

The Effect of Selection Attributes of Public Delivery Apps and Support for Public Institutions on the Intention of Restaurant Service Providers to Use Public Delivery Apps

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Abstract

Recently, local governments that provide mobile-based public delivery app services have been increasing a lot. The purpose of this study is to analyze whether the restaurant self-employed's public delivery app selection attributes and public institutions' perception of support, which are under economic pressure due to the high delivery fee burden of private delivery apps, affect the intention to use public delivery app services. In this study, the degree of perception of each factor was measured using the Likert 5-point scale, and it was verified through statistical analysis using SPSS. The effect of the selection attribute of public delivery apps and the perception of self-employed people in the restaurant industry on the intention to use the service was empirically analyzed, and the hypothesis was verified using regression analysis. As a result of this study, it was confirmed that convenience, economy, and public interest had a significant effect among the factors of public app selection attributes, and educational support had a significant effect on public institution support.

Keywords: Public delivery apps, private delivery apps, self-employed people in the restaurant industry, delivery fees.

1. Introduction

The explosive increase in the use of mobile devices is expanding the field of wireless mobile service provision by companies and providing various services through the development of mobile applications. The restaurant industry is one of the industries most affected by the expansion of the mobile service industry, and the size of the restaurant industry using mobile services such as delivery apps has been increasing exponentially in the recent COVID-19 pandemic. Various private delivery apps such as Baemin, Yogiyo, and Coupang Eats are growing rapidly thanks to the global pandemic, but due to the nature of private delivery apps aimed at making profits, high delivery fees are putting economic pressure on many restaurants self-employed people. Recently, many local governments are pushing to expand the provision of various mobile-based services, and public delivery apps are one of the services. The development of public delivery app services by local

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governments and public institutions can be evaluated as having high practical value in terms of public service. Due to the recent influence of the COVID-19 pandemic, the efficient use of public delivery apps has become an essential tool, not an option, for purchasing delivery food and daily necessities shopping. Most of the previous studies related to delivery apps mainly focus on consumer-oriented studies that choose delivery apps, and there are few studies targeting small business owners, especially self-employed people in the restaurant industry, who are the biggest stakeholders of delivery apps. Therefore, this study aims to examine the effectiveness of the restaurant self-employer's public delivery app selection attribute and public institution's perception of support on the use of the delivery app, and to analyze the relationship between the introduction of the public delivery app and performance.

2. Literature review

2.1 Characteristics and status of the delivery restaurant industry

Unlike other industries, the restaurant industry is an industry in which the cooperation between stakeholders such as managers, employees, and customers is very important. Side effects such as diseases occur immediately when there is a quality problem, and they are sensitive to the flow of the economy depending on whether they like taste or service, so they should pay a lot of attention to hygiene, service, and quality. As of 2020, 804,173 restaurant companies were registered, an increase of 19.1% from 675,056 in 2016. The number of workers in restaurants increased slightly from 1,988,472 in 2016 but decreased by 12.4% in 2020. This is the same phenomenon in both the restaurant industry and the pub and non-alcoholic beverage businesses, and it is believed that the main reason is the deterioration of management due to the COVID-19 pandemic.

2.2 Public delivery app

With the rapid spread of smartphone applications, each local government is taking the lead in developing public application services that provide administrative information. Public apps are developing in a direction to strengthen interconnection with the public by providing delivery app services considering the characteristics that they can conveniently use services on the go and personalized services considering the location of users.

Small business owners who have not subscribed to the delivery app are in a difficult environment amid the high advertising and handling fees of private delivery apps, and the domestic delivery app market environment in which one company monopolizes more than 90%. In addition, it was controversial due to a unilateral change in service policy of private delivery apps and an increase in handling fees. As a result, it was discussed about preparing public services by pointing out monopoly and commission issues politically, economically, and socially, and local governments began to develop their own public delivery app services. Since it first started in Gunsan, Jeollabuk-do in March 2020, more than 18 local governments are currently providing services.

