Journal of Smart Tourism

Empirical Research Article

Attitude Change Towards Self-Service Technology Adoption Using Latent Growth Modeling

Taehyee Um[a] and Namho Chung[b,*]

[a] *Conrad N. Hilton College of Hotel & Restaurant Management, University of Houston, TX 77204, USA*
[b] *Smart Tourism Research Platform, Kyung Hee University, Seoul 02447, South Korea*

Abstract

As the utilization of technology in the tourism field becomes familiar, it greatly impacts people's tourism activities. These changes could also affect the behavior of tourists during the pandemic. To investigate consumers' adaptation to the self-service technology (SST) environment during the coronavirus disease of 2019 (COVID-19) pandemic, we adopted a model of absorptive capacity as the main framework for empirical research. To track the social effects of COVID-19, consumers' behavioral intentions for four different points in time are collected. The analysis was conducted using latent growth and structural equation modeling. We set the organizational and environmental characteristics as the first step of the model, with assimilation and trust as a middle step. Intention to use a kiosk is placed at the final step as an exploit. Findings indicate that organizational characteristics and environmental characteristics positively influenced assimilation and trust, except for environmental characteristics. Consumers' assimilation in SST encourages immediate intention to use a kiosk. Consumers' trust in kiosks positively impacts both immediate and continuance intention to use a kiosk during COVID-19.

1. Introduction

Areas of technology-based service utilization in the hospitality industry continue to expand. It has become inevitable for people to confront technology-based services while engaging in tourism activities (Um et al., 2022a). Self-service technology (SST), which has been applied since the early 2000s, has helped supply simple transactions such as banding machines and ATMs. Recently, SST has appeared in combination with several new technologies and forms, such as mobility, mobile services, and artificial intelligence. Compared to 2018, the kiosk global market size is expected to grow 220% to 32.5 billion by 2027 (Patil & Humbare, 2020). Furthermore, as coronavirus disease of 2019 (COVID-19) pandemic continues, the avoidance of face-to-face services will increase, and the use of self-service will accelerate accordingly.

If so, it is necessary to confirm how the customer perceives the phenomenon and adapts to this service delivery type. This is because even if the environment expands and the supplier increases the utilization of SST, it is the customer who ultimately handles it. In addition to personal preferences and intrinsic motivation, the motivation of people's use of technology can also be influenced by external pressures (Prentice et al., 2020). Therefore, it is important to explore the influence of factors that can stimulate their intention to use.

Prior empirical research on SST with users' behavior intention was focused on technology quality, user characteristics, and technology acceptance (Blut et al., 2016; Shiwen et al., 2022). Additionally, researchers studied SST with hospitality field or situational factors (Wei et al., 2016). Several studies have also confirmed the environment for building SST in stores and customer reactions to the pressure to use SST (Cserdi & Kenesei,

2021; Feng et al., 2019). However, little research has been conducted to investigate technological environment, customers' participation, and behavior intention as components in a single framework. Meanwhile, people may become more accustomed to using technology in a pandemic situation (García-Milon et al., 2021). In addition, there may be clear differences in people's perceptions and behaviors over time after the outbreak of a pandemic. Nevertheless, studies on people's perceptions related to SST do not take this into account sufficiently (Chang et al., 2022).

We tried to confirm how the technology environment and the supplier's adoption of SST affect the customers' adaptation and perception, and ultimately how to inspire customers' intention to use SST. For this, we set the model of absorptive capacity as the basic frame of this study to design the technology environment and individual adaptation and response as one flow. The absorptive capacity model describes the flow in which an organization acquires external knowledge or information to secure a competitive advantage.

Regarding the pandemic impact, the World Bank (2020) predict that COVID-19 can have a direct negative effect economically after the outbreak constantly. Therefore, merely dividing the study of human behavior into pre- and post-corona studies will not sufficiently reflect the effects of the pandemic after the outbreak of the infectious disease. To identify changes in people's perception of intention to use SST in pandemic situation, we employ latent growth model (LGM) as a dependent variable in our research model. LGM produces growth trajectories by repeating measurements at different time points for the same observational measurements (Assaker et al., 2011). Since this trajectory has an advantage in estimating individual variability, it is suitable for our study.

*Corresponding author:
Namho Chung, Smart Tourism Research Platform, Kyung Hee University, Seoul 02447, South Korea
E-mail address: nhchung@khu.ac.kr

Tourists can easily experience SST through kiosks at airports, accommodations, or restaurants. Regarding this, we set a kiosk as a representative object of SST to study tourist perceptions of the SST environment. We investigate how the external circumstances surrounding the kiosk and the individual can influence an individual's assimilation and trust in technology. Our model also investigates whether these responses from individuals will encourage their intention to use the kiosk and engage in continued use shortly. A research model and hypotheses are established to examine how this flow can support people's awareness of kiosk during the COVID-19 pandemic. The time of occurrence of the coronavirus is divided into four stages, and the flow of people's perception is investigated. Finally, we conduct a rival model analysis to check how appropriately the theoretical framework of the model we applied fits with the research we designed.

2. Background

2.1 Self-service Technology and Kiosk

Self-service is defined as a customer's production of service without a human service agent's direct interaction (Rowley, 2006). Initially, the supplier reduced the burden of supply using human resources by converting a simple service process of self-service. At the same time, SST to which technological interfaces that can support self-service are applied also began to develop (Meuter et al., 2000). As SST is used in both online and offline fields, it is necessary to study this concept separately (Alt, 2021). There is a difference between unmanned systems in stores, which can be represented as kiosks, and self-service online, due to the various variables that can affect customer behavior, such as store environment or assistance of employees (Um et al., 2022b). Some destinations and hotels use artificial intelligence or service robots to let people experience SST (Um & Chung, 2021). Nevertheless, since we are interested in the perception of people who have been exposed to the environment where SST is prevalent, we study people's behavior with kiosks that have been used as a representative physical SST for a long time rather than cutting-edge technology.

A person's learning process can be influenced intrinsic motivation and external pressure (Rau et al., 2008). Prior studies of a business situation with SST, Turner and Shockley (2014) argued that design for self-service in the case of a retailer improves the transaction value. However, they only emphasized the in-store design. Reinders et al. (2008) suggested that forced use of technology-based self-service negatively affects consumers' attitudes toward service and provider. Moreover, they argued that forced use could have an adverse effect on behavioral intention indirectly. Nevertheless, their research has limitations in explaining the current technology-intensive environment because it is a study at a time when the concept of SST was just known to people. Liu (2012) also revealed that forced use of SST has a negative effect on trust causes users' technology anxiety. However, they did not address the role of observation or exposure to the technological environment.

Recent studies have considered the social expansion of SST and changes in the environment. Chen et al. (2022) argued that people's disclosure to SST environment can stimulate their SST readiness. However, they only lightly dealt with the SST environment and people's adaptation to the extent of exposure to SST information. Tavera-Mesias et al. (2022) presented the research result that the facilitating condition, which can be measured by the expansion of the SST store, can reduce the resistance to the use of SST. However, their study also did not confirm environmental change, individual adaptation, and the resulting behavior as a single frame. Meidute-Kavaliauskiene et al. (2021) studied the people's perceptions and behavioral intentions toward self-service and robot which can be affected by the environment change caused by pandemic. However, they focused on the radical change of the pandemic and people's reaction, not

the phenomenon of expanding the field of technology.

Based on the review of the above studies, few studies have been conducted that deal with the environment that naturally expands rather than the forced use of SST. Additionally, studies that comprehensively reviewed changes in the brick and mortar's SST environment or social environment along with individual perceptions have not yet been conducted. As for the competencies related to the use of SST of individuals, enjoyment and novelty emerged as intrinsic motivations in existing studies (Wei et al., 2016). In addition, self-efficacy, confidence, habit, and past experience were utilized in relation to the individual's will or experience (Lee & Lyu, 2016). Lastly, technology readiness as ability to use technology has been employed. However, few studies have empirically confirmed the technological environment and assimilation of individuals.

