Citizens' Trust Measurement in Smart Government Services

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ABSTRACT The embracing of digital technology has enhanced different approaches for authorities worldwide to deliver services to their citizens in a smart way. Smart government services contribute to increasing citizens' trust in government performance providing public services, as it allows interactions anytime, anyplace, through any device that merge digital technology and government public services. Furthermore, it is essential to consider citizens' trust in smart public services since citizens are consumers of the services. Existing studies measure citizens' trust in smart government services focusing on technological and government aspects. Therefore, this study proposes a framework to measure trust in smart government services and its impact on service adoption and satisfaction. This framework uses Information System (IS) Success Model and expands the dimension with government aspects, citizen aspects, citizens engagement, and social influence. This study surveyed the citizens of West Java Province Indonesia who have used government digital services for checking and paying vehicle taxes. The findings revealed significant factors, which are technological aspects, government aspects, and citizens engagement to measure citizens' trust in smart government services. The more citizens trust the services, the more they will use these services. Trusted smart government services also deliver value and satisfaction to the service users. However, we found social influence and the citizen aspects are not supported the citizens' trust in smart government services. We believe this paper will be a significant contribution for the academicians, governments, and service providers to build or increase citizens' trust in smart government services.

INDEX TERMS Citizens aspects, digital technology, citizens engagement, government aspects, service adoption, perceived value, satisfaction, smart government services, social influence, trust.

I. INTRODUCTION

Previous research has reported that the government is not adaptive enough in managing their public services due to the rapid change in the technological landscape [1]. Further, citizens want to have more effective and efficient public services that could provide accurate and real-time information. According to study [1] the government needs to implement smart government concept to be able to adapt with

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the emerging technologies. There are two different strategies to achieve smart government described in the literature. These can be approached by a smart city program [2], [3], with IoT and AI as the key technologies [4], or by improving e-government services [3]–[5]. According to study [5] smart government is more advanced than e-government in improved service delivery and engagement with the citizens by providing public services that are accessible through smart technology. We use this definition in our research.

Smart government concept is not limited to technologies utilized for public services, but is a process that is expected

to become more agile and creative in combining swift technology development to improve government accountability, interoperability and citizen engagement [3]. Smart government development stimulates mutual attitudes among various stakeholders to take part in providing public services to the citizens and to support citizens' quality of life [2], [6]. The smart government also aims to accomplish better public service delivery to create citizen satisfaction within public services [6], [7], and service value for users [5].

Study [6] highlights that user trust was partially dependent on the level of service user satisfaction. Citizen service satisfaction can boost a citizen's level of trust with the government's services [8]. The improvement of the users' trust level in using smart government services positively impacts services use, which in turn affects the whole deployment, operations, and user experience [9]. Trust in the smart government services according to study [5] could be understood as the users belief and expectations regarding the services. However, to enhance citizens trust in smart government services recent studies highlight the importance of trust only in technological and governmental aspects [5], [10].

In addition, to increase citizens trust, smart government needs to focus not only on the quality of the service but also on the service value creation [5], how trustworthy the government is [5], [11] and how the government engages with their citizens [12]. Furthermore, some earlier investigations have explored the influence of trust in smart government service adoption [5], [13]. However, there are limited studies that empirically examine the association between citizens' trust in smart government services and the impact of their satisfaction. Therefore, we propose this research because trust in smart government services is a multifaceted situation and there are many aspects that need to be considered by the government to increase trust among service users that could impact their service adoption [11].

The motivation of this study is to address those gaps by developing a framework to measure citizens' trust in smart government services. We validated the model through a quantitative study in the West Java Province, Indonesia. This research aims to answers the following research questions: 1) How can trust in smart government services be measured? 2) What kind of factors influence citizens' trust in smart government services? 3) How does citizen's trust in smart government services impact the adoption of the services? This research contributes insights into the government and service provider's capacity to fully understand how to build or increase trust in smart government services, which give impact to the service adoption [5], [11], [13], service satisfaction [11], and improve citizens perceived value of the service [5], [14].

Background to smart government services, their opportunities and challenges are presented in Section 2, the literature review. In Section 3, we provide a theoretical perspective of trust in smart government services which is followed by the research hypotheses. The methodology of this research is highlighted in Section 4, while Section 5 provides an analysis of the research findings. In Section 6 we discuss the results of this research. In Section 7 we offer conclusions and implications. Finally, Section 8 provides limitations and directions for future studies.

II. SMART GOVERNMENT SERVICES

Digital-based government services have become a common tool utilized by the government to deliver public services including in the West Java Province Indonesia. For example, the West Java Province has developed *SAMBARA*[1] services used for checking and paying motor vehicle taxes through a smartphone device; developing the *Desa Digital Jawa Barat*[2] as a program to supply digital technology and internet connection into villages to enhance villagers empowerment, economic development and information dissemination; *Sapa Warga* a public smartphone application helps community to communicate easily with the government; also, *PIKOBAR*[3] a digital application-based government service for COVID-19 related information in the West Java Province.

Another example of smart government services commonly used worldwide is a mobile application-based service to report or request services. Request service applications help citizens to report the potholes, noise pollution or dangerous conditions to the authorities [15]. Request services will go through the appropriate agency and instantly notify the agency accordingly [15]. Furthermore, research by [16] highlights the utilization of big data analytics is a sophisticated tool, not only to fulfil citizens' request but also to generate public value for the communities. In addition, citizens also found that smart parking apps provided by the smart government are useful as they could help the citizens to identify their position, search for nearby transport links, show possible parking areas, and book a parking slot [17].

In the United Kingdom (UK), according to [18] it is common to use real time services to access weather forecasts and public transport information through smart devices. Moreover, the mobile application for weather forecasts can also provide smallholder farmers to get beneficial information to support their daily agricultural activities [14]. In Australia, there is a location-based emergency service that is accessible through mobile devices to assist people with emergency need [19].

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[1]Indonesian acronym of *SAMSAT Mobile Jawa Barat*. SAMBARA is a mobile application-based government services developed by West Java Province Regional Revenue Agency collaborated with the other West Java *SAMSAT* team members. *SAMSAT* is an Indonesian acronym of *Sistem Administrasi Manunggal Satu Atap*. *SAMSAT* is a one stop administration services office for a series of activities in the implementation of registration and identification of motorized vehicles, payment of motorized vehicle taxes, customs of transfer of motorized vehicle names, and payment of mandatory donations for traffic accidents and road transportation in an integrated and coordinated manner in *SAMSAT* joint office. *SAMSAT* joint office is a place for three different government organizations: the Republic Indonesia Police Department, the Regional Revenue Agency, and National Owned Business Entity in organizing *SAMSAT*.

[2]Indonesian words that mean digital villages in West Java Province.

[3]Indonesian acronym of *Pusat Informasi dan Koordinasi COVID-19 Jawa Barat*.

Furthermore, smart government adoption also increased in digital ticketing for public transport. Digital ticketing reduces purchase time, provides easy ways to validate a ticket, and citizens no longer need to queue [20]. Mobile application-based ticketing services also increases the possibility to obtain up-to-date information regarding public transportation timetables and interruptions [20]. Another example is the implementation of medical apps such as in Taiwan called Taiwan Medical Travel (TMT) app. The Taiwanese government has developed medical applications to promote and enhance Taiwan's healthcare services for their medical tourists [21].

Even though there are many digital-based government applications for public sectors, researchers highlight some challenges in developing and implementing smart government services. Previous researchers conclude organizations need to understand more factors that influence success smart government initiatives [22], how to measure achievement of smart government services [23], and the need to understand how to create clear direction and priorities in smart government developments [24]. In a qualitative study proposed by [22], researchers report three important component for making successful smart government programs, which are the institutional, organizational, and leadership.

