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## Bibliometric Analysis of E-Government and Trust: A Lesson for Indonesia

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### ABSTRACT

The development of digitalisation has spectacularly affected global society, including Indonesia. Many governments are aware of the opportunities and benefits of this development, so they carry out digital transformation and adaptation through e-government systems. However, public trust emerges as one of the determining factors in assessing the success of implementing e-government. This tendency prompted this study to search for available research documents to examine relevant topics regarding e-government and trust. The method used was a bibliometric analysis by maximising the Vosviewer analysis tool. The data was obtained from the Scopus database. This study reveals the need for further research on the relationship between e-government and trust in Indonesia. These subjects are relatively less explored despite gaining global recognition as vital areas for future research. This unpopularity has contributed to the need for more discussion about the quality of e-government services regarding the level of trust. Trust is a fundamental aspect of the government system in many countries. The findings of this study encourage a logical consequence to consider factors of trust in implementing e-government in Indonesia in the future. This approach can encourage the government to improve the quality of services and adopt e-government use. Such improvements are expected to bolster trust in the government and sustainably stimulate public interest in its utilisation.

## A. INTRODUCTION

Public service issues within government systems continue to be criticised and are deemed suboptimal in several countries, including Indonesia (Cordella & Tempini, 2015; Huda & Yunas, 2016). The problem of poor local government capacity is a significant obstacle to improving public services (Setiawan et al., 2022). Subpar government services stem from public disillusionment with service quality, security, and privacy (Kanaan et al., 2023). Poor government services and public disappointment can lead to public distrust in government, especially in Indonesia. The loss of public trust will affect the government's political stability (West, 2004; Baharuddin, Jubba, et al., 2022). Currently, many governments in the world are adopting a digitalisation approach through e-government systems. It is expected to be an alternative and participate in enhancing the quality of government services (Gaozhao et al., 2023). This approach is seen as capable of delivering efficient services and addressing issues

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associated with traditional government services, although its impact on public trust remains a subject of concern (Nulhusna et al., 2017).

E-government refers to using information and communication technology (ICT) to improve government administration efficiency, transparency, participation, and service (Uyar et al., 2021). This concept involves the transformation of traditional government processes into a digital environment, enabling citizens to interact with the government online, access public information, and perform various administrative services without having to physically come to government offices (MacLean & Titah, 2022; Mensah et al., 2021). E-government can help reduce regulations, increase accountability, and accelerate the acceleration of public services, making it a powerful tool for modernising government governance (Dhaoui, 2022).

The e-government system, enabled by digitalisation, serves as a bridge for governance reform to enhance the efficiency and effectiveness of public services (Dobrolyubova et al., 2019). The digitalisation approach contributes to cost reduction, quick response, easy accessibility, reduced service time, increased available information, and improved quality (Sergi & Ucal Sari, 2021). Digitalisation services also facilitate interaction between the government and citizens (Pappel et al., 2019). It shows that technological advances in public services are increasing (Arundel et al., 2019). There is an increasing demand for enhanced services, and citizens vigilantly monitor and seek improvements and drive the government to keep pace. Adopting digital solutions in public services must be thoughtfully considered and optimised (Baharuddin, Qodir et al., 2022).

While numerous studies have linked the digitalisation of services through e-government with the concept of trust (Abdulkareem et al., 2022; Khan et al., 2021), only a limited number of studies focus on conducting bibliometric analyses to globally map the interconnected research outcomes, especially examining their relevance to Indonesian cases. However, several previous studies are considered quite relevant. *First*, there are persistent service issues in government, potentially leading to inequality in service quality due to the coexistence of digital and manual service delivery (Larsson, 2021). *Second*, improving public services hinges on the government's willingness to adopt digital or electronic systems for administrative efficiency, promoting open government practices, upholding professionalism, and cultivating increased public trust (Twizeyimana & Andersson, 2019). *Third*, transparency is the most vital factor influencing Indonesia's decision to adopt e-government (Sabani, 2020). *Fourth*, the mapping of research developments contributes to controlling the position of subsequent research (Baharuddin, Nurmandi et al., 2022) and as a basis for evaluation, especially in the future implementation of e-government (Roziqin et al., 2022).

