

## Article

# Non-Face-to-Face Public Services and Perceptions of Public Organizations

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**Abstract:** Public services are the primary channels and government activities in which citizens contact public organizations. In turn, public services provided by the government are critical for citizens to recognize public organizations and governments according to their content and procedure. With the onset of COVID-19, the existing face-to-face public service delivery system has shown limitations in meeting citizens' needs for public services (fastness, transparency, and safety); as a result, a shift to non-face-to-face public services is required. The study proposes the question: "How does citizens' satisfaction with non-face-to-face public services affect public organizations (response and transparency) and government satisfaction?". The purpose of this study is to verify the effect of satisfaction (content and procedural) with non-face-to-face public services on the perception (responsiveness and transparency) of public organizations and governments' satisfaction. Specifically, non-face-to-face public services are divided into content and procedural aspects to analyze the responsiveness and transparency of public organizations and their impact on government satisfaction. This study used a structural equations model for analysis and used data collected in 2019 by the Korea Institute of Public Administration, a representative public research institute in Korea. The main analysis results are as follows: the responsiveness and transparency of public organizations increased alongside satisfaction with content and procedural satisfaction with non-face-to-face public services, and government satisfaction increased with responsiveness to and transparency toward public organizations.

**Keywords:** public service; non-face-to-face; COVID-19; public organization; government satisfaction



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## 1. Introduction

The new-era challenge of COVID-19 is causing various aspects of society to change. It has occurred at a time when the flow of digital transformation, which seeks to fundamentally change the competitive model of the global industry, was in full swing. Digital technology has been usefully used to solve human crises in various fields [1]. In addition, as strong social distancing was implemented after the COVID-19 pandemic, the demand for non-face-to-face work using new technologies, regardless of public and private sectors, has increased.

In particular, the increase in the need for non-face-to-face services is causing unprecedented changes in the public service delivery system. Non-face-to-face public services are playing an essential role in civic policy strategies in the era of COVID-19 [2]. Since the onset of COVID-19, the existing face-to-face public service delivery system has shown limitations in meeting citizens' needs for public services (fastness, transparency, and safety); as a result, a shift to non-face-to-face public services is required.

Notably, the basic public services that citizens need in their daily lives are the factors of influence through which citizens perceive public organizations and even the government. Public services are the primary channels and government activities in which citizens contact

public organizations; in turn, public services provided by the government are an important factor for citizens to recognize public organizations and governments according to their content and procedure. In other words, the key to the success and core of e-government (non-face-to-face public services, etc.) is the trust of citizens [3]. Therefore, research on the government's non-face-to-face public services is necessary and urgent.

The study proposes the question: "How does citizens' satisfaction with non-face-to-face public services affect public organization (response and transparency) and government satisfaction?". The purpose of this study is to verify the effect of satisfaction (content and procedural) with non-face-to-face public services on the perception (responsiveness and transparency) of public organizations and governments' satisfaction. Specifically, non-face-to-face public services are divided into content and procedural aspects to analyze the responsiveness and transparency of public organizations and their impact on government satisfaction. This study used a structural equations model for analysis and used data collected in 2019 by the Korea Institute of Public Administration, a representative public research institute in Korea.

Through this, this study confirms whether it is the content or procedural aspect of the service that the government should focus its capabilities on for non-face-to-face services that will continue to expand in the future. Based on the impact relationship between responsiveness and transparency of public organizations, it also provides evidence for policy design and decisions on whether to strengthen the content or procedural aspects of non-face-to-face services based on the cultural situation of each society and organization. This study seeks to expand the theoretical domain of public service delivery systems by supplementing traditional face-to-face, public service-oriented research. Furthermore, it intends to gather evidence of the structural design of non-face-to-face public services around which the future public service delivery system will be centered.

## 2. Theoretical Background

### 2.1. New Values and Public Services of Public Organizations

Among the various values that public organizations should prioritize and aim for, the value emphasized in the recent COVID-19 situation is 'agility'. Changes in the public administrative environment, such as the occurrence of COVID-19, are difficult to predict and complex, so if it is difficult to solve the problem, the government needs to respond by changing in an agile manner [4,5].

