



# Electronic government and corruption: Systematic literature review, framework, and agenda for future research

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## ABSTRACT

The notion of corruption has emerged as a prominent topic against the backdrop of e-government. However, there are diverse but disorganized viewpoints about the relationship between e-government and corruption, thus creating difficulties in obtaining a structured overview of the existing literature and identifying the avenues to take this research area forward. Despite this, prior studies have made limited attempts to gather these fragmented observations to guide future research holistically. To address this concern, we conduct a systematic literature review (SLR) of 63 articles discussing e-government and corruption and provide a comprehensive synthesis of the current knowledge in this domain. In particular, we offer a thematic classification of prior studies, uncover the key gaps in the literature, identify the potential research areas, and provide recommendations to broaden the avenues for future studies. Furthermore, we propose an integrated conceptual framework to caution policymakers about the incomplete understanding offered by the existing studies and to inspire further research in several ways.

## 1. Introduction

E-government refers to the development and use of information and communication technologies (ICTs) with the aim of streamlining the delivery of public services to citizens, businesses, and public agencies (Carter and Belanger, 2005; Nam, 2014); recently, it has become a life-sustaining means for managing a crisis due to its ability to improve service delivery, leadership, communication, and collaborative efforts (United Nations, 2020). In light of this, e-government is also argued to increase transparency in government processes, enhance citizen participation, and minimize the risk of corruption (Ahmad et al., 2019; Bhuiyan, 2011; Chen and Aklirikou, 2019; Zhao and Xu, 2015).

Corruption is defined as the abuse of public office for personal or private advantage (Srivastava et al., 2016). It is widely known to pose significant challenges to the effectiveness of government initiatives and the efficiency of service delivery. It is one of the largest societal concerns that can penetrate every nook of a country and be detrimental to its well-being (Khan and Krishnan, 2019). Transparency International (2020a), a reputable global body, suggests that over two-thirds of the 180 countries and territories surveyed scored less than 50, on a scale of

0 (highly corrupt) to 100 (very clean), indicating the vast pervasiveness of corruption worldwide.

Driven by the need to stem it, corruption has received increasing attention amongst e-government researchers in the last decade and has become a well-debated subject in the area of information systems (IS). While the most common discourse has focused on the anti-corruption ability of e-government initiatives (e.g., Aduwo et al., 2020; Hartani et al., 2020; MácHová et al., 2018), some studies have maintained the view that e-government cannot be the panacea to corruption in the public sector (e.g., Basyal et al., 2018; Park and Kim, 2019). Specifically, a host of studies have posited that e-government technologies and applications can control corruption in the public sector by addressing the issues of information asymmetry, poor accountability, government inefficiency, and service delay, among others (e.g., Ahmad et al., 2019; Nam, 2018; Srivastava et al., 2016; Vu and Hartley, 2018). In contrast, some studies have argued that e-government may not be effective enough to deal with corrupt practices that have persisted even after the digitization of public services (Saxena, 2017). This stance is also supported by the fact that most countries have made little to no progress in tackling corruption in almost a decade (Transparency International,

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2020a). Interestingly, the number of countries with open government data portals (which could curb corruption by reducing red tape and shortening the delay in public information provision) increased from 46 in 2014 (24%) to 153 in 2020 (80%) (United Nations, 2020). There are even arguments that overinvestment by the government in ICTs may lead to more opportunities for corruption (Charoensukmongkol and Moqbel, 2014). In essence, there are several disorganized viewpoints concerning the association between e-government and corruption.

With such conflicting findings, it is difficult to interpret what the overall picture is, what questions remain unaddressed, and which arguments and results are reliable to be used as the basis for policy decisions (Siddaway et al., 2019). There could be various challenges in not only obtaining a structured overview of the existing literature but also identifying the gaps between what is known and what needs to be known and the avenues to take this research area forward as well. Moreover, having an incomplete understanding of a phenomenon may not provide an accurate frame of policy-level implications on corruption control. However, prior studies have put little effort into holistically accumulating these fragmented observations to drive future research on e-government and corruption. Motivated by this dearth of systematic inquiries, our guiding research question (RQ) is:

**RQ:** *How can the state-of-the-art literature on e-government and corruption be used for setting the future research agenda?*

We strive to answer this question by carrying out a systematic literature review (SLR) of the existing body of knowledge discussing e-government and corruption. An SLR is instrumental in providing a comprehensive summary of the current knowledge in a research area and identifying the extant knowledge gaps and future research directions (Siddaway et al., 2019; Tandon et al., 2020). While there are a handful of studies (e.g., Inuwa et al., 2019; Palvia et al., 2017) that have conducted reviews on e-government and corruption and imparted useful understanding, they are primarily based on the assumption of e-government's ability to curb corruption. That is, these studies have fallen short of considering other possible linkages between e-government and corruption (e.g., the influence of the latter on the former), leading to limited directions for future research. Second, the existing reviews captured an aggregated view of the e-government and corruption constructs without digging deeper into the construct conceptualizations. Our study overcomes these limitations and adds crucial insights to the prior research by (1) broadening the scope of investigations in terms of considering other possibilities beyond the impact of e-government on corruption, (2) realizing the significance of diverse conceptualizations of the main constructs (e.g., types of corruption), and (3) proposing a theoretical framework. In particular, this study makes the following key contributions. First, it presents an organized and comprehensive view of the literature with a discussion of the state-of-the-art research profile, thematic classifications, limitations, and potential research areas that are expected to help enrich this field. Second, this study develops a conceptual framework depicting the existing and potential research areas, which, we believe, will be instrumental in guiding researchers and practitioners in advancing this area.

The rest of the paper is structured into seven sections. Section 2 provides an overview of e-government and corruption. Section 3 explains the methodology followed in this SLR, while Section 4, 5, and 6 present the findings. In particular, Section 4 depicts the research profile of the prior studies, Section 5 discusses the thematic classifications, and Section 6 provides a detailed understanding of the research gaps and proposes the conceptual framework. Section 7 discusses the implications and limitations of this study. Lastly, we draw concluding remarks by reaffirming the value of our study.

## 2. Background

### 2.1. An overview of e-government

With the advancement of ICTs, public administration in many countries has embraced these technologies to enhance the efficiency of government processes and obtain better provisioning of services. While government organizations have been using ICTs for a long time, this usage remained inward-focused in the past, predominantly limited to the internal affairs of the government (Das et al., 2017). Nevertheless, with technological advances, government organizations have undergone a gradual transformation from such an inward-focused endeavor to a citizen-centric, outward-focused approach through which they can connect to external stakeholders (e.g., citizens and businesses), understand their needs and concerns, and take action accordingly (Ho, 2002; Nam, 2014). Based on these two approaches, e-government can be represented differently. It can be defined as the use of ICTs in the internal operations of the public sector to integrate workflows, improve transaction times, and enable open information transfers to address the inefficiency induced by traditional paper-based systems (Abu-Shanab et al., 2013), and it can also refer to the use of ICTs by the government to interact with and provide services to external stakeholders, such as citizens and businesses (Das et al., 2017). In summary, we posit that e-government can be used for a wide range of purposes, including better service, improved management, enhanced governance, increased public participation, and better relationships with citizens and businesses, to name a few. Such diverse benefits have inspired many researchers and practitioners to regard e-government as an effective anti-corruption tool (e.g., Hartani et al., 2020; Nam, 2018). In contrast, another set of studies have expressed their concerns over the ability of e-government in preventing corruption (e.g., Basyal et al., 2018; Pathak et al., 2008). These conflicting views make it imperative to comprehend the extent to which e-government is associated with corruption while also calling for a deeper understanding of the notion of corruption.

### 2.2. An overview of corruption

Institutions play critical roles in determining economic activities (North, 1990). Accordingly, it has been argued that people tend to engage in activities that yield greater economic returns (North, 1990). In many countries, these activities are generally identified as offering bribes, kickbacks, and illegal favors that benefit certain individuals at the cost of negative implications to the economy and society (Garcia-Murillo, 2013). These illegal activities, when rooted in cultural, political, and economic affairs, become an integrated part of society. While corruption bears various definitions, it is widely considered to encompass activities whereby a public office is used (abused) to satisfy the personal interests of a public officer, against the rules of the office and the interests of the country (Jain, 2001; Khan and Krishnan, 2019). Corruption includes both monetary and non-monetary benefits and can be in the form of bribery, extortion, embezzlement, fraud, nepotism, favoritism, and opportunism, among others (Khan and Krishnan, 2019). It is typically identified as consisting of three types, namely, (1) petty corruption, (2) state capture, and (3) grand corruption (Shah and Schacter, 2004). *Petty bureaucratic corruption* indicates corrupt practices involving the low-level administration of the public sector. It usually entails corruption experienced by citizens on a daily basis when they access public information and services from educational institutions, hospitals, police, and other government sectors (Transparency International, 2020d). *State capture* refers to a situation where the powerful entities (individuals, organizations, institutions, or groups) within or outside a country undemocratically influence public policies, legal environment, and the economy of a country to accomplish their private objectives (Transparency International, 2020b). Finally, *grand corruption* occurs at the level of political elites who abuse their power to make economic policies that maximize their personal gains (Jain, 2001). It

implies large political corruption involving high-level public officials (e.g., ministers) and significant embezzlement of public funds or resources that lead to serious gross human rights violations (Transparency International, 2020c).

As indicated earlier, the literature on e-government and corruption is characterized by mixed findings. In this study, we aim to summarize and organize these diverging thoughts to better interpret the relationship between e-government and corruption and extrapolate the associated research and practical implications. To this end, we employ an SLR approach, the discussion of which is elaborated upon in the ensuing sections.

### 3. Methodology

Consistent with the extant research (e.g., Dhir et al., 2020), we adopted the SLR approach to synthesize the knowledge base linking e-government and corruption systematically. The SLR approach of reviewing prior literature offers a comprehensive view of the literature in a given field and helps identify avenues for future research by uncovering the research gaps (Tandon et al., 2020). Guided by the SLR protocols proposed by Behera et al. (2019) and Dhir et al. (2020), we conducted the review in three main phases, namely, (1) preparation, (2) study selection, and (3) assimilation.

#### 3.1. Preparation

The preparation phase consisted of two key steps, namely, framing the research objectives and determining the search criteria and databases. While the former step enables scholars to define the scope of the present review, the latter sets the review protocol (Dhir et al., 2020).

##### 3.1.1. Framing the research objectives

Consistent with most research undertakings, an SLR begins with a relevant research question, objective, or purpose. Based on our guiding research question mentioned previously, we framed the following five research objectives (ROs) for the purpose of our analysis:

**RO1:** To present the research profile of studies linking e-government and corruption in terms of the summary statistics.

**RO2:** To understand the themes that emerged from the accumulation of the knowledge from the existing research.

**RO3:** To discuss the research gaps in the existing literature.

**RO4:** To propose the routes through which the future research on e-government and corruption may be driven.

**RO5:** To develop a conceptual framework depicting the existing research areas and possible opportunities.

##### 3.1.2. Determining search criteria and databases

The essential yet challenging step in an SLR is to locate relevant studies, which, in turn, depends on setting the search criteria and appropriate databases. To this end, we determined the search keywords, identified the databases, and decided on the publication types to be included in this study. Given the vastness of the e-government and corruption literature, which spans multiple disciplines, including IS and public administration, it could be challenging to identify our search keywords. Since the scope of our study surrounds the linkage between e-government and corruption, we defined these two terms (i.e., 'e-government' and 'corruption') as the primary keywords and carried out a thorough search by using a range of keywords synonymous with them.