Meanwhile, Kokkinou and Cranage (2013) argued that service level and performance of the kiosks should be considered to adopt a self-service in hotels. Nijssen et al. (2016) also demonstrated that consumers perceive shopping as more beneficial along with the degree of performance and adoption of SST. Shin and Perdue (2019) asserted that the study of diffusion phenomenon of SST with a temporal concept in hospitality industry is a promising area. Thus, customers' behavior intention to SST should be scrutinized.

2.2 Absorptive Capacity

The original concept of absorptive capacity was introduced by Cohen and Levinthal (1990), who empirically studied firms' innovation. According to the study, outside sources are crucial to exploit external knowledge. These outside sources includes the development of technology and science (Cohen & Levinthal, 1990). In other words, absorptive capacity can maximize the use of knowledge or technology and induce organizational innovation through a series of processes that explore, assimilate, and apply values at this elemental level.

Research on the initial absorptive capacity was focused on the firm level. Research from an organizational perspective has been extended to inter-organizational and national units (Zahra & George, 2002). Studies have been conducted on organizational learning, innovation, and knowledge expansion (Volberda et al., 2010), since the concept arose with interest in organizational innovation using external sources of the organization. The use of the concept at the individual level has also emerged for organizational research by considering the ability of individuals located within the organization (Van Den Bosch et al., 2003).

On the other hand, this concept was used as framework for direct research on individual behaviors and competencies. Enkel et al. (2017) studied the influence of individuals' ability to use external knowledge on innovation activities. Wang et al. (2014) argued that the assimilation and transformation of knowledge could be a vital antecedent in an individual's intention to use IS. S. Chang et al. (2018) used the absorptive capacity concept to explain how recognizing investment in human resources for hotel employees can lead to individual innovative behavior. Kale et al. (2019) emphasized hotel manager's absorptive capacity to benefit of the organization. As such, the concept was applied to research on individual innovation or intention to use a new service or system. This study applied the absorptive capacity frame for individuals' adaptation to self-service environment and behavioral intention to technology usage with three steps.

2.2.1 Recognizing the Value

Cohen and Levinthal (1990) argued that recognizing value must occur before applying external information or knowledge. In this vein, they emphasis recognizing value as a first step in absorptive capacity. In a study by Zahra and George (2002), the components of the existing absorptive capacity were synthesized and redeposited into four concepts. Moreover, by dividing the

absorptive capacity into the potential part (acquisition, assimilation) and realized part (transformation, exploitation), a new model in which knowledge sources lead to competitive advantage was proposed. In their study, the previously emphasized recognition was included in the acquisition process as a potential for absorptive capacity. However, subsequent studies argued that it is difficult to simultaneously occur acquisition and assimilation, and transformation and exploitation are also unreasonable to be proposed in the same line. So, a study proposed an updated model (Todorova & Durisin, 2007). Todorova and Durisin (2007) emphasized the practice of recognizing the value, saying that exposure to or observing a phenomenon or environment can be based on absorptive capacity.

In our study, the first step in absorptive capacity is considered individuals' perception of SST in stores and the environment surrounding them. Specifically, we tried to distinguish between users' perception of the place where the kiosk was directly installed and the overall external environment. To do this, we divided the recognizing the value into organizational characteristics and environmental characteristics as independent variables. Organizational characteristics is the degree to which the customers perceived that the structure and layout of certain place support a "do it yourself" service environment for their transaction (Turner & Shockley, 2014). Environmental characteristics is the degree to which individuals perceive how much the transaction environment using self-service is activated. Since both constructs emphasize the people's observation or exposure of SST, it can be considered 'recognize the vale.'

2.2.2 Acquire and Assimilate

In the early study of absorptive capacity, the processes of cognition, assimilation, and utilization acted as a broad framework. After that, concepts such as imitation and transformation emerged, as the role of intermediate processes was emphasized before application and activation. Transformation occurs when an organization attempts to accept and absorb external knowledge or information, but there is an incompatible aspect (Todorova & Durisin, 2007). In these cases, the firm develops a new perceptual process or switches for an established process (Zahra & George, 2002). In the transaction service, the search or change of a new route other than the kiosk can be considered the execution of face-to-face service or the termination of the transaction. Therefore, absorptive capacity transformation is not considered in this study.

On the other hand, if a new environment, situation, or idea is consistent with the organization's cognitive schema, these external sources are naturally assimilated after slight modifications (Todorova & Durisin, 2007). Assimilation refers to understanding, interpretation, and learning of sources acquired from the outside. Cohen and Levinthal (1990) emphasize the internal circumstance and role of subunits for assimilation. At the individual level, Fischer (1980) stated that it is possible to go through assimilation through recognition and experience of external factors. Todorova and Durisin (2007) emphasized the correlation between concepts located in the intermediate absorptive capacity process. Furthermore, they suggested exploitation as a next step.

2.2.3 Exploit

As the final step in the absorptive capacity process, a competitive advantage can be achieved through practical implementation (Zahra & George, 2002). Zahra and George (2002) regarded this step as realized after potential. Organizations can also expect to use them as core competencies and harvest resources through this step. In addition, organizations can pursue continuous knowledge expansion through the exploitation step (Liao et al., 2017).

At the individual level, this step can be expressed in usage for systems, functions, etc. (Lee et al., 2012). In addition, supporting an organization's continuous innovation activities can be considered an action of reuse for individuals. Therefore, in applying the exploitation stage of absorptive capacity to the customer's kiosk situation, we set the initial score and rate of change of intention to use kiosk.

3. Hypothesis Development

3.1 The Outbreak of COVID-19 and Intention to Use Kiosk

As the number of coronavirus infections continues to increase, people are participating in social distancing movements to prevent transmission through social activities. Because of the fear of contagion, they implement restrictions on behaviors that may lead to contact between people, such as meetings and tourism activities. Therefore, the intention to use a kiosk will be greater than before the COVID-19 outbreak, rather than ordering or trading activities through employees, people tend to adapt to negative events over time or have a weakened emotional response (Wilson & Gilbert, 2008). Zohar et al. (2003) argued that, if there are no additional outbreak events, people will decelerate rates of change over time until the slope levels off. We assume that the value of behavior intention toward kiosk use will be increased during the COVID-19 pandemic, yet rates of increase will be decreased over time.

Hypothesis 1: While the value of intention to use kiosk increases after the COVID-19, rates of increase are decreased over time.

3.2 Recognizing the Value and Assimilation

It is important to explore the process of assimilation and factors that can activate an organization's innovative technology (Zhu et al., 2006). Regarding individual-level process, being assimilated into a certain environment means that someone can selectively perform necessary actions in that environment. If an individual is not assimilated into a particular environment, he or she may not be active or take full advantage of the environment.

The flow that assimilation achieves through the process of recognizing external knowledge or environment has been proven not only in the absorptive capacity model but also in cognitive theory. When self-service is adopted instead of employees in providing services, a machine that can support a sufficient rate of service should be introduced to eliminate difficulties in use. Suppliers place kiosks to induce self-service to naturally intervene in the movement of customers. In this way, the internal environment is strategically modified in the direction the supplier wants so that customers can naturally adapt to the changing environment. Alternatively, a strategy is employed to lower the barriers to entry for the use of technology by assigning employees who can help with technology use. Furthermore, structural designs that support consumers' self-service technology also have a significant impact on their ability to use technology (Turner & Shockley, 2014).

The external environment has a great influence on a company's strategic behavior. It can be said that being located in the regional cluster to strengthen competitiveness is also effective for assimilation into a place in which related knowledge is aggregated. The process of assimilation can occur passively, and the process of assimilation can proceed simply by checking the existence of a service or system or seeing what others are using. In addition, an individual's learning process can occur simply by observing the behavior of others or by looking at the consequences of their behavior. However, since exposure to the external environment does not directly drive the process of assimilation, the amount of knowledge or inputs must be sufficiently fostered. Pulkkinen et al. (2019) said that the

continuous expansion of the physical environment related to smart mobility can lead to service action. It means that expansion of service areas can stimulate consumers' participation. So, we established hypothesis 3.

