The Effects of the Delivery Service Quality of Online Fresh Food Shopping Malls on E-Satisfaction and Repurchase Intention of Online Customers

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Abstract

Purpose - The purpose of this study is to analyze the effect of 'delivery service quality' of online fresh food shopping malls on 'e-satisfaction' and 'repurchase intention' of online customers.

Research design, data, and methodology – To demonstrate the relationship between the delivery service quality of online fresh food shopping mall and the e-customer satisfaction and repurchase intention, the research model was designed with 5 sub-factors (promptness, accuracy, economy, safety, information) based on the contents of previous studies. The data collection is conducted with sampling survey. The participants are customers who have visited, purchased and received their orders within the last 6 months in online fresh food shopping malls. This study analyzed collected data, then confirmed and finalized the hypothesis by using IBM SPSS Statistics 21.0 statistical program.

Results – Hypothesis 1: The service quality of online fresh food shopping mall will have a statistically significant effect on online customers' e-customer satisfaction. Hypothesis 2: The service quality of online fresh food shopping mall will affect the repurchase intention of online customers. Hypothesis 3: The e-customer satisfaction of online fresh food shopping mall will have a statistically significant effect on repurchase intention. Among the 5 sub-factors (promptness, accuracy, economy, safety, information) of delivery service quality, three factors such as promptness, accuracy, and safety have stronger influence on e-satisfaction and repurchase intention of online customers.

Conclusions – This study has proven the feasibility and viability of the hypotheses that 1) The excellent delivery service quality of an online fresh food shopping mall primarily affects e-customer satisfaction; and that 2) E-customer satisfaction will secondarily serve to improve repurchase intention.

Keywords: Online Fresh Food Shopping, Delivery Service Quality, E-customer Satisfaction, Repurchase Intention, Online Customers

JEL Classification Code: M10, M31.

1. Introduction

Since 21st century, with increasing interest in well-being and physical and mental health in Korean society, more and more people are actively looking for fresh and clean food in natural condition and high-quality food and ingredients that are harmless to the human body and rich in nutrients (Gwak & Jang, 2008).

As one of the indicators of the developed society, both the well-being and luxurious eating habits of people, and specialization, segmentation, large scale of the food and beverage industry are evident in our society (Chun, 2018). Especially, since 2000, online food shopping malls have been growing and increasing rapidly due to the highly developed food and beverage industry combined with the active online e-commerce. Online food shopping malls have accumulated relatively high competitiveness and marketing competence while they are responding to contradictory and picky demands of customers. The customers want to get good food easily which is guaranteed in high quality and nutrition, while they do not spend long time food purchasing, preparation and cooking because of their busy work and social life (Gwak & Jang, 2008).

In this trend, this study will focus on the online fresh food shopping malls among the online shopping malls which have been rapidly developing for 20 to 30 years recently. As today's customers strongly want clean and fresh food, online fresh food shopping malls are divided from general food shopping malls and have been developed exclusively, they are now regarded as one of the fields with the highest potential (Park et al., 2017). The cleanliness and of food is a pivotal issue in principle. However, these days, because of the higher standard of quality of life and well-developed tastes of food, more and more customers want to get fresh, clean, and safe food with reliable origins.

There is a high need to supply and increase exclusive online fresh food shopping malls in order to meet these social demands and to provide fresh and clean food to more consumers. It is needed for social and public purposes that improve the customers' mental and physical health and overall quality of life as well as the business and marketing of the food and beverage industry.

This study, based on the awareness of these problems, aims to seek a future-oriented development strategy of online fresh food shopping malls, which are growing rapidly and are expected to have high growth potential. The empirical analysis was conducted to examine the effect of the delivery service quality of the online fresh food shopping malls on the e-customers' satisfaction and repurchase intention.

2. Theoretical Framework

2.1. Online fresh food shopping mall

Generally, when a customer intends to purchase specific food, they tend to choose it considering the containing characteristics in it. The containing characteristics mean the freshness, quality, taste, smell, color, texture and nutritional composition of the food and these containing characteristics of the food have these disadvantages, easy to be spoiled, and hard to keep it safe for a long time compared to manufactured products (Lee, 2018). Because of these disadvantages of fresh food, processed food have been taken main parts in online food sales. However the demand for fresh food shopping through online has been greatly increasing due to the great development of technology in delivery, storage and packaging over the past 10 years, and with nationwide supply and delivery system, online sales could maintained a similar level of freshness as offline stores (Park et al., 2017).