Meanwhile in study [23], researchers claim that to assess smartness in smart government services, the service provider needs to consider how efficient, effective, transparent, and collaborative the service is in both internal and external perspective. In study [24] researchers propose eight key features for smart government development in a smart city context, which are (1) enlarge community digitalization and advance its digital capabilities; (2) redefine collaboration approaches between administration, politics and communities; (3) clearly define the collaboration guidelines and range of impact; (4) each stakeholder perform with the accountability of decision-making and the accomplishment of the selected strategies; (5) create a space for invention and risk-taking acceptance; (6) regulate personal data materials without reducing creativity and expansion; (7) assure the security, equality, and fairness; and (8) improve connectivity, collaboration, and communication.

Despite the benefits and challenges, smart government services adoption is continuing to grow. The literature review as demonstrated in [5], [13], and [25] proposed theoretical models and experimental studies regarding smart government service adoption. Study [5] suggests a comprehensive system success model by combining Technology Acceptance Model (TAM) and Information System (IS) success theory. In empirical study [5], researchers recommend IoT utilization in the public sector, which can accelerate public value creation, citizens trust as well as their intention to use public services.

Further, in empirical study [13], researchers use the Diffusion of Innovation Theory (DOI) framework to show how service innovation is influenced by citizens perceived risk, trust and quality, which is important for smart government service acceptance. On the other hand, study [25] shows that the IS

success model component, which are System Quality, Information Quality and Service Quality is important to consider for smart government service adoption. As IS success model is widely used, it shows a comprehensive understanding as to how to create success information systems [11]. However, study [25] is limited in displaying the effectiveness of service adoption as it only partially used the IS success model.

III. THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

In this section, the authors review the theoretical framework and propose the hypotheses that was developed according to literature review. The research framework as shown in Figure 1 adopts the IS success model that used to measure trust in electronic government [26]. This model aims to study how the technological aspects, government aspects, citizen aspects, engagement, and social influence could affect the citizens' trust in smart government services. Further, the proposed framework examines the implication of citizens' trust in smart government services to the service adoption, satisfaction, and perceived value.

A. TECHNOLOGICAL ASPECTS

Technology is a vital component for IT-based government service adoption since it affects individual beliefs that interactions with these systems are expected and can be trusted [11]. There are three different measurements to understand the technological aspects of IS according to [25], which are Information Quality, System Quality, and Service Quality.

1) INFORMATION QUALITY

The IS output includes accuracy, extent of completeness, extent of relevance, the substances, also whether the information in time, is measured in Information Quality [7]. In addition, information quality also correlated with how the information was presented to the potential users as it needs to be displayed in a well-organized way, up-to-date, appropriate, accurate, and easy to understand [25], [27]. When users receive inadequate, unrelated or unclear information regarding the smart government services, it will have a negative influence on their trust level of the services [28].

2) SYSTEM QUALITY

System quality is a measurement for the information processing system that included stability, user-friendliness, good availability, and reliability of the system [7], [25], [29]. Furthermore, study [30] proposed that the reliability of the IS was reflected in the proper and accurate functioning of the service, interacting with it as promised by service providers. Moreover, study [13] describes in more detail the availability and reliability of the services, such as the system being accessible 24 hours/7 days anywhere without any interruption. However, study [30] argued that the quality of smart government technologies related to the relative advantage of the service. Citizens who receive smart government services that reliable will lead them to trust the system [28]. When

they trust the system service, they will continue to use the services [11], [31].

3) SERVICE QUALITY

According to [7] service quality is the customer perception on the quality of hardware and software, how reliable the service is, and how supportive the staff on handling the service. Study [32] specifically highlights how important customer services is to service quality. It is important that the smart government customer service is always available and responds quickly to citizens' concerns [7], [29]. Furthermore, study [30] also noted how utilization of smart government services can avoid the bureaucratic procedures that sometimes appears when citizens directly visit public services. Poor service quality will lead consumers to mistrust the services [28], [26]. Moreover, service users will be hesitant and unwilling to use such services if they found the service quality experience was beyond their expectation level [7]. According to the above discussions, this paper developed a hypothesis as follow.

Hypothesis 1. Technological aspects positively affect citizen's trust in smart government services and positively influence their intention to use them.

B. GOVERNMENT ASPECTS

Study [33]–[35] proposed that trust in smart government as service provider was determined by their skills, benevolence, and integrity. Skills are a collection of abilities and competencies that allow the service provider to have an influence on a certain area [33]–[35]. Benevolence is the level of citizens' trust the government's ability to act ethically toward their citizens and do not become self-centered and by taking advantage of their citizens [33]–[35]. Meanwhile integrity

is citizens perceptions of a set of principles inherent in the government, which can be accepted by the citizens [33]–[35]. For example, study [34] proposed the significance of perceived good governance and minimizing corruption as vital components enhancing trust in smart government. Study [33] suggested the government needs to be able to understand citizens' need and preference, as well as making citizens' interest as their first priority. According to the above analysis, the following hypothesis was generated.

Hypothesis 2. Government aspects positively affect citizen's trust in smart government services and positively influence their intention to use them.

C. CITIZEN ASPECTS

Study [36] describes the importance of citizen aspects, such as their personal attitude to trust the smart technology. Whereas, study [11], [26] focus on how significant the user experience is using smart-government-based services to evaluate their trust level for those services.

For example, according to [11], people who have experience in using technology such as the internet, they tend to trust more IT-based government services. Accordingly, the following hypothesis is proposed.

Hypothesis 3. Citizen aspects positively affect their trust in smart government services and positively influence their intention to use them.

D. SOCIAL INFLUENCE

When people consider trying a new service, they likely to ask their social circle about their experience using such services [28], [38], [39]. Researchers have also mentioned that social support might give a contribution to others accepting smart government services [39], [40]. In addition,
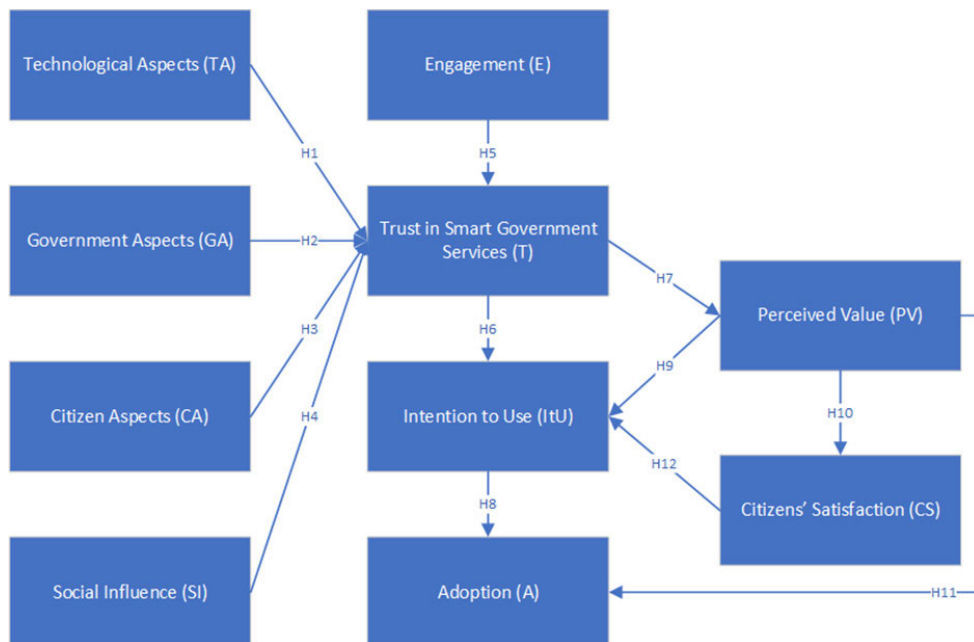

FIGURE 1. The proposed framework and hypotheses.

word-of-mouth plays a critical role in inducing customer's trust in online services because different customers' experience and comments regarding a product or services are important to consider for people before they decided to buy a product or services [28]. Moreover, when recommendations come from particular people who have specialized knowledge such as a therapist in health care, the users tend to consider his/her suggestion to adopt technology that useful for their wellbeing [36]. According to the above analysis, the following hypothesis has been formulated

Hypothesis 4. Social influence positively affects citizen's trust in smart government services and positively influence their intention to use them.

