMSEA=.09, SRMR=.06; Newsom, 2012). As
47
48 shown in Table 5, the standardized factor loadings ranged from .73 to .94, confirming that the measured variance
49
50 was greater than the error variance (Gefen, Straub, & Boudreau, 2000). The average variance explained (AVE)
51
52 values for all constructs were greater than or equal to .57, indicating that shared variance was greater than the error
53
54 variance (Fornell & Larcker, 1981). The correlations between any two first-order constructs were less than the
55
56 square root of the two constructs, supporting discriminant validity (Fornell & Larcker, 1981), as shown in Appendix
57
58

1
2
3
4 2. Lastly, the smallest Cronbach's alpha was .86, and composite reliability ranged between .86 and .94,
5
6 demonstrating adequate internal consistency (Nunnally & Bernstein, 1978).

7
8 [Table 5]
9

10 **4. MEASUREMENT VALIDATION**

11 **4.1. Hypothesis Development and Testing in the Context of Mobile Application for Measurement Validation**

12
13
14 The present study identified mechanical trust and relational trust as major dimensions of digital trust and developed
15 its measurement scales. To further validate the proposed scale of digital trust suggested by prior scale development
16 studies (e.g., Koc & Ayyildiz, 2022, Lu, Cai, & Gursoy, 2019; Pijls, Groen, Galetzka, & Pruyn, 2017; Shin, Jeong,
17 So, & DiPietro, 2022), this study empirically investigated the relationship between digital trust and its potential
18 outcomes, explaining customers' experiential, cognitive, and behavioral responses- customer experience, brand
19 trust, and continued use intentions. Even though digital technologies are prevalently used, customers have high
20 concerns about privacy and security issues when using digital technologies (Wu, Moody, Zhang, & Lowry, 2020);
21 thus, customers' digital trust becomes an important key to determining their continued use intentions. With the
22 increasing demand and competition of digital technologies, it is important to understand the role of digital trust on
23 customers' responses with digital technologies to promote their continued usage (Han, 2023; Nel & Boshoff, 2017;
24 Moin, Devlin, & McKechnie, 2023).
25
26

27 *4.1.1. Experience*

28
29 Experience can be conceptualized by the object of the experience. For instance, online customer experience
30 describes customers' online experiences based on their interactions with a website (Rose, Clark, Samouel, & Hair,
31 2012), while brand experience explains customers' experiences through interactions with the firm/organization
32 brand (Brakus, Schmitt, & Zarantonello, 2009). In this research, digital technology experience refers to customers'
33 experiences through their interactions with the technology. With the development and diffusion of digital
34 technology, digital technology services such as online food delivery have become popular in the hospitality and
35 tourism industry and have changed the way customers behave (e.g., dine out and order food) (Cheng, Chang, &
36 Chen, 2021).
37
38

39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

Prior research explains customer experience as a multidisciplinary concept that includes cognitive and affective reactions (Molinillo, Navarro-García, Anaya-Sánchez, & Japutra, 2020). Islam and Rahman (2017), for

1
2
3
4 instance, explained that customers' interactions influenced cognitive and affective perceptions of the service
5
6 delivery cycle, which eventually determined customer experience. In relation to mobile app experiences, Mclean,
7
8 Al-Nabhani, and Wilson (2018) identified the utilitarian factors of technology, enjoyment, and timeliness as
9
10 important factors that influenced customer experience in the context of mobile commerce applications. Sharma and
11
12 Sharma (2019) suggested that trust is critical and creates a positive user experience when using technologies.
13
14 Shahid, Islam, Malik, and Hasan (2022) reported that trust, convenience, social influence app attributes, and
15
16 customer support affected customers' experience with a mobile banking app. Even though prior research has
17
18 identified trust as one of the factors that influences customer experience with digital technologies, the effects of
19
20 different types of digital trust on customers' experience with digital technologies have not been explored. To
21
22 investigate how different types of digital trust influence customers' experiences with digital technologies, this
23
24 research proposes the following hypotheses.

25
26 *H1: Mechanical digital trust including (a) responsiveness, (b) legitimacy, and (c) efficiency positively influences*
27
28 *customers' experience with digital technologies.*

29
30 *H2: Relational digital trust including (a) care and (b) credibility positively influences customers' experience with*
31
32 *digital technologies.*

33 34 35 36 37 *4.1.2. Brand Trust*

38
39 Brand trust refers to "the willingness of the average consumer to rely on the ability of the brand to perform its stated
40
41 function" (Chaudhuri & Holbrook, 2001, p. 82). It explains customers' perceptions of a brand's reliability and
42
43 responsibility, regardless of how familiar they are with the brand (Chaudhuri & Holbrook, 2001). Brand trust is an
44
45 important construct in various contexts, including hotel mobile apps (Lee & Lee, 2019), travel booking mobile apps
46
47 (Albayrak, Rosario González-Rodríguez, Caber, & Karasakal, 2021), and restaurant brand development (Han,
48
49 Nguyen, & Lee, 2015). Albayrak et al. (2021), for instance, investigated the role of brand trust in the context of
50
51 mobile applications for travel booking. They identified that brand trust had a positive effect on customers' intention
52
53 to use mobile applications for travel booking. Brand trust also leads to positive organizational outcomes such as
54
55 customer satisfaction (Zboja & Voorhees, 2006) and brand loyalty (Chaudhuri & Holbrook, 2001).
56
57
58
59
60
61
62
63
64
65

1
2
3
4 The impact of trust in digital technology on brand trust is driven by the trust transfer process. The theory of
5 trust transfer explains the direct impact of trust in an organization on brand trust (Zhao, Huang, & Su, 2019). Trust
6 transfer is a cognitive process whereby an individual's trust in one domain has an influence on attitudes and
7 perceptions in another domain (Xiao, Zhang, & Fu, 2019). According to trust transfer theory, intra-channel and
8 inter-channel transfer are two different types of trust transfer (Lee, Kang, & McKnight, 2007). Intra-channel trust
9 transfer is the transfer of trust between related entities in the same channel (Lin, Lu, Wang, & Wei, 2011). Inter-
10 channel trust transfer refers to trust transfer from an entity in one context to the same entity in another context (Lin
11 et al., 2011). Xiao et al. (2019) explored trust transfer between different channels, examining trust from the
12 intermediary platform to the user community. According to the trust transfer theory, if a customer trusts a seller, this
13 trust can be transferred to the brand (Zhao et al., 2019). Zhao et al. (2019) confirmed the effects of trust in sellers on
14 brand trust in the context of customer-to-customer social commerce. Accordingly, when customers develop digital
15 trust using digital technology, they can develop brand trust, explaining trust transfer between the digital technology
16 and the brand. Thus, the following hypotheses are developed.

17
18
19
20
21
22
23
24
25
26
27
28
29
30
31 *H3: Mechanical digital trust including (a) responsiveness, (b) legitimacy, and (c) efficiency positively influences*
32 *brand trust.*

33
34
35 *H4: Relational digital trust including (a) care and (b) credibility positively influences brand trust.*

36 37 38 39 4.1.3. Continued Use Intention

40 Intention to continue to use digital technology reflects the likelihood that a customer will continue to use the digital
41 technology. Investigating customers' use intention has become an important factor in the development of digital
42 technology due to its power to predict the customer's actual behavior (Venkatesh & Davis, 2000). Customers'
43 experiences with digital technologies (e.g., online food delivery) influence their behavior, such as loyalty and
44 continued use (Homburg, Jozić, & Kuehnl, 2017). Brand trust also influences brand loyalty (Chaudhuri & Holbrook,
45 2001) and continued use intentions (Albayrak et al., 2021). Therefore, it is expected that customers' experience and
46 brand trust influence their intentions to continue to use digital technology. Accordingly, this research proposes the
47 following hypotheses.

48
49
50
51
52
53
54
55
56
57 *H5: Customers' experience with digital technologies positively influences their continued use intentions.*

1
2
3
4 *H6: Customers' brand trust positively influences their continued use intentions.*

5
6 Based on the above discussions, Figure 3 shows the proposed research framework to validate two dimensions of
7
8 digital trust in the context of the restaurant mobile app.
9

10 [Figure 3]

11 **4.2. Data Collection and Analysis**

12 For the measurement assessment phase, an online survey was developed on Qualtrics, and respondents were
13
14 recruited through an online survey recruiting company. Consistent with previous survey data collection, restaurant
15
16 mobile apps were the research setting. The survey consisted of five sections, starting with a consent form and
17
18 description of the research's purpose. The second section asked the respondents about restaurant mobile app usage
19
20 patterns, such as frequency of use, the restaurant brand they used the most, and their reasons for using restaurant
21
22 apps. Several filtering questions were also included in the second section. As the population of interest was
23
24 customers who used a restaurant's mobile app, respondents who said they only used third-party mobile apps such as
25
26 Grubhub and UberEats were removed from the survey. The third section included the items developed to measure
27
28 digital trust. Measurement items for the constructs that were within the nomological network of digital trust (i.e.,
29
30 mobile app experience, brand trust, and continued use intention) were contained in the fourth section. The last
31
32 section asked the respondents about their socio-demographic information.
33
34
35

36 All items were measured on a 7-point semantic differential or Likert scale. Responsiveness, legitimacy, and
37
38 efficiency were each measured with four items developed in the procedure described above. Care was measured
39
40 with five items, while credibility was measured with two items. The other constructs were measured using multiple
41
42 items drawn from previous studies. Four items from Lee et al. (2020) were used to measure experience. Four items
43
44 from Chaudhuri and Holbrook (2001) were used to measure brand trust. Continued use intention was measured with
45
46 three items from Lee (2018). To ensure the quality of the data, the respondents were asked to declare that they
47
48 would provide truthful and accurate answers at the beginning of the survey, and several attention check questions
49
50 were included in the middle of the survey. Furthermore, the survey was limited to those who had not participated in
51
52 the previous surveys, including pilot tests. Between September 13, 2021, and November 10, 2021, 509 complete
53
54 responses were collected. The socio-demographic characteristics of the respondents are provided in Table 2.
55
56
57
58
59

1
2
3
4 Prior to the data analysis, the distribution of the data and the descriptive statistics were assessed. Then, R
5
6 4.1.1. with multiple packages were used to analyze the data. The analysis began with factor structure investigation
7
8 and a factor invariance test, followed by the two-step approach (Anderson & Gerbing, 1988). The factor structure
9
10 was investigated using EFA and CFA. Factor invariance tests were conducted in a hierarchical manner (configural,
11
12 metric, and scalar invariances). Covariance-based structure equation modeling (CB-SEM) was used to test the
13
14 measurement model and structural model.

