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Article

Improving service quality, accountability and transparency of local government: The intervening role of information technology governance

Cogent Business & Management

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Suggested Citation: Sofyani, Hafiez; Riyadh, Hosam Alden; Fahlevi, Heru (2020) : Improving service quality, accountability and transparency of local government: The intervening role of information technology governance, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 7, Iss. 1, pp. 1-20,
<https://doi.org/10.1080/23311975.2020.1735690>

This Version is available at:

<https://hdl.handle.net/10419/244803>

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To cite this article: Hafiez Sofyani, Hosam Alden Riyadh & Heru Fahlevi | (2020) Improving service quality, accountability and transparency of local government: The intervening role of information technology governance, Cogent Business & Management, 7:1, 1735690, DOI: [10.1080/23311975.2020.1735690](https://doi.org/10.1080/23311975.2020.1735690)

To link to this article: <https://doi.org/10.1080/23311975.2020.1735690>



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Published online: 02 Mar 2020.



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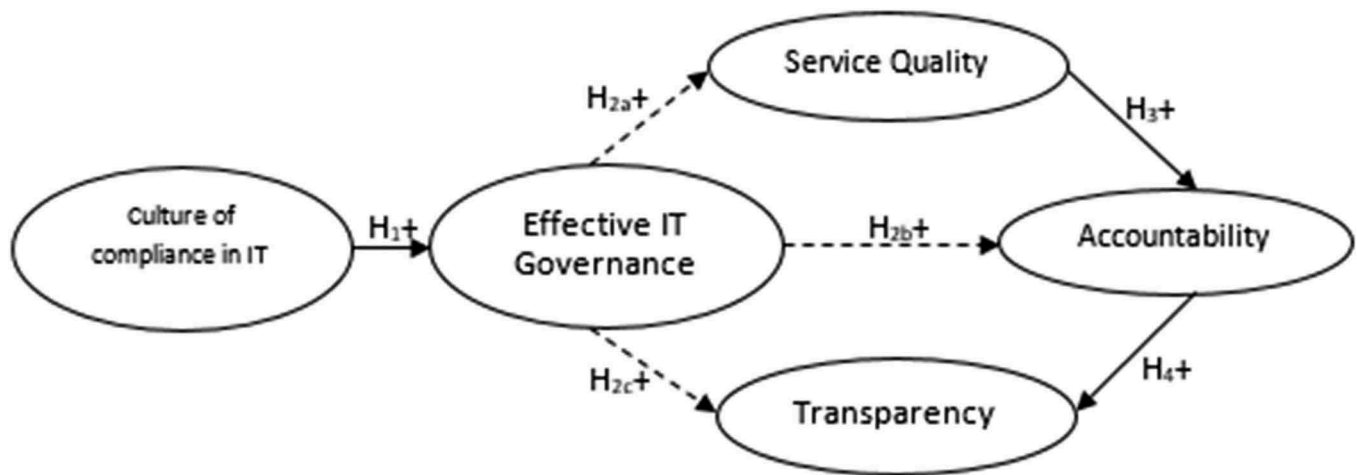
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Cogent Business & Management (2020), 7: 1735690



Received: 27 September 2019
 Accepted: 13 February 2020

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Reviewing editor:
 Lorenzo Ardito, Politecnico Di Bari, Italy

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OPERATIONS, INFORMATION & TECHNOLOGY | RESEARCH ARTICLE

Improving service quality, accountability and transparency of local government: The intervening role of information technology governance

Hafiez Sofyani^{1*}, Hosam Alden Riyadh¹ and Heru Fahlevi²

Abstract: This study aims to examine the perception of government employees about the association of the culture of compliance in information technology (IT) on the service quality, accountability, and transparency through effective IT governance (ITG) as an intervening variable. This study was carried out in the local government (city) of Surabaya, Indonesia. The population of this study is all Local Government Organizations (LGOs) in the Surabaya, while the samples are LGOs for public services and administration. Data was gathered through the questionnaires distributed directly to the respondents. The respondents are LGOs employees who are involved with e-government implementation. The number of distributed questionnaires was 200, but there were only 141 returned and analyzed. The partial Least Square-Structural Equation Modeling (PLS-SEM) was utilized to analyze the data. The results of this study demonstrate that the culture of compliance in IT associates with service quality, accountability, and transparency indirectly through effective ITG. The result implies that effective ITG is a crucial aspect that must be considered for achieving successful e-government development in Indonesian local governments.

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PUBLIC INTEREST STATEMENT

This study aims to address the phenomena where IT development in local governments in Indonesia (developing country context) cannot trigger an optimal performance in terms of service quality, accountability and transparency. From an academic point of view, IT should not be seen merely as a tool, rather a strategy in accelerating government activities. To bring out the success of e-government, academics emphasize the importance of IT governance. The lack of study examining the role of the IT governance to improve government service quality and governance i.e. accountability and transparency practices in public sector, is the main motivation of this research. We found that effective IT governance has an intervening role. Thus, it is suggested that IT development should be accompanied by concern in IT governance implementation to reach successful e-government implementation in local government.

Subjects: Accounting; Management of Technology & Innovation; Information Technology

Keywords: culture of compliance in IT; IT governance; service quality; accountability; transparency; local government; E-government

JEL: H7; M4; O3

1. Introduction

It is no longer a debate that in terms of delivery time, the quality of public services in developing countries are generally less efficient than in developed countries. This can be attributed to less advanced electronic government (e-government) utilization in developing countries compared to developed countries such as the United States and countries in Western Europe (Nfuka & Rusu, 2011). In the disruption era of industrial revolution 4.0 today, citizens seek fast and accurate government services. In Indonesia, even though e-government features have been used since 2003 in provincial and regency/city governments,¹ they have not been utilized optimally, and thus, their impact on public service quality is still insignificant.²

In early 2017, the Indonesian Administrative and Bureaucratic Ministry reported poor performance of Indonesian local government accountability based the assessment of the Performance Accountability of Government Institution Report (PAGIR). The assessment showed that 83 percent (423 out of 514) of the reports were satisfactory enough to unsatisfactory (ranked CC, C, and D). In addition, the Indonesian Ombudsman³ reported that local governments received the highest number of complaints in 2017 out of all other government institutions. To be precise, there were 3,427 complaints registered to the Ombudsman in 2017. This amount is equivalent to 42.30% of all public reports to the Ombudsman.