This research aims to fill in the gaps in previous research by relying on a bibliometric analysis approach. This approach was chosen to map the results of developing a study on e-government with trust. The results of this study help map recommendations on government cases in Indonesia. The research questions are as follows: (a) How are the development trends in global studies on e-government with trust? (b) How is the mapping of relevant themes in e-government and trust? (c) How can Indonesia learn from the results of these global studies? These three questions make it possible to determine the development trend of international studies on e-government with trust. It is also possible to view themes related to the study. Besides, it is also possible for Indonesia to learn to adopt e-government by considering trust.

## B. LITERATURE REVIEW

### E-government and Digitalisation

Today's society has made remarkable progress in advancing modern and efficient digital government. Increasingly, digital transformation demands further strengthening of digital governance systems and service delivery (Wirtz, 2022). Studies on digital government use

government considerations to map opportunities, challenges, and gaps in government systems (Zein & Twinomurinzi, 2019). Nonetheless, the digital government continues to confront challenges concerning protecting personal information or user privacy (Lin et al., 2021). Digitalisation is highly dependent on adequate infrastructure and Internet network capacity. An issue that looms large is the uneven distribution of infrastructure and Internet networks, regrettably limiting their reach to certain government areas, leading to disparities in digitisation applications. Addressing this dilemma necessitates a prompt government response to identify and mitigate the factors impeding the optimal implementation of this digital approach (Glyptis et al., 2020).

The development of digitalisation has encouraged the government to adapt and embrace a new governance model called digital government or e-government. Governance adaptation to the digital era is thought to change the relationship between public institutions and citizens (Umbach & Tkalec, 2022). Digital transformation of e-government systems can initiate changes in government, including increasing transparency, accountability, and efficiency. The e-government system encourages the integration of public services (Castro & Lopes, 2022). Several studies show that e-government will continue to experience an increasing trend globally, primarily driven by factors such as the quality of information and public services (Manoharan et al., 2021). In the Indonesian context, e-government studies, characterised by a multidisciplinary approach, continue to develop. However, it has made considerable contributions to social science (Roziqin et al., 2022).

### **Trust In Government and E-Government Systems**

Citizens' trust in government has been studied for many years (Grimmelikhuijsen & Knies, 2017). Trust is a fundamental aspect of government systems in many countries, including Indonesia (Baharuddin, Jubba, et al., 2022). The government makes general efforts to gain public trust through public sector transparency. The government uses e-government systems to support this transparency and influence public trust (Porumbescu, 2017). In contrast, other studies show that even though the government has implemented an e-government system, a decline in trust can still occur (Pérez-Morote et al., 2020). This decline is affected by factors such as limited accessibility, information quality, service provision, and the performance of government websites (Baharuddin, Qodir et al., 2022).

The successful implementation of e-government is highly dependent on public trust (Alzahrani et al., 2017). The link between public trust and e-government systems is influenced by opportunities for community and government interaction mediated by websites (Parent et al., 2005). These government websites create online interactions and influence public responses (Baharuddin, Qodir, et al., 2022). Increasing public trust depends on government initiatives (Haque, 2011). The government frequently initiates efforts to enhance public trust by providing reports on government achievements and performance, often positive—however, the public remains sceptical of such information (James & Van Ryzin, 2017). The opportunity to increase public trust through the implementation of e-government depends on how the government responds in maximising the technical development of the available digitalisation systems.

### **C. METHOD**

This study obtained research publication documents from the Scopus database. It is helpful to help the researchers observe the development of global studies related to E-Government and trust based on available published papers. Figure 1 displays the research procedure.

