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Linking Operational Transparency and Trust in Government: The Mediating Roles of Information Quality and Perceived Effort

Abstract

Purpose: This research empirically investigates the relationship between operational transparency and citizens' trust in their government through two mediation mechanisms, namely information quality and perceived effort.

Study design/methodology/approach: Hypotheses were tested using regression-based mediation analysis, utilizing a series of OLS regression models. Moderated mediation was performed as an additional robustness check.

Sample and data: Data were collected from 715 individuals who used a Kuwaiti government website or app within the six months prior to completing an online survey in early 2021.

Results: Operational transparency was found to have both "direct" and "indirect" effects on trust. The indirect effects are notably channeled through the proposed mediating mechanisms, highlighting the roles of information quality and perceived effort as key mediators in the relationship between operational transparency and trust in government.

Originality/value: The study extends existing research by specifically examining the mediation roles of information quality and perceived effort in the operational transparency-trust dynamic within e-government services. It also develops and validates a survey-based measure for perceived operational transparency, which can be used by researchers and practitioners aiming to gauge individual perceptions of operational transparency in service contexts.

Research limitations/implications: Strengthening operational transparency can boost citizen trust in government services. Yet, the study's findings are constrained by its cross-sectional design, highlighting the need for future research with different methods and longer-term analyses.

Keywords: Operational Transparency, Information Quality, Trust, Effort, E-government, Service Operations.

JEL classification: M10, L86, C01, H83

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الملخص

تأثير الشفافية التشغيلية على ثقة المواطنين في الحكومة: دراسة دور جودة المعلومات والجهد المُدرَك كوسيطين

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هدف الدراسة: تهدف هذه الدراسة إلى استكشاف العلاقة بين الشفافية التشغيلية وثقة المواطنين في حكومتهم من خلال آليتي وساطة، هما: جودة المعلومات والجهد المُدرَك. تصميم/ منهجية/ طريقة الدراسة: اختبرت الفروض باستخدام تحليل الوساطة المعتمد على الانحدار (Regression-based Mediation Analysis) عبر سلسلة من نماذج الانحدار الخطي البسيط (OLS). أُجري تحليل للوساطة المعدلة (Moderated Mediation) كاختبار إضافي للتحقق من متانة نتائج الدراسة. عينة الدراسة وبياناتها: جمعت البيانات من 715 مشاركاً ممن استخدموا موقعاً إلكترونياً أو تطبيقاً حكومياً كويتياً خلال الأشهر الستة السابقة لإكمالهم استبانة إلكترونية في أوائل عام 2021. نتائج الدراسة: تشير نتائج الدراسة إلى أن الشفافية التشغيلية لها تأثيرات "مباشرة" و"غير مباشرة" على ثقة المواطنين في حكومتهم؛ مما يبرز دور كل من جودة المعلومات والجهد المُدرَك كوسيطين أساسيين في تفسير العلاقة بين الشفافية التشغيلية والثقة في الحكومة. أصالة الدراسة: تسهم هذه الدراسة في توسيع نطاق الدراسات الحالية من خلال فحص أدوار الوساطة لجودة المعلومات والجهد المُدرَك بشكل خاص في العلاقة بين الشفافية التشغيلية والثقة في الخدمات الحكومية الإلكترونية. كما تقدم مقياساً يعتمد على الاستبانة لقياس الشفافية التشغيلية المدركة، وهو مقياس يمكن أن يستخدمه الباحثون والممارسون لتقييم تصورات الأفراد حول الشفافية التشغيلية في سياق الخدمات. حدود الدراسة وتطبيقاتها: يمكن للشفافية التشغيلية أن تعزز ثقة المواطنين في الخدمات الحكومية. ومع ذلك، تقتصر نتائج هذه الدراسة على التصميم المقطعي؛ مما يشير إلى الحاجة إلى دراسات مستقبلية تستخدم طرقاً مختلفة وتحليلاً طويلاً الأجل.

الكلمات المفتاحية: الشفافية التشغيلية، جودة المعلومات، الثقة، الجهد، الحكومة الإلكترونية، عمليات قطاع الخدمات.

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Introduction

Electronic government (e-government) has emerged as a primary channel for information exchange between governments and citizens (Sawalha et al., 2019; Tejedo-Romero et al., 2022) and a considerable approach for improving the effectiveness of public policy implementation (Choi et al., 2016; Wirtz & Daiser, 2018). E-government is widely acclaimed as a convenient and effective way to provide public services, replacing physical channels requiring face-to-face interaction with citizens. Another advantage of e-government is its role in disseminating accessible information to citizens (Tejedo-Romero et al., 2022). Additionally, e-government contributes to the operations of government by enhancing administrative efficiency, reducing operational costs, and facilitating better decision-making. Accordingly, the digitization of government services has been viewed as an effective tool not only to improve public services but also to enhance the image of governments and mitigate the decline in public trust (Aljukhadar et al., 2022; Amosun et al., 2022; Gracia & Arino, 2015). Research has shown that one of the causes of the decline of citizens' trust in government is the information gap between governments and the public (Mahmood et al., 2019; Welch et al., 2005). Therefore, e-government has the potential to be a transformational technology. It can reduce the information gap by providing trustworthy and high-quality data, thereby restoring faith in government (Morgeson III et al., 2011).

Several studies found a positive relationship between e-government and public trust in government (e.g., Gracia & Arino, 2015; Jalali & Khorasani, 2012), with some studies further exploring the mechanism through which e-government can be used to build trust. For example, Welch et al. (2005) examined how citizens' perceptions of e-government service convenience, transparency, and interactivity influence their trust in government. Additionally, Tolbert and Mossberger (2006) found that the use of e-government can build public trust by improving citizens' perceptions of government responsiveness. Furthermore, Mahmood et al. (2019) demonstrated that citizen trust in government is influenced by e-government-led transformations that enhance transparency and accountability, and meet citizens' expectations. Alaaraj and Hassan (2016) also found that good governance, measured by efficiency, transparency, and accountability, mediates the relationship between e-government and public trust. Lastly, Alsarraf et al. (2022) investigated how e-government service quality leads to trust in government, find-

ing that service quality leads to satisfaction, which in turn leads to more favorable perceptions of governmental effort and, ultimately, trust in government.

While service quality significantly contributes to building citizens' trust in government through e-government platforms, the transparency of e-government operations and the quality of the information it provides—particularly information offering direct benefits to citizens—are integral to this trust-building process. Existing studies have explored the relationship between operational transparency and trust or perceived effort (e.g., Buell et al., 2021; Mejia et al., 2019). These studies provide valuable insights into how operational transparency can influence user perceptions and trust. However, our research seeks to expand on this existing knowledge by specifically examining the role of information quality as an intermediary in the operational transparency-effort-trust pathway within the context of e-government. While the potential of e-government to bridge the information gap between government and citizens, thereby increasing trust, is acknowledged, the nuanced mechanisms by which citizens form their perceptions of e-government's information quality, and how these perceptions subsequently influence their attitudes towards the government, are yet to be fully explored. Our study aims to address this gap by providing a more comprehensive understanding of the interplay between e-government's operational transparency, information quality, perceived effort, and the subsequent trust in government.