Considering this trend, the volume of online fresh food transactions continues to increase, reaching 1.73 trillion won in 2016, which is one quarter of the total amount of food and beverage sales, KRW 7,110 billion (Lee, 2018).

With the advent of online fresh food section, there are not only specialty shopping malls that focus on fresh food only, but also exclusive categories of 'fresh food' or 'healthy food' in the sub classification in grocery shopping malls and large open markets.

For example, Gmarket classified the food section into fresh food, processed food, healthy food, coffee and drinks, and 11th Street divided it into agricultural, fishery, livestock, kimchi, side dishes, homemade food, processed food, instant food, healthy food, etc. and Auction sub-categorized it into rice, fruit, healthy food, fresh food, diet, coffee and drinks, instant food, side dishes, and processed food etc (Kim, Lee, & Kim, 2008).

However, because online fresh food shopping malls are still in the early stages of development, there are scarce researches on them, and no academic definition for the meaning of fresh food.

There are some prior studies directly related to fresh food, one is a study that analyzes the decision factors of customers' fresh food shopping in open market in terms of delivery period, delivery accuracy, and shopping report (Lee, 2018), another is a study that analyzed the current status and future plan for online fresh food shopping malls (Park et al., 2017). It is unlikely to be found the prior studies that empirically analyzed the quality of goods and services, customer satisfaction, and business performance in exclude online fresh food shopping malls. So this study aims to make up the shortcomings of prior studies and to be helpful to activate and develop online fresh food sections with great potential.

Meanwhile, since it is difficult to find a recognized academic definition of fresh food products due to the lack of direct prior research, this study defines 'fresh food' as 'agriculture, water, and livestock products only in the state of transportation, accumulation and sorting without processing after harvesting in the field'. These include rice, grains, fruits, vegetables, mushrooms, sesame seeds, fresh ginseng, unprocessed meat, fish and shellfish in detail. Based on this definition, this study conducts an empirical survey with recruited online customers from four medium-sized online fresh-food shopping malls specializing in these foods.

2.2. Quality of delivery service

2.2.1. Definition of delivery service quality

Delivery service includes every step from customers' purchase and payment for a product to receipt of it in online or offline market (Lee, 2017). The delivery service is a pivotal one in online shopping malls that determines the success or failure of a business. In particular, unlike an offline store where most of the customers purchase goods directly from the shop, the customer who paid the goods in the online shopping mall can only receive the goods through the delivery service (Seo, Kwon, & Choi, 2013).

In this respect, most online shopping malls value delivery services as a key factor among all supply chain management and make effort to through management and supervision (Kim, Seo, & Lee, 2011). Supply Chain Management refers to a management system of every supply process from production to sale to customers (Kim, Lee, & Kim, 2007). Supply Chain Management is a business strategy to understand and manage all logistics flows, from production to distribution, sales, and consumption, and it is an idea to achieve the overall best. In fact online shopping malls which have effective supply chain management experience distinct improvement of their business performance (Park & Choi, 2012).

The delivery service seems to be more significant for food related shopping malls, which usually deal with food and ingredients (Jeong, 2012). The speed and safety of the delivery can be vital because the food and ingredients loose freshness, favor, and aroma a lot only after one or two days from production. Moreover, for online fresh food shopping malls, where expiration dates are much shorter than general food and ingredients, freshness and cleanliness are key to quality, quality of delivery service can determine total business performance.

The importance of delivery service quality of online fresh food shopping malls will be growing and growing in business performance and service quality management. As the kinds and quantity of fresh food products will increase, the quality control and maintenance will become more important. In particular, the delivery service that sends fresh food to customers promptly and safely in a fresh condition without any damage of the contents will be a key factor to determine success or failure of an exclusive online fresh food shopping mall.