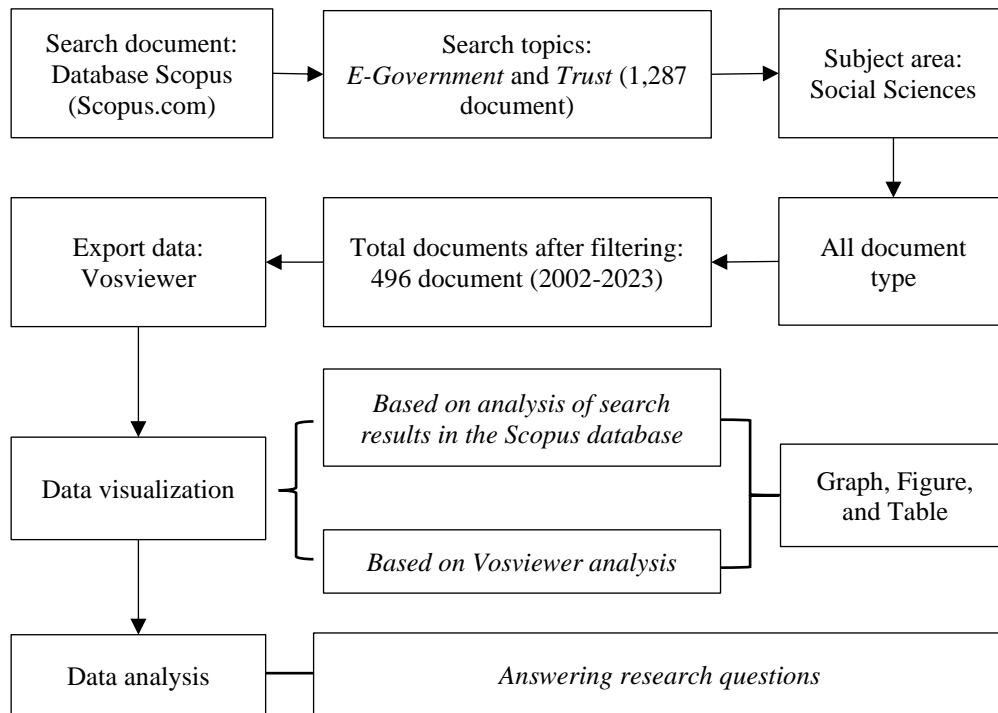


Figure 1. Research Procedure

Figure 1 shows the research procedure. The data source used was the Scopus database. A document search was carried out in January 2023. The choice of the Scopus database was based on its reputation for being famous and highly selective, with a strict document selection policy maintained by independent reviewers, ensuring the highest quality index. The data search was determined based on keywords focused on searching the literature on e-government and trust. Initially, the search yielded 1,287 documents covering these two topics. The subsequent step involved refining the results to the defined subject area, namely social science.

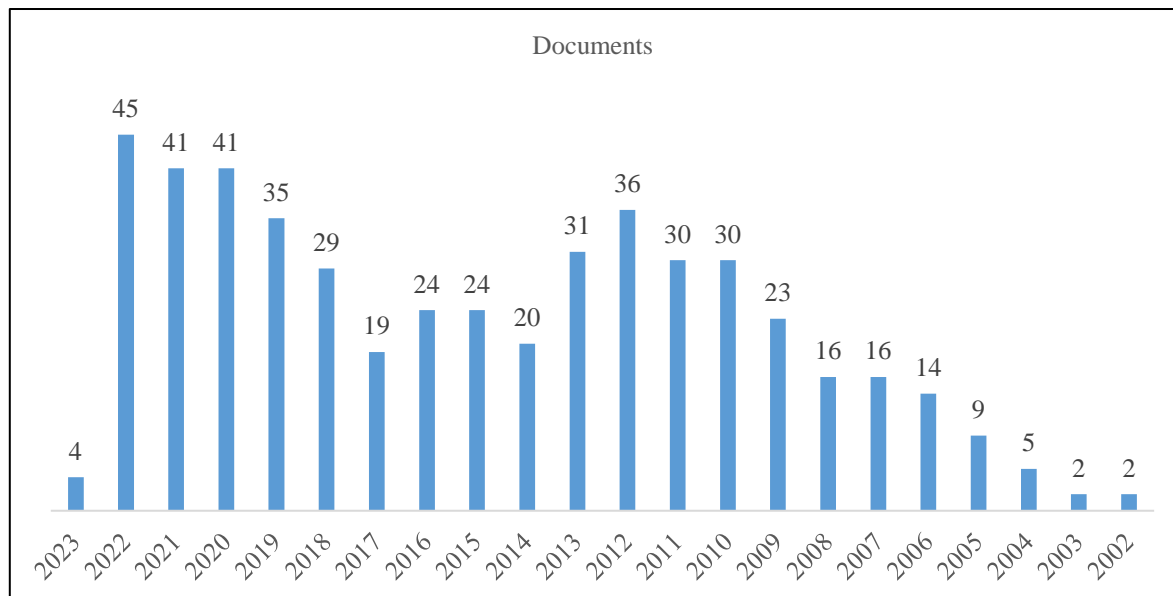
Additionally, the filter included all document types for several reasons. *First*, the researchers sought a comprehensive overview of the subject by encompassing all document types. *Second*, considering the breadth of the studied topics, the researchers were open to various document types, including editorials. Although editorials might not represent direct research outcomes, they can still provide essential contributions to the references of publications. Editorials are usually written by people with knowledge or experience in fields related to magazines or journals.