While e-government is largely about exchanging information and services electronically with its users (Carter and Belanger, 2005), the term has evolved to encompass e-voting, e-democracy, and e-participation (Khan and Krishnan, 2021; Nam, 2014). As the scope of e-government has been extended, open government and the use of social media and smart technologies have emerged as new means of e-government (Nam, 2012). Thus, the first set of keywords that we used as a

selection criterion in the "title of the studies" mainly represented various terms (e.g., digital government, e-service, e-democracy, e-participation, ICTs, and social media) related to e-government and included the following: ("electronic govern\*" OR "e govern\*" OR "egovern\*" OR "digital govern\*" OR "open govern\*" OR "open data" OR "m govern\*" OR "mgovern\*" OR "mobile govern\*" OR "smart govern\*" OR "e service\*" OR "electronic service\*" OR "digital\* service\*" OR ("Internet" AND "corrupt\*") OR ("Internet" AND "govern\*") OR ("IT" AND "corrupt\*") OR ("IT" AND "govern\*") OR "ICT" OR "information and communication technolog\*" OR "information technolog\*" OR "information system\*" OR "e procurement" OR "electronic procurement" OR "e parliament" OR "electronic parliament" OR "e voting" OR "electronic voting" OR "e democracy" OR "electronic democracy" OR "digital democracy" OR "e participation" OR "eparticipation" OR "electronic participation" OR ("online" AND "govern\*") OR ("online" AND "corrupt\*") OR ("online" AND "public\*") OR ("social media" AND "govern\*") OR ("social media" AND "corrupt\*") OR ("social media" AND "public\*"). These keywords were further combined with another set of keywords that represented corruption, as we strove to analyze the literature encompassing both e-government and corruption. Given that corruption takes myriad forms (Aladwani, 2016; Khan and Krishnan, 2019), we used the following terms as a selection criterion in the title, keywords, and abstract of the studies: ("corrupt\*" OR "bribe\*" OR "extortion" OR "embezzlement" OR "favoritism" OR "nepotism" OR "fraud" OR ("abuse" AND "power") OR "graft" OR "clean govern\*").

We utilized two widely acknowledged databases, namely, Scopus and Web of Science (WoS), that are predominantly used in most review research (e.g., Dhir et al., 2020). The third database that we used was the Digital Government Reference Library (DGRL), which is a well-known database dedicated to e-government research (Scholl, 2020). We sought to include studies that were available in these three databases through October 2020 and published in peer-reviewed journals in English. Based on these criteria, we began the screening process, as detailed in the ensuing sections.

#### 3.2. Study selection

This phase concerned the identification of appropriate articles for further analysis. It consisted of three major steps, namely, the initial database search, determining the inclusion and exclusion criteria, and selecting the relevant studies.

##### 3.2.1. Initial database search

The keywords-enabled search initially yielded 985, 571, and 155 studies from the Scopus, WoS, and DGRL databases, respectively. These encompassed studies belonging to different languages and diverse categories, including journal articles, conference papers, reviews, book chapters, books, and editorials, among others. After further pruning the results based on the publication type, we were left with 478 Scopus-listed, 288 WoS-listed, and 73 DGRL-listed articles published in peer-reviewed journals in English. These articles were then screened to identify duplicates, thereby yielding a total of 574 unique articles.

##### 3.2.2. Determining the inclusion and exclusion criteria

Motivated and guided by past research (e.g., Tandon et al., 2020; Zhang et al., 2017), we determined the inclusion and exclusion criteria to select relevant studies for the analysis. We used the following inclusion criteria: (1) studies related to e-government; (2) studies discussing the relationship between e-government and corruption; and (3) empirical studies employing qualitative or quantitative research methodology. The exclusion criteria were: (1) review articles; (2) studies having only conceptual or theoretical framework(s); (3) studies having no measures regarding the use of e-government tools and technologies; and (4) studies focusing only on internet use by individuals for non-governmental affairs.

### 3.2.3. Selecting the relevant studies

The selection of appropriate studies involves assessing the relevance, robustness, and quality of the articles through specific selection criteria (Webster and Watson, 2002). To distinguish articles pertinent to this study objective, the screening process first focused on the titles and abstracts of the 574 studies to gain basic ideas about them. We applied the aforementioned first and second inclusion criteria to distinguish 180 studies that were likely to serve our purpose, thus excluding 394 studies that did not conform to the scope of the present study. We then read the full-text versions of the 180 articles to understand their research objectives, research design, and data analysis processes and applied all of the inclusion and exclusion criteria mentioned above to select 76 studies for further assessment.

The final screening was performed to ensure the quality of articles selected for the review. Table 1 presents the criteria for calculating each study's quality score. As the maximum score was 9, in line with Tandon et al. (2020), the threshold value was set as 4.5 (i.e., 50% of the maximum score), indicating that articles scoring 4.5 or more would be included in the final sample. Two authors were involved in this assessment and evaluated all of the articles individually. In case of any disagreement, the authors engaged in a discussion and corrected the differences to reach a consensus. In the process, 15 articles were removed for not qualifying the quality evaluation criteria, leading to 61 articles being identified as the most suitable papers for this SLR. In the next step, we conducted backward and forward citation chaining to address feedback loops. This process led to the identification of another seven articles, of which five were excluded for not satisfying the quality evaluation criteria, thereby leaving 63 articles for the final evaluation, as depicted in the flowchart presented in Fig. 1. Table A1 in Appendix A provides a summary of the selected studies.

### 3.3. Assimilation

The final phase, assimilation, involved extracting information from the selected articles, organizing and presenting them, and analyzing the contents to address all five research objectives presented above (Dhir et al., 2020). That is, this phase focused on presenting the research profile of the prior literature, exploring the themes, identifying research gaps, proposing future research agendas, and developing the conceptual framework, the discussion of which is carried out in separate sections as follows.

## 4. Research profiling

We profiled the studies under review to learn the current status of the research linking e-government and corruption. In doing so, we present

**Table 1**  
Quality evaluation criteria.

Sr. No.	Criteria	Score
QE1	Explicit and adequate discussion of data analysis	"quantitative": (+2); "qualitative": (+1.5); "no evidence": (+0)
QE2	Appropriate explanation of the relevance (contributions) of the study outcomes and challenges	"yes": (+2); "partially": (+1.5); "no": (+0)
QE3	Outcomes aligned with the utilized methodology and topic of interest?	"yes": (+2); "partially": (+1.5); "no": (+0)
QE4	Peer-recognition and source reliability (expressed as sum of citations and H Index)	"sum $\geq$ 100": (+2); "sum $\geq$ 50 and $<$ 100": (+1.5); "sum $\geq$ 1 and $<$ 50": (+1); "sum = 0": (+0)
QE5	The method(s) utilized are commonly used in past studies?	"yes": (+1); "no": (+0)

the descriptive statistics in terms of the yearly distribution of publications, their geographic scope, theoretical foundations, research design, and data analysis techniques. As Fig. 2 shows, the field was initially underdeveloped with very few systematic inquiries due to a lack of theoretical guidance. Gradually, with technological advancement, the potential of e-government was realized, and the topic gained prominence and increased attention from scholars and practitioners.

We further observed that a major portion (26 articles) of the prior studies used cross-country data to examine the phenomenon, while the other major part (30 articles) comprised studies that focused on a single country, as evident from Fig. 3. The remaining studies, which were classified as "others" in the figure, included (1) a few comparative studies focusing on a group of two or three countries, such as India, Ethiopia, and Fiji (Singh et al., 2010), Jordan, Ethiopia, and Fiji (Pathak et al., 2012), Denmark, the Netherlands, and Portugal (Mélou and Spruk, 2020), and China and India (Wu et al., 2020); as well as (2) a few studies based on multiple countries belonging to one region (e.g., Sub-Saharan African countries (Verkijika and De Wet, 2017) or ASEAN countries (Hartani et al., 2020)).

While examining the theoretical bases of the studies, we observed that most quantitative studies did not formally develop hypotheses using a theory. Instead, they were found to draw arguments from the existing literature without discussing the theoretical underpinnings. In contrast, a few studies employed well-established theories, such as the institutional theory (e.g., Kim et al., 2009), the agency theory (or, the principal-agent-client model) (e.g., Garcia-Murillo, 2013; Krishnan et al., 2013; Neupane et al., 2014a, 2014b; Ojha and Palvia, 2012; Srivastava et al., 2016; Zhao and Xu, 2015), the deterrence theory (e.g., Starke et al., 2016), the modernization theory (e.g., Nam, 2018), and the normalization theory (e.g., Inuwa et al., 2020), among others (see Appendix A for details).

In terms of research design, we observed that more than 70% of studies under review (i.e., 45 articles) employed a quantitative methodology, as shown in Fig. 4. In contrast, only 19% of studies (i.e., 12 articles) used a qualitative methodology, with the remaining six articles adopting a mixed-method approach (see Appendix A for details). Furthermore, the prior literature was found to employ different but commonly used data analysis techniques, such as regression analysis (linear and panel), correlation analysis, parametric tests (*t*-test), factor analysis, cluster analysis, structural equation modeling, difference-in-differences estimates, and thematic and content analysis, with the most common method being the simple linear regression analysis.

## 5. Thematic foci

We analyzed the contents of the selected studies to deliver crucial insights into the nature of the relationships between e-government and corruption. We relied on content analysis because it is widely acknowledged to be an effective technique to synthesize qualitative data. As suggested by Miles and Huberman (1994), two authors of this study independently analyzed and coded the selected articles to explore the thematic foci of the existing literature. The authors followed an iterative approach (Locke, 2001), moved backward and forward between the data and the emerging conceptions, and simultaneously compared the codes. In the case of a difference of opinion, the authors discussed the reasons for the discrepancies and continued the discussion until a consensus was achieved. Six broad themes, as shown in Fig. 5, emerged that characterized the research on e-government and corruption. Table 2 outlines these themes along with some of the illustrative coding used. In the following sections, we draw a detailed presentation of the six themes.

### 5.1. E-government as a tool for fighting corruption

Most studies under this review considered e-government as an anti-corruption tool. Their primary argument was that e-government could