Several studies have highlighted the association between e-government's provision of high-quality information and trust in online systems delivering government services (Nulhusna et al., 2017; Teo et al., 2008; Venkatesh et al., 2016). However, these studies have primarily focused on the direct impact of information quality on trust in the e-government system rather than exploring its effect on trust in the government institution itself (Nulhusna et al., 2017). Similarly, Tolbert and Mossberger (2006) indicate that using government websites enhances perceptions of transparency and information accessibility but does not necessarily translate into increased trust in government institutions, hinting at limitations in the current understanding of e-government's impact on citizen attitudes toward the government.

In our research, we delve deeper into this relationship, proposing that the missing link in existing studies is a comprehensive exploration of the mechanisms underlying the connection between e-government operational transparency, information quality, perceived effort, and trust in government. Specifically,

we contend that understanding the role of government's "operational transparency", which involves revealing internal government processes, is key in reducing uncertainty related to the interaction with e-government and, consequently, increasing predictability. We argue that the interaction with e-government services, whether for informational or transactional purposes, involves uncertainties related to service tasks and workflow (Venkatesh et al., 2016). When citizens use online government services, they require access to pertinent information, such as service status and updates. Inadequate information can lead to uncertainties about how and when to receive required services. These uncertainties are likely to cause citizens to be less appreciative of government efforts and thus less likely to trust the government. Our study contends that e-government can alleviate these uncertainties by showcasing the work performed by government officials in response to service requests. This operational transparency can enhance citizens' appreciation of the quality of information provided by government websites, leading to a greater acknowledgment of government efforts and, ultimately, fostering trust in the government.

We present a theoretical model that aims to explain the relationship between e-government operational transparency, information quality, perceived effort, and trust in government. Citizens form their attitudes toward the government based on information that serves as "trustworthiness cues" (Smith, 2010). Government websites may include diverse information related to government activities, decisions, procedures, and results. However, they typically do not provide details on internal government operations (Buell et al., 2021). Our research suggests that information about government actions executed behind the scenes in response to citizens' requests are particularly important in the trust-building process. Previous research has found that the category of information most valued by citizens—and thus used as trustworthiness cues—is information related to achieving a goal or associated with direct benefits to the citizen, such as transaction-related information (Rasool & Warraich, 2018; Smith, 2010). Therefore, enhancing operational transparency of the government by displaying such valuable information related to the government's efforts to meet citizens' demands is expected to improve the perceived quality of e-government information and the perceived efforts of the government. Consequently, our theoretical model proposes that perceived information quality and effort mediate the relationship between the operational transparency of e-government and the trust citizens place in the government. Investigating this mediation role deepens our theoretical understanding on how operational transparency

in e-government affects the attitudes of citizens towards their government. The proposed model can also guide e-government development initiatives aiming to enhance public trust by emphasizing the importance of operational transparency, which is highly valued by citizens and is likely to foster trust.

This paper is structured as follows: First, we review the existing literature on e-government, operational transparency, information quality, and trust in government, and develop our hypotheses based on identified research gaps. Next, we describe the data used in our analysis and the econometric specification employed to test our model. Following this, we present the results of our analysis, supported by a supplementary analysis to ensure robustness. Finally, we conclude with a discussion of our findings, their theoretical and practical implications, and directions for future research.

Literature Review and Hypotheses Development

Operational Transparency and Trust in Government

Trust in government is defined as “the confidence of citizens in the actions of government to do what is right and perceived as fair” (OECD, 2013). Operational transparency has been identified as a crucial determinant in fostering trust in governmental institutions. Operational transparency refers to the extent to which organizations disclose and make visible their internal processes to external stakeholders (Buell et al., 2021). This notion holds significant importance, especially within the realm of government services since the disclosure of operational processes to the public might cultivate a heightened comprehension and recognition of governmental endeavors.

Empirical evidence supports the positive impact of operational transparency on trust in government. For instance, Buell et al. (2021) found that operational transparency, manifested through a digital platform that showed Boston's residents the operational efforts behind their public service requests, significantly increased trust and engagement with the local government. This study demonstrates that when citizens could see the work being done on their behalf, their trust in the government improved. Furthermore, Mejia et al. (2019) investigated the impact of operational transparency on perceived trust in the context of crowdfunding platforms for emergency response. They found that participants who were provided with work-related updates (symbolizing operational transparency) exhibited a higher level of perceived trust compared to those who received non-operation-

al updates or no updates. Such findings underscore the potential of operational transparency in fostering trust, which may be extended to the dynamics between operational transparency and trust in government.

In summary, studies have shown that when websites offer operations-related updates such as pictures showing the status of a service requested by a citizen (Buell et al., 2021) or status updates on a donation campaign (Mejia et al., 2019), then website providers are more likely to be trusted by the visitors. Therefore, it can be inferred that higher perceptions of operational transparency among citizens are likely to correlate with increased trust in the government.

H1: Operational transparency is positively related to trust in government.

Operational Transparency and Information Quality

Operational transparency, characterized by clear and open governmental procedures, holds promise for enhancing information quality, which is pivotal for informed citizen engagement. Information quality refers to the provision of information that is sufficient, accurate, and up to date (Teo et al., 2008). Government websites can be a great source of reliable information, including details about procedures, decisions, actions, and outcomes that may aid citizens in evaluating government performance and forming their attitudes toward the government (Al-jukhadar et al., 2022). However, internal government functions are rarely made transparent to the public. Citizens may remain unaware of the actual efforts of government agencies and employees, despite easy access to services and observable government results. By detailing citizen-requested services, e-government can potentially enhance citizen awareness of the work in progress and the actual actions taken by government representatives. We contend that e-government can offer a great opportunity to reveal this otherwise hidden work (Buell et al., 2021) and, thereby, enhance how citizens view the information quality of the e-government.

We argue that operational transparency, which entails opening the “black box” of hidden processes, provides direct benefits to citizens who want to understand the activities happening behind the scenes. Research suggests that the type of information that directly benefits citizens is the category most likely to be observed by those citizens (Smith, 2010). Evidence from other service sectors supports this notion. For example, in the healthcare sector, patients’ access to clinical and process information through health information technology can potentially increase their perception of information quality, particularly when transparency efforts are

supported by “high levels of communication quality” (Sharma et al., 2019, p. 2556). Given the service-oriented nature of e-government, citizens typically encounter task and workflow uncertainties when visiting an e-government website. These uncertainties often relate to questions about how to complete transactions, which government agency or department will process the requested service, and the expected timeline for receiving these services (Venkatesh et al., 2016). Thus, we anticipate that providing citizens with information related to the desired service will directly benefit citizens by resolving such task and workflow uncertainties. Therefore, when interacting with government websites, citizens are likely to pay special attention to service-related information, such as transaction status and work in progress (Buell et al., 2021). This sort of information that demonstrates the work the government does in response to citizen requests and shows “what’s right on the inside, in the guts of its operations” (Oliver, 2004, p. 37), will enhance the public’s perception of e-government’s information quality. Consequently, we anticipate that the higher the perception of operational transparency, the more likely citizens will perceive the information offered by e-government as sufficient, accurate, and up to date.

H2: Operational transparency is positively related to information quality.

