Article

The Role of E-Government Ambidexterity as the Impact of Current Technology and Public Value: An Empirical Study

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Abstract: This study aims to assess the impact of public value on e-government ambidexterity. Furthermore, current technology variables, public value variables, and e-government ambidexterity are incorporated into a framework for measuring e-government service performance. The partial least square structural equation modeling (SEM-PLS) approach was used in this study as the quantitative method. Four hundred twenty-five final data points were used as a sample, and all seven proposed hypotheses are accepted, have positive values, and have a significant impact. This study can be used as a guide for e-government organizers at the national and regional levels, as well as a resource for other studies examining e-government ambidexterity.

Keywords: e-government; e-government ambidexterity; public value; current technology

1. Introduction

The aftermath of the COVID-19 pandemic has seen its far-reaching impact realized, changing how people communicate, do business, learn and access government services. This has led to human activities being transformed into digital activities. However, this transformation is not new as these developments have occurred over the last five years, which we call Industrial Revolution 4.0. However, the pandemic has led to an acceleration of this industrial revolution.

With the introduction of e-government, the government becomes amongst the bodies feeling the impact of digitalization since public services are delivered digitally. This transition to digitalization is expected to support the government's efforts to adapt to the post-COVID-19 pandemic society and improve government services for the population. In general, many people are familiar with and use e-government services, such as digitization and information systems in schools, searching for regional information, paying taxes, managing civil registration, and conducting auctions. The development of e-government is progressing and must be adapted to current conditions. It facilitates changes in the existing bureaucracy and will affect future views and behaviors.

Government is responsible for providing services to the community, especially information services that the public needs. E-government is one of the digital channels that can connect government services to the public in a two-way link that can adapt to changes in technology, design, and strategy. E-government information is not only normative in nature but can also be a direct two-way interaction that benefits the relationship between the two parties. In order to foster support for public values, the government must be able to select e-government materials with the appropriate level of quality when creating content. This can influence citizen behavior and contribute to the continued success of e-government services.

The quality of e-government services is one of the most influential variables in shaping public opinion about the quality of government services. In contrast, public value is how consumers feel about their trust and satisfaction with the interactions that affect them.

Several previous studies have examined the relationship between e-government quality and public value, but the analysis has not been unified into a single paradigm. In their paper, Hariguna et al. [1] explains the concept of expectancy confirmation theory concerning e-government quality and public value. According to another study, five experimentally proven characteristics influence citizens' intentions to use a product or service [2]. In their study, Wirtz et al. [2] examined the elements that determine the success of e-government implementation. Also frequently cited is further research on relationship quality in social media marketing [3]. Relationship quality is defined in social media marketing as the link between user behavior and user experience, while in e-government, it has clear parallels with consumer and citizen behavior.

This study aims to quantify two public value concepts and assess the impact of e-government quality on public participation. This research will also assess the contribution of e-government and public value to online services, social media, mobile services, personalized users, online participation, and public information in e-government activities, which are the precursors of public value. In addition, this research will contribute to government in the form of facts and concrete instructions for developing e-government services that will facilitate public participation in using all e-government services. The research hopefully also assures that government performance affects Public Value. Previous studies have shown that the quality of information systems in e-government services can improve public sector performance [4]. This research will therefore provide a conceptual framework that can bridge the gaps between e-government, public values, and their antecedents.

The alignment between the different dimensions of the role of e-government and public values in the government environment, such as the depth and breadth of e-government types and the operational and strategic public values of e-government, is an additional consideration in this research [5]. Using the assimilation theory of information technology [6] and the value theory of information technology [7,8], the first step of this study is to assess the function of e-government in terms of public value independently. Then, using the concept of organizational ambidexterity, we examine the impact of merging the two aspects of e-government adoption on strategic value and operational value. The proposed model and hypotheses were then tested on a sample of government agencies. Additionally, this study includes recommendations for policymakers and consequences for the government on how public agencies can produce public value and adapt to the various dimensions of e-government, as well as the depth and breadth of e-government as public values that support e-government.

2. Literature Review

2.1. Online Service

Online services are an essential requirement for e-government, even though not all e-government services provide full access to online services. This notion aims at resolving public issues efficiently and accurately without intermediaries. They also enable users to conduct public e-transactions from a single access point in a comprehensive and exclusive online engagement. Analysis and benchmarking show that an example of best practice is to consider the performance of online services as a key factor of a modern public administration's e-government strategy. However, Chircu [9] has shown that the availability of full online services varies widely across countries. Therefore, adopting online services should be encouraged as they offer numerous benefits, including cost and time savings, which benefits both governments and citizens [9]. Hair et al. [10] points to a lack of research on integrating transactional and inclusive services in online services. Existing studies do not empirically examine the relationship between citizens' use of online services and their intention to use e-government services [11]. Usually, these studies propose a conceptual framework to capture the maturity of e-government. This study shows how online service users can influence their intention to use the e-government city portal.

2.2. Social Media

In recent years, both profit-oriented companies and government agencies have recognized the benefits of social networks. Because social media provides a robust platform for direct contact with citizens and is more interactive than face-to-face websites, the number of countries using social media applications for e-government services almost doubled between 2010 and 2014. Integrating social media into e-government portals will significantly change the public administration process in light of recent advances [12,13]. It is because citizen participation in administrative processes can lead to higher levels of transparency and improve citizens' relationships with government [14]. Bonson et al. [14] and Michaelidou and Hassan [15] found that when e-government services are delivered through social media apps, people are more likely to be interested because their online habits are changing.

