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The Effect of Food Delivery Application on Customer Loyalty in Restaurant*

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Abstract

The Purpose: This study aims to identify the characteristics of customer satisfaction of the restaurants delivery applications that is increasing globally, especially in Korea. Due to demographic changes, social trends and the development of food science, customers no longer want to visit restaurants. This represents an important change in the restaurant business, and related research is also very urgent. **Research design, data, and methodology:** With 296 surveyed questionnaire, the study analyzed to verify the validity and reliability of measured variables in Korea. And structural equation model was used for hypotheses test of the research. **Results:** The result showed that consumers' usefulness, mobility, and reliability influenced on satisfaction. Specifically, mobility and reliability influencing the satisfaction and loyalty as well. And significant impact of satisfaction and loyalty are also corroborated. However, the path from informative to both satisfaction and loyalty was not statistically significant. This means food application developers should no longer focus on providing too many information, instead, concentrate on improving mobility and trust of mobile applications. **Conclusions:** This study analyzed the influence of attributes of food delivery applications on satisfaction and loyalty, and suggested crucial strategic implications of delivery marketing companies involved in the implementation of mobile application developers.

Keywords : Food delivery, Application, Service characteristics, Satisfaction, Loyalty

JEL Classification Code : D11, D12, L66, L81

1. Introduction

Germany's Delivery Hero, the operator of the food delivery app Yogiyoyo, acquired Baedal Minjok, a major domestic competitor, in the nation's largest internet startup merger and acquisition agreement in Korea. Woowa Brothers, who runs the Baedal Mijok app, had announced that Delivery Hero had the largest stake with 87% stake and the company's value would be set at \$ 4 billion (The Investor, 2020). Recently, the number of customers using smart phone applications is increasing in Korea. Smartphones have the advantages of convenient mobility used anywhere and portability carry easily, so that mobile

service market has been growing and creating new consumption trends. The food service industry, where consumers use mobile applications, can easily receive information from restaurants anywhere, regardless of location. The market for application catering information services is expanding due to increased convenience and economic efficiency. In the past, food service has been used as a means of eating for workers and travelers, but the number of people who eat out or enjoy simple meals is increasing due to the convenience for saving time (Kim & Beik, 2005). The tendency of consumers to prefer simple consumption patterns has increased, and these simple consumption patterns have led to the development of food storage and processing technology, therefore, it has been possible to supply better quality food to consumers.

Based on this background, the food service delivery market and service quality developed (Kim & Cha, 2010). Delivery over the next decade is expected to drive food service growth. These changes affect all aspects of your business, including marketing, technology investments, and operations. Specifically, growth in meal delivery predicts an increase in the percentage of meals that are not cooked at home and will lead to increased catching in virtual

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restaurants, subscription services, and retail stores. The association influences consumer loyalty to individual restaurants by predicting when consumers will increase their loyalty to third-party apps (Food delivery news, 2019).

As the number of single-person households increased, consumers preferred home delivery food more than eating out. Delivery services have led to the development of delivery applications that take advantage of the mobile services market, and the delivery applications that deliver not only fast foods such as chicken, pizza, and hamburgers, but also desserts such as bread, cakes, etc. The market size of the mobile food delivery service is increasing. In addition, there are opinions that the delivery service is a solution to the restaurant companies to solve the problems such as labor cost and rent increase. It is expected that the utilization rate of the delivery application will continue to increase in the future, and the quality of the delivery application service expected by the smartphone users should be understood and reflected in the application service. F&B companies must actively use the application as a marketing tool and strategic differentiation is needed to drive customer satisfaction with delivery applications.

The delivery application reviews provide users with information about the product to other consumers, and based on the information, leads consumers to consume the product by increasing the reliability of the product (Choi, 2015). F&B companies should have methods and means to assess the quality of the services they provide. Service quality is directly linked to the performance of the company, so evaluation of service quality is essential. Therefore, this study aims to analyze the service quality characteristics of the delivery application used by food service consumers and to investigate whether it affects consumer's satisfaction and brand loyalty. It is assumed that the reliability of application services, the mobility using location information service, Information provided by other consumers or by reviews, usability that application users can use conveniently will have a significant impact on brand loyalty and consumer satisfaction of delivery applications. This study aims to present the information necessary for strategic marketing planning of the food service industry by identifying factors influencing delivery application service performance and consumers' reuse delivery application based on the results.