2.2.2. The factors of delivery service quality

This study referred to Lee (2017)'s study which analyzes the effect of delivery service quality of online shopping malls on customers' satisfaction and repurchase intention and consisted of five sub-factors such as promptness, accuracy, economy, safety, and information. Promptness means the how fast the delivery from ordering to shipping including all procedures and spending time, accuracy means the correctiveness of the product content, type, quantity, method, etc. Economy means cheap and economical degree of product weight, delivery distance, and delivery time compared to shipping cost. Safety means the degree of the product delivered to the customer safely and conveniently without damage or harm. Information refers to the degree of providing detailed information of entire process of delivery in real time to customers.

2.3. e-customers satisfaction

Customer Satisfaction is one of the core concepts of business and marketing research. When on or off-line shopping malls or business provide customers excellent products and friendly service to meet customers' needs and expectations, it can be defined as a state of continuously improving and maintaining the reliability, preference, and loyalty of products, services, and brands in the shopping mall and as a increase of customers' returning (reconnecting online) and the repurchase rate (Kim, Yang, & Lee, 2018).

As companies and businesses maintain high customer satisfaction and keep them stable for a long period of time, they can enjoy their ties with existing customers, prevent departure of existing customers, reduce total marketing costs, save new customer attraction costs, improve business and brand awareness, which can lead to mid or long-term development while increasing sales and profits more stably (Moon, 2018).

These days, as the proportion and influence of online services have rapidly increased, researches for demonstrating and analyzing customer satisfaction on the online shopping have been gradually increasing. Such online customer satisfaction is especially referred to as "e-customer satisfaction" or "e-satisfaction '(Kim, 2010). E-learning businesses that sell and provide intangible services, digital libraries, and Internet banking that mediate online financial transactions get attracting attention as well as online shopping malls' selling tangible products (Yun & Park, 2016).

On the other hand, online food shopping malls are rapidly increasing due to the development of shipping and storage technology since 2000s. This is due to the demand of busy modern people who do not have time to buy food or food in offline market in their work and social life (Hwang & Na, 2017). It is now quite natural to buy raw food or cooked food through online (Seo, Joo, & Seo, 2017)

Based on this trend, a number of studies have been conducted recently to empirically analyze the relationship between online e-commerce sales products and e-service quality and e-customer satisfaction. The main results of this study are as follows: 1) empirical analysis of the effect of sales product quality, product related information and service accuracy on e-customer satisfaction in online food shopping malls (Back & Kim, 2009). An empirical analysis of the effect of goods and service quality of mobile food shopping malls on e-satisfaction and e-loyalty of online consumers (Hwang & Na, 2017). HMR (Home Meal Replacement) in an on-line shopping mall, the effect of the quality of home-made convenience food on the customers' satisfaction and repurchase intention. (Yang & Cho, 2015), the influence of quality attributes and service factors of processed food sold in online shopping mall on customers' purchase decision and repurchase intention (Jeong, 2012).

2.4. Repurchase intention

Repurchase intention refers to 'the intention of the current customer to repeatedly purchase and use products and services from current commodity and service providers in the future (Lim, 2014).

Repurchase intention has been used as an important subordinate variable in customer satisfaction which has direct affect, and causality in business and marketing (Lim, 2014). Customers who have repurchased and repeatedly purchased products in a specific shopping mall generally have a strong sense of trust, preference, and loyalty to the brand or business if such preferences and loyalty persist for a long period of time (Hwang & Na, 2017). Therefore, repurchase intention has a close correlation with customer loyalty, including the intention to actively recommend and recommend it to others (McDougall & Levesque, 2000).

Repurchase intention is realized through actual repurchase and repetitive purchasing behavior of the customer, and it is a key factor in deciding the business maintenance, sales and profit maintenance, management and business performance improvement. Companies and businesses that can maintain stable service satisfaction and persistent repurchase intentions of a large number of customers will gradually increase sales and profits by improving and improving the overall customer relationship management (CRM) and customer relationship quality (Lim, 2014).

In addition, it is possible to reduce the cost of attracting new customers by activating repetitive purchasing and repurchasing of existing customers (Park, 2008). It is also reported that among the existing customers, the top 20% % of the total customers conduct 80% of gross sales (Lee, 2013). Considering this, it can be seen that securing excellent customers and loyal customers who shows high rate of repurchase and repetitive purchase is a very important factor in the business performance. In this sense, this study also examines the customers' intention of repurchase in online fresh food shopping malls with e-customer satisfaction.