Similarly, Riyanto [16] provides an overview of interactive and citizen-centered governance in their paper. According to their research, a government that is active on social media provides a forum for government and the public to discuss, create, implement and monitor public services, as well as offer solutions to problems with public services. In his study, Grimsley and Meehan [17] also explores how governments can engage with citizens. Hair et al. [10] focuses on visualizing public impressions of the environment through the use of data, photos and crowdsourcing from various social media platforms, laying the groundwork for more effective incorporation of public values into the planning process. According to Pang et al. [18], governments need to use modern technologies such as social media to engage citizens. Similarly, Moore [19] examined the use of social media to create public value by local governments. In their paper, they proposed a paradigm for studying Government 2.0 services based on the concept of public value. Similarly, Suhartono an Sari [20] examined the impact of social media on building public value in e-government.

2.3. Mobile Service

Smartphones are the most common technology nowadays, and nearly all citizens own one; hence, smartphones play a significant role in the activities of modern citizens. The use of smartphones involves the utilization of applications in the fields of education, health, business, and administration. Due to the rising demand for mobile service-based applications, it is necessary to take proper steps while designing a website compatible with tablet devices. Practitioners and academics have acknowledged the significance of m-government for citizens utilizing public services, as m-government has the potential to provide location-based and real-time information on demand, create electronic transaction services, and reach mobile citizens with innovative specialized services.

Given these benefits, and even though the deployment of m-government is still in its infancy [21], several more advanced e-governments have progressively increased the number of mobile services available on their municipal portals. The results of this study benchmarking indicate that the e-government website of the City of Hong Kong, for instance, has more than seventy approved mobile applications that provide information and services in all categories. The current transition from e-government to m-government necessitates study on m-government integration, as complete integration of government m-services has not yet been attained [22]. Consequently, residents may have quality and user acceptance problems with public M-services [23], as research on the successful adoption of m-government by citizens is insufficient at present.

2.4. Personalized User

Personalized user functions are utilized to support increasingly complicated and demanding community activities. This notion allows e-government services connected with other online services to be personalized. The personalized user feature enables citizens to tailor the services they require. Additionally, developers of e-government services can make this service interoperable with mobile services. For instance, it can be incorporated into e-service applications that enable citizens to organize frequently accessed online services into

a checklist for easier access, subscribe to a reminder device, receives notification functions for specific information or bills, or view bill accounts and make online payments. Recent events have prompted research into the function of personalized e-government.

E-commerce research examining web content personalization, such as difficult catalog navigation and product customization, demonstrates that the experience of customized features enhances online performance and boosts user satisfaction, brand loyalty, and revenue [24–26]. However, experts have also observed that user privacy should be considered when administering websites and customizing services [27]. In contrast to the empirical findings on personalization features in e-commerce, the role of personalization features in the context of e-government has not been thoroughly investigated. Thus, the outcomes of the personalization of e-commerce services can be easily applied to the setting of e-government. Although the impact of e-government personalization features has significant value for public services and increases the intention to use e-government services on an ongoing basis, there is a dearth of research that empirically examines the relationship between these features and e-government usage. In addition, the researchers recommend paying attention to conditions that can be troublesome in e-government personalization features, such as access rights, security, control, and privacy. Based on these findings, additional research can be conducted on this personalization option. Therefore, the impact of customization features on citizens' intent to use e-government is a suitable indicator of the efficacy of e-government material. Based on this finding, the personalization of services is a crucial element of e-government.

2.5. E-Participations

The main purpose of e-government is to facilitate government-to-citizen engagement by providing citizens with efficient, all-encompassing access. This can be accomplished by including citizens in the political process and through citizen involvement as a form of collaboration to promote democratic values [28,29]. E-participation refers to e-government based on citizen involvement and participation. Many local governments have gradually introduced e-participation services into their e-government websites without achieving citizen expectations and engagement [30]. In addition, this study's benchmarking results indicate that present e-government websites do not meet the requirements for e-participation services. However, the coherence of the benefits of e-participation services is quite high and substantially affects the demands of residents, particularly in cities that serve an international audience. A previous study confirms that the relationship between the administration of e-participation services and citizen experience is not fully explored in the literature on e-participation [31].

2.6. Public Informations

Based on the assessment of information system quality by Dwivedi et al. [32], the value of information is to reduce uncertainty. Therefore, several factors, including up-to-date information, are important attributes of the quality of a website. They must be properly considered when designing the information component of a website [12]. In this context, Dragulanescu [33] used the timeliness of public information to evaluate a website to measure the amount of information disseminated. Vien [34] extends and defines the definition by describing that information timeliness is part of information accuracy, which is enhanced by the truthfulness and relevance of information changes.

The high public demand for e-government services, accompanied by an increase in the number of current users of information technologies, has encouraged the government to provide a variety of services, including up-to-date government information, data, statistics, and other public e-services, which are currently considered as a single entity and have become standard guidelines for website design in government agencies. The main goal of designing and maintaining e-government is to maximize the accuracy and timeliness of information and services [35].

2.7. Public Value

According to Raisch et al. [36], one of the marketing principles that may be implemented for the growth of e-government is the relationship that is built and maintained to promote user-provider harmony, which delivers benefits such as customer loyalty, word-of-mouth (WoM), and also effectiveness. It is crucial to guarantee the continued use of e-government. Public values play a crucial role in guaranteeing the continued use of e-government services to win the public's support, which takes time and effort. On the other side, the presence of activities or resources that can provide feedback on services is essential for determining a service's effectiveness.

Loyalty is one of the criteria for implementing public value. Bowles and Hwang [13] define public value as the frequency with which people are willing to use a service. According to Jap [35], a person's intention to use a service again is influenced by previous opportunities and positive experiences. Generally, people use e-government services to receive information that corresponds with their thoughts and backgrounds. The public has a typical tendency to assess, compare, investigate, and even eliminate the information they gather. Both Hapsari et al. [37] and Falvian and Guinaliu [38] identify intention as a significant public behavior variable.