Hypothesis 2: Organizational characteristics have a positive effect on assimilation with kiosk usage.

Hypothesis 3: Environmental characteristics have a positive effect on assimilation with kiosk usage.

3.3 Recognizing the Value and Trust

Trust in kiosk is defined as confidence in the reliability and integrity of kiosk service. The role of trust in areas other than transactions with employees was emphasized. In particular, research of SST in the hospitality industry, where the role of employees has traditionally been powerful, highlighted users' concerns and trust toward technologies (Shiwen et al., 2022). If the consumer does not have confidence in the use of technology, it may lead to significant losses to a provider by showing anxiety as well as immediate inconvenience of service operation (Um et al., 2020).

Users could be frustrated if the machine does not work well when delivering services using kiosks in stores, or they could face uncomfortable situations such as time pressure when using kiosks (Collier et al., 2015). Conversely, recognizing that the circumstances or the store environment are suitable for self-service can affect the ability to use kiosks (Turner & Shockley, 2014). Even during a service transaction situation, if customers feel that providers have built an environment for self-service, they can have confidence while using kiosks. Meanwhile, consistency is an important concept for building trust in service transactions. Customers can check the technology application service's consistency if they feel that the organization's self-service environment is well established.

From the perspective of social norm, a lot of people's use of a particular technology can be interpreted that the technology is reliable (Beldad & Hegner, 2018). If someone can easily identify who uses the kiosk in their daily life, he or she can believe that a social norm for SST has been formed. In other words, in this context, environmental characteristics can stimulate trust. Environmental characteristics is also critical as a role of reducing user risk related to technology use. Park and Tussyadiah (2017) stated that exposure to or observation of technical use in consumption situations could lower the risk of using mobile services. In this regard, if an individual witnesses the use of SST easily, he or she may see the technology use as less risky. Trust in a brand arises from consumers' perception of a particular brand. Min et al. (2022) argued that people can build a trust even they just aware of the employees' fair activity. If a person feels fairness of services from the environmental characteristics of kiosk, he or she may have trust in kiosks. Social influence is an important variable in building trust in a new system (Zhang et al., 2020). If someone aware social influence through the proliferation of self-service environments, it can lead to people's trust in technologies.

Hypothesis 4: Organizational characteristics has a positive effect on trust in kiosk.

Hypothesis 5: Environmental characteristics has a positive effect on trust in kiosk.

3.4 Assimilation and Exploit

Previous studies have shown the absorptive capacity and, differences in causality, correlation, and contingent factors of components. However, it was suggested as a unified frame that

application and exploitation occur after assimilation. Investigating behavior intention as exploitation stage is necessary because it can be associated with service situation and even firm performance (Shiwen et al., 2022).

Moreover, at a point when the COVID-19 outbreak could lead to a greater dependence on the technology of suppliers, it is crucial to explore factors that can stimulate people's intention to use kiosk and continued use.

Assimilation to a particular knowledge or environment means that people can understand and interpret it. In other words, this indicates that it is ready for use. An individual's technology readiness is a concept that determines how much a user understands a technology (Parasuraman, 2000). A person who has high technology readiness can be considered as a person who is assimilated with the technology(Lin & Hsieh, 2007). So, it can be assumed that a person who is highly assimilated in SST will have intention to use kiosk. Whereas, those who cannot assimilate and resist environmental changes have a negative attitude toward the introduction of new information systems (Laumer et al., 2010).

According to the model of absorptive capacity, assimilation is connected to competitive advantage through exploitation. In this vein, assimilation might not affect the continuance intention of SST. However, compared with the firm level, consumers' kiosk usage is quite simple and implemented without much effort. So, we assumed that assimilation to the SST can also inspire the slope of intention to use kiosk.

Hypothesis 6: Assimilation has a positive effect on the initial score of intention to use kiosk.

Hypothesis 7: Assimilation has a positive effect on the rate of change of continuance intention to use kiosk.

3.5 Trust and Exploit

Trust has a strong influence on purchase intention or visit intention, and at the same time, it stimulates an additional change of perception that can derive an indirect effect. Thus, customer's trust in the kiosk can lead to an intention to use SST independent of the user's ability or will. Trust is an important attribute of use or participation intent in business environments in which service transaction types such as internet, mobile, social media, or sharing economy are diversified. Nelms et al. (2018) emphasized the trust regarding the social payments. These are all performed in an intangible form, trust will be an important factor in using kiosks as well.

In order to be consistent in the customer's future behavioral intentions, trust can play a fundamental role. Aurier and N'Goala (2010) proved that customer's trust to a company can associate with their intensity of relationships with the company. In addition, trust is important in creating individual loyalty (DeWitt, et al., 2008). Loyalty is a vital element in future behavioral intentions (Kim et al., 2014), and reduces people's switching intention (Petrick, 2004). Harris and Goode (2010) stated that consumers' trust in the company formed through an online servicescape plays a key role in their repetitive behavior. In this vein, we believe that if customers have trust in kiosk, they can boost an ongoing transaction behavior of kiosk.

Hypothesis 8: Trust in kiosk has a positive effect on the initial score of intention to use kiosk.

Hypothesis 9: Trust in kiosk has a positive effect on the rate of change of continuance intention to use kiosk.

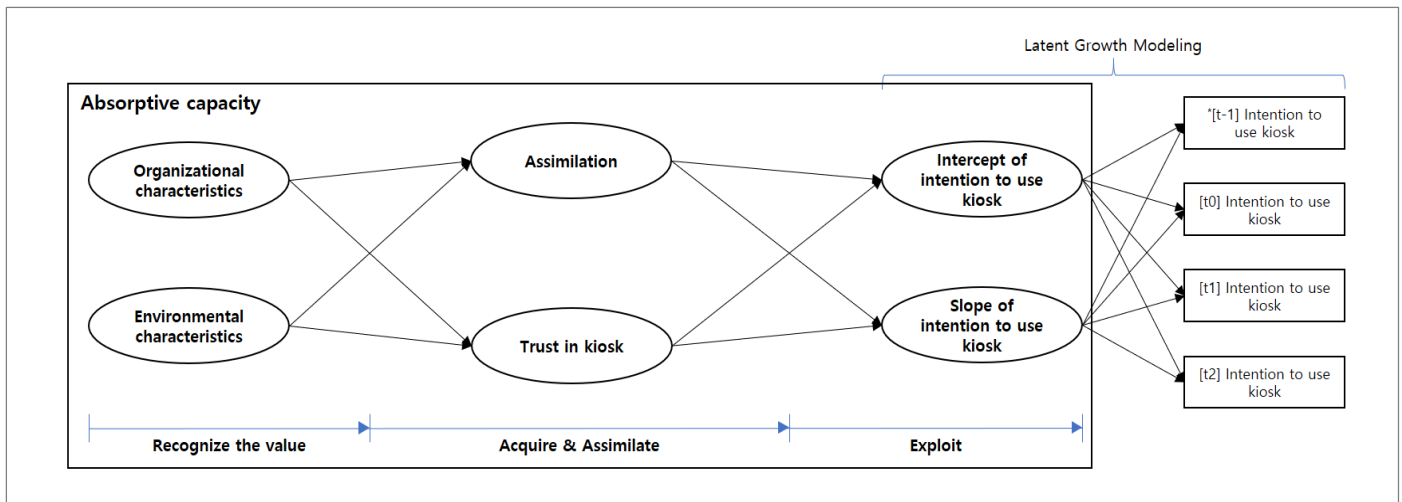As mentioned above, we suggest our research model in Fig. 1.

Fig. 1. Research model. Note: *t-1: Before COVID-19, t0: Right after COVID-19, t1: 1 year after COVID-19, t2: 2 years after COVID-19.

