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Antecedents of Behavioral Intention to Use Mobile Telecommunication Services: Effects of Corporate Social Responsibility and Technology Acceptance

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Abstract: The concepts of corporate social responsibility (CSR) and user experience have been identified as core determinants of the success of service providers. Accordingly, practitioners and researchers have investigated the effects of service providers' CSR and user experience on behavioral intention to use a particular service. Based on the importance of these concepts, the current study integrates subjective dimensions of CSR with the technology acceptance model (TAM) to explore whether the CSR efforts of mobile telecommunication services providers and the service acceptance of their customers have significant effects on behavioral intention to use a service. We apply structural equation modeling and find that two factors from the TAM (*i.e.*, usefulness and ease of use) as well as economic, social, and environmental responsibility are significantly related to customer attitude and satisfaction. Moreover, our results show that there are significantly positive relationships between customer attitude and behavioral intention to use a service, as well as

between customer satisfaction and intention. Practical and theoretical implications along with notable limitations of the current study are presented.

Keywords: corporate social responsibility; technology acceptance model; behavioral intention to use

1. Introduction

Predicting human behavior has been one of the important factors in the economic success in the service industry. In recent decades, many marketing and consumer behavior studies have investigated the various factors influencing consumer responses, including loyalty, behavioral intention, satisfaction, and attitude [1–3]. In particular, according to the theory of reasoned action (TRA) [4,5], the theory of planned behavior (TPB) [6], and the behavioral reasoning theory (BRT) [7], customer satisfaction (CS) has been considered as one of the most significant determinants of consumers' behavioral intentions.

Previous studies have focused only on how service value or service quality influence consumer behavior in the form of customer satisfaction (CS), customer loyalty (CL), and behavioral intentions (BI) in the banking [8], hotel and restaurant [9], and airline service industries [10,11]. In these industries, the value of tangible goods is not a significant consideration. However, investigations of consumer behavior in the mobile industry require consideration of the value of both tangible goods and mobile service.

Recently, scholars have focused on two main streams of research in the mobile service industry. Several studies have examined the impact of CSR on consumer behavior. Specifically, studies by Salmones and colleagues, and Vlachos and colleagues indicated that CSR has a significant impact on consumer behaviors [12,13], such as loyalty, trust, and recommendation intention, in mobile telephone services. In addition, studies have focused on the relationship between service quality (SQ) and CS in short message service (SMS) and mobile value-added service [14,15]. Kou and colleagues identified that service quality positively influences both satisfaction and post-purchase intention [15], whereas Lai indicated that the positive effect of SQ on CS varies according to dimensions of SQ [14].

In addition, the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT) have been introduced to explain customer behaviors [16,17]. Previous studies on the TAM and UTAUT have indicated that ease of use and usefulness are considered fundamental in determining the acceptance of information systems in various mobile products and applications, including wireless mobile data service [18], mobile map services [19], mobile social network games [20], and mobile internet service [21].

However, few studies have combined the concepts of the TAM and CSR to investigate behavioral intention to use mobile telecommunication services. Therefore, the proposed research model integrates the concepts of the TAM and CSR as significant antecedents of customer behaviors (CS and BI). In other words, this study attempts to examine the effects of two determinants (*i.e.*, TAM and CSR) on customer behaviors (customer attitude (CA) and CS), which, in turn, influence BI in Korean mobile telecommunication services.

The remainder of this study is organized as follows. Section 2 explores the previous literature and proposes the research hypotheses. Section 3 explains the research model and describes the methodology.

Section 4 explores the results of the structural equation model. Finally, Section 5 concludes with a summary of the major findings, implications, limitations, and future research directions.

2. Literature Review and Hypotheses

2.1. Corporate Social Responsibility

The notion of CSR has emerged in the corporate world during the past decade, and is defined as "a firm's obligation towards stakeholder and society" [1,22,23]. Previous studies have used the concept of CSR in marketing and consumer behavior literature, with several scholars examining the influence of CSR initiatives and consumer responses on financial performance [1,3].