2. Theoretical background

2.1. Quality of service characteristics

SERVQUAL is a compound word of Service and Quality. It compares consumers' perceptions and expectations of services and analyzes the degree or direction of agreement

to manage service quality. In SERVQUAL, measures of service quality (service quality characteristics) are composed of empathy, reliability, type, assurance, and responsiveness. This study was conducted with reference to reliability items in SERVQUAL. Reliability is a factor in providing customers with trust and accuracy (Han, 2016).

First of all, the theoretical background of the service quality characteristics and previous studies will be examined. While service quality is called subjective perceived quality by consumers, it is defined as perceived service quality to distinguish it from objective quality. Many existing studies on service quality consider that service quality is related to the difference between consumer's expectation of service and the perception of service provided. Consumers have certain expectations about the quality of services before buying them, and they have some perceptions about the services. Usually consumer perceives the service quality of the product service through comparison with the consumer's expectation and perceived perception before purchase.

In this study, based on the existing SERVQUAL, the service characteristics specialized in mobile food delivery services were reconstructed as 'informative', 'reliability', 'usefulness', 'mobility' based on the researches of existing researchers (Sherifi & Senja, 2018; Abu El Samen, Akroush, & Abu Lail, 2013; Suki & Suki, 2011; Deng et al., 2016). Therefore, this study will focus on the research model that can show service quality universally and popularly by differentiating it from other papers. Table 1 shows the summary of previous researches.

Table 1: Summary of previous researches

Selective Attributes	Previous Researchers
Informative	Ranganathan and Ganapathy (2002), Jessie and Kincade (2001), Sherifi and Senja (2018)
Reliability	Jun, Yang, & Kim (2004), Mayer, Davis and Schoorman (1995), Abu-El Samen, Akroush, and Abu-Lail (2013)
Usefulness	Lee and Jeon (2016), Choi (2014), Davis (1989), Suki and Suki (2011)
Mobility	Kim (2011), Ryu et al. (2007), Deng et al. (2016)

2.1.1. Informative

By providing food information in the delivery application, consumers can easily obtain information about the origin, nutritional information, dosage, and menus of the food. In addition, the user can look at the hygiene system and franchise discount information about the restaurant. Food menu information is the most influential factor when a user considers purchasing a product (Jessie & Kincade, 2001; Cha & Lyu, 2019), and information search on the product

provides data to the consumer, which form the quality of service of the delivery application. Consumers get more information about their products and easily purchase the products they need (Ranganathan & Ganapathy, 2002). If online shopping provides good quality information and readability, consumer satisfaction is improved.

2.1.2. Reliability

Reliability is the level of emotion that consumers believe that the company will provide what they want and defined as the confidence or belief that consumers can trust and trade in a company. Restaurant ratings are provided to customers according to the reviews and payment frequency of other users in the delivery application. In addition, by sharing reviews, such as recommendation, consumers order products through the delivery application based on the data provided by the delivery application with the reliability of the restaurant. Reliability and fast delivery from the appreciation are important factors influencing consumer satisfaction, while reliability, had significant impacts on both customers' perceived overall service quality and their satisfaction (Jun, Yang, & Kim, 2004; Cha & Seo, 2019b).

2.1.3. Usefulness

The usefulness of a delivery application helps a user make an easier purchase in the process of purchasing a product.

Delivery applications can be expected to be more convenient for users than any other ordering method, regardless of time and space, in the systems provided by any ICT (Lee & Jeon, 2016).

This definition was revised and defined to be appropriate for this study, based on the work of Davis (1989) and previous studies on the acceptance model in the food service sector (Davis, 1989). Defining the usability of a delivery application allows you to reduce menu selection time when ordering, efficiency in selecting restaurants, and faster ordering and payment. And it also means that it helps in many ways. The usage of the system by the consumer does not require much mental and physical effort, and the use of the delivery application is easy, simple, and convenient for the consumer.