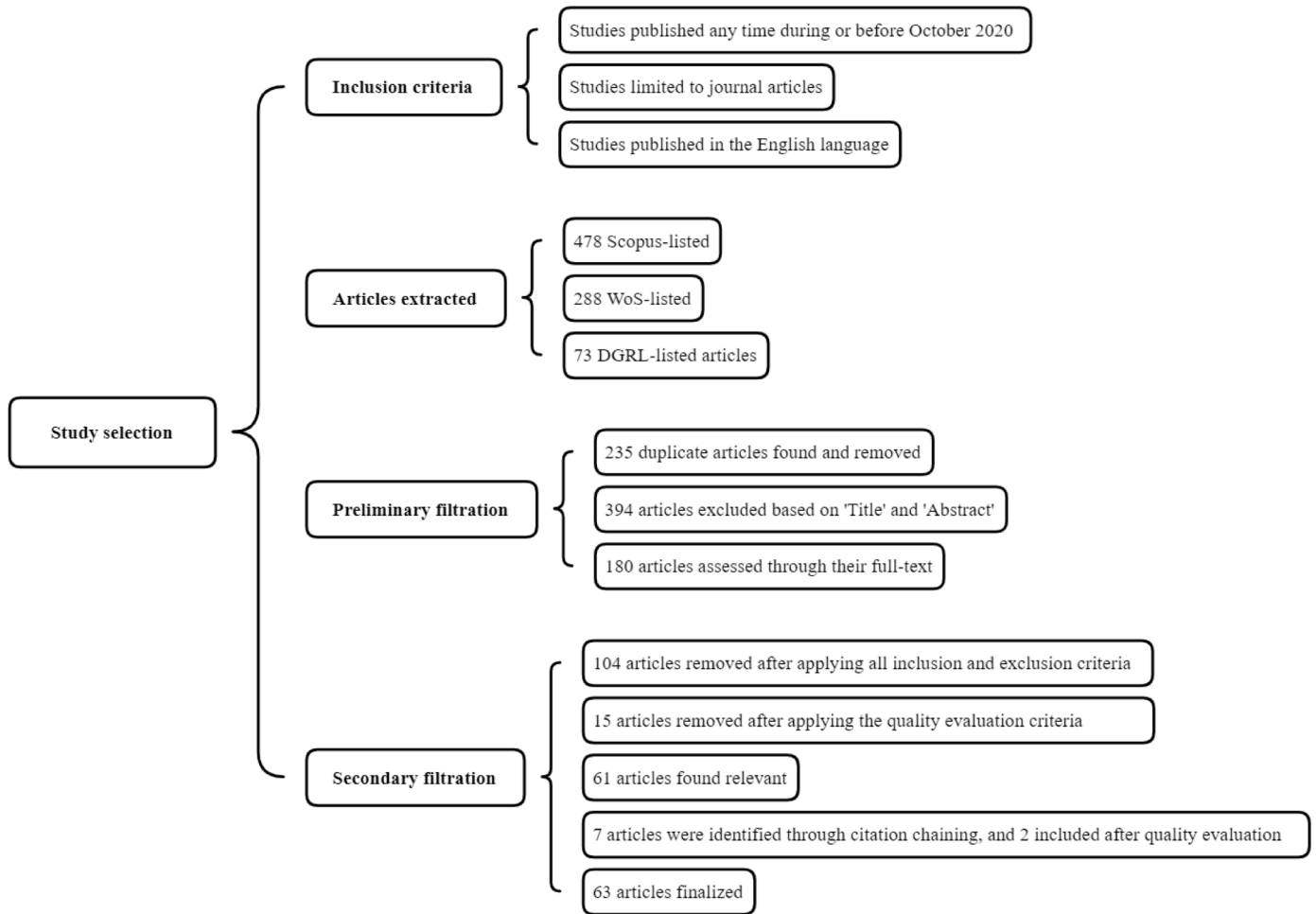


Fig. 1. Flowchart of study selection.

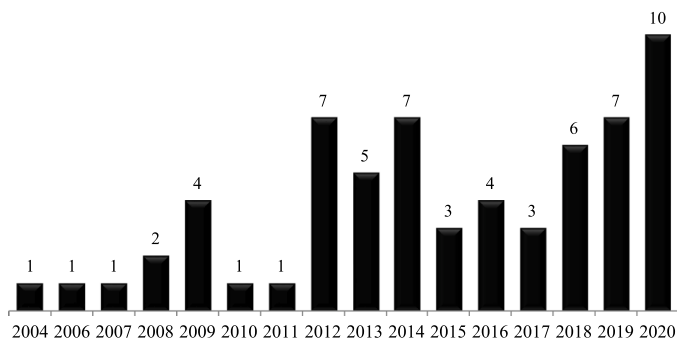


Fig. 2. Year-wise distribution of the selected studies.

make the government more transparent, efficient, accountable, citizen-centric, and responsive, thus reducing corruption (Bertot et al., 2012; Khan and Krishnan, 2021). Guided by these past studies, we present the following strategies to combat corruption using e-government.

5.1.1.1. Prevention strategy

The prevention strategy, when dealing with corruption in the public sector, is concerned with simplifying, standardizing, and depersonalizing public service delivery. While the complex and ambiguous rules and procedures involved in the delivery of public services create opportunities for corruption, standardized work processes prevent public servants from demanding bribes from the public. E-government initiatives intend to simplify and standardize these bureaucratic processes, thereby

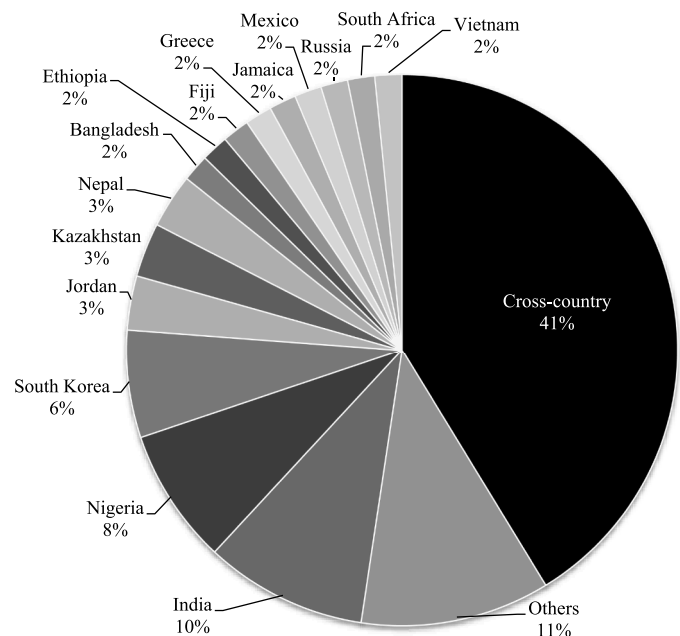


Fig. 3. Geographical scope of the selected studies.

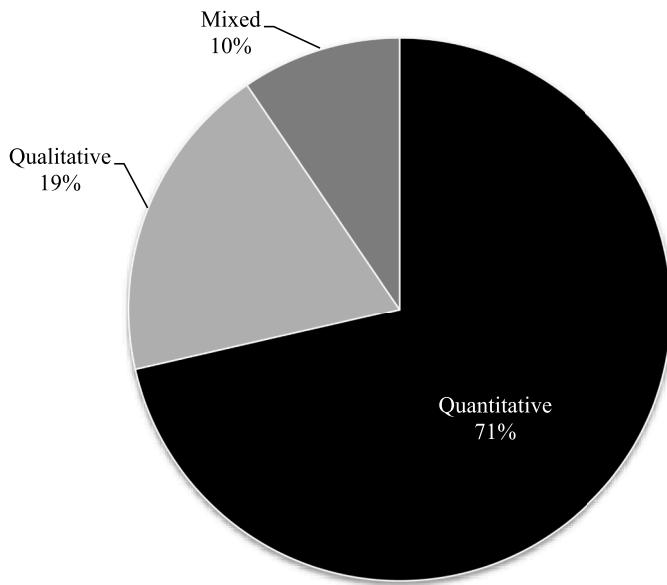


Fig. 4. The research design of the studies.

reducing ambiguities and the possibility of corruption (Garcia-Murillo, 2013; Kim et al., 2009). In other words, e-government decreases the risk of uncertainty by simplifying and publishing policy, procedures, rules, and guidelines online (Abu-Shanab et al., 2013; Wu et al., 2020; Zhao and Xu, 2015), which, according to the transaction cost economics (TCE) perspective, would result in reduced corruption because the opportunity of bribing could be considerably prevented with the reduction in uncertainty (Ojha and Palvia, 2012; Prasad and Shivarajan, 2015). For example, e-procurement systems help to regulate the bidding process of a government contract and compare the bidding price, making it difficult for public agents or government officials to favor a particular bidder (Aduwo et al., 2020; Neupane et al., 2014a).

Citizens can access and check necessary information through e-government portals and applications in real-time from anywhere in the world (Abu-Shanab et al., 2013; Ojha and Palvia, 2012), thus decreasing asset specificity that will help eliminate bribes, as argued in the TCE. Thus, e-government is argued to depersonalize the delivery of public services by reducing physical contact with government officials (Prasad and Shivarajan, 2015; Shim and Eom, 2009). For example, the e-government system, OPEN (Online Procedures Enhancement for Civil Application) in Seoul, South Korea, was found to reduce corruption opportunities by limiting human intervention (Kim et al., 2009). The Seoul local government encountered a number of corrupt activities before the implementation of the OPEN system. Most often, citizens had to wait for extended periods of time to avail themselves of public

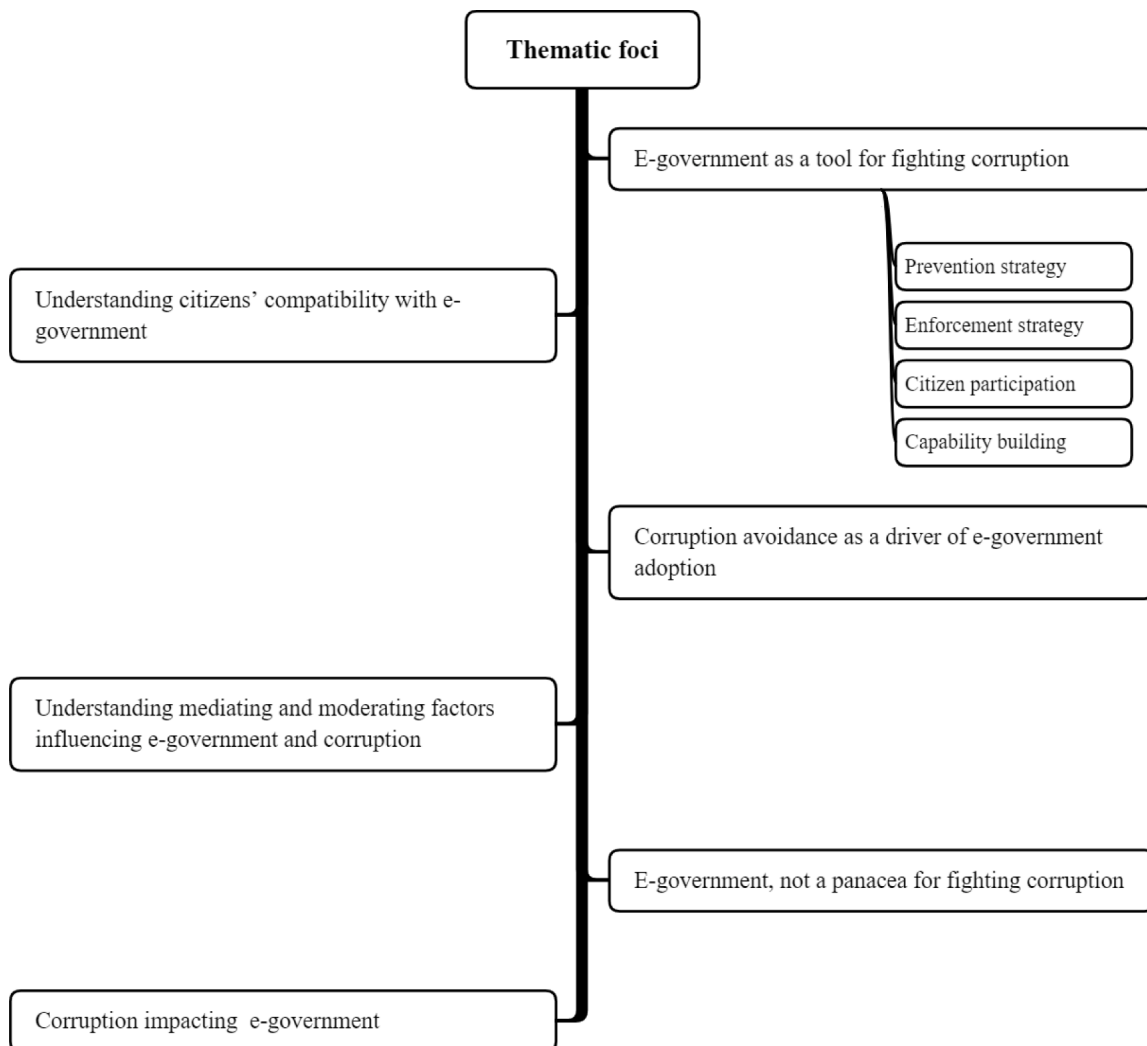


Fig. 5. Thematic foci.

