The Effect of Service Quality on the Reuse Intention of a Chatbot: Focusing on User Satisfaction, Reliability, and Immersion

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Abstract: This study examined the impact of chatbot service quality (process quality, outcome quality, and servicescape quality) on user satisfaction and reliability by identifying the relationships between user satisfaction, reliability, immersion, and the paths of three variables influencing reuse intention. The survey was conducted of Korean users in their teens and 70s who had experience using chatbot services. A total of 218 convenience samples were extracted and the data analyzed. By the IS success and SERVQUAL model, the results of structural equation modeling revealed that the chatbot service quality did not affect user satisfaction and reliability. However, user satisfaction and reliability of the chatbot services were shown to lead to reuse intention, and user satisfaction was shown to affect immersion and immersion in reliability. The results showed that satisfaction, reliability, and immersion in the chatbot services were important factors in the chatbot reuse intention. Through the satisfaction and reliability gained through the service, the users wanted to reuse the chatbot services, especially the chatbot services that gained reliability, which will have a greater impact on reuse intention. We can use these results as marketing information to attract loyal customers by identifying the reuse intention of the chatbot service users.

1. Introduction

People's everyday living conditions have continued to change in a variety of shapes with the development of IT. In the mid-1980s, as PC emerged and became increasingly available, the use of PC naturally became part of everyday life and work environments. Although each PC was independent, the Internet market grew rapidly with the creation of an easy Internet access environment through web browsers, and as wireless Internet emerged and smartphones expanded, the core of the Internet market moved to mobile platforms, forming a diverse application ecosystem [1]. This paradigm of Information and Communication Technologies (ICI) has continued to evolve over a 10-year cycle, and recently ICT platforms are rapidly changing from mobile platforms to messenger platforms. In particular, with the advent of artificial intelligence-based chatbot services, customer contact points are changing from person-to-person to person-to-technology in various industries, and while artificial intelligence-based technologies such as deep learning and natural language processing are evolving, chatbot services, which users can feel, are spreading and growing across the entire industry [2].

Chatbot is short for chat + robot, which refers to artificial intelligence (AI)-based communication software that responds through text conversations with people and provides answers to questions or related information [1]. Chatbot has the advantage of being convenient because it can save waiting time and visiting time for service from the perspective of service users, and because it can be used efficiently and without any place restrictions. Also, from the service provider's perspective, it can replace simple, repetitive customer responses, enabling efficient use. Because these secured user groups can be used as service targets, it is expected that various services will continue to provide chatbot services through mobile messenger platforms [3]. Based on this

usefulness, there is a need to understand the service quality of chatbot and consider factors that affect user's intention to use them.

Twenty-six out of 352 financial firms are operating chatbot services to replace existing customer call centers, with 21 more to be introduced by 2019 [4]. The private sector is focused on 'talk-type commerce' and the public sector is focusing on introducing chatbot in 'civil service and administrative counseling' and the level of service is gradually increasing due to professional knowledge-based counseling such as law. In particular, there are various use cases in the medical sector such as depression and stress management that are difficult to provide face-to-face counseling, and where medical costs are high [2]. Chatbot services are being used in such diverse industries, and the use of chatbot services is expected to expand in the future along with technological developments. Therefore, the purpose of this paper is to identify the quality factors of chatbots that should be considered for users' continued use through understanding of the quality of chatbots used by artificial intelligence technology and examining factors that affect the user's intention of use from a long-term perspective.

With the introduction and utilization of information systems in various areas along with the development of information technology, a number of researchers in the MIS field became interested in the performance of the information system, and these research trends developed in the direction of proposing a typical model for successfully operating the information system. The revised information system success model (2003) consists of six interrelated dimensions, taking into account the impact of use and user satisfaction [5], In this paper, we look at the factors affecting the users of chatbot services based on the revised IS model to find out how to successfully operate a competitive new technology service called chatbot.

Therefore, this paper seeks to explore the effect of the quality service of chatbot on user satisfaction and reliability, and the effect of parameters leading to service quality and intention of reuse through a model of relationship with reuse intention. And by identifying the relative importance of chatbot quality factors that use artificial intelligence technology, it contributes to collecting marketing strategies by presenting characteristics of service quality that service providers need to manage.

2. Related work or Analysis

2.1 Chatbot Service

Chatbot refers to 'artificial intelligence-based communication software' that responds through conversations with people and provides appropriate answers to user's questions or relevant information [2]. Chatbot explains that it simply imitates conversations in a way that presents answers out of a limited set of responses without memory or knowledge [6]. Chatbot systems are based on natural language processing technology that converts user's verbalness content into text, as they interact through text between users and systems. Therefore, it requires a dialogue controller that considers interaction with users, and consequently a technology that produces answers to be delivered to users, namely artificial intelligence technology [7].