2.1.4. Mobility

A mobile service that distinguishes from existing electronic devices is defined as a service that can provide or receive information desired by a user using a mobile device such as a smart phone or a mobile device without restriction of space and time. As the user shares the information location with the delivery application, the delivery application provides more customized information. The application recommends services such as the best restaurants with information about the user from the

platform of the mobile communication network (Ryu et al., 2007). In the age of information technology with advanced transportation and communication skills, the mobility of smartphones solves the limitations of physical mobility unlike the previous generation experienced. More broadly, the mobility and goal in wireless communication is to exchange information in various forms using portable terminals anytime, anywhere, and anybody.

2.2. Brand loyalty

Brand loyalty is the degree of customers' loyalty to a particular brand (Aaker, 1997). Brand loyalty is generally defined as an expression of sustained buying behavior in the form of future repurchase, recommendation, word of mouth, etc. based on trust of the brand (Schreiner et al., 2008). Brand loyalty refers to a state in which an emotional bond and a feeling of solidarity formed through continuous interaction with a specific brand used by a consumer. In other words, brand loyalty tends to repurchase a preferred product or service because it has a deep attachment to a particular brand which conversion behavior can be triggered by contextual influences or marketing efforts (Oliver, 1999). Customers with high brand loyalty have a relatively positive response to the brand and also prevent them from switching to another brand. The behavioral aspect of loyalty is the tendency of a customer to repeatedly buy a particular store or brand over a period of time, and this measure is often measured by the amount or frequency of purchase of a particular brand. At the ultimate level of loyalty, consumers repeatedly buy certain brands due to the inertia of their behavior. Also, successful brand expansion helps to increase customer loyalty and promote repeated purchases.

2.3. Consumer satisfaction

Satisfaction with using a mobile app is in many ways the result of evaluating and raising the user's app performance, and intention to order through mobile applications includes an individual assessment of the subjective probability or effort to make a decision. There are reasons why the four interactive-based benefits of mobile apps are expected to affect satisfaction. The perceived value by customers leads to customer satisfaction, which is a major motivation in long-term customer relationships (Egan, 2011; Cha & Seo, 2019a; Kim et al., 2020). Revels, Tojib and Tsarenko (2010) found that the satisfaction of the study is influenced by perceived usability, ease of use, and perceived enjoyment, analyzing the relationship between customer engagement, perceived value, and satisfaction. Hollebeek (2013), Brodie et al. (2013) considered the value and satisfaction perceived by customers as a result of customer engagement.

According to Kim et al. (2013), participation in mobile technologies and services leads to perceived value and satisfaction, which leads to future customer loyalty (Kim et al., 2013). Rajah et al. (2008) argued that co-creation through active customer engagement, interaction and personalization can affect customer satisfaction, which strengthens the relationship between the company and the customer, along with factors such as trust. Therefore, the following subsections discuss and hypothesize the impact of each interaction-based benefit of mobile apps on satisfaction and purchase intentions. Thus, in the following subsections, the effect of mobile apps on satisfaction is hypothesized.

H1: Usefulness of a delivery app would have a significant positive impact on satisfaction.

H2: Informative of the delivery app would have a significant positive impact on satisfaction.

H3: Mobility of the delivery app would have a significant positive impact on satisfaction.

H4: Reliability of the delivery app would have a significant positive impact on satisfaction.

H5: Usefulness of a delivery app would have a significant positive impact on brand loyalty.

H6: Informative of the delivery app would have a significant positive impact on brand loyalty.

H7: Mobility of the delivery app would have a significant positive impact on brand loyalty.

H8: Reliability of the delivery app would have a significant positive impact on brand loyalty.

H9: Consumer satisfaction with the delivery app would have a significant positive impact on brand loyalty.