2.3 previous studies

As the delivery restaurant market continues to grow from 15 trillion won in 2017, services related to restaurants are being expanded in various directions, and research on delivery apps is being studied in various fields. The selection attributes of the public delivery app set in this paper consist of six sub-dimensions: convenience, playability, economy, public interest, fulfillment, and security.

Convenience means that it is easy to use and easy to operate, and various previous studies have verified it as a factor influencing the intention to accept delivery apps. Li Xuezhu said that the convenience of the restaurant delivery app service has a significant positive (+) effect on customer satisfaction and behavioral intention [1], and Lee Ga-hee found that the perceived value and acceptance of the delivery app service are due to the convenience of the app perceived by consumers [2]. Han Jun-hyung et al. said that playfulness means the degree to which the act of using a product or service itself is enjoyable and provides psychological rewards to consumers [3], and Park Eun-young found that playfulness is an acceptance factor of ICT-based services for restaurant consumers [4]. Yang Seung-ho empirically analyzed fintech technology acceptance characteristics for Korean and Chinese consumers to find out that economic feasibility has a positive (+) effect on intention to use [5]. Public delivery apps are projects promoted for the public interest and prioritize public interest over profitability. In the PCSI model influenced by Oliver and Rust [6], among the four dimensions of

service quality (integrity, public interest, safety), social quality is evaluated as the core quality that separates public and private services as a quality dimension that most actively reflects the characteristics and values of social services (Lee Yoo-jae et al.) [7]. Implement ability refers to the extent to which a promised product or service is performed accurately in terms of time, place, quantity, etc. (Parasuraman et al.) [8]. Due to the nature of non-face-to-face online purchasing activities such as delivery apps, the exact fulfillment of promises between consumers and producers has a huge impact on satisfaction and intention to use the service. Therefore, transferability is used as a major measurement measure in various measures to evaluate the quality of online services. Security means controlling the collection and use of personal information, and consumers who use online services are more likely to perceive the risk of personal information leakage than other services (Bahli et al.) [9]. Jeong Jong-hee argued that the government's small business support program was a determinant of management performance [10], and Kim Soon-tae suggested funding, education support, and consulting support as factors of the government support policy [11]. Park Chun-rae et al. said that small business owners who have received various government support services can effectively improve corporate performance [12].

In a study on consumers' accommodation selection attributes, Kim Jeong-lae et al. said that convenience, interaction, economic feasibility, transaction reliability, product reliability, and information provision affect consumers' selection behavior [13]. Kim Seyun said that the reliability and attractiveness of broadcasters' broadcast commentators affect viewers' continuous viewing [14].

3. Analytical methods

3.1 Research Model

In this study, the degree of perception of each factor was measured using the Likert 5-point scale, and the distribution of the data was verified by calculating skewness and kurtosis. The effect of self-employed people's perception of public delivery app selection attributes and support from public institutions on service use intention was empirically analyzed, and the hypothesis was verified using regression analysis.

In this study, a research model was established based on previous studies on selection factors and a hypothesis was established to confirm the relationship between factors. The research model is presented in Figure 1, and the research hypothesis is presented in Table 1-3.