One example of how e-government does not (fully) contribute to the improvement of local government performance can be found in one of biggest city in Indonesia. Although the city government has the most sophisticated e-government application compared to other regions, its PAGIR report received the grade CC (satisfactory enough) (Sofyani, Akbar, & Ferrer, 2018). This might indicate that the e-government in that city government has not been used optimally to improve public service performance.

Sofyani and Dwirama (2018) have investigated the level of information disclosure on local government websites in Indonesia. They found that local government websites have not fully provided important and sufficient information for the public. Not all websites contained Local Government Financial Reports, work programs, government development policies, and PAGIRs. Because of this, the Ministry of Home Affairs now requires each local government to establish a new position called Information and Documentation Management Officer that is responsible for public information transparency. The Ministry of Home Affairs is also developing IT to improve transparency in the local governments. The aims are to avoid the possibility of information asymmetry in the public sector and to mitigate a chance of fraud (Halbouni, Obeid, & Garbou, 2016). The demand of e-government application is also increasingly emphasized by the Indonesian Finance Minister. E-government aims to ease public service provision, enhance financial management and supervision in government institutions, and mitigate potential fraud (Putu, Jan van Helden, & Tillema, 2007).

However, it is important to note that previous studies on the influence of IT advancements for organization performance have found divergent results (Liang, Chiu, Wu, & Straub, 2011; Wu, Straub, & Liang, 2015). A less optimal role of IT in improving performance is usually linked to a false paradigm which considers IT as non-strategic tool that supports the practice of good governance in institutions (Ali, Green, & Roob, 2012). Ali and Green (2005) argue that an effective Information Technology Governance (ITG) is the most important tool to increase performance in an organization where e-government is developed.

2. Statement of the Problems

The implementation of e-government in Indonesia focuses not only on IT development, but also ITG since the government enacted the Law number 11 (2008) regarding Information and Electronic Transactions, Government Regulation Number 82 (2012) concerning the Implementation of Electronic Systems, and the latest, Communication and Information Minister Number 4 (2016) which concerns Information Security Management System. However, the e-government implementation is still not optimal due to the lack of system integration. In 2016 the e-government Summit Forum in Jakarta again emphasized the importance of strengthening ITG and the forum strongly encouraged ITG development in all local governments in Indonesia.

Many studies have been conducted to examine determinants of ITG effectiveness (or in some studies, the authors used the term “successful ITG”). Details about previous empirical study results are discussed in the empirical literature review part of this paper. On the other hand, most studies on ITG in the public sector have focused on how fit the ITG model is for a public sector organization (Al Omari, Barnes, & Pitman, 2012; Ribeiro & Gomes, 2009). Departing from this research gap, Nfuka and Rusu (2011) say that expanding ITG studies into the public sector, especially in developing country contexts, is imperative as the contexts are significantly different from the private sector or developed country studies. Based on the literature review conducted, we conclude that there is limited research on ITG application in the public sector, especially at the local government level in developing countries such as Indonesia. This study is an important step fill these gaps as development of ITG in public institutions, particularly e-government implementation in developing countries has intensively started.

Furthermore, Buchwald, Urbach, and Ahlemann (2014) suggested that researchers examine the determinants of ITG and their impacts on the organization in one model to gain more contributing and comprehensive findings. So far, each prior study focused on either the determinants or consequences of ITG and studied them separately. Therefore, this study examines one of the main determinants of ITG, namely the culture of compliance in IT, and at the same time investigate the role of ITG in service quality, accountability, and transparency in public sector organizations (or the consequences). This study was conducted in one of the most innovative and high performing Indonesian local governments, Surabaya City. The examination of the three consequences of ITG is one of this study’s novelties. Another novelty is that the ITG is positioned as an intervening variable, in which it is predicted that service quality, accountability, and transparency will not be realized even though there is a good culture of compliance in IT unless effective ITG is in place. In other words, this study investigates whether ITG can be as a intervening of the relationship of the culture of compliance in IT with service quality, good accountability, and transparency. This idea departs from Ali and Green (2005) who believe that IT does not always succeed in providing benefits for the organization if it is not accompanied by the presence of effective ITG (Woodhead, 2004). To prove that claim, empirical evidence is needed.

3. Research objectives and research questions

Based on the problem explained above, this study aims to examine the association of a culture of compliance in IT with effective ITG, and also the association of a culture of compliance in IT with service quality, accountability and transparency using effective ITG as an intervening variable. This study also examines the association between service quality toward accountability and accountability toward transparency. Accordingly, we formulated the research questions as the following:

- (1) How is a culture of compliance in IT associated with effective ITG?
- (2) How does effective ITG intervene with the association between a culture of compliance in IT and service quality?
- (3) How does effective ITG intervene with the association between a culture of compliance in IT and accountability?

- (4) How does effective ITG intervene with the association between a culture of compliance in IT and service quality?
- (5) How is service quality associated with accountability?
- (6) How is accountability associated with transparency?

It is important to note that this study is only based on the perception of government employees, not top management (mayor of the city, government secretary, the head of local development planning agency). Also, the study was only conducted in one local government. As a result, the generalizability of this study is very limited. However, this study provides empirical evidence that effective ITG has a decisive role in improving local government service performance, accountability, and transparency. Theoretically, the results of this study provide an important explanation about the development of e-government, especially the role of ITG within. Practically, the results of this study offer recommendations for the government for adjusting and improving regulations or policies related to the development of e-government, specifically in Indonesia.