Many of the existing services using chatbot are designed to save time, improve user experience, and enhance accessibility through chatbot. This is because chatbot can simplify the existing complex UI (User Interface) and communicate user's intentions to the system more efficiently. Therefore, effective use of these chatbots makes it easy for people with low digital literacy to access and use them because they can get the results they want only through everyday conversation [8]. According to [9], chatbot service is emerging as a new alternative to the already saturated app market, and people using messenger service apps are also becoming very dependent on dialogue, and thus entering the market provided on the messenger platform of chatbot services is very advantageous. Therefore, chatbot, which is stable and activated, is expected to evolve into a powerful medium for marketing.

Up until now, prior research on chatbot has been conducted in various ways with research on determining the acceptance of chatbot, usability of functions or user characteristics. Reference [10] focused on the expanded technology acceptance model (ETAM), and looked at the impact of personal innovativeness, self-efficiency and perceived playfulness on the intention of using chatbot services based on messenger platforms. Reference [4] conducted a study on quality factors on the intention of using financial chatbot, reference [11] looked at factors that affect client relationship proneness, trust, commitment and reuse intention in IT services. Reference [12] focused on the news subscription chatbot application, and looked at the impact of chatbot level of conversational interaction on the system reliability and continuous usage intention.

2.2 IS Success Model and Service Quality

As information systems were introduced and utilized in various areas along with the development of information technology, numerous researchers in the MIS field became interested in the performance of the information system. This research trend has evolved in the direction of proposing a typical model for successfully operating the information system [13]. A typical theoretical model from investing in information systems to producing results is the DeLone & McLean model [14].

Reference [15] presented an information system success model (Information System Success Model), summarizing the concepts and effects commonly used in numerous studies that defined and analyzed the performance of these information systems. They analyzed and integrated the assessment factors presented in the previous studies into six performance variables: system quality, information quality, use, user satisfaction, personal performance, and organizational performance. These performance variables interact with each other, explaining that system quality and information quality affect perceived usefulness, that user use and perceived usefulness interacts, and that these factors influence personal effects and then organizational effects. That is, it reflects the process concept of improving organizational performance through personal performance rather than direct effect on the performance of an organization [13].

Reference [16] defined perceived service quality as "a form of attitude different from objective quality as a consumer's judgment on the overall excellence or superiority of a particular service" and "perceived quality is shown in terms of the direction and degree of difference between consumer's perception and expectations". They also argued based on [17] that service quality can be assessed at 10 service levels (types, responsiveness, etiquette, reliability, ability, credit, communication, reliability, customer understanding, accessibility) regardless of service type, in subsequent studies, the SERVQUAL model was proposed, with 97 measurement items readjusted to five dimensions (types, reliability, assurance, responsiveness, empathy) through a factor analysis.

Reference [18] noted that the service quality consists of three dimensions: 'service product', 'service delivery' and 'service environment'. Here the service product relates to the resulting quality of [17], service delivery relates to the process quality, the service environment is related to the background of the service delivery, or the 'service scape'.

The SERVQUAL model is being developed through empirical analysis of related factors in research literature in the information technology sector. Reference [19] used the model to find out the effect of the quality of perceived chatbot service on customer satisfaction and word of mouth, reference [20] used the model to find out about the intention of using chatbot service with a focus on accessibility. Quality of information system services should be measured conceptually in a complex and multidimensional manner, so they are being developed through exploratory elicitation of quality assessment-related factors for services perceived by users, and these measurements can be utilized as strategic assets of service providers.

Chatbot is an information system service that provides appropriate answers or various related information to questions from text users. Therefore, based on the concept of quality of the information system, the service quality dimensions were largely divided into 'process quality', 'outcome quality' and 'service scape quality'. The process quality refers to the quality of the customer's interpersonal relationship with the service employee, the outcome quality is similar to the concept of a service product [18] or technical quality [17] and refers to the degree to which the resulting desire is satisfied after delivery of the service. Finally, the service scape quality is the service environment behind the delivery of the service and includes the quality of the building exterior and material facilities [21].