4. Methodology

4.1 Latent Growth Modeling

Unlike normal cross-sectional studies, empirical studies using latent growth modeling (LGM) investigate changes in their perceptions and behavior while tracking objects with sufficient time. There are two methods for time series measurement on the same sample. One is to trace the same sample after a certain period of time and to receive a response again (Reddy et al., 2003). The other is that respondents assume the passage of time and respond to how they may act or perceive at another point. In the latter case, researchers can investigate respondents' future behavioral intentions or perceptions (Assaker et al., 2011). Respondents can also answer the questionnaire by comparing the past value to present and future value (Lee & Mirchandani, 2010). Our study investigates changes in people's behavior intention before and after incident of the coronavirus pandemic. Therefore, instead of conducting several surveys for people's actual behavior considering passage of time, we examined intentions for relative behavioral changes in the past and future with one survey. Furthermore, since people's perceptions of the COVID-19 can be influenced by various factors such as the number of confirmed cases or cluster infections, we identified the perception of people how they will behave in the near future at once.

4.2 Data Collection

We employed a quota sampling method to gather impartial respondents focusing on age, gender, and usage experience. Data was collected using an online survey in June 2020 via Embrain, which is one of the major survey company in South Korea. The firm sent an e-mail to panels with a link. Data was collected using an online survey in June 2020. We sent an e-mail with a link to participate in the survey. A screening question was used to identify the proper respondents who had experienced kiosks during the one year before the survey administration. We collected respondents' experiences of using kiosks to determine how much they experienced kiosks in tourism-related fields. Eliminating incomplete and inappropriate answers, 441 samples were selected for empirical analysis. The demographic characteristics of the sample are presented in Table 1.

Table 1. Sample demographics

Demographics		Frequency	Percent	Demographics		Frequency	Percent
Gender	Male	173	39.2				
	Female	268	60.8		Student	97	22.0
					Office job	194	44.0
	Under 20	77	17.5		Sales service	17	3.9
	20-29	87	19.7		Technical post	11	2.5
Age	30-39	86	19.5	**Job**	Specialist	42	9.5
	40-49	72	16.3		Self-employed	18	4.1
	50-59	72	16.3		Public servant	5	1.1
					Housewife	32	7.4
					Other	25	5.7
	High school	52	11.8				
Education	University/college	79	17.9	**Marital**	Married	222	50.3
	Bachelor's degree	252	57.1		Unmarried	219	49.7
	Graduate school	58	13.2				
					Hotel/Airport	333	75.5
					Restaurant	426	96.6
	≤100	84	19.0	**Experience**	Mart	236	53.5
	100-199	39	8.8		Bank	302	68.5
Monthly income	200-299	121	27.4		Hospital	189	42.9
	300-399	64	14.5				
	400-499	39	8.8				
	500	94	21.3	Total		441	100

4.3 Questionnaires

All measurement items were derived from previous studies and revised to match the context of our research. Four items for organizational characteristics were adopted from Turner and Shockley (2014). We combined the work of Baumann et al. (2015), Liu et al. (2013), and Lu and Su (2009) to measure the environmental characteristics. Four items regarding assimilation were adopted from Lee et al. (2012). Four items for trust in kiosk were adopted from Tussyadiah and Park (2018). Intention to use kiosk was operationalized using a single item (Assaker et al., 2011). The survey measured intentions over four time periods corresponding to before, immediate, short-term, and long-term (3 months before COVID-19, right after COVID-19, one year after COVID-19, and two years after COVID-19, respectively). All items were measured on a 7-point Likert-scale (1=strongly disagree, 7=strongly agree).

5. Results

5.1 Common Method Bias (CMB)

This research uses items to check common method issues that can occur in data collection and confirm that the results of the analysis are not statistically problematic. To check CMB, Harman's single-factor test was conducted. The test was examined based on exploratory factor analysis in SPSS. The result of EFA without rotation showed that the first factor was explained by 54.6%. The result is slightly exceeded the acceptable criteria of 50% (Podsakoff et al., 2003). We checked the fit value of single factor model in AMOS. As shown in Table 2, the fit is quite poor compared to the standard criteria. So, it can be considered that the CMB in our study has no serious issue (Gupta & Gupta, 2020). To clarify this issue, we checked the multicollinearity problem. We conducted a linear regression analysis to extract variance inflation factors (VIFs). The value is 1.94, which is lower than the strict threshold of 3 (Hair et al., 2011). Thus, there is no multicollinearity problem with our statistical calculations.

5.2 Unconditional Latent Growth Analysis

We estimated the intercept and slope of intention to use kiosk adopted from the LGM. All of the values were statistically significant using AMOS. The intercept of intention to use kiosk, which refers to the initial value of user's intention was 4.92. The slope of intention to use kiosk, which means the rate of change, showed an average of 0.16. The result suggests that intention to use kiosk increase with a positive slope for about a year after COVID-19. The covariance between the intercept and slope (0.02, n.s.) was not significant, indicating that the two variables were unrelated. We reported the results in Table 3.

Table 2. Model fits from CFA

Fit	CMIN/DF	NFI	RFI	IFI	TLI	CFI	RMSEA
Research model CFA	2.602	0.959	0.948	0.974	0.968	0.974	0.06
Harman's Single factor CFA	30.524	0.454	0.395	0.462	0.403	0.461	0.259

Table 3. LGM with unconditioned model

	Construct	Estimate	S.E.	C.R.	P
Means	Intercept	4.918	0.056	88.01	***
	Slope	0.156	0.015	10.378	***
Covariance	Intercept-Slope	0.02	0.021	0.958	0.338
Implied means	Time	t -1	t 0	t 1	t 2
	Value	4.918	5.074	5.229	5.385

5.3 Measurement Model

To check the conditioned LGM, we conducted a confirmative factor analysis (CFA) first. Convergent validity and discriminant validity of all instruments were assessed with CFA using AMOS. All of the average variance extracted (AVE) values for each instrument positioned from 0.602 to 0.756, which is recommended over 0.5. (Hair et al., 2011). The values to check the discriminant validity are arranged in Table 4. The lowest value of the square root of AVE (0.776) was more significant than the highest value of instruments' correlation (0.728), which proved discriminant validity (Fornell & Larcker, 1981). All of the digits for CFA were shown in Table 5.

The unstandardized loadings of intention to use kiosk for the intercept factor were set at 1. Slope factors from t-1 to t2 were established as 1, 2, 3, and 4 to determine people's awareness of intention to use kiosk involved with the prevalence of COVID-19. Model fit suggested good fit indices ($\chi2$ = 320.1, df = 123 ($\chi2$ /df = 2.602), p < 0.001, NFI = 0.959, RFI = 0.948, IFI = 0.974, TLI = 0.968, CFI = 0.974, and RMSEA = 0.06).

Table 4. Discriminant validity test and correlation of constructs.

Constructs	Mean	S.D	Organizational characteristics	Environmental characteristics	Assimilation	Trust in kiosk
Organizational characteristics	5.06	1.03	0.776			
Environmental characteristics	5.35	0.96	.670**	0.826		
Assimilation	5.35	1.10	.598**	.550**	0.856	
Trust in kiosk	5.04	1.11	.728**	.568**	.579**	0.869

Note: Italic digit means the square root of AVE.