Operational Transparency and Perceived Effort

Research has demonstrated that individuals tend to appreciate governmental or organizational efforts more when they interact with e-services displaying a clear depiction of the operational processes concerning their requests (Buell & Norton, 2011; Buell et al., 2017, 2021; Mejia et al., 2019). For example, Buell and Norton (2011) observed that a travel website could elevate customers’ perceptions of the effort invested by the service provider by presenting a dynamic list of sites being searched, alongside an animation of fares “as they were found” while customers awaited the search results. Essentially, the presence of operational transparency, which unveils the ongoing actions behind the scenes (as perceived by the customer), enhances customers’ perceptions of effort.

Aligning with this notion, Buell et al. (2017) suggest that operational transparency, particularly allowing customers to see the effort involved in service delivery, “can cause customers to better appreciate the effort exerted by employees” (Buell et al., 2017, p. 1690). The authors supported this claim through an experiment simulating a service interaction at a cafeteria sandwich counter, where

participants, assuming the role of customers, observed the service process via videos. These videos were designed to exhibit varying degrees of transparency regarding the chef's actions and the sandwich-making process. Their findings revealed a notable trend; participants who had the opportunity to observe the chef working throughout the process tended to report a higher level of perceived effort compared to those who had limited or no visual access to the chef and the process. This indicates that operational transparency can significantly enhance the perception of effort exerted by service providers.

Moreover, Buell et al. (2021) demonstrated that “revealing the hidden work that government performs” augments citizens' perceptions of the effort applied by the government (Buell et al., 2021, p. 782). Specifically, the study found that users who submitted a “trash-removal” service request via a governmental app perceived higher levels of government effort when the app displayed a photo of the service location after the completion of the trash removal service. This implies that users place considerable emphasis on operational updates relevant to their service requests. Similarly, Mejia et al. (2019) found that users of crowdfunding platforms perceived greater effort when campaigns provided work-related updates on the campaign webpage.

Based on these insights, we hypothesize that operational transparency, entailing the disclosure of governmental operational processes to citizens, will lead to more favorable perceptions of government effort.

H3: Operational transparency is positively related to perceived effort of government.

The Mediating Roles of Information Quality and Perceived Effort

The relationship between operational transparency and trust in government is pivotal in understanding the dynamics of citizen-government interactions. Previous studies have underscored the importance of operational transparency in enhancing trust in various organizational settings (Buell et al., 2021; Mejia et al., 2019). However, operational transparency is not the sole contributor to trust; other factors may also play significant roles. We posit that the connection between operational transparency and governmental trust is influenced indirectly by the quality of information presented on governmental apps and perceptions of effort exerted by the government.

Studies have found a significant decline in public trust in government in re-

cent years (Alaaraj & Hassan, 2016; Gracia & Arino, 2015; Jameel et al., 2019; Lee-Geiller & Lee, 2019; Mahmood et al., 2019). One contributing factor to this decline is the information gap between the public and the government (Morgeson III et al., 2011; Welch et al., 2005). Public trust in government is formed through cognitive interpretations of information acquired by the public about the performance of the government (Welch et al., 2005). Hence, the absence of such “trustworthiness cues” creates an information gap that may hinder trust formation, potentially leading to a decline in public trust (Lee & Levy, 2014; Morgeson III et al., 2011; Welch et al., 2005). In fact, one of the main purposes of e-government is to establish a direct, reliable channel for information exchange with the citizens. Teo et al. (2008) argue that online information dissemination is the primary function of e-government. Therefore, the digital transformation of government services is expected to narrow the information gap between citizens and governments and therefore restore public confidence in the government (Song & Lee, 2015). While information about government performance can be obtained from several sources, people consider information that is communicated directly through a personal experience or an interaction as more credible than information communicated through a secondary source (Smith, 2010). Therefore, we expect that information obtained by citizens through their direct interaction with e-government websites has the potential to increase public trust in government.

The quality of information on government websites is crucial for the success of e-government, as it substitutes for face-to-face interactions between citizens and government (Venkatesh et al., 2016). Alenezi et al. (2015) found that enhancements in e-government information quality led to a better organizational image. We propose that the higher the perceived level of e-government information quality, the stronger its influence on citizens' attitudes towards the government. Sztompka (1999) argues that higher-quality information serves as more effective trustworthiness cues and is therefore expected to have a greater influence on citizens' judgment of the government. When government websites provide accurate and complete information, citizens are more likely to perceive them as capable of serving their needs. In contrast, inaccurate or incomplete information can lead to confusion, misguided decisions, and frustration among citizens (Venkatesh et al., 2016) and thus undermine their trust in the government and its ability to effectively serve their needs. Therefore, citizens' “perceptions” of e-government information quality can have a significant impact on their trust in the government. People are more likely to trust and rely on the government for decisions affecting their

lives if they believe the information received from the government is sufficient, accurate, and timely (Teo et al., 2008).

As demonstrated earlier, operational transparency is a crucial factor that enhances perceived information quality. In specific, the focus is on how operational transparency helps to clarify process uncertainties for citizens using service-centric government websites. Information related to the service workflow and transaction status are expected to increase the perceived information quality of the e-government. Such uncertainty resolution achieved through the e-government operational transparency leads citizens to raise their evaluations of the government's intentions and improve their predictability of the government behavior (Venkatesh et al., 2016). The government's openness about its operations and workflow signals its genuine willingness to serve its citizens and, therefore, implies government accountability and competency. As a result, this leads to increased citizens' trust in the government. Therefore, we expect that revealing work exercised by government agencies behind the scenes will help improve perceived information quality, which is expected to enhance citizen's trust in the government. In other words, we propose that information quality mediates the relationship between operational transparency and trust in government. Studies have shown that when websites offer complete, rich, and updated transaction-related information such as pictures showing the status of a service requested by a citizen (Buell et al., 2021) or status updates on a donation campaign (Mejia et al., 2019), then website providers are more likely to be trusted by the visitors.

Another factor that can mediate the relationship between operational transparency and trust in the government is the extent to which citizens perceive government efforts. Several studies in operations management literature have presented a process-based view that examines the mechanisms through which trust forms between entities (e.g., citizens and governments). Özer and Zheng (2017), for instance, have identified business process design as a major building block that underlies the trust forming process. "This building block focuses on factors that companies or individuals can change or redesign such that the business processes in question can give rise to high trust and cooperation" (Özer & Zheng, 2018, p. 507). Similarly, Kraft et al. (2022) advocate that organizations "can bolster consumer trust by amplifying supply chain visibility," which in turn yields favorable outcomes for the organization (Kraft et al., 2022, p. 4126). Empirical evidence further corroborates that operational design modifications, inclusive of sharing high-quality

ity information, can shape individuals' perceptions of the effort rendered by service providers (Buell & Norton, 2011; Mejia et al., 2019), thus enhancing citizens' trust in their governments (Buell et al., 2021). For example, in a crowdfunding context, Mejia et al. (2019) found that operational transparency, through work-related updates, heightened perceived effort and perceived trust among donors. Similarly, Buell et al. (2021) suggest that operational transparency leads to more favorable perceptions of effort and appreciation for the government, resulting in more trust in the government. Thus, we expect that operational transparency can enhance perception of effort, which subsequently cultivates governmental trust.

Taken together, these insights suggest that operational transparency enhances both information quality and perceptions of effort, ultimately promoting public trust in the government. Hence, we propose the following:

H4: Operational transparency's impact on governmental trust is mediated by information quality and perception of effort.