2.2.1 Service Quality and User Satisfaction

While it is common for user satisfaction to increase as service quality is perceived to be higher, recent studies have proven its validity [22-24]. Reference [25] investigated which of the three best models for service quality were the customer satisfaction (CS)-service quality (SQ)-action (BI) models, which proved to be the best. Reference [26] surveyed bank service customers, proving a causal relationship in which service quality affects customer satisfaction. In other words, improved service quality increases customer satisfaction, then, increases the WOM intention and willingness to repurchase, therefore, the performance of the entity is improved [25, 26]. Reference [19] confirmed that customer satisfaction increased as the quality of the perceived service of chatbot improved.

As for the dimensions of service quality, marketers will focus on how each dimension of service quality affects customer satisfaction [27]. Reference [28] found that 'core service quality' and 'relational service quality' are the determinants that directly affect the satisfaction of bank customers, respectively. This paper also modelled the perception of each service quality dimension as having a direct effect on satisfaction, not on the overall service quality.

        H1. Each dimension of chatbot service quality will have a positive (+) effect on user satisfaction.
        H1.1 Process quality will have a positive impact on user satisfaction.
        H1.2 Outcome quality will have a positive impact on user satisfaction.
        H1.3 Service scape quality of will have a positive impact on user satisfaction.

2.2.2 Service Quality and Reliability

Reliability plays a critical role in the use of information systems as a key factor in the success of the service [29]. When the information is exchanged in an online environment where the other party is not face-to-face, the reliability that the information recipient has in the information carrier is based on a continuous relationship [30]. Reliability is the intention to rely on the counterpart of the transaction in faith [31], to recognize a high proportion of the adjustments the other party wants in relation to its sincere performance [32].

Reliability generally appears to have a static relationship with service quality, and [33] explains that trust is an important factor in service marketing. Also, a study looking at the impact of perceived service quality on satisfaction and reliability found that perceived service quality had a significant impact on customer reliability [34]. Reference [35] emphasized the intangible nature of the service, arguing that faith and reliability are the most important factors in providing the service quality. It also said that reliability and immersion act as a medium for the service component and the intention of repurchase to customers who have a high relationship with the businesses. In experiments, reference [36] identified increased reliability in information when interactive agents communicated it. The chatbot system is interacting with the user through the text between the system and the user, based on this, the quality of chatbot services that provide information is expected to have the following impact on reliability.

        H2. Each dimension of service quality will have a positive impact on reliability.
        H2.1 Process quality will have a positive impact on reliability.
        H2.2 Outcome quality will have a positive impact on reliability.
        H2.3 Service scape quality will have a positive impact on reliability

2.3 User Satisfaction and Reliability

Reliability arises under conditions where there is an inactivity and ambiguity about whether consumers will meet expectations through their consumption experience [37, 38]. In other words, within the existence of uncertainty, consumers have a motivation to seek reliability. Reliability in the service aspect is an important variable in predicting purchasing or repurchase behavior, as services inherently imply uncertainty about quality. "Reliability evolves from past experience and previous interactions", argued [38]. Reference [39] also said, "reliability develops through experience". Based on this, reliability can be viewed as being shaped based on consumer's experience of consumption that has accumulated over a long period of time in the past, and it can be inferred that the experience of consumption is derived from overall satisfaction with the service. Therefore, considering the causal relationship between user satisfaction and reliability, the customer's experience in using the service results in satisfaction/discontent after use, where customer satisfaction can be described as a direct and overall assessment of the experience of use, so user satisfaction is a direct prior variable of trust [40, 41].

        H3 User satisfaction will have a positive impact on reliability.

2.4 Immersion

The immersion associated with the sustainability of a relationship is variously defined as the variables that appear in the relationship marketing study along with trust. Reference [31] described immersion as a desire to maintain a lasting relationship and its value in the study of relationships between sellers and consumers. In other words, it means the importance of relationships with partners and the desire to continue them in the future. Reference [42] argues that relationship immersion exists only when the relationship is considered important from the member and willing to feel a willingness to have a lasting relationship, including the belief that a lasting relationship with another person deserves maximum effort to maintain it. Reference [43] also defined

immersion as 'the need to maintain relationships with the other party and to maintain a lasting relationship with the future'. Looking at the study on immersion, reference [44] confirmed that commitment in Internet tourism information services has a positive effect on behavior intention. Reference [45] confirmed that when users interact with chatbot to achieve their goals, the higher the level of interaction, the greater their immersion level.

2.4.1 User Satisfaction and Immersion

Immersion in relationships is an important and essential condition for successfully maintaining long-term relationships and preempting competitive advantage, and that the method of customer involvement is changing from customer satisfaction to customer immersion. They said that if satisfaction meets customer needs in the short term, immersion is relatively long-term and creates interdependent relationships with the businesses. In relationship marketing, businesses were interested in immersion, an essential element for building successful exchange of relationships and continuing relationships [32, 46, 47]. In addition, many studies have been conducted to prove that immersion in relationships is related to satisfaction, reliability, communication, etc. [32].