15 16 **4.3. Factor Structure Re-examination and Factor Invariance Test**

17
18 EFA was first performed to evaluate the factor structure of digital trust. The number of factors was determined based
19
20 on multiple criteria: EFA, PCA, parallel analysis, and very simple structure. All the methods suggested that there
21
22 were five factors in digital trust, three of which were related to mechanical trust and two of which were related to
23
24 relational trust. As the EFA results showed all loadings were greater than the threshold of .4 (Stevens, 1992), all
25
26 items were included in the CFA. A CFA that only included digital trust items was first tested to ensure the accuracy
27
28 of the factor structure.

29
30 The results showed that all items had standardized factor loadings equal to or greater than .70, except one
31
32 item of credibility (.69). The AVEs for each construct were equal to or greater than .58. The bivariate correlations
33
34 between any two components of digital trust were less than the square root of AVE, and Cronbach's alpha and
35
36 composite reliability were greater than .80. Thus, convergent and discriminant validities and internal consistency
37
38 were satisfactory. Furthermore, the fit indices ($\chi^2/df=3.07$, CFI=.95, TLI=.94, RMSEA=.06, SRMR=.05) also
39
40 indicated good model fit (Newsom, 2012). Before testing the overall measurement model and research framework,
41
42 the measurement invariance of the digital trust scale was tested by randomly splitting the sample into two sub-
43
44 samples. Configural invariance was supported as the measurement model test showed good model fit without any
45
46 constraints (CFI=.94, TLI=.93, RMSEA=.07, SRMR=.05). Metric ($\chi^2_{16}=24.58$, $p>.05$) and scalar ($\chi^2_{16}=6.51$, $p>.05$)
47
48 invariances were also supported.

49 50 **4.4. Measurement Model Test**

51
52 As the developed digital trust construct was found to be valid and reliable, further analyses were performed to assess
53
54 the impacts of digital trust. The measurement model test showed satisfactory model fit ($\chi^2/df=2.61$, CFI=.94,
55
56 TLI=.94, RMSEA=.06, SRMR=.04). The standardized factor loadings were equal to or greater than .70, except for
57
58

1
2
3
4 two items from credibility (.69). As shown in Table 6, the AVE for all constructs was equal to or greater than .58.
5
6 Thus, there was sufficient convergent validity. The correlations between two constructs were less than the square
7
8 root of AVE, indicating sufficient discriminant validity (Appendix 3). Cronbach's alpha and composite reliability
9
10 values were equal to or greater than .84, indicating satisfactory internal consistency.

11
12 [Table 6]

13 14 **4.5. Structural Model Test**

15
16 The fit indices confirmed that the structural model had a good fit ($\chi^2/df=2.99$, CFI=.93, TLI=.92, RMSEA=.06,
17
18 SRMR=.06). The R² was .51 for experience, .71 for brand trust, and .34 for continued use intention, showing that a
19
20 substantial amount of variance in the outcome constructs was explained by the model. Responsiveness ($\beta=-.09$,
21
22 $z=-1.58$, $p>.05$) and legitimacy ($\beta=.02$, $z=.27$, $p>.05$) did not influence customers' experience with restaurant
23
24 mobile app. However, efficiency positively influenced customers' digital technology experience ($\beta=.64$, $z=6.32$,
25
26 $p<.001$). Although efficiency was the only aspect of mechanical trust that was a positive antecedent of digital
27
28 technology experience, both care ($\beta=.35$, $z=4.48$, $p<.001$) and credibility ($\beta=.26$, $z=2.38$, $p<.05$) had positive impacts
29
30 on customers' experience with the digital technology.

31
32
33 Responsiveness ($\beta=-.04$, $z=-.66$, $p>.05$) and efficiency ($\beta=.11$, $z=1.02$, $p>.05$) had no significant impact on
34
35 brand trust, but legitimacy was a positive antecedent of brand trust ($\beta=.52$, $z=5.82$, $p<.001$). The two relational trust
36
37 components, care ($\beta=.96$, $z=8.94$, $p<.001$) and credibility ($\beta=.30$, $z=2.50$, $p<.05$) positively affected brand trust.
38
39 Customers' experience with digital technology had a significantly positive impact on their intention to continue to
40
41 use the digital technology ($\beta=.42$, $z=8.39$, $p<.001$). When consumers' trust in the brand increased, their intention to
42
43 continue to use the brand's digital technology also increased ($\beta=.10$, $z=2.87$, $p<.01$).

44
45 The effect of efficiency on customers' continued use intention was mediated by experience ($\beta=.27$, $z=5.39$,
46
47 $p<.001$). A mediating effect of experience in the relationship between care and continued use intention was also
48
49 found ($\beta=.15$, $z=.407$, $p<.001$). The positive impact of credibility on customers' continued use intention was
50
51 mediated by experience ($\beta=.11$, $z=2.30$, $p<.05$). Brand trust mediated the relationship between legitimacy and
52
53 continued use intention ($\beta=.05$, $z=2.62$, $p<.01$). Continued use intention was influenced by care mediated by brand
54
55 trust ($\beta=.09$, $z=2.80$, $p<.01$). Table 7 summarizes the hypothesis testing and mediation test results.

56
57 [Table 7]

5. CONCLUSIONS AND DISCUSSION

5.1. Conclusions

Even though digital technologies have received considerable attention from both researchers and practitioners in the hospitality and tourism industry, one of the key concepts in customer relationship research, customer trust, has been underexplored in the context of digital technologies. The present research developed a set of measurement scales to assess customers' digital trust in digital technologies by using restaurant mobile apps and examined how digital trust affects customer experience, brand trust, and behavioral intention. Through the scale development process, this study identified two dimensions of digital trust- mechanical trust and relational trust. Responsiveness, legitimacy, and efficiency were under mechanical trust, whereas credibility and care were part of relational trust. To validate the proposed dimensions of digital trust, this study then tested the roles of mechanical trust and relational trust on customer experience, brand trust, and continued use intentions in the context of a restaurant mobile app.

Results identified efficiency, care, and credibility influenced customer experience, whereas legitimacy, care, and credibility influenced brand trust. Both customer experience and brand trust positively influenced customers' continued use intentions. Relational trust showed significant effects both on customer experience and brand trust. However, efficiency in mechanical trust only influenced customer experience, and legitimacy in mechanical trust showed effects on brand trust only. This study further investigated the mediating roles of customer experience and brand trust on the relationship between digital trust and customers' continued use intention. Customer experience mediated efficiency, care, and credibility aspects of digital trust on customers' continued use intention, whereas brand trust mediated legitimacy and care aspects of digital trust on customers' continued use intention.

Most of the dimensions in digital trust showed effects either on customer experience or on brand trust. Among various dimensions of digital trust, responsiveness in mechanical trust did not influence customer experience nor brand trust. It might be due to the overlapping characteristics of responsiveness. Responsiveness can be viewed as mechanical trust, but it can be also considered as one of the key dimensions of service quality (Ladhari, 2010). As shown in the results of this study, a single aspect of digital trust should not be practiced, rather multidimensional aspects of digital trust should be focused on enhancing customers' responses. These results were consistent with prior research that identified the multidimensions of trust (Marcoz et al., 2016; Palácios et al., 2021). Consistent

1
2
3
4 with prior research, this study confirmed the importance of investigating different dimensions of digital trust that
5 enhanced customer experience and brand trust, which in turn increased customers' continued use intentions.
6
7

8 **5.2. Theoretical Implications**

9

10 This study makes a significant theoretical contribution by conceptualizing of digital trust in the context of hospitality
11 by integrating concepts from customer experience management (Islam & Rahman, 2017; Molinillo, et al., 2020) and
12 trust transfer theory (Zhao, Huang, & Su, 2019). Despite the importance of trust in hospitality and tourism research,
13
14 customer trust in digital technologies has not yet been established. Although many studies have attempted to
15
16 conceptualize or measure digital trust from customer trust and brand trust, there has been no groundbreaking
17
18 measurement of digital trust reflected in digital technologies (see Table 1). To address this gap in the literature, this
19
20 study comprehensively conceptualized digital trust using a multi-method (qualitative and quantitative) and multi-
21
22 data (unstructured survey data for thematic analysis, focus group discussion, and structured surveys) approach.
23
24 Specifically, digital trust was developed as a hierarchical construct consisting of two second-order constructs
25
26 (mechanical trust and relational trust) and five first-order constructs (responsiveness, legitimacy, efficiency, care,
27
28 and credibility) to accurately capture the multi-faceted nature of customer trust in digital technologies. This
29
30 hierarchical structure provides a more comprehensive and nuanced theoretical foundation for understanding the
31
32 multifaceted nature of digital trust beyond a simplified, single-dimensional approach, thereby enhancing our
33
34 understanding of how trust operates in digital environments, particularly in the context of the hospitality setting
35
36 (e.g., restaurant mobile apps).
37
38
39

40 The findings of this study advance trust transfer theory by demonstrating how digital platforms act as
41
42 intermediaries in building trust between customers and service providers. When customers develop trust in a digital
43
44 platform's mechanical aspects (e.g., responsiveness, legitimacy, and efficiency), this trust can be transferred to the
45
46 service provider, strengthening the overall brand-customer relationship. This theoretical insight expands our
47
48 understanding of how digital technologies mediate trust formation in the modern service environment. In addition to
49
50 mechanical trust, relational trust (e.g., care and credibility) between customers and service providers reaffirms
51
52 established digital trust through mechanical trust as a form of trust transfer, thereby enhancing our understanding of
53
54 how social norms and agreements function in the digital environment. These results suggest that trust transfer is not
55
56 merely a technical process, but rather involves complex social and relational elements that bridge the gap between
57
58
59

1
2
3
4 digital platforms and service providers, contributing to a more nuanced understanding of trust formation in the
5
6 digital context. Thus, the theoretical framework can serve as a foundation for future research that explores the
7
8 interplay between the two dimensions of trust in various digital contexts. Therefore, this study developed a new
9
10 concept of digital trust to specifically reflect consumers' trust in technological media/platforms (i.e., digital
11
12 technologies).