Moreover, several studies have attempted to investigate the effects of CSR on factors such as customer loyalty, trust, word of mouth, intentions, attitudes, satisfaction, and brand identification [22,24–26]. Among these, recent studies have explored the relationship between CSR and CS, with the majority considering CSR to be one of the most important antecedents of CS. Although many previous studies have investigated the direct impact of CSR on marketing and profitability [26], some scholars have identified that CS plays a mediating role between CSR and firm market value [27,28]. Other studies have indicated that CSR affects CS, which, in turn, affects numerous other factors of firm market value through loyalty [29,30], word of mouth [31], and customers' willingness to pay premium prices [32].

However, previous studies have a notable limitation: they consider only simplified and limited indicators of CSR in their research model. Some studies have tried to overcome this limitation by investigating multidimensional indicators of CSR in their research models [1,3,24]. Others have tried to investigate multidimensional indicators of CSR in accordance with varying perspectives to overcome the limitations of previous literature [12,22]. From an economic perspective, the fundamental motivation for CSR is to maximize firm profitability for shareholders [33,34]. However, some scholars indicated that corporations bear a responsibility to contribute to the betterment of society as a whole [1,24,35,36], as well as to integrate environmental concerns in business operations [37].

Thus, this study considers the following three dimensions of CSR: economic, social, and environmental. These factors are expected to have a significant effect on customer satisfaction in mobile telecommunication service.

H1. Economic responsibility is positively related to consumer satisfaction.
H2. Social responsibility is positively related to consumer satisfaction.
H3. Environmental responsibility is positively related to consumer satisfaction.

2.2. Customer Satisfaction

In the service industry, customer satisfaction is one of the important antecedents for positive outcomes, including continual intention to employ a particular service. This argument has been supported in the literature on service marketing [38], and user behavior [39]. A large number of empirical studies have indicated that customer satisfaction plays a dominant role in determining customers' intention to continue to use [40]. Therefore, customers with a high degree of satisfaction are more likely to keep using the same service than are other customers. A large number of studies have supported that customers' satisfaction with their previous mobile services is critical to improving usage intention [14,15,21]. Thus,

this study expects that customer satisfaction with a mobile telecommunication service is a significant antecedent to their intention to use the service.

H4. Customer satisfaction is positively related to intention to continue to use.

H5. Customer satisfaction is positively related to word of mouth.

H6. Customer satisfaction is positively related to willing to pay.

2.3. Technology Acceptance

In the mobile services context, predicting customer behavior has been one of the most important factors for market success. Several notable theories related to psychology and service industry, including the TRA [6], the TAM [16], and the UTAUT [17], have been introduced to predict customer actions and behaviors. In particular, the TAM is a well-defined model that attempts to explore the determinants of user acceptance of information systems and information technology [16]. For more than 20 years, the TAM has been applied and validated in research on various mobile products and applications, including mobile games [20], mobile cloud services [41], mobile shopping services [42], and mobile map services [19]. Considering that the TAM has been validated in both hedonic and utilitarian services, which comprise the functional majority of mobile services and products, it may be appropriate to consider it as one of the best-defined business models for explaining customer behavior of mobile services and products.

The TAM is organized into five constructs: ease of use, usefulness, attitude, intention to use, and external variables. In the model, specific characteristics and functionalities are generally employed as external variables that determine usefulness and ease of use. Customer attitude plays a mediating role in bridging intention to use and usefulness, and intention to use and ease of use.

Usefulness is defined as "a user's perception that utilizing a newly introduced technology or product will improve the user's performance" [16]. Given the topic of the current study, the definition of usefulness can be revised as "customers' perception that utilizing their current mobile telecommunication service will improve their performance". A study by Davis introduced the definition of ease of use as "a user's perception that utilizing a newly introduced technology or product will be free from physical/mental efforts" [16]. Applying this definition to the context of the current study, ease of use is considered as "customers' perception that their current mobile telecommunication service is easy to use". Consistent with the findings of the initial TAM studies, ease of use and usefulness are hypothesized as predictors of customer attitude.