Looking at the results of research on immersion in marketing, we find that it plays an important role that as a parameter that make up the relevant quality with satisfaction and reliability influences consumer's future purchase intentions. In addition, immersion is highlighted as a key element in interorganizational marketing and service marketing.

H4 User satisfaction will have a positive effect on immersion in services.

2.4.2 Reliability and Immersion

The destruction of trust occurs when one member feels a another member's lack of immersion. In other words, reliability is an important factor in shaping the quality of relationships.   Reference [42] also confirmed that immersion was unrelated to deviance and considered that reliability affected immersion.

Looking at the preceding study on immersion and reliability, reference [61] explains that reliability affects immersion in the buyer-seller relationship. Reference [62] explained immersion, "When a service is highly trusted, customers like the service and want to continue the relationship, but when the reliability is low, they decide whether to continue through calculating benefits and costs". Also, reference [11] confirmed that reliability in IT services has a defined impact on immersion.

H5 Reliability will have a positive influence on immersion.

2.5 Reuse Intention

Intention to use means that the user wants to use the service regularly [5]. Intention to use is a key concept for maintaining a continuous relationship between an entity and a user, and the expected benefits formed on the basis of past experience play an important role [48]. In the information system sector, the intent to use is recognized as an important concept because the intent to use in the information system area is an important cause for the development of the system [49].

In the definition of reuse intention, reference [50] defined the intention of consumers to continue to use current service providers in the future based on past experience, while [35] defined reuse intention as the possibility of consumers using service providers or service products over and over again in the future. In other words, the extent to which consumers who have used a product or service in the past are willing to continue using the product or service in the future [51]. In the IT service industry, it is very easy to access, enter, or leave information, so it is not easy to maintain loyal customers with a tendency to repeat use, so we need to identify variables that affect their intention to reuse them.

2.5.1 User Satisfaction and Reuse Intention

According to the definition of satisfaction in [49], low expectations or high performance will consequently increase user satisfaction and have a positive impact on future continuing use intention. On the other hand, dissatisfaction has a negative effect on the continuing use intention, so the two factors have a positive correlation.

Consumer's satisfaction or dissatisfaction will ultimately have a huge impact on their customer's reuse intention. Looking at the studies of user satisfaction and reuse intention, reference [52] resulted that the service quality directly affects customer satisfaction and loyalty, so that the differentiation of services should lead to customer satisfaction and revisitation. In addition, reference [53] said, "The brand image of the coffee shop has

a significant impact on the customer's satisfaction and revisitability, and the customer's satisfaction has a significant impact on the customer's revisit, so the brand image recognized by the customer raises the customer satisfaction level and leads the customer to revisit". Reference [4] confirmed that the higher user satisfaction with the financial chatbot service, the more intent it is to use it.

       H6 User satisfaction will have a positive impact on the reuse intention.

2.5.2 Immersion and Reuse Intention

       Immersion was developed by Csikszentmihalyi in 1975 and used in many areas, including sports, shopping, games, hobbies, and computer use, and has been recognized as a useful concept for expressing human-computer interaction [54].

       Reference [31] described immersion as a desire to maintain a lasting relationship and a relationship value in studying the relationship between buyers and sellers [55]. This implies the importance of a relationship to a partner and the desire to continue the relationship. Reference [56] also show that customer benefits from previous purchasing experiences affect immersion, while [35] who studied various roles of satisfaction, trust and immersion in customer relationships, found that immersion affects future purchasing intent [57]. Reference [4] confirmed that the level of immersion in financial chatbot affects the intention of use, reference [11] said that immersion in IT services had an effect on the reuse intention.

       The reason for introducing the concept of immersion in mobile service research is that the continuing use of mobile services is closely related to the experience of immersion, and the challenge and curiosity of the technology, known as the leading variables of immersion, can give each individual the appropriate impetus to use the mobile service [58].

       H7 Immersion of the service will have a positive impact on the reuse intention.

2.5.3 Reliability and Reuse Intention

       For users who receive information, reliability can only be generated if the information that someone provides them is accurate, unanticipated, and consistently reliable, and this reliability can lead to the belief that they will continue to trust and rely on the information provider. Reference [38] revealed that depending on the extent of this reliability, dependence on relationships with people varies and these dependence were also associated with sustainability. Reference [59] confirmed in a study that the higher the reliability, the higher the continuous usage intention.