13
14
15 The findings of the study also contribute to the growing body of research on restaurant mobile apps,
16
17 particularly in the context of contactless services in the hospitality industry, as highlighted by Hao and Chon (2022).
18
19 By exploring the relationship between contactless service interactions and customer trust via mobile apps, this study
20
21 extends an understanding of how digital trust is formed and maintained in an increasingly technology-driven
22
23 hospitality environment. Building on Mazzella et al. (2016) on digital trust in the sharing economy, this study
24
25 provides new insights into the unique dynamics of trust formation in the context of digital hospitality. Adopting the
26
27 concepts of affective and cognitive experiences in building digital trust via mobile apps (Molinillo et al., 2020), this
28
29 study advances theoretical understanding and a novel conceptualization of how functional and emotional elements
30
31 of digital interactions contribute to trust formation in the hospitality context. This theoretical framework goes
32
33 beyond existing models of service quality and satisfaction to provide a more nuanced view of the customer
34
35 experience in digital environments.

36
37
38 Finally, this study introduces the concept of triadic relationships in digital trust formation. This theoretical
39
40 framework demonstrates how digital trust operates among three key players: customers, digital technologies, and
41
42 service providers. This triadic relationship extends traditional dyadic customer-service provider trust models by
43
44 incorporating the crucial role of digital technologies as a mediating factor. As result, this study extends the
45
46 theoretical perspective on customer-service provider relationships and brand recognition. Digital technologies can
47
48 serve as a fundamental foundation and crucial mediator in the customer-service provider relationship by maintaining
49
50 continuous connections and enhancing operational efficiency, leading to strong digital trust between the two parties,
51
52 which in turn leads to high customer loyalty and improved service provider performance. The results of this study
53
54 also contribute to brand recognition theory by revealing how customers' views of digital platforms directly affect
55
56 their brand recognition and preference. Brand recognition and preference are now intrinsically linked to digital
57
58

1
2
3
4 experiences, extending traditional brand theory into the digital domain. This study demonstrates how customers
5
6 view digital platforms can strengthen or weaken their brand recognition and preference in the current digital market.
7
8

9 **5.3. Practical Implications**

10 The findings of this study offer practical insights. First, this research provides a comprehensive framework for
11 understanding and strengthening digital trust, which can help the hospitality and tourism industry find key ways in
12 which mobile apps create digital trust for customers. By distinguishing between mechanical trust and relational
13 trust, this study offers practical guidance for balancing technological improvements with customer-centric
14 approaches. For example, while investing in improving the functionality and efficiency of digital platforms
15 (mechanical trust), hospitality operators should also focus on demonstrating care and credibility (relational trust) in
16 their digital interactions. This balanced approach can lead to more effective trust-building strategies in digital
17 environments. Furthermore, with the five identified components of digital trust (responsiveness, legitimacy,
18 efficiency, care, and credibility), restaurant operators can develop targeted strategies to improve their digital
19 offerings and build stronger trust relationships with their customers.
20
21
22
23
24
25
26
27
28
29
30

31 The proposed scale for measuring digital trust, in particular, with five first-order constructs, would provide
32 hospitality operators with a practical tool to assess and monitor their performance in building digital trust. Regular
33 evaluation using this scale can help hospitality firms identify areas for improvement, track progress over time, and
34 benchmarking against competitors, which can help inform decision-making processes related to digital strategy,
35 customer experience design, and technology investments. Additionally, the five first-order components of digital
36 trust can serve as a checklist for designing and evaluating digital interfaces and interactions. For instance, hospitality
37 firms can focus on improving the responsiveness, legitimacy, and efficiency of their digital systems to enhance
38 mechanical trust, while they can incorporate elements that convey care and credibility to boost relational trust. This
39 detailed understanding of the digital trust components can potentially enable targeted improvements to digital
40 products and services, thereby leading to increased customer adoption, loyalty, and continued use intentions in the
41 competitive digital environment of the hospitality and tourism industry.
42
43
44
45
46
47
48
49
50
51
52

53 This research sheds light on how restaurants can strengthen brand trust by building digital trust. The results
54 confirm that customer trust in digital technologies can be transferred to a hospitality and tourism brand. Considering
55 the transfer of customer trust, small disappointments with digital technologies can have a disproportionate impact,
56
57
58

1
2
3
4 undermining customers' brand trust. For instance, if personal information (e.g., credit card numbers) entered into a
5 digital technology is affected by a data breach, customers might not trust the brand anymore. Accordingly, it is
6 recommended that the hospitality and tourism industry pay close attention to their digital technologies so that
7 customers can build digital trust in digital technologies, thereby enhancing their brand trust. Hospitality and tourism
8 brands should strengthen the security of their digital technologies and be transparent about their services so that
9 customers can believe their digital technologies are trustworthy, which will increase their trust in the brand.

16 **5.4. Limitations and Future Directions**

18 This research is not free from limitations, which lead to several suggestions for future research. First, this research
19 developed a digital trust construct by focusing on customers' perceptions of restaurants' own mobile apps, such as
20 those for Domino's Pizza, Panera Bread, and Starbucks. Accordingly, the findings might not be applicable to third-
21 party restaurant mobile apps, such as DoorDash, Grubhub, and UberEats. Therefore, future studies could develop a
22 digital trust scale for third-party restaurant mobile apps and conduct a parallel analysis to detect the differences in
23 customers' digital trust of restaurants' own mobile apps and third-party mobile apps.

30 In a similar vein, the findings of this research are not generalizable to other sectors of the hospitality and
31 tourism industry, such as the hotel industry, as the context of this research was the restaurant industry. Hence, future
32 research is recommended to use a digital trust construct developed in the current research to compare that of other
33 sectors of the hospitality and tourism industry. In addition, as the focus of this research was restaurants' mobile
34 apps, customers' digital trust in other digital technologies in restaurants, such as table-top tablets and/or self-service
35 kiosks, might be divergent. Therefore, future studies could apply the digital trust construct to other digital
36 technologies in restaurants to expand the findings of this research.

44 Due to the primary focus of the present research on developing the constructs of digital trust and assessing
45 their impacts on customers' digital experiences, brand trust, and continued use intentions, this study may limit the
46 extent to which older customers can participate in the study. Although digital technologies, such as restaurant
47 mobile apps, are a widely used medium for food ordering and contactless payment, older customers may have
48 limited digital experience and brand awareness, so their responses may not be fully reflected in the findings of the
49 study. Thus, it will be of great importance in future studies to include a representative number of older customers
50
51
52
53
54
55
56
57
58
59

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

using a stratified sampling method to draw more precise conclusions for all age groups. This will allow the study findings to be more generalizable by eliminating potential issues related to demographic constraints.

Lastly, the present study discussed prior research on trust, digital trust, and e-trust to understand what we have known and what we have not known. Despite our effort synthesizing past trust studies, further research elaborates more on discussing and synthesizing past trust studies published in business, hospitality, and tourism journals and presenting critical development of a trust construct and concept over time with future research agenda.

6. REFERENCES

- Agag, G., & El-Masry, A. A. (2016). Understanding the determinants of hotel booking intentions and moderating role of habit. *International Journal of Hospitality Management*, 54, 52-67.
- Albayrak, T., Rosario González-Rodríguez, M., Caber, M., & Karasakal, S. (2023). The use of mobile applications for travel booking: impacts of application quality and brand trust. *Journal of Vacation Marketing*, 29(1), 3-21.
- Almeida, F., Santos, J. D., & Monteiro, J. A. (2020). The challenges and opportunities in the digitalization of companies in a post-COVID-19 World. *IEEE Engineering Management Review*, 48(3), 97-103.
- Amin, M., Ryu, K., Cobanoglu, C., & Nizam, A. (2021). Determinants of online hotel booking intentions: website quality, social presence, affective commitment, and e-trust. *Journal of Hospitality Marketing & Management*, 30(7), 845-870.
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411.
- Baki, R. (2020). Analysis of factors affecting customer trust in online hotel booking website usage. *European Journal of Tourism, Hospitality and Recreation*, 10(2), 106-117.
- Baki, R. (2023). The evaluation of target markets for hazelnut exports with the classification approach of potential market alternatives. *British Food Journal*, 125(10), 3540-3552.
- Bandalos, D. L. (2018). *Measurement theory and applications for the social sciences*.
- Benbasat, I., Gefen, D., & Pavlou, P. A. (2010). Introduction to the special issue on novel perspectives on trust in information systems. *MIS Quarterly*, 34(2), 367-371.
- Bidmon, S. (2017). How does attachment style influence the brand attachment–brand trust and brand loyalty chain in adolescents?. *International Journal of Advertising*, 36(1), 164-189.
- Bonfanti, A., Vigolo, V., & Yfantidou, G. (2021). The impact of the Covid-19 pandemic on customer experience design: The hotel managers' perspective. *International Journal of Hospitality Management*, 94, 102871.
- Brakus, J. J., Schmitt, B. H., & Zarantonello, L. (2009). Brand experience: what is it? How is it measured? Does it affect loyalty?. *Journal of Marketing*, 73(3), 52-68.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data?. *Perspectives on Psychological Science*, 6(1), 3-5.
- Cearley, D., (2020). *Top 10 strategic technology trends for 2020*.
<https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2020>
- Chaudhuri, A., & Holbrook, M. B. (2001). The chain of effects from brand trust and brand affect to brand performance: the role of brand loyalty. *Journal of Marketing*, 65(2), 81-93.
- Chen, G., & Li, S. (2021). Effect of employee–customer interaction quality on customers' prohibitive voice behaviors: Mediating roles of customer trust and identification. *Frontiers in Psychology*, 12, 773354.
- Cheng, C. C., Chang, Y. Y., & Chen, C. T. (2021). Construction of a service quality scale for the online food delivery industry. *International Journal of Hospitality Management*, 95, 102938.