3. Research Method

3.1. Design of Research Model

In order to demonstrate the relationship between the delivery service quality of online fresh food shopping mall and the e-customer satisfaction and repurchase intention, a research model was designed as shown in <Figure 1> based on the contents of the previous studies
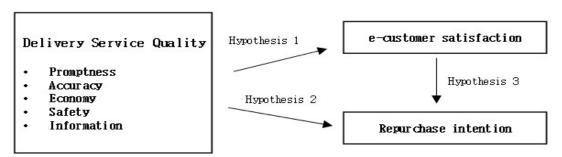

Figure 1: Research Model

3.2. Research Hypothesis

These are research hypothesis based on the research model in the previous section and the contents of the prior study reviewed in chapter 2.

Hypothesis 1: The service quality of online fresh food shopping mall will have a statistically significant effect on online customers' e-customer satisfaction.
  Hypothesis 1-1: The promptness of the delivery service quality will have a positive effect on the online customer's e-customer satisfaction.
  Hypothesis 1-2: The accuracy of the delivery service quality will have a positive effect on the online customer's e-customer satisfaction.
  Hypothesis 1-3: The economy of the delivery service quality will have a positive effect on the online customer's e-customer satisfaction.
  Hypothesis 1-4: The safety of the delivery service quality will have a positive effect on the online customer's e-customer satisfaction.
  Hypothesis 1-5: The information of the delivery service quality will have a positive effect on the online customer's e - customer satisfaction(+)

Hypothesis 2: The service quality of online fresh food shopping mall will affect the repurchase intention of online customers.
  Hypothesis 2-1: The promptness of the delivery service quality will have a positive effect on the online customer's repurchase intention.
  Hypothesis 2-2: The accuracy of the delivery service quality will have a positive effect on the online customer's repurchase intention.
  Hypothesis 2-3: The economy of the delivery service quality will have a positive effect on the online customer's repurchase intention.
  Hypothesis 2-4: The safety of the delivery service quality will have a positive effect on the online customer's repurchase intention.

Hypothesis 2-5: The information of the delivery service quality will have a positive effect on the online customer's repurchase intention.

Hypothesis 3: The e-customer satisfaction of online fresh food shopping mall will have a statistically significant effect on repurchase intention.

3.3. Measurement Items

In this study, I selected and extracted measurement items for independent and dependent variables based on a number of relevant prior studies to design questionnaires for the empirical survey process. The questionnaire consists of four areas: delivery service quality, e-customer satisfaction, re-purchase intention, and demographic characteristics of survey respondents. The three areas except the demographic characteristics were the Likert-type 5-point isometric scale (1 point: 'strongly disagree', 2 points 'disagree', 3 points 'normal', 4 points 'agree', 5 points 'strongly agree')

First, there are total 20 items for measuring quality of delivery service designed referring to the relevant prior studies: four items measuring promptness, four items measuring accuracy, four items measuring economy, four items measuring safety and four items measuring information.

Second, referring to Moon (2008), there are four the measurement items of e-customer satisfaction: satisfaction of the shipping service quality of the online fresh food shopping mall, satisfaction of the overall service quality, satisfaction with information and knowledge about products, satisfaction with decision to select specific shopping mall, and so on.

Third, for the measurement items of repurchase intentions, referring to the Yang and Lim (2014), there are four items: the intention of continuous re-visit to the online fresh food shopping mall, the intention of continuous repurchase, and the intention to actively recommend, etc.

3.4. Data Analysis

The data collection is conducted with sampling survey. The participants are customers who have visited, purchased and received their orders within the last 6 months in online fresh food shopping malls.

Questionnaires for collecting the empirical data were conducted by sampling survey for customers who have visited the online fresh food shopping mall within the last 6 months and purchased the product and have received the delivery. The survey was conducted from May 5, 2018 to May 15, 2018, and the participants for survey were recruited from four online fresh and healthy food shopping malls that are somewhat stabilized in management and business performance. During the survey period, total 220 questionnaires were distributed, after coding and refining the data, 190 pieces of data are chosen excluding the 30 pieces which are judged to be inadequate because the reliability of the answer is somewhat lacking or the question contents are misunderstood.