Table 5. Reliability and convergent validity of constructs

Constructs	Items	Loading	C.R. [a]	AVE [b]	α [c]
Organizational characteristics	*- The hotels, airports/restaurants, stores that I have visited,* Make it easier for customers to perform the products and services they want using Kiosks. Designed the interior to make it easy for customers to use the kiosk. Were in 'self-service' environment. Equipped with modern-looking equipment and features.	0.838 0.810 - [d] 0.810	0.818	0.602	0.859
Environmental characteristics	There are various services that can be traded through kiosks. The service trading environment through kiosk can be easily found. I can easily find people who use kiosks. It is often seen in my daily life that someone uses kiosks.	- [d] 0.717 0.910 0.902	0.865	0.683	0.873
Assimilation	I have the ability to handle technology and machinery such as kiosks well. I have the necessary knowledge to understand kiosks. I have a clear understanding of the role of kiosks. I am well aware of the latest technologies used in kiosks, such as screen touch, QR code and payment using applications.	0.893 0.918 0.895 0.868	0.917	0.733	0.939
Trust in kiosk	Kiosk service is generally reliable. I can trust the kiosk service. I can have confidence in the kiosk service. I can rely on kiosk services for trading or ordering.	0.917 0.929 0.922 0.848	0.925	0.756	0.946
Intention to use kiosk	My intention to use kiosk three months before COVID-19. My intention to use kiosk right after COVID-19. My intention to use kiosk one year after COVID-19. My intention to use kiosk two years after COVID-19.	-	-	-	-

Note: [a] Composite reliability, [b] Average variance extracted, [c] Cronbach's alpha, [d] Items were removed after confirmatory factor analysis

5.4 Hypothesis Testing and Conditioned Latent Growth Model Analysis

For hypothesis 1, we conducted repeated measure ANOVA. Tests of Within-Subjects Effects was statistically significant (F = 55.678, p<0.001). The score of intention to use kiosk was increased over time. However, the rate of increase slightly decreases ([t 0] – [t -1] = 0.2, [t 1] – [t 0] = 0.21, and [t 2] – [t 1] = 0.09). Therefore, hypothesis 1 was supported (See Table 6). To test hypotheses 2 to 9, we employed SEM and conditioned LGM together. In the context of recognizing the value to acquire and assimilate, hypotheses 2, 3, and 4 are supported. Specifically, hypothesis 2 (β = 0.685, t = 8.569) and 3 (β = 0.211, t = 3.057) are supported, which indicates the relationship between recognize the value (organizational characteristics and environmental characteristics) and assimilation. Hypothesis 4 (β = 0.924, t = 11.862) is also supported, while hypothesis 5 (β = 0.035, n.s) is rejected. It means that only organizational characteristics have a positive effect on trust in kiosk. As part of the process of acquire & assimilate to exploit, hypotheses 6, 8, and 9 are supported, but not 7. Both assimilation (β = 0.311, t = 6.126) and trust in kiosk (β = 0.364, t = 6.916) have a positive impact on the intercept of intention to use kiosk. Non assimilation (β = -0.015, n.s) shows a significant impact on slope of intention to use kiosk but trust in kiosk has results of (β = 0.057, t = 3.312). We showed the outcomes in Fig. 2.

Table 6. Descriptive analysis of intention to use kiosk

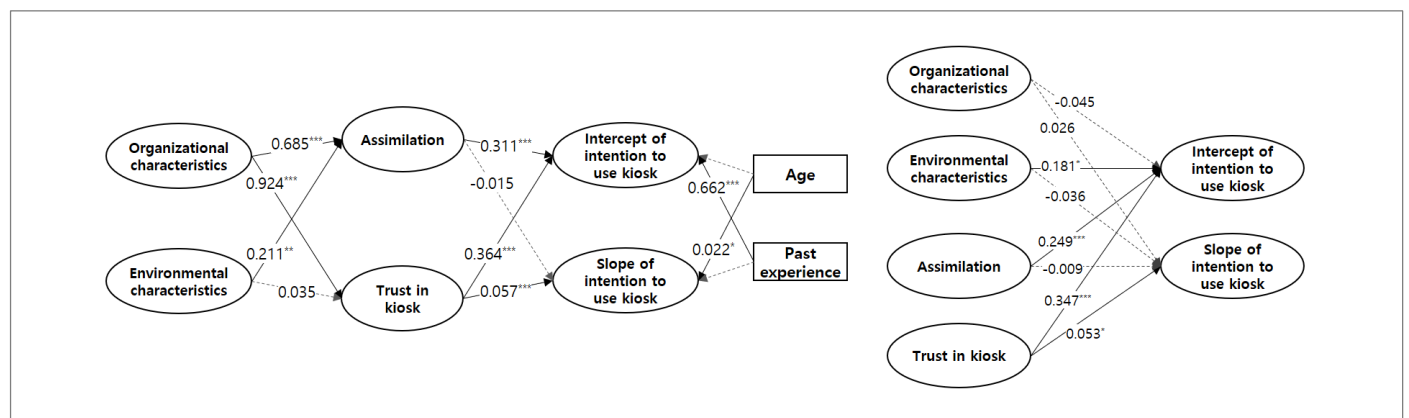| Time	Mean	S.D	Difference	N
t -1	4.85	1.175	-	441
t 0	5.06	1.288	0.204	441
t 1	5.27	1.210	0.209	441
t 2	5.36	1.224	0.091	441
		Type III Sum of Squares = 66.891, df = 3, Mean Square = 22.297, F = 55.678, p<0.001		

Fig. 2. Analysis results of research model and rival model. *p < 0.05, **p < 0.01, ***p < 0.001

5.5 Competing Model Testing

We designed a rival model to determine how sophisticated the process of absorptive capacity supports customers' behavioral intention (Fig. 2). In addition, through this test, we tried to analyze whether the environment surrounding SST can directly influence the intention to use the kiosk. We presented a model in a basic form while comparing it with the model we presented. For this, a model was established to verify the direct effect of the four constructs on the dependent variable set as intercept and slope.

We confirmed the model fit of each model for comparison and determine how many paths were statistically significant. First of all, we compared model fit. Although the rival model has a good

level of fit (CMIN/DF = 2.348, NFI = 0.963, RFI = 0.953, IFI = 0.978, TLI = 0.973, CFI = 0.978, RMSEA = 0.055), our research model has better values in several indexes (CMIN/DF = 2.289, NFI = 0.962, RFI = 0.955, IFI = 0.978, TLI = 0.974, CFI = 0.978, RMSEA = 0.054). Second, four out of eight direct paths are statistically significant with the rival model. Six out of eight direct paths are statistically significant with ours. Therefore, constructs in the level of recognize the value have little or no direct effect on intention to use kiosk. Furthermore, it can be interpreted that our application of absorptive capacity to explain the customers' intention to use kiosk and future behavior was appropriate. We described the result in Table 7.

Table 7. Comparison of rival model and research model

	Model fit			Path analysis					
	Rival		Research	Rival model			Results	Research model			Results
χ^2	286.40		290.65	Organizational characteristics	→	II	Supported	Organizational characteristics	→	Assimilation	Supported
CMIN/DF	2.348	<	2.289	Organizational characteristics	→	SI	Not Supported	Organizational characteristics	→	Trust in kiosk	Supported
NFI	0.963	>	0.962	Environmental characteristics	→	II	Supported	Environmental characteristics	→	Assimilation	Supported
RFI	0.953	<	0.955	Environmental characteristics	→	SI	Not Supported	Environmental characteristics	→	Trust in kiosk	Not Supported
IFI	0.978	=	0.978	Assimilation	→	II	Supported	Assimilation	→	II	Supported
TLI	0.973	<	0.974	Assimilation	→	SI	Not Supported	Assimilation	→	SI	Not Supported
CFI	0.978	=	0.978	Trust in kiosk	→	II	Supported	Trust in kiosk	→	II	Supported
RMSEA	0.055	<	0.054	Trust in kiosk	→	SI	Supported	Trust in kiosk	→	SI	Supported

Note: II = Intercept of intention to use kiosk, SI = Slope of intention to use kiosk

6. Discussion

We tried to empirically verify how the intention to use kiosk will change before and after the coronavirus pandemic. The model of Absorptive capacity was adopted as the basic framework of our research in order to comprehensively examine changes in the social environment, personal changes, and future behavioral intentions. Based on this model, we performed hypothesis verification by combining LGM and SEM for empirical analysis. Additionally, the rival model analysis was performed together to confirm whether the model proposed by us has an appropriate shape. The results support seven out of nine hypotheses. The comparison between the rival model and our research model showed that our proposed model was more appropriate in both main aspects.