First of all, Gunasekaran and Yusuf [6] defined agility as "an organization's ability to meet changing needs, maximize customer service levels, minimize costs, and increase competitiveness". Dahmardeh and Pourshahabi [7] defines "an organization's ability to respond quickly and effectively to changes to meet the diverse needs of citizens". In addition, Odkhuu et al. [8] defined an agile organization or government as "an organization that adapts, is flexible, and has accelerated the decision-making process in line with constant changes in the administrative environment". Agile is used as an adjective to indicate the need for organizations to be more flexible and adaptable and act faster [9]. As such, the agility of a government organization can be seen as an important value and role in the operation of a government organization as the ability to understand and respond quickly to the needs of the public and citizens in a changing and uncertain environment [4,7,10]. Additionally, this relates primarily to their responses to external social, economic, and market threats [7,11]. These external threats or challenges also include the adoption of new technologies or systems [12]. As a result, the government carries out various types of efforts to meet the changing needs of citizens, and for this, a system that quickly adapts to environmental changes must be established [12].

The 2012 OECD Global Governance Forum emphasized agility as a new value for organizations and governments to effectively respond to economic crises and social changes. Since then, more interest and emphasis have been placed on the agility of organizations and governments in the recent COVID-19 pandemic situation. The reason for the need for agility is to properly respond to citizens' diverse demands and high expectations, as well

as to solve social and economic crises that have high uncertainties, complicated causes, and difficult solutions, such as COVID-19.

In particular, in terms of administrative services that this study focuses on, agility within public organizations enables a rapid response to internal changes such as the introduction of new IT technologies and advanced systems within government organizations [10]. Agile government organizations can provide services that meet the changing needs of citizens through a process of rapidly redesigning repetitive policy decisions [13,14]. In addition, agile organizations can respond quickly to changing customer demands and increase work performance [6,7]. Accordingly, agility has recently attracted attention as an important value within public organizations. Additionally, it is a representative public administrative practice case of the agile organization described above and a necessary field in the future is ‘non-face-to-face public service’.

## 2.2. Non-Face-to-Face Public Services

Public services can be seen as intangible services directly or indirectly provided by administrative agencies to meet the needs of residents and improve their quality of life. Public services focus on the benefits provided to beneficiaries (citizens), the final destination of government activities, and on software rather than hardware; in particular, civil service administration services have an executive nature and tend to contact residents. Thus, they value the position of service users (citizens) over service providers (administrative agencies) [15].

As an early discussion of public services, Chaffey and Williams [16] divided public service into online and offline based on web and e-mail interaction. Recently, public services have been largely divided into face-to-face and non-face-to-face public services, depending on how they are provided.

First, the former type implies that the government provides public services directly to citizens. It is a traditional way of providing services where citizens visit official institutions directly and use the necessary administrative needs. Recently, however, the scope of public services that the government must provide has been expanding gradually, and the demand for public services by citizens has also diversified. As a result, face-to-face public services are showing limitations in actively responding to citizens’ demands, and there are difficulties in meeting the citizens’ desire to actively participate in public administration.

Second, the term “non-face-to-face public services” means that civil petitioners handle their duties without visiting the relevant government offices, directly through electronic systems such as the Internet and mobile. Specifically, it may include providing public services (giving administrative information, collecting opinions of public administrative civil petitioners, and providing civil service using information and communication technology) electronically. In addition to the existing concept, non-face-to-face public services have recently been expanded to provide public services online and through artificial intelligence (AI). This non-face-to-face provision of public services can improve the procedural aspects of the delivery of the existing face-to-face ones. As people can access them through network services anytime and anywhere, such provision may allow them to escape time and economic inconvenience, unlike face-to-face methods that require visiting in person. In particular, with the introduction of non-face-to-face public services from the perspective of citizens, citizens can be expected to increase satisfaction with services by communicating with governments and receiving public services regardless of time and place [17].

The above non-face-to-face public services have been increasingly established since the introduction of e-government in the 2000s, in response to the continued development of technology and the increased demands from citizens. However, since the advent of COVID-19, non-face-to-face public services have faced a critical inflection point as they have been required in all sectors, and discussions have been active. The public sector has strengthened the provision of non-face-to-face services, making increasing attempts to enhance them. Through the combination of information and communication networks and smart technologies, the government is increasing the responsiveness, transparency,

and communication of public services and facilitating the creation of a non-face-to-face work environment.