This study analyzed collected data, then confirmed and finalized the hypothesis by using IBM SPSS Statistics 21.0 statistical program. Followings are the major data analysis methods.

First, frequency analysis was conducted on the demographic characteristics of the survey respondents (gender, age, education, occupation, income, marital status, etc.).

Second, the exploratory factor analysis was conducted to verify the validity of the delivery service quality as an independent variable, e-customer satisfaction, and repurchase intention of the online fresh food shopping mall as a dependent variable.

Third, reliability analysis was conducted to check the internal consistency of the chosen variables. This study used reliability coefficient of Cronbach's Alpha to verify reliability verification (Song, 2015). Fourth, Correlation analysis was conducted to verify the relationship between independent variable (delivery service quality) and dependent variables (customer satisfaction, repurchase intention). Fifth, simple regression analysis and multiple regression analysis were conducted to demonstrate the influence and causal relationship between independent variables (causal variables) and dependent variables (outcome variables).

4. Results

4.1. The demographic characteristics of survey respondents

The purpose of this study is to investigate the effect of the delivery service quality of online fresh food shopping mall on e-customer satisfaction and repurchase intention, the demographic characteristics of survey respondents are as follows: 1) sex, 2) age, 3) education, 4) job 5) monthly average income 6) marital status The results of the frequency analysis are shown in <Table 1>.

Table 1: Demographic characteristics of survey respondents

Variable	Category	Number	(%)
Gender	Male	61	32.11
	Female	129	67.89
Age	20s	61	32.11
	30s	68	35.79
	40s	39	20.53
	Over 50	22	11.58
Education	High School Graduate	32	16.84
	College Graduate	125	65.79
	Graduate School or Higher	29	15.26
	Other	4	2.11
Job	Professions	29	15.26
	Office, Management	90	47.37
	Sales, Service	22	11.58
	Student	12	6.32
	Housewife	23	12.11
	Other	14	7.37
Monthly Average Income	Less than W 2 million	14	7.37
	W 2~3 million	53	27.89
	3~4 million	68	35.79
	4~5 million	41	21.58
	5~6 million	14	7.37
	Above 6 million	0	0.00
Marital Status	Single	52	27.37
	Married	138	72.63

4.2. Reliability, Validity, Corelation Validation

4.2.1. Validity validation

This study used Principal Components Analysis (PCA) as a factor extraction method to validate the collected survey data. The factor rotation was adopted as the varimax method and for the eigen-value, the factors above 1.0 were adopted. In the social sciences, a factor load of 0.4 or higher, indicating the degree of correlation between the detailed sub-components that make up each variable, is considered a valid item, and a factor of 0.6 or higher is considered important (Chae, 2016) 0.4 or higher were judged to be valid items. The results of the validity analysis of this study are summarized in Tables 2 to 4.

Table 2: Feasibility analysis of the delivery service quality of online fresh food shopping mall

Factor	Measurement items	Factor loading	Commonality	Eigen-value	Variance (%)	Cumulated variance (%)
Promptness	Promptness 1	0.824	0.718	3.081	15.404	15.404
	Promptness 2	0.860	0.804			
	Promptness 3	0.822	0.795			
	Promptness 4	0.781	0.704			
Accuracy	Accuracy 1	0.818	0.755	3.006	15.032	30.437
	Accuracy 2	0.840	0.780			
	Accuracy 3	0.811	0.715			
	Accuracy 4	0.770	0.681			
Economy	Economy 1	0.770	0.697	2.615	13.075	43.512
	Economy 2	0.733	0.703			
	Economy 3	0.755	0.713			
	Economy 4	0.637	0.573			
Safety	Safety 1	0.672	0.575	2.558	12.791	56.302
	Safety 2	0.769	0.631			
	Safety 3	0.781	0.650			
	Safety 4	0.784	0.668			
Information	Information 1	0.718	0.578	2.438	12.191	68.493
	Information 2	0.739	0.586			
	Information 3	0.728	0.716			
	Information 4	0.661	0.659			

Table 3: Result of feasibility analysis on e-customer satisfaction

Measurement items	Factor loading	Commonality	Eigen-value	Variance (%)	Cumulated variance (%)
Customer satisfaction 1	0.935	0.875	3.617	90.437	90.437
Customer satisfaction 2	0.965	0.931			
Customer satisfaction 3	0.942	0.887			
Customer satisfaction 4	0.962	0.925			