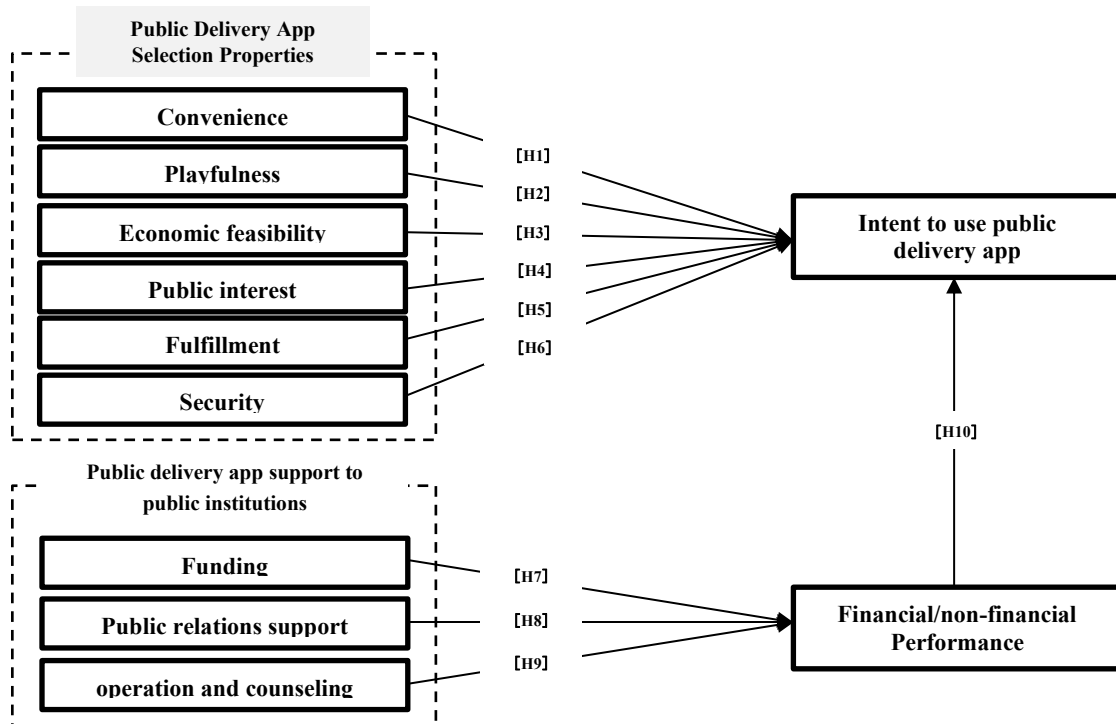


Figure 1. Research Model

Table 1. The relationship between the selection attributes of the public delivery app service and the intention to use the service.

hypothesis	content
H1	The convenience of public delivery apps will have a positive (+) effect on the intention to use the service.
H2	The playfulness of the public delivery app will have a positive (+) effect on the intention to use the service.
H3	The economic feasibility of public delivery apps will have a positive (+) effect on the intention to use the service.
H4	The public interest of public delivery apps will have a positive (+) effect on the intention to use the service.
H5	The fulfillment of the public delivery app will have a positive (+) effect on the intention to use the service.
H6	The security of the public delivery app will have a positive (+) effect on the intention to use the service.

Table 2. Relationship between Support Activities and Operation Performance of Public Institutions

hypothesis	content
H7	Funding from public institutions will have a positive (+) effect on the operational performance of public delivery app services.
H8	Education support from public institutions will have a positive (+) effect on the operational performance of public delivery app services.
H9	The operation and counseling support of public institutions will have a positive (+) effect on the operational performance of public delivery app services.

Table 3. Relationship between Operational Performance and Usage Intention

hypothesis	content
H10	The operational performance of the public delivery app service will have a positive (+) effect on the intention to use it.

4. Empirical analysis

The survey for this study was conducted on 250 self-employed people in the restaurant industry in Gyeonggi Province using public delivery apps from March 15 to April 5, 2022. Among the 250 collected questionnaires, 215 questionnaires were finally used for analysis, excluding those with inadequate or insincere responses or non-response questionnaires. The demographic characteristics of 215 samples in the survey are shown in <Table 4>.

Table 4. Analysis of demographic characteristics of survey subjects (N = 215)

Categorization	Details	Respondent (person)	Ratio (%)
Gender	Man	86	40.0
	Woman	129	60.0
Age	20 ~ 29	11	5.1
	30 ~ 39	74	34.4
	40 ~ 49	94	43.7
	50 ~ 59	23	10.7

	60 <	13	6.0
academic background	High school	24	11.2
	junior college	96	44.7
	University	87	40.5
	Graduate school	8	3.7
Monthly income	> 2 million won	6	2.8
	2 million won ≤ and > 3 million won	1	0.5
	3 million won ≤ and > 5 million won	38	17.7
	5 million won ≤ and > 10 million won	133	61.9
	> 10 million won	37	17.2

4.1 Evaluation of measurement items

In this study, exploratory factor analysis was conducted separately on 12 sub-dimensions of the four factors set, and the suitability was based on the test values of Kaiser-Meyer-Olkin (KMO) and Bartlett. KMO and Bartlett's test is a value indicating the degree of suitability that each variable is well explained by other variables and is interpreted as having a higher suitability as it is 0.7 or more and closer to 1. Principle component analysis was adopted for component extraction in factor analysis, and varimax was used in an orthogonal rotation method to simplify factor loading. The criteria for factor analysis set in this study are an eigenvalue of 1.0 or more and a factor loading value of 0.5 or more.