### *2.3. Citizens' Perception of Non-Face-to-Face Public Services and Government*

Public services focus on the benefits provided to the citizens and the final destination of government activities, and they emphasize the position of service users (citizens). In the discussion regarding measuring the performance and quality of public services and providing better public services to the people, research on the satisfaction of public services has been continuous [18–20]. Citizen satisfaction indicates how many citizens are satisfied and how much they have reached their expectations [21]. This represents citizen evaluation and citizen awareness through the non-face-to-face experience of using public services [22]. The reason why citizens' satisfaction with public services is important is that it is the criterion for evaluating whether public services for citizens are provided by citizens' needs and expectations. It can be used as basic data for the improvement of public services by identifying related issues through citizens' satisfaction or dissatisfaction [23]. This improvement in satisfaction with public services enhances the well-being of the people and contributes to national development [24].

In particular, non-face-to-face public services are defined as providing online information and services to the public using the Internet or digital means [25]. It has been pointed out that non-face-to-face public services is a government innovation movement that goes beyond external changes such as cost reduction or government scale reduction and pursues the higher goals of improving citizens' satisfaction and realizing democracy [26]. Accordingly, the provision of non-face-to-face public services is a citizen-centered changing government [27], and its introduction and utilization should be oriented toward citizen-centeredness [28]. Therefore, subjective evaluation measured from the subjective standpoint of citizens should be treated as more important than objective evaluation, and it is recognized as such [29].

As such, public services have a very close relationship with citizens due to their characteristics. Importantly, citizens' satisfaction with public services is an important factor in the citizens' perceptions of public organization and government. That is, public services are an important part of government-wide activities, and the satisfaction level of public services has a significant impact on the perception of the government as a provider.

The relationship between the satisfaction with public services and the perceptions of public organizations and the government is an area of the public sector that has undergone continuous research. For example, Christensen et al. [30] stated that enforcement of public services improves the citizens' perception of (trust in) the government. Lanin and Harmanto [31] found that the higher the satisfaction with public services supplied from local governments, the better the positive perception of local governments. Kampen et al. [32] identified that satisfaction with public services has an important impact on the perception of government, especially trust. Van de Walle and Bouckaert [33] revealed that the level and performance of public services provided by the government to citizens have an important impact on the perception (trust) that citizens have of the government. Song [34] announced that the quality of public services improves the support of local governments through residents' satisfaction and trust. As a result of Eric et al. [35]'s study, it was confirmed that the more satisfied the government was with the disclosure of information provided online, the more individuals tended to visit the website. This is because the government's online site is perceived as providing a space for citizens' opinions and expression, and citizens perceive that there is a lot of available information available. It was found that the more satisfied the individual was with the e-government and the government website, the more trust they had in the government, and the more satisfied the individual was who trusted the government with e-government [18]. As a result, satisfaction with non-face-to-face administrative services is connected with government satisfaction.

On the other hand, satisfaction with non-face-to-face administrative services can be improved by eliminating dissatisfaction. Some studies have confirmed that it is important

to decrease the number of dissatisfied citizens rather than increase the number of citizens who use government services satisfactorily in order to increase the level of satisfaction with government services [32]. This can also be applied to non-face-to-face administrative services. Government satisfaction can be increased by identifying and managing factors that reduce service use satisfaction level. Studies have shown that the better the quality of public services experienced by the residents, the better the residents' positive perception of local governments and the government.

Specifically, non-face-to-face public services can implement citizen-centered service administration, thereby enhancing the responsiveness and transparency of public organizations by improving accessibility. First, they can improve the speed of responding to the public's administrative acceptance and improve the efficiency and accuracy of public services. In particular, as Thomas [36] and Goodsell [37] underscore, most citizens are more satisfied when a public official responds to their requests. Therefore, rapid response and processing through non-face-to-face services to diversified citizens' demands for public services is an important factor in improving citizens' satisfaction with public organizations.

Next, non-face-to-face public services enhance transparency value by providing information to citizens through web-based information and communication infrastructure and by improving information accessibility. This enables the distribution and management of safe and reliable information. Bertot et al. [38] said that the introduction of non-face-to-face public services has the potential to strengthen government transparency and eradicate corruption by eliminating direct contact between citizens and public officials. Wong and Welch [39] said non-face-to-face public services would help strengthen government accountability by making the flow of work clearer and accountable. In summary, non-face-to-face public services affect the perception of public organizations and governments by implementing citizen-centered service administration and promoting responsiveness and transparency through increased accessibility.