**Table 2**  
Themes and illustrative coding.

Thematic foci	Illustrative coding
I. E-government as a tool for fighting corruption	
Prevention strategy	E-government reducing the intermediate channels of communication (Kumar and Best, 2006); streamlining procedures (Wu et al., 2020)
Enforcement strategy	E-government enhancing the transparency in governmental policy and decision-making (Stamati et al., 2015); increasing the accountability of public administration (Arayankalam et al., 2020)
Citizen participation	E-government decreasing cost of citizen participation and making public supervision more powerful (Zheng, 2016)
Capability building	Telecommunication infrastructure driving the positive impact of e-government on curbing corruption (Elbahnasawy, 2014)
II. Understanding citizens' compatibility with e-government	The government's use of websites improving citizens' perceptions of transparency, efficiency, and corruption (Valle-Cruz et al., 2016)
III. Corruption avoidance as a driver of e-government adoption	Monopoly power and information asymmetry as antecedent attitudes towards intention to adopt public e-procurement (Neupane et al., 2014a)
IV. Understanding mediating and moderating factors influencing e-government and corruption	Government administrative effectiveness mediating the relationships between e-government maturity and corruption dimensions (Arayankalam et al., 2020)
V. E-government, not a panacea for fighting corruption	E-government initiatives are not likely to have any effect on high-level corruption (Sheryzdanova and Butterfield, 2017)
VI. Corruption impacting e-government	Corruption in the public sector is inversely related to the supply of e-government (Seri et al., 2014)

services after they had submitted an application. They even had to pay an “express fee” to the corrupt government officials to reduce the delay and expedite the process. The OPEN system eliminated such illegal practices by reducing the instances of physical contact between the applicants and government agents. The system enabled applicants to track every work process involved in their applications online and identify the government official responsible for any delay. The need for human intervention for accessing public services was reduced significantly, thus leading to decreased corruption.

### 5.1.2. Enforcement strategy

The enforcement strategy to combat corruption lies in ensuring the transparency of government functionalities and the accountability of public servants (Abu-Shanab et al., 2013). Transparency implies the availability of relevant, timely, quality, and reliable information about government functions and services to the public (Harrison et al., 2011). According to the agency theory, the principal (e.g., the government) often delegates work to its agents (e.g., the public officials), which gives rise to the agency problem (Eisenhardt, 1989) in which the principal suffers from the disadvantage of information asymmetry and often fails to monitor the self-seeking behavior of the agents; as a result, the corrupt practices continue to exist unchecked. Increased access to government information can diminish the issue of information asymmetry, mitigate the agency problem, and lower the risk of corruption (Krishnan et al., 2013; Neupane et al., 2014a; Srivastava et al., 2016). In our review, most studies have perceived e-government as a promising tool for combating corruption as it can enhance the transparency of information regarding government initiatives, the rules and procedures of accessing and governing public services, the actions and decisions of government bodies, the outcomes of government decisions, and the performance indicators of various departments (Kim, 2014; Krishnan et al., 2013; Kumar et al., 2018).

Accountability is defined as the degree to which public servants are answerable for their decisions and actions (if not performed properly at the beginning) (Besley and Coate, 2000). E-government has been proposed as a potential solution to the accountability problem in the public sector (Garcia-Murillo, 2013; Neupane et al., 2014a). As ICTs can create a digital audit trail of government work processes, government activities can be easily monitored, and corrupt behaviors could be uncovered (Aduwo et al., 2020; Garcia-Murillo, 2013). Thus, e-government could lower the cost of monitoring and enable the government to keep track of officials' activities. That is, higher-ranked government officials can monitor the workflow by accessing the digital log file stored in the server and detect corrupt behaviors efficiently (Shim and Eom, 2008, 2009). As the economics of crime perspective suggests, the trail of electronic evidence generated by e-government will increase the probability of conviction and thus reduce corruption levels (Ojha and Palvia, 2012). Moreover, e-government can limit the corrupt officials' capacity to delay a process and earn illegal payments in the name of faster service provision by tracking and controlling each step of the process. E-government can further enable citizens to force public servants to explain the reasons for any delay in the service delivery, thereby making them accountable (Kim et al., 2009). In sum, e-government facilitates the transparency of government processes and the accountability of public servants, which lessen the risk of corruption, in turn.

### 5.1.3. Citizen participation

Citizen participation has been widely acknowledged as an effective way of controlling corruption in a nation (Shim and Eom, 2008; Zheng, 2016). The new public service (NPS) theory also favors this bottom-up approach in which citizens are empowered to participate in policy decision-making and to share their opinion and experiences (Denhardt and Denhardt, 2000) to create a meaningful societal change (Khan and Krishnan, 2017). However, traditional citizen participation is a difficult process to execute as it requires considerable effort, time, and money. Government officials may have to conduct numerous meetings and workshops and make arrangements so that citizens can raise their voices and be motivated to engage in this type of political participation. The traditional way of implementing citizen participation is to increase the workload of public employees, thus leading to their disinterest in implementing citizen participation (Ho, 2002). Citizens are often hesitant as well to participate in civil affairs as it demands substantial time and a high level of commitment.

E-government, specifically e-participation platforms, can play a critical role in overcoming these limitations. Compared with the traditional citizen participation process, e-participation makes citizen involvement simpler and faster. Through such online platforms, citizens may easily express their opinions anytime with less physical effort. As the coordination cost decreases with the use of ICTs, more citizens are expected to participate and demand government information, thereby increasing the openness and transparency of the government initiatives (Shim and Eom, 2008; Wang et al., 2020; Zheng, 2016). Citizens can detect and report their experiences of corrupt activities more systematically through e-government and participate in corruption control as well (Kim et al., 2009). Through consultation, feedback, and decision-making, e-participation platforms enable citizens to interact with the government (Krishnan et al., 2017) and question unreasonable governmental activities and procedures, thereby reducing the possibility of corruption for government officials (Choi, 2014; Wang et al., 2020). Furthermore, citizen participation is argued to help the government decentralize its authority by balancing the power between government and citizens, which could, in turn, serve as a long-term deterrent to corruption (Zheng, 2016). In sum, by facilitating citizen participation, e-government reinforces citizen empowerment (Khan and Krishnan, 2020), which then contributes to corruption control because it “re-defines governance through technology-driven changes of the concepts of citizenship and democracy” (Choi, 2014, p. 225).

#### 5.1.4. Capability building

To realize the potential of e-government as an anti-corruption tool, a country needs to build its capability with the help of advanced ICT infrastructure, skills, and budgets, as indicated by some of the studies under review (e.g., Cho and Choi, 2004; Kim et al., 2009; Kochanova et al., 2020; Lee et al., 2018; Wang et al., 2020). Building capability is consistent with the complementary resource theory, which highlights the significance of the resources or capabilities that allow organizations to earn the benefits of a strategy, technology, or innovation (Tece, 1986). The theory further suggests that the value or impact of a resource or capability (e.g., e-government) is multiplied in the presence of another resource or capability (e.g., ICT infrastructure) (Wang et al., 2020). Accordingly, it can be argued that the availability and affordability of ICTs will enable governments to provide effective and faster services and allow citizens to access government information more easily. In South Korea, the ICT usage in delivering public services was argued to be higher than in other countries due to its advanced ICT infrastructure (Kim et al., 2009). This increased diffusion of the Internet and the development of the ICT infrastructure prompted Korean citizens to expect that their government would provide the required services and information by creating more transparent administrative procedures. Such public demand and expectations acted as a normative pressure for the Seoul Metropolitan Government to implement the OPEN system for tackling corruption (Kim et al., 2009). Bertot et al. (2012) and Stamati et al. (2015) also emphasized the need for ICTs, such as social media, to promote openness and accountability. Through a semi-structured interview of government officials in Greece, the study by Stamati et al. (2015) found that social media played an essential role in enhancing visibility (i.e., transparency in government policy and decision-making), increasing communicability and interactivity, allowing collaborative activity, and offering anonymity (i.e., providing an anonymous space for citizens to express their opinions and feedback), which thus contribute to accountability. Along similar lines, Wu et al. (2020) conducted in-depth email interviews with public officials from China and India and argued that the lack of infrastructure could obstruct the e-government's ability to rein in corruption. Many other studies have posited that if a country has a sophisticated telecommunication infrastructure, its corruption level will be diminished (e.g., Choi, 2014; Wang et al., 2020).

In addition to the telecommunication infrastructure, a country needs to build economic strength to make substantial investments in its e-government and employ it as an anti-corruption tool. The case study by Cho and Choi (2004) indicated that the design and development of the OPEN system were observed to incur an extremely high start-up cost in South Korea. In line with this, a number of quantitative studies on "e-government–corruption" observed that a country's economic condition (mostly measured by GDP) had negative impacts on corruption (e.g., Choi, 2014; Nam, 2018). Moreover, there is a need for strong leadership among the higher-ranked government officials for the successful implementation and usage of e-government as an anti-corruption tool (Kim et al., 2009). Government employees need to be competent and have the necessary skills to deal with e-government initiatives as government effectiveness could have a strong influence on reduced corruption (Kim, 2014).

While several studies have defined this theme, they often simplified the phenomenon during the empirical investigation by neglecting factors other than e-government (e.g., political scenario, historical factors, and culture) that could control corruption within a country. However, the true impact of e-government could have been realized if its association with corruption was established even after considering traditional anti-corruption factors. Furthermore, a major part of this theme has been characterized by cross-country analyses that could not explain the varying impact of e-government from one country to another. The conceptualization and theorization also lack depth in most studies under this theme. Nevertheless, this theme shares an important viewpoint regarding the potential of e-government and can be made more useful

with more systematic and rigorous research.

#### 5.2. Understanding citizens' compatibility with e-government

In our review, we observed studies attempting to understand citizen perceptions about e-government's ability to eradicate corruption (e.g., Belwal and Al-Zoubi, 2008; Pathak et al., 2012; Singh et al., 2010; Valle-Cruz et al., 2016). In particular, these studies collected primary data from citizens to understand what they feel about the potential impacts of e-government on corruption in the public sector. Nevertheless, these studies were not explicit about whether citizens adopted and used e-government and participated in online governmental initiatives; the analyses have instead relied on citizens' impression of what e-government platforms were capable of doing. Analyzing whether e-government was successful in reducing corruption was also beyond the scope of these studies. For example, the survey-based research conducted in Jordan, Ethiopia, and Fiji revealed that citizens believed bureaucratic corruption to be rising in their countries as demand for bribes was increasing (Pathak et al., 2012). They also perceived that e-government initiatives might curb corruption as they could improve government-citizen relationships, reduce monopoly, enhance the transparency of government processes, increase accountability, monitor corrupt behaviors, and increase coordination among citizens against corruption. Similarly, the study by Abu-Shanab et al. (2013) suggested that Jordanian citizens had higher perceptions of e-government's ability to reduce the time and cost of public services, enable access to information, provide faster, more convenient, and higher quality services, ensure an audit and accountability system, and limit mediators and brokers. Consistent with these studies, Valle-Cruz et al. (2016) examined the effects of the government's use of websites, social media tools, and other technologies (e.g., virtual assistants, email, mobile technologies, and artificial intelligence techniques) on citizens' perceptions of transparency, efficiency, and corruption in three Mexican municipalities, finding that municipal government's presence on websites and social media had positive implications for citizens' perceptions of corruption control.