- 1
2
3
4 Cheng, X., Fu, S., Sun, J., Bilgihan, A., & Okumus, F. (2019). An investigation on online reviews in sharing
5 economy driven hospitality platforms: A viewpoint of trust. *Tourism Management*, 71, 366-377.
6
7 Cheng, X., Fu, S., Sun, J., Bilgihan, A., & Okumus, F. (2019). An investigation on online reviews in sharing
8 economy driven hospitality platforms: A viewpoint of trust. *Tourism Management*, 71, 366-377.
9
10 Chick, J., (2021). *The restaurant of the future: A vision evolves*. [https://www2.deloitte.com/us/en/pages/consumer-
12 business/articles/restaurant-future-survey-technology-customer-experience.html](https://www2.deloitte.com/us/en/pages/consumer-
11 business/articles/restaurant-future-survey-technology-customer-experience.html)
13
14 Churchill Jr, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of
15 Marketing Research*, 16(1), 64-73.
16
17 Çiftçi, Ş. F., & Çizel, B. (2020). Predictors of e-trust for Web-based travel intermediaries: a survey on Istanbul
18 visitors. *Journal of Hospitality and Tourism Technology*, 11(4), 667-680.
19
20 Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods
21 approaches*. Sage.
22
23 Dennis, A. R., Robert Jr, L. P., Curtis, A. M., Kowalczyk, S. T., & Hasty, B. K. (2012). Research note—trust is in
24 the eye of the beholder: A vignette study of postevent behavioral controls' effects on individual trust in
25 virtual teams. *Information Systems Research*, 23(2), 546-558.
26
27 Dobrykowski, D., & Hoffman, W., (2019). *We need to build up 'digital trust' in tech*. <https://www.wired.com/story/>
28
29 Eid, M. I. (2011). Determinants of e-commerce customer satisfaction, trust, and loyalty in Saudi Arabia. *Journal of
30 Electronic Commerce Research*, 12(1), 78.
31
32 El-Garaihy, W. H. (2013). Developing and validating a hospitality service quality scale in Saudi Arabia (HOSP-SQ):
33 A structural equation model. *International Journal of Business and Social Science*, 4(14), 224-238.
34
35 Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and
36 measurement error. *Journal of Marketing Research*, 18(1), 39-50.
37
38 Garbarino, E., & Johnson, M. S. (1999). The different roles of satisfaction, trust, and commitment in customer
39 relationships. *Journal of Marketing*, 63(2), 70-87.
40
41 Gefen, D., & Straub, D. W. (2004). Consumer trust in B2C e-Commerce and the importance of social presence:
42 experiments in e-Products and e-Services. *Omega*, 32(6), 407-424.
43
44 Gefen, D., Straub, D., & Boudreau, M. C. (2000). Structural equation modeling and regression: Guidelines for
45 research practice. *Communications of the Association for Information Systems*, 4(1), 7.
46
47 Han, H., & Hyun, S. S. (2015). Customer retention in the medical tourism industry: Impact of quality, satisfaction,
48 trust, and price reasonableness. *Tourism Management*, 46, 20-29.
49
50 Han, M. C. (2023). Checkout button and online consumer impulse-buying behavior in social commerce: A trust
51 transfer perspective. *Journal of Retailing and Consumer Services*, 74, 103431.
52
53 Han, S. H., Nguyen, B., & Lee, T. J. (2015). Consumer-based chain restaurant brand equity, brand reputation, and
54 brand trust. *International Journal of Hospitality Management*, 50, 84-93.
55
56 Han, S., Ulhøi, J. P., & Song, H. (2024). Digital trust in supply chain finance: the role of innovative fintech service
57 provision. *Journal of Enterprise Information Management*, in press.
58
59
60
61
62
63
64
65

- 1
2
3
4 Hao, F., & Chon, K. K. S. (2022). Contactless service in hospitality: bridging customer equity, experience, delight,
5 satisfaction, and trust. *International Journal of Contemporary Hospitality Management*, 34(1), 113-134.
6
7 Hart, P., & Saunders, C. (1997). Power and trust: Critical factors in the adoption and use of electronic data
8 interchange. *Organization Science*, 8(1), 23-42.
9
10 Hinkin, T. R., Tracey, J. B., & Enz, C. A. (1997). Scale construction: Developing reliable and valid measurement
11 instruments. *Journal of Hospitality & Tourism Research*, 21(1), 100-120.
12
13 Homburg, C., Jozić, D., & Kuehnl, C. (2017). Customer experience management: toward implementing an evolving
14 marketing concept. *Journal of the Academy of Marketing Science*, 45, 377-401.
15
16 Hospitality Technology (2023). *2023 lodging technology study: Embracing mobility & self-service*.
17 <https://hospitalitytech.com/2023-lodging-tech-study>.
18
19 Huaman-Ramirez, R., & Merunka, D. (2019). Brand experience effects on brand attachment: the role of brand trust,
20 age, and income. *European Business Review*, 31(5), 610-645.
21
22 Huang, L., Shao, J., & Wang, W. (2013, November). Research on the relationships between hotel internet word-of-
23 mouth and customers' behavior intention based on trust. In *2013 6th International Conference on*
24 *Information Management, Innovation Management and Industrial Engineering* (Vol. 2, pp. 250-254).
25
26 Husain, R., Paul, J., & Koles, B. (2022). The role of brand experience, brand resonance and brand trust in luxury
27 consumption. *Journal of Retailing and Consumer Services*, 66, 102895.
28
29 Islam, J. U., & Rahman, Z. (2017). The impact of online brand community characteristics on customer engagement:
30 An application of Stimulus-Organism-Response paradigm. *Telematics and Informatics*, 34(4), 96-109.
31
32 Jiao, H., Wong, I. A., & Lin, Z. (2024). Understanding customer multi-interactions, trust, social support and
33 voluntary performance in smart restaurants. *Journal of Hospitality and Tourism Technology*, in press.
34
35 Kandampully, J., Zhang, T. C., & Bilgihan, A. (2015). Customer loyalty: a review and future directions with a
36 special focus on the hospitality industry. *International Journal of Contemporary Hospitality*
37 *Management*, 27(3), 379-414.
38
39 Kaushik, A. K., Agrawal, A. K., & Rahman, Z. (2015). Tourist behaviour towards self-service hotel technology
40 adoption: Trust and subjective norm as key antecedents. *Tourism Management Perspectives*, 16, 278-289.
41
42 Kim, D. (2005). Cognition-based versus affect-based trust determinants in E-commerce: Cross- cultural comparison
43 study. International Conference on Information Systems, ICIS 2005, Las Vegas, pp. 741-753.
44
45 Kim, H. S. (2018). Restaurant customer's word of mouth information and structural relationship among trust,
46 purchasing intention, and word of mouth intention-Focused on mediation role of SNS poster's
47 trait (Doctoral dissertation, Sangmyung University).
48
49 Kim, J., Jin, B., & Swinney, J. L. (2009). The role of retail quality, e-satisfaction and e-trust in online loyalty
50 development process. *Journal of Retailing and Consumer Services*, 16(4), 239-247.
51
52 Klein, D., (2019). Fighting for share in the \$16.6 billion delivery app market. QSR.
53 <https://www.qsrmagazine.com/technology/fighting-share-166-billion-delivery-app-market>
54
55
56
57
58
59
60
61
62
63
64
65