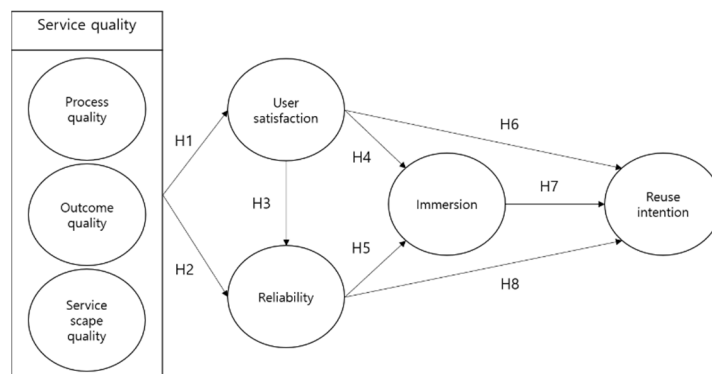   H8 Reliability will have a positive impact on the reuse intention.

Figure 1. Research Model

3. Method

3.1 Data Collection and Analysis Method

       This paper carried out empirical surveys to explain the service reuse intention by introducing process quality, outcome quality and service scape quality. Measurement items for the survey were prepared according to the intent of this paper by reviewing the preceding study.

       Based on the chatbot currently being serviced, there is a closed answer to choose one of the options proposed by chatbot and an open answer for artificial intelligence to understand and respond to the meaning of

natural language. In a study analyzing the user experience according to the level and type of conversational interaction of chatbot, the higher the intimacy of conversational interaction of chatbot, the higher the satisfaction and continuous usage Intention, but the lower the system reliability [12]. So, this paper conducted a survey on all types of chatbot users, regardless of open or closed answer, to examine factors that affect user satisfaction and reliability.

The demographic characteristics of respondents are as follows: The gender distribution was 48.2 percent and 51.8 percent for men and women, respectively, with 20.6 percent for those in their 40s, 20.2 percent for those in their 20s and 30s and 18.8 percent for teens. The distribution by occupation was 54.6 percent for office workers, 15.6 percent for others, and 13.3 percent for college/graduate students.

The hypothesis of the study was basically established based on the hypothesis presented by [60], referring to the existing prior study conducted. The effects of service quality among system quality were examined, and the factors that constitute service quality were selected based on the three-dimensional quality model of [18].

4. Discussion

4.1 Demographic Characteristics

The survey was conducted on Korean users in their 10s and 70s who have experience using chatbot services. A total of 218 convenience samples were extracted and data analyzed. The characteristics of the entire sample are shown in Table 1. The gender ratio of all participants consisted of 105 males (48%) and 113 females (52%). The distribution by age was the highest at 20.6 percent for those in their 40s, followed by 20.2 percent for those in their 20s and 30s and 18.8 percent for teens. The distribution by occupation was 54.6 percent for office workers, 15.6 percent for others, and 13.3 percent for college/graduate students.

4.2 Descriptive Statistics and Correlation

Prior to the analysis of the structural equation to be conducted to verify the theory of study, the statistical characteristics between the three components of the service quality (process quality, outcome quality, service scape quality), which are independent variables, and the dependent variables(user satisfaction, reliability, immersion and reuse intention) were analyzed, and the results are shown in Table 2.

Correlation analysis was performed to determine how strong the primary relationship between the two variables. Table 3 shows that there is a general correlation between variables.

Table 1. Result of frequency analysis for demographic variables

Variable	Category	Frequency	Percentage(%)
Gender	Male	105	48.2
	Female	113	51.8
Age	15-19	41	18.8
	20-29	44	20.2
	30-39	44	20.2
	40-49	45	20.6
	50-59	37	17.0
	60-69	6	2.8
	70-79	1	0.5
Occupation	College/graduate student	29	13.3
	Office Job	119	54.6
	Housewife	20	9.2
	Private Business	16	7.3
	Etc.	34	15.6

Table 2. Descriptive of variables

	Average	Standard deviation	N
Process quality	3.5057	0.64510	218
Outcome quality	3.3471	0.73971	218
Service scape quality	3.5569	0.66994	218
Reliability	3.4917	0.69417	218
User satisfaction	3.3750	0.79066	218
Immersion	3.2927	0.81078	218
Reuse intention	3.5064	0.76926	218