However, so far, research on the impact relationship between citizens' satisfaction with non-face-to-face public services and their perceptions of public organizations and government has been relatively insufficient. Therefore, at a time when the public service supply method is transitioning from face-to-face, research between the delivery system, the public organization, and the government is required.

### 3. Materials and Methods

#### 3.1. Analytical Model

In this study, the analysis process is as follows. First, it analyzes the effect of non-face-to-face public service satisfaction (content satisfaction and procedure satisfaction) on public organization recognition (public organization responsiveness and public organization transparency). Second, this study analyzes the effect of public organization perceptions (public organization responsiveness and public organization transparency) on government satisfaction (government satisfaction and government credibility).

Based on this, this study establishes the hypotheses shown in Table 1. The basis for each hypothesis is as follows. Responsiveness refers to how sensitively public services respond to environmental demands and is related to how well they satisfy the needs, preferences, and values of external groups [40]. The government is conducting various studies to understand the needs of citizens to respond sensitively to the demands of public administration services. Representatively, Jeong [41] emphasized the importance of the content aspect of services to improve the government's responsiveness to public services. The government's responsiveness means that it is important to accurately meet the needs of citizens, that is, service users, in terms of content. Therefore, this study established the following research hypothesis.



**Table 1.** Research hypotheses.

H1	Content satisfaction influences the positive (+) direction of public organization responsiveness.
H2	Procedural satisfaction influences the positive (+) direction of public organization transparency.
H3	The responsiveness of public organizations influences government satisfaction in the positive (+) direction.
H4	The transparency of public organizations influences government satisfaction in the positive (+) direction.

**Hypotheses 1 (H1).** *Content satisfaction influences the positive (+) direction of public organization responsiveness.*

Transparency in public services has an important relationship with procedure satisfaction. It is important to actively disclose and share the progress and decisions of public institutions regarding the progress of public services to citizens [42]. In particular, non-face-to-face public services provide real-time Internet and online-based matters related to various public sectors to solve the corruption problem, one of the important problems of public services. Anyone can always easily access the system and see the process at all times, reducing corruption and injustice, enhancing transparency, and increasing satisfaction. Welch, Hinnant, and Moon [35] stated that procedural disclosure and openness in the public service sector have a positive effect on enhancing transparency and improving satisfaction. Therefore, this study established the following research hypothesis.

**Hypotheses 2 (H2).** *Procedural satisfaction influences the positive (+) direction of public organization transparency.*

Government satisfaction refers to satisfaction with the public services provided by the government. Satisfaction with the government as a whole is formed by receiving public services provided by the government and repeating the experience of government satisfaction perceived by individuals [43]. Accordingly, the positive experience of the government affects the satisfaction of the government in a positive direction.

Specifically, this research selected the perception of public service responsiveness and transparency as important influencing factors on government satisfaction based on theoretical discussions. Providing fast and appropriate public services with high responsiveness to citizens' demands and needs can enhance citizens' satisfaction with overall public services. This is also an important variable in many studies [44–46]. In addition, in the principle of procedural disclosure and opening and the process of handling transparent and fair public services can enhance citizens' satisfaction with public services. However, many studies on the responsiveness and transparency of public services on citizens' satisfaction are limited to face-to-face public services, and the analysis of the impact relationship in non-face-to-face public services is insufficient. Therefore, this study aims to verify whether responsiveness and transparency will have an important effect on satisfaction, focusing on non-face-to-face public services.

**Hypotheses 3 (H3).** *The responsiveness of public organizations influences government satisfaction in the positive (+) direction.*

**Hypotheses 4 (H4).** *The transparency of public organizations influences government satisfaction in the positive (+) direction.*

### 3.2. Variables and Measurement Indicators

The analytical variables used in this study are as follows (Table 2). Non-face-to-face public services, which are the independent variable, were divided into content satisfaction and procedural satisfaction. For content satisfaction, we selected the accuracy and usefulness of the information provided. For procedural satisfaction, we selected convenience

of use, the convenience of the processing procedure, and speed of business processing. The parameters of public organization perceptions were divided into responsiveness and transparency. Public organization responsiveness, professionalism, openness, and validity were selected. Legality, corruption, and impartiality were selected for the transparency of public organizations. For government satisfaction, which is the dependent variable, the satisfaction and reliability of the current government were selected.