Table 4: Result of feasibility analysis on repurchase intention

Measurement stems	Factor loading	Commonality	Eigen-value	Variance (%)	Cumulated variance (%)
Repurchase intention 1	0.892	0.796	3.000	74.997	74.997
Repurchase intention 2	0.921	0.848			
Repurchase intention 3	0.845	0.714			
Repurchase intention 4	0.801	0.641			

According to Tables 2 to 4, the eigen-values of the five sub-factors constituting the independent variable of delivery service quality are 3.081, 3.006, 2.615, 2.558 and 2.438, respectively. The factor loadings are 0.637 - 0.860, The eigen-value of e-customer satisfaction is 3.617, factor loading value is 0.935 ~ 0.965, intrinsic value of repurchase intention is 3.000 and factor load value is 0.801 ~ 0.921. Therefore, the validity of the three variables is confirmed. In addition, since the total description of the variance between the items that constitute the quality of the delivery service is 68.493%, e-customer satisfaction is also reasonable, and 90.3 % is the total description of the items that are measured in the re-purchase intent. In addition, the total explanatory power due to the dispersion among the measurement items constituting the delivery service quality is 68.493% and the total explanatory power due to the dispersion between the e-customer satisfaction and the repurchase intention is 90.437% and 74.997%, respectively. Factor and metric composition are also appropriate. Generally, in the social sciences, the appropriateness of the factors is judged based on 60% of the total variance (Chae, 2016).

4.2.2. Reliability Validation

Reliability means the exclusiveness of differences in the result of measurement. The less the level of differences in measurement, the reliable is the result. This study used Cronbach's Alpha as a method of evaluating reliability, such as parallel verification method, verification-re-verification method, internal consistency method, and Cronbach's Alpha (Noh & Jeong, 2010). In the social sciences, Cronbach's Alpha value of 0.6 or higher is generally considered to be reliable (Chae, 2016).

Table 5: Reliability verification result

Factor		No of items	Reliability
Delivery Service Quality	Promptness	4	0.886
	Accuracy	4	0.874
	Economy	4	0.828
	Safety	4	0.790
	Information	4	0.798
Customer satisfaction		4	0.964
Repurchase intention		4	0.878

4.2.3. Correlation Validation

Next, this study analyzed the correlation between all variables in this study. Correlation analysis is an index that measures the intensity of the primary correlation between variables. It can predict the direction and degree of analysis results through analysis of correlation between variables, (Lee, 2012). Generally, Pearson correlation coefficient (Pearson Correlation Coefficient) is used for correlation analysis in social science field (Song, 2015). The results of the correlation analysis between the variables of this study are summarized in <Table 6>.

Table 6: Correlation analysis

Factor	Promptness	Accuracy	Economy	Safety	Information	Customer satisfaction	Repurchase intention
Promptness	1						
Accuracy	0.278**	1					
Economy	0.477**	0.466**	1				
Safety	0.379**	0.188**	0.419**	1			
Information	0.354**	0.501**	0.577**	0.331**	1		

Customer satisfaction	0.674**	0.609**	0.668**	0.602**	0.604**	1	
Repurchase intention	0.717**	0.612**	0.666**	0.601**	0.565**	0.809**	1

* p<0.05   ** p<0.01

Correlation analysis shows that the correlation between multiple factors ranged from ± 0.4 to ± 0.9 and the correlation between minority factors ranged from ± 0.1 to ± 0.4. Generally, in the social science field, the correlation is high when the range is from 0.7 to 0.9, the correlation is somewhat high when the range is from 0.4 to 0.7, and the correlation is low when the range is from 0.2 to 0.4 (Song, 2015). From this, it can be confirmed that the correlation and validity between the three variables of this study and each sub-factor are secured, and the direction of the research hypothesis and the design of the research model are properly established.

4.3. Result and Interpretation

4.3.1. Result and Interpretation of Hypothesis 1

<Table 7> shows the result of multi regression analysis of <Hypothesis 1> and its sub hypothesis.