- 1
2
3
4 Koc, E., & Yazici Ayyildiz, A. (2022). An overview of tourism and hospitality scales: Discussion and
5 recommendations. *Journal of Hospitality and Tourism Insights*, 5(5), 927-949.
6
7 Kohn, S. C., De Visser, E. J., Wiese, E., Lee, Y. C., & Shaw, T. H. (2021). Measurement of trust in automation: A
8 narrative review and reference guide. *Frontiers in psychology*, 12, 604977.
9
10 Komiak, S. X., & Benbasat, I. (2004). Understanding customer trust in agent-mediated electronic commerce, web-
11 mediated electronic commerce, and traditional commerce. *Information Technology and Management*, 5,
12 181-207.
13
14 Ladhari, R. (2010). Developing e-service quality scales: A literature review. *Journal of Retailing and*
15 *Consumer Services*, 17(6), 464-477.
16
17 Lee, K. C., Kang, I., & McKnight, D. H. (2007). Transfer from offline trust to key online perceptions: an empirical
18 study. *IEEE Transactions on Engineering Management*, 54(4), 729-741.
19
20 Lee, M. (2022). Evolution of hospitality and tourism technology research from Journal of Hospitality and Tourism
21 Technology: A computer-assisted qualitative data analysis. *Journal of Hospitality and Tourism*
22 *Technology*, 13(1), 62-84.
23
24 Lee, M., Ahn, J., Shin, M., Kwon, W., & Back, K. J. (2021). Integrating technology to service innovation: Key
25 issues and future research directions in hospitality and tourism. *Journal of Hospitality and Tourism*
26 *Technology*, 12(1), 19-38.
27
28 Lee, M., Lee, S. A., Jeong, M., & Oh, H. (2020). Quality of virtual reality and its impacts on behavioral
29 intention. *International Journal of Hospitality Management*, 90, 102595.
30
31 Lee, M., Sisson, A. D., Costa, R., & Bai, B. (2023). Disruptive technologies and innovation in hospitality: A
32 computer-assisted qualitative data analysis approach. *Journal of Hospitality & Tourism Research*, 47(4),
33 818-872.
34
35 Lee, S. (2018). Enhancing customers' continued mobile app use in the service industry. *Journal of Services*
36 *Marketing*, 32(6), 680-691.
37
38 Lee, S. A., & Lee, J. (2019). Enhancing customers' brand loyalty via branded hotel apps. *Journal of Quality*
39 *Assurance in Hospitality & Tourism*, 20(3), 339-361.
40
41 Lewrén, M., Murdoch, R., & Johnson, P. (2014). The four keys to digital trust. Don't be left behind.
42
43 Li, C. Y., & Tsai, M. C. (2022). What makes guests trust Airbnb? Consumer trust formation and its impact on
44 continuance intention in the sharing economy. *Journal of Hospitality and Tourism Management*, 50, 44-54.
45
46 Li, C., & Chang, C. (2016). The influence of trust and perceived playfulness on the relationship commitment of
47 hospitality online social network-moderating effects of gender. *International Journal of Contemporary*
48 *Hospitality Management*, 28(5), 924-944.
49
50 Li, M. W., Teng, H. Y., & Chen, C. Y. (2020). Unlocking the customer engagement-brand loyalty relationship in
51 tourism social media: The roles of brand attachment and customer trust. *Journal of Hospitality and Tourism*
52 *Management*, 44, 184-192.
53
54
55
56
57
58
59
60
61
62
63
64
65

- 1
2
3
4 Li, M. W., Teng, H. Y., & Chen, C. Y. (2020). Unlocking the customer engagement-brand loyalty relationship in
5 tourism social media: The roles of brand attachment and customer trust. *Journal of Hospitality and Tourism*
6 *Management, 44*, 184-192.
7
8 Liao, S. H., Chung, Y. C., & Chang, W. J. (2019). Interactivity, engagement, trust, purchase intention and word-of-
9 mouth: a moderated mediation study. *International Journal of Services Technology and Management,*
10 *25*(2), 116-137.
11
12 Lin, J., Lu, Y., Wang, B., & Wei, K. K. (2011). The role of inter-channel trust transfer in establishing mobile
13 commerce trust. *Electronic Commerce Research and Applications, 10*(6), 615-625.
14
15 Liu, J., Wang, C., Fang, S., & Zhang, T. (2019). Scale development for tourist trust toward a tourism
16 destination. *Tourism Management Perspectives, 31*, 383-397.
17
18 Lu, L., Cai, R., & Gursoy, D. (2019). Developing and validating a service robot integration willingness
19 scale. *International Journal of Hospitality Management, 80*, 36-51.
20
21 Luo, Q., & Zhang, H. (2016). Building interpersonal trust in a travel-related virtual community: A case study on a
22 Guangzhou couchsurfing community. *Tourism Management, 54*, 107-121.
23
24 Marcoz, E. M., Mauri, C., Maggioni, I., & Cantù, C. (2016). Benefits from service bundling in destination branding:
25 the role of trust in enhancing cooperation among operators in the hospitality industry. *International Journal*
26 *of Tourism Research, 18*(3), 260-268.
27
28 Mazzella, F., Sundararajan, A., d’Espous, V. B., & Möhlmann, M. (2016). How digital trust powers the sharing
29 economy. *IESE Business Review, 26*(5), 24-31.
30
31 McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). The impact of initial consumer trust on intentions to
32 transact with a web site: a trust building model. *The journal of strategic information systems, 11*(3-4), 297-
33 323.
34
35 McLean, G., Al-Nabhani, K., & Wilson, A. (2018). Developing a mobile applications customer experience model
36 (MACE)-implications for retailers. *Journal of Business Research, 85*, 325-336.
37
38 McNamara, C. (2009). General guidelines for conducting research interviews.
39
40 Mintel, (2021). *Foodservice disruptors US, 2021*. Mintel Group Ltd.
41
42 Moin, S. M. A., Devlin, J., & McKechnie, S. (2023). Introducing a composite measure of trust in financial
43 services. *The Service Industries Journal, 43*(11-12), 896-922.
44
45 Molinillo, S., Navarro-García, A., Anaya-Sánchez, R., & Japutra, A. (2020). The impact of affective and cognitive
46 app experiences on loyalty towards retailers. *Journal of Retailing and Consumer Services, 54*, 101948.
47
48 Moorman, C., Zaltman, G., & Deshpande, R. (1992). Relationships between providers and users of market research:
49 The dynamics of trust within and between organizations. *Journal of Marketing Research, 29*(3), 314-328.
50
51 mouth and customers' behavior intention based on trust. In *2013 6th International conference on*
52 *information management, innovation management and industrial engineering* (Vol. 2, pp. 250-254). IEEE.
53
54 Mubarak, M. F., & Petraite, M. (2020). Industry 4.0 technologies, digital trust and technological orientation: What
55 matters in open innovation?. *Technological Forecasting and Social Change, 161*, 120332.
56
57
58
59
60
61
62
63
64
65

- 1
2
3
4 Nel, J., & Boshoff, C. (2017). Development of application-based mobile-service trust and online trust transfer: An
5 elaboration likelihood model perspective. *Behaviour & Information Technology*, 36(8), 809-826.
6
7 Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*. Sage.
8
9 Newsom, J. T. (2012). Some clarifications and recommendations on fit indices. *USP*, 655, 123-133.
10
11 Nunnally, J. C., & Bernstein, I. H. (1978). Psychometric testing.
12
13 Palácios, H., de Almeida, M. H., & Sousa, M. J. (2021). A bibliometric analysis of trust in the field of hospitality
14 and tourism. *International Journal of Hospitality Management*, 95, 102944.
15
16 Park H., Lee, M., & Back, K. (2023). A critical review of technology-driven service innovation in hospitality and
17 tourism: Current discussions and future research agendas, *International Journal of Contemporary*
18 *Hospitality Management*.
19
20 Park, C. W., Sutherland, I., & Lee, S. K. (2021). Effects of online reviews, trust, and picture-superiority on intention
21 to purchase restaurant services. *Journal of Hospitality and Tourism Management*, 47, 228-236.
22
23 Pavlou, P. A., Liang, H., & Xue, Y. (2007). Understanding and mitigating uncertainty in online exchange
24 relationships: A principal-agent perspective. *MIS Quarterly*, 105-136.
25
26 Pijls, R., Groen, B. H., Galetzka, M., & Pruyn, A. T. (2017). Measuring the experience of hospitality: Scale
27 development and validation. *International Journal of Hospitality Management*, 67, 125-133.
28
29 **Pratono, A. H. (2022). Innovation strategy beyond the COVID-19 pandemic: the role of trust under disruptive**
30 **technology. *Foresight*, 24(3/4), 358-376.**
31
32 PV, G. (2021). *Complete guide to role of mobile application in business digital transformation*.
33 <https://www.hakunamatatatech.com/our-resources/blog/role-of-mobile-app-in-digital-transformation>
34
35 Qingyun, J. I. A. N. G., Xun, H. U. A. N. G., & Zhuohao, C. H. E. N. (2009). Antecedents and consequences of
36 consumers' trust in electronic intermediaries: An empirical study of hotel booking websites. *Frontiers of*
37 *Business Research in China*, 3(4), 647-666.
38
39 Rose, S., Clark, M., Samouel, P., & Hair, N. (2012). Online customer experience in e-retailing: an empirical model
40 of antecedents and outcomes. *Journal of Retailing*, 88(2), 308-322.
41
42 Saldana, J. (2021). *The Coding Manual for Qualitative Researchers*. Sage.
43
44 Seri, P., Bianchi, A., & Matteucci, N. (2014). Diffusion and usage of public e-services in Europe: An assessment of
45 country level indicators and drivers. *Telecommunications Policy*, 38(5-6), 496-513.
46
47 Shahid, S., Islam, J. U., Malik, S., & Hasan, U. (2022). Examining consumer experience in using m-banking apps: A
48 study of its antecedents and outcomes. *Journal of Retailing and Consumer Services*, 65, 102870.
49
50 Sharifi-Tehrani, M., Bapiri, J., Esfandiar, K., & Chitsaz, A. (2017). Comparing and Ranking tourism websites
51 performance based on e-satisfaction, e-trust, e-quality, and e-loyalty: A combined approach of structural
52 equation modeling, fuzzy and analytical hierarchical process. *Iranian Journal of Information Processing*
53 *and Management*, 32(4), 1065-1092.
54
55
56
57
58
59
60
61
62
63
64
65