**Table 2.** Variables and measurements.

Variables		Measurement Questions
Non-face-to-face public services	Contents satisfaction	The accuracy of the information provided
		The usefulness of the information provided
	Procedural satisfaction	Convenience of use
		The Simplicity of processing procedure
		Speed of business processing
Recognition of public organizations	Public organization responsibility	Professionalism
		Openness
		Relevance
	Public organization transparency	Legality
		Corruption
Government satisfaction		Fairness
		Satisfaction level of the current government
		Credibility level of the current government

Responsiveness, convenience, accessibility, cost-effectiveness, reliability, usefulness, safety, and empathy were used as evaluation indicators in many studies, including the variables selected in this study as some of the online administrative service satisfaction evaluation indicators [47–51].

### 3.3. Method and Data Collection

The data used in this study were survey data conducted by the Korea Institute of Public Administration from 1 August to 30 September, 2019. In particular, since the Korea Institute of Public Administration is a representative research institute under Office for Government Policy Coordination, the data have public confidence. The demographic characteristics of the survey respondents of this study are as follows (Table 3). Of the 923 respondents, 489 were males (53%) and 434 were females (47%). The age groups were as follows: 189 respondents were in their 20s (20.5%), 198 in their 30s (21.5%), 234 in their 40s (25.4%), 194 in their 50s (21.0%), and 108 in their 60s or older (11.7%). Regarding academic background, five students (0.5%) had an education level lower than middle school, 209 students (22.6%) had received high school education, 214 students (23.2%) had a college education, 396 students (42.9%) had graduated from university, and 99 students (10.7%) had attended graduate school. Looking at the marital status, 562 people (60.9%) were married, 316 people (34.2%) were single, and 45 people (4.9%) had other marital statuses. There were 59 households with an income of fewer than two million won (6.4%), 171 households with more than two million to less than three million won (18.5%), 169 households with more than three million to less than four million won (18.3%), 156 households more than four million to less than five million won (16.9%), and 368 households with five million won or more (39.9%).

**Table 3.** Analysis of demographic characteristics.

	Division	Sample (Person)	Rate (%)		Division	Sample (Person)	Rate (%)
Gender	Male	489	53.0	Marital status	Married	562	60.9
	Female	434	47.0		Bereavement	9	1.0
Age	The 20 s	189	20.5		Divorce	27	2.9
	The 30 s	198	21.5		Separation	5	0.5
	The 40 s	234	25.4		Single	316	34.2
	The 50 s	194	21.0		Cohabit	4	0.4
	More than 60 s	108	11.7		≥2 million won	59	6.4
Educational background	Below middle school education	5	0.5	Household income	2–3 million won	171	18.5
	High school education	209	22.6		3–4 million won	169	18.3
	College	214	23.2		4–5 million won	156	16.9
	Graduated from university	396	42.9		≥5 million won	368	39.9
	Graduate school	99	10.7				

#### 4. Results

##### 4.1. Descriptive Statistical Analysis

Table 4 shows the descriptive statistics analysis results of the variables. The minimum value of all variables was 1 point, the maximum value was 5 points, and the total sample was 923 people. First, the scores for information accuracy and information usefulness of the content satisfaction were 3.99 and 3.90, which were higher than the average (3 points). In procedural satisfaction, the convenience of use, simplicity of processing procedure, and speed of business processing were 3.64, 3.78, and 3.93, respectively, which were higher than the average (3 points). Contrastingly, concerning public organization responsibility, professionalism was 2.99, openness was 2.75, and relevance was 2.82, which were lower than the average (3 points). Transparency legality, corruption, and impartiality were 2.85, 2.5, and 2.29 points, respectively, which were lower than the average (3 points). Finally, as dependent variables, the satisfaction level and credibility of the current government were 3.09 and 3.17, which were higher than the average (3 points).