Table 3. Correlation of variables

Variable	Process quality	Outcome quality	Service scape quality	Reliability	User satisfaction	Immersion	Reuse intention
	1						
	0.753**	1					
	0.728**	0.751**	1				
	0.668**	0.687**	0.725**	1			
	0.682**	0.831**	0.786**	0.765**	1		
	0.526**	0.691**	0.655**	0.564**	0.730**	1	
	0.594**	0.733**	0.715**	0.675**	0.772**	0.759**	1

4.3 Validity and Reliability

The measurement variables in this paper have been eliminated through the scale purification process. Prior to the hypothesis test, the reliability and validity of measurement variables consisting of two or more items were verified. The Cronbach'α factor was used to measure reliability and an exploratory factor analysis was performed to verify validity. All measurement variables used principle component analysis to extract components, and the orthogonal rotation method (varimax) was adopted to simplify factor loading. The selection criteria for the questions in this paper are 1.0 or higher for eigen value and 0.40 or higher for factor value. Of the total 33 questions, two questions were removed because of structure of the theory, and 31 questions were finally used for analysis. The results of the reliability verification of the measured items of these major variables are shown in Table 4.

In this paper, the loading values between the observed and the potential variables were analyzed using the method of confirmatory factor analysis by the maximum likelihood method using AMOS prior to the structural equation analysis. In addition, in order to verify the convergence validity of the manipulation of the concept of a configuration in the study, the construct reliability(CR) and the average variance extraction(AVE) were performed.

The appropriateness of the research model was analyzed prior to the full-scale hypothesis verification. The results of an analysis of the $\chi2$ values, AGFI(Adjusted Goodness of Fit Index), GFI(Goodness of Fit Index), RMR(Root Mean Residual), RMSEA(Root Mean Square Error of Approximation), which are commonly used as the absolute fit index of a structural model and NFI(Normed Fit Index), CFI(Comparative Fix Index), which are incremental fit index, are given in Table 5. The result show that the goodness of fit generally meet all acceptance criteria (RMR≤0.05, GFI≥0.9, AGFI≥0.9, NFI≥0.9 CFI≥0.9 RMSEA≤0.05), and that overall, the suitability of the model is acceptable.

Generally, it is said that it is meaningful if the average variance extracted (AVE) value is 0.5 or higher and the construct reliability (CR) value is 0.6 or higher. The confirmatory factor analysis results presented in Table 6 show that the relationship between the potential variables in the overall observation category is statistically

significant (p<.05). The average variance extracted (AVE) results for each variable showed that all were greater than the standard figure of 0.5 and the construct reliability was also greater than the standard figure of 0.7.

The square of correlation with the AVE of each variable was compared to verify the discriminant validity. As a result, the square root of each of the potential factors of the AVE, as shown in Table 7, was greater than their each correlations, and the discriminant validity between the components was identified.

4.4 Structural Equation Model Analysis

The following table shows the data fit of the measurement model. The results showed that x2=748.634, df=329, RMR=0.035, GFI=0.803, AGFI=0.757, CFI=0.914, NFI=0.858, IFI=0.915. Among them, the GFI, AGFI and NFI were smaller than 0.9 but were close to 0.9 so there was no problem in determining fit. Overall, the fit of the model was secured.

4.5 Hypothesis Testing

This paper examines the impact of chatbot service quality (process quality, outcome quality, service scape quality) on user satisfaction and reliability, consists to identify relationships between user satisfaction, reliability, immersion, and paths that three variables influence reuse intention. A path analysis was performed using AMOS 26.0 to identify the relationship between each variable.

H1-1 set to explain the relationship between process quality and user satisfaction during chatbot service quality was rejected(b=-1.133, p=.452), the relationship between outcome quality and user satisfaction set to hypothesis H1-2 was also rejected (b=1.863, p=.496), and the relationship between service scape quality and user satisfaction, set to hypothesis H1-3 was also rejected(b=.084, p=.961).

H2-1, set to explain the relationship between process quality and reliability, was rejected(b=13.872, p=.956), and the relationship between outcome quality and reliability set to hypothesis H2-2 was also rejected(b=-22.997, p=.955). The relationship between service scape quality and reliability set by hypothesis H2-3 was also rejected(b=.650, p=.963).

H3, set to explain the relationship between the satisfaction and reliability of chatbot users, was rejected(b=11.672, p=.955). H4 looked at the effects of chatbot user's satisfaction on immersion and was statistically significant(b=0.900, p=.000). H5 was statistically significant as a hypothesis to explain the relationship between reliability and immersion(b=-.263, p=.027).

H6 is statistically significant, so chatbot user's satisfaction have a positive impact on their reuse intention(b= .386, p=.014). H7 assumed that immersion would have a positive effect on the reuse intention, but is rejected(b=.172, p=.158). H8 assumed that the reliability of chatbot services would have a positive effect on reuse intention and is statistically significant(b=.172, p=.000).