Khan et al. [39] define loyalty as a citizen's long-term propensity to reuse a service. Mazhari et al. [40] emphasized that loyalty provides service providers long-term benefits. Public fidelity is crucial to preserving excellent relationships with providers [13]. The goal of public engagement was defined by Jap [35] in terms of marketing, which is crucial and effective for disseminating information. According to Harrison et al. [41], participation is the public's desire to get active in government-sponsored events to provide ideas and suggestions for new services [41]. This study investigates the integration of e-government and public value based on intention and loyalty as an indicator of public behavior.

2.8. E-Government on Public Value

According to Bannister and Connolly [7], perceived value must support technology adoption. Understanding e-government and the value created requires expertise in public sector management. There are differences in services regarding the sense of attentiveness felt by users in relation to services provided by public institutions and private organizations. Private organizations provide for-profit services, i.e., services to each citizen as a user, while government organizations provide services with a citizen orientation. Therefore, in order for citizens to reuse public services, government organizations must consider public value as public sustainability.

This study is based on the theory of public value in public administration, which Moore [19] defines as citizens' shared expectations of government and public services. Usually, the influence of government action is not directly perceived by citizens but rather by stakeholders [42]. According to Castelnovo [42], some stakeholder groups and their interests are crucial for the study of public value. This view is reinforced by Harrison et al. [41]. They stated that public organizations need to develop public value as their organizational goal to meet the public's demands and desires. Cordella and Bonina [5] argued that public value could be used to address complicated sociopolitical issues that arise from the public sector's use of ICT. According to Cordella and Bonina [5], public sector reform in the context of public value is a combination of expectations of social fairness, trust, and legitimacy, with perceived impacts determined by the sociopolitical context in which they are implemented.

E-government interventions can be evaluated in terms of their effectiveness in enhancing public administration's capacity to increase the community's public value as service users, users, policymakers, and operators of public services. Moore [19] emphasizes that public value theory is used in an ICT-enabled public sector to examine these updates. As in previous studies examining the relationship between public value and e-government, Liao et al. [26] used a paradigm developed by Lavie et al. [43]. According to another study, an in-depth study of the impact of public value requires understanding and changing the perspective of public behavior that can be changed by ICT. To achieve public value,

the government implements economic, political, and social strategic goals, such as public service efficiency, voter equality, transparency, public regeneration, public welfare improvement, responsibility, and accountability [5,9,14,17,44]. In other words, obtaining public values in e-government can be viewed as a service provided by the e-government system to improve administrative efficiency, community services, and social ideals such as inclusion, democracy, transparency, and participation. Pee and Kankanhalli [45] confirmed the results of their study, in which they found that public value can be created using information technology resources derived from five organizational strengths: the strength of public service delivery, the strength of public participation, the strength of joint product production, the strength of resource formation, and the strength of public sector renewal.

2.9. E-Government Ambidexterity

Rather than focusing on the effects of a single adoption dimension, theoretical studies of the impacts of e-government adoption on public values should examine the combined impacts of many adoption factors. A review of the relevant literature shows that e-government ambidexterity can be used to analyze the appropriate strategies among the many dimensions of e-government adoption and their causal processes regarding public value.

Ambidexterity is the ability of a person to use both hands with equal skill [14,20]. In organizational management research, Cao et al. [46] and Fuhrer and Moore [47] describe ambidexterity as a metaphor for an organization that is able to both leverage and explore. March [48] first introduced the terms exploration and exploitation. March [48] explains that exploration is synonymous with change, risk-taking, experimentation, play, adaptability, and creativity. Exploration efforts focus on fundamental changes based on new information and resources. These changes may therefore involve greater risk but are critical to the long-term development of e-government [49]. March [48] describes that exploitation includes tasks such as extension, alternative, production, precision, screening, application, and implementation. Exploration activities focus on complementary changes from reusing existing knowledge and resources. Therefore, the risks taken tend to be lower; these change activities affect the short-term sustainability of e-government [50].

De Visser and Faems [49] and March [48] explain their findings, which reveal a tension between exploration and exploitation activities. Both activities struggle for resources but require very different mentalities and organizational procedures. Nonetheless, these tasks are critical to the survival and effectiveness of a government [51]. To increase its effectiveness and ensure longevity, the government must engage in both activities and choose them overtly and implicitly. This is referred to by Simsek [24] as ambidextrous e-government. In addition, previous studies on ambidexterity have focused on its perception, evaluation, influence, and impact and used it to examine a variety of e-government events, including strategy and relationship management, change and technology management, learning and design techniques. Several previous research studies have also demonstrated the role of ambidexterity in improving agency performance [24,43]. The construct definition used in this research is shown in Table 1.

Table 1. Construct Definition.

Construct	Definition	Source
E-Government Ambidexterity	E-government's capability to explore and leverage innovation activities collaboratively.	[24,49,50]
Public Value	The value generated by service activities, laws, regulations, and other government activities consists of two main roles, strategic and operational.	[7,41,42]
Online Service	Public understanding of modern e-government strategies and complete e-government services.	[52]
Social Media	Attempts made to gain insights into people's behavior toward e-government services by studying their activities on social networks.	[14]

Table 1. *Cont.*

Construct	Definition	Source
Mobile Service	Conducting an assessment of the public's understanding of integrated mobile government services.	[21,23]
Personalized User	Assessing public understanding of the use of personal accounts in e-government services.	[25,26]
Online Participation	Assessing public understanding regarding the integration of e-participation services into e-government services.	[30,31]
Public Information	Knowing the public's knowledge regarding current situation.	[12,31]

3. Hypothesis Development

One of the factors measuring public service is online service (OS). Using e-government allows citizens to access all public services without having to visit the office physically. E-government is intended as a communication medium between society and government. However, it should be noted that this form is heterogeneous depending on the maturity of society in certain sectors. On the other hand, OS services are a prominent aspect of e-government services that citizens can use without time or space limitations. Ultimately, public trust and satisfaction with these circumstances significantly affect the government's ability to create public value.