**Table 4.** Descriptive analytical results.

	Latent Variable	N	Mean	SD	Min	Max
Contents satisfaction	Information accuracy	923	3.99	0.781	1	5
	Information usefulness	923	3.90	0.793	1	5
Procedural satisfaction	Convenience of use	923	3.64	0.858	1	5
	The simplicity of processing procedure	923	3.78	0.877	1	5
	Speed of business processing	923	3.93	0.872	1	5
Public organization responsibility	Professionalism	923	2.99	1.069	1	5
	Openness	923	2.75	0.992	1	5
	Relevance	923	2.82	0.943	1	5
Public organization transparency	Legality	923	2.85	0.927	1	5
	Corruption	923	2.50	0.970	1	5
	Fairness	923	2.29	0.988	1	5
Government satisfaction	Satisfaction level of the current government	923	3.09	1.144	1	5
	Credibility level of the current government	923	3.17	1.133	1	5



#### 4.2. Confirmatory Factor Analysis

Confirmatory factor analysis was performed to verify the construct validity of the concepts used in this study (Table 5). Through this, the concentration validity and internal consistency were verified by calculating the factor loading amount and concept reliability of each concept. As a result of the analysis, the standard loading values of the observed variables were all 0.5 or more, and conceptual reliability was 0.7. Thus, in this study, the internal consistency and reliability, as well as the construct validity, were ensured.

**Table 5.** Confirmatory factor analysis results.

Latent Variable		Factor Loading	Standardized Factor Loadings	SE	CR	Level of Confidence	AVE
Contents Satisfaction	Information Accuracy	0.986 ***	0.796	0.046	21.334	0.846	0.734
	Information Usefulness	1.000	0.772				
Procedural satisfaction	Convenience of use	0.931 ***	0.730	0.044	20.933	0.840	0.637
	The simplicity of processing procedure	0.993 ***	0.762	0.046	21.784		
	Speed of business processing	1.000	0.771				
Public Organization responsibility	Professionalism	0.900 ***	0.684	0.041	22.118	0.672	0.618
	Openness	1.000	0.819				
	Relevance	0.998 ***	0.860	0.034	29.621		
Public Organization transparency	Legality	0.967 ***	0.833	0.035	27.672	0.848	0.651
	Corruption	1.000	0.823				
	Fairness	0.904 ***	0.730	0.038	23.605		
Government satisfaction	Satisfaction level of the current Government	1.000	0.937			0.887	0.796
	Credibility level of the current Government	0.940 ***	0.890	0.029	32.434		

\*\*\*  $p < 0.01$ .

#### 4.3. Structural Equation Model

The initial model of the goodness of fit in this study was the same as in Table 6, and it was modified using the modified index as it did not strictly meet the acceptance criteria. As a result of the modified goodness-of-fit analysis, all the acceptance criteria are met. First, in the suitable index, the root means square error of approximation value decreased from 0.099 to 0.046, and the goodness-of-fit value increased from 0.913 to 0.963, thereby indicating improved goodness of fit. Second, in the incremental goodness-of-fit index, the normed fit index value increased from 0.854 to 0.958, and the comparative fit index value increased from 0.866 to 0.972, improving the goodness of fit. Third, the AIC (Akaike information criterion) value decreased from 1113.508 to 399.036, and the PRATIO (parsimony ratio) value decreased from 0.735 to 0.728 in the index suitable for simplicity, improving the model's suitability. As a result, the overall goodness of fit of the modified model was improved compared to the initial model, and the analysis was performed on the final model.

**Table 6.** Model fits verification results.

Fidelity	Goodness-of-Fit Index		Index
	Primary Model	Modified Model	
$\chi^2(df), p$	1007.508(100), 0.000	291.036(99), 0.000	decrease
$\chi^2/df$	10.075	2.940	decrease
RMSEA	0.099	0.046	decrease
GFI	0.913	0.963	increase
NFI	0.854	0.958	increase
TLI	0.818	0.961	increase
CFI	0.866	0.972	increase
AIC	1113.508	399.036	decrease
PRATIO	0.735	0.728	decrease

The analysis results based on the established model were the same as in Table 7. First, the degree of content satisfaction had a positive (+) effect at a statistically significant level, with the influence of public organizational responsiveness being 0.189. Second, the effect of procedural satisfaction on the transparency of public organizations had a positive (+) effect at a statistically significant level of 0.123. Third, the effect of public sector responsiveness on government satisfaction was 1.187, which had a positive (+) effect at a statistically significant level. Fourth, the influence of public organization transparency on government satisfaction was 0.130, which had a positive (+) effect at a statistically significant level.