Data

Participants and Procedure

Data was gathered from individuals who had accessed or used any Kuwaiti government website or app within the six months leading up to their date of participation in the study. Usable data consisted of 715 responses from eligible participants who completed an Internet-based survey during the time period from late January to late February 2021. Survey participants were asked to indicate the name of the governmental agency they had interacted with electronically (i.e., by visiting the agency's website and/or using its app).

The top 5 visited websites/apps were Meta, MOI, PACI, MOH, and MOCI. Meta, which had the highest representation at 29%, is an online portal that allows users to book and manage appointments with government agencies, facilitating a streamlined and efficient process for accessing various government services. The Ministry of Interior's (MOI) online platform, which accounted for 16% of the visits, offers renewal and management services for passports, traffic fines, residency permits, among other services. The Public Authority for Civil Information's (PACI) online platform, representing 13% of the visits, offers a wide range of civil ID-related services, including ID renewals, payments, and status checks. The Ministry of Health's (MOH) online platform, which had an 11% representation, provides

a range of e-services such as appointment scheduling for medical examinations, accessing laboratory and X-ray results, and managing health records. Finally, the Ministry of Commerce and Industry's (MOCI) online platform, with 10% representation, offers various services including company registration, import license issuance, trademark registration, and the management of commercial registries.

Participants were subsequently presented with survey questions that included measures of perceived operational transparency, information quality, perceived effort, and trust in government. Finally, participants were presented with questions used to assess control measures (e.g., demographics, education level, etc.). Table 1 includes a summary of sample characteristics.

Table 1
Summary of Sample Characteristics

Variable	Values	Percentage	Notes
Gender	Male	65%	
	Female	35%	
Age Group	18-24	9%	
	25-34	28%	
	35-44	35%	
	45-54	18%	
	55-64	9%	
	65+	1%	
Education Level	Below High School	< 1%	
	High School	4%	
	Vocational Training	1%	
	Diploma	12%	
	Bachelor's	58%	
	Master's	16%	
Citizenship Status	Ph.D.	8%	
	Kuwaiti	94%	
	Non-Kuwaiti	6%	

Cont. Table 1
Summary of Sample Characteristics

Variable	Values	Percentage	Notes
Governorate	Ahmadi	8%	
	Asimah	31%	
	Farwaniya	6%	
	Hawalli	37%	
	Jahra	2%	
	Mubarak Alkabeer	17%	
Purpose of Visit	Booking Appointment	51%	Making an appointment to visit the governmental agency
	Completing Transaction	38%	e.g., issue or renewal of a formal document
	Obtaining Information	11%	e.g., opening hours, tracking status of existing transaction, etc.

Measures

Unless otherwise indicated, all survey items used 5-point Likert-type scales with anchors of 1 (strongly disagree) to 5 (strongly agree). A sample item for each measure is provided below, with the full detailed items available in the Appendix. Table 2 includes summary statistics of our main study variables.

Table 2
Descriptive Statistics, Correlations, and Reliabilities for Main Variables

Variable	Mean	Std Dev	1	2	3	4
1. Operational Transparency	2.81	0.97	(0.93)			
2. Information Quality	3.23	1.02	0.50	(0.94)		
3. Perceived Effort	2.64	1.09	0.58	0.50	(0.94)	
4. Trust in Government	2.43	1.16	0.57	0.41	0.79	(0.98)

Notes: Sample size $N = 715$. All correlations were significant at the $p < 0.0001$ level. Coefficient alpha estimates of reliability are in parentheses on the diagonal.

Dependent Variable

Trust in government (TRUST_i). The measurement of trust in government was based on items adapted from Buell et al. (2021). Participants were asked about their level of agreement with statements about their beliefs concerning government services in Kuwait. A sample statement is: “I can trust the government”. The mean trust score was 2.43 ($\alpha = 0.98$).

Independent Variable

Perceived operational transparency (OT_i). We measured perceived operational transparency using a three-item scale developed through multiple stages. Initially, we generated a set of 10 statements based on a comprehensive review of the operational transparency literature (Hinkin, 1998). A panel of experts—including academics in operations management, information systems, and e-government, as well as practitioners with extensive experience in governmental services in Kuwait—reviewed the items for clarity, relevance, and redundancy. Through this iterative process, we refined the scale to three distinct and representative statements that measure perceived operational transparency. These items were: “In general, government websites and applications offer tracking services that show the status of service requests”, “In general, government websites and applications show the work being done in response to customers' requests”, and “In general, government websites and applications share information about the expected service completion time”. We then shared these items with our study participants, preceded by a question about the extent to which those statements aligned with their perceptions of government services in Kuwait. We also assessed the psychometric properties of our scale in terms of its factor structure and reliability. In particular, we conducted Confirmatory Factor Analysis (CFA) in Stata 17 SE which confirmed that a four-factor structure (i.e., distinguishing operational transparency from trust, perceived effort, and information quality) was a better fit than alternative factor structures (i.e., one-, two-, or three-factor structures that combined some or all of the variables). The results of the CFA are presented in Table 3 where it shows that only the four-factor model reached conventional levels of fit (Hu & Bentler, 1999) with a Root Mean Square Error of Approximation (RMSEA) less than the suggested maximum value of 0.06, a Comparative Fit Index (CFI) greater than the suggested minimum value of 0.95, and a Standardized Root Mean Square Residual (SRMR) less than the maximum suggested value of 0.08. These results suggest that perceived operational transparency is distinct from other key measures of our

study and that the remaining measures are also distinct from one another. We also calculated Cronbach's alpha coefficient of reliability for our measure using SAS 9.4. The results indicate adequate internal consistency reliability with Cronbach's $\alpha = 0.93$, which exceeds the cutoff value of 0.7 (Nunnally, 1978). The mean perceived operational transparency score was 2.81.

Mediating Variables

Information quality (IQ_i). We measured information quality with items adapted from Teo et al. (2008). These items reflected the participants' interaction with the referred government website/application. A sample item is: "This website/application provides sufficient information". The mean information quality score was 3.23 ($\alpha = 0.94$).

Perceived effort ($EFFORT_i$). Perceived effort was assessed by employing a three-item scale that was adapted from Buell et al. (2021). Participants responded to statements regarding their perceptions of government services in Kuwait. A sample item is: "I think the government exerts adequate efforts on behalf of its people". The mean perceived effort score was 2.64 ($\alpha = 0.94$).

Controls

Our control variables included participants' demographics (i.e., gender, age group, education level, citizenship status, spoken language(s), and the governorate they lived in). We also controlled for the governmental agency's fixed effects using a set of dummy variables that indicate the target website/app of the participant's encounter. Moreover, we controlled for the main motive for the participant's usage of the government's online platform (i.e., booking an appointment with a government entity, completing a transaction, or obtaining general information about a government entity). To further isolate platform effects, we controlled for both the survey language (English/Arabic) and prior online experience (i.e., whether they "used the Internet to purchase or order a product or service (e.g., buying items from an online store)").