Table 7: Multiple regression analysis between online service quality and e-customer satisfaction

Division	Non standardized coefficients		Standardizedcoefficients	t	Sig.	Collinearity Statistics	
	B	SD	Beta			Tolerance	VIF
(Constant)	-3.033	0.265		-11.428	0.000		
Promptness	0.459	0.051	0.353	8.968	0.000**	0.726	1.377
Accuracy	0.414	0.052	0.318	7.913	0.000**	0.698	1.432
Economy	0.289	0.090	0.148	3.195	0.002**	0.527	1.899
Safety	0.438	0.055	0.301	7.898	0.000**	0.773	1.294
Information	0.276	0.089	0.135	3.089	0.002**	0.586	1.707
Adjusted R square=0.787, df1=5, F=140.992, p=0.000							

Dependent variable: e-customer satisfaction
* p<0.05, ** p<0.01

According to the analysis results, the F value of the above regression equation is 140.992 and the significance is 0.000, which is statistically significant. Here, F value is 140.992, p .000 is significant. The overall explanatory power (corrected R-squared) of the independent variable, e-customer satisfaction, which is a dependent variable, is 78.7%, which is also statistically significant. Also, since the VIF (dispersion expansion factor) value is less than 10.0, this regression equation also solves the multicollinearity problem. Multicollinearity is a problem of strong correlation between independent variables in regression analysis, and this problem should be decided in order to have a statistically significant regression (Chae, 2016).

As a result of multiple regression analysis between the delivery service quality and the e-customer satisfaction of the online fresh food shopping mall, all five sub-factors of the delivery service quality have a statistically significant positive effect on e-customer satisfaction. Among the five factors, β coefficient of promptness proved to have the greatest effect as 0.353, followed by β coefficient of accuracy of 0.318, β coefficient of safety of 0.301, β coefficient of economy of 0.148, β coefficient of information of 0.135, respectively.

4.3.2. Result and Interpretation of Hypothesis 2

<Table 8> shows the results of multiple regression analysis for <Hypothesis 2> and its sub hypotheses.

Table 8: Multiple regression analysis between delivery service of online fresh food shopping and repurchase intention

Division	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics	
	B	SD	beta			Tolerance	VIF
(Constant)	1.961	0.107		18.276	0.000		
Promptness	0.235	0.021	0.418	11.351	0.000**	0.726	1.377
Accuracy	0.191	0.021	0.339	9.031	0.000**	0.698	1.432
Economy	0.124	0.037	0.147	3.398	0.001**	0.527	1.899
Safety	0.186	0.022	0.296	8.285	0.000**	0.773	1.294
Information	0.058	0.036	0.065	1.598	0.112	0.586	1.707
Adjusted R square=0.814, df1=5, F=166.629, p=0.000							

Dependent variable : Repurchase intention
* p<0.05, ** p<0.01

In the regression equation above, the overall explanatory power (modified R squared value) is 81.4%, the F statistic value is 166.629, the significance value is 0.000, and the VIF value is less than 10. Therefore, this regression equation is statistically significant and the problem of multi-collinearity is also solved. As a result of multiple regression analysis, four factors of promptness, accuracy, economy, and safety among 5 sub-factors of delivery service quality have statistically significant positive effect on repurchase intention, 0.05) but information did not have a significant effect. Among the four factors, *β* coefficient of promptness is 0.418, and *β* coefficient of accuracy is 0.339, *β* coefficient of safety is 0.296, *β* coefficient of economy is 0.147. respectively.

4.3.3. Result and Interpretation of Hypothesis 3

<Table 9> shows the results of simple regression analysis for <Hypothesis 3>.

Table 9: Simple regression analysis between e-customer satisfaction and repurchase intention

Division	Non-standardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics	
	B	Std. error	beta			Tolerance	VIF
(Constant)	3.462	0.060		57.931	0.000		
e-customer satisfaction	0.350	0.019	0.809	18.854	0.000**	1.000	1.000
Adjusted R square=0.652, df1=1, F=355.466, p=0.000							

Dependent variable: Repurchase Intention
* p<0.05, ** p<0.01

The regression equation is statistically valid because the explanatory power of the e-customer satisfaction as an independent variable is 65.2%, F value is 355.466, and the significance of 0.000. on the repurchase intention as a dependent variable. As a result of simple regression analysis between e-customer satisfaction and repurchase intention, *β* coefficient of e-customer satisfaction is 0.809, which proves to have a statistically significant positive effect on repurchase intention.