4. Research Context: E-government in Indonesia

Electronic government or e-government refers to information and communication technology used in government institutions (Ulum & Sofyani, 2016). Some scholars argue that there is not any universally accepted definition of the concept of e-government (Halchin, 2004). In order to cover the variety of uses and nuances sufficiently, one definition is presented below. E-government is defined as “utilizing the Internet and the World-Wide-Web for delivering government information and services to citizens” (UN & ASPA, 2002, p. 1). In the Indonesian context, according to Presidential Decree No. 20 of 2006, e-government is defined as the use of information and communication technology in government processes to improve efficiency, effectiveness, transparency, and accountability in government administration.

Based on 2018 data from the Ministry of Home Affairs, out of 548 local governments in Indonesia, only five local governments are considered prominent in their e-government development. These local governments are Surabaya City, Bojonegoro Regency, Binjai City, Bandung City, and Yogyakarta City. Indeed, Surabaya City has been selected as the role model for e-government development in Indonesian cities. The reason is that these local governments have better and more sophisticated information systems than other Indonesian local governments. The local government of Surabaya city already has e-Human Resource, e-Monitoring, e-Education, e-Permit, e-Office, e-Health, e-Transportation department, Media Center, and Disaster Alert System. Also, the development of e-government in Surabaya has improved the financial and non-financial performance of the Surabaya city government. In the Indonesian context, many other local governments still have not developed e-government. From a practitioner’s point of view the constraints on the development of e-government in the organizations can be linked to several factors: unclear regulation (legal umbrella), limited human resources, problems in data integration between regional government units, inadequate budget, lack of standardization of infrastructure, and lack of information security in the implementation of e-government (Sofyani & Dwirama, 2018).

5. Literature review

5.1. The concept of information technology governance (ITG)

The ITG refers to a concept where authority and responsibility are shared appropriately when making a decision that encourages the use of information technology in an entity (Weill & Ross, 2004). A broader and more dynamic definition of ITG is “an integral part of entity governance and consists of leadership and organizational structures and processes that ensure that IT organizations can sustain and expand organizational strategies and objectives” (ITGI, 2003, p. 10). A similar definition that focuses on IT-business alignment is proposed by W Van Grembergen (2005). He describes ITG as “the organizational capacity carried out by the board, executive management and

IT management to control the formulation and implementation of IT strategies and in this way ensure a mix of business and IT (W Van Grembergen, 2005, p. 1).

Although some literature on ITGs focus on different areas, most previous publications look at certain main aspects. ITG is often referred to as part of corporate governance (Heart, Maoz, & Pliskin, 2010; Webb, Pollard, & Ridley, 2006). As described in several previous studies, ITG consists of five basic content domains: (1) ensuring the interrelationship between business and IT plans (strategic alignment); (2) optimizing IT spending and proving the value of IT (value delivery); (3) securing optimal investment and appropriate management of important IT resources (resource management); (4) handling security of IT assets, disaster recovery, and continuity of operations (risk management); and (5) tracking project delivery and monitoring IT services (performance measurement) (ITGI, 2003; Meyer, Zarnekow, & Kolbe, 2003; Webb et al., 2006). Furthermore, there is a widely accepted consensus that ITG deployment consists of structures (for example, organization of Chief Information Officers [CIOs], and IT committees), processes (for example, strategic IT decision making and monitoring procedures), and relational mechanisms (for example, IT business and partnerships, strategic dialogue, and sharing of learning) (De Haes & Van Grembergen, 2008a; Van Grembergen, De Haes, & Guldentops, 2004). From the above discussion, the ITG domain is indeed indirectly related to the dependent variable in this study, namely service quality, which is related to value delivery, and accountability and transparency which is related to aspects of performance measurement.

5.2. Theoretical underpinning

One of the most famous and broadly used theories which has been used to explain the source of sustained competitive advantage for organizations is the resource-based view (RBV) theory (Barney, 1991; Lazic & Heinzl, 2011). This theory claims that to achieve sustained competitive advantage, organizations must have resources that fulfill four criteria. The resources must be valuable, rare, and difficult to imitate, and have no equivalent substitutes (Barney, 1991). Barney (1991) divides the resources into three groups: physical capital, human capital, and organizational capital. Physical capital resources cover IT infrastructure within an organization, geographic location, plant, and equipment. Human capital resources include individual management experience, management judgment, intelligence, and insight. Lastly, organizational resources cover the organization's "formal reporting structure, its formal and informal planning, coordinating systems, controlling, and informal relations among groups within the organization and their environment (Barney, 1991).

This research adopts the RBV theory because the ITG mechanism involves both human and organizational capital resources (Barney, 1991). ITG provides the means through which organizations can govern their IT investments and thus help to ensure optimal benefits for themselves. Effective ITG needs boards of directors and top management team members to actively participate in managing and governing the IT of an organization. This involvement requires skills and knowledge which evolve and accumulate over time and are thus more likely to be tacit and highly local or organization-specific (Ali, Green, & Robb, 2015; Sambamurthy & Zmud, 1997). From the RBV theory, it is suggested that local governments have different resources in terms of having a comprehensive understanding of how to manage and govern their IT investments in products called e-government. It is believed that different implementation strategies used by local governments when developing ITG will lead to different results in the improvement of service quality, accountability, and transparency (Barrutia & Echebarria, 2015).

On the other hand, considering this study is also related to the disclosure of information by an organizations, other theories are also involved, namely signaling theory. As Cohen, Krishnamoorthy, and Wright (2008) suggested, multiple theories and perspectives should be considered when describing the implementation of governance practices. Brigham and Houston (2012) argued that the signaling theory explains the organizational management behavior of giving guidance to stakeholders on the management's views on the organization's prospects. According to this theory, the

organization should disclose the success or failure signals of an organization (Rustiarini, 2013). In the context of the public sector, the information disclosure about its success, in this case the quality of service, accountability, and transparency, proves that the public management has carried out their duties properly (Suchman, 1995). This is expected to increase public trust and maintain the leader's electability (Sofyani, Suryanto, Wibowo, & Widiastuti, 2018).