Table 3
Results of Confirmatory Factor Analysis

Model	χ^2	RMSEA	CFI	SRMR
Four factor	107.20***	0.04	0.99	0.03
Three factor (OT & EFFORT combined)	665.86***	0.13	0.91	0.07
Three factor (OT & TRUST combined)	830.69***	0.15	0.89	0.10
Three factor (OT & IQ combined)	872.58***	0.15	0.88	0.09
Two factor (OT & IQ; TRUST & EFFORT combined)	1173.72***	0.17	0.84	0.10
Two factor (OT & TRUST; IQ & EFFORT combined)	1697.24***	0.21	0.77	0.13
Two factor (OT & EFFORT; IQ & TRUST combined)	1760.96***	0.21	0.76	0.14
One factor (all combined)	2029.21***	0.23	0.72	0.13

Notes: $N = 715$. χ^2 = chi-square statistic; RMSEA= root mean square error of approximation; CFI= comparative fit index; SRMR= standardized root mean square residual. *** denote statistical significance at the $p < 0.0001$ level.

Econometric Specification

We test our hypotheses by using a conditional process analysis (Hayes, 2022) that utilizes multi-step mediation analysis which estimates a series of Ordinary Least Square (OLS) regression models. This procedure is widely used by researchers in top-tier management journals (e.g., Peinkofer & Jin, 2023; Ülkü et al., 2022). We indicate the econometric specification and procedure used for testing each hypothesis. For the discussion that follows, let X_i denote a vector of control variables and ϵ_{ji} indicate the disturbance term of model (j) where $j \in \{1, 2, 3, 4, 5\}$.

Hypothesis 1 is tested by regressing trust in government on perceived operational transparency while controlling for other key variables as indicated in model (1) below:

$$TRUST_i = \beta_0 + \beta_1 OT_i + X_i B + \epsilon_{1i} \tag{1}$$

Hypothesis 2 is tested by regressing information quality on perceived operational transparency while controlling for other key variables as indicated in model (2) below:

$$IQ_i = \gamma_0 + \gamma_1 OT_i + X_i \Gamma + \epsilon_{2i} \quad (2)$$

Hypothesis 3 is tested by regressing perceived effort on perceived operational transparency while controlling for other key variables as indicated in model (3) below:

$$EFFORT_i = \pi_0 + \pi_1 OT_i + X_i \Pi + \epsilon_{3i} \quad (3)$$

We estimate models 1-3 using the SAS 9.4 PROC REG procedure.

Hypothesis 4 predicts that information quality and perceived effort mediate the operational transparency-trust relationship. This suggests three potential mediation paths:

- **Path A:** Information quality mediates the operational transparency-trust relationship (i.e., Operational transparency → Information quality → Trust).
- **Path B:** Perceived effort mediates the operational transparency-trust relationship (i.e., Operational transparency → Effort → Trust).
- **Path C:** Information quality and perceived effort sequentially mediate the operational transparency-trust relationship (i.e., Operational transparency → Information quality → Effort → Trust).

We test Hypothesis 4 using the following procedure, which is recommended by Hayes (2022) for testing models with multiple (including sequential) mediators:

1. Estimate the perceived operational transparency effect on information quality (as indicated by the γ_1 coefficient from model 2).
2. Estimate the perceived operational transparency and information quality effects (μ_1 and μ_2 , respectively) on perceived effort as indicated in model (4) below:

$$EFFORT_i = \mu_0 + \mu_1 OT_i + \mu_2 IQ_i + X_i M + \epsilon_{4i} \quad (4)$$

3. Estimate the information quality and perceived effort effects (λ_2 and λ_3 , respectively) on trust in government while controlling for perceived operational transparency as indicated in model (5) below:

$$TRUST_i = \lambda_0 + \lambda_1 OT_i + \lambda_2 IQ_i + \lambda_3 EFFORT_i + X_i \Lambda + \epsilon_{5i} \quad (5)$$

4. Estimate the magnitude of the indirect effect of **Path A** by multiplying the coefficients of γ_1 (model 2) by λ_2 (model 5).

5. Estimate the magnitude of the indirect effect of **Path B** by multiplying the coefficients of μ_1 (model 4) by λ_3 (model 5).
6. Estimate the magnitude of the indirect effect of **Path C** by multiplying the coefficients of γ_1 (model 2) by μ_2 (model 4) and λ_3 (model 5).
7. Estimate the statistical significance of the indirect effects obtained in steps 4-6 by generating a bootstrap-based 95% confidence interval for each indirect effect. Statistical significance is indicated by a 95% confidence interval that excludes zero.

We estimate this procedure using Hayes’s SAS PROCESS macro (Hayes, 2022), which automates the estimation procedure by running the statistical models needed to obtain the required coefficients, calculating the magnitudes of the indirect effects, and estimating the bootstrap-based 95% confidence intervals for the indirect effects using 10,000 bootstrap samples. Figure 1 illustrates the path diagram for the relations used to test Hypothesis 4.

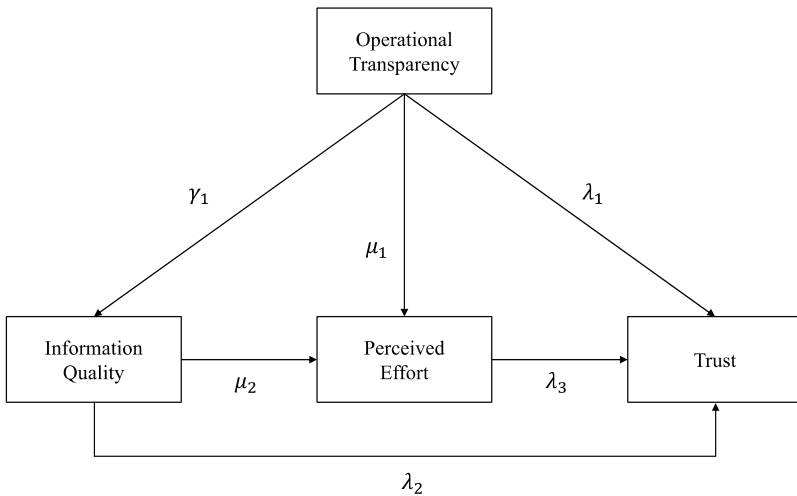


Figure 1: Path Diagram of the Full Model (With Corresponding Coefficients from Regression Models 1-5)

Results

The results of our regression analyses are presented in Table 4. Specifications 1-5 of Table 4 show the results of estimating regression models 1-5, respectively. Supporting Hypothesis 1, the analysis showed that operational transparency was

positively related to trust in government as indicated by the positive coefficient of operational transparency from specification (1) of Table 4 ($\beta_1 = 0.6041, p < 0.0001$).

Similarly, the positive coefficient of operational transparency from specification (2) of Table 4 ($\gamma_1 = 0.4934, p < 0.0001$) suggests higher levels of operational transparency were associated with more favorable perceptions of information quality, which supports Hypothesis 2. Next, supporting Hypothesis 3, the positive coefficient of operational transparency from specification (3) of Table 4 suggests a positive association between operational transparency and perceived effort ($\pi_1 = 0.5985, p < 0.0001$).