Furthermore, attitude is defined as the positive/negative feelings on a particular object or behavior [6]. The TAM and TRA insist that users' intention to enact particular behaviors is generally affected by their attitude and other emotional factors [6,43]. Moreover, in the mobile context, attitude is considered as one of the strong predictors of users' decision-making process. Thus, this study hypothesizes a connection between customer attitude and behavioral intention to use.

H7. Ease of use is positively related to customer attitude.

H8. Usefulness is positively related to customer attitude.

H9. Customer attitude is positively related to intention to continue to use.

H10. Customer attitude is positively related to word of mouth.

H11. Customer attitude is positively related to willing to pay.

2.4. The Research Model

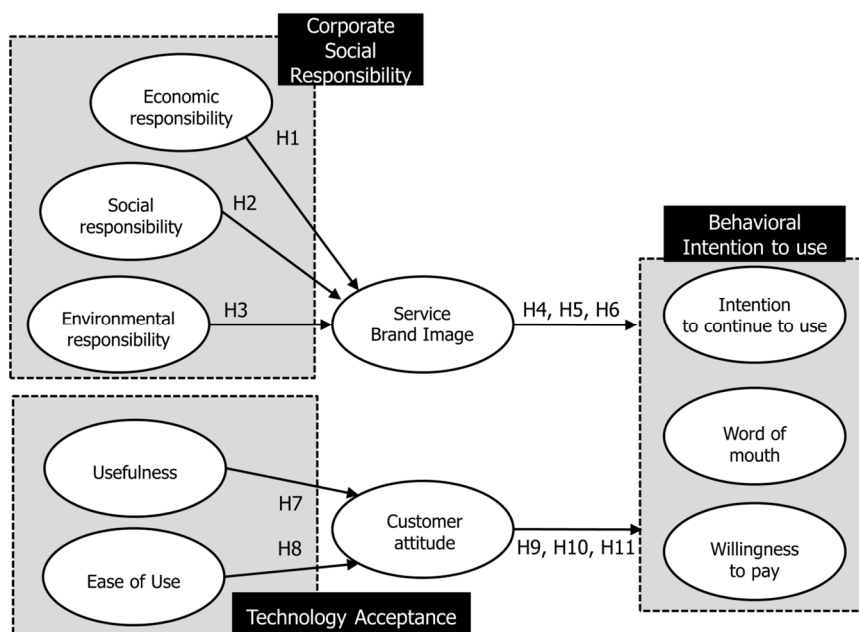The research model based on the hypotheses is presented in Figure 1.

Figure 1. The research model.

3. Study Method

3.1. Measures

All questionnaire items used in the current study were initially adopted by previous studies, as shown in Table 1. The respondents were instructed to answer all items using a seven-point Likert scale (1 = "strongly disagree" and 7 = "strongly agree").

Table 1. Questionnaire items of the survey.

Factors	Descriptions	Sources
Economic responsibility	ECR1: The mobile telecommunication service provider I currently use makes a significant effort to contribute to our society by investing and generating profits. ECR2: The mobile telecommunication service provider I currently use makes a significant effort to create new jobs. ECR3: The mobile telecommunication service provider I currently use makes a significant effort to contribute to national development by creating more value.	[2,44,45]
Social responsibility	SR1: The mobile telecommunication service provider I currently use makes a notable effort to raise social fund. SR2: The mobile telecommunication service provider I currently use encourages its employees to take part in volunteering activities in local communities. SR3: The mobile telecommunication service provider I currently use supports sporting and cultural events.	[2,44,45]

Table 1. *Cont*.