5.3. Empirical literature review

Research related to ITG is generally divided into three issues: the implementation, determinants, and impacts of ITG. Ribbers, Peterson, and Parker (2002) who studied ITG processes found that regardless of the level of environmental dynamism and turbulence, effective ITG processes are characterized by both methodological comprehensiveness and social interventions, involving strategic integration of business and IT decisions, and building collaborative relationships and shared understanding among key stakeholders.

Ali and Green (2005) who study the determinants of ITG found that there are significant positive relationships between the overall level of effective ITG and the following factors: an IT strategy committee, the involvement of senior management in IT, the existence of ethics/culture of compliance in IT, and corporate communication systems. Research by Nfuka and Rusu (2011) found that involvement and support of senior management have strong association with effective ITG. Meanwhile, consolidation, standardization and the management of IT infrastructure and application to optimize costs and information flow across the organization have a small to moderate impact on ITG.

Bowen, Cheung, and Rohde (2007) conducted a comprehensive study about the determinants and impact of ITG. They found that more effective IT governance performance outcomes are determined by a shared understanding of business and IT objectives, active involvement of IT steering committees, a balance of business and IT representatives in IT decisions, and comprehensive and well-communicated IT strategies and policies. They also found that ITG has a prominent role in fostering project success and delivering business value. Moreover, De Haes and Van Grembergen (2008b) found that ITG is able to improve Business-IT alignment maturity while (Heart et al., 2010) claimed that ITG would be increasing IT-enabled enterprise adaptability. Some researchers (Lazic, Groth, Schillinger, & Heinzl, 2011; Lazic, Heinzl, & Neff, 2011; Liang et al., 2011; Weill & Ross, 2004; Wu et al., 2015) found that ITG is a pivotal factor in enhancing corporate performance.

Based on the empirical literature review, it can be concluded that most of the previous studies of ITG are in the context of private institutions. This argument is also claimed by other researchers (Ali, Green, & Parent, 2009; Ali et al., 2012; De Haes & Van Grembergen, 2008b; Rodriguez-Repiso, Setchi, & Salmeron, 2007; Warland & Ridley, 2005). There are still very few related studies in public sector organization (Ali et al., 2015; Nfuka & Rusu, 2011). Meanwhile, a study pertaining to the role of ITG in enabling good governance practices in terms of accountability and transparency and enhancing the performance of service quality in local governments are also getting very limited attention. On the other hand, it is important to highlight that most of the previous studies about ITG are mostly conducted on divergent observed phenomena, case contexts, and types of industries. Most of the related studies undertaken examine the determinants, while other studies investigated the impacts. Meanwhile, a comprehensive study which both examines the determinants and impact of ITG is still rare especially one that examines the role of ITG as an intervening variable (Buchwald et al., 2014). This study tries to fill these empirical gaps.

5.4. Hypotheses development

Culture of compliance in IT is reflected by the respect of people in the organization who have a high awareness of the purpose of IT essentially and promote the usage of IT in the organization (Ali et al., 2009). In this paper, we call this the culture of compliance in IT. Ali and Green (2005) state that there is a need to promote a culture/ethics of compliance so that the entity can achieve ITG effectively. This environment is useful in preventing and detecting behaviors that could

potentially hinder the achievement of IT governance objectives. To create a culture of compliance in IT, the organization needs to develop a comprehensive conceptual framework such as the Committee of Sponsoring Organizations of the Treadway Commission, COBIT (Control Objectives for Information and Related Technology), ITIL (Information Technology Infrastructure Library), or ISO 17,799 which provides sufficient ethical training for employees, and provides a reporting hotline (Ali et al., 2009). It is also important for top management to have leadership that promotes awareness of ethical compliance in their organizations, because it sends a message for all employees and in turn, shapes their organizational culture (Beyer & Nino, 1999).

H1. A culture of compliance in IT is positively associated with effective ITG.

The ultimate goal of ITG is the realization of good governance practices in the organizations (Bertot, Jaeger, & Grimes, 2010; Layne & Lee, 2001). In the context of local governments, the three main principles of good governance are responsiveness (a part of quality in service), accountability, and transparency (Ulum & Sofyani, 2016). With the IT support coupled with ITG, there will be awareness within the organization to focus on the value of delivery to the community through the role of IT by increasing the effectiveness and efficiency of services through e-government. The IT can be designed in such a way that it is aligned with the entity's operations. To achieve this, the ITG must be taken into account (Buchwald et al., 2014; De Haes & Van Grembergen, 2008b; Wu et al., 2015). In addition, the ITG also must focus on establishing the IT function as a control tool so that it complies with regulations (IT rule compliance), which is related to demands for accountability and transparency as a parts of good governance practices (Buchwald et al., 2014; Weill & Ross, 2004). Weill and Ross (2004) contend that ITG is the process by which the organizations align IT actions with their performance goals and assign accountability for those actions and their outcomes. Many leading organizations have turned to ITG to pursue gains in efficiency, accountability, and regulation compliance (Lee, Lee, Park, & Jeong, 2008).

As stated by Ali and Green (2005), IT development and adherence in implementing it do not necessarily enhance the performance of the entity, which may get better even if it is not accompanied by effective ITG. This indicates that ITG has a mediating role in achieving organizational performance goals, which in the context of local governments, are service performance, accountability, and transparency. However, in the area of public sector studies, especially e-government in local governments, this statement by Ali and Green (2005) has not been empirically proven.

H2a. Effective ITG mediates the relationship between the culture of compliance in IT and service quality.

H2b. Effective ITG mediates the relationship between the culture of compliance in IT and accountability.

H2c. Effective ITG mediates the relationship between the culture of compliance in IT and transparency.