E. ENGAGEMENT
Based on study [41], resident engagement could influence citizens' trust level on the use of smart public services. Communication among the service provider and the service user is important to increase citizens' trust and engagement with IT-based services [41]. Study [18] explained that understanding citizens engagement in digital government services is critical as it can impact in creating benefit, not only for themselves but also for their communities. When citizens are greatly involved using these smart government services, it will have a beneficial impact on the services acceptance level [9]. Study [9] also suggests that using smart government services could connect citizens to the government so they can communicate and express their needs and expectations without boundaries. However, to establish such high engagement between citizens and government, citizens need to be trained and informed on how to enhance their participation using smart public services [9], [29]. According to the above analysis, the following hypothesis is generated.

Hypothesis 5. Engagement positively affects citizens' trust in smart government services and positively influence their intention to use them.

F. TRUST
Researchers have mentioned in their studies that the role of citizens' trust should be taken into account before implementing the use of any digital-based services [11], [31], [42]. Furthermore, study [36] described the importance of trust that could influence older adults' attitude on digital public services and their intention to use them. Study [10], [29], [42] described that trust on services is also influenced by the technical capability of the services to complete the task and the regulation that covers the deployment of the smart government services. In addition, study [43] explained their findings in a statistical manner where trust can influence digital-based government services usage in rural areas. Moreover, citizens' trust in smart government services also impacts their perceived value of the services [5], [14]. Accordingly, this manuscript proposes the following hypotheses:

Hypothesis 6. Citizen's trust in smart government services positively affects their intention to use them.

Hypothesis 7. Citizen's trust in smart government services positively affects their perceived value of them.

G. INTENTION TO USE
Study [7] describes the intention to use smart public services as a personal behavioral attitude that reshapes a personal's tendency to real use. In the previous study of smart government services, there have been validated the position of behavioral intention on the adoption of such services [7], [11], [31]. Moreover, study [7], [11] highlight that when the service users realize the benefits of the services, they intend to be more likely to continue using the services. Furthermore, study [7], [11] argue that when users intend to use such services, they will strongly be involved in the use of the smart public services. Thus, this research formed the hypothesis as follow:

Hypothesis 8. Citizen's intention to use smart government services positively affects their adoption of them.

H. PERCEIVED VALUE
Researchers have explained how the users' perceived value can have a positive effect on the citizens' intention to use the ICT based services continuously [18], [44]. Perceived value, according to the literature, refers to the whole evaluation of the function of a product considering what has been received by the users and what has been given by the product [18]. In fact, every user will have their own perception regarding the value since some of them will consider the volume, quality, comfortability, whereas others think of the cost, time or effort they need to spend [18]. Furthermore, study [18] highlights that citizens' perceived value influences their intention to use smart public services. Study [14] found that users' perceived value on IT-based services impact user service adoption. However, previous studies limited in presenting the correlation between smart government value perception and user satisfaction. Therefore, we developed hypotheses as follows:

Hypothesis 9. Citizens' perceived value on smart government services positively affects their intention to use them.

Hypothesis 10. Citizens' perceived value on smart government services positively affects their satisfaction with them.

Hypothesis 11. Citizens' perceived value on smart government services positively affects their adoption of them.

I. CITIZENS' SATISFACTION
Service consumers are more likely to compare their knowledge after using smart government services with their expectation, which then become satisfaction consideration [7], [26], [41]. This satisfaction level depends on how the users evaluate the service as it could be the same or above their expectations, which means satisfied, or otherwise unsatisfied if they received the service below their expectations [7]. Citizen's satisfaction with smart government services positively affects their intention to use smart government services [7], [11], [41]. Study [41] revealed that once people are satisfied with existing services, they have a tendency to continue to

use such services as they realize the consequences when they do not use the service. Moreover, users will be interested and committed to using the service [41]. Accordingly, the following hypothesis was generated.

Hypothesis 12. Citizens' satisfaction with smart government services positively affects their intention to use them.

IV. METHODOLOGY

To ensure research reliability and validity, this manuscript was developed based on the result of previous smart public services research studies. This research also has gained approval from Deakin University and the West Java Province Government. The authors developed questionnaires based on the literature review listed in Appendix (Table 8). The questionnaire also documented the demographics of the respondents. All questions that measure the create variables, which are applied to a five-point Likert scale, varying from 1 (''strongly disagree'') to 5 (''strongly agree''). Furthermore, the questionnaires were translated by the author from English into Indonesian as the participants are mostly non-English speakers.

Previously we developed a pilot survey of twenty citizens who have the same characteristics with the target respondent to get their feedback for the survey questions in Indonesian. We also discussed the questionnaires with higher degree research students to allow the researchers to obtain extra feedback on the questionnaires. Some of the feedback included to reduce the number of the questions, use simpler language, and shorter statements. The final Indonesian and English edition of the survey were sent to English teacher who could speak both languages to check and validate the translation of all survey questions.

The respondents were selected through random sampling, and we use an online survey. The researchers developed the online survey in Qualtric platform and distributed it to the West Java Province citizens who have used the *SAMBARA* mobile application. We distributed the survey through social media: Facebook, Instagram, and WhatsApp Groups from September to November 2020. Before the respondents answered the research questions, we asked them some screening questions regarding their ages (minimum 18 years old), have they registered their vehicle in West Java Province, do they work for West Java Province Regional Revenue Agency, and have they used *SAMBARA*. We also asked where they registered their vehicles. Table 1 reveals the names of the cities and regencies where citizens registered their vehicles. It lists the various cities and regencies of the survey participants (25/27 cities and regencies), with most participants from Bandung City (36%) and Bandung Regency (14.9%).

We also asked the participants about their perception on the quality of the services. Table 2 shows that 47.2% of the participants said that the services were excellent and 27.6% said it was good. As gratitude for respondent's participation in the survey, the authors offered mobile phone vouchers IDR 25,000 (USD 1.7). In total, there were 712 record responses, with only 311 respondents who filled the survey completely.

From 311 survey participants, only 303 were valid as we found eight participants submitted more than once survey answers. There were no missing values for each question as we instructed that each question need to be answered by the participants. Linear Regression Analysis was used to validate the hypotheses and for investigating the functional relationship between variables.

V. RESEARCH FINDINGS
A. DEMOGRAPHIC PROFILE

A report of the respondents' demographic is summarized in Table 3. The results emphasized that the average participant's age ranged from 18 to 50 with the most of the participant's age from 18 to 30. In addition, 71.6% participants were male, and the rest were females (28.4%). The majority of respondents' education were diploma or bachelor's degree (51.2%). The respondents were mostly the government employee (32.7%) and private employee (29.4%). For the respondents' income per month mostly ranged between IDR 2,000,001 (USD 140) to IDR 5,000,000 (USD 351) which was 28.1%.