While the existing literature has seldom provided a theoretical conceptualization of how citizens perceive e-government's payoffs in terms of reduced corruption, the concept can be argued to be theoretically anchored in the notion of compatibility. Rogers (1983) defined the compatibility of innovation as the extent to which an innovation is perceived as being consistent with the existing values and needs of the potential adopter. Past studies on innovation have viewed this construct as highly significant in explaining innovation adoption and diffusion. In line with these studies, we posit that when citizens value integrity and believe e-government can facilitate a corruption-free environment, they will be compatible with this technological innovation. While the studies under this theme did not explore citizens' adoption and usage behavior, their compatibility with e-government could act as a prelude to their intention to adopt and use this innovation, as discussed in our next theme.

#### 5.3. Corruption avoidance as a driver of e-government adoption

In contrast to the previous theme, some studies on e-government and corruption have sought to analyze the adoption of e-government systems by various stakeholders, including government officials, citizens, and businesses. IS research has long explored why and how individuals adopt information technology, using a range of theories (e.g., the theory of reasoned action (TRA), the theory of planned behavior (TPB), technology acceptance model (TAM), innovation diffusion theory (IDT), and unified theory of acceptance and use of technology (UTAUT)) to explain the factors determining the adoption behavior (Khan et al., 2020). Given that the success of e-government initiatives is contingent upon stakeholders' willingness to adopt these services (Kumar et al., 2018), the studies under this theme analyzed corruption avoidance as the primary



driving force of e-government adoption. For example, in a primary study conducted in Nepal, anti-corruption factors, such as the reduction of monopoly power and information asymmetry and a possible increase in transparency and accountability, influenced government officers' willingness to adopt e-procurement at all levels of government (Neupane et al., 2014a). The same factors could also drive bidders' willingness to adopt e-procurement systems for the supply of goods and services to the government of Nepal (Neupane et al., 2014b). In qualitative research in India, corruption avoidance, transparency, and fairness in the process were found to be significant factors enabling citizens to adopt e-government services (Kumar et al., 2018). Similarly, the level of perceived corruption, combined with the degree of social capital, was found to predict e-participation adoption in South African municipalities (Ingrams and Schachter, 2019). In sum, the significance of e-government's benefit in terms of corruption control was evident in these studies; however, this theme fell short of providing a comprehensive understanding of the anti-corruption factors that could drive e-government adoption. In addition to these studies' examinations of power equilibrium, information symmetry, transparency, and accountability, other anti-corruption factors, such as faster public service, reduced cost of public service, lowered favoritism, increased government efficiency, and decreased procedural complexity, could also determine e-government adoption, the investigation of which could serve as an agenda for future researchers.

#### 5.4. Understanding mediating and moderating factors influencing e-government and corruption

While understanding the relationships among the primary variables of interest (here, e-government and corruption) is essential, it is valuable to have knowledge of the mediators and moderators shaping these relationships. However, only a handful of studies investigated the mediating and moderating factors influencing the relationship between e-government and corruption. Studies involving mediation analyses were largely negligible, except for a handful of empirical research as follows. In their cross-country study, Srivastava et al. (2016) conceptualized corruption to be existing in three basic national institutions, namely, political, legal, and media institutions, and two national stakeholder systems, namely, business and citizen systems. While e-government development in a nation was negatively related to corruption in political, legal, and media institutions, the mediation analysis revealed that e-government influenced corruption in stakeholder systems by impacting corruption in basic national institutions. Similarly, in another cross-country analysis, e-government maturity in a country was found to influence legislative, executive, and judicial corruption by improving the administrative effectiveness of government organizations (Arayan-kalam et al., 2020).

Amongst the few studies on interaction and moderation effects, Elbahnasawy (2014) analyzed the interaction effect between e-government and internet adoption on corruption through a panel data analysis and found the effect to be statistically significant. The study suggested that e-government and internet adoption could complement each other in anti-corruption programs. Kim (2014) also performed a cross-country analysis to understand the moderating impact of government effectiveness and found this variable to play a significant role in shaping the anti-corruption efforts of e-government. In particular, the study indicated that e-government could be more successful in containing corruption in the presence of high-quality public bureaucracies with competent public agents. In another study, Nam (2018) used country-level data from secondary sources to investigate the moderating effects of national culture on the impact of e-government on corruption control. The study found that the anti-corruption effect of e-government significantly decreased in high power distance and high uncertainty avoidance cultures. In contrast, the culture of masculinity-femininity and individualism-collectivism did not exert any moderating influence (Nam, 2018). Following this, Žuffová (2020) examined the moderating

role of press and internet freedom in influencing the relationship between transparency policies and corruption levels, finding that the effect of open data on corruption reduced with diminishing media and internet freedom. Given the volume of literature on e-government and corruption, studies under this theme appear to be limited. As mediators and moderators influence the theoretical understanding of a phenomenon to a great extent, this theme needs to be further developed to bring out vital and interesting insights into the "e-government–corruption" relationship.

#### 5.5. E-government, not a panacea for fighting corruption

While a large number of studies under review have conceptualized e-government as an effective tool for combatting corruption (e.g., Abu-Shanab et al., 2013; Andersen, 2009; Srivastava et al., 2016) by drawing on the agency theory, economics of crime, and the TCE, some studies have raised their doubts regarding e-government's efficacy in this area after evaluating its impact on corrupt practices. For example, the study by Saxena (2017) explored whether corruption decreased in public services after the launch of the Digital India program. After surveying over 200 Indian citizens, she found corruption to be prevalent even after the launch of this e-government platform. In particular, citizens perceived that the cost incurred for availing themselves of government services increased along with government inefficiency. They also perceived that the issue of nepotism and favoritism was not curbed and that transparency was not achieved, which then led to increased corruption (Saxena, 2017). In another study, Basyal et al. (2018) analyzed a fully heterogeneous non-linear model with panel data from 176 countries between 2003 and 2014 and found no significant effect of e-government on corruption, concluding that there was no evidence of an association between these constructs. Similarly, Linde and Karlsson (2013) reported that in non-democratic countries, there was no evidence that e-participation had anti-corruption effects or improved the general quality of government. Along similar lines, Mélon and Spruk (2020) found that the adoption of e-procurement failed to bring about a structural, institutional change (e.g., control of corruption and regulatory quality) in Portugal. Accordingly, it was suggested that e-government could be a measure of corruption control but might not be the only panacea (Basyal et al., 2018; Pathak et al., 2008, 2009).

Furthermore, the effects of e-government on corruption may vary depending on the type of corruption and the sector or areas of civil application (Cho and Choi, 2004; Žuffová, 2020). Such a viewpoint was supported by Sheryazdanova and Butterfield (2017), who found e-government to be effective in reducing petty corruption but ineffective in controlling high-level corruption. Also, Ojha and Palvia (2012) observed that some but not all of the e-government projects (related to e-procurement and land record computerization) could reduce corruption and improve service delivery in India. By comparing the level of corruption before and after implementing the e-government, they concluded that projects, such as *Interstate Check Posts Computerization* (used for partial computerized checking of commercial vehicles passing through the check-posts), had a minimal impact on corruption control, while *Passport Services Computerization* (used for the online submission of passport application) was similarly unsuccessful in reducing corruption. Thus, it would be incorrect to hold the view that a country with a higher level of e-government will always be less corrupt, which thus necessitates a better conceptualization of corruption to capture the true impact of e-government.

#### 5.6. Corruption impacting e-government

While most of the studies under review hypothesized the potential impact of e-government on corruption and analyzed this one-way relationship, there was a dearth of studies exploring the other-way relationship—the impact of corruption on e-government. Among the few studies to test this inverse relationship, Elbahnasawy (2014) analyzed

panel data covering 160 countries and found that the relationship was directed from e-government to corruption but not the other way round. Conversely, in an econometric analysis of 24 European countries, corruption was found to negatively impact the supply of e-government services to businesses, leading to the conclusion that a clean public administration could be the main driver of the diffusion of business-oriented e-services (Seri et al., 2014). In sum, this theme is significantly under-explored and lacks both theoretical reasoning and empirical accounts, which could be taken up as a future research area.

## 6. Research gaps and potential research areas

Our systematic review of the prior literature enabled us to gather a detailed and comprehensive understanding of the state of the research in the field connecting e-government and corruption. It also helped us identify several gaps in the prior research and its derived findings. In the following sections, we discuss these research gaps, which form the basis for our proposed future research agenda.

### 6.1. Research gaps

#### 6.1.1. Data-related gaps

We observed four data-related issues in the prior literature: (a) concerns with research design, (b) concerns with self-reported survey research, (c) generalizability problems, and (d) data collection issues. Regarding the first concern, some studies were based on the tenets of qualitative research to examine the relationship between e-government and corruption (e.g., Stamati et al., 2015). The qualitative research design has some inherent problems, such as a limited sample, ethical considerations, contextual issues, and non-numerical data analysis. While these are common limitations to any qualitative research, they could impact the findings as well as raise questions about the rigor of the study if the chosen research design is not appropriate and justified (Kumar and Best, 2006; Kumar et al., 2018; Ojha and Palvia, 2012).

The second concern regards issues in self-reported surveys (e.g., Saxena, 2017) and semi-structured interviews (e.g., Kumar et al., 2018). For instance, participants in self-reported surveys could remain guarded in their responses and not answer factually (e.g., Kim and Lee, 2012; Pathak et al., 2007; Singh et al., 2010). The problem of selection bias could also be present in the collected responses (e.g., Aduwo et al., 2020; Asogwa, 2013; Belwal and Al-Zoubi, 2008; Pathak et al., 2012).

The third concern relates to the generalizability of the study findings, which was commonly observed in several studies under review. The case-based research in our review, for example, was restricted to one particular country or a few regions, thereby limiting the analytical generalizability of the findings (e.g., Stamati et al., 2015). To elaborate, most qualitative studies under this review were in the form of a single case study and restricted to one country, which is likely to limit the transferability of findings from one context to another (Kim et al., 2009; Kumar et al., 2018). Furthermore, this review observed the concern of statistical generalizability in several primary survey-based quantitative studies where drawing inferences from data to a population was troublesome (e.g., Abu-Shanab et al., 2013; Pathak et al., 2012).

The final concern centers on data collection issues. Many quantitative studies were found to use non-random sampling (e.g., convenience and purposive sampling) to gather primary data without confirming whether the sample was relevant for the study (e.g., Pathak et al., 2009). A few qualitative studies also had concerns regarding sampling strategy; while some studies justified their approach (e.g., Kumar et al., 2018), a few did not clarify the sampling strategy adopted in their research (e.g., Kumar and Best, 2006; Stamati et al., 2015). Moreover, the concern of small sample sizes was observed in various studies (e.g., Asogwa, 2013; Neupane et al., 2014a; Saxena, 2017). There were also a large number of cross-country studies that collected data from secondary sources. While secondary sources reduced the effort and time of collecting primary data, many countries were omitted due to the unavailability of the data

(e.g., Krishnan et al., 2013; Nam, 2018; Zhao and Xu, 2015). Such random omission of countries raises the question of whether the sample was globally representative. Further, the measures obtained from secondary sources could not be verified for data reliability and validity, thus creating concerns over the quality of data (e.g., Starke et al., 2016; Zheng, 2016). In addition to the aforementioned gaps, we also identified several gaps concerning the overall nature of the analysis and the contributions of the studies, the discussion of which is presented in the following sections.