As is explained in the previous section, one of the domains of ITG is value delivery (Weill, 2004), where IT is seen as a means of improving services to the community, for example by accelerating certain IT-based services (e-government) and also the role of IT in the interests of rule compliance (Buchwald et al., 2014). The benefits provided by IT are able to encourage entities to fulfill all demands—including service quality and accountability—effectively and efficiently (Ulum & Sofyani, 2016). When organizations can provide certain performance—in the case of this study, an optimal quality of services provided—there will be a tendency to have better accountability. This is an attempt at positive signaling (Connelly, Certo, Ireland, & Reutzel, 2011; Haraldsson, 2016)

and legitimation that organizations and management have worked in accordance with the demands of society and regulation (Spence, 2002). Thus the expectations fulfilled are expected to attract sympathy from the community (Nurriksiana, Handayani, & Widiastuty, 2017) and the issues further strengthen the legitimacy of the local government in the eyes of the people.

H3. Service quality has a positive effect on accountability.

According to Mardiasmo (2002), public accountability in the context of government organizations refers to the provision of information to the public as public stakeholders regarding activities, programs, and performance both financially and non-financially by the local government. Public accountability has the goal of encouraging good and reliable performance. The correlation between accountability and transparency is access to government information that is important for the community (Adi, Martani, Pamungkas, Simanjuntak, & Ntim, 2016; Piotrowski & Bertelli, 2010). In the viewpoint of signaling theory (Connelly et al., 2011), entities—in this case, the local governments—as stewards will try to reduce information asymmetry related to regional financial management by producing financial report information and activities (performance) with quality and integrity. Specifically, the local government through the local inspectorate auditor reviews the regional financial reports and needs to get good opinion from independent parties, in this case, the Republic of Indonesia Financial Audit Agency (Nurriksiana et al., 2017). Positive signals in the form of accountability will lead local governments to be more transparent. It also serves as a means of communication (Lander & Auger, 2008) and legitimacy to show the community that the local government has carried out its obligations and responsibilities as bearers of the people's mandate (Certo, 2003). This policy also has the aim of increasing public satisfaction and trust in the government (Nurriksiana et al., 2017). Therefore, well-run accountability by the local government will be shown to the public through information media such as local government websites.

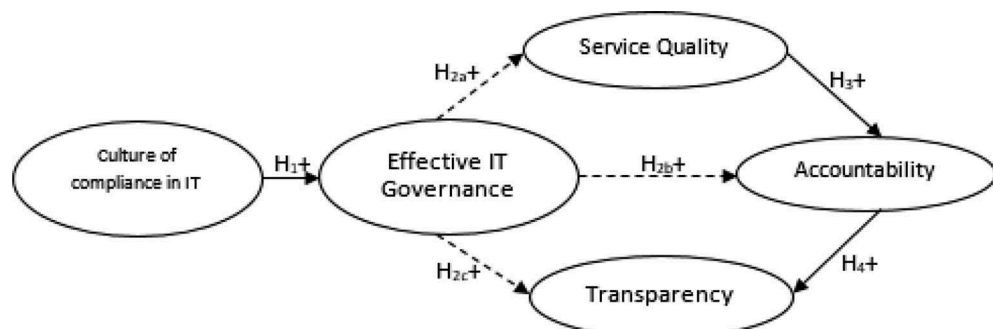
H4. Accountability has a positive effect on Transparency

Based on hypotheses developed, we formulate the model of the research as shown by Figure 1.

6. Research methodology

This study is a survey-based research that aims to test some hypotheses. The approach used is an explanatory research model which is useful for analyzing how one variable relates to other variables through hypotheses testing (Cooper & Schindler, 2001; Creswell, 2012; Hartono, 2013). This study is carried out in Surabaya city local government which is a role model for

Figure 1. Research Model.



e-government development in Indonesia. From 2004 to 2017 the city obtained awards from the Indonesian Ministry of Interior as a city with the best service and the best electronic-based services in Indonesia. The population of this study is in the working units of the Surabaya city government or labeled as local government organization (LGO). The selection of HEIs uses purposive sampling technique since it fits to research objectives which do not require strong generalizations due to the small sample (Thornhill, Saunders, & Lewis, 2009). The criteria to be a sample is that the LGOs manage e-government practices in Surabaya city. Hence, 26 LGOs are involved as samples which consists of 22 LGOs from public service offices and four from administration offices. Moreover, the research respondents were LGO staff who are involved in the use of local government information systems (e-government). Thus, the sample and respondents of this study are related to the objectives of this study. There were 141 respondents to this study from various positions such as treasurer, finance department worker, accountant, and head of sub-division, IT staff and ordinary staff who are e-government application users in the Surabaya City government environment.

All variables were measured by using the Likert scale 1 to 5 where 1 = strongly disagree; 2 = disagree; 3 = doubt; 4 = agree; and 5 strongly agree. An explanation of the operation definition and measurement of variables is presented in Table 1. The data were collected by distributing the questionnaires directly to the respondents in their office. This approach likely has a higher response rate than sending questionnaires via mail or post (Hartono, 2013)

In this study, the variant-based Partial Least Square-Structural Equation Modeling (PLS-SEM) approach was used to analyze the data. The method can simultaneously perform measurement model tests while testing structural models (Chin, Marcolin, & Newsted, 2003; Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014; Hartono & Abdillah, 2011). According to Cook and Campbell (1979), PLS is useful for testing statistical conclusion validity. This analysis is intended to address a set of interrelated research questions in a single, systematic and comprehensive analysis by modeling the relationship between several independent and dependent constructs simultaneously (Gefen, Straub, & Boudreau, 2000). PLS works by measuring the relationship path simultaneously, so there is no statistical problem with the lack of connections between lines. PLS also tends to be able to overcome multicollinearity and data distribution problems (Gustafsson & Johnson, 2004). Another reason to use PLS is the non-parametric nature of the Likert scale and the magnitude of the possible elements of multicollinearity. Besides, it has been widely used in information systems research studies (Urbach & Ahlemann, 2010). Following Akbar, Pilcher, Perrin, and Adler (2012), PLS is fit for this study because it allows minimal data assumptions and requires a relatively small sample size and hypotheses that are based on theoretical foundations that are not yet so strong (Chin et al., 2003). Specifically, we use SmartPLS, which is one software commonly used with favorable requirements, methodological choices, and available ease of use (Ringle, Wende, & Will, 2005). The measurement criteria using PLS are presented in Table 2.