Factors	Descriptions	Sources
Environmental responsibility	ENR1: The mobile telecommunication service provider I currently use makes a notable effort to participate in environment campaigns. ENR2: The mobile telecommunication service provider I currently use makes a notable effort to minimize waste and to use environmentally friendly products. ENR3: The mobile telecommunication service provider I currently use utilizes energy and resources efficiently.	[2,44,45]
Usefulness	U1: Using my current mobile telecommunication service increases my productivity. U2: Using my current mobile telecommunication service enhance my effectiveness on the job. U3: I find my current telecommunication service useful in my life.	[16,43]
Ease of use	E1: Using my current mobile telecommunication service does not require lots of mental effort. E2: I find my current mobile telecommunication service easy to use. E3: My interaction with my current mobile telecommunication service is clear and understandable.	[16,43,46]
Customer satisfaction	CS1: Using my current mobile telecommunication service is a wise choice. CS2: I am satisfied with my choice to use my current mobile telecommunication service. CS3: The mobile telecommunication service I am using now meets my expectations.	[47,48]
Customer attitude	CA1: I would have positive feelings toward my current mobile telecommunication service in general. CA2: It would be a good idea to use my current mobile telecommunication service. CA3: I think that my current mobile communication service makes my life more convenient.	[16,43]
Intention to continue to use	IU1: My intentions are to continue using my current mobile telecommunication service rather than using my alternative means (other communication tools). IU2: Even though I have a chance to change my current mobile telecommunication service, I do not want to change it. IU3: I intend to continue using my current mobile telecommunication service whenever I need it.	[16,40,43,49–51]
Word of mouth	WM1: I want to encourage my colleagues to use the mobile telecommunication service I currently use.	[49]
Willing to pay	WP1: If given the choice, I would maintain my current mobile telecommunication service even if it is more expensive than other telecommunication services.	[52,53]

3.2. Samples

The survey was conducted in two of the large universities in South Korea. The current study used a convenience sampling method. The survey web page was posted on the announcement section of the universities. About 1050 undergraduate and graduate students initially participated in the survey, and they received $5 in exchange for their participation. After a sample-validation procedure for data filtering, 935 samples remained. All respondents answered that they use mobile telecommunication services with over six months of experience. The students were instructed to consider their currently used mobile telecommunication services. The students were asked to describe their experience in using the services. The respondents showed an average age of 24.9 years, and 51.2% were male.

4. Results

4.1. Evaluations of the Measurements

Table 2 presents the descriptive analyses. Overall fit indices as well as convergent, internal, and discriminant validity tests were conducted in order to evaluate the measurement model. As shown in Table 3, the confirmatory factor model fits the collected data well. Cronbach's alpha values were calculated for internal validity, and the values ranged from 0.798 to 0.887.

Table 2. Descriptive analyses.

Construct	Mean	Standard deviation
Economic responsibility	4.77	1.02
Social responsibility	4.23	0.98
Environmental responsibility	4.32	1.22
Usefulness	5.01	1.03
Ease of use	5.12	1.02
Customer satisfaction	4.97	1.16
Customer attitude	5.06	0.94
Intention to continue to use	5.02	0.95
Word of mouth	4.96	0.99
Willing to pay	5.01	1.21

Moreover, factor loadings of more than 0.7, composite reliability greater than 0.5, and average variance extracted higher than 0.5 should be found to ensure convergent reliability. The current study satisfied these recommendations (Table 3). For discriminant validity, the square root values had to be higher than the shared coefficient values between two particular factors. As shown in Table 4, the present study fulfills the recommendations for discriminant validity. Moreover, the goodness-of-fit indices of the measurement model indicated that the collected data is well fitted to the measurement model (Table 5).

Table 3. Convergent and internal reliability of the constructs.

Construct		Internal reliability		Convergent reliability		
		Cronbach's alpha	Item-total correlation	Factor loading	Composite reliability	Average variance extracted
Economic responsibility	ECR1	0.887	0.701	0.843	0.857	0.668
	ECR2		0.754	0.881		
	ECR3		0.766	0.719		
Social responsibility	SR1	0.798	0.891	0.728	0.848	0.651
	SR2		0.815	0.820		
	SR3		0.740	0.866		
Environmental responsibility	ER1	0.824	0.876	0.794	0.845	0.645
	ER2		0.706	0.811		
	ER3		0.791	0.805		
Usefulness	U1	0.884	0.798	0.929	0.899	0.749
	U2		0.846	0.851		
	U3		0.855	0.813		
Ease of use	E1	0.872	0.824	0.832	0.901	0.751
	E2		0.821	0.878		
	E3		0.855	0.890		
Customer satisfaction	CS1	0.855	0.715	0.723	0.824	0.610
	CS2		0.795	0.822		
	CS3		0.851	0.794		
Customer attitude	CA1	0.840	0.811	0.834	0.847	0.649
	CA2		0.824	0.810		
	CA3		0.862	0.771		
Intention to continue to use	IU1	0.799	0.719	0.904	0.939	0.837
	IU2		0.810	0.927		
	IU3		0.815	0.914		