#### 6.1.2. Gaps related to analysis

##### a) Omission of relevant variables

Most of the studies were found to neglect necessary variables while analyzing the relationship between e-government and corruption (e.g., Máchová et al., 2018; Mistry and Jalal, 2012; Shim and Eom, 2008). Corruption was regarded as the dependent variable in nearly all of the studies, and though it could be impacted by several factors, such as political system, culture, history, and religion, thereby influencing the e-government's anti-corruption effects, these were seldom accounted for in the prior studies. There were even studies that did not employ any control variables (e.g., Pathak et al., 2007; Singh et al., 2010), thereby raising concerns regarding the reliability of the study findings. Corroborating this, Linde and Karlsson (2013) argued that some prior findings could be subjected to weak research design and the exclusion of certain important control variables, observing that the association between e-participation and corruption, which was established in earlier studies, was non-existent when they employed sophisticated data analysis techniques. Furthermore, studies on e-government adoption were found to explore limited anti-corruption factors (e.g., information symmetry, transparency, accountability, and citizen participation), as indicated earlier. Omitting crucial variables, such as the time and cost of public service delivery and government efficiency, may also inhibit a comprehensive understanding of all relevant anti-corruption factors that could drive e-government adoption.

##### b) Lack of comparative studies

While our pool of selected studies contained many cross-country analyses and a wide geographical focus, there was a lack of comparative analyses to provide in-depth views of the relationship between e-government and corruption. That is, the comparison between different countries was largely neglected in this area even though e-government development and corruption level were found to vary across countries. In line with this, Mistry and Jalal (2012) examined the relationship between e-government and corruption in developed and developing countries and found developing countries to benefit the most from the increased use of ICTs in the seven-year period between 2003 and 2010. More such comparative studies will be instrumental in not only addressing the concerns of generalizability but also making valuable contributions to the literature.

##### c) Lack of studies uncovering mediating and moderating factors

The majority of the prior studies did not explore mediating and moderating factors affecting the "e-government–corruption" relationship. For instance, while the studies proposed that e-government could control corruption by increasing transparency and accountability and decreasing monopoly and the discretionary power of government agents, these mechanisms were not empirically validated. This concern was predominant in quantitative studies employing secondary data sources (e.g., Lee et al., 2018; Zheng, 2016). As a result, these studies fell short of establishing the mechanisms of how e-government could impact corruption, which calls for a greater understanding of more mediating factors. Similarly, our review observed a few moderating factors (e.g.,

virtual social networks (VSN) diffusion, ICT access, and national culture), which provided a limited understanding of the conditions that could influence and alter the “e-government–corruption” relationship. Other moderating factors must be explored to strengthen the knowledge base of the linkage between e-government and corruption.

#### d) *Lack of theoretical understanding*

Most studies under this review did not utilize any theory or conceptual framework to formulate their hypotheses and lacked the theoretical underpinnings that would strengthen their arguments and render crucial insights into the relationship between e-government and corruption (e.g., Andersen, 2009; Choi, 2014; MácHová et al., 2018; Pathak et al., 2009; Singh et al., 2010). Moreover, only a few studies from the selected pool employed relevant theories in support of the hypothesized relationships (e.g., Krishnan et al., 2013; Srivastava et al., 2016; Starke et al., 2015). There was also a lack of inductive reasoning to develop theories from specific observations in the qualitative studies (e.g., Mistry, 2012; Sheryzdanova and Butterfield, 2017), which again prevents this field of research from being theoretically sound.

#### e) *Lack of studies on the impact of corruption on e-government*

As our earlier discussion showed, the state of the research on the relationship between e-government and corruption remained one-sided, with a vast amount of studies focusing on the impact of e-government on corruption. Conversely, there was little research on the impact of corruption on e-government, even though Aladwani (2016) highlighted that corruption could contribute to the failure of e-government. While studies under the first stream offered useful understanding, researchers must know that missing the other possible relationship may leave out crucial policy implications (Aladwani, 2016).

In essence, several important limitations and research gaps must be addressed to take this field of research forward. To this end, the following sections suggest potential areas for further research.

## 6.2. Potential research areas

### 6.2.1. Exploring the effect of corruption on e-government

As we indicated earlier, the literature linking e-government and corruption is mostly skewed toward examining the impact of the former on the latter. While this stream of research presents mixed findings, having one group of studies arguing e-government to be an effective tool to control corruption in a country (e.g., Cho and Choi, 2004; Elbahnasawy, 2014; Srivastava et al., 2016) and another group questioning e-government’s anti-corruption ability (e.g., Basyal et al., 2018; Saxena, 2017), this stream is still substantially developed. In contrast, the literature delivers a limited understanding of the potential impact of corruption on e-government.

Corruption is often regarded as a major impediment in the way of innovation (Riaz and Cantner, 2020) since it could induce uncertainty, deter investment incentives, increase transactional costs, and misallocate resources (Riaz and Cantner, 2020; Rose-Ackerman, 1998). Given that corruption affects innovation activities in the private sector, it is less reasonable to imagine that e-government, the technological innovation in the public sector (Meijer, 2015), will remain immune to corruption. Besides, corruption could be one of the reasons why many countries struggle in achieving e-government success (Aladwani, 2016). Thus, it will be worthwhile to explore whether corruption in a country poses a threat to its e-government development and maturity. Future studies may thus consider addressing this void in the literature by theorizing and investigating the possible impact of corruption occurrences on e-government.

### 6.2.2. Improving research design and data analysis

While most of the existing studies have hypothesized the impact of e-

government on corruption, one of the primary concerns in examining this conjecture lies in the rigor of the methods employed. We observed that most of the studies utilized poor research methodology and weak data analysis techniques. Hence, we recommend that scholars focus on improving their research design and data analysis approach to validate their arguments. In particular, they should consider refining their sampling strategy so that the sample is representative of the population that is aware of e-government technology and usage. It is essential to draw correct inferences about the population, which indicates the significance of the sampling strategy. In addition, the primary studies under our review tended to examine the phenomenon from the perspective of either governments or citizens. This gives a biased overview of the e-government initiatives within a particular country, state, or region, as the experience would vary from government employees, who are the suppliers of e-government services, to citizens, who are the end-users. Thus, we recommend that future studies should consider the viewpoint of all relevant stakeholders to draw conclusions about e-government’s ability to prevent corruption. Another concern lies in ensuring data reliability and validity, an issue that is most apparent in studies using secondary data sources. We suggest that future studies scrutinize the sources and confirm whether the data can be considered reliable and valid.

Furthermore, we call for mixed-method research to present a comprehensive view of the phenomenon. For example, studies may complement their understanding from quantitative data analysis with the insights generated from a qualitative study. They may also conduct an investigation at a more granular level and collect both primary and secondary data to have an in-depth analysis of the association between e-government and corruption in a country. Data may be gathered from citizens, governments, and business representatives, who are the primary stakeholders of e-government and are expected to have experience regarding whether e-government affects corruption or corruption affects e-government. Additionally, we suggest collecting data from published government reports, which could be reliable and help scholars compare these findings with those from their primary data analysis, thereby leading to a firm conclusion.

Many studies were found to depend on simple correlation values or simple regression analysis between e-government (independent variable) and corruption (dependent variable), leading to two major concerns. First, such research neglects variables and conditions that cause corruption to vary with the political, cultural, historical, economic, and judicial environment and public sector policies of countries (Mistry and Jalal, 2012). Second, such an analysis falls short of establishing the direction of causality between variables (Elbahnasawy, 2014; Shim and Eom, 2008). We thus recommend that future studies improve their research design by taking into account appropriate control variables that could impact e-government’s potential to control corruption (Neupane et al., 2014a; Ojha and Palvia, 2012). We also suggest that future research focus on sophisticated data analysis techniques, preferably a longitudinal one, and perform causality tests to make a significant contribution to the field. In sum, we recommend that future investigations focus on increasing their methodological rigor to properly validate the relationship between e-government and corruption.

### 6.2.3. Extending the geographical focus

As discussed before, the generalizability of the extant findings was a major concern. For qualitative research, analytical generalizability could be achieved if similar results are obtained from other case studies (Yin, 2010). That is, case study findings can be generalizable to theoretical propositions when the arguments are grounded in literature and the findings impact (e.g., support or challenge) a particular theory, construct, or theoretical sequence of events, which could be applied to explain other situations or contexts in which similar events occur (Yin, 2010). Thus, scholars may consider replicating case studies in different settings and countries to expand and generalize theories. Such an approach is likely to provide a complete view of the extent to which

e-government could influence corruption (or vice versa) and the associated pre-conditions and contingencies. In quantitative research, studies may consider addressing the concern of statistical generalizability by selecting a sample that represents the population reasonably and is non-biased. Future research must pay attention to the sampling strategy, justify their approach, and adopt the random sampling method to avoid sampling bias. Furthermore, there must be comparisons between countries. As e-government development and corruption vary depending on a country's economic, social, political, and cultural conditions (Mistry and Jalal, 2012), the "e-government–corruption" relationship need not be stable across countries. Hence, the e-government literature would be enriched if future studies carry out comparisons between developed and developing countries and between democratic and non-democratic countries. Along similar lines, studies understanding citizens' perceptions of e-government's anti-corruption ability and studies focusing on e-government adoption could be extended to various countries to realize why and how citizens' compatibility with e-government and adoption behavior varies from one country to another. Therefore, this study calls for comparative and replication studies that can uncover the nuances of the phenomenon by highlighting differences or similarities among countries to provide novel and enriched insights.

#### 6.2.4. Deeper understanding of mechanisms and moderating factors

While prior research aimed to understand the association between e-government and corruption, a few studies conceptualized and empirically validated the mechanisms of how e-government could influence corruption. In light of this, we observed that most studies relied on the assumption of the ICT's ability to enhance transparency and accountability, increase public participation, and reduce public official's discretionary power, and accordingly expected that e-government would reduce corruption in the public sector. Although these studies impart essential insights into the possible reasons why e-government would influence corruption, they could not adequately explain and empirically validate these mechanisms (Garcia-Murillo, 2013). Therefore, we suggest that future studies explore mediating variables (e.g., citizen participation) and empirically validate whether they could explain the link between e-government and corruption. Similarly, the relationship could be contingent on several factors, including demographic variables, cultural factors, and a country's developmental status, among others. These factors, specifically demographic variables, could also moderate the relationship between corruption perception and citizens' e-government adoption. Future studies should uncover such moderators and test their role in influencing the aforementioned relationships.

#### 6.2.5. Strengthening theoretical underpinning

There is a growing opportunity for future studies to extend this field by addressing the dearth of theory-driven research. We suggest that future research should use novel theories to offer various explanations for the relationships between e-government and corruption. Studies may also employ inductive reasoning to develop theories from specific observations. Theory-driven studies would refine the understanding of how e-government could influence corruption and propose mechanisms explaining how corruption could influence e-government. For example, theories, such as the rent-seeking theory and the trust in institutions perspective, could provide adequate ground for conceptualizing the other possible relationship between e-government and corruption—the impact of the latter on the former.

#### 6.2.6. Understanding e-government and corruption from diverse conceptualizations

In our review, most studies were observed to use an aggregated measure of e-government and public-sector corruption. However, e-government is a broad term that encompasses various types of usage of ICTs in the public sector (see Section 6.3.1 for details). Accordingly, its conceptualization and corresponding impact on corruption could vary

depending on its usage. Along similar lines, it is crucial to note that the public sector includes different institutions, and the level of corruption can vary depending on the type of germinating institution (e.g., political and judicial institutions). For example, in a cross-country study, while e-government maturity was found to negatively affect the level of corruption in the legislature, executive, and judiciary branches of the government, VSN diffusion was observed to moderate this relationship negatively for legislative and executive corruption but positively for judicial corruption (Arayankalam et al., 2020). Along similar lines, the impact of e-government on corruption can be argued to be contingent upon the different types of corruption (e.g., petty corruption, grand corruption, or state capture) in the public sector. Thus, to have a detailed understanding, we must examine what kind of e-government arrangements can be most effective in fighting the various forms of corruption (Wu et al., 2020). Future studies thus need to delineate the different conceptualizations of both e-government and corruption constructs to dig into their associations, which will provide better and more useful implications for research and practice.