Table 4. Result of Reliability testing

Variable	Measure	Alpha if item Deleted	Cronbach α
Process quality	Process quality 1	.755	.755
	Process quality 2	.600	
	Process quality 3	.679	
	Process quality 4	.689	
Outcome quality	Outcome quality 1	.787	.839
	Outcome quality 2	.793	
	Outcome quality 3	.750	
Service scape quality	Service scape quality 1	.798	.839
	Service scape quality 2	.820	
	Service scape quality 3	.790	
	Service scape quality 4	.808	
	Service scape quality 5	.813	
Reliability	Reliability 1	.879	.888
	Reliability 2	.862	

	Reliability 3	.854	
	Reliability 4	.856	
	Reliability 5	.868	
User satisfaction	User satisfaction 1	.852	.891
	User satisfaction 2	.860	
	User satisfaction 3	.857	
	User satisfaction 4	.859	
Immersion	Immersion 1	.898	.909
	Immersion 2	.885	
	Immersion 3	.882	
	Immersion 4	.897	
	Immersion 5	879	
Reuse intention	Reuse intention 1	.887	.915
	Reuse intention 2	.896	
	Reuse intention 3	.891	
	Reuse intention 4	.905	
	Reuse intention 5	.898	

Table 5. Fit of model structure

Fit index	x2	x2/df	NFI	TLI	CFI	RMSEA
Criteria	p≥0.05	≤3	≥0.9	≥0.9	≥0.9	≤0.05 : Good 0.05~0.1 : Acceptable
Research Model	748.634 (p=0.000)	2.275	0.858	0.902	0.914	0.077

Table 6. Result of confirmatory factor analysis

Concept	Measure	Factor loading	Std factor loading	C.R.	AVE	Construct reliability
Process quality	Process quality 4	1.000	.759	0.000*	0.639	0.710
	Process quality 3	1.094	.740	10.944		
	Process quality 2	0.831	.638	9.302		
Outcome quality	Outcome quality 3	1.000	.860	0.000*	0.758	0.780
	Outcome quality 2	0.924	.750	13.481		
	Outcome quality 1	0.862	.781	14.372		
Service scape quality	Service scape quality 5	1.000	.753	0.000*	0.663	0.725
	Service scape quality 3	0.942	.732	11.149		
	Service scape quality 1	0.828	.703	10.648		
Reliability	Reliability 5	1.000	.798	0.000*	0.735	0.952
	Reliability 4	1.078	.848	14.111		
	Reliability 3	1.087	.851	14.173		
	Reliability 2	0.866	.731	11.629		
	Reliability 1	0.762	.669	10.429		
User satisfaction	User satisfaction 5	1.000	.859	0.000*	0.813	0.945
	User satisfaction 4	1.117	.835	15.998		
	User satisfaction 3	1.007	.843	16.262		
	User satisfaction 2	0.932	.815	15.325		
Immersion	Immersion 5	1.000	.754	0.000*	0.785	0.955

	Immersion 4	1.260	.820	12.569	
	Immersion 3	1.362	.827	12.684	
	Immersion 2	1.238	.810	12.393	
	Immersion 1	1.304	.873	13.494	
Reuse intention	Reuse intention 5	1.000	.866	0.000*	
	Reuse intention 4	1.023	.843	16.245	
	Reuse intention 3	0.939	.839	16.104	0.797 0.945
	Reuse intention 2	0.806	.761	13.690	
	Reuse intention 1	0.962	.821	15.500	

Table 7. Result of Validity testing

variable	Process quality	Outcome quality	Service scape quality	Reliability	User satisfaction	Immersion	Reuse intention
	0.799						
	0.753**	**0.871**					
	0.728**	0.751**	**0.814**				
	0.668**	0.687**	0.725**	**0.857**			
	0.682**	0.831**	0.786**	0.765**	**0.902**		
	0.526**	0.691**	0.655**	0.564**	0.730**	**0.886**	
	0.594**	0.733**	0.715**	0.675**	0.772**	0.759**	**0.893**