<Table 5> shows the results of exploratory factor analysis of the public delivery app selection attribute. All 24 items in all six sub-dimensional dimensions were at least 0.7 and it was verified that the selection of the items was appropriate. In addition, all six sub-dimensions showed KMO levels of 0.6 or higher, and the eigenvalues also met the criteria, confirming that the composition of the factors was well established.

Table 5. Exploratory Factors of Public Delivery App Selection Attribute Variables

Factor	Question	Factor loading	Eigenvalue	Distributed Explanatory Power	KMO	
Convenience	3	0.925	2.926	73.140	0.685	0.806
	4	0.882				
	2	0.811				
	1	0.797				
Playfulness	1	0.971	3.400	85.002	0.819	
	2	0.955				
	4	0.902				
	3	0.855				
Economic feasibility	1	0.927	3.306	82.649	0.854	
	2	0.923				
	4	0.919				
	3	0.866				
Public	3	0.922	3.194	79.848	0.847	

interest	2	0.909				
	1	0.907				
	4	0.832				
Fulfillment	1	0.978	3.448	86.210	0.807	
	2	0.949				
	4	0.940				
	3	0.842				
Security	1	0.963	3.325	83.116	0.811	
	2	0.933				
	4	0.901				
	3	0.845				

<Table 6> shows the results of exploratory factor analysis of public institution support activities. All 10 items in all three sub-dimensions showed a factorial value of 0.7 or more, and it was confirmed that the selection of the items was appropriate. In addition, all three sub-dimensions showed KMO levels of 0.6 or higher, and the eigenvalues also met the criteria, confirming that the composition of the factors was well established.

Table 6. An Exploratory Factor Analysis of Support Activity Variables in Public Institutions

Factor	Question	Factor loading	Eigenvalue	Distributed Explanatory Power	KMO
Funding	1	0.863	1.928	64.261	0.639
	2	0.775			
	3	0.763			
Public relations support	1	0.980	2.775	92.485	0.721
	3	0.955			
	2	0.950			
Operation and counseling	3	0.929	3.347	83.679	0.839
	2	0.925			
	1	0.922			
	4	0.883			

<Table 7> shows the results of exploratory factor analysis of operational performance. All six items in the two sub-dimensional were verified to be appropriate with a factorial value of 0.9 or more. In the case of non-financial performance, the factor composition was found to be good with a KMO value of 0.769, but the KMO value of financial performance was 0.500, which was somewhat lower than other sub-dimensions.

Table 7. Exploratory Factor Analysis of Operational Performance Variables

Factor	Question	Factor loading	Eigenvalue	Distributed Explanatory Power	KMO
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Financial performance	1	0.965	1.863	93.150	0.500	0.893
	2	0.965				
Non-financial performance	3	0.946	2.661	88.689	0.769	
	1	0.940				
	2	0.939				

In terms of service use intention, all three items showed a factorial value of 0.9 or more, and the eigenvalues and KMO values met the criteria, so it was verified that the selection of items and the composition of factors were appropriate. See Table 8.

Table 8. Exploratory Factor Analysis of Service Intention Variables

Factor	Question	Factor loading	Eigenvalue	Distributed Explanatory Power	KMO
Intention to use the service	2	0.947	2.629	87.620	0.758
	1	0.939			
	3	0.922			

4.2 Reliability Analysis

Reliability is a measure of confirming the internal consistency of the response to the question, and it is to check how repeatedly the same value is produced when repeatedly measuring the variable. The scale of evaluation is expressed by the Cronbach alpha coefficient (reliability index), and the closer it is to 1, the higher the reliability. In general, it is recognized as an acceptable range when the alpha coefficient of Cronbach is 0.6 or higher, and it is known that the reliability of the data is very high, especially when the reliability is 0.800 or higher. All 12 sub-dimensions of the four factors set in this study showed an alpha coefficient value of Cronbach of 0.6 or higher, confirming that there was no problem with the reliability of the measurement tool. See Table 9.