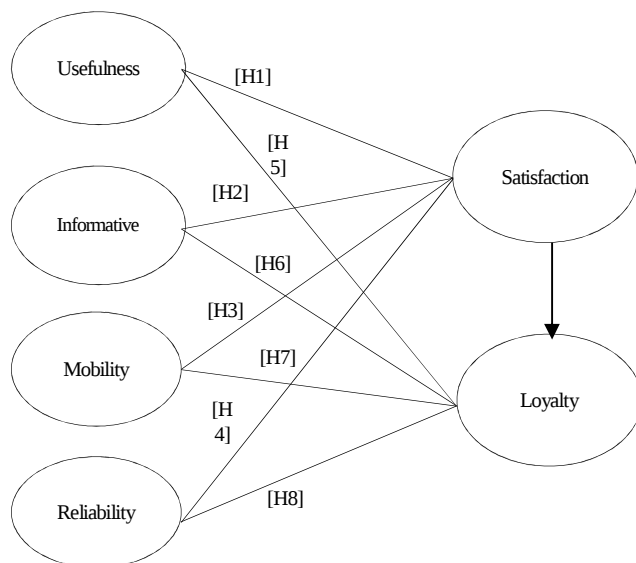


Figure 1: Study Model

3. Research method

3.1. Operational Definition of Variables

In this study, informative is defined as that consumers can easily obtain information about the origin of the food, nutritional information, capacity, and menus, based on the studies of previous researchers (Ranganathan & Ganapathy, 2002; Jessie & Kincade 2001). Reliability was defined by accurate and fast delivery, clear returns and refund policies, based on research by Jun, Yang, and Kim (2004), Mayer, Davis and Schoorman (1995).

The usefulness is defined based on Davis's (1989) study and previous studies on the acceptance model in the dining out area, which means that the menu selection time can be shortened when ordering, the efficiency in selecting a restaurant, and the order and payment are processed quickly. Mobility is defined as a means that shares information location with delivery application based on PAD emotion scale study, so that delivery application provides more customized information.

Satisfaction is a subjective evaluation and perspective of consumers on how satisfied their needs are (Reichheld & Sasser, 1990). Brand loyalty is the degree of loyalty to a particular brand of the customer (Aaker, 1997). Brand loyalty usually defined as consumer's continued purchasing activity, which based on trust in the brand, which later displayed in the form of repurchase, word of mouth, and recommendation to others.

3.2. Sampling and Investigation Procedures

The items of the survey modified and supplemented to for the research. For the selection and refinement of each questionnaire, the literatures of previous studies were reviewed and revised. The survey was conducted from July 1, 2019 to August 30, 2019 using SNS. The survey was conducted on smartphone app users. In this study, the criteria for selecting delivery apps were selected among the top five rank of Android and iPhone. The survey consisted of service quality characteristics (16 questions), satisfaction (4 questions), and brand loyalty (4 questions).

A total of 296 collected questionnaires were used in this study and the analysis method was carried out as follows. First, in order to verify convergence and discriminant validity between measurement variables, exploratory factor analysis was performed using Amos 20.0, and then inappropriate factors were removed. After that, Amos 20.0 was used for confirmatory factor analysis. Next, the structural equation modeling was used to test the hypothesis of this study.

Table 2: Demographic content

Variables	Measurement	Sample	Percent (%)
Gender	Male	115	38.9
	Female	181	61.1
Age	10 – 19	12	4.1
	20 – 29	148	50
	30 – 39	46	15.5
	40 – 49	26	8.8
	> 50	64	21.6
Marriage	Unmarried	176	59.5
	Married	120	40.5
Income (Thousand USD)	<1000	128	43.2
	1000 ~ 2000	41	13.9
	2000 ~ 3000	56	18.9
	3000 ~ 4000	25	8.4
	> 4000	46	15.6
Occupancy	Student	98	33.1
	Self-employed	31	10.4
	Company worker	87	29.4
	Housewife	48	16.2
	Misc.	32	10.8

Of the 296 respondents, 115 were male (38.9%) and 181 were female (61.1%). The age distribution is 12 (4.1%) for 10-19 years, 148 (50%) for 20-29 years, 46 (15.5%) for 30-39 years, 26 (8.8%) for 40-49 years, and 64 (21.6%) were over 50 years old. Among the respondents, 176 were singles (59.5%), 120 married (40.5%). Respondents spend less than 1,000 USD, 128(24%), between 1 and 2,000 USD, 41 (13.9%), between 2 and 3, 000 USD, 56 (18.9%), between 3 and 4,000 USD 25 (8.4%) and 46 (15.6%) were over 4,000 USD. There are 98 students (33.1%), self-employed 31 (10.4), 87 employees (29.4%), 48 housewives (16.2%), 32 others (10.8%). Table 2 shows the demographic content.