Therefore, Cai et al. [53] provide recommendations for optimizing the use of operating systems in e-government. This strategy can improve perceived values to the public and government, such as time and cost savings. Zhang et al. [54] state that a dearth of research uses operating systems to study operational services. Based on the available evidence, some previous studies have not used OS to investigate the public purpose and public value of e-government [54]. Some scholars focus exclusively on developing a conceptual framework for e-government maturity in this context. Therefore, this study aims to investigate whether OS policies influence e-public value and government ambidexterity, and the following hypotheses are proposed:

Hypothesis 1 (H1): *Online service has a positive and significant impact on public value.*

Social media is important for personal branding, knowledge dissemination, and e-government socialization. Social media can help citizens determine their brand, find a good location, and communicate effectively. Social media allows users to join established communities and receive instant feedback. The benefits of social media extend to bookmarking, sharing articles and information, and building opinions. In addition, social media facilitates meeting people with similar interests and activities in real life. Social media is a public information source that serves as an alternative means of disseminating information for the government and society as a whole so that the information obtained is transparent. Using social media as the government's media to communicate and disseminate information to the public is a method of adapting e-government to the growth of information technology.

Social media (SM) offers an alternative communication channel for e-government and the public, especially for those who are not frequent SM users. The use of social media in e-government has the advantage that the various functions and advantages of social media can be used to solve communication problems between e-government and the public. Therefore, using social media to communicate public information can promote more effective and efficient interaction between the government and citizens. This study shows that the use of social media in e-government increases public values, which leads us to the following hypothesis:

Hypothesis 2 (H2): *The use of social media in e-government will have a positive impact on public value.*

Nowadays, it is undeniable that mobile services (MS) have become the main target of various businesses and government organizations. The convenience and benefits offered by MS have prompted government agencies to include MS in the programs offered to the public. Not only social media but the use of smartphones in daily life is increasing very rapidly. Nonprofit and government organizations have developed online services and integrated them with smartphones. Some practitioners and scholars recognize the need for m-government to provide real-time and on-demand information, electronic transaction services, mobile phone communication, and personalized services to public service users.

Anima [55] stated that the application of m-government is still in its early stages. However, some of the more advanced e-governments continue to expand the offering of mobile services on their websites. This study confirms that many countries have developed e-government with official mobile applications to provide various information such as mHealth, mFilling, and mCulture. Duarte et al. [11] explain that the lack of integration of m-government services means that the shift from e-government services to m-government requires further research, especially in terms of m-government integration. This also affects the quality and acceptance of m-services among the population. Since there is still a lack of appropriate literature on adopting m-government, this study investigates how integrating mobile services into e-government can affect public value. The following hypothesis is proposed in this study.

Hypothesis 3 (H3): *The integration of mobile services into e-government has a positive and significant impact on public value.*

To improve services at the individual level, the current trend in e-government customizes each service so that citizens have the freedom to select services that meet their needs, find exclusive services, and view a list of available services. In this way, officials can independently deliver customized e-government services on mobile devices, while citizens are free to create their accounts. E-services, for example, allow citizens to manage their checklists of frequently used online services, making it easier to search and access them, view bills and conduct transactions online, and access important government information through various news channels.

This recent trend requires a review of the performance of each e-government service. Several e-commerce studies have used the personalized user to analyze the personalization of online information, including catalog service features and product customization. Smith et al. [56] argues that personalized experiences can promote strong online performance, increase consumer satisfaction and loyalty, and facilitate comprehensive marketing. However, when personalizing websites and services, user privacy is a critical factor. Despite several empirical studies on personalization in e-commerce, the role of personalization in e-government has not been thoroughly investigated [57]. Nonetheless, studies on personalized e-government services have provided new evidence suggesting that personalized e-government services in the public sector offer important opportunities to improve communication and positively impact public value through the use of e-government content. Duarte et al. [11] suggested in their research that users' constraints on personalized e-government services should be considered, such as users' access rights, preferences, trust, and privacy. Therefore, further research is called for in the area of personalized e-government. To determine the usability and effectiveness of personalized e-government materials, we can assess the extent to which personalization affects citizens' willingness to use online portals. Based on the results of the research suggesting that providing unique and personalized user accounts in online content and personalized e-government services are important variables for evaluating the quality of public engagements, we propose the following hypotheses.

Hypothesis 4 (H4): *The integration of personalized users in e-government has a positive and significant impact on public value.*

Online participation (OP) is often referred to as e-government; Duarte et al. [11] describe OP as an integrated technology that gives users full access rights to the services offered. To achieve this, it is necessary to involve policymakers. Dospinescu et al. [58] and community involvement together promote democratic attitudes [58]. According to Liang and Turban [59], e-participation is the engagement and participation of citizens in the continuous improvement of the idea of e-government and technological development. The integration of e-participation services into e-government has been implemented in many cities. On the other hand, comparative findings show that the evaluation results of some websites are at different stages of development concerning offering e-participations. However, e-government continues to offer a wider range of services, so public participation is likely to increase. Much literature shows that scholars agree with the significant gap in the perceived relationship between the management of e-participations services and citizens' experiences of using e-participations [60]. Therefore, we believe that the implication of integrating e-participations into e-government can help to resolve this gap, and thus we propose the following hypothesis in this study:

Hypothesis 5 (H5): *Citizen activeness with online participation in e-government has a positive and significant impact on public value.*

Previous research has confirmed that public information (PI) is associated with the quality of information an information system produces. Hapsari et al. [37] added that information is useful if it is correct and accurate. Consequently, building a website necessitates consideration of multiple factors, including aspects of website quality [37,38]. Previous studies have analyzed websites based on their recency and the distribution of the information they contain. Additionally, Cordella and Bonina [5] describe how the veracity and relevance of up-to-date information can enhance information accuracy.