Compared to the pre-coronavirus environment, people's perception changes were statistically significant over the four stages immediately after, one year after, and two years after the outbreak. Based on the fact that COVID-19 is an infectious disease, it seems that people's willingness to use kiosks continues to increase to avoid confrontation with other people. In addition, the increase rate was found to decrease between 1 year and 2 years later. This can be interpreted in a similar context to the previous studies that the initial impact by specific events or fears can be tempered over time (Walker et al., 1997). People may have expectations that the number of infections will increase until a certain period during an epidemic and then decrease again (McMillen et al., 1997). As a result, the fear of face-to-face service is relatively reduced, and it can be seen that it has influenced the intention to use the kiosk in the future.

In line with prior research and the model of absorptive capacity, organizational characteristics and environmental characteristics had a significant influence on assimilation. This is a similar result to those of previous studies that the pressure of stakeholders directly or indirectly affects assimilation related to the company's new system (Liang et al., 2007). If the top management support presented by Liang et al. (2007) is viewed as

self-service support within the space in which the kiosk is placed, this can be viewed within the same context as hypothesis 2. Meanwhile, individuals can show a rational reaction to external situations, as the role of social context still has powerful leverage in the process of assimilation of immigrants (Xie & Greenman, 2011). This can be matched with the result of hypothesis 3. The expansion of the self-service environment leads to the discovery, understanding, and absorption of consumers' SST.

Regarding the relationship between recognizing the value and trust in kiosk, hypotheses 4 and 5 showed different results. Organizational characteristics, which can be linked to internal circumstances of self-service can encourage users' ability to approach kiosk. Therefore, hypothesis 4 can be seen as the result of the user's ability to stimulate trust in kiosk. The rejection of Hypothesis 5 is a result that is inconsistent with the existing studies that trust in the online environment can be strengthened by third parties, and peripheral routes such as reputation and structural assurance can also have a direct effect (Salo & Karjaluoto, 2007). This is interpreted as the result that environmental characteristics did not directly affect the factors for building trust in kiosk.

Within the role of assimilation as antecedents for the initial value of usage intention and change rate of usage intention, only hypothesis 6 showed statistical significance. This finding is consistent with the study by Park et al. (2007). They demonstrated that assimilating certain systems lead to application of the system. However, contrary to our argument, assimilation was not significant for the slope of intention to use kiosk. In the context of organizational level, assimilation with exploitation is not always guaranteed a consistent competitive advantage. Zahra and George (2002) highlighted the moderating role of regimes of appropriability. Of course, contingent conditions like environmental shift or unexpected situations can penetrate the process of absorptive capacity. Additionally, assimilation is often considered inactive action rather than transformation. Park et al. (2007) also emphasized the role of organizational support as a moderating variable on the impact on firm performance. In this

vein, employee intervention can play an important role in boosting customers' exploitation of kiosk.

Trust in kiosks positively influences the intercept and slope of intention to use kiosks, which refers to the initial value and rate of change. This indicates that the trust perceived during transactions is an important factor in the continuous intention to use during the COVID-19 crisis. The initial score and rate of change we have examined are not longitudinal observations to examine effectiveness, but rather a perception of people based on a pandemic event with globally destructive power levels. In other words, it focuses on changes based on fear, not changes in the time in which the positive aspects are expected. Because COVID-19 is characterized as being highly contagious from person to person, we feel more trust in transactions through kiosks rather than face-to-face with employees. Bae and Chang (2020) said that perception of risk acts as a powerful constraint in people's tourism behavior under the COVID-19 outbreak. Both hypotheses 8 and 9 appear to have been adopted, because trust in contactless transactions will play a more pivotal role compared to face-to-face services, rather than an individual's ability to understand or utilize skills.

In summary, the results of our analysis, organizational characteristics, and environmental characteristics ac recognizing the value positively influence assimilation, which stimulates only the perception of the initial value of kiosk usage, whereas trust in kiosk was affected by organizational characteristics. This significantly suggests that both the intercept and slope of intention to use kiosk differs from assimilation. This means that an individual's general observation about the technology environment is not enough to build trust. Furthermore, trust is the fit with a self-service under the fear, arises during a fatal pandemic.

7. Conclusion

Since technologies provide a lot of support throughout the tourism industry, it can be said that conducting research on tourists' technology use is important in understanding their tourism behavior (Um, Chung, & Stienmetz, 2022). We conducted an empirical study to confirm people's perception of using kiosks concerning the coronavirus outbreak. The hypothesis was tested by designing a research model based on the theoretical framework. This was employed by combining statistical analysis methods that can perform the appropriate verification of hypotheses. We conducted a discussion on the results and presented the theoretical and practical contributions, and we finally describe the limitations of the study.

Our research has the following theoretical implications. First, our study used a model to explain the acquisition and use of external knowledge at the organizational level to explain people's perception, assimilation, and intention to use tools within a self-service environment. We also examined the adequacy of the design of the study model through comparison with rival models. Of course, there is a gap between the organizational research and consumer research (e.g., transformation) that is adequate to support our storyline. By employing empirical research with consumers' awareness, our study contributes to the extension of absorptive capacity research field.

Second, our study can contribute to the theoretical expansion of the research field of tourism and SST. In particular, previous studies on SST have shed light on the social trend or in-store situation separately. We try to cover the provider perspective and social flow surrounding the SST in one storyline. Our study has academic significance in that it empirically studies changes in perceptions of individuals and tourists due to the accumulated environment in society beyond individual values and attributes. Therefore, this study will be used as academic material for future research on technology, environment, and human behavior.

Third, as in the post-COVID-19 stage, we demonstrated the importance of trust under the self-service setting. While trust was not entirely affected by the external circumstances of transaction,

it had a significant influence on intention to participate in self-service directly. We also found that trust can work as a predictor of intention to use kiosk not only originally, but also after the COVID-19 pandemic began. Furthermore, it has the power to accelerate consumers' behavior along with the aftereffect of the pandemic. So, our study contributes to the introduction of future studies by emphasizing trust.

We combined the SEM and LGM methods to investigate people's perceptions before and after the coronavirus as well as to verify their intention to continue using kiosks. Prior scholars emphasized that the impact of pandemic should not be disregard to study a person's behavior in their study limitations. By exploring the factors that can influence the intention to use the four distinct viewpoints and factors that can facilitate the growth of the four viewpoints, we were able to overcome the existing limitations. Therefore, this study made a theoretical contribution by utilizing a tool suitable for measuring the aftereffect that can occur due to the coronavirus.

This study has the following practical implications. First of all, service providers must put pressure on creating an appropriate environment and a certain level of use so that customers can be naturally assimilated into a self-service environment. It is also necessary to design the environment so that customers can naturally access SST in a space where the kiosk is placed. Even so, to build a trust with customers regarding SST, practitioners should more focus on detail strategies.

The extended space beyond which the kiosk is arranged can affect assimilation of the user's technical environment. To this end, practitioners need to maintain a unified concept for introducing kiosks in the same franchise or facilities with extensive spaces and services, such as airports. Reluctance to use can be reduced by exposing consumers to a service environment in which continuous SST is used. Nonetheless, practitioners should not assume that people's assimilation of a certain situation means their continuing acceptance of the situation.

Practitioners can also build trust in the introduction and application of self-service, emphasizing that kiosks can support activities such as transmission prevention and social distancing. The trust generated by SST as a strategy to respond to viruses or infections can continuously deliver the value of technology use for consumers. From a short-term perspective, the extent of excellent technology utilization skills at this point can be important. However, in order to maintain a lasting relationship with customers, it is necessary to build sufficient trust in transactions. Trust in the transaction channel will also be effective in suppressing any form of risk in the service process.

Despite the above implications, our research has some limitations. Since our study applied a theoretical model to explain the absorption and utilization of knowledge at the organizational level, it can be difficult to say that a perfect fit was achieved. Therefore, there is a need for research from a new perspective by applying our research flow to consumer behavior research theory. Consumers' perceptions of kiosks can slightly differ depending on the type, industry, and purpose of use. Therefore, a more detailed study would be possible if the subsequent study divided the various types of kiosks and specifically investigated users' perceptions. Lastly, there are limitations to the study in that the variables that have traditionally been important in research on SST acceptance are not sufficiently reflected in this research content. For example, if variables related to the quality of kiosk service or personal characteristics of users (e.g., innovativeness, self-efficacy) are reflected in the research, more abundant research results can be presented.