4. Results

Overall model fit was assessed satisfactorily with GFI = 0.868, AGFI=0.837, NFI=0.873, CFI=0.926, IFI=0.926, TLI=0.95. CR (Composite Reliability) and AVE (Average Variance Extracted) meet the criteria presented by Bagozzi and Yi (1988) (CR 0.6, AVE 0.5), and the factor loadings

are all statistically significant ($p < 0.01$). Convergent validity was confirmed. Table 3. shows the results of confirmatory factor analysis.

Table 3: Confirmatory factor analysis

Variables	Measure	Standardized Regression Coefficient	CR	AVE
Mobility	MOB1	0.679	0.862	0.611
	MOB2	0.837		
	MOB3	0.842		
	MOB4	0.757		
Usefulness	USE1	0.858	0.904	0.703
	USE2	0.861		
	USE3	0.783		
	USE4	0.849		
Reliability	REL1	0.777	0.873	0.632
	REL2	0.772		
	REL3	0.803		
	REL4	0.827		
Informative	INF1	0.785	0.854	0.594
	INF2	0.786		
	INF3	0.774		
	INT4	0.737		
Satisfaction	SAT1	0.851	0.833	0.560
	SAT2	0.788		
	SAT3	0.579		
	SAT4	0.748		
Loyalty	LOY1	0.829	0.875	0.638
	LOY2	0.833		
	LOY3	0.819		
	LOY4	0.706		

$\chi^2 = 537.782$ (df = 243), GFI = 0.868, AGFI=0.837, NFI=0.873, CFI=0.926, IFI=0.926, TLI=0.95, RMSEA=0.064 ($p < 0.001$)

The square root of the AVE was used to verify the discriminant validity between the factors that proved one-dimensionality. As a result, as shown in Table 4, the value of square root of AVE is greater than 0.5 and is larger than all non-diagonal correlation values in related rows and columns. Therefore, the discriminant validity that the corresponding difference should appear in the result of the measurement between different components is proved.

Table 4: Discrimination validity

	Loyalty	Mobility	Usefulness	Reliability	Informative	Satisfaction
Loyalty	0.798					
Mobility	0.541	0.782				
Usefulness	0.349	0.445	0.838			
Reliability	0.591	0.573	0.680	0.795		
Informative	0.435	0.743	0.582	0.543	0.771	
Satisfaction	0.509	0.591	0.472	0.545	0.491	0.748

Note: The values presented along the diagonal are the square root of AVE

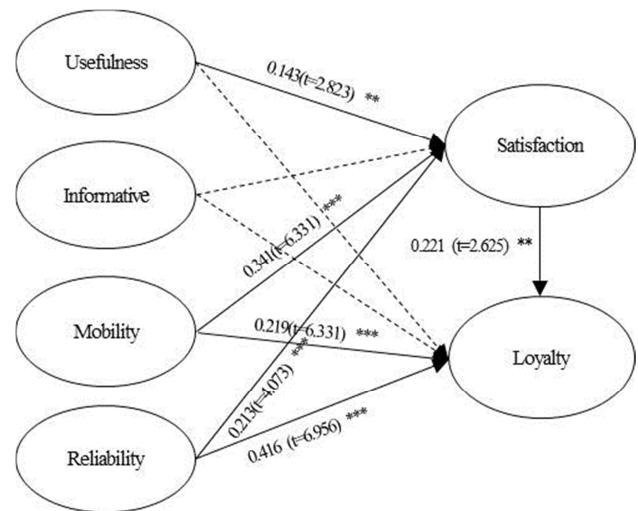
Table 5 is the result of verification of the hypothesis. The hypothesis test on the main effect showed that usefulness, reliability, and mobility had a positive effect on the satisfaction of consumers using the delivery application. Also, reliability and mobility had a positive effect on brand loyalty. However, informative was found to have no effect on satisfaction and brand loyalty. On the other hand, since this path coefficient has a positive effect, it shows that consumers' satisfaction and brand loyalty are high in usefulness, mobility and reliability.