B. DESCRIPTIVE STATISTICS

Table 4 describes the items' mean and standard deviation. All items of the construct have a mean that greater than the neutral point as we used a five-point Likert scale 1 to 5. In addition, the Citizen Aspect construct was previously measure by three items, i.e., CA1, CA2, and CA3. Nevertheless, when we calculated the Cronbach alpha, the score was 0.168 which showed low reliability of the construct. Based on the result, if CA3 was deleted, the Cronbach alpha will get a high score (above 0.7). To increase the Cronbach alpha, we removed item CA3. In addition, Table 4 also describes that the Cronbach's alpha of all structures was over 0.79. It indicates that there was a highly reliable and internal consistency among the scales of the statistics. According to [45], the reliability is considered excellent if the Cronbach's alpha is between 0.93 and 0.94, strong if between 0.91 and 0.93, reliable if between 0.84 and 0.90, and fairly high if between 0.76 and 0.95.

C. CORRELATION ANALYSIS

The correlation analysis in this case used Spearman correlation. Since the data distribution is not a normal distribution, after conducting the Reliability Analysis we inspected the correlation using Spearman correlation (ρ) to discover the relationships between twelve factors and investigate the hypotheses using SPSS 26. The correlation between each construct using Spearman correlation shown in Table 5. The correlations between the TA, GA, CA, SI, E, T, ItU, A, CS and PV are positive and significant.

D. HYPOTHESES TESTING

To further strengthen the findings above, we test the hypotheses using a regression analysis. In Table 6 we can see that the independent variables TA, GA, CA, SI, E with dependent variable T has the value of R square 0.801. It indicates

TABLE 1. Summary of the cities and regencies where the participants registered their vehicles.

Cities and Regencies		N = 303	Percentage (%)
Cities			
1.	Bandung	109	36
2.	Cimahi	16	5.3
3.	Sukabumi	15	5.0
4.	Tasikmalaya	12	4.0
5.	Cirebon	5	1.7
6.	Banjar	5	1.7
7.	Depok	4	1.3
8.	Bekasi	3	1.0
9.	Bogor	3	1.0
Regencies			
10.	Bandung	45	14.9
11.	Bandung Barat	18	5.9
12.	Sukabumi	15	5.0
13.	Ciamis	9	3.0
14.	Garut	8	2.6
15.	Tasikmalaya	7	2.3
16.	Cianjur	6	2.0
17.	Indramayu	5	1.7
18.	Kuningan	4	1.3
19.	Bekasi	3	1.0
20.	Bogor	3	1.0
21.	Purwakarta	2	0.7
22.	Sumedang	2	0.7
23.	Cirebon	2	0.7
24.	Karawang	1	0.3
25.	Subang	1	0.3
26.	Pangandaran	0	0.0
27.	Majalengka	0	0.0

TABLE 2. Citizens perception regarding the service quality of the SAMBARA services.

Service quality scale 1 (extremely poor) to 5 (excellent)	N = 303	Percentage (%)
1	3	1.0
2	7	2.3
3	36	11.9
4	114	37.6
5	143	47.2
Total	303	100.0

the independent variables (TA, GA, CA, SI, E) explained 80.1% of the variation in Trust. Furthermore, between (T, PV, CS) and ItU the value of R square 0.713 indicates that independent variables (T, PV, CS) explained 71.3% of the variation in Intention to Use. In addition, R square value between (ItU, PV) and A was 0.783, which shows the independent variables (ItU, PV) explained 78.3% of the variation in Adoption. As we can also see from the table, the value of R square variable Trust explained 48.9% of the variation in Perceived Value. In addition, the value of R square variable Perceived Value explained 52.2% of the variation in Citizens' Satisfaction.

TABLE 3. The demographics report of the survey respondents.

Demographics Variables	N = 303	Percentage (%)
Gender		
Male	217	71.6
Female	86	28.4
Age		
18 – 30	123	40.6
31 – 40	104	34.3
41 – 50	60	19.8
51 – 60	14	4.6
Above 60	2	0.7
Education		
Primary School	2	0.7
Junior High School	12	4.0
Senior High school	70	23.1
Diploma/Bachelor	155	51.2
Postgraduate	64	21.1
Occupation		
Student	31	10.2
Entrepreneur	47	15.5
Government employee	99	32.7
Private employee	89	29.4
Self-employee	16	5.3
Pensionary	3	1.0
Housewife	18	5.9
Income per month (IDR)		
0 (No income)	32	10.6
1 - 2,000,000	66	21.8
2,000,001 - 5,000,000	85	28.1
5,000,001 - 10,000,000	74	24.4
10,000,001 - 20,000,000	41	13.5
Above 20,000,000	5	1.7

In Table 7 the standardized coefficient (β) of Technological Aspects has 0.222, which is a significant result the p-value less than 0.001, therefore support H1. Government Aspects has $\beta = 0.386$, which is a significant result impacted the support of H2. Citizen Aspects has $\beta = -0.049$ but had an insignificant p-value, therefore rejected H3. In addition, Social Influence has $\beta = 0.112$, but the insignificant p-value and resulted in the rejection of H4. Whereas Engagement has $\beta = 0.314$ with a significant p-value and resulted in supporting H5. Trust has a positive result $\beta = 0.402$ and had a substantial and positive effect on Intention to Use and supported H6. In addition, β of Trust is 0.700 and had a necessary and positive impact on Perceived Value supporting H7. Standardized coefficient(β) of Intention to Use 0.666 as it means that the variable Intention to Use had an important and positive impact on Adoption and which supported H8. Perceived Value has $\beta = 0.178$ and had a substantial and positive effect on Intention to Use, supporting H9. Perceived Value also has the standardized coefficient(β) 0.722 and had a necessary and positive impact on Citizens' Satisfaction supporting H10. Perceived Value also had a substantial and positive influence on Adoption, supporting H11. Finally, Citizens' Satisfaction had a substantial and positive

TABLE 4. The descriptive statistics of the survey data.

Construct	Item	N	Min	Max	Mean	Std. deviation	Cronbach alpha	No. of Item
Technological Aspects (TA)	InfQ1	303	1	5	4.33	0.765	0.943	14
	InfQ2	303	1	5	4.29	0.715		
	InfQ3	303	1	5	4.14	0.820		
	InfQ4	303	1	5	4.27	0.723		
	InfQ5	303	1	5	4.19	0.784		
	SysQ1	303	1	5	4.43	0.802		
	SysQ2	303	1	5	4.33	0.800		
	SysQ3	303	1	5	4.30	0.860		
	SysQ4	303	1	5	4.02	0.947		
	SerQ1	303	1	5	4.33	0.786		
	SerQ2	303	1	5	4.22	0.764		
	SerQ3	303	1	5	4.00	0.748		
	SerQ4	303	1	5	3.92	0.832		
	SerQ5	303	1	5	3.84	0.873		
Government Aspects (GA)	GA1	303	1	5	4.31	0.702	0.909	3
	GA2	303	1	5	4.21	0.737		
	GA3	303	1	5	4.16	0.756		
Citizen Aspects (CA)	CA1	303	1	5	4.46	0.623	0.792	2
	CA2	303	1	5	4.30	0.776		
Social Influence (SI)	SI1	303	1	5	4.05	0.879	0.951	3
	SI2	303	1	5	4.02	0.838		
	SI3	303	1	5	4.00	0.852		
Engagement (E)	E1	303	1	5	4.02	0.795	0.821	3
	E2	303	1	5	4.15	0.809		
	E3	303	1	5	3.75	0.874		
Trust (T)	T1	303	1	5	4.27	0.672	0.939	6
	T2	303	1	5	4.12	0.739		
	T3	303	1	5	4.21	0.682		
	T4	303	1	5	4.17	0.706		
	T5	303	1	5	4.06	0.785		
	T6	303	1	5	4.06	0.759		
Intention to Use (ItU)	ItU1	303	1	5	4.26	0.701	0.870	3
	ItU2	303	1	5	4.05	0.818		
	ItU3	303	1	5	4.05	0.808		
Adoption (A)	A1	303	1	5	4.23	0.685	0.856	2
	A2	303	1	5	4.08	0.806		
Citizens' Satisfaction (CS)	CS1	303	1	5	4.30	0.758	0.910	3
	CS2	303	1	5	4.25	0.740		
	CS3	303	1	5	4.13	0.811		
Perceived Value (PV)	PV1	303	1	5	4.38	0.597	0.900	3
	PV2	303	1	5	4.38	0.628		
	PV3	303	1	5	4.35	0.658		

impact on Intention to Use, supporting H12. As illustrated by Figure 2 overall regression analysis coefficients supported ten hypotheses (H1, H2, H5, H6, H7, H8, H9, H10, H11 and H12) and rejected two hypotheses (H3 and H4).