7. Results

The questionnaire distribution and collection in this study was assisted by the head of the e-government development team in Surabaya who are working at the local Development Planning Agency. The objective was to ensure that the questionnaires were filled in by people who fulfilled the criteria of the respondents. After the questionnaires were filled in, the respondents submitted or returned the questionnaire through the head of the e-government team. There were 200 distributed questionnaires. However, only 141 questionnaires were returned and filled in completely. There were 175 questionnaires that were returned to the Development Planning Agency, but the 34 questionnaires that were not completely filled in were not submitted to us by the Development Planning Agency.

Before testing the hypotheses, the validity and reliability of the construct were tested. The validity test includes convergent and discriminant validity tests. The measure of convergent validity refers to the outer loading and AVE. From the results of the PLS analysis, it was found that the outer loading indicator was more than 0.4 (refer to Table 3). Referring to Hair et al. (2006),

Table 1. Operationalization of Research Variables

Variable's name and Role	Definition of Operation	Indicators	Sources
Culture of compliance in IT (Exogenous)	The level of organizational obedience in implementing IT and the ability to avoid obstacles in the implementation of IT to achieve the objectives of the IT	<ol style="list-style-type: none"> (1) IT compliance to achieve IT goals by all employees (2) Top management exemplary for IT compliance (3) Ability to avoid barriers in using IT to achieve IT goals 	Trevino, Weaver, Gibson, and Toffler (1999)
Effective ITG (Endogenous/ Intervening)	The extent to which IT can provide a role and added value to the environment at every level of the organization	<ol style="list-style-type: none"> (1) The positive impact of ITG in the environment at every level of the organization. (2) The added-value provided by ITG to the organization (3) The significant supporting factor of ITG in the organization 	Ali and Green (2009) and (Ali et al., 2009)
Service Quality (Exogenous and Endogenous)	The quality of service performance provided by local governments that are divided into five dimensions: tangible, reliable, responsive, assured, and empathatic	<ol style="list-style-type: none"> (1) Up to date Physical (IT) application (2) Exciting Physical (IT) application display (3) Cleanliness and neatness of government employees who are responsible for electronic services (4) Service accuracy (5) Flawless service (error) (6) Timely service (7) Responsive service (8) Service Empathy (9) Prioritizing aspirations or responding to community requests (10) Maintaining public trust (11) Ensuring that the community feels comfortable in every service they receive (12) Ethical and polite service (13) Easy to find and use (14) Trying to serve the community well 	Zeithaml, Parasuraman, and Berry (1990)

(Continued)

Table 1. (Continued)

Variable's name and Role	Definition of Operation	Indicators	Sources
Accountability (Exogenous and Endogenous)	Financial reporting and performance carried out by local governments through a website or online	(1) Accountability of public funds (2) Financial reporting (3) Performance reporting (4) Presentation of financial statements and performance on time	Sofyani and Akbar (2015), Sofyani (2018) and (Nurrizkiana et al., 2017) _ENREF_51
Transparency (Exogenous and Endogenous)	Submission of financial reporting and performance achievements (activities and programs) carried out by the government through the website or online that can be accessed by the public	(1) Availability of information systems (2) Accessibility of financial statements (3) Publication of financial statements (4) Availability of information related to audit results (5) Availability of performance achievement report	(Nurrizkiana et al., 2017) _ENREF_51

Table 2. Criteria for Assessment of Measurement and Structural Model of PLS

Testing type	Parameter	Rule of thumb	Source
Convergent Validity	Outer Loading	$\geq 0,4$	(Hair, Black, Babin, Anderson, & Tatham, 2006)
	Average Variance Extracted (AVE)	$\geq 0,5$	(Fornell & Larcker, 1981)
	Communality	$\geq 0,5$	(Chin et al., 2003)
Discriminant Validity	Cross Loading (Discriminant Validity)	Item loads on its construct \geq to other construct	(Gefen & Straub, 2005)
Reliability	Cronbach Alpha	$\geq 0,6$	(Chin et al., 2003)
	Composite Reliability	$\geq 0,5$	(Fornell & Larcker, 1981)
Structural Model	Path coefficient Significance of Path Coefficient (t-value)	$\geq 1,96$ (0,05); $\geq 2,58$ (0,001)	(Hair, Anderson, Tatham, & Black, 1995)

it can be concluded that convergent validity has been fulfilled. This is corroborated by the AVE score presented in Table 4 whose value is above 0.5 (Fornell & Larcker, 1981).

From the PLS analysis, it was found that the value of item loading on its own construct is higher than to other constructs (Gefen & Straub, 2005), meaning this discriminatory validity assumption is also fulfilled. Next is the reliability test that refers to Cronbach Alpha and Composite Reliability (see Table 4). The results of the PLS analysis found that the Cronbach's Alpha values of all constructs are more than 0.6 and Composite Reliability is also greater than 0.5. From these results it can be concluded that all variable constructs in this study have met the criteria of both convergence and