- 1
2
3
4 Sharma, S. K., & Sharma, M. (2019). Examining the role of trust and quality dimensions in the actual usage of
5 mobile banking services: An empirical investigation. *International Journal of Information*
6 *Management, 44*, 65-75.
7
8
9 Shin, D. D. (2019). Blockchain: The emerging technology of digital trust. *Telematics and Informatics, 45*, 101278.
10
11 Shin, D. H. (2010). The effects of trust, security and privacy in social networking: A security-based approach to
12 understand the pattern of adoption. *Interacting with Computers, 22*(5), 428-438.
13
14 Shin, H. H., Jeong, M., So, K. K. F., & DiPietro, R. (2022). Consumers' experience with hospitality and tourism
15 technologies: Measurement development and validation. *International Journal of Hospitality*
16 *Management, 106*, 103297.
17
18 Sirdeshmukh, D., Singh, J., & Sabol, B. (2002). Consumer trust, value, and loyalty in relational exchanges. *Journal*
19 *of Marketing, 66*(1), 15-37.
20
21 Stevens, J. P. (2012). *Applied multivariate statistics for the social sciences*. Routledge.
22
23 Stewart, K. J. (2003). Trust Transfer on the World Wide Web. *Organization Science, 14*(1), 5-17.
24
25 Su, D. N., Nguyen, N. A. N., Nguyen, L. N. T., Luu, T. T., & Nguyen-Phuoc, D. Q. (2022). Modeling consumers'
26 trust in mobile food delivery apps: perspectives of technology acceptance model, mobile service quality
27 and personalization-privacy theory. *Journal of Hospitality Marketing & Management, 31*(5), 535-569.
28
29 Sundararajan, A. (2019). Commentary: The twilight of brand and consumerism? Digital trust, cultural meaning, and
30 the quest for connection in the sharing economy. *Journal of Marketing, 83*(5), 32-35.
31
32 Sundararajan, A. (2019). Commentary: The twilight of brand and consumerism? Digital trust, cultural meaning, and
33 the quest for connection in the sharing economy. *Journal of Marketing, 83*(5), 32-35.
34
35 Treat, D. (2021). *How to build trust in a new digital world*. [https://www.accenture.com/us-](https://www.accenture.com/us-en/insights/blockchain/digital-trust)
36 [en/insights/blockchain/digital-trust](https://www.accenture.com/us-en/insights/blockchain/digital-trust)
37
38 Turner III, D. W. (2010). Qualitative interview design: A practical guide for novice investigators. *The Qualitative*
39 *Report, 15*(3), 754.
40
41 Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four
42 longitudinal field studies. *Management Science, 46*(2), 186-204.
43
44 Vyas, M., (2022). *10 benefits of using mobile app technology in a restaurant business*.
45 <https://www.peerbits.com/blog/restaurant-mobile-app-technology-benefits.html>
46
47 Wang, L., Law, R., Hung, K., & Guillet, B. D. (2014). Consumer trust in tourism and hospitality: A review of the
48 literature. *Journal of Hospitality and Tourism Management, 21*, 1-9.
49
50 Wirtz, J., Kunz, W. H., Hartley, N., & Tarbit, J. (2023). Corporate digital responsibility in service firms and their
51 ecosystems. *Journal of Service Research, 26*(2), 173-190.
52
53 Wu, D., Moody, G. D., Zhang, J., & Lowry, P. B. (2020). Effects of the design of mobile security notifications and
54 mobile app usability on users' security perceptions and continued use intention. *Information &*
55 *Management, 57*(5), 103235.
56
57
58
59
60
61
62
63
64
65

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

Xiao, L., Zhang, Y., & Fu, B. (2019). Exploring the moderators and causal process of trust transfer in online-to-offline commerce. *Journal of Business Research*, 98, 214-226.

Ye, C., Hofacker, C. F., Peloza, J., & Allen, A. (2020). How online trust evolves over time: The role of social perception. *Psychology & Marketing*, 37(11), 1539-1553.

Zboja, J. J., & Voorhees, C. M. (2006). The impact of brand trust and satisfaction on retailer repurchase intentions. *Journal of Services Marketing*, 38(1), 390.

Zhao, J. D., Huang, J. S., & Su, S. (2019). The effects of trust on customers' continuous purchase intentions in C2C social commerce: A trust transfer perspective. *Journal of Retailing and Consumer Services*, 50, 42-49.

Table 1. Measures for Digital Trust in Business, Hospitality, and Tourism Research

Author(s)	Context	Construct Name	Measures and Sources	Notes
Han et al. (2024)	Business	Digital trust	Qualitative research via interviews	Digital trust in supply chain finance
Kim et al. (2009)	Business	E-trust	Three items from Gabarino and Johnson (1999)	E-trust in the online retailing
Mubarak and Petraite (2020)	Business	Digital trust	Trust (4 items) and Industry 4.0 technologies (19 items)	Digital trust in open innovation
Shin (2019)	Business	Trust	Three items from Dennis et al. (2012); Shin (2010)	Measuring trust in the Blockchain technology
Sundararajan (2019)	Business	Digital trust systems	Conceptual work	Digital trust in the sharing economy
Amin et al. (2021)	Hospitality	E-trust	Four items from Agag and El-Masry (2016)	Hotel website
Çiftçi and Çizel (2020)	Hospitality	Trust in E-tailer	Three items from Kim (2005)	Trust in web-based travel intermediaries
Jiao et al. (2024)	Hospitality	Customer trust	Three items from Chen and Li (2021)	Trust in smart restaurants
Park et al. (2021)	Hospitality	Trust	Four items from Kim (2018)	Trust in the online review sites
Su et al. (2022)	Hospitality	Consumer's trust in mobile food delivery apps	Four items from Eid (2011)	Trust in the mobile food delivery apps

Table 2. Respondents' Profile

Socio-Demographics	Assessment (n = 197)		Validation (n = 509)	
	n	%	n	%
Gender				
Male	82	41.60%	208	40.90%
Female	115	58.40%	301	59.10%
Age Generation				
Generation Z	97	49.20%	152	29.90%
Generation Y	85	43.10%	267	52.50%
Generation X	10	5.10%	66	13.00%
Baby Boomers or Older	5	2.50%	24	4.70%
Ethnicity				
Caucasian	137	69.50%	362	71.10%
African American	11	5.60%	41	8.10%
Hispanic or Latino	9	4.60%	21	4.10%
Asian	27	13.70%	59	11.60%
American Indian or Alaska Native	1	0.50%	4	0.80%
Others	12	6.10%	22	4.30%
Education Level				
High school	54	27.40%	130	25.50%
Associate degree	25	12.70%	62	12.20%
Bachelor's degree	103	52.30%	240	47.20%
Postgraduate degree	13	6.60%	69	13.60%
Others	2	1.00%	8	1.60%
Employment Status				
Employed full time	95	48.20%	311	61.10%
Employed part time	36	18.30%	57	11.20%
Self-employed or business owner	8	4.10%	33	6.50%
Unemployed or students	55	27.90%	92	18.10%
Retired	1	0.50%	7	1.40%
Others	2	1.00%	9	1.80%
Annual Household Income				
Less than \$30,000	52	26.40%	117	23.00%
\$30,000 to \$50,000	31	15.70%	101	19.80%
\$50,001 to \$70,000	43	21.80%	123	24.20%
\$70,001 to \$90,000	25	12.70%	68	13.40%
\$90,001 to \$110,000	17	8.60%	35	6.90%
More than \$110,000	29	14.70%	65	12.80%
Dining Expenditure per Month				
Less than \$100	47	23.90%	124	24.40%
\$100 - \$200	52	26.40%	152	29.90%
\$201 - \$300	42	21.30%	113	22.20%
\$301 - \$400	18	9.10%	37	7.30%

\$401 - \$500	1	0.50%	15	2.90%
\$500 or more	37	18.80%	68	13.40%
Favorite Type of Restaurants				
Fast Food, Quick Service	48	24.40%	124	24.40%
Fast Casual	38	19.30%	100	19.60%
Casual Dining	45	22.80%	108	21.20%
Upscale Casual	8	4.10%	25	4.90%
Fine Dining	13	6.60%	32	6.30%
Ethnic	31	15.70%	91	17.90%
Pub & Bars	12	6.10%	24	4.70%
Others	2	1.00%	5	1.00%
Number of Mobile Order				
Several times a week	35	17.80%	96	18.90%
About once a week	60	30.50%	155	30.50%
About 2 – 3 times a month	57	28.90%	137	26.90%
About once a month	25	12.70%	74	14.50%
About 2 – 4 times a year	11	5.60%	31	6.10%
About once a year	4	2.00%	7	1.40%
Less than once a year	5	2.50%	9	1.80%
Number of Brand Mobile Order				
Several times a week	32	16.20%	76	14.90%
About once a week	52	26.40%	133	26.10%
About 2 – 3 times a month	64	32.50%	157	30.80%
About once a month	29	14.70%	87	17.10%
About 2 – 4 times a year	15	7.60%	42	8.30%
About once a year	3	1.50%	10	2.00%
Less than once a year	2	1.00%	4	0.80%

Table 3. Digital Trust Components

Construct (Order)	Definition
Digital Trust (3)	Customers' belief that the technology itself or the service provider of the technology would perform in certain ways as they expected.
<i>Mechanical Trust (2)</i>	Customers' confidence that digital technology would work as expected.
Responsiveness (1)	Customers' trust in digital technology's responses to the task requested.
Legitimacy (1)	Customers' confidence in a probability that digital technology would be utilized in ethical, legitimate, and safe ways.
Efficiency (1)	Customers' trust in digital technology's capability to perform the task efficiently
<i>Relational Trust (2)</i>	Customers' belief that the service provider would utilize digital technology and behave in certain ways in order to provide the best service possible.
Credibility (1)	Customers' belief that the service provider would be transparent in their utilization of digital technology.
Care (1)	Customers' belief in the service provider's ability to offer friendly/caring services through their digital technology.