**Table 7.** Structural equation modeling analytical results.

Independent Variable	Dependent Variable	Estimate	SE	CR	<i>p</i>
Contents Satisfaction	Public organization Responsibility	0.189 (0.159) ***	0.044	4.286	0.000
Procedural Satisfaction	Public organization transparency	0.123 (0.104) ***	0.044	2.813	0.005
Public organization responsibility	Government satisfaction	1.187 (0.812) ***	0.146	8.151	0.000
Public organization transparency	Government satisfaction	−0.128 (−0.065)	0.127	−1.006	0.314
Gender	Government satisfaction	0.130 (0.061) **	0.057	2.263	0.024
Age	Government satisfaction	−0.061 (−0.074) ***	0.022	−2.806	0.005
Educational Background	Government satisfaction	0.004 (0.004)	0.028	0.143	0.886
Household income	Government satisfaction	−0.008 (−0.022)	0.009	−0.824	0.410

\*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 8 is the hypothesis test result. As a result of the verification, the hypothesis H4 was rejected, and H1, H2, and H3 were accepted. Therefore, it was confirmed that content satisfaction and procedural satisfaction had a positive effect on the responsiveness and transparency of the public organization and that the responsiveness of the public organization had a positive effect on the satisfaction of the government.

Table 9 exhibits the results of analyzing the effect of procedural satisfaction and content satisfaction of non-face-to-face public service users on government satisfaction through public organizational responsiveness and transparency. We observed that, first, the content satisfaction of non-face-to-face public services affected the satisfaction of the government by 0.060 through the responsiveness of public organizations; second, procedural satisfaction with non-face-to-face public services affected government satisfaction by −0.038, mediated

by the transparency of public organizations. However, it was confirmed that content satisfaction alone enhances government satisfaction through the responsiveness of public organizations at a statistically significant level.

**Table 8.** Research hypothesis test results.

H1	Content satisfaction influences the positive (+) direction of public organization responsiveness.	Adoption
H2	Procedural satisfaction influences the positive (+) direction of public organization transparency.	Adoption
H3	The responsiveness of public organizations influences government satisfaction in the positive (+) direction.	Adoption
H4	The transparency of public organizations influences government satisfaction in the positive (+) direction.	Rejection

**Table 9.** Indirect effect and total effect analyses results.

Path	Indirect Effect	Total Effect
Contents satisfaction→public organization responsibility→government satisfaction	0.060 ***	0.060 ***
Procedural satisfaction→public organization transparency→government satisfaction	−0.038	−0.038

\*\*\*  $p < 0.01$ .

These analysis results are consistent with the perspective of previous studies [39,40], which state that government awareness (trust) improves when public services are effectively enforced. Public services should provide information and materials needed by consumers (citizens) on time. Recently, the priority of online-based services provided by public and private institutions has increased. In South Korea, e-government-based citizen services have been advanced through immigration control systems, quarantine control systems, disaster management systems, disaster safety characters, and self-diagnosis apps. Particularly with COVID-19, a general culture of conducting business non-face-to-face is spreading in society, and the demand for accelerating digital transition is increasing. The expansion of non-face-to-face public services must be accompanied by a concern for qualitative as well as quantitative expansion. Through this, it should be able to contribute to the efficiency of government operations, the provision of public services, and the improvement of quality [52]. This is because the qualitative satisfaction with services directly affects the government's trust.

Specifically, public services reflect the exact needs of consumers. When content satisfaction (satisfaction with requirements) is achieved, as in the research results, it also has a positive effect on the perception of public organizations' responsiveness (professionalism, openness, and appropriateness). South Korea has built a system to provide online complaint services since 2000. The "Government 24" homepage, which can issue various petition materials, was launched in August 2010. Efforts have been made to improve the quality of services to meet demand, but the focus has been on the quantitative expansion and speed of information disclosure. As society becomes more complex, the demand for public services required by individuals diversifies. The government's confidence can be increased when it can provide agile and consumer customization services. It is then necessary to increase the government's trust in non-face-to-face public services and focus on the content aspect of service provision to improve user satisfaction. This will have a positive effect on improving the intention to use non-face-to-face public services in the future.