Table 4. Discriminant test (ECR: Economic responsibility; SR: Social responsibility; ENR: Environmental responsibility; CS: Customer satisfaction; CA: Customer attitude; IR: Intention to continue to use).

	1	2	3	4	5	6	7	8	9	10
1. ECR	0.817									
2. SR	0.421	0.807								
3. ENR	0.195	0.224	0.803							
4. Usefulness	0.546	0.121	0.225	0.865						
5. Ease of use	0.087	0.432	0.229	0.221	0.867					
6. CS	0.512	0.294	0.135	0.193	0.177	0.781				
7. CA	0.291	0.230	0.482	0.425	0.351	0.117	0.806			
8. IU	0.315	0.375	0.152	0.195	0.275	0.242	0.632	0.915		
9. Word of mouth	0.187	0.189	0.246	0.264	0.225	0.351	0.364	0.487	-	
10. Willing to pay	0.533	0.197	0.261	0.274	0.213	0.351	0.337	0.394	0.542	-

Table 5. The measurement model's fit indices.

Fit indices	The measurement model	Satisfactory level	Sources
Chi-square/d.f. (degree of freedom)	4.556	<5.000	[54–58]
Goodness of Fit Index (GFI)	0.911	>0.900	
Adjusted Goodness of Fit Index (AGFI)	0.901	>0.900	
Normed Fit Index (NFI)	0.902	>0.900	
Relative Fit Index (RFI)	0.887	>0.800	
Incremental Fit Index (IFI)	0.860	>0.800	
Comparative Fit Index (CFI)	0.892	>0.800	
Root Mean Square Error of Approximation (RMSEA)	0.070	<0.080	

4.2. Hypothesis Tests

A structural equation modeling method was used to examine the hypothesized connections. The fit indices of the research model are generally acceptable (Table 6). Thus, the research model is deem to fit well with the collected data.

Table 6. The research model's fit indices.

Fit indices	The measurement model	Satisfactory level	Sources
Chi-square/d.f. (degree of freedom)	4.709	<5.000	[54–58]
Goodness of Fit Index (GFI)	0.921	>0.900	
Adjusted Goodness of Fit Index (AGFI)	0.909	>0.900	
Normed Fit Index (NFI)	0.915	>0.900	
Relative Fit Index (RFI)	0.896	>0.800	
Incremental Fit Index (IFI)	0.872	>0.800	
Comparative Fit Index (CFI)	0.849	>0.800	
Root Mean Square Error of Approximation (RMSEA)	0.067	<0.080	

Figure 2 and Table 7 present a summary of the tested hypotheses. All structural coefficients of connections among the factors were significant. Although the effects of social (H2, $\beta = 0.156$, CR = 2.513, $p < 0.05$) and environmental responsibility (H3, $\beta = 0.302$, CR = 7.502, $p < 0.001$) were significantly related to customer satisfaction, economic responsibility had the greatest effects on customer satisfaction (H1, $\beta = 0.386$, CR = 6.673, $p < 0.001$). Moreover, 56.2% of the variance in customer satisfaction was explained by economic, social, and environmental responsibility.

With regard to technology acceptance, both antecedents (*i.e.,* usefulness and ease of use) were significantly associated with customer attitude, although usefulness (H8, $\beta = 0.513$, CR = 14.483, $p < 0.001$) had a stronger effect than did ease of use (H7, $\beta = 0.336$, CR = 9.005, $p < 0.001$). Usefulness and ease of use explained 56.5% of the variance in customer satisfaction.