Table 9. Reliability Analysis of Measurement Tools

Factor		Measurement questions	Cronbach's α		
Public Delivery App Selection Properties	Convenience	4	0.876	0.805	0.843
	Playfulness	4	0.939		
	Economic feasibility	4	0.929		
	Public interest	4	0.915		
	Fulfillment	4	0.945		
	Security	4	0.930		
Public delivery app support to public institutions	Funding	3	0.710	0.776	
	Public relations support	3	0.959		
	operation and counseling	4	0.935		
Operational	Financial Performance	2	0.926	0.848	

performance	non-financial Performance	4	0.633	
Intention to use service		3	0.929	

4.3 Verification of research hypotheses

A hierarchical regression analysis was conducted to verify the effect of the restaurant self-employer's public delivery app selection attribute and public institution's perception of support on service use intention. The multicollinearity problem due to several independent variables was identified through a VIF (Variance Inflation Factor), and the Durbin-Watson value was verified to verify the independence of the residuals.

① Relationship between public delivery app selection attributes and service intention ([H1]-[H6])

As a result of multiple regression analysis of public delivery app selection attributes and service intention, R^2 was 0.369, showing high explanatory power, and the significance level of model fit was also secured ($F = 20.315$, $p = 0.000$). Durbin-Watson value of 2.445 was shown to secure the independence of the residuals, and the VIF value was also 1.016-1.254, confirming that there was no significant problem with multicollinearity. According to the analysis results, convenience, economy, and public interest showed standardization coefficients of 0.250 ($p = 0.000$), 0.193 ($p = 0.002$), and 0.355 ($p = 0.000$), respectively, which has a significant positive (+) effect on service use intention, which is a result variable. In the case of public interest, a high standardization coefficient of 0.355, which is a result showing that self-employed people perceive publicity as the most important virtue among the selection attributes of public delivery apps. Based on the above results, H1, H3, and H4 were adopted, and H2, H5, and H6 were rejected. See Table 10.

Table 10. Results of multiple regression analysis of public delivery app selection attributes and service intention

Resulting variables	preceding variable	Non-standardized coefficients		standardization coefficient	t	Significant probability	VIF
		B	Standard error	β			
Intention to use the service	Convenience	0.306	0.076	0.250	4.054	0.000	1.254
	Playfulness	0.045	0.066	0.037	0.675	0.500	1.016
	Economic feasibility	0.220	0.069	0.193	3.165	0.002	1.228
	Public interest	0.391	0.066	0.355	5.935	0.000	1.181
	Fulfillment	-0.076	0.067	-0.064	-1.138	0.256	1.045
	Security	-0.056	0.065	-0.048	-0.861	0.390	1.040

* $R = 0.608$, $R^2 = 0.369$, R^2 (Adj- R^2) = 0.351, F -value = 20.315, Durbin-Watson = 2.445

② Relationship between public institution support activities and operational performance ([H7]-[H9])

Multiple regression analysis was performed to verify the effect of support activities of public institutions on operational performance. See Table 11. R^2 appeared as 0.320 ($p = 0.000$), confirming that the research model was appropriately set, and the Durbin-Watson value was also 2.037, confirming that the independence of the residuals was secured. The fund support, operation, and counseling support dimensions showed significance probabilities of 0.927 and 0.692 respectively, and the results were not significant. However, the level of public relations support showed a high standardization coefficient of 0.568 at a significance probability of 0.000, and it was confirmed that there was a significant positive (+) causal relationship with operating performance. This is a result of showing that support from public institutions preferred by self-employed

people in the restaurant industry is a direct promotion activity for public delivery apps rather than commissions or AS. Based on the above results, H8 was adopted, and H7 and H9 were rejected.