In Table 3, we provide a summary of the aforementioned six future research areas along with a number of suggestions for advancing the literature on e-government and corruption.

### 6.3. Conceptual framework

Guided by the insights obtained from this review, we develop a conceptual framework to offer a comprehensive overview of the relationships between e-government and public sector corruption. In particular, we focus on the key constructs (i.e., e-government and corruption), delve deeper into their conceptualizations, depict their common associations, and unveil certain potential but under-explored relationships.

To elaborate, the framework shows that the first stream of research—the impact of e-government on corruption—has been widely investigated as compared to the second stream: the influence of corruption on e-government. Thus, future studies may consider shifting their focus to the second stream to produce a complete understating of the association between e-government and corruption. Moreover, prior studies primarily used aggregated measures of both the e-government and corruption constructs without digging deeper into their diverse conceptualizations. Our framework, as shown in Fig. 6, highlights these possibilities as under-explored relationships. In the ensuing sections, we detail the key building blocks of this framework.

#### 6.3.1. E-government

The construct of e-government can be interpreted from different perspectives depending on its usage. While the common notion of e-government involves the use of ICTs to provide government information and services to several stakeholders (Carter and Belanger, 2005), in reality, e-government tools and applications encompass multiple functionalities. The prior literature on e-government reveals that its usage spreads in various directions, ranging from delivering general information on government activities, sharing policy-related information, and providing public services to enabling citizen participation in consultation and decision-making to co-creating data, services, and public policies (Khan and Krishnan, 2020; Nam, 2014). Accordingly, we identify three broad categories of e-government usage, namely, (1) provision of government information and services, (2) citizen participation in political discussion and decision-making, and (3) co-creation of government services, applications, and policies. We suggest that studies should consider these different types of ICT usage in the public sector while investigating the relationships between e-government and corruption since the effect of one on the other could vary depending on the usage types (Ingrams and Schachter, 2019). Our review observed that most studies implicitly conceptualized e-government from the perspective of the first category (i.e., data and service provision) and analyzed its impact on corruption accordingly. Moreover, the other

**Table 3**  
A summary of future research areas.

Research area	Suggestions
Exploring the effect of corruption on e-government	<ul style="list-style-type: none"> <li>a. Conceptualize the possible mechanisms through which corruption may influence e-government</li> <li>b. Empirically validate the relationships</li> </ul>
Improving research design and data analysis	<ul style="list-style-type: none"> <li>a. Refine the sampling strategy</li> <li>b. Ensure the reliability and validity of the data, especially data retrieved from secondary sources</li> <li>c. Incorporate all relevant control variables</li> <li>d. Test the direction of causality</li> <li>e. Implement sophisticated data analysis techniques</li> </ul>
Extending the geographical focus	<ul style="list-style-type: none"> <li>a. Perform comparative studies among countries</li> <li>b. Replicate studies in different countries and settings</li> </ul>
Deeper understanding of mechanisms and moderating factors	<ul style="list-style-type: none"> <li>a. Explain mechanisms of how e-government could influence corruption and empirically validate the mediating factors, such as government effectiveness and citizen participation</li> <li>b. Explore and validate moderating factors, such as demographic variables, cultural factors, and the country's developmental status</li> </ul>
Strengthening theoretical underpinning	<ul style="list-style-type: none"> <li>a. Utilize theoretical frameworks to develop the study arguments</li> <li>b. Employ inductive reasoning to develop theories from specific observations</li> </ul>
Understanding e-government and corruption from diverse conceptualizations	<ul style="list-style-type: none"> <li>a. Conceptualize e-government depending on its usage</li> <li>b. Conceptualize corruption in different public institutions (e.g., political and legal institutions)</li> <li>c. Understand the role of different types of corruption in shaping the relationship between e-government and corruption</li> </ul>

kinds of e-government usage were not extensively studied in association with corruption, as shown in our conceptual framework. Therefore, future studies may consider exploring how implementing and using e-government for citizen participation and co-creation could impact corruption in the public sector.

### 6.3.2. Corruption

Similar to e-government, the construct of corruption can also be conceptualized in various ways. First, in line with [Srivastava et al. \(2016\)](#), corruption in a country can be construed as the level of corruption in major national institutions (e.g., political, legal/judicial, and media institutions) and national stakeholder service systems (e.g., business and citizen service systems) by drawing on the institutional perspective. In light of this, corruption can be argued to penetrate any institution in a country but with varying intensity, making the relationship of e-government with corruption to vary depending on the type of institution. Therefore, it is worth considering such an institutional perspective when construing corruption and systematically examining its association with e-government. However, only a handful of studies have captured such nuances and carried out an in-depth inquiry in this area (e.g., [Arayankalam et al., 2020](#); [Srivastava et al., 2016](#)), thus creating a void in our understanding. Second, given the variety of corrupt offenses, corruption can be distinguished as petty corruption, state capture, and grand corruption ([Pathak et al., 2007](#)). It is thus reasonable to argue that not all types of corrupt offenses would be equally affected by e-government, as observed by [Akingbade et al. \(2012\)](#). However, the existing literature, with the exception of a handful of studies (e.g., [Knox and Janenova, 2019](#)), lacks an examination of these differences when studying the linkage between e-government and corruption, as indicated in [Fig. 6](#) (see dotted arrows). Hence, this study calls for a more systematic understanding and examination of the aforementioned relationship by considering different conceptualizations of corruption.

### 6.3.3. Mediating, moderating, and control variables

Furthermore, the framework suggests that there could be different moderators and mediators shaping the relationships between e-government and corruption. As shown in [Fig. 6](#), we expect a number of moderating effects to have potentials that are yet to be explored. In light of this, variables, such as ICT infrastructure sophistication, and human capital characterizing capability building, can be argued to play multiple roles as they are prerequisites for the implementation of e-government in a country ([Krishnan et al., 2017](#)). As such, they act as antecedents of e-government and can moderate the “e-government–corruption” relationship ([Wang et al., 2020](#)) as well. While a handful of moderators have been examined in the past (e.g., [Arayankalam et al., 2020](#); [Nam, 2018](#)), the exploration of mediating variables (e.g., government-citizen interaction and government effectiveness) appears to be exiguous, thus limiting our understanding of mechanisms through which e-government could reduce corruption. Accordingly, this study recommends identifying and examining relevant moderating and mediating variables to enrich the literature.

[Fig. 6](#) further indicates that there could be numerous pertinent control variables, such as traditional anti-corruption approaches (e.g., press freedom, the rule of law, and voice and accountability measures), which could affect corruption. These must thus be taken into account while examining the impact of e-government on corruption ([Park and Kim, 2019](#)). Similarly, there could be certain variables (e.g., education level and the economic condition of a country) that may determine e-government implementation and development ([Krishnan and Teo, 2012](#); [Lee et al., 2019](#); [Schopf, 2019](#)) and, therefore, must be controlled while examining the impact of corruption on e-government. In sum, we posit that it is essential to control for the effects of variables that could impact corrupt practices in a country to capture the real effect of e-government on corruption.

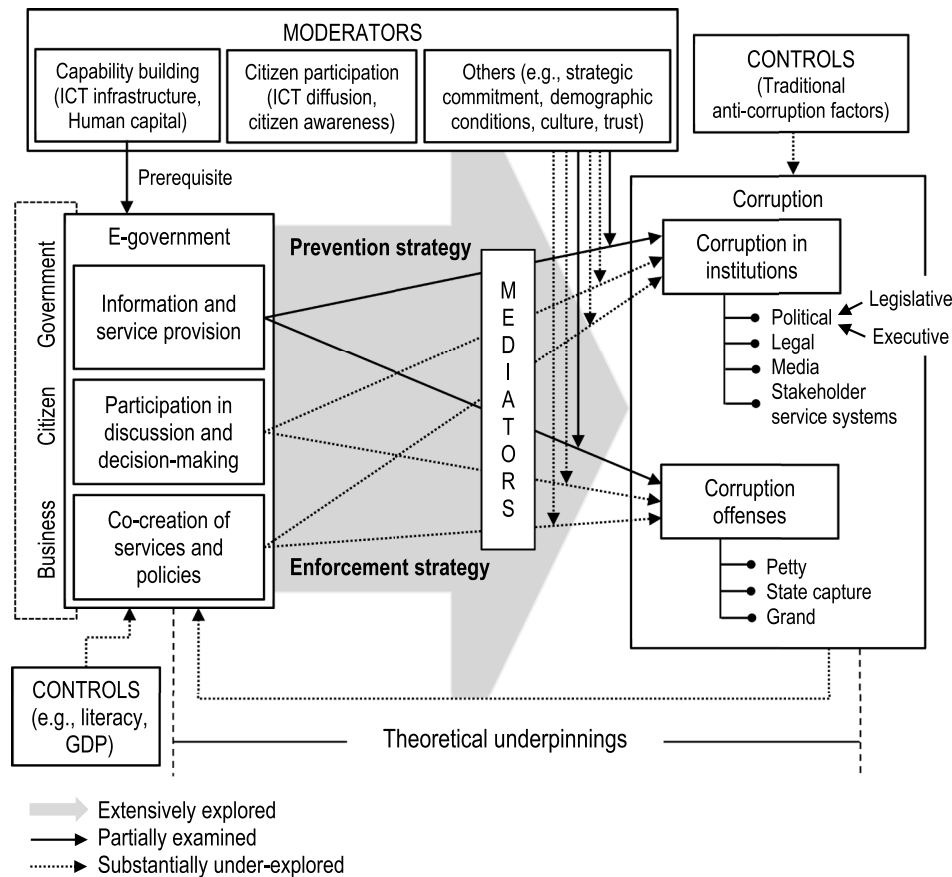


Fig. 6. Conceptual framework delineating the relationships between e-government and corruption.

6.3.4. Theoretical underpinning

In addition, the framework emphasizes the need for greater theoretical underpinnings to justify the relationships between e-government and corruption. While prevention and enforcement strategies have been illustrated in the prior literature in connection with e-government’s ability to control corruption, these studies often lacked a theoretical basis. We suggest that exploring and analyzing various mediating and moderating variables must also be theoretically grounded as well. In essence, this study calls for theory-driven empirical research to make more useful contributions to the literature.

6.3.5. Stakeholders

Lastly, the framework draws the attention of readers to the three major stakeholders of e-government, namely, the government, citizens, and businesses, which are the key constituents of the literature linking e-government and corruption. We thus suggest that the studied phenomenon can be explored from the perspectives of three different stakeholders. It is worthy to note that the government represents the supply side of e-government as they are responsible for implementing the e-government initiatives and applications (Khan and Krishnan, 2019). Furthermore, citizens and businesses are argued to represent the demand side of e-government since they are generally the end-users of e-government services (Khan and Krishnan, 2019). In light of this, our review observed that the prior studies focused on all three stakeholders, with most discussing the viewpoints of the government and citizens.

6.4. Theme-based research questions

Besides proposing recommendations for addressing the research gaps, this study identifies a number of research questions pertaining to the six themes described above. These potential research questions, as

shown in Table 4, are grounded on the preceding discussions on the future research areas and conceptual framework. They are thus expected to guide scholars in developing their studies.

7. Discussion

7.1. Contributions to research

This study offers several significant contributions to e-government research. Firstly, this is one of the first studies to conduct a comprehensive and systematic review of the relationships between e-government and corruption, thereby contributing to the IS and public administration literature. Corruption has emerged as a well-debated topic against the context of e-government (Khan and Krishnan, 2019). Although there has been much debate over the anti-corruption ability of e-government initiatives (e.g., Basyal et al., 2018; Elbahnasawy, 2014; Nam, 2018), this field suffers from mixed and disorganized arguments, making it difficult to grasp an overview of the field and identify avenues for future research. By employing an SLR approach, this study not only outlines a structured research profile of the literature linking e-government and corruption but also identifies the emergent research gaps, thereby directing researchers on how further investigations can be taken forward.