The filtering process identified 496 document results (2002-2023). Subsequently, the analysis was conducted using the filtered set of 496 documents. The data was then imported into an analytical tool, namely Vosviewer. Data visualisation was performed based on the results of the Scopus and Vosviewer websites to assist the analysis. Vosviewer uses the Co-occurrence analysis type and the All-keywords analysis unit to build a network with nodes representing words and edges (lines) connecting pairs of words that appear together in the same document. The Co-occurrence analysis type focuses on word pairs in a record, while the All-keywords analysis unit treats all words as the essential analysis element. The analysis results follow the data trend observed during the process, which may exclude keywords or information with minimal weighting to ensure clarity. The insights generated by the analysis were subsequently employed to address the research questions.

## D. RESULT AND DISCUSSION

### Development Trends: E-Government and Trust

Publication documents related to research on E-government and trust were analysed following the trends in search results and filtering on the Scopus website. The data was then visualised following the weight calculated and the data's movement. This also affects not displaying data visualisation on other less relevant items. This section explicitly describes research development trends based on the year of publication, the number of documents by authors, and the number of citations. Figure 2 illustrates the movement of published papers based on the year of publication.



(Source: Scopus (2023))

Figure 2. Publication Trends Related to E-Government and Trust by Year of Publication

Figure 2 shows the timeline of publications related to E-government and Trust, commencing in 2002 with only two research documents. The impetus for this research stems from acknowledging the challenges residents face in accessing sufficient information. E-government offers a unique opportunity to solve at least part of the problem. E-government allows citizens to become more familiar with government processes. Access to adequate information and public familiarity with government processes influence trust (Altman, 2002). Following the publication of the research in 2002, there was an increase in the number of documents in the following years, indicating that early research stimulated the interest of subsequent scholars. A notable surge occurred in 2012, with 36 papers. The most significant increase in the number of documents was observed from 2020 to 2022.

The number of documents peaked in 2022, with 45 published papers. This surge is attributed to the recognition that addressing the declining public trust in government requires more than delivering public sector services through the e-government system (West, 2004). It also has an impact on public acceptance of using e-government services. Public perception of the relative advantages of e-government services is pivotal in encouraging their adoption. Simultaneously, the perceived complexity of these services influences the public's reluctance to engage with e-government. This argument then triggered an adaptation pattern of e-government implementation by considering various aspects of trust (Abu-Shanab, 2019). It prompts discussions about government efforts to optimise e-government systems by advocating for transparency and good governance (Jameel et al., 2019).