Cordella and Bonina [5] noted that the most up-to-date information and public services must be fulfilled when creating government websites in light of the rapid growth of ICT and the fact that e-government currently offers a vast array of services. The primary objectives of e-government development are to improve service efficacy and accuracy. Since the most important aspects of e-government quality are up-to-date information and public services, the following hypothesis is proposed in this study.
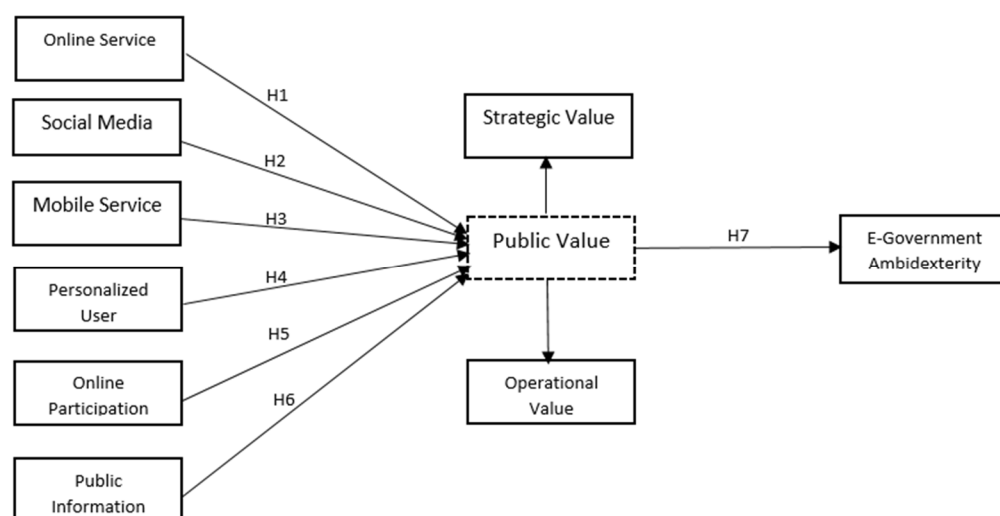
Hypothesis 6 (H6): *Public information in e-government has a positive and significant impact on public value.*

The rapid development of digital media encourages policymakers such as the government to exchange and engage with the public through digital networks, especially social media, to organize and build mutually beneficial relationships in the e-government environment. Trust is a component of the public value perspective that positively impacts the needs of the public. Hsu et al. [61] confirmed that public loyalty and intent are critical indicators of government and public relations effectiveness. Clark et al. [62] added that public relations built through digital media significantly impact public loyalty over time.

Based on the previous statement, we believe connecting the public to e-government services can strengthen the public's positive relationship with the government. A good relationship between the public and the government can also increase the public's intention, loyalty and enthusiasm to use e-government services. Therefore, in this study, we put forward the following hypothesis:

Hypothesis 7 (H7): *Public value is positive and has a significant correlation with e-government ambidexterity.*

This study contains seven hypotheses with ten variables, one of which is a second-order construct, as shown in Figure 1.

Figure 1. Research design and hypothesis development. Note: Online Service (OS); Social Media (SM); Mobile Service (MS); Personalized User (PU); Online Participation (OP); Public Information (PI); Strategic Value (SV); Operational Value (OV); E-Government Ambidexterity (GA).

4. Research Methodology

In this study, the survey was distributed online through a Google form. The duration of data collection spanned three months in 2022, specifically February, March, and April. Respondents with experience using e-government services, such as users of e-filing, e-budgeting, e-auction, and e-health, provided the collected data. This is done to ensure that the respondents conducting the evaluations have actual experience with e-government services, thereby minimizing bias in the collected data. After filtering the collected data, the sample size for this study is 425 (N = 425), as opposed to 453 before filtering. Thus, 425 separsate data are utilized for the subsequent analysis procedure. The demographic composition of the e-government users surveyed for this study is displayed in Table 2.

Table 2. Demographics sample.

Demographic of Characteristic	Items Demographic	Frequency	Percentage
Demographic of gender	Male	225	53%
	Female	200	47%
Demographic of education level	High School	100	24%
	Under Graduate	186	44%
	Post Graduate (Master and Doctoral Degree)	139	33%
Experience using e-government	Less than two years	71	17%
	Three-to-four years	226	53%
	More than four years	128	30%
Demographic by the age	Less than twenty-six years old	75	18%
	Twenty-six to thirty years old	105	25%
	Thirty-one to thirty-five years old	132	31%
	More than thirty-six years old	113	27%

The questionnaire designed for this study is divided into two distinct sections. The first section describes the respondents' demographic information, including their gender, level of education, e-government experience, and age. The second section is a test of the established hypothesis. In addition, changes and refinements are made so that the framework proposed in this study is harmonious, using standards derived from frameworks established in previous studies. The framework and hypotheses proposed in this study are depicted in Figure 1. The employed indicators are chosen and modified based on references

or prior research. To validate the indicators, experts in the field of e-government conduct a rigorous review. This study's assessment should be more accurate due to using a Likert scale ranging from 1 to 7. To ensure that respondents only took the test once, they were required to provide their email addresses in the questionnaire section.

5. Data Analysis

To validate the collected data, this study employs partial least squares structural equation modelling (PLS-SEM) as an analysis method to generate reliable statistical tests for empirical research [10]. PLS-SEM is a variance-based method that is also reliable to other methods, can handle small amounts of data, non-normal data, use formative and reflective constructs concurrently, handle complex models, and offer an exploratory approach [63]. PLS-SEM has been utilized in numerous studies to address complex problems in information systems research, particularly in e-government [45,63].

SmartPLS 3 software is used as this study's computational and data analysis medium. The study's instruments are listed in Table 3. They were chosen based on previous research and modified to fit the current case study. In this study, two phases must be completed: first, the outer model must be validated, and then, the inner model must be validated.