Secondly, this study uncovers six thematic foci that are grounded in various theories, such as the agency theory, TCE, NPS, TAM, economics of crime, and the notion of compatibility, among others. Regarding the impact of e-government on corruption, these themes impart crucial ideas about (a) how e-government could control corruption by employing prevention and enforcement strategies, increasing citizen participation, and building capability; (b) how citizens perceive e-government’s abilities; and (c) what alternative views (e.g., e-government

**Table 4**  
Thematic foci and potential research questions.

Description	Potential research questions
<p><b>Thematic foci I:</b> E-government as a tool for fighting corruption Discussed that e-government could curb corruption.</p>	<p>a. Does e-government affect all types of corrupt activities (e.g., petty corruption and grand corruption) in the public sector? b. To what extent can corrupt activities be controlled by implementing e-government? c. How does the impact of e-government on corruption vary from one country to another (i.e., comparative analysis)? d. Does the aforementioned impact differ depending on the developmental (or economic) status and culture of a country (i.e., moderating effects of developmental status and culture)? e. Does e-government perform better than other traditional anti-corruption factors in reducing corruption?</p>
<p><b>Thematic foci II:</b> Understanding citizens' compatibility with e-government Focused on understanding what the citizens perceive about the potential impacts of e-government on corruption.</p>	<p>a. What are the theoretical explanations regarding citizens' perceptions of e-government's ability to influence corruption? b. Do such perceptions vary based on the demographic profile of citizens? c. What types of corruption (e.g., petty/grand corruption, political and legal corruption) can be controlled by e-government in the eyes of citizens? d. Do citizens' perceptions vary between developing and developed countries?</p>
<p><b>Thematic foci III:</b> Corruption avoidance as a driver of e-government adoption Corruption avoidance is a perceived benefit of using e-government and a primary driving force for e-government adoption.</p>	<p>a. Does corruption avoidance drive e-government adoption by citizens, businesses, and governments differently? b. Which anti-corruption factors determine e-government adoption and continuance intention? c. Can the relationship between corruption avoidance and citizens' e-government adoption be moderated by their demographic profile (e.g., age and gender)? d. How does the effect of corruption avoidance on e-government adoption vary between developing and developed countries?</p>
<p><b>Thematic foci IV:</b> Understanding the mediating and moderating factors Explored mediating and moderating factors influencing the relationships between e-government and corruption.</p>	<p>a. Which factors theoretically explain how e-government could influence corruption? How do these factors mediate the relationships between e-government and corruption (empirical evidence)? b. What are the possible factors (e.g., ICT infrastructure sophistication, the strategic commitment of the high-level public officials, and human capital) on which the relationship between e-government and corruption is contingent? What is the nature of the moderation effects?</p>
<p><b>Thematic foci V:</b> E-government, not a panacea for fighting corruption Argued that e-government might not always be effective in reducing corruption in the public sector.</p>	<p>a. What theories could explain e-government's ineffectiveness in fighting corruption? b. Why and how does this phenomenon vary from one country to another?</p>
<p><b>Thematic foci VI:</b> Corruption impacting e-government Mentioned the influence of corruption on e-government.</p>	<p>a. Can corruption influence e-government implementation and maturity in a country? What is the nature of such an influence? b. Can corruption determine the success or failure of e-government in a country? c. What are the theoretical explanations regarding the impact of corruption on e-government? d. How do different forms of corruption (e.g., political corruption and legal corruption) influence e-government development and maturity? e. What factors could mediate and moderate the influence of corruption on e-government?</p>

not being an effective solution to corruption) are present in the literature. The discussion of the thematic foci also indicates the possibility of two-way relationships between e-government and corruption, which indicates that researchers should go beyond the common understanding of the “e-government-to-corruption” phenomenon. In sum, this study provides systematic knowledge of the themes that characterize the literature linking e-government and corruption, which, we believe, will help researchers understand the focal areas of this literature and extend the research on this phenomenon.

Thirdly, this study develops a conceptual framework that provides an extensive overview of the key elements defining the literature on e-government and corruption. To this end, we underscore the aforesaid two broad categories of research streams, the significance of mediating, moderating, and control variables, the role of three key stakeholders, and the need for theoretical understanding, with a special emphasis on conceptualizations of the e-government and corruption constructs. In particular, our framework summarizes the existing relationships between e-government and corruption and brings out new research possibilities, thereby making a novel theoretical contribution to the IS and public administration literature. In doing so, this study also adds to the prior SLRs that were based on the assumption of e-government’s effectiveness in curbing corruption and consequently neglected to consider the nuances of other e-government and corruption constructs (Inuwa et al., 2019; Palvia et al., 2017). Our study is thus instrumental in providing crucial insights into this phenomenon and detailing pertinent avenues to encourage future researchers.

Fourthly, this study highlights that this field suffers from certain issues that require adequate consideration. For instance, we found that the prior literature contained few theoretically driven empirical studies and lacked the use of rigorous methodologies. Furthermore, the conceptualization and investigation of the “corruption-e-government” phenomenon are still in the nascent stages, whereas the first stream—the study of e-government as an anti-corruption tool—has soared with many recurrent cross-country examinations. The major concern is that such repetitive works with simple research models and methodologies often fall short of adding novel theoretical and practical insights. This study thus proposed to address this issue by suggesting potential research areas and a number of possible research questions for future studies on the first stream of research. In particular, this study calls for more researchers to direct their focus on case-based comparative analyses to explore whether and how the differences (e.g., socio-political, economic, and cultural) among countries could play a role in shaping the influence of e-government on corruption. In addition, this study realizes the value of exploring the other possible relationship between e-government and corruption (i.e., the impact of the latter on the former) and calls for more theoretical and empirical studies on this phenomenon to make significant contributions to the literature.

## 7.2. Implications for practice

From a practical standpoint, this study suggests that e-government may not be the only solution to the menace of corruption. While some prior studies have found empirical evidence of e-government’s anti-corruption ability (e.g., Abu-Shanab et al., 2013; Andersen, 2009), some recent studies employing sophisticated data analysis techniques have provided conclusive evidence against it (e.g., Basyal et al., 2018; Mélon and Spruk, 2020). Moreover, a few studies have argued that both traditional anti-corruption approaches and e-government usage could play vital roles in preventing corruption (e.g., Park and Kim, 2019; Shim and Eom, 2008; Wu et al., 2020). It is highly possible, though, that depending on the type of corruption (e.g., petty, state capture, grand) and the concerned national institution (e.g., executive, legislative, judicial), the e-government’s ability to limit corruption can vary. A similar thought was echoed in the study by Wu et al. (2020), which delineated different types of corruption and examined the e-government’s effectiveness in combating them. In light of this, some studies

have argued that e-government could be effective in controlling petty bureaucratic corruption in the provision of some e-government services but might not be successful in reducing state capture and grand corruption (Belwal and Al-Zoubi, 2008; Knox and Janenova, 2019; Sheryazdanova and Butterfield, 2017). Thus, it is recommended that a country must not rely on e-government alone but instead develop strategies to synergize the merits of both traditional and ICT-based anti-corruption approaches to combat corruption.

Secondly, we posit that e-government and corruption constructs could be measured in different ways. For example, e-government may be construed as a tool for information and service provision as well as a platform for citizen online participation. Similarly, corruption in a country can be measured as the level of corrupt activities in different national institutions. Accordingly, there could be several possible linkages between e-government and corruption, as delineated in our conceptual framework (see Fig. 6). Even the impact could vary depending on the kind of government information disseminated through e-government portals. This is further corroborated by some recent studies (e.g., Žuffová, 2020) that only found an association between a few types of government data (e.g., land ownership data) and corruption levels, thereby suggesting that not all types of government datasets could contribute to the anti-corruption fight. Furthermore, our proposed framework depicts different variables (mediators, moderators, and controls) shaping the phenomenon of interest. The findings of our study, along with our framework, are thus expected to help policymakers access a detailed but concise overview of the literature linking e-government and corruption and guide them in formulating policies and strategies in light of these different possible relationships.

Thirdly, this study draws the attention of policymakers to the present research gaps and suggests they reconsider the findings of prior studies with data-related concerns, such as those regarding research design, generalizability issues, and data collection issues. Policymakers have to be mindful of the limited geographic scope of case studies and the lack of in-depth comparative studies currently available. While the literature contains many cross-country studies that could be considered useful for providing a broad comparison among a large number of countries, they often could not explain the mechanisms of the effects or detail the reasons for the differences. Therefore, policymakers ought to understand that the findings may not be generalizable; instead, the relationships between e-government and corruption could unfold differently depending on the country. We further suggest that a country should not mimic the anti-corruption approaches of other countries without analyzing and considering socio-political, cultural, and economic differences.

Fourthly, this study highlights the role of capability building and citizen participation to realize the benefits of e-government. Capability building, which is perceived as a critical prerequisite to e-government (see Fig. 6), entails the readiness of the government in terms of the state of ICT infrastructure in a region or a country, the level of expertise of government employees, and the degree of their ICT know-how, among other elements. On the other hand, citizen participation involves the degree of ICT diffusion among citizens, their awareness about e-government projects and initiatives, and the level of their education and ICT-related expertise. In line with prior studies (Umar and Masud, 2020; Wu et al., 2020), we suggest that policymakers should focus on developing ICT-related knowledge, expertise, and infrastructure for improving their capability, which would enable them to design e-government platforms and services more effectively. Furthermore, they must formulate strategies for increasing public awareness and technical know-how (e.g., training interventions). They should also pay attention to the issue of the digital divide and facilitate widespread access to the internet and other ICTs. Unless citizens could access e-government, its anti-corruption ability may not be assessed properly.



### 7.3. Limitations

The findings of this study need to be interpreted in light of two limitations. Firstly, this SLR is based on studies that were available in three selected scholarly databases (i.e., Scopus, WoS, and DGRL) and published in peer-reviewed journals in English. Thus, studies published in other languages and belonging to other types of sources, such as books, conferences, and reviews, were excluded. While we obtained additional studies through citation chaining, some studies that appear in other scholarly databases might have been omitted. Secondly, this SLR may not have used an exhaustive list of search keywords, although a large number of relevant keywords were considered. We acknowledge that e-government and corruption are expressed using numerous terms, some of which might have been missed in this research. Nevertheless, this study draws conclusions from 63 journal articles, which we conceive to be adequate to offer an in-depth view of the literature linking e-government and corruption.

### 8. Concluding remarks

The discourse surrounding the association between e-government and corruption has been present for decades. However, the literature consists of disorganized and conflicting arguments, which prevent a systematic understanding of the “e-government–corruption” relationship and potential research areas. As a remedy to this concern, this study adopts an SLR approach to holistically encapsulate these diverse observations and identify avenues to propel future research in this domain. This study thus proposes six thematic classifications, uncovers the key gaps in the literature, identifies the research areas for future studies, and provides a number of suggestions and research questions to guide further research in this area. Moreover, this study develops an integrated conceptual framework to delineate the existing and potential relationships between e-government and corruption, which, we believe, will not only caution policymakers about the incomplete understanding offered by the existing studies but also inspire future research in several ways.

### Author statement

**Anupriya Khan:** Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Writing - Original Draft, Project administration. **Satish Krishnan:** Conceptualization, Methodology, Validation, Resources, Writing – Reviewing and Editing, Visualization, Supervision, Project administration. **Amandeep Dhir:** Methodology, Resources, Writing – Reviewing and Editing, Visualization.

### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.techfore.2021.120737](https://doi.org/10.1016/j.techfore.2021.120737).

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