VI. DISCUSSION

According to the results of this quantitative study, it shows that trust in the services provided by smart government might become an essential component in shaping citizens' choice to use the services. The research study describes those technological aspects, government aspects, and engagement influences citizens' trust in smart government services. Moreover, a significance of those factors and directly affected between citizens' trust in digital government services and their intention to use and adopt the services is founded. In addition, this research also shows the correlation between citizens' trust and their perceived value and satisfaction regarding the service. Reflecting on the literature in study [11], [26]

TABLE 5. The correlation analysis using Spearman correlation (ρ).

	TA	GA	CA	SI	E	T	ItU	A	CS	PV
TA	1.000	0.765**	0.712**	0.663**	0.617**	0.751**	0.677**	0.691**	0.730**	0.689**
GA	0.765**	1.000	0.727**	0.713**	0.714**	0.817**	0.722**	0.759**	0.765**	0.739**
CA	0.712**	0.727**	1.000	0.576**	0.563**	0.637**	0.676**	0.684**	0.714**	0.737**
SI	0.663**	0.713**	0.576**	1.000	0.747**	0.774**	0.728**	0.700**	0.669**	0.577**
E	0.617**	0.714**	0.563**	0.747**	1.000	0.760**	0.695**	0.717**	0.670**	0.565**
T	0.751**	0.817**	0.637**	0.774**	0.760**	1.000	0.751**	0.739**	0.746**	0.685**
ItU	0.677**	0.722**	0.676**	0.728**	0.695**	0.751**	1.000	0.842**	0.741**	0.708**
A	0.691**	0.759**	0.684**	0.700**	0.717**	0.739**	0.842**	1.000	0.778**	0.744**
CS	0.730**	0.765**	0.714**	0.669**	0.670**	0.746**	0.741**	0.778**	1.000	0.746**
PV	0.689**	0.739**	0.737**	0.577**	0.565**	0.685**	0.708**	0.744**	0.746**	1.000

**Correlation is significant at the 0.01 level (2-tailed).

TABLE 6. Summary of R square independent and dependent variables.

Dependent Variables	Independent Variables	R square (R^2)
Trust in Smart Government Service (T)	TA, GA, CA, SI, E	0.801
Intention to Use (ItU)	T, PV, CS	0.713
Adoption (A)	ItU, PV	0.783
Perceived Value (PV)	T	0.489
Citizens' Satisfaction (CS)	PV	0.522

TABLE 7. The result of hypotheses testing.

Hypotheses	Variables	β value	p value	Finding
H1	Technological Aspects → Trust	0.222	0.000***	Supported
H2	Government Aspects → Trust	0.386	0.000***	Supported
H3	Citizens Aspects → Trust	-0.049	0.275	Rejected
H4	Social Influence → Trust	0.112	0.015	Rejected
H5	Engagement → Trust	0.314	0.000***	Supported
H6	Trust → Intention to Use	0.402	0.000***	Supported
H7	Trust → Perceived Value	0.700	0.000***	Supported
H8	Intention to Use → Adoption	0.666	0.000***	Supported
H9	Perceived Value → Intention to use	0.178	0.000***	Supported
H10	Perceived Value → Citizens' Satisfaction	0.722	0.000***	Supported
H11	Perceived Value → Adoption	0.278	0.000***	Supported
H12	Citizens' Satisfaction → Intention to Use	0.341	0.000***	Supported

***Correlation is significant at p value < 0.001.

emphasized on the position of user's trust in digital-based government services including how the services can add confidently towards increasing their satisfaction and the benefits in using the services.

Furthermore, in the context of smart government services, citizens can predict trust when they utilize the services before they constantly use and adopt it. In determining the significant problems affecting citizens' trust in smart government services, the results verified three key determinants and two insignificant aspects. The three significant factors are: technological aspects, government aspects, and engagement. Whereas factors that are insignificant were citizens aspects and social influence. In technological aspects, we found positive impact according to our observed work that when citizens received the reliable technology experience, it will impact their trust of the services. This result is constant with the earlier studies, which underlined how technological factors can certainly impact creating trust in digital-based government services [5], [11]. Further, our results have also confirmed government aspects impact citizens' trust in the services provided by the government. This is consistently in line with the literature which proposed that when the governments are transparent and trusted, these will influence public trust to the services the government provides [5], [11]. Studies have also confirmed engagement between citizens and government also impact citizens' trust in government services [46].

Further, our results have also confirmed citizens' trust in smart government services impacts citizens' intent to use the services. Previous literature has validated this finding as well that trust can positively influence citizens' intent to use smart government services [11], [31], [39]. Moreover,
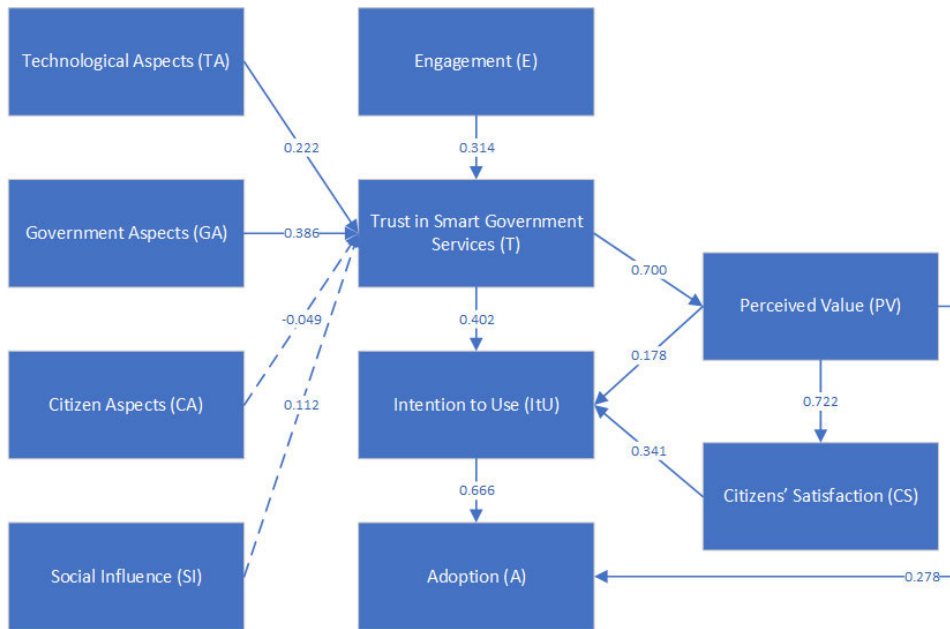
FIGURE 2. The result of hypotheses testing using regression analysis.

our results have also confirmed the intention of citizens to use smart government services also impacts on service adoption. This result is aligned with studies proposed the citizens' intention can impact citizens' adoption of digital-based smart government services [11], [31]. In addition, our results have confirmed citizens' trust in smart government services also impacts citizens' perceived value of the services. This has also proven by [14] whose research confirmed that trust can positively affect citizens' perceived value of digital-based government services. Further, our results have also confirmed citizens' perceived value in smart government services impacts citizens' adoption of the services. This finding has been verified by earlier literature, which proposed that perceived value can positively impact citizens' adoption of digital-based government services [14].