Table 1. Top 5 Most Frequently Cited Research Documents

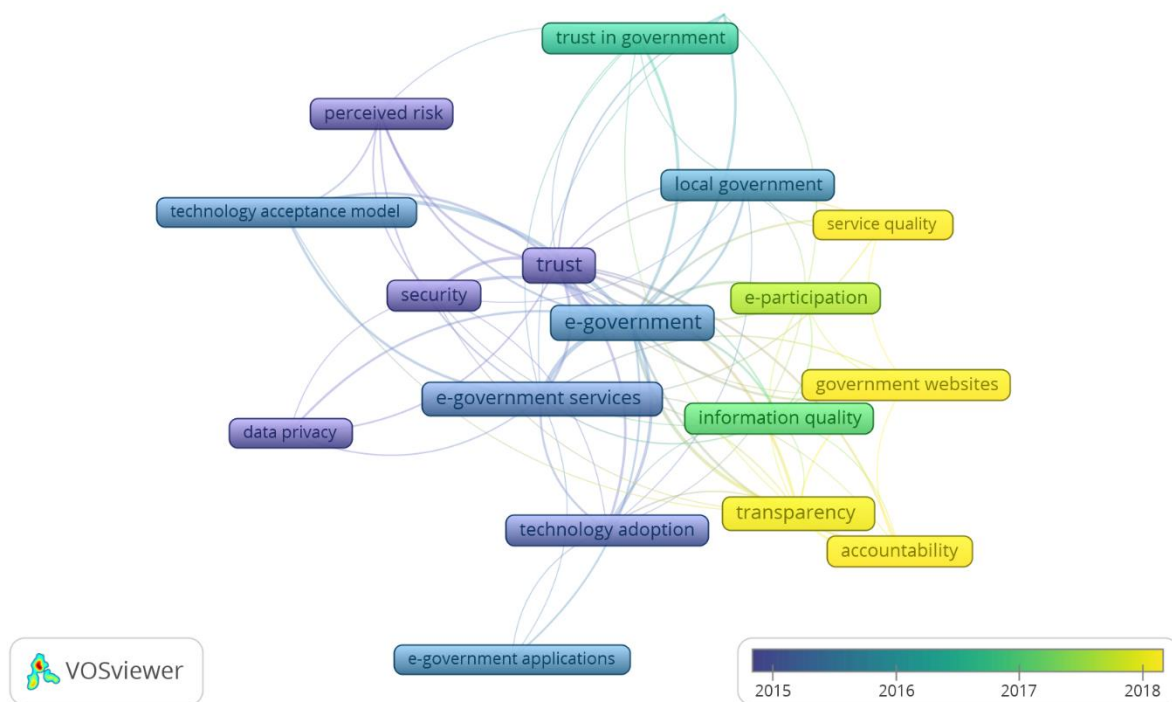
Document Title	Authors	Cited
E-Government and the Transformation of Service Delivery and Citizen Attitudes (2004)	West, D.M.	1006
Linking Citizen Satisfaction with e-government and trust in government (2005)	Welch, E.W., Hinnant, C.C., Moon, M.J.	740
The effects of E-government on trust and confidence in government (2006)	Tolbert, C.J., Mossberger, K.	654
Local e-government 2.0: Social media and corporate transparency in municipalities (2012)	Bonsón, E., Torres, L., Royo, S., Flores, F.	616
Blockchain in government: Benefits and implications of distributed ledger technology for information sharing (2017)	Ølnes, S., Ubacht, J., Janssen, M.	453

Source: Scopus (2023)

The high number of citations on published documents indicates that other scientific papers in academic research and discussion have widely cited these documents, indicating that the document is essential and influential in specific research fields. Contributions from records with a high number of citations may vary, depending on the area of research and the context. However, documents with many sources show advanced knowledge and understanding of specific research fields (Tahamtan & Bornmann, 2019).

### Mapping Themes: E-Government and Trust

This study further discusses the topic or research theme of e-government and trust. Some of the issues or themes are described in Figure 3.



(Source: Processed by Researchers Using Vosviewer (2023))

Figure 3. Research Topics and Themes Related to E-government and Trust

Figure 3 shows that the research topics or themes on E-government and Trust also relate to other research topics. The identified topics or themes include data privacy, security, perceived risk, technology adoption, technology acceptance model, e-government applications,

e-government services, local government, trust in government, information quality, and e-participation. These topics are commonly discussed in research on e-government and trust, which existed before 2018. Data privacy arises from research findings indicating the potential risk of personal data exposure with the implementation of e-government. One of the main challenges of e-government adoption is the need for more security. The government's ability to protect citizens' data is substantial. The government's inability to safeguard personal data will affect public trust in the government, underscoring the need for enhanced e-government systems implementation (Bayaga et al., 2020).