Finally, Hypothesis 4 posited that information quality and perceived effort serve as mediating mechanisms in the relationship between operational transparency and trust in government. Figure 2 and Table 4 present the coefficient estimates used to test this hypothesis. The prior analyses suggest that operational transparency was positively related to information quality, perceived effort, and trust in government. In addition, we found that information quality had a positive impact on perceived effort, above and beyond the perceived operational transparency effect, as indicated by the positive coefficient of information quality from specification (4) of Table 4 ($\mu_2 = 0.2680, p < 0.0001$). Furthermore, controlling for operational transparency, we observed that the effect of information quality on trust in government was statistically non-significant ($\lambda_2 = -0.0504, ns$), while perceived effort had a significant positive effect ($\lambda_3 = 0.7445, p < 0.0001$) on trust in government, as shown in specification (5) of Table 4. We also determined that two of the three indirect effects from operational transparency to trust in government were positive and statistically significant. Specifically, the indirect effect through Path B (i.e., Operational transparency \rightarrow Effort \rightarrow Trust) was 0.3471 with a 95% confidence interval of [0.2804, 0.4081]. Also, the indirect effect via Path C (i.e., Operational transparency \rightarrow Information quality \rightarrow Effort \rightarrow Trust) was 0.0985 with a 95% confidence interval of [0.0663, 0.1328]. However, the indirect effect associated with Path A (i.e., Operational transparency \rightarrow Information quality \rightarrow Trust) was statistically non-significant, as its confidence interval included zero (indirect effect: -0.0248 , 95% confidence interval: $[-0.0573, 0.0066]$). Despite the lack of statistical support for the direct effect of information quality on trust (when controlling for operational transparency and effort) and the non-significant indirect effect via Path A, the remaining evidence provide substantive support for Hypothesis 4.

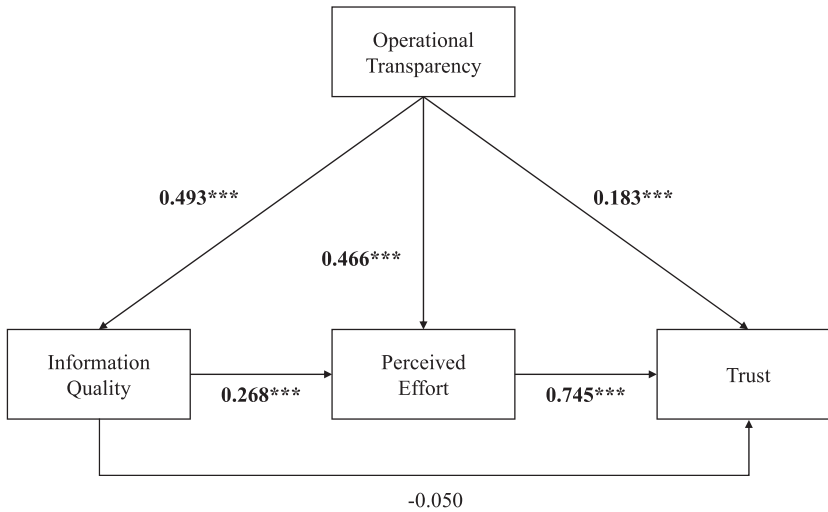


Figure 2: Coefficient Estimates of the Full Model (***) Indicate Statistical Significance at $p < 0.0001$ Level)

Table 4
Regressions for Trust, Operational Transparency, Effort, and Mediated Models

Variable	Dependent Variable				
	Specification Number				
	Trust	Information Quality	Effort	Effort	Trust
	(1)	(2)	(3)	(4)	(5)
Operational Transparency	0.6041*** (0.0384)	0.4934*** (0.0364)	0.5985*** (0.0360)	0.4662*** (0.0391)	0.1834*** (0.0348)
Information Quality	–	–	–	0.2680*** (0.0367)	-0.0504 (0.0308)
Effort	–	–	–	–	0.7445*** (0.0312)
Controls	Yes	Yes	Yes	Yes	Yes
N	715	715	715	715	715
Model fit	F = 11.64***	F = 7.71***	F = 12.13***	F = 14.05***	F = 35.06***
R ²	0.4086	0.3140	0.4185	0.4612	0.6867

Note: Standard errors are in parenthesis. *** indicate significance at the $p < 0.0001$ level.

Supplementary Analysis

While our original model controls for key variables that may influence the outcomes of interest, it does not consider scenarios where the indirect influence of information quality on governmental trust, through operational transparency and perceptions of effort, depends on the values of other variables.

This possibility gives rise to a variety of intriguing scenarios. For example, the strength or even existence of the mediation process might fluctuate based on the purpose of a user's visit to the e-government website, be it booking an appointment, gathering information, or executing a transaction. The mediation process could also be moderated by demographic characteristics such as gender, age, or education level. Alternatively, the temporal proximity of the user's visit to the governmental website might influence the mediation process.

With this in mind, we explored alternative models where moderated mediation occurs. The structure of these models is visualized in Figure 3. By examining these potential variations, we aimed to enhance the robustness of our findings and ensure their resilience to differing conditions and circumstances.

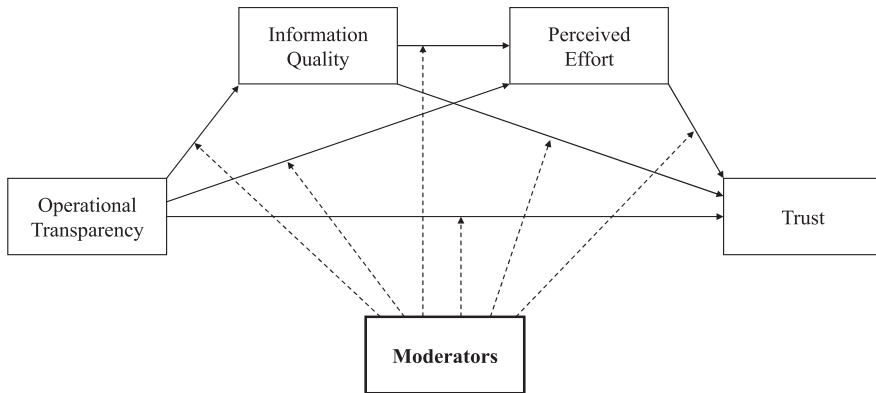


Figure 3: Moderated Mediation Model

Moderation by Purpose of Visit

The first moderator we employ is the purpose of the visit, which includes visiting a governmental website to book an appointment, obtain information, or perform a transaction. This variable could play a significant role in the information users seek and their reaction to the received data, hence potentially influencing the mediation process.

To assess this, we adapted the econometric procedure detailed in the Econometric Specification section to include the purpose of visit as a moderator for all relationships present in the original model¹. We estimate the modified model using SAS 9.4 with Hayes's PROCESS macro (Hayes, 2022), utilizing two moderator variables: a dummy variable, w , denoting booking an appointment as the purpose of visit, and another dummy variable, z , marking the purpose as performing a transaction, with “obtaining information” as the reference purpose-of-visit scenario.

We then probe the models at each possible combination of the w and z variables to get an estimate of the conditional effects of the mediation process for a given purpose-of-visit scenario (e.g., $w = 0$ and $z = 1$ for the transaction scenario). The results of this analysis were supportive of our original findings. First, the interaction terms were statistically non-significant. Moreover, probing the models for each purpose-of-visit scenario yielded outcomes that were qualitatively similar to the original results². Therefore, our analysis indicates the purpose of the visit had no substantial impact on the mediation process.