In addition, our results have also confirmed that perceived value in smart government services also impacts on the intention to use the services. This has also been confirmed by [18] whose study demonstrated that perceived value can significantly influence citizens' intention to use digital-based public services. Moreover, our findings have also confirmed citizens' perceived value in smart government services also impacts citizens' satisfaction towards the services. This argument is supported by earlier research, which proposed that citizens' satisfaction on digital-based government services might be impacted by citizens' perceived value [47]. Finally, our results have also confirmed citizens' satisfaction of smart government services impacts citizens' intention to use the services. In studies [7], [11], [41] also proposed that inhabitants' intention to use digital-based public services is positively impacted by citizens' satisfaction regarding those services. Moreover, this study also found that citizen's aspects regarding their ability and preference using the digital-based government services was insignificant regarding citizens' trust

in smart government services. Study [36] also supports this result as they found that a person's behavioral intention to use a digital-based product might not be motivated by the individual's trust in the product. Perhaps this caused by the research participants were mainly from ages 18 - 40 years old, which is categorized as younger adults that normally use modern technology. Our findings also revealed that social influence had not supported citizens' trust in smart government services. Even though some scholars have proposed social influence is important to support trust in digital-based services in their quantitative studies [40], but it was rejected by our empirical study.

Citizens usually ask their social circles or ask advice from experts, to minimize uncertainty in using a new technology [38], [39]. In the other words, the significance of social influence can support the citizens' intention to use digital services but partially support their trust in the technology.

In general, this study presents new understandings on the reasons citizens provide for trusting and adopting digital-based government services. It highlights the power of a citizens' trust and its effect on their decision to adopt the technological innovations of digital-based government services. Furthermore, people are interested in implementing smart government services if they think that using such services is consistent with their beliefs [18], [14], [44]. In this respect, our study demonstrates how trust in smart government services can offer the government help enhancing citizens' perceived value and satisfaction with the government services.

VII. CONCLUSION AND IMPLICATIONS

The aim of this investigation is to recognize the position of citizens' trust in smart government services in their service adoption. According to review on the previous literature, this paperwork created a framework for examining citizens'

TABLE 8. The survey questions.

Constructs with items		Sources
Information Quality		
InfQ1	Data generated by SAMBARA application is accurate.	[7], [25]
InfQ2	Data generated by SAMBARA application is relevant for me.	[7], [25]
InfQ3	The information provided by SAMBARA application is complete.	[27]
InfQ4	The information provided by SAMBARA application is easy to understand.	[25]
InfQ5	The information provided by SAMBARA application is up to date.	[25], [27]
System Quality		
SysQ1	SAMBARA application is easy to download and install through mobile device.	[32]
SysQ2	SAMBARA application is easy to use.	[7], [25]
SysQ3	SAMBARA application is accessible for 24 hours online every day and I can access it anywhere.	[13]
SysQ4	SAMBARA application enables me to complete transactions without interruptions.	[30], [32]
Service Quality		
SerQ1	Using SAMBARA application to pay motor vehicle tax can avoid payment delays caused by bureaucratic procedures.	[30]
SerQ2	The service quality of SAMBARA application is reliable.	[7]
SerQ3	SAMBARA application technical staff are competent.	[7]
SerQ4	SAMBARA application customer service is always available.	[29]
SerQ5	SAMBARA application customer service is quick in responding to citizens' concerns.	[29]
Government Aspects		
GA1	SAMBARA application service provider (West Java Province Regional Revenue Agency) is credible.	[35]
GA2	SAMBARA application service provider puts citizens' interests first.	[35]
GA3	SAMBARA application service provider understands citizens' needs and preferences.	[35]
Citizen Aspects		
CA1	I could use the SAMBARA application.	[48]
CA2	I like using SAMBARA application.	[49]
CA3*	I prefer to see government services directly, rather than using mobile application.	[11]
Social Influence		
SI1	People who are important to me think I should use SAMBARA application.	[38]
SI2	The people I know think I should use SAMBARA application.	[38]
SI3	My friends think I should use SAMBARA application.	[38]
Engagement		
CE1	Citizens are well connected with West Java Province Regional Revenue Agency via SAMBARA application.	[9]
CE2	Citizens are well advised and trained to use SAMBARA application.	[9]
CE3	Citizens' participation using SAMBARA application is well established.	[9]
Trust		
T1	SAMBARA application is trustworthy.	[31]
T2	Information Communication Technology (ICT) regulation adequately protects me from problems on SAMBARA application.	[31]
T3	SAMBARA application has the ability to fulfil its task.	[31]
T4	I trust the technology that SAMBARA application are using.	[42]
T5	Privacy on SAMBARA application is well-protected.	[39]
T6	I believe that SAMBARA application is secure.	[39]
Intention to Use		
ItU1	I intend to continue using SAMBARA application.	[30]
ItU2	I would prefer to use SAMBARA application than other SAMSAT services.	[7]
ItU3	I think most of the citizens in West Java Province will be using SAMBARA application.	[7]
Adoption		
Ado1	I will continue to use SAMBARA application.	[48]
Ado2	I encourage everyone to use SAMBARA application.	[48]
Citizens' Satisfaction		

TABLE 8. *Continued.* **The survey questions.**

CS1	SAMBARA application makes my motor vehicle tax payment easy.	[7]
CS2	I am satisfied with SAMBARA application.	[41]
CS3	SAMBARA application have met my expectations.	[41]
Perceived Value		
PV1	Compared to the effort I need to put in, the usage of SAMBARA application to check and pay motor vehicle tax is beneficial to me.	[18]
PV2	Compared to the time I need to spend, the usage of SAMBARA application to check and pay motor vehicle tax is worthwhile to me.	[18]
PV3	Overall, the usage of SAMBARA application to check and pay motor vehicle tax delivers good value for me.	[18]

*CA3 question was deleted based on insignificant level measurement.

utilization of smart government services and the effect that trust has on service adoption. The theoretical framework was examined across an empirical study conducted in the West Java Province Indonesia using data collected from 303 users of mobile application-based services for vehicle tax payment. The empirical results found demonstrated the effect of citizens' trust was motivated by, not only technological aspects, but also engagement and government aspects, which can lead to citizens' intention to adopt the service. Furthermore, the consequences of this empirical research have also shown the substantial and constructive impact of citizens' perceived value on their intention to use and adopt the services. Moreover, it also highlighted the important and positive impact of citizens' satisfaction on their intention to use.

Whereas, from the users' standpoint it is obvious that they would trust smart government services if the services were of good quality and performance well. Moreover, government performance is also important for citizens. The more the government perform good governance and try to promote and educate citizens on how to use the service, the more they will trust the services. In addition, the government also needs to increase citizens' trust in using smart public services, as citizens' trust significantly impacts on the use of services. Furthermore, citizens' trust in the end would improve the whole consumption, operations, and users' involvement in smart public services in the West Java Province.

This research provides significant information for researchers and practitioners from the perspective of the citizens regarding smart government services. From a researchers' perspective, this study contributes to understanding the role of citizens' trust in the utilization of digital-based public services. By exploring the influence of trust and its correlation with promoting citizens' service adoption, this study has provided a new perspective on how creative and promising technology could play a critical part in citizens daily lives if they trusted the services. Our research findings also verify that smart government services offer citizens not only value, but also satisfaction in public services.