Table 4. The Results of EFA

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Mechanical_Responsiveness_1	0.744				
Mechanical_Responsiveness_2	0.852				
Mechanical_Responsiveness_3	0.905				
Mechanical_Responsiveness_4	0.963				
Mechanical_Legitimacy_1		0.813			
Mechanical_Legitimacy_2		0.989			
Mechanical_Legitimacy_3		0.854			
Mechanical_Legitimacy_4		0.812			
Relational_Care_1			0.783		
Relational_Care_2			0.687		
Relational_Care_3			0.682		
Relational_Care_5			0.849		
Relational_Care_6			0.698		
Mechanical_Efficiency_1				0.809	
Mechanical_Efficiency_2				0.818	
Mechanical_Efficiency_3				0.715	
Mechanical_Efficiency_4				0.716	
Relational_Credibility_1					0.616
Relational_Credibility_2					0.879
Relational_Credibility_3					0.683
Relational_Credibility_4					0.753
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
SS loadings	3.089	3.074	2.812	2.541	2.502
Proportion Var	0.147	0.164	0.134	0.121	0.119
Cumulative Var	0.147	0.293	0.427	0.548	0.668

Table 5. Construct Descriptive Statistics for Assessment Sample

Construct/Item	Mean	Sd	FL	α	CR	AVE	Skew	Kurto
<i>Mechanical Trust</i>								
Responsiveness				0.93	0.93	0.77		
[Selected Brand] mobile app lets me know when my order is ready.	6.17	0.88	0.79				-1.67	5.72
[Selected Brand] mobile app lets me know the status of my order.	6.24	0.91	0.89				-1.79	5.63
[Selected Brand] mobile app tracks my order.	6.04	1.03	0.89				-1.71	4.77
[Selected Brand] mobile app keeps me updating about my order.	5.93	1.13	0.91				-1.41	2.58
Legitimacy				0.93	0.94	0.78		
I believe [Selected Brand] mobile app keeps my personal information safe.	5.62	1.02	0.87				-0.38	-0.53
I believe [Selected Brand] mobile app secures my personal information.	5.56	1.04	0.94				-0.25	-0.93
I believe [Selected Brand] mobile app protects my privacy.	5.57	1.08	0.85				-0.38	-0.56
I believe [Selected Brand] mobile app is secure to use.	5.70	1.00	0.88				-0.53	-0.43
Efficiency				0.86	0.86	0.61		
I believe [Selected Brand] mobile app is efficient.	5.97	0.89	0.81				-1.23	4.05
I believe [Selected Brand] mobile app saves my time.	5.92	1.05	0.73				-1.25	2.34
I believe [Selected Brand] mobile app promptly processes what I have asked.	5.90	0.96	0.79				-1.25	3.09
[Selected Brand] mobile app is believed to complete my order quickly.	5.86	0.91	0.80				-1.16	3.61
<i>Relational Trust</i>								
Care				0.87	0.87	0.57		
When using its mobile app, I believe [Selected Brand] pays attention to me.	5.38	1.20	0.77				-0.76	0.48
When using its mobile app, I believe [Selected Brand] takes care of me.	5.47	1.15	0.77				-0.90	0.96
When using its mobile app, I believe [Selected Brand] provides me with comfort.	5.39	1.22	0.78				-1.06	1.55
When using its mobile app, I believe [Selected Brand] shows genuine interest in me.	5.00	1.45	0.74				-0.68	-0.22
When using its mobile app, I believe [Selected Brand] provides personalized services.	5.30	1.27	0.73				-0.90	0.67
Credibility				0.88	0.88	0.65		
When using its mobile app, I believe [Selected Brand] is transparent about my ordering process.	5.88	0.99	0.79				-1.36	3.06
When using its mobile app, I believe [Selected Brand] is not deceptive to me.	5.85	1.14	0.76				-1.59	3.06
When using its mobile app, I believe [Selected Brand] provides credible services.	6.04	0.90	0.85				-1.64	5.21
When using its mobile app, I believe [Selected Brand] is reliable.	6.01	0.92	0.86				-1.54	4.61

Table 6. Construct Descriptive Statistics for Validation Sample

Construct/Item	Mean	Sd	FL	α	CR	AVE	Skew	Kurto
<i>Mechanical Trust</i>								
Responsiveness				0.93	0.93	0.78		
[Selected Brand] mobile app lets me know when my order is ready.	5.47	1.45	0.81				-1.18	1.09
[Selected Brand] mobile app lets me know the status of my order.	5.37	1.55	0.90				-1.15	0.76
[Selected Brand] mobile app tracks my order.	5.33	1.56	0.89				-1.12	0.61
[Selected Brand] mobile app keeps me updating about my order.	5.19	1.61	0.91				-1.06	0.35
Legitimacy				0.93	0.93	0.77		
I believe [Selected Brand] mobile app keeps my personal information safe.	5.40	1.10	0.88				-0.33	-0.23
I believe [Selected Brand] mobile app secures my personal information.	5.39	1.12	0.90				-0.45	0.10
I believe [Selected Brand] mobile app protects my privacy.	5.38	1.15	0.85				-0.35	-0.24
I believe [Selected Brand] mobile app is secure to use.	5.52	1.06	0.89				-0.50	0.04
Efficiency				0.86	0.86	0.61		
I believe [Selected Brand] mobile app is efficient.	5.89	0.96	0.82				-1.06	2.41
I believe [Selected Brand] mobile app saves my time.	5.89	1.03	0.75				-1.20	2.36
I believe [Selected Brand] mobile app promptly processes what I have asked.	5.89	0.98	0.75				-1.18	2.91
[Selected Brand] mobile app is believed to complete my order quickly.	5.83	0.95	0.81				-1.00	2.33
<i>Relational Trust</i>								
Care				0.88	0.88	0.60		
When using its mobile app, I believe [Selected Brand] pays attention to me.	5.26	1.30	0.83				-0.86	0.62
When using its mobile app, I believe [Selected Brand] takes care of me.	5.28	1.25	0.81				-0.83	0.62
When using its mobile app, I believe [Selected Brand] provides me with comfort.	5.20	1.34	0.76				-0.90	0.76
When using its mobile app, I believe [Selected Brand] shows genuine interest in me.	4.70	1.57	0.78				-0.51	-0.42
When using its mobile app, I believe [Selected Brand] provides personalized services.	5.21	1.35	0.70				-0.96	0.94
Credibility				0.85	0.84	0.58		
When using its mobile app, I believe [Selected Brand] is transparent about my ordering process.	5.78	1.01	0.69				-1.15	1.96
When using its mobile app, I believe [Selected Brand] is not deceptive to me.	5.69	1.19	0.69				-1.32	1.86
When using its mobile app, I believe [Selected Brand] provides credible services.	5.96	0.91	0.86				-1.25	2.83
When using its mobile app, I believe [Selected Brand] is reliable.	6.01	0.87	0.86				-1.19	2.73

Mediator

Experience				0.89	0.89	0.67		
My previous experience with [Selected Brand] mobile app was bad: good	6.43	0.89	0.84				-2.10	5.73
My previous experience with [Selected Brand] mobile app was negative: positive	6.38	0.98	0.81				-1.95	4.48
My previous experience with [Selected Brand] mobile app was unpleasant: pleasant	6.29	1.01	0.84				-1.73	3.42
My previous experience with [Selected Brand] mobile app was unenjoyable: enjoyable	6.23	1.04	0.78				-1.38	1.46
Brand Trust				0.87	0.87	0.69		
I trust [Selected Brand].	5.84	1.02	0.83				-1.28	2.52
[Selected Brand] is an honest brand.	5.64	1.13	0.82				-1.00	1.26
[Selected Brand] is safe.	5.85	0.98	0.84				-1.16	2.39

Dependent Variable

Continued Use Intention				0.88	0.88	0.71		
I intend to use [Selected Brand] mobile app next time.	5.90	1.02	0.79				-1.25	2.73
I will use [Selected Brand] mobile app in the future.	6.14	0.85	0.88				-1.16	2.68
I plan to use [Selected Brand] mobile app in the future.	6.15	0.83	0.88				-1.21	3.33

Table 7. Hypothesis Testing

Direct Path Analysis					
Hypothesis	β	<i>se</i>	<i>z</i>	<i>p</i>	Result
Responsiveness → Experience	-0.09	0.06	-1.58	> 0.05	Not Supported
Legitimacy → Experience	0.02	0.08	0.27	> 0.05	Not Supported
Efficiency → Experience	0.64	0.10	6.32	< 0.001***	Supported
Care → Experience	0.35	0.08	4.48	< 0.001***	Supported
Credibility → Experience	0.26	0.11	2.38	< 0.05*	Supported
Responsiveness → Brand Trust	-0.04	0.07	-0.66	> 0.05	Not Supported
Legitimacy → Brand Trust	0.52	0.09	5.82	< 0.001***	Supported
Efficiency → Brand Trust	0.11	0.10	1.02	> 0.05	Not Supported
Care → Brand Trust	0.96	0.11	8.94	< 0.001***	Supported
Credibility → Brand Trust	0.30	0.12	2.50	< 0.05*	Supported
Experience → Continued Use Intention	0.42	0.05	8.39	< 0.001***	Supported
Brand Trust → Continued Use Intention	0.10	0.03	2.87	< 0.01**	Supported
Mediation Analysis					
Indirect Path	β	<i>se</i>	<i>z</i>	<i>p</i>	Result
Responsiveness → Experience → Continued Use Intention	-0.04	0.03	-1.56	> 0.05	Not Supported
Legitimacy → Experience → Continued Use Intention	0.01	0.03	0.27	> 0.05	Not Supported
Efficiency → Experience → Continued Use Intention	0.27	0.05	5.39	< 0.001***	Supported
Care → Experience → Continued Use Intention	0.15	0.04	4.07	< 0.001***	Supported
Credibility → Experience → Continued Use Intention	0.11	0.05	2.30	< 0.05*	Supported
Responsiveness → Brand Trust → Continued Use Intention	0.00	0.01	-0.64	> 0.05	Not Supported
Legitimacy → Brand Trust → Continued Use Intention	0.05	0.02	2.62	< 0.01**	Supported
Efficiency → Brand Trust → Continued Use Intention	0.01	0.01	0.96	> 0.05	Not Supported
Care → Brand Trust → Continued Use Intention	0.09	0.03	2.80	< 0.01**	Supported
Credibility → Brand Trust → Continued Use Intention	0.03	0.02	1.90	> 0.05	Not Supported