Table 3. Questionnaire measurement items.

Measurement Items	
Public Value; source: [22,64,65]	
PV1	Public value is a general reference for me in assessing e-government.
PV2	Public values make me believe more in e-government.
PV3	I tend to really like e-government developments that have clear public values.
E-Government Ambidexterity; source: [40,66]	
GA1	E-Government ambidexterity plays an important role in the balance of innovation.
GA2	E-Government ambidexterity is the reason I always support new e-government programs.
GA3	I always thought that e-government would be difficult to develop without the concept of ambidexterity.
Online Service; Source: [54]	
OS1	Online service simplifies the processing of my requests significantly.
OS2	I see and feel the benefits of utilizing online services regarding the effectiveness of my work.
OS3	Online service is intuitive, lightning-fast, and trustworthy.
Social Media Integration; Source: [22,61]	
SM1	The integration of e-government with social media facilitates my communication with the government.
SM2	The government's use of social media as part of e-government instills confidence in the information provided.
SM3	Thanks to social media, I can participate in e-government more actively.
Mobile Service Integration; Source: [38,62,67]	
MS1	Even inexperienced users can easily navigate a government website based on the concept of mobile service.
MS2	Mobile-based e-government services meet current needs and trends.
MS3	Mobile-based e-government services must be further developed.
Personalized User; Source: [14,63–71]	
PU1	The personalized account function makes it easier for me to manage my e-government activities.
PU2	Personalized user accounts in e-government can integrate my essential needs so that my productivity at work increases.
PU3	Personalized user accounts can provide services that meet my current needs and help deliver notifications directly.
Online Participation; Source: [64,70]	
OP1	By combining e-participation and e-government, I feel empowered to express my views to the government.
OP2	The e-participation service motivates me to participate actively in government programs.
OP3	E-participation is a great idea for me because it allows me to freely make suggestions and complaints about government programs that I need.

Table 3. *Cont.*

Measurement Items
Public Information; Source: [28,37,38]

PI1	I need information to be up-to-date and official from government sources.
PI2	Public information makes me feel satisfied using e-government services.
PI3	I believe that the government has at least partially met the public's needs by providing them with current information.

5.1. Outer Model Validation

The basic concept for outer model validation consists of three aspects: reliability analysis validation, convergent analysis validation, and discriminant analysis validation. Furthermore, when minimizing the quality of the reliability composite, it is critical to remember that all construct values must be greater than 0.7 for the construct reliability value to be considered acceptable. Yang et al. [71] proposal that a construct is declared convergent valid if the loading factor value exceeds 0.5 and the AVE value exceeds 0.5 is used in this study. Table 4 displays the loading factor value as well as the reliability test results.

Table 4. Analysis of convergent reliability and validity.

Construct	Measurement Items	Factor Loading/Coefficient (t-Value)	AVE	Composite Reliability	Cronbachs Alpha
E-Government Ambidexterity (GA)	GA1 GA2 GA3	0.879 0.882 0.872	0.770	0.909	0.852
Mobile Service (MS)	MS1 MS2 MS3	0.908 0.902 0.891	0.811	0.928	0.883
Online Participation (OP)	OP1 OP2 OP3	0.792 0.929 0.914	0.775	0.911	0.855
Online Service (OS)	OS1 OS2 OS3	0.901 0.877 0.874	0.782	0.915	0.860
Operational Value (OV)	OV1 OV2 OV3	0.840 0.919 0.895	0.784	0.916	0.862
Public Information (PI)	PI1 PI2 PI3	0.917 0.954 0.949	0.884	0.958	0.935
Personalized User (PU)	PU1 PU2 PU3	0.919 0.934 0.811	0.791	0.919	0.868
Social Media (SM)	SM1 SM2 SM3	0.925 0.815 0.918	0.787	0.917	0.866
Strategic Value (SV)	SV1 SV2 SV3	0.902 0.859 0.913	0.795	0.921	0.871

The degree of difference between variables is used to calculate discriminant validity. Two approaches can be used in this case: the loading factor and the square root of the AVE. Suppose the loading factor of each latent item for each construct is greater than the loading

factor of each construct among themselves. In that case, it indicates that each variable has met the discriminant validity criteria, as explained in Table 5.

Table 5. Factor loadings and cross-loadings.

Items Construct	GA	MS	OP	OS	OV	PI	PU	SM	SV
GA1	0.879	0.661	0.889	0.656	0.718	0.771	0.693	0.639	0.654
GA2	0.882	0.849	0.681	0.831	0.882	0.669	0.880	0.711	0.882
GA3	0.872	0.645	0.781	0.640	0.788	0.900	0.668	0.560	0.616
MS1	0.775	0.908	0.675	0.902	0.811	0.646	0.821	0.812	0.801
MS2	0.793	0.902	0.664	0.890	0.821	0.626	0.855	0.707	0.907
MS3	0.671	0.891	0.565	0.879	0.766	0.536	0.775	0.720	0.869
OP1	0.600	0.473	0.792	0.469	0.538	0.616	0.585	0.594	0.448
OP2	0.895	0.694	0.929	0.685	0.760	0.807	0.732	0.665	0.681
OP3	0.799	0.666	0.914	0.661	0.731	0.825	0.689	0.581	0.626
OS1	0.764	0.898	0.667	0.901	0.803	0.638	0.812	0.804	0.795
OS2	0.761	0.861	0.649	0.877	0.785	0.615	0.821	0.667	0.858
OS3	0.645	0.863	0.534	0.874	0.736	0.514	0.745	0.701	0.840
OV1	0.869	0.664	0.792	0.661	0.840	0.914	0.701	0.575	0.641
OV2	0.847	0.869	0.662	0.852	0.919	0.659	0.886	0.698	0.914
OV3	0.724	0.811	0.636	0.800	0.895	0.614	0.913	0.724	0.797
PI1	0.747	0.554	0.800	0.547	0.681	0.917	0.589	0.503	0.518
PI2	0.836	0.648	0.810	0.647	0.766	0.954	0.690	0.569	0.634
PI3	0.884	0.678	0.818	0.675	0.827	0.949	0.696	0.597	0.642
PU1	0.883	0.880	0.695	0.865	0.931	0.695	0.919	0.723	0.932
PU2	0.743	0.833	0.665	0.823	0.898	0.620	0.934	0.752	0.820
PU3	0.654	0.692	0.694	0.689	0.662	0.550	0.811	0.762	0.638
SM1	0.742	0.787	0.677	0.779	0.762	0.609	0.802	0.925	0.751
SM2	0.436	0.588	0.438	0.584	0.472	0.325	0.590	0.815	0.514
SM3	0.713	0.796	0.688	0.784	0.724	0.592	0.785	0.918	0.733
SV1	0.784	0.878	0.656	0.869	0.805	0.605	0.842	0.699	0.902
SV2	0.637	0.866	0.534	0.856	0.739	0.501	0.755	0.704	0.859
SV3	0.799	0.815	0.616	0.795	0.845	0.602	0.834	0.649	0.913