Customer satisfaction and attitude had significant effects on behavioral intention to use a mobile telecommunication service. The effects of customer attitude on intention to continue to use (H9, $\beta = 0.484$, CR = 13.074, $p < 0.001$) and willingness to pay (H11, $\beta = 0.293$, CR = 8.017, $p < 0.001$) were greater than those of customer satisfaction (H4, $\beta = 0.306$, CR = 8.462, $p < 0.001$; H6, $\beta = 0.232$, CR = 6.127,

$p < 0.001$). However, the impact of customer satisfaction on word of mouth (H5, $\beta = 0.293$, CR = 7.740, $p < 0.001$) was slightly greater than that of customer attitude (H10, $\beta = 0.264$, CR = 7.333, $p < 0.001$).
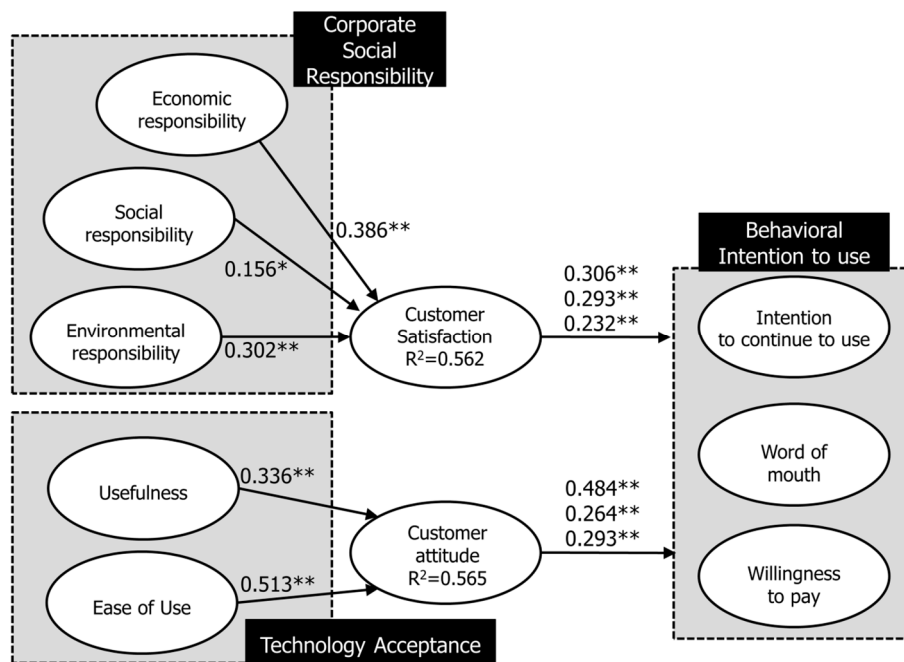

Figure 2. The results of the research model (* $p < 0.05$, ** $p < 0.001$).

Table 7. Summary of the research model (* $p < 0.05$, ** $p < 0.001$).

Hypotheses	Standardized path coefficient	SE	CR	Results
H1. Economic responsibility → Customer satisfaction	0.386 **	0.036	6.673	Supported
H2. Social responsibility → Customer satisfaction	0.156 *	0.044	2.513	Supported
H3. Environmental responsibility → Customer satisfaction	0.302 **	0.021	7.502	Supported
H4. Customer satisfaction → Intention to continue to use	0.306 **	0.046	8.462	Supported
H5. Customer satisfaction → Word of mouth	0.293 **	0.072	7.740	Supported
H6. Customer satisfaction → Willing to pay	0.232 **	0.073	6.127	Supported
H7. Ease of use → Customer attitude	0.336 **	0.063	9.005	Supported
H8. Usefulness → Customer attitude	0.513 **	0.040	14.468	Supported
H9. Customer attitude → Intention to continue to use	0.484 **	0.030	13.074	Supported
H10. Customer attitude → Word of mouth	0.264 **	0.044	7.333	Supported
H11. Customer attitude → Willing to pay	0.293 **	0.045	8.017	Supported

5. Discussion and Conclusions

This study integrates the mediating factors of customer attitude and satisfaction in order to explore whether the technology acceptance of mobile telecommunication services and service provider CSR have notable effects on behavioral intention to use a mobile telecommunication service. Based on structural equation modeling, the results validated eleven hypotheses of the research model. There were significant levels of variance in customer satisfaction as affected by CSR, and in customer attitudes as affected by two factors of the TAM (*i.e.*, usefulness and ease of use). Thus, customer attitude and satisfaction play bridge roles between CSR and behavioral intention to use, and between the two TAM factors and behavioral intention to use.