Table 11. Results of Multiple Regression Analysis of Support Activities and Operational Performance of Public Institutions

Resulting variables	preceding variable	Non-standardized coefficients		standardization coefficient	t	Significant probability	VIF
		B	Standard error	β			
Operational performance	Funding	0.008	0.084	0.005	0.091	0.927	1.034
	Public relations support	0.539	0.055	0.568	9.732	0.000	1.058
	operation and counseling	-0.025	0.063	-0.023	-0.397	0.692	1.033

* R= 0.566, R²= 0.320, R² (Adj- R²)= 0.311, F-value= 33.134, Durbin-Watson = 2.037

③ Relationship between operation performance and service intention ([H10])

Regression analysis was conducted to confirm the causal relationship between operation performance and service use intention. R² was 0.106 (p = 0.000), and the Durbin-Watson value was 1.914, confirming that the independence of the residuals was secured. As a result of the analysis, it was confirmed that the preceding variable, operating performance, had a significant positive (+) effect on the result variable, the intention to use the service ($\beta = 0.326$, p = 0.000). Based on the above results, H10 was adopted. See table 12.

Table 12. Results of multiple regression analysis of operation performance and service use intention

Resulting variables	preceding variable	Non-standardized coefficients		standardization coefficient	t	Significant probability	VIF
		B	Standard error	β			
Intention to use the service	Operational performance	0.377	0.075	0.326	5.027	0.000	-

* R= 0.326, R²= 0.106, R² (Adj- R²)= 0.102, F-value= 25.273, Durbin-Watson = 2.145

The results of hypothesis verification by regression analysis are presented in Table 13.

Table 13. Hypothesis Verification Results

hypothesis	content	Verification
H1	The convenience of public delivery apps will have a positive (+) effect on the intention to use the service.	adopted
H2	The playfulness of the public delivery app will have a positive (+) effect on the intention to use the service.	rejected
H3	The economic feasibility of public delivery apps will have a positive (+) effect on the intention to use the service.	adopted
H4	The public interest of public delivery apps will have a positive (+) effect on the intention to use the service.	adopted
H5	The fulfillment of the public delivery app will have a positive (+) effect on the	rejected

	intention to use the service.	
H6	The security of the public delivery app will have a positive (+) effect on the intention to use the service.	rejected
H7	Funding from public institutions will have a positive (+) effect on the operational performance of public delivery app services.	rejected
H8	Education support from public institutions will have a positive (+) effect on the operational performance of public delivery app services.	adopted
H9	The operation and counseling support of public institutions will have a positive (+) effect on the operational performance of public delivery app services.	rejected
H10	The operational performance of the public delivery app service will have a positive (+) effect on the intention to use it.	adopted

5. Conclusions

This study was conducted to examine the effect of the selection attribute of public delivery apps perceived by self-employed people in the restaurant industry on the intention to use, and to analyze the relationship between the perception of support from public institutions and management performance and intention to use. Through this study, it was intended to verify the effectiveness of public delivery apps and support from public institutions and to provide evidence for deriving effective improvement measures in the future.

This study is significant in that it examines various aspects of public delivery apps from the perspective of self-employed people in the restaurant industry, the largest stakeholder in the use of public delivery apps and is differentiated from other studies.

Unlike previous studies, this study examined the effect on management performance and intention to use by setting the selection attribute of delivery apps and support activities of public institutions as leading factors at the same time. It is significant in that convenience, economy, and public interest among the various optional attributes of public delivery apps affect the intention to use the service, and that self-employed people's favorite support activities are support related to publicity or advertising. This study is difficult to use the results of this study universally because the sample size used in the survey is small and the region is limited, and research is needed to use consumers, self-employed people, and public institutions as samples at the same time. The public delivery app is a service in which public funds raised by taxpayers' money are invested and is used by both consumers and self-employed people. Therefore, only the opinions of either party should not be reflected, and the positions of all relevant stakeholders should be considered. If the positions of public institutions that propose policies, including consumers and self-employed people, can be reflected at the same time, it will be easier to derive effective improvement measures that everyone can satisfy. Since then, how the expansion or reduction of public delivery apps will affect small and medium-sized self-employed people should be revealed through new research.

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