Note: E-Government Ambidexterity (GA); Mobile Service (MS); Online Participation (OP); Online Service (OS); Operational Value (OV); Public Information (PI); Personalized User (PU); Strategic Value (SV).

5.2. Validation of Inner Model and Hypotheses Result

PLS-SEM uses the inner model concept to demonstrate the results of the proposed hypothesis. The t-value is the criterion used to determine whether or not the hypothesis is accepted, and it must be greater than 1.96. The results of the hypothesis are presented in Table 6 and Figure 2, with Table 6 also explaining the value of the path coefficients.

Table 6. Summary of the inner model result.

Hypotheses	Path	Standardized Path Coefficient	t-Values	Supported
H1	OS → PV	0.149	2.106	Yes
H2	SM → PV	0.142	3.375	Yes
H3	MS → PV	0.643	4.241	Yes
H4	PU → PV	0.554	6.977	Yes
H5	OP → PV	0.178	2.347	Yes
H6	PI → PV	0.178	3.623	Yes
H7	PV → GA	0.522	9.046	Yes

Note: E-Government Ambidexterity (GA); Mobile Service (MS); Online Participation (OP); Online Service (OS); Operational Value (OV); Public Information (PI); Personalized User (PU); Strategic Value (SV).

In addition, Table 6 and Figure 2 demonstrate that the variable OS to PV has a significant correlation with a positive value. Thus, the first hypothesis is supported (H1: OS → PV = 0.149, t-value = 2.106). Since the SM variable on PV has a significant positive correlation, hypothesis 2 is accepted (H2: SM → PV: = 0.142, t-value = 3.375). The MS

variable has a significant positive correlation with the PV variable, so hypothesis 3 is accepted (H3: MS → PV: = 0.643, t-value = 4.241). In addition, this study demonstrates that the positive correlation between the PU variable and PV is statistically significant. Consequently, hypothesis 4 is accepted (H4: PU → PV = 0.554, t = 6.977). The correlation between OP and PV is significant and positive, indicating that hypothesis 5 is accepted (H5: OP → PV: = 0.178, t-value = 2.347). The hypothesis that the PI variable has a significant positive correlation with the PV variable is accepted (H6: PI → PV: = 0.178, t-value = 3.623). Therefore, hypothesis 7 is accepted (H7: PV → GA: = 0.522, t-value = −9.046)
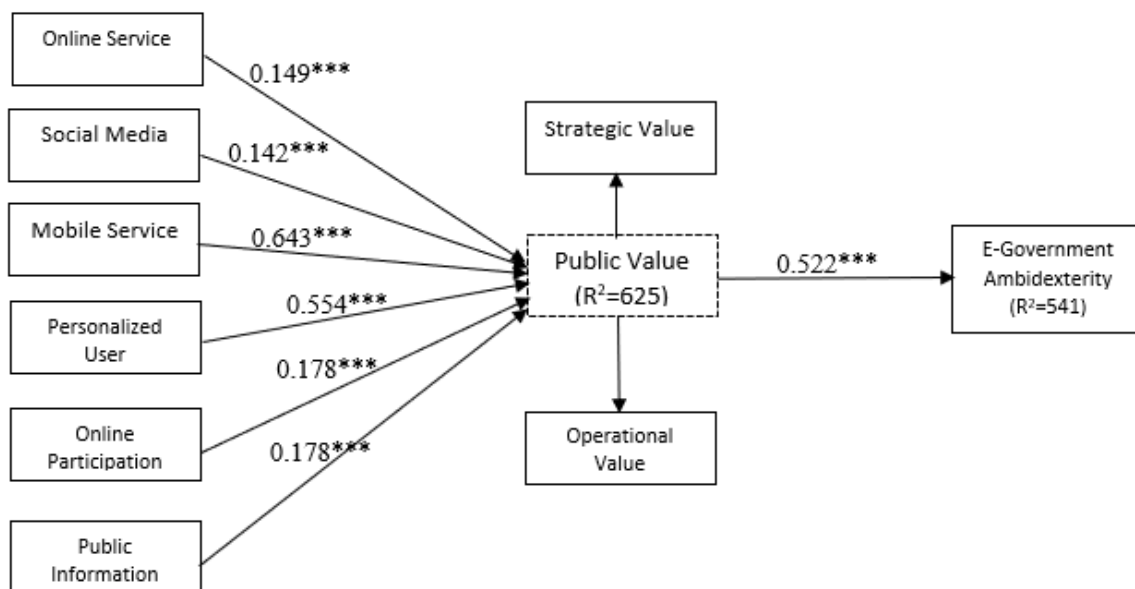
Figure 2. Results of the research model. Note: *** *p*-value < 0.001.