Declaration of competing interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ORCID iD

Taehyee Um https://orcid.org/0000-0002-5313-1827
Namho Chung https://orcid.org/0000-0002-2118-0413

References

Alt, R. (2021). Digital transformation in the restaurant industry: Current developments and implications. *Journal of Smart Tourism, 1*(1), 69–74.

Assaker, G., Vinzi, V. E., & O'Connor, P. (2011). Examining the effect of novelty seeking, satisfaction, and destination image on tourists' return pattern: A two factor, non-linear latent growth model. *Tourism Management, 32*(4), 890–901.

Aurier, P., & N'Goala, G. (2010). The differing and mediating roles of trust and relationship commitment in service relationship maintenance and development. *Journal of the Academy of Marketing Science, 38*(3), 303–325.

Bae, S. Y., & Chang, P.-J. (2020). The effect of coronavirus disease-19 (COVID-19) risk perception on behavioural intention towards 'untact' tourism in South Korea during the first wave of the pandemic (March 2020). *Current Issues in Tourism*, 1–19.

Baumann, C., Hamin, H., & Chong, A. (2015). The role of brand exposure and experience on brand recall—Product durables vis-à-vis FMCG. *Journal of Retailing and Consumer Services, 23*, 21–31.

Beldad, A. D., & Hegner, S. M. (2018). Expanding the technology acceptance model with the inclusion of trust, social influence, and health valuation to determine the predictors of German users' willingness to continue using a fitness app: A structural equation modeling approach. *International Journal of Human–Computer Interaction, 34*(9), 882–893.

Blut, M., Wang, C., & Schoefer, K. (2016). Factors influencing the acceptance of self-service technologies: A meta-analysis. *Journal of Service Research, 19*(4), 396–416.

Chang, Y.-S., Cheah, J.-H., Lim, X.-J., Morrison, A. M., & Kennell, J. S. (2022). Are unmanned smart hotels du jour or are they here forever? Experiential pathway analysis of antecedents of satisfaction and loyalty. *International Journal of Hospitality Management, 104*, 103249.

Chen, C.-J., Tsai, P.-H., & Tang, J.-W. (2022). How informational-based readiness and social influence affect usage intentions of self-service stores through different routes: An elaboration likelihood model perspective. *Asia Pacific Business Review, 28*(3), 380–409.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), 128–152.

Collier, J. E., Moore, R. S., Horky, A., & Moore, M. L. (2015). Why the little things matter: Exploring situational influences on customers' self-service technology decisions. *Journal of Business Research, 68*(3), 703–710.

Cserdi, Z., & Kenesei, Z. (2021). Attitudes to forced adoption of new technologies in public transportation services. *Research in Transportation Business and Management, 41*, 100611.

DeWitt, T., Nguyen, D. T., & Marshall, R. (2008). Exploring customer loyalty following service recovery: The mediating effects of trust and emotions. *Journal of Service Research, 10*(3), 269–281.

Enkel, E., Heil, S., Hengstler, M., & Wirth, H. (2017). Exploratory and exploitative innovation: To what extent do the dimensions of individual level absorptive capacity contribute? *Technovation, 60–61*, 29–38.

Feng, W., Tu, R., Lu, T., & Zhou, Z. (2019). Understanding forced adoption of self-service technology: The impacts of users' psychological reactance. *Behaviour and Information Technology, 38*(8), 820–832.

Fischer, K. W. (1980). A theory of cognitive development: The control and construction of hierarchies of skills. *Psychological Review, 87*(6), 477–531.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.

García-Milon, A., Olarte-Pascual, C., & Juaneda-Ayensa, E. (2021). Assessing the moderating effect of COVID-19 on intention to use smartphones on the tourist shopping journey. *Tourism Management, 87*, 104361.

Gupta, A. K., & Gupta, N. (2020). Effect of corporate environmental sustainability on dimensions of firm performance–Towards sustainable development: Evidence from India. *Journal of Cleaner Production, 253*, 119948.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*(2), 139–152.

Harris, L. C., & Goode, M. M. H. (2010). Online servicescapes, trust, and purchase intentions. *Journal of Services Marketing*, 24(3), 230–243.

Kale, E., Aknar, A., & Başar, Ö. (2019). Absorptive capacity and firm performance: The mediating role of strategic agility. *International Journal of Hospitality Management, 78*, 276–283.

Kim, M. J., Lee, C.-K., Chung, N., & Kim, W. G. (2014). Factors affecting online tourism group buying and the moderating role of loyalty. *Journal of Travel Research, 53*(3), 380–394.

Kokkinou, A., & Cranage, D. A. (2013). Using self-service technology to reduce customer waiting times. *International Journal of Hospitality Management, 33*, 435–445.

Laumer, S., Maier, C., & Eckhardt, A. (2010). *Why do they resist? –An empirical analysis of an individual's personality trait resistance regarding the adoption of new information systems*. ECIS 2010 Proceedings. 31.

Lee, H.-J., & Lyu, J. (2016). Personal values as determinants of intentions to use self-service technology in retailing. *Computers in Human Behavior, 60*, 322–332.

Lee, K., & Mirchandani, D. (2010). Dynamics of the importance of IS/IT skills. *Journal of Computer Information Systems, 50*(4), 67–78.

Lee, Y.-K., Park, J.-H., Chung, N., & Blakeney, A. (2012). A unified perspective on the factors influencing usage intention toward mobile financial services. *Journal of Business Research, 65*(11), 1590–1599.

Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management. *MIS Quarterly*, 31(1), 59–87.

Liao, S.-H., Chen, C.-C., Hu, D.-C., Chung, Y.-c., & Yang, M.-J. (2017). Developing a sustainable competitive advantage: Absorptive capacity, knowledge transfer and organizational learning. *Journal of Technology Transfer, 42*(6), 1431–1450.

Lin, J.-S. C., & Hsieh, P.-L. (2007). The influence of technology readiness on satisfaction and behavioral intentions toward self-service technologies. *Computers in Human Behavior, 23*(3), 1597–1615.

Liu, S. (2012). The impact of forced use on customer adoption of self-service technologies. *Computers in Human Behavior, 28*(4), 1194–1201.

Liu, Y., Li, H., & Hu, F. (2013). Website attributes in urging online impulse purchase: An empirical investigation on consumer perceptions. *Decision Support Systems, 55*(3), 829–837.

Lu, H. P., & Yu-Jen Su, P. Y. J. (2009). Factors affecting purchase intention on mobile shopping web sites. *Internet Research*, 19(4), 442–458.

McMillen, J. C., Smith, E. M., & Fisher, R. H. (1997). Perceived benefit and mental health after three types of disaster. *Journal of Consulting and Clinical Psychology, 65*(5), 733–739.

Meidute-Kavaliauskiene, I., Yıldız, B., Çiğdem, Ş., & Činčikaitė, R. (2021). The effect of COVID-19 on airline transportation services: A study on service robot usage intention. *Sustainability, 13*(22), 12571.

Meuter, M. L., Ostrom, A. L., Roundtree, R. I., & Bitner, M. J. (2000). Self-service technologies: Understanding customer satisfaction with technology-based service encounters. *Journal of Marketing, 64*(3), 50–64.

Min, J., Yang, K., & Kim, J. (2022). The role of perceived vulnerability in restaurant customers' co-creation behavior and repatronage intention during the COVID-19 pandemic. *Journal of Vacation Marketing, 28*(1), 38–51.

Nelms, T. C., Maurer, B., Swartz, L., & Mainwaring, S. (2018). Social payments: Innovation, trust, Bitcoin, and the sharing economy. *Theory, Culture and Society, 35*(3), 13–33.