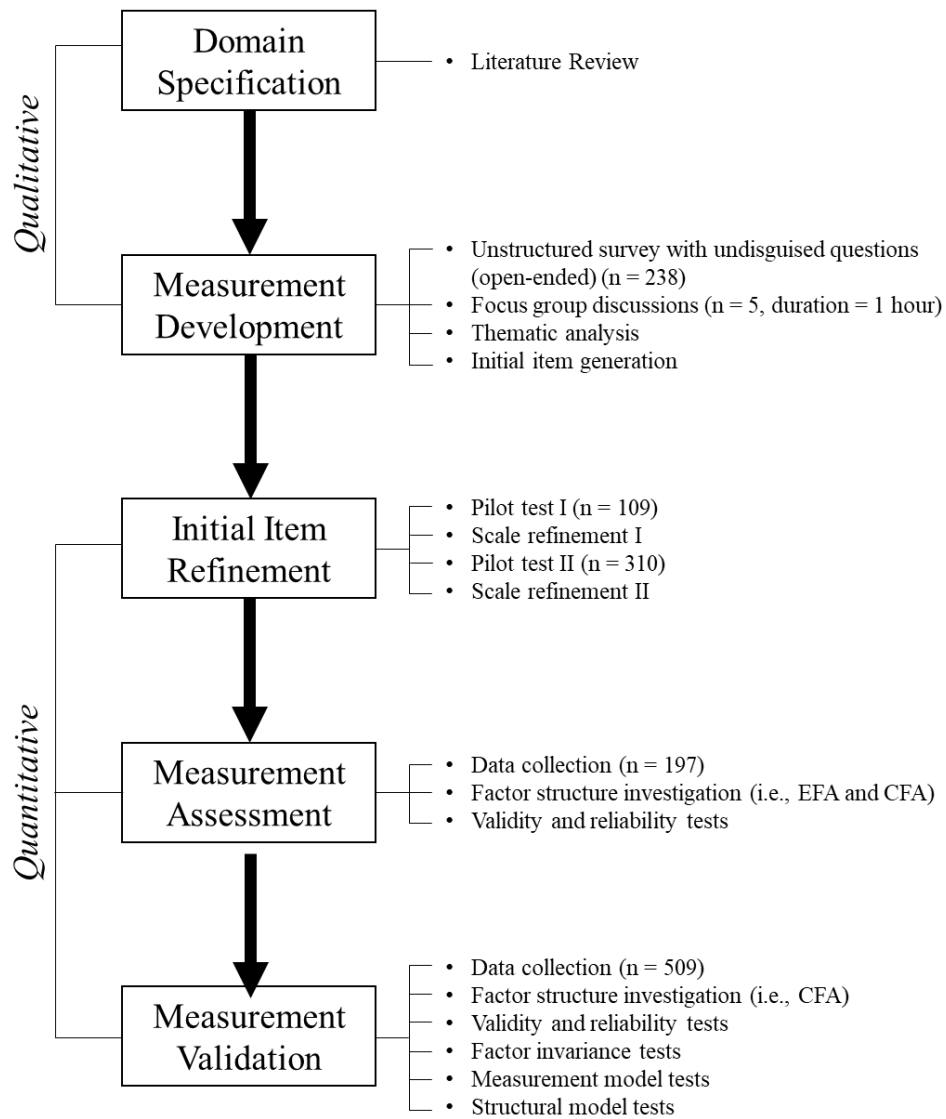
Figure 1. Scale Development Procedures

Figure 2. Focus Group Discussion Process

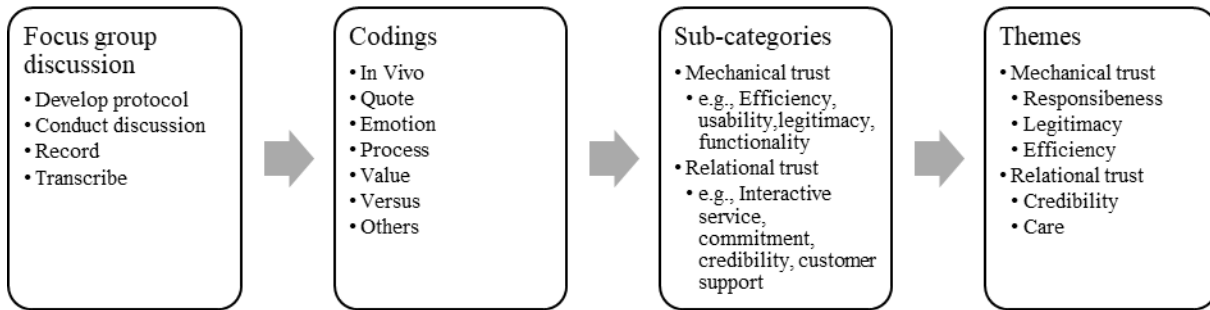
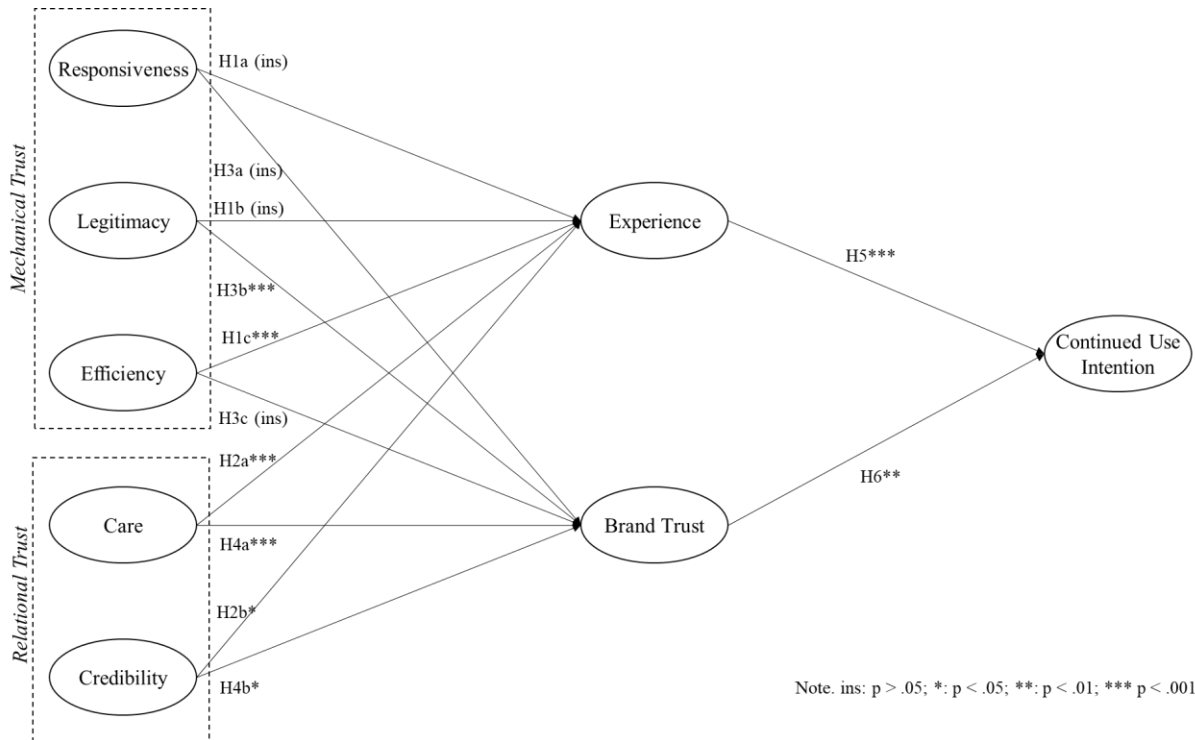


Figure 3. Research Framework for Measurement Validation



Declaration of Interest Statement

Trust toward digital technology in hospitality and tourism: Conceptualization and scale development of digital trust

We confirm that there is no financial/personal interest or belief that could affect our objectivity.

Appendix 1. Thematic Analysis Results

Dimensions	Quotes
<i>Mechanical Trust</i>	
Responsiveness	<p>“You know the functions will be there.”</p> <p>“When I'm using the mobile technology, you know, just place orders. It worked perfect every single time.”</p>
Legitimacy	<p>“That could be a little related to the security issue.”</p> <p>“I don't trust that my data that I put in is secure.”</p>
Efficiency	<p>“It was faster and convenience, like, I was planning to go get it.”</p> <p>“So simply click the button of my past purchases and it goes very fast.”</p>
<i>Relational Trust</i>	
Credibility	<p>“I already felt that it is not really making sure about the process of the service.”</p>
Care	<p>“I prefer being connected to directly to the restaurants” (when using mobile apps)</p> <p>“They do have customer service.”</p> <p>“One time I ordered again using an app, and I mistakenly put like days, like three days later from today. I was not aware of it, but then I got a call from their manager asking me about the order.”</p> <p>“I think it's almost 100% because there is an employee who's always helping me out.”</p>

Appendix 2. Discriminant Validity for Assessment Sample

	1	2	3	4	5
Responsiveness	0.88				
Legitimacy	0.23	0.89			
Efficiency	0.31	0.47	0.78		
Care	0.49	0.55	0.46	0.75	
Credibility	0.33	0.50	0.78	0.56	0.81

Appendix 3. Discriminant Validity for Validation Sample

	1	2	3	4	5	6	7	8
Responsiveness	0.88							
Legitimacy	0.27	0.88						
Efficiency	0.29	0.51	0.78					
Care	0.38	0.55	0.36	0.78				
Credibility	0.29	0.62	0.73	0.55	0.76			
Experience	0.21	0.46	0.62	0.47	0.60	0.82		
Brand Trust	0.32	0.68	0.48	0.76	0.64	0.62	0.83	
Continued Use Intention	0.14	0.42	0.73	0.33	0.61	0.53	0.41	0.84