Moderation by User's Gender

The second moderator is the user's gender. We employ a similar empirical strategy as for the moderation by purpose of visit, but with a single moderator, w , which is a dummy variable equal to one if the user is female and zero otherwise. The outcomes of this analysis supported our primary findings, implying no significant divergence in the conditional effects of the mediation process between male and female users.

Moderation by User's Age

In our third robustness check, we examined age as a potential moderator. Different age groups might perceive and interpret information differently, potentially leading to varying levels of trust in the government. We categorized the data into three age groups: Below 35 years old (36% of the sample), between 35 and 44

¹ We removed the purpose of visit as a control variable from the analysis, given its new role as a moderator.

² The only exception occurred when the purpose of the visit was to obtain information about the governmental agency (i.e., the baseline scenario with both w and z set to zero); in this instance, the indirect effect of operational transparency on trust through the sequential mediation of information quality and perceived effort became statistically non-significant, which might be attributed to the limited number of observations in this purpose of visit category, representing only 11% of the sample.

years old (35%), and 45 years or older (29%). Following the empirical procedure in the Moderation by Purpose of visit section, we assigned w and z to dummy variables indicating a user's age between 35 and 44, and 45 years or older, respectively, with "below 35 years old" as the baseline. The results of this analysis reiterated the general findings of our primary model, suggesting that the user's age had no significant influence on the mediation process.

Moderation by User's Education Level

Our fourth check involved education level as a possible moderator, as education could influence the user's ability to perceive the quality of information and its implications on their perception of operational transparency and effort. We segregated the data into three educational levels: Sub-baccalaureate (18% of the sample), Bachelor's Degree holders (58%), and Graduate Degree holders (24%). Our analysis, which followed a similar empirical procedure to previous sections, did not indicate a significant impact of the user's education level on the mediation process.

Moderation by Time of Visit

A potential alternate consideration might be how the temporal proximity of the user's visit to the governmental website could exert influence on the mediation process. This influence could stem from the fact that the recency of the visit could impact the user's recall accuracy and the saliency of their experiences, thereby affecting their perceptions of information quality, operational transparency, and the government's perceived effort.

Thus, we used the time of the user's visit to the governmental website as the fifth moderator. We split the data into three segments based on the time of visit: those who visited the website within the week prior to taking the survey (35% of the sample), within the month prior to taking the survey (30%), and over a month before the survey (35%). The results, once again, were consistent with our primary findings, suggesting that the user's timing of the visit did not significantly influence the mediation process.

Discussion and Conclusion

Theoretical Contributions

The present study has shown that information quality and perceived effort play a mediating role in the relationship between e-government operational trans-

parency and citizens' trust in their government. In particular, we demonstrated that operational transparency is positively associated with information quality, perceived effort, and ultimately trust in government. Our findings suggest that operational transparency influences trust in government both “directly” and “indirectly” through its impact on information quality and perceived effort. These findings hold significant implications for multiple literature streams.

First, we contribute to the growing body of research on the role of operational transparency in influencing attitudes toward organizations and governments. Specifically, we identify information quality as a critical intermediary in the “operational transparency – perceived effort – trust in government” pathway (Buell & Norton, 2011; Buell et al., 2021; Mejia et al., 2019). This insight highlights the crucial role of operational transparency in shaping how citizens perceive information quality of governmental apps, which subsequently affects their trust.

Additionally, our study is the first to measure operational transparency as “perceived” by citizens, diverging from traditional objective measures of operational transparency (e.g., by website design alterations). In doing so, we devised and validated a 3-item survey instrument that captures citizens' perceptions of operational transparency. This tool offers researchers a way to measure operational transparency from the user's perspective, fostering more citizen-centered investigations in the future. This tool is not only a theoretical contribution but also a practical asset for both academia and policy implementation, deepening our understanding of the interplay between operational transparency, information quality, perceived effort, and trust in government.

Furthermore, our study enriches the information systems literature by offering a fresh perspective on the role of information quality in shaping government trust. While previous research underscores the influence of e-government on trust, results have been mixed, attributed to a lack of thorough exploration of underlying mechanisms (Morgeson III et al., 2011; Porumbescu, 2016). We propose a novel framework positioning operational transparency as a primary catalyst in a sequential process leading to trust. Here, high-quality information is seen as a consequential factor, contingent on the degree of transparency in governmental operations. Aligning with the notion of “trustworthiness cues” (Smith, 2010), our study posits that operational transparency not only enhances perceptions of information quality but is also a fundamental precursor to fostering trust in government.

Managerial Implications

From a practical perspective, the present study has important implications for governments seeking to build and maintain trust among their citizens. Our findings suggest that despite the fact that self-service e-government technologies may not facilitate face-to-face interactions with a service provider, governments can still enhance trust by adapting the interfaces of these technologies to effectively communicate high-quality information that underlines the dedication and effort put forth by the government on behalf of its citizens. By doing so, governments can compensate for the citizen's inability to directly observe the employees working diligently to complete tasks, ultimately leading to a more positive attitude towards the government. In other words, while it is expected that citizens primarily care about the outcome of a government transaction requested online, our research highlights the importance of revealing the behind-the-scenes work while the transaction is in progress. This additional layer of transparency can further enhance citizens' attitudes toward the government, creating a perception of honesty, openness, and integrity.

To operationalize these insights, governments might consider implementing both visual and textual transaction details, such as a clear display of the actual steps being taken or the progress of the transaction as it is being executed by government agencies. Providing real-time updates or interactive process diagrams could help citizens feel more involved and informed, fostering a stronger sense of trust in the government's commitment to delivering quality services. These interventions not only improve transparency but also provide citizens with a clear view of the effort exerted by their government, thereby enhancing trust.

In addition, our study points to the importance of maintaining high-quality information in e-government systems. As our data reveals, the quality of information provided by e-government services can indirectly affect trust in government through its influence on perceived governmental effort. Therefore, governments should ensure that the information provided through their e-government platforms is accurate, timely, relevant, and comprehensive, to maximize its effectiveness in fostering trust.

While the focus of this study is on governmental services, its findings also hold important implications for other non-governmental sectors. The concepts of operational transparency, information quality, and perceived effort are universal and can be adapted to various industries. For example, online retailers could

improve customer's trust by providing detailed tracking information, clarifying shipping and return policies, and showing behind-the-scenes operations like packaging processes. In the healthcare sector, it is crucial to provide accurate, timely, and relevant information to patients that reflects transparency in the process of treatment or diagnosis. In essence, providing “transparent information on the process, criteria, and constraints of [a healthcare] agent's decision-making creates the perception that the agent takes responsibility for its decisions, thereby conveying trust ... toward the agent” (Kyung & Kwon, 2022, p. 6). In general, service-oriented organizations can enhance customer trust by providing more transparent processes, leading to better perceptions of information quality and effort, which will likely enhance customer's trust in the organization.

Policy Implications

From a public policy perspective, promoting operational transparency in e-government, which leads to trust, can be seen as a strategic investment with several potential benefits. Adopting a more open and transparent approach that displays high-quality information and reveals the work behind the scenes can enhance not only citizens' trust but also their engagement with government operations. In fact, utilizing technology effectively by providing convenient and accessible platforms for interaction and feedback can bridge the gap between government and citizens. Proactive engagement efforts, such as operationally transparent e-government, can foster a sense of connection and empowerment among citizens. A more engaged citizenry can provide valuable insights and perspectives that would help governments formulate more effective public policies and programs. Moreover, increased citizen engagement can contribute to a more energetic and responsive democracy, ensuring that the voices of all citizens are heard and considered in the governance process.