Table 8. Result of structural model testing

Path	Estimate	S.E.	Sig.	P
H1-1	process quality → user satisfaction	-1.133	1.506	-.753
H1-2	result quality → user satisfaction	1.863	2.739	.680
H1-3	service environment quality → user satisfaction	.084	1.715	.049
H2-1	process quality → reliability	13.872	249.435	.056
H2-2	result quality → reliability	-22.997	411.599	-.056
H2-3	service environment quality → reliability	.650	13.832	.047
H3	user satisfaction → reliability	11.672	204.664	.057
H4	user satisfaction → immersion	.900	.124	7.266
H5	Reliability → immersion	-.263	.119	-2.206
H6	user satisfaction → reuse intention	.386	.157	2.455
H7	Immersion → reuse intention	.172	.122	1.410
H8	Reliability → reuse intention	.548	.115	4.778

5. Conclusions

5.1 Practical Implication

This paper started with an integrated study of structural relationships from service quality to reuse intention by identifying major dimensions where service quality factors affect user satisfaction, reliability, and immersion, and identifying the relative importance of chatbot service quality factors that are divided into multiple dimensions. In particular, the literature review and empirical analysis of the formation process of reuse intention were attempted by dividing the service quality of chatbot services into the process quality, outcome quality, and service scape quality.

First, the three service quality dimensions (process quality, outcome quality and service scape quality) of service quality were found to have no significant impact on user satisfaction and reliability, H1 and H2 was

rejected. These results can be attributed to the Non Face-to-face characteristic of chatbot services. In fact, the characteristics of chatbot services delivered via mobile or PC rather than meeting and interacting with the service provider makes it relatively difficult for customers to build reliability, and there are limitations in responding to all situations that meet the needs of users, which can be interpreted as difficulties in shaping user satisfaction. As a result, service quality does not have significant impact on user satisfaction and reliability in chatbot service.

Second, User satisfaction has a positive effect on immersion and serves as a leading factor in increasing the reuse intention, so H4 and H6 were accepted. This is the result of supporting the preceding studies such as [4] and [11]. As a result, as user satisfaction levels increase, the impact relationship on the reuse intention shows a positive (+) relationship, so user satisfaction with the service not only helps to immerse itself in the service, but also increases the likelihood of reusing the service.

Among the hypotheses set in this paper, the 'user satisfaction' variable does not have a significant impact on reliability, H3 was rejected. This can be seen as a different result from the prior study referred to in this paper, as the chatbot service quality did not affect user satisfaction and reliability, thus no significant relationship was found between the variables.

Third, reliability acted as a leading factor in increasing reuse intention, H8 was accepted. This is the result of supporting [12]. H5 that identifies the relationship between reliability and immersion was also accepted, and the analysis results showed that reliability increases as the immersion in services increases, which is different from the preceding study [11]. In other words, the more you immerse yourself in chatbot service, the more reliability you have in the service, and the more you intend to reuse it. Therefore, in order to increase the reuse of chatbot services, it is necessary to provide satisfactory services to user first.

Among the hypotheses set in this paper, the 'immersion' does not have a significant effect on the reuse intention, so H7 was rejected. This can be interpreted for many reasons, but considering the current environment of chatbot services, the level of fun and curiosity experienced through chatbot is not yet a level affecting reuse intention.

Therefore, it provides the following implications.

First, this paper found that service quality is the starting point for formulating the reuse of services, and after conducting a systematic and comprehensive review of existing literature, it derived a model of service quality dimension of the concept of composition in a multidimensional manner.

By overcoming the limitations of a single-dimensional study that failed to reflect qualitative differences in service quality, it attempted a multi-dimensional approach that reflected the different qualitative characteristics of service quality of chatbot. Therefore, it can be assessed that the theoretical structure was used to provide more practical administrative implications than the results of existing studies.

Second, It found that user satisfaction, reliability and immersion in chatbot services are important factors in the reuse intention of chatbot. This is empirically obtained from a study model that was not seen in previous studies. Users want to reuse the chatbot service through satisfaction and reliability gained through the service, and it implicates that the chatbot service, which has gained reliability, in particular, will have a greater impact on the reuse intention.

5.2 Limitation

Despite the implications of this paper, it has the following limitations. Based on this, we are looking for direction for future research.

First, looking at the influence of service quality on three dimensions, one can see that service quality at each level does not affect user satisfaction and reliability. This proves that the perception of satisfaction and reliability through the experience of chatbot users occurs at different levels of service quality. Given the result that the user's satisfaction and reliability in chatbot services leads to a reuse intention, a more detailed study will have to be conducted on what factors are there in the service quality of chatbot services that can elicit user satisfaction and reliability.

Second, the study was conducted on customers who have used chatbot services. Chatbot service is currently used in various fields, and it is expected that variables that lead to characteristics of service quality and reuse intention will be different for each sector. Therefore, if the research is conducted through case analysis based on various fields of chatbot service, there will be more concrete and complementary research results.

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