Table 3. Outer Loading

Variable	Indicator	Code	Loading
Accountability	Accountability of public funds	ACC1	0.87
	Financial reporting	ACC2	0.85
	Performance reporting	ACC3	0.83
	Presentation of financial statements and performance on time	ACC4	0.88
Effective IT governance	The positive impact of ITG in the environment at every level of the organization.	EITG1	0.87
	The added-value provided by ITG to the organization	EITG2	0.85
	The significant supporting factor of ITG in the organization	EITG3	0.84
Culture of Compliance in IT	IT compliance to achieve IT goals by all employees	CCIT1	0.77
	Top management exemplary for IT compliance	CCIT2	0.88
	Ability to avoid barriers in using IT to achieve IT goals	CCIT3	0.86
Service Quality	Up to date Physical (IT) application	SVC1	0.70
	Exciting Physical (IT) application display	SVC2	0.47
	Cleanliness and neatness of government employees who are responsible for electronic services	SVC3	0.58
	Service accuracy	SVC4	0.82
	Flawless service (error)	SVC5	0.75
	Timely service	SVC6	0.65
	Responsive service	SVC7	0.75
	Service Empathy	SVC8	0.76
	Prioritizing aspirations or respond to community requests	SVC9	0.69
	Maintaining public trust	SVC10	0.76
	Ensuring that the community feels comfortable in every service they receive	SVC11	0.79
	Ethical and polite service	SVC12	0.80
	Easy to find and use	SVC13	0.76
	Trying to serve the community well	SVC14	0.81
Transparency	Availability of information systems.	TRA1	0.76

(Continued)

Table 3. (Continued)

Variable	Indicator	Code	Loading
	Accessibility to financial statements	TRA2	0.82
	Publication of financial statements	TRA3	0.79
	Availability of information related to audit results	TRA4	0.88
	Availability of performance achievement report	TRA5	0.87

Table 4. Overview of AVE, Composite Reliability, R Square and Cronbach's Alpha

Variable	Code	AVE	Composite Reliability	R Square	Cronbach's Alpha
Accountability	ACC	0.737257	0.918161	0.290595	0.882055
Service Quality	SVC	0.528258	0.946221	0.293292	0.938588
Transparency	TRA	0.664811	0.922202	0.210284	0.905344
Effective IT governance	EITG	0.727311	0.888881	0.147651	0.813434
Culture of Compliance in IT	CCIT	0.698729	0.874010		0.790091

Table 5. Hypotheses Testing Result

Hypothesis	Symbol	Original Sample	T Statistics	Conclusion
H1	CCIT -> EITG	0.384254	3.779597*	Supported
H2a	CCIT -> EITG -> SVC	0.541565	7.046372*	Supported as intervening
H2b	CCIT -> EITG -> ACC	0.409217	3.954864*	Supported as intervening
H2c	CCIT -> EITG -> TRA	0.370759	4.597290*	Supported as intervening
H3	SVC -> ACC	0.417421	3.686981**	Supported
H4	ACC -> TRA	0.295752	2.682211*	Supported

Note: *Significant alpha level 0.001; ** Significant alpha level 0.05

discriminant validity and reliability. Therefore, the testing of hypotheses in the next stage can be done.

The results of the hypothesis test are presented in Table 5. It can be seen that the culture of compliance in IT has a significant positive association on effective ITG hence, H1 is supported. This means that one of the keys for an effective ITG in local government is the consistent effort to obey IT and have positive intentions and perceptions on IT when providing excellent service to the community.

ACC = Accountability; EITG = Effective IT governance; CCIT = Culture of Compliance in IT; SVC = Service Quality; TRA = Transparency

Next, the second hypothesis test (H2a, H2b, H2 c), where effective ITG is treated as an intervening variable, reveals that effective ITG has a role as a mediator of the relationship between culture of compliance in IT with community service, accountability of the local government, and transparency. The results can be seen from the t-value, which is more than 2.58 or significant at p-value 0.001. From these findings, it can be concluded that culture of compliance in IT in the aim of providing excellent service, accountability of local government organizations and good transparency will be more optimal if the culture of compliance in IT first can lead to effective ITG. The study also concludes in support of H3 which means that the good quality of service to the community significantly influences the accountability of local governments. Lastly, this study also supports H4 which proves that accountability is positively associated with transparency of local government.

8. Discussion

The results of this study confirm the study conducted by Ali and Green (2012) which concluded that the culture of compliance in IT is positively associated with achieving effective ITG. This study extends the findings of Ali and Green (2012) since their research was carried out for the ITG context of IT outsourcing, while this study departed from the ITG context in the government where the IT procurement, in this case e-government, was a pure investment (established) by the local government (Ali & Green, 2005). Trevino et al. (1999) contend that commitment from employees is urgently needed to increase adherence to a rule or policy. Meanwhile, increasing employee awareness in their compliance with IT use is influenced by support from top management (Beyer & Nino, 1999).

It is important to note, however, some studies from the business sector prove that in addition to a culture of compliance in IT, other factors have significant association with ITG, such as transparency of IT decisions, actively designed IT, education on ITG, simplicity of governance arrangements, aligned incentives and reward systems, governance designed at multiple organizational levels (Weill & Ross, 2004), IT leadership, top management support, performance measurement system consolidation, training (Nfuka & Rusu, 2011), methodological comprehensiveness, strategic integration of business and IT decisions, building collaborative relationships and shared understanding among key stakeholders (Ribbers et al., 2002), equivalent corporate communication systems (Ali & Green, 2005, 2007), clear IT principles and policies, equivalent organizational cultures, equivalent support for financial resources, and Clear ITG processes (Lee, Lee, & Jeong, 2008). Nevertheless, in the public sector context, related studies that investigate those various determinants are very difficult to find. Hence, research is needed to address these gaps. In addition, because the public sector is very close to the nuances of politics (Akbar et al., 2012), variables regarding politics such as central government and community pressure are more likely to be determinants that might associate with effective ITG.