5.3. Validation of Mediation Effects

In this study, the significance of the mediator variables is evaluated using the Sobel test. The Z-value is used to determine the significance of testing, and the mediation test is deemed significant if the Z-value is greater than 1.96. As shown in Table 7, based on the results of the analysis, all mediation variables were accepted in this study, with Z-values ranging from 2.051 to 5.524. In conclusion, all mediators are positive and have a significant correlation.

Table 7. Mediation test result.

Construct	Construct Relationship	t-Values	z-Value and *p*-Value
H1a: OS → PV → GA	OS → PV PV → GA	2.106 9.046	2.051 (0.04)
H2a: SM → PV → GA	SM → PV PV → GA	3.375 9.046	3.162 (0.001)
H3a: MS → PV → GA	MS → PV PV → GA	4.241 9.046	3.839 (0.0001)
H4a: PU → PV → GA	PU → GA PV → GA	6.977 9.046	5.524 (0.0001)
H5a: OP → PV → GA	OP → PV PV → GA	2.347 9.046	2.271 (0.02)
H6a: PI → PV → GA	PI → PV PV → GA	3.623 9.046	3.363 (0.0001)

Note 1: E-Government Ambidexterity (GA); Mobile Service (MS); Online Participation (OP); Online Service (OS); Operational Value (OV); Public Information (PI); Personalized User (PU); Strategic Value (SV). Note 2: a (Hypothesis for mediation test)

6. Discussion

This study is a continuation and expansion of previous research, and it incorporates ideas from Hariguna et al., Wirtz and Kurtz [28], and Liang and Turban [59]. Furthermore, these studies incorporate the concepts of perceived value and e-government ambidexterity. Perceived value is a requirement for e-government ambidexterity, and it has two critical dimensions: strategic value and operational value. Six other constructs influence public value: online service, social media, mobile service, personalized user, online participation, and public information. The high score for public value influences the importance of e-government ambidexterity. This research benefits both the academic community and practitioners in general.

6.1. Theoretical Implications

This study made several contributions to knowledge. First, we created an integrated model of public value theory and e-government ambidexterity. We added two dimensions to the theory of perceived value: operational value and strategic value. This study's concept of public value is of the second order formative construct. Second, this is the first study to integrate the concept of public value with antecedents' latest technology to measure the degree of e-government ambidexterity. In contrast, previous research relied on the concept of current technology to support the public's intention to use e-government. Because this is an empirical study that uses the concept of online data collection, the data used in this study are new and can be used as a benchmark for e-government research.

6.2. Managerial Implications

This study provides the government with novel solutions for improving public services, particularly through e-government channels. The government can use the findings of this study to show that the new technology paradigm embedded in e-government allows for the development of the concept of public value. This is so that developers can consider the new technology paradigm when developing e-government.

Based on Hypothesis 1, this study concluded that online public service activities have a positive and significant impact on public value. Therefore, e-government policymakers should consider building public service facilities that are all-online, to the extent that people are preferring online activities. Furthermore, e-government services must include contact information such as e-mail addresses, phone numbers, fax numbers, etc. Based on Hypothesis 2, this study concludes that the role of social media has a positive and significant effect on public value, where the public can use social media as a two-way communication channel for e-government organizers. This shows that the public has a significant role in governance. As a result, e-government must be adaptable to changing patterns. According to the findings of Hypothesis 3, mobile service applications have a significant impact on public value. According to current data, the number of mobile devices is increasing, which leads to an increase in applications for these devices that improve the effectiveness of the service. To strengthen the role of e-government, the mobile service concept, which allows citizens easier access to required information, must be included. E-government developers must be able to implement mobile services, in addition to ensuring that e-government services are accessible via the website channel. According to Hypothesis 4, personalized media significantly impacts public value. This concept is available to those who require more private services, as certain citizens require individualized access rights to their accounts. Hypothesis 5 found that online public participation significantly affects Public Value. Hypothesis 6 analysis found that public information significantly impacts public value. This demonstrates that when the public's information needs are effectively communicated, public participation in e-government tends to increase; thus, e-government managers must ensure that the data and information displayed are accurate and reliable. This study discovered that public value significantly affects e-government ambidexterity based on the analysis of hypothesis 7. E-government developers and administrators must carefully manage and promote the concept of public value in its two dimensions (strategic

value and operational value). The strategic concept refers to top management, whereas operational value refers to execution; both must be aligned in activity execution to achieve ambidexterity in e-government.

7. Conclusions

The growing digitization of government services indicates that the public wants more information and easier interactions with the government. As a result, the government must adapt to the needs of a society that is becoming increasingly complex and demands easy access to these services. This risk is mitigated by e-government, which also encourages public participation in e-government access based on people's perceptions of the benefits they receive. Due to the ambidextrous nature of e-government, this study provides a comprehensive evaluation that the underlying concept of public value comprises two perceptions: operational value and strategic value. The government as an organizer and the public as a user or end user can use these two constructs. Furthermore, this study investigated whether the role of current technologies (online services, social media, mobile services, personalized users, online participation, and public information) has a significant impact on public perception of value and thus indirectly contributes to e-government ambidexterity. As a result, it is critical that e-government system developers pay attention to this and incorporate modern technology into e-government systems.

This study provided a comprehensive framework for research design, from hypothesis formulation to data collection and analysis to anticipated outcomes. Nonetheless, for future research, it should be emphasized that the e-government examined in this study is still generic, allowing it to be oriented toward a more specific e-government in the future. Although the data used in this study was rigorously sorted, it tends to be skewed because the demographics used as respondents are still concentrated in a single country. It is possible that the subsequent poll will be conducted in several countries. Incorporating new construct factors, such as social value and relationship quality variables, which play an important role in users' relationships with providers, is a distinct possibility for the e-government concept's future.

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