Operational transparency could also improve the legitimacy of government institutions. By offering sufficient, accurate, and up-to-date information about the government's efforts to provide public services, citizens can better understand the “what,” “when,” “where,” and “why” behind government procedures, decisions, actions, and outcomes, leading to improved trust and perceived legitimacy. Openness can dispel suspicions of corruption and secrecy, fostering a more collaborative and inclusive relationship between a legitimate government and its citizens. In addition, this openness helps citizens hold the government accountable for its actions, further enhancing the legitimacy of government institutions.

By making government operations more visible, operational transparency can deter corruption and misconduct. When officials know their actions are open to public scrutiny, they are less likely to engage in unethical behavior, motivated by the need to maintain public trust. Transparency empowers citizens to act as guardians of integrity, holding officials accountable and deterring future misconduct by highlighting potential wrongdoing within government operations.

Limitations and Directions for Future Research

This study, like many empirical studies that employ field data, has limitations that present opportunities for future research. First, our study utilizes cross-sectional data which was collected at a specific point of time. Although such a study design can offer valuable insights into the relationships between variables at that particular point, it hinders our ability to draw causal inferences or establish temporal relationships. As cross-sectional data provides a snapshot rather than a time-lapse view of the phenomena, it restricts our understanding of the dynamics of the relationships over time. Future studies may reduce this concern by employing experimental or longitudinal study designs. A longitudinal approach would allow researchers to track the same variables over time, providing more insights into the evolution of these variables over time, while an experimental design would allow us to examine potential causal relationships between variables of interest.

Furthermore, our study relies on self-reported data. While this approach provides a direct way of understanding participants' perceptions and experiences, it is also susceptible to various biases such as social desirability bias, recall bias, and response bias. In other words, participants may have misrepresented their responses to appear more socially acceptable, failed to remember past experiences accurately, or been influenced by the way the survey questions were phrased. To reduce social desirability bias, we ensured the anonymity of survey responses, which is likely to lead to more honest responses since such responses cannot be linked to users' identities. To reduce concerns about recall bias, we inquired about the participants' most recent interaction with the specific government website in question. The results show that most users visited the website within the week prior to taking the survey (35%), while 30% of respondents indicated that they visited the website within the month prior to taking the survey. The remaining respondents visited the website more than one month prior to taking the survey. We controlled for the time of visit when running the analysis. We also ran an additional robustness check with the time-of-visit as a moderator to the mediation

process as described in the Supplementary Analysis section. The results suggest that the study's findings are not significantly influenced by recall bias. As for common method bias, it may arise from utilizing a single survey instrument to measure our study's variables. However, it is worth noting that the impact of such bias "is often overestimated", (Crompton & Wagner III, 1994, as cited in Brinkhoff et al. 2015, p. 194). To further mitigate this risk, future studies could consider employing more objective methods to measure information quality and operational transparency, or they could spread the measurement of these variables across multiple time points. These methods could help reduce potential inaccuracies and biases in self-reported data.

Moreover, our study is based on a single national sample, which raises questions about the generalizability of our findings. The cultural, socioeconomic, and political context of a nation may impact the perceptions of information quality and trust in government. Therefore, the results from this particular national sample may not necessarily apply to other nations or regions. Future research can address this limitation by employing samples from a broader range of nations or locations. Cross-cultural studies or multi-country comparisons can contribute to understanding the influence of cultural or contextual factors on the interactions among the focal constructs of this study. They can also assist in discerning the robustness and universality of our findings across different contexts. In addition to these cross-cultural and multi-national explorations, future studies should extend the scope of research to different domains within e-government services. While our study concentrated on the Government-to-Consumer (G2C) e-services, future studies should venture into examining the operational transparency, information quality, perceived effort, and trust dynamics in Government-to-Business (G2B) contexts. This extension is particularly relevant given the evolving landscape of e-government services and the distinct challenges and opportunities presented in G2B interactions.

Furthermore, an important avenue for future research involves examining customer heterogeneity and its impact on perceptions and attitudes towards e-government services. Customer diversity in demographics, technological proficiency, and cultural backgrounds can significantly influence their experiences with and attitudes towards e-service platforms. In our study, we controlled for various customer characteristics such as gender, age group, education level, citizenship status, and technology use, acknowledging their potential influence on customer

perceptions. Additionally, we conducted robustness checks to determine if some of these variables moderate the mediation process. However, it is crucial to recognize that there are additional factors, possibly unobserved in our study, that could also play a significant role in shaping customer perceptions and attitudes. These may include intrinsic customer traits, which were not directly observed or measured. Future studies should delve deeper into exploring how these broader and possibly unobserved characteristics, such as personal values, beliefs, and psychological traits, influence user experiences and perceptions of e-government services. Such an investigation would contribute to a more nuanced understanding of customer engagement with e-government platforms and support the development of more targeted and effective service delivery strategies.

Finally, while the current study focuses on customer perceptions, future research should explore the impact of operational factors on the provider side, specifically governmental workers. The behavioral operations literature has long emphasized that service workers play an active role as strategic decision-makers, whose actions and decisions are significantly influenced by the operational structures in which they work. These structures, such as workload design and resource allocation, directly affect workers' productivity and service quality outcomes (Ashkanani et al., 2022; Kc & Terwiesch, 2009). By understanding these dynamics, we can better appreciate how governmental agents respond not only to the tasks they are assigned to but also to the operational conditions under which they work. Recent studies have taken this further by exploring the diversity of reactions among service providers, particularly how different workers may respond to the same operational system in varied ways (Ashkanani, 2023). This opens up new possibilities for understanding the nuanced relationships between system-level factors, such as operational transparency, information quality, and perceived effort, and how these factors shape the behavior of different groups of workers. For governmental agents, such insights could reveal significant differences in how they adapt to or resist changes in operational transparency and other system-level variables, potentially informing strategies to enhance their efficiency and service outcomes.

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Appendix: Survey Items

The scale items associated with our primary survey variables are detailed below.

Perceived Operational Transparency:

Please indicate to what extent you agree or disagree with the following statements on your beliefs about the government services in Kuwait.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
In general, government websites and applications offer tracking services that show the status of service requests.					
In general, government websites and applications show the work being done in response to customers' requests.					
In general, government websites and applications share information about the expected service completion time.					

Information Quality (adapted from Teo et al. (2008)):

Please indicate to what extent you agree or disagree with the following statements about your interaction with the government website/application that you referred to previously.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
This website/application provides sufficient information.					
Information provided by this website/application is accurate.					
Information provided by this website/application is up-to-date.					

Perceived Effort (adapted from Buell et al. (2021)):

Please indicate to what extent you agree or disagree with the following statements on your beliefs about the government services in Kuwait.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
I think the government exerts adequate efforts on behalf of its people.					
I think the government has sufficient expertise.					
The government is thorough in addressing the needs of its people.					

Trust in Government (adapted from Buell et al. (2021)):

Please indicate to what extent you agree or disagree with the following statements on your beliefs about the government services in Kuwait.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
I can trust the government.					
I can rely on the government.					
The government is honest.					

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