Supporting the hypothesis that placed ITG as an intervening variable reinforces that the effective ITG is very crucial because intensive IT development will not succeed if it is not accompanied by ITG (Ali & Green, 2005; Ali et al., 2012; Buchwald et al., 2014). The intervening role of effective ITG in achieving good service quality, accountability, and transparency is suggested by some scholars (Bertot et al., 2010; Layne & Lee, 2001). It is believed that the main goal of ITG is the realization of good governance practices for organizations. This result could also be the answer to the phenomenon where there are local governments in Indonesia that have developed massive IT based in their large investments, but are still not able to achieve optimal performance and accountability which is still relatively weak. This case happened in one large local government in Indonesia, which only gained the title of CC (Good Enough) performance in 2017 whereas in the development of e-government, that local government is considered more advanced than other regional governments in Indonesia. It could be that this local government is not concerned with ITG issues when implementing the e-government (Ali & Green, 2005; Woodhead, 2004).

The study also found that the good quality of service to the community would lead to better accountability of local governments. This is in line with the signaling theory proposed by Connelly et al. (2011) that organizations, in fact, will strive to provide a positive signal to the public as the stakeholders through financial and performance reporting to reduce information asymmetry (Haraldsson, 2016; Spence, 2002). Thus, when information as a signal from the local government reaches the stakeholder, the local government hopes that it will be judged as responsible by meeting community expectations and the constitution (Ahyaruddin & Akbar, 2018). For this reason, local governments will increase the accountability of their financial management along with increasing the quality of the community services they provide. In the context of this study, this situation is very clearly illustrated where excellent service quality and performance in the Surabaya city government was accompanied by the best award of unqualified opinion among other regional governments in East Java in 2017. The findings in the field and the results of hypothesis testing are strong evidence of the relationship between service quality and accountability variables.

This study also found that good accountability in local governments will stimulate good transparency. Having better accountability, the organization logically will convey this information as a positive signal to the public. The reason could be, in the case of local government, the transparency of local governments is a tool to maintain legitimacy (Certo, 2003) which shows that the government has worked in accordance with the mandate (DiMaggio & Powell, 1991), attracts sympathy and increases community satisfaction (Nurrizkiana et al., 2017), and shows the quality of the government management in power (Connelly et al., 2011; Filatotchev & Bishop, 2002). In the case of the city of Surabaya, all information relating to the services and management of the local government is available in full and neatly, not only mandatory information, but voluntary as well. Referring to the results of the hypothesis test, it is confirmed that this is influenced by the good quality of financial reporting and performance (accountability) of the Surabaya City Government. In 2017 the city of Surabaya even received an award from the Information and Documentation Management Officer as a city that attained the A rank in terms of information disclosure. Thus it can be concluded that the better the accountability of local governments, the better the transparency of information.

As a final note in the discussion section, in general, this study reinforces the RBV theory which claims that competitive advantage of organizations, including in the public sector, will be achieved if the resources investments are valuable, rare, difficult to imitate, and have no equivalent substitutes (Barney, 1991). Practically, IT investments which are accompanied by effective ITG in form of e-government is able to improve service quality, accountability and transparency (Barrutia & Echebarria, 2015).

9. Conclusion and practical implication

This study demonstrated that the culture of compliance in IT was able to improve the effectiveness of ITG. Meanwhile, effective ITG is the main strategy for the realization of good service quality, in this case, fast and according to service standards, increased quality of accountability, and transparency. This study also found that accountability is determined by good service quality while transparency is triggered by good accountability. This result is a very important and meaningful input for all local governments and regulators in Indonesia and also in developing countries especially in terms of the development of e-government. Based on those findings, we have highlighted, at least, important implications that are divided into two, public policy and suggestions for the managers in local government. Changes in local government organizations in service practices and good government governance (accountability and transparency) from manual processes towards e-government can achieve good results when accompanied by efforts to achieve effective ITG. However, it must be noted that effective ITG will be reached if IT infrastructure is properly developed as needed and supported by intellectuals from top management and operators or implementers of e-government in the local government environment. As such, these results emphasize the importance of changing the mindset about IT by the top management of local government as well as the staff even at the lowest level. This change is related to the view on IT investment from what used to be called a “tool” to a “strategy”. It is suggested that the development of e-government through IT infrastructure and

service software application development is not enough. These two things are important, but building adherence to IT and ITG will make the development of e-government stronger and more strategic, which improves performance (service quality) and governance (accountability and transparency). Then, we also suggest to focus on service quality enhancement since it has a positive role in improving accountability and in turn complying with transparency.

10. Limitation and recommendation

This study certainly has some limitations. First, this research was only carried out in the Surabaya city government. Also, this study is based on a survey from the perception of government employees, not top management who are considered to understand more about their effective ITG condition. Therefore, the reader needs to be careful in concluding the results of this research in general. Future study should research ITG in across-local government and involve top management in local governments as the respondents to obtain better study results. Nevertheless, this research results can be the starting point for development at the government level at different levels, to strengthen the validity of the findings of this study. This study only tests one factor that influences effective ITG. Furthermore, considering this survey-based research, the description, and explanation in depth of how effective ITG can lead to improving service quality, accountability, and transparency is not able to be presented. Therefore, further research can consider a qualitative approach to complement the findings of this research.

Furthermore, when referring to some other research results, service quality, accountability and transparency in public organizations are not always influenced by the advancement of e-government and e-governance practices, but also political issues, central government and community pressure. Thus, it is highly recommended to include these variables in the next research to examine their interactions with the practices of e-government, e-governance, and ITG. Various theoretical points of view such as institutional, isomorphism, managerial hegemony, agency and stewardship can be considered.

Funding

The authors received no direct funding for this research.

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Cover Image

Source: Author

Citation information

Cite this article as: Improving service quality, accountability and transparency of local government: The intervening role of information technology governance, Hafiez Sofyani, Hosam Alden Riyadh & Heru Fahlevi, *Cogent Business & Management* (2020), 7: 1735690.

Notes

1. Indonesia has four levels of government: (I) central government; (II) provincial government; (III) regency/ city government; and (IV) village government.
2. <http://news.metrotvnews.com/peristiwa/3NOYMBXk-e-government-di-indonesia-masih-lemah>.
3. the Indonesian office of the Ombudsman is a state institution in Indonesia that has the authority to

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