Nijssen, E. J., Schepers, J. J. L., & Belanche, D. (2016). Why did they do it? How customers' self-service technology introduction attributions affect the customer-provider relationship. *Journal of Service Management*, 27(3), 276–298.

Parasuraman, A. (2000). Technology Readiness Index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research, 2*(4), 307–320.

Park, J.-H., Suh, H.-J., & Yang, H.-D. (2007). Perceived absorptive capacity of individual users in performance of Enterprise Resource Planning (ERP) usage: The case for Korean firms. *Information and Management, 44*(3), 300–312.

Park, S., & Tussyadiah, I. P. (2017). Multidimensional facets of perceived risk in mobile travel booking. *Journal of Travel Research, 56*(7), 854–867.

Patil, A., & Humbare, R. (2020, June). *Interactive Kiosk Market Size, Share and Growth.* Allied Market Research. https://www.alliedmarketresearch.com/interactive-kiosk-market

Petrick, J. F. (2004). Are loyal visitors desired visitors? *Tourism Management, 25*(4), 463–470.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.

Prentice, C., Weaven, S., & Wong, I. A. (2020). Linking AI quality performance and customer engagement: The moderating effect of AI preference. *International Journal of Hospitality Management, 90*, 102629.

Pulkkinen, J., Jussila, J., Partanen, A., Trotskii, I., & Laiho, A. (2019). Smart mobility: Services, platforms and ecosystems. *Technology Innovation Management Review, 9*(9), 15–24.

Rau, P.-L. P., Gao, Q., & Wu, L.-M. (2008). Using mobile communication technology in high school education: Motivation, pressure, and learning performance. *Computers and Education, 50*(1), 1–22.

Reddy, R., Rhodes, J. E., & Mulhall, P. (2003). The influence of teacher support on student adjustment in the middle school years: A latent growth curve study. *Development and Psychopathology, 15*(1), 119–138.

Reinders, M. J., Dabholkar, P. A., & Frambach, R. T. (2008). Consequences of forcing consumers to use technology-based self-service. *Journal of Service Research, 11*(2), 107–123.

Rowley, J. (2006). An analysis of the e-service literature: Towards a research agenda. *Internet Research*, 16(3), 339–359.

Salo, J., & Karjaluoto, H. (2007). A conceptual model of trust in the online environment. *Online Information Review*, 31(5), 604–621.

Shin, H., & Perdue, R. R. (2019). Self-Service Technology Research: A bibliometric co-citation visualization analysis. *International Journal of Hospitality Management, 80*, 101–112.

Shiwen, L., Kwon, J., & Ahn, J. (2022). Self-service technology in the hospitality and tourism settings: A critical review of the literature. *Journal of Hospitality and Tourism Research, 46*(6), 1220–1236.

Tavera-Mesias, J. F., van Klyton, A., & Zuñiga Collazos, A. (2022). Social stratification, self-image congruence, and mobile banking in Colombian cities. *Journal of International Consumer Marketing, 34*(3), 312–331.

The World Bank. (2020, June 8). *The Global Economic Outlook During the COVID-19 Pandemic: A Changed World*. Retrieved from www.worldbank.org/en/news/feature/2020/06/08/the-global-economic-outlook-during-the-covid-19-pandemic-a-changed-world

Todorova, G., & Durisin, B. (2007). Absorptive capacity: Valuing a reconceptualization. *Academy of Management Review, 32*(3), 774–786.

Turner, T., & Shockley, J. (2014). Creating shopper value: Co-creation roles, in-store self-service technology use, and value differentiation. *Journal of Promotion Management, 20*(3), 311–327.

Tussyadiah, I. P., & Park, S. (2018). When guests trust hosts for their words: Host description and trust in sharing economy. *Tourism Management, 67*, 261–272.

Um, T., & Chung, N. (2021). Does smart tourism technology matter? Lessons from three smart tourism cities in South Korea. *Asia Pacific Journal of Tourism Research, 26*(4), 396–414.

Um, T., Chung, N., & Stienmetz, J. (2022). Factors affecting consumers' impulsive buying behavior in tourism Mobile commerce using SEM and fsQCA. *Journal of Vacation Marketing*, 13567667221090991.

Um, T., Kim, H., Kim, H., Lee, J., Koo, C., & Chung, N. (2022a). *Travel Incheon as a Metaverse: Smart Tourism Cities Development Case in Korea.* Paper presented at the ENTER22 e-Tourism Conference.

Um, T., Kim, H., Rhee, J., & Chung, N. (2022b). A mixed-method approach to explore the motivations and constraints of kiosks consumers. *Asia Pacific Journal of Information Systems, 32*(1), 92–124.

Um, T., Kim, T., & Chung, N. (2020). How does an intelligence chatbot affect customers compared with self-service technology for sustainable services? *Sustainability, 12*(12), 5119.

Van Den Bosch, F. A., Van Wijk, R., & Volberda, H. W. (2003). *Absorptive capacity: Antecedents, models and outcomes*. ERIM Report Series Reference No. ERS-2003-035-STR, Available at SSRN: https://ssrn.com/abstract=411675.

Volberda, H. W., Foss, N. J., & Lyles, M. A. (2010). Perspective—Absorbing the concept of absorptive capacity: How to realize its potential in the organization field. *Organization Science, 21*(4), 931–951.

Walker, W. R., Vogl, R. J., & Thompson, C. P. (1997). Autobiographical memory: Unpleasantness fades faster than pleasantness over time. *Applied Cognitive Psychology, 11*(5), 399–413.

Wang, W., Liu, L., Feng, Y., & Wang, T. (2014). Innovation with IS usage: Individual absorptive capacity as a mediator. *Industrial Management and Data Systems*, *114*(8), 1110–1130.

Wei, W., Torres, E., & Hua, N. (2016). Improving consumer commitment through the integration of self-service technologies: A transcendent consumer experience perspective. *International Journal of Hospitality Management, 59*, 105–115.

Wilson, T. D., & Gilbert, D. T. (2008). Explaining away: A model of affective adaptation. *Perspectives on Psychological Science, 3*(5), 370–386.

Xie, Y., & Greenman, E. (2011). The social context of assimilation: Testing implications of segmented assimilation theory. *Social Science Research, 40*(3), 965–984.

Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review, 27*(2), 185–203.

Zhang, T., Tao, D., Qu, X., Zhang, X., Zeng, J., Zhu, H., & Zhu, H. (2020). Automated vehicle acceptance in China: Social influence and initial trust are key determinants. *Transportation Research Part C, 112*, 220–233.

Zhu, K., Kraemer, K. L., & Xu, S. (2006). The process of innovation assimilation by firms in different countries: A technology diffusion perspective on e-business. *Management Science, 52*(10), 1557–1576.

Zohar, D., Tzischinski, O., & Epstein, R. (2003). Effects of energy availability on immediate and delayed emotional reactions to work events. *Journal of Applied Psychology, 88*(6), 1082–1093.

Author Biographies

Taehyee Um is working on Conrad N. Hilton College of Hotel & Restaurant Management in University of Houston as a postdoctoral researcher. He worked in Smart Tourism Research Center as a researcher assistant. He received his Ph.D. degree in hospitality management from Kyung Hee University in Seoul. His research interests include travel behavior, internet marketing, smart tourism, and accommodation management. His research work has been published in journals such as Asia Pacific Journal of Tourism, Journal of Vacation Marketing, Asia Pacific Journal of Information Systems and others.

Namho Chung is a Dean at the College of Hotel & Tourism Management and the Director of Smart Tourism Research Center (STRC) at Kyung Hee University in Seoul, South Korea. He had received his Ph.D. degree in MIS from Sungkyunkwan University in Seoul. Also, he had been a Visiting Research Fellow at School of Hospitality and Tourism Management, University of Surrey in Guildford, UK. His research interests lie in the smart tourism, tourist behavior & information technology, and knowledge management. Currently, he leads BK21 Four and SSK projects supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea. His name listed in the Hall of Fame at Kyung Hee University for his outstanding achievements.