The security topic stems from the argument that e-government services, which a robust security system should ideally support, have paradoxically resulted in reduced user trust and participation (Kanaan et al., 2023). The perceived risk topic is recognised as one of the factors influencing the adoption of e-government services (Karavasilis et al., 2016). Other topics, such as technology adoption and acceptance models, stem from the view that governments can enhance their services by adopting E-Government. Public engagement in e-government adoption is contingent on the quality of information and services, with low quality significantly impacting diminished trust. The decreasing faith will impact the public adoption of e-government services (Al-Omairi et al., 2021; Xin et al., 2022). In addition, researchers have employed the Technology Acceptance Model (TAM) to identify the primary factors influencing the use of e-government services. Trust, perceived usefulness, and perceived relative advantage have a significant positive relationship with the intention to use the service (Xie et al., 2017).

The topic of e-government applications is developed based on technology acceptance and innovation integration. E-government applications refer to the delivery of public services by the government, which is evaluated based on the quality of the information and the computer's ability. These qualities are pivotal in influencing public trust in adopting e-government applications (Shuib et al., 2019). Other topics, such as e-government services, are used to examine the effect of service quality on trust and loyalty to e-government services (Alkrajji & Ameen, 2022). The topic of local government analyses the performance and adoption of e-governance in remote areas outside major cities. The adoption of e-government by local governments poses unique challenges, especially the imperative of raising awareness about the use of digital technology to enhance work efficiency (Kiettikunwong, 2022). Topics regarding trust in government, information quality, and e-participation have the same attachment to the previous issues. These topics revolve around the argument that the success of e-government hinges on gaining public trust, which is contingent on the quality of information. Trust and high-quality information profoundly influence online participation or e-participation while bolstering confidence in government institutions (Abdulkareem et al., 2022).

Additionally, several relatively new topics have emerged in the research and discourse on e-government and trust, including accountability, transparency, service quality, and government websites. Accountability and transparency within the context of e-government and faith are closely intertwined, as e-government implementation enables public scrutiny and assessment of government activities (Field, 2019). Service quality is increasingly recognised for influencing the public's adoption of e-government services. This recognition has encouraged the government to emphasise service quality more (Kanaan et al., 2023). Government websites have also gained prominence, piquing the interest of global scholars studying the connection between e-government and trust. Government websites play a pivotal role in making adequate information accessible. Information accessed through these websites shapes user's perceptions about usability and trust in government websites (Ahmad & Kirmani, 2020). This mapping of research topics or themes presented highlights the interconnectedness of various aspects within e-government studies. These connections demonstrate that research on E-government and Trust is not mutually exclusive; instead, it offers the possibility of

simultaneous analysis and comprehension. This presents a valuable opportunity for future research endeavours.

Future problems will likely be much more complex. This likelihood is underscored by the evolving perspectives of researchers, as evidenced by the documents scrutinised in this article. The volume of documents grows yearly, accompanied by a diversification of interlinked research topics and themes. This study recommends considering the above issues, especially topics relatively new to research, such as accountability, transparency, service quality, and government websites. These areas can instigate a new paradigm globally, offering valuable insights into the adoption and advancement of e-government in Indonesia and beyond.

### E-government and Trust: How the Indonesian Government can Learn

In the Indonesian context, e-government has begun to be adopted in many regions. However, its adoption and implementation must be improved (Nulhusna et al., 2017; Muhtar et al., 2018). Indonesia should learn from the experiences of other countries that have previously campaigned for e-government services, with a particular focus on trust. This trend has begun to be studied, especially by Indonesian writers, to discuss Indonesian cases by participating in publishing their research results globally. Some of the documents collected are described in Table 2.