The structural results also indicated that behavioral intention to use mobile telecommunication services is significantly determined, supported, and validated by the concepts of CSR and TAM. In addition, the present research model was deemed acceptable based on the measurement models applied. Moreover, the bridge roles of customer attitude and satisfaction support that corporate activities for CSR, usefulness, and ease of use tend to improve customers' attitude toward and satisfaction with mobile telecommunication services, inducing them to show greater degrees of behavioral intention to use.

Among the subjective factors of CSR, economic responsibility is found as a more significant determinant of customer satisfaction than social and environmental responsibility. These findings could be explained by the nature of the South Korean mobile telecommunication service market. The Korean mobile telecommunication market is the most competitive and mature market in the world, and three major conglomerates dominate it. Economic activities for South Korean society, including new job creation, value contributions, and investments to the society are the main responsibility of South Korean conglomerates. Moreover, because of the mature market condition, market researchers have consistently aimed to investigate how to gain more customers and maintain current ones.

The strong connections between perceived usefulness, ease of use, and customer attitude might be a result of the unique features of mobile telecommunication services. Consistent with previous studies that provided strong validation of the TAM in mobile services, mobile telecommunication services closely interact with their customers via mobile devices. Therefore, user-oriented behavior should be considered as one of the most important factors in attracting more customers and improving corporate success in the market.

The current study sheds light on the relationships between behavioral intention to use and the TAM, and between behavioral intention to use and CSR by exploring the concrete components of CSR and TAM in mobile telecommunication service providers.

The study presents theoretical and practical implications for researchers and practitioners of mobile telecommunication services interested in determining how to attract customers. This study extends previous knowledge of CSR, the TAM, and behavioral intention to use by validating the current research model. First, customer attitude and satisfaction are core mediating factors, having significant effects on behavioral intention to use. Thus, they should be considered as two important concepts in providing and designing mobile telecommunication services.

Second, the structural results demonstrate that both factors of the TAM (usefulness and ease of use) as well as the CSR activities of service providers are closely and similarly associated with behavioral intention to use. In particular, the effects of customer attitude resulting from the TAM factors on

intention to continue to use and willingness to pay are greater than those of customer satisfaction as cultivated by CSR. However, the effects of customer satisfaction resulting from CSR on word of mouth are greater than those of customer attitude resulting from TAM. Thus, whereas a positive service experience may be most effective in helping to maintain customers and their willingness to pay for services, the external and social images of the providers are the most important factor in how customers' communicate about their provider to others.

Third, corporate economic responsibility shows the greatest impact on customer satisfaction. This means that providers of mobile telecommunication services should focus on conducting more economic activities aimed at helping society.

6. Limitations and Future Studies

Although the current study provides several implications, it also presents some significant limitations. First, we examined the user data of mobile telecommunication services in South Korea. This means that the findings of the current study are limited in their generalizability [59,60]. Second, the current study did not consider any individual characteristics [61]. Previous studies indicated that there are individual characteristics that can significantly affect behavioral intention to use. Third, although this study considered three detailed concepts of behavioral intention to use, this study does not track actual subsequent use or repurchase behaviors. Fourth, this study did not consider a quantitative analysis on the factor of willing to pay. If a quantified question on the willingness to pay is conducted, it could be a more productive and valid measure. Therefore, future research should be conducted to explore the aforementioned limitations.

Acknowledgments

Author Contributions

Sanghoon Lee and Eunil Park conducted the analyses and wrote the majority of the manuscript. Sang Jib Kwon and Angel P. del Pobil contributed to data collection and interpretation of data.

Conflicts of Interest

The authors declare no conflict of interest.

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