## 5. Conclusions

In this study, we sought to expand the theoretical domain of public service provision systems, complementing the traditional research centered on face-to-face public services.

Public services for citizens have traditionally been studied with a focus on face-to-face services; however, responding to changes in the environment—such as the new public management theory, public private cooperation in national administration, and the emergence and increase of active information and communication technology (ICT) infrastructure management methods in the private sector—the service transmission system in the public sector has changed. The introduction of basic ICT is now required; in particular, the onset of COVID-19 has prompted the need for new discussions and research on non-face-to-face public services. Therefore, in this study, we attempted to complement and extend the related theory by analyzing non-face-to-face public services and comparing them with existing face-to-face provision systems.

Next, we constructed basic academic materials required for forming and reorganizing non-face-to-face public service provision systems. The association between the content and procedural aspects of non-face-to-face public services derived through this study and the responsiveness and transparency of public organizations may improve citizens' satisfaction with using non-face-to-face public services in the future. This study may be used as a basis for designing a possible transmission system.

The policy implications of this study are as follows. First, it is necessary to improve the quantity and quality of non-face-to-face public services provided by public organizations. In particular, as a result of the analysis, it was found that the perception of content satisfaction had a significant influence on the responsiveness of public organizations and government satisfaction. Therefore, it is necessary to continuously expand the service field provided through non-face-to-face public services. Currently, various services are regulated or restricted due to information and security problems. Therefore, it is necessary to improve citizens' service satisfaction and move toward agile organizations and governments responding to changing times by gradually expanding the fields provided through non-face-to-face administrative services based on institutional reform and technological innovation. In addition, it is necessary to strengthen immediate responsiveness to citizens by utilizing real-time online Q&A and feedback on inconvenience and improvement measures in the use of non-face-to-face public services.

Second, it is necessary to improve the transparency of the procedures of non-face-to-face public services provided by the government. In particular, simplification of procedures is one of the ways to improve transparency. As the procedure becomes more complex, the process becomes less transparent, which leads to a decrease in citizens' satisfaction. Therefore, it is necessary to seek to minimize the process and improve satisfaction through simplification of procedures as advantages of non-face-to-face public services. In addition, discrimination in information access should be eradicated. The process of disclosing information provided by non-face-to-face public services is based on the Information Disclosure Act, but there are still ambiguous elements, and there is room for arbitrary discretion in operation. Therefore, it is necessary to reduce corruption and unfairness and increase satisfaction by allowing anyone to easily access the civil complaint system and see the process at all times in public services. Disclosure of information and processes should not be restricted based on various regulations.

Third, R&D and active support should be provided to reform regulations related to non-face-to-face public services and establish technological infrastructure. In particular, in the case of local governments that face and handle tasks with actual citizens at the front line, there are many cases where resources and expertise to introduce non-face-to-face public services are insufficient. Accordingly, there are also many cases where citizens experience inconvenience. Therefore, it is necessary to establish a multi-year policy plan at the central government level and to implement and utilize non-face-to-face public services through systematic support and management.

Fourth, institutional efforts need to be accompanied so that the socially disadvantaged (disabled, elderly, etc.) do not experience inconvenience in using non-face-to-face public services. In particular, in the case of the socially disadvantaged, there is a high possibility that they will not be able to actively utilize non-face-to-face services. Accordingly, through

interest and support at the level of the government and local governments, the information gap should be reduced, and inconvenience should not be experienced in daily life. In that respect, education, publicity, and further support should be provided so that non-face-to-face public services can also be used.

The relationship between the content and procedural aspects of non-face-to-face administrative services derived through this study and the responsiveness and transparency of public organizations can be used as evidence for designing a delivery system that can improve citizens' satisfaction with non-face-to-face public services in the future. Furthermore, in the future, government organizations can be used to move toward 'agile' organizations.

However, in future studies, the following points need to be supplemented. This is a limitation of the study on the types of non-face-to-face public services use. This study was conducted targeting users of online-based public services. Recently, various forms of non-face-to-face administrative services such as mobiles, PCs, and kiosks have been provided. It is expected that there will be differences in users' government satisfaction with the provision method. This point should be supplemented in future studies.

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