Whereas, from a practitioners' perspective, these research findings recommend service providers to enhance their performance and credibility to increase citizens' trust on the services they are providing. Similarly, the government also needs to engage with the citizens in various ways to attract the citizens to use their digital-based services. When citizens' feel that the services have given them value, they feel satisfied with it, so their trust levels will increase. On the other hand, from a policy maker's perspective, this research could become an important reference to the governments and service providers to understand and develop effective smart government services adoption strategies.

Our findings also suggest the authorities and the service providers to improve citizens' knowledge on digital based government services as this can increase citizens usage and trust on public services. However, to improve the citizens' trust level, both the government and service provider need to consider enhancing the technological aspects, government aspects and engagement. Nonetheless, despite such challenges, smart government services provide an opportunity to citizens who used the services for receiving both value and satisfaction.

VIII. LIMITATIONS AND DIRECTIONS FOR FUTURE STUDIES

We found some limitations in this study. Firstly, the survey sample covered one province: West Java Province Indonesia. As a result, the findings cannot be viewed as a generalization since the results might be different in other provinces. Secondly, the evaluation of this research did not cover the citizens background since this study focused on citizens' opinions and behaviors towards digital public services. In addition, this research adds to the existing knowledge of citizens' trust on innovative technologies in public services.

The research framework found three key factors i.e., technology, government aspects, and engagement, and how they individually impact citizens' trust in smart government services and how these factors affect service adoption. In the other words, this research has provided a reasonable contribution to IS trust and its impact to service acceptance and use in government service. Moreover, this study has enriched the existing literature trust in IS in the context of smart government services. Furthermore, Indonesia has 34 provinces, and each province has different way to manage their vehicle tax system. Future research could target the citizens from other provinces or countries to present a comparative study on the role of trust towards digital government services.

Even though this work was undertaken in the West Java Province, the respondents did not cover the whole population in West Java Province which is spread in 27 cities and regencies since most of them from the Bandung City, and its neighbors: Cimahi City, Bandung Regency, and Bandung Barat Regency. The West Java Province is a large province with various citizens' culture and characteristics in each region. In other words, the results cannot be interpreted as a generalization for the province.

APPENDIX
See Table 8.

REFERENCES

[1] B. W. Wirtz, J. C. Weyerer, and F. T. Schichtel, "An integrative public IoT framework for smart government," *Government Inf. Quart.*, vol. 36, no. 2, pp. 333–345, Apr. 2019.

[2] G. V. Pereira, G. Eibl, C. Stylianou, G. Martínez, H. Neophytou, and P. Parycek, "The role of smart technologies to support citizen engagement and decision making: The SmartGov case," *Int. J. Electron. Government Res.*, vol. 14, no. 4, pp. 1–17, Oct. 2018.

[3] J. R. Gil-Garcia, J. Zhang, and G. Puron-Cid, "Conceptualizing smartness in government: An integrative and multi-dimensional view," *Government Inf. Quart.*, vol. 33, no. 3, pp. 524–534, Jul. 2016.

[4] A. Kankanhalli, Y. Charalabidis, and S. Mellouli, "IoT and AI for smart government: A research agenda," *Government Inf. Quart.*, vol. 36, no. 2, pp. 304–309, 2019.

[5] S. R. Chohan and G. Hu, "Success factors influencing citizens' adoption of IoT service orchestration for public value creation in smart government," *IEEE Access*, vol. 8, pp. 208427–208448, 2020.

[6] S. K. Kim, M. J. Park, and J. J. Rho, "Does public service delivery through new channels promote citizen trust in government? The case of smart devices," *Inf. Technol. Develop.*, vol. 25, no. 3, pp. 604–624, Jul. 2019.

[7] S. Chatterjee, A. K. Kar, and M. P. Gupta, "Success of IoT in smart cities of India: An empirical analysis," *Government Inf. Quart.*, vol. 35, no. 3, pp. 349–361, Sep. 2018.

[8] P. N. Sharma, F. V. Morgeson, S. Mithas, and S. Aljazzaf, "An empirical and comparative analysis of E-government performance measurement models: Model selection via explanation, prediction, and parsimony," *Government Inf. Quart.*, vol. 35, no. 4, pp. 515–535, Oct. 2018.

[9] S. Chatterjee and A. K. Kar, "Effects of successful adoption of information technology enabled services in proposed smart cities of India: From user experience perspective," *J. Sci. Technol. Policy Manage.*, vol. 9, no. 2, pp. 189–209, Jul. 2018.

[10] N. A. S. Almuraqab and S. M. Jasimuddin, "Factors that influence end-users' adoption of smart government services in the UAE: A conceptual framework," *Electron. J. Inf. Syst. Eval.*, vol. 20, no. 1, p. 11, 2017.

[11] L. Alzahrani, W. Al-Karaghouli, and V. Weerakkody, "Investigating the impact of citizens' trust toward the successful adoption of e-government: A multigroup analysis of gender, age, and Internet experience," *Inf. Syst. Manage.*, vol. 35, no. 2, pp. 124–146, Apr. 2018.

[12] S. Kumagai and F. Iorio, *Building Trust in Government Through Citizen Engagement*, World Bank, Washington, DC, USA, 2020. [Online]. Available: https://openknowledge.worldbank.org/handle/10986/33346License:CCBY3.0IGO

[13] M. I. R. M. Jaradat, A. A. Moustafa, and A. M. Al-Mashaqba, "Exploring perceived risk, perceived trust, perceived quality and the innovative characteristics in the adoption of smart government services in Jordan," *Int. J. Mob. Commun.*, vol. 16, no. 4, pp. 399–439, 2018.

[14] P. Jayashankar, S. Nilakanta, W. J. Johnston, P. Gill, and R. Burres, "IoT adoption in agriculture: The role of trust, perceived value and risk," *J. Bus. Ind. Marketing*, vol. 33, no. 6, pp. 804–821, Jul. 2018.

[15] W.-N. Wu, "Determinants of citizen-generated data in a smart city: Analysis of 311 system user behavior," *Sustain. Cities Soc.*, vol. 59, Aug. 2020, Art. no. 102167.

[16] A. T. Chatfield and C. G. Reddick, "A framework for Internet of Things-enabled smart government: A case of IoT cybersecurity policies and use cases in U.S. federal government," *Government Inf. Quart.*, vol. 36, no. 2, pp. 346–357, Apr. 2019.

[17] A. Fahim, M. Hasan, and M. A. Chowdhury, "Smart parking systems: Comprehensive review based on various aspects," *Heliyon*, vol. 7, no. 5, May 2021, Art. no. e07050.

[18] R. El-Haddadeh, V. Weerakkody, M. Osmani, D. Thakker, and K. K. Kapoor, "Examining citizens' perceived value of Internet of Things technologies in facilitating public sector services engagement," *Government Inf. Quart.*, vol. 36, no. 2, pp. 310–320, Apr. 2019.

[19] N. F. A. Budi, H. R. Adnan, F. Firmansyah, A. N. Hidayanto, S. Kurnia, and B. Purwandari, "Why do people want to use location-based application for emergency situations? The extension of UTAUT perspectives," *Technol. Soc.*, vol. 65, May 2021, Art. no. 101480.

[20] R. B. Adducul, "Mobile bus ticketing system: Development and adoption," *Int. J. Adv. Trends Comput. Sci. Eng.*, vol. 9, no. 1, pp. 189–196, Jun. 2020.

[21] H.-Y. Lu and W.-Y. Wu, "Factors associated with medical travel behaviours: The input–process–output perspective," *Current Issues Tourism*, vol. 21, no. 3, pp. 243–258, Feb. 2018.