5. Conclusion

This study is conducted to examine and analyze the effect of the delivery service quality in online fresh food shopping mall on e-customers' satisfaction level and repurchase intention. Followings are the main results of this study.

First, the <hypothesis 1>: 'The delivery service quality in online fresh food shopping mall will have a significant effect on the satisfaction level of e-customers in online shopping mall' and sub-hypothesis (1-1, 1-2, 1-3, 1-4, 1-5) are all adopted. The five sub-factors of delivery service quality were proved to have a significant positive effect on e-customers' satisfaction level in the order of promptness, accuracy, safety, economy, and information

Second, 'Delivery service quality of online fresh food shopping mall will have a significant effect on repurchase intention of online customers', and four detailed hypotheses, 2-1, 2-2, 2-3, 2-4 out of 5 are adopted and 2-5 is rejected. Therefore, Hypothesis 2 was adopted. The four factors which have significant influence on repurchase intention among 5 sub-factors of delivery service quality are positively (+) in order of promptness, accuracy, safety and economy. In contrast, information has proven to have no significant effect.

Among the sub-factors of delivery service quality, β coefficient value of three factors such as promptness, accuracy, and safety is higher, confirming that these three factors have a strong influence on e-customer satisfaction and repurchase intention of online customers. That is, the customers of the online fresh food shopping malls are concerned with the speed of the delivery time, the accuracy of the delivery contents (the correct product delivery, the delivery quantity, the place of delivery, the delivery time, etc.) The safe delivery without damage or harm is considered to be more important. On the other hand, it is found that the low cost of shipping and the provision of information related to delivery are relatively less important.

Shipping cost is less considered than the other three factors, because the low cost and high efficiency shipping service is developed in most of online shopping malls, the shipping cost ranges 2,000 ~ 3,000 won (Lee & Kwak, 2014), actually the customers do not care much for the shipping costs. The customers do not consider the real time delivery information through text messages, karaoke, SNS, etc. as necessary because they are more concerned with the actual delivery result than the delivery information.

With above all analysis, customers in the online fresh food shopping malls put a great value on promptness, accuracy and safety of delivery. In fact, these three are core factors to keep and deliver fresh food's quality and taste, and value as it is. According to the above analysis, customers in the online fresh food shopping mall put a great value on promptness, accuracy and safety of delivery. In fact, t these three factors are a key part in delivering and preserving the quality, flavor, and value of fresh food.

Therefore, the online fresh food shopping mall must continuously improve the e-satisfaction and repurchase intention of online customers to improve the business performance by responding promptly, accurately and safely to food delivery in accordance with customer needs and expectations.

Third, <Hypothesis 3> was adopted that 'e-customer satisfaction of online fresh food shopping mall will have a statistically significant effect on repurchase intention.' As a result of simple regression analysis between e-customer satisfaction and repurchase intention, β coefficient of e-customer satisfaction was 0.809, which proves to have a very high influence and correlation with repurchase intention. Therefore, when an online fresh food shopping mall increase the customers' satisfaction level through prompt, accurate and safe shipping service, which immediately leads their revisit and repurchase intention. It will be helpful to raise the business performance of online fresh food shopping malls and improve brand awareness, preference, and loyalty.

This research proves that the quality of good shipping service in online fresh food shopping malls has a primary impact on e-customer satisfaction level, and secondly impact on higher repurchase intention.

There are limits of this study. First, the survey was conducted only with the online fresh food shopping mall customers. Second, with the scarce numbers of prior studies on the shipping service quality of fresh food shopping malls, the sub-factors and measurement items are constructed by referring to the previous studies on other kinds of shopping malls.

For further study, a significant research result and conclusion will be drawn by conducting larger scale sample surveys among online fresh food shopping mall customers, and by developing a checklist of shipping service quality factors in specialized online fresh food shopping malls. Additionally, the results of this study are expected to be utilized as effective theoretical and practical guidelines and basic references to improve the customer service, business management and marketing of many online fresh food shopping malls.

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