Table 5: Results of research hypothesis

hypothesis	Path	Standardized regression coefficient	t - value	Results
H1	Usefulness → Satisfaction	0.143	2.823**	Support
H2	Informative → Satisfaction	0.027	0.521	Reject
H3	Mobility → Satisfaction	0.341	6.331***	Support
H4	Reliability → Satisfaction	0.213	4.073***	Support
H5	Usefulness → Loyalty	-0.105	-1.956	Reject
H6	Informative → Loyalty	0.065	1.214	Reject
H7	Mobility → Loyalty	0.219	3.508***	Support
H8	Reliability → Loyalty	0.416	6.956***	Support
H9	Satisfaction → Loyalty	0.221	2.625**	Support

These results are consistent with previous studies showing that mobility affects satisfaction and customer loyalty (Marinkovic & Kalinic, 2017; Cyr, Head, & Ivanov,

2006), and reliability affects satisfaction and customer loyalty (Deng et al., 2010; Bayraktar et al., 2012), but It is not the same as previous research that usefulness affects loyalty. Mobile usefulness in terms of design affects loyalty, but mobile application usefulness does not affect loyalties (Cyr, Head, & Ivanov, 2006). The results are shown in the figure 2.

**Figure 2:** Result of the research model

5. Implications and Conclusions

5.1. Theoretical implications

The purpose of this study was to identify factors that affect consumer satisfaction and brand loyalty by empirically analyzing the service quality characteristics of delivery applications perceived by consumers. Based on the literature overview, examination of causality where factors lead to satisfaction and customer loyalty, four selected factors were considered to be suitable for the attributes of mobile application. The results of the study are summarized as follows.

First, the study proposed specific model which integrates selection attributes of mobile applications and customers' satisfaction. Also, those attributes were considered with loyalty.

Second, the effect of attribute of mobile applications on the satisfaction and loyalty was analyzed. Usefulness was shown to significantly enhance satisfaction (H1, Beta 0.143, t - value 2.823, $p < 0.01$). This means that when users feel mobile applications are useful, customers are satisfied. In IT research, the importance of the useful aspect has been

emphasized (Stock et al., 2015). The mobility was revealed to affect satisfaction (H3, Beta 0.341, t - value 6.331, $p < 0.001$) and loyalty (H7, Beta 0.219, t - value 3.508, $p < 0.001$) as well. Therefore, when consumers perceive high levels of mobility of applications, they would use food application ordering food. The result of data analysis indicated reliability has the greatest influence on loyalty (H8, Beta 0.416, t - value 6.956, $p < 0.001$) and also significantly affected satisfaction (H4, Beta 0.213, t - value 4.073, $p < 0.001$). And also, the path from satisfaction to loyalty was significant (H9, Beta 0.221, t - value 2.625, $p < 0.01$) statistically.

Third, the effect of informative on satisfaction (H2, Beta 0.027, t - value 0.521, $p > 0.05$) and loyalty (H6, Beta 0.065, t - value 1.214, $p > 0.05$) was not statistically significant, being contrary to expectations. The result is somewhat different from the results of previous studies (Koivumäki, Ristola, & Kesti, 2008), which suggests the importance of informative in adopting a new technology.

5.2. Practical implications

The practical implications of this study are that mobility and reliability of mobile applications affect both satisfaction and loyalty, while usefulness, mobility, and reliability only affect satisfaction. However, informative did not affect both satisfaction and loyalty. Therefore, if mobile food delivery application companies manage and develop these optional attributes consistently, they will be able to use marketing strategies to win the competition. However, the informative of the food delivery application does not affect satisfaction and loyalty, so the provision of too much information may add to the fatigue for customers. Thus, mobile application developers and operators need to develop and operate a food delivery application that can be used intuitively and simply by customers with minimal information.

In Korea, the food delivery industry is growing rapidly, and the development and operation of food delivery applications is also high competitive (Reuters, 2019). Companies need to introduce new marketing through the development of innovative applications to keep pace with changing consumer needs and consumption behaviors, and it is urgent to develop mobile food applications that can generate customer loyalty beyond customer satisfactions.

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