Table 2. Research Documents Based on Country Affiliation (Indonesia)

Document title	Authors	Source
The relation of E-government Quality on public trust and its impact on public participation (2017)	Nulhusna, R., Sandhyaduhita, P.I., Hidayanto, A.N., Phusavat, K	Transforming Government: People, Process and Policy
E-procurement system success factors and their impact on transparency perceptions: Perspectives from the supplier side (2018)	Aminah, S., Ditari, Y., Kumaralalita, L., (...), Phusavat, K., Anussornnitisarn, P.	Electronic Government
Trust and its impact towards the continuance of use in government-to-business online service (2018)	Pinem, A.A., Immanuella, I.M., Hidayanto, A.N., Phusavat, K., Meyliana	Transforming Government: People, Process and Policy
Exploring factors that influence behavioural intention to use E-government services using unified theory of acceptance and use of technology 2 (2018)	Syamsudin, Meiyanti, R., Satria, D., Wahyuni, R., Sensuse, D.I.	2018 International Seminar on Research of Information Technology and Intelligent Systems, ISRITI 2018
E-archives Implementation Readiness: A Case of the National Archives of the Republic of Indonesia (2018)	Nusantara, P., Nazief, B., Sandhyaduhita, P., Fathony, H.	Proceedings - 2018 4th International Conference on Science and Technology, ICST 2018
Evaluation of E-government services based on social media using structural equation modelling (2019)	Nindito, H., Madyatmadja, E.D., Dian Sano, A.V.	Proceedings of the 2019 International Conference on Information Management and Technology, ICIMTech 2019
A review of the generic end-user adoption of e-government services (2019)	Jacob, D.W., Fudzee, M.F.M., Salamat, M.A., Herawan, T.	International Review of Administrative Sciences
The influence of Attitude and Subjective Norms on citizen's intention to use e-government services (2020)	Gultom, S., Dalle, J., Restu, (...), Hairudinoar, Gultom, S.	Journal of Security and Sustainability Issues
Enterprise architecture planning for e-government (2020)	Aulawi, H., Fitriani, L.	International Journal of Innovation, Creativity and Change

Analysis of Factors That Affect the Quality of E-Government Services: A Case Study in Ombudsman of the Republic of Indonesia (2020)	Durachman, Y., Nuryasin, Harahap, D., (...), Faisal Bakti, A.M., Mansoer, M.	2020 8th International Conference on Cyber and IT Service Management, CITSM 2020
Taxpayer Behavior in Using E-Vehicle in Indonesia (2021)	Zubaidah, E., Nurmandi, A., Pribadi, U., Hidayati, M.	Asia Pacific Journal of Information Systems
Personal and reliability factors affecting adoption and utilisation of e-government: An effect of intention to use (2022)	Rachmawati, Aswar, K., Sumardjo, M., Wiguna, M., Hariyani, E.	Problems and Perspectives in Management
Adoption of E-Government by Indonesian State Universities: An Application of Technology Acceptance Model (2022)	Aswar, K., Ermawati, E., Juliyanto, W., Andreas, A., Wiguna, M.	Problems and Perspectives in Management
The Success of Information Systems and Sustainable Information Society: Measuring the Implementation of a Village Financial System (2022)	Ariyanto, D., Dewi, A.A., Hasibuan, H.T., Paramadani, R.B.	Sustainability (Switzerland)

Source: Scopus (2023)

While it does not directly mention the relationship between e-government and trust, the document may open the door to essential considerations about how governments can build trusting relationships with their citizens through technology. As such, the paper can significantly contribute to developing a broader discussion about the importance of trust in the context of e-government.