[22] A. A. Guenduez, S. Singler, T. Tomczak, K. Schedler, and M. Oberli, "Smart government success factors," *Yearbook Swiss Administ. Sci.*, vol. 9, no. 1, pp. 96–110, 2018.

[23] O. Velsberg, U. H. Westergren, and K. Jonsson, "Exploring smartness in public sector innovation–creating smart public services with the Internet of Things," *Eur. J. Inf. Syst.*, vol. 29, no. 4, pp. 350–368, Jul. 2020.

[24] P. J. Sankowska, "Smart government: An European approach toward building sustainable and secure cities of tomorrow," *Int. J. Technol.*, vol. 9, no. 7, pp. 1355–1364, 2018.

[25] A. Ameen, K. Alfalasi, N. A. Gazem, and O. Isaac, "Impact of system quality, information quality, and service quality on actual usage of smart government," in *Proc. 1st Int. Conf. Intell. Comput. Eng. Towar. Intell. Solut. Dev. Empower. Our Soc. (ICOICE)*, Dec. 2019, pp. 1–6.

[26] L. Alzahrani, W. Al-Karaghouli, and V. Weerakkody, "Analysing the critical factors influencing trust in e-government adoption from citizens' perspective: A systematic review and a conceptual framework," *Int. Bus. Rev.*, vol. 26, no. 1, pp. 164–175, Feb. 2017.

[27] S. K. Sharma, A. Al-Badi, N. P. Rana, and L. Al-Azizi, "Mobile applications in government services (mG-App) from user's perspectives: A predictive modelling approach," *Government Inf. Quart.*, vol. 35, no. 4, pp. 557–568, Oct. 2018.

[28] R. Nulhusna, P. I. Sandhyaduhita, A. N. Hidayanto, and K. Phusavat, "The relation of e-government quality on public trust and its impact on public participation," *Transforming Government, People, Process Policy*, vol. 11, no. 3, pp. 393–418, Aug. 2017.

[29] F. Shahzad, G. Xiu, I. Khan, and J. Wang, "M-government security response system: Predicting citizens' adoption behavior," *Int. J. Hum.–Comput. Interact.*, vol. 35, no. 10, pp. 899–915, Jun. 2019.

[30] S. M. E. Sepasgozar, S. Hawken, S. Sargolzaei, and M. Foroozanfa, "Implementing citizen centric technology in developing smart cities: A model for predicting the acceptance of urban technologies," *Technol. Forecasting Social Change*, vol. 142, pp. 105–116, May 2019.

[31] A. A. Alalwan, A. M. Baabdullah, N. P. Rana, K. Tamilmani, and Y. K. Dwivedi, "Examining adoption of mobile internet in Saudi Arabia: Extending TAM with perceived enjoyment, innovativeness and trust," *Technol. Soc.*, vol. 55, pp. 100–110, Nov. 2018.

[32] M. A. Shareef, V. Kumar, Y. K. Dwivedi, and U. Kumar, "Service delivery through mobile-government (mGov): Driving factors and cultural impacts," *Inf. Syst. Frontiers*, vol. 18, no. 2, pp. 315–332, Apr. 2016.

[33] G. A. Porumbescu, "Linking public sector social media and e-government website use to trust in government," *Government Inf. Quart.*, vol. 33, no. 2, pp. 291–304, Apr. 2016.

[34] G. A. Porumbescu, "Placing the effect? Gleaning insights into the relationship between citizens' use of E-government and trust in government," *Public Manage. Rev.*, vol. 18, no. 10, pp. 1504–1535, Nov. 2016.

[35] J. Xu, R. T. Cenfetelli, and K. Aquino, "Do different kinds of trust matter? An examination of the three trusting beliefs on satisfaction and purchase behavior in the buyer–seller context," *J. Strategic Inf. Syst.*, vol. 25, no. 1, pp. 15–31, Mar. 2016.

[36] V. Chang, Y. Wang, and G. Wills, "Research investigations on the use or non-use of hearing aids in the smart cities," *Technol. Forecast. Soc. Change*, vol. 153, Apr. 2020, Art. no. 119231.

[37] E. Vaportzis, M. G. Clausen, and A. J. Gow, "Older adults perceptions of technology and barriers to interacting with tablet computers: A focus group study," *Frontiers Psychol.*, vol. 8, pp. 1–11, Oct. 2017.

[38] N. Singh, N. Sinha, and F. J. Liébana-Cabanillas, "Determining factors in the adoption and recommendation of mobile wallet services in India: Analysis of the effect of innovativeness, stress to use and social influence," *Int. J. Inf. Manage.*, vol. 50, pp. 191–205, Feb. 2020.

[39] S. Z. Ahmad and K. Khalid, "The adoption of M-government services from the user's perspectives: Empirical evidence from the United Arab Emirates," *Int. J. Inf. Manage*, vol. 37, no. 5, pp. 367–379, 2017.

[40] W. Chaouali, I. Ben Yahia, and N. Souiden, "The interplay of counter-conformity motivation, social influence, and trust in customers' intention to adopt internet banking services: The case of an emerging country," *J. Retailing Consum. Services*, vol. 28, pp. 209–218, Jan. 2016.

[41] W.-T. Wang, W.-M. Ou, and W.-Y. Chen, "The impact of inertia and user satisfaction on the continuance intentions to use mobile communication applications: A mobile service quality perspective," *Int. J. Inf. Manage.*, vol. 44, pp. 178–193, Feb. 2019.

[42] I. Almarashdeh and M. K. Alsmadi, "How to make them use it? Citizens acceptance of M-government," *Appl. Comput. Informat.*, vol. 13, no. 2, pp. 194–199, Jul. 2017.

[43] S. Kamarudin, S. Z. Omar, Z. Zaremohzzabieh, J. Bolong, and M. N. Osman, "Factors predicting the adoption of e-government services in telecenters in rural areas: The mediating role of trust," *Asia–Pacific Social Sci. Rev.*, vol. 21, no. 1, pp. 20–38, 2021.

[44] M. R. Sultana, A. R. Ahlan, and M. Habibullah, "A comprehensive adoption model of M-government services among citizens in developing countries," *J. Theor. Appl. Inf. Technol.*, vol. 90, no. 1, pp. 49–60, 2016.

[45] K. S. Taber, "The use of Cronbach's alpha when developing and reporting research instruments in science education," *Res. Sci. Educ.*, vol. 48, no. 6, pp. 1273–1296, Dec. 2018.

[46] A. M. Aladwani and Y. K. Dwivedi, "Towards a theory of SocioCitizenry: Quality anticipation, trust configuration, and approved adaptation of governmental social media," *Int. J. Inf. Manage.*, vol. 43, pp. 261–272, Dec. 2018.

[47] H.-C. Wu, T. Li, and M.-Y. Li, "A study of behavioral intentions, patient satisfaction, perceived value, patient trust and experiential quality for medical tourists," *J. Qual. Assurance Hospitality Tourism*, vol. 17, no. 2, pp. 114–150, Apr. 2016.

[48] M. A. Shareef, Y. K. Dwivedi, S. Laumer, and N. Archer, "Citizens' adoption behavior of mobile government (mGov): A cross-cultural study," *Inf. Syst. Manage.*, vol. 33, no. 3, pp. 268–283, Jul. 2016.

[49] C.-L. Hsu and J. Chuan-ChuanLin, "An empirical examination of consumer adoption of Internet of Things services: Network externalities and concern for information privacy perspectives," *Comput. Hum. Behav.*, vol. 62, pp. 516–527, Sep. 2016.

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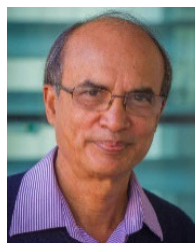
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