Table 2 shows several published research documents covering e-government and trust in Indonesia. However, the title does not explicitly link e-government and trust. This study's findings reveal a scarcity of research specifically addressing e-government with due consideration to the element of trust. Therefore, there is a need for more explicit research in this domain. It was also identified that more interest from other countries, especially Indonesian researchers, was needed to study these topics. Even so, some of the research results mentioned can influence future discussions on e-government and trust. The 14 documents serve as a reference for further research, promoting a more focused and concurrent examination of e-government and trust and providing valuable insights for the Indonesian government in considering these two aspects. The Indonesian government should focus on information management, information quality, system quality, security, and ease of access. These factors can have implications for the development of trust (Nulhusna et al., 2017). The concept of e-government also initiates transparency. In this context, system quality, service quality, regulation, trust, user satisfaction, and perceived benefits determine the success of an e-government system. Trust is the dominant influencer of perceived transparency (Aminah et al., 2018).

Another study suggests that users' trust in e-government services does not directly affect their continued use. Instead, trust its influence through perceived benefits and satisfaction with the service (Pinem et al., 2018). Usage habits also affect the continued use of e-government services (Syamsudin et al., 2018). The numerous challenges associated with e-government implementation underscore the significance of assessing readiness levels as a crucial step in minimising potential failures and having implications for user trust (Nusantara et al., 2018; Ariyanto et al., 2022). Furthermore, a significant challenge for the government is to increase citizen adoption and public trust in technological progress (Jacob et al., 2019; Gultom et al., 2020; Aswar et al., 2022; Rachmawati et al., 2022; Zubaidah et al., 2021). The government must increase trust by delivering services that align with the community's expectations (Nindito et al., 2019). In addition, optimising government websites can serve as a bridge for public

engagement with the government through the disclosure of information (Durachman et al., 2020).

Public relations with the government based on full service, information management, information quality, system quality, security, and ease of access affect trust. Increased trust can influence the intention and adoption of E-government services (Kurfali et al., 2017; Sulistyowati et al., 2020). Low confidence might impede the adoption and public endorsement of the implementation of the e-government system, highlighting the imperative for e-government to run optimally. Information and communication technology used in e-government systems can bring the expected benefits only when citizens want and trust in using these systems and services (Li, 2021; Sulistyowati et al., 2020). It reiterates that the research results linking e-government and trust are an attempt to assess and evaluate the quality of e-government services. The insights drawn from this study can provide valuable lessons for the Indonesian government from global research outcomes, emphasising that the implementation of e-government should also consider aspects of trust.

## E. CONCLUSION

E-government can deliver its anticipated benefits only when citizens express a desire for and trust in the system. It depends on how the government ensures the provision of services, information management, information quality, system quality, security, and ease of access. One key to e-government success is establishing public trust, which is critical to government systems worldwide. This study has identified the need for improvements in research linking e-government and trust within the context of Indonesia. These topics are considered less popular, even though globally, they have begun to be adopted for the development of future studies. The findings of this study encourage consideration of aspects of trust in implementing E-government in Indonesia in the future. It could encourage the government to improve the quality of services and use of e-government. In the context of e-government and trust, the benefits to the public include efficiency in public services, ease of access to information and services, improvement of government-society relations, better acceptance of technology, and democratisation processes.

Improving service quality is predicted to foster trust in the government, thereby stimulating sustained public engagement. Researchers, particularly those focused on government responses, may consider the recommendations of this study. In addition, this study identifies research gaps for future studies, some of which are relatively new topics to research and discuss in linking studies on e-government and trust. These topics include accountability, transparency, service quality, and government websites. The issue of government websites is particularly notable, as they play a pivotal role in enhancing the relationship and trust between the government and the community. Government websites can be transparent platforms for disseminating information and services, providing accessible policies and decisions, and facilitating public participation and feedback.

Consequently, the availability of a high-quality government website significantly contributes to reinforcing trust and relationships. The limitation of this study lies in the missed opportunity to examine it through observation. Observational methods could provide direct insights into technical issues and, thus, should be considered for future research.

## Contributorship

Abdul Halil Hi Ibrahim, Tawakkal Baharuddin, and Marno Wance (Conceptualisation and writing—preparation of the original draft). Tawakkal Baharuddin (Methodology and operation of analytical tools). Tawakkal Baharuddin and Marno Wance (Data visualisation). Abdul Halil Hi Ibrahim (Supervisor). All authors have read and agree to the published version of the manuscript.

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