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EVALUATION OF COBIT IMPLEMENTATION IN E-GOVERNMENT: SYSTEMATIC LITERATURE REVIEW FOR IMPROVED GOVERNANCE

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Abstract

This study explores the implementation of COBIT in the context of e-government through a systematic literature review. The primary objective is to assess the development of COBIT adoption in e-government over the period from 2014 to 2024 and to identify potential directions for future research. Utilizing the Systematic Literature Review (SLR) method based on the PRISMA framework, this study analyzed 62 articles retrieved from academic platforms, including Google Scholar and ResearchGate. After a three-stage structured screening process, 20 articles went into detailed analysis. It emerges from the findings that COBIT plays an imperative role in IT governance and information systems auditing within e-government. Its implementation has demonstrated how to enhance risk management performance, ensure compliance with regulation, and increase transparency and accountability within the dispensation of public services. This study will add to the comprehensive understanding of COBIT's role in e-government and point out the critical areas that need further research. The findings will help practitioners and researchers with an effective reference for building up IT governance strategies that are in line with the development of e-government.

Keywords: COBIT, E-Government, IT Governance, Information Systems Audit, Systematic Literature Review.

Introduction

The government still strives to enhance the quality of information and communication technology in response to global demand. Since the government's main task is to provide reliable and effective services to satisfy the needs of its citizens, this project aims at enhancing public services. One of the government's priorities for developing technology is an integrated internet system known as electronic government, or E-government. E-government refers to the development and management of more effective government systems, transactions, and processes that use information and communication technology to provide citizens with better services while lowering corruption and waste. Additionally, it seeks to improve public trust, accountability, and openness (Dhiaaul Kusnaa Washilatul Arba'ah, 2023).

An information technology (IT) audit is required for the e-government idea to be implemented to match IT management with government agencies' planning, goals, and business strategies. Information technology (IT) is a tool that helps businesses, organizations, and academic institutions reach their objectives more quickly and take their operations to the next level. IT governance helps firms become more efficient and gives them a chance to gain a competitive edge. Delegating decision-making to those best suited to comprehend organizational needs and their ramifications is ensured by effective IT governance (Khther & Othman, 2013).

An IT audit entails collecting and reviewing information to evaluate whether existing systems have efficiently used available resources, effectively supported the fulfillment of organizational goals, maintained data integrity, and protected the organization (Dhiaaul Kusnaa Washilatul Arba'ah, 2023). Previous research has shown that IT audits are necessary because they offer data that can be used as references or resources for resolving inconsistencies inside organizations.

The Control Objectives for Information and Related Technology (COBIT) framework serves as the benchmark for information technology (IT) audits. COBIT is one of the standards used to implement information system auditing processes (Nugroho, 2020). Its strength is in allowing for thorough governance capability measurement to accomplish desired goals by integrating information security governance into larger IT governance (Nugroho, 2020). The COBIT framework differentiates between the concepts of governance and management. Governance ensures that stakeholders' circumstances, needs, and decisions are evaluated in a manner that will help achieve the pre-defined organization objectives. Performance is directed through the agreed-upon objectives and principles; through the decisions and

prioritization, the direction is determined. On the other hand, management involves arranging, making, executing, and supervising operations according to rules laid down by governance to achieve organizational objectives (Dhiaaul Kusnaa Washilatul Arba'ah, 2023).

This makes understanding academic research trends in the use of COBIT in e-government indispensable, as this will bring changes to the governance and public service provided by a government. The literature review follows the Systematic Literature Review method, which investigates the implementation of COBIT within Indonesian e-government. The two major objectives of the current study are an in-depth analysis of the tendency of research during the last decade and underlying themes that require more detailed study. This review will try to provide insights that have implications both in theoretical development and practical applications.

Method

This study follows the PRISMA framework, or Preferred Reporting Items for Systematic Reviews and Meta Analysis and uses the Systematic Literature Review approach. The steps involved in the research methodology are as follows:

1. Identifying appropriate search terms and strategies to locate useful studies from databases.
2. Applying the PRISMA process (identification, screening, eligibility, and inclusion) to select studies based on predefined criteria.
3. Key information from the selected studies will be extracted, including methodology, key findings, publication year, author details, and other relevant data.
4. Utilizing appropriate evaluation tools to assess the quality and risk of bias in the included studies.
5. Providing a descriptive or narrative summary of the key findings derived from the evaluated studies to synthesize the results of the selected research.

Research Stages

Data Collection

We downloaded the materials for this research from ResearchGate and Google Scholar, respectively; the publications date back between 2004 and 2024. We systematically sorted out keywords, abstracts, and article titles to extract data.

Data Selection

An initial search was conducted using keywords related to COBIT and IT governance, which formed the basis for the selection process. The initial dataset was retrieved without any pre-filtering, and all relevant references were included. This research applied the SLR methodology, starting with searches in ResearchGate and Google Scholar, among other platforms. The searches produced 62 references. After that, a selection was made using predefined eligibility criteria regarding the type of literature, removing duplicates, and the relevance of the topics. In this way, three stages of filtering were applied, leaving 20 references prepared for detailed analysis. Thus, the first filter of paper type, relevance, removal of duplicates, and broken links enabled us to retain 45 of the initial 62 references. Next, the remaining references were scrutinized to ensure that they conformed to the goals of the research and to the nature of the study, methodology, and key questions. This approach decreased the cumulative number of references to 26. Therefore, during the third step, we utilized more specific criteria for selecting among those 26 references and came to an observation that 20 of these are the most useful ones to study further. The literature that was chosen was strictly based on this step-by-step process. This ensured that it met high criteria of quality and relevance for laying the foundation of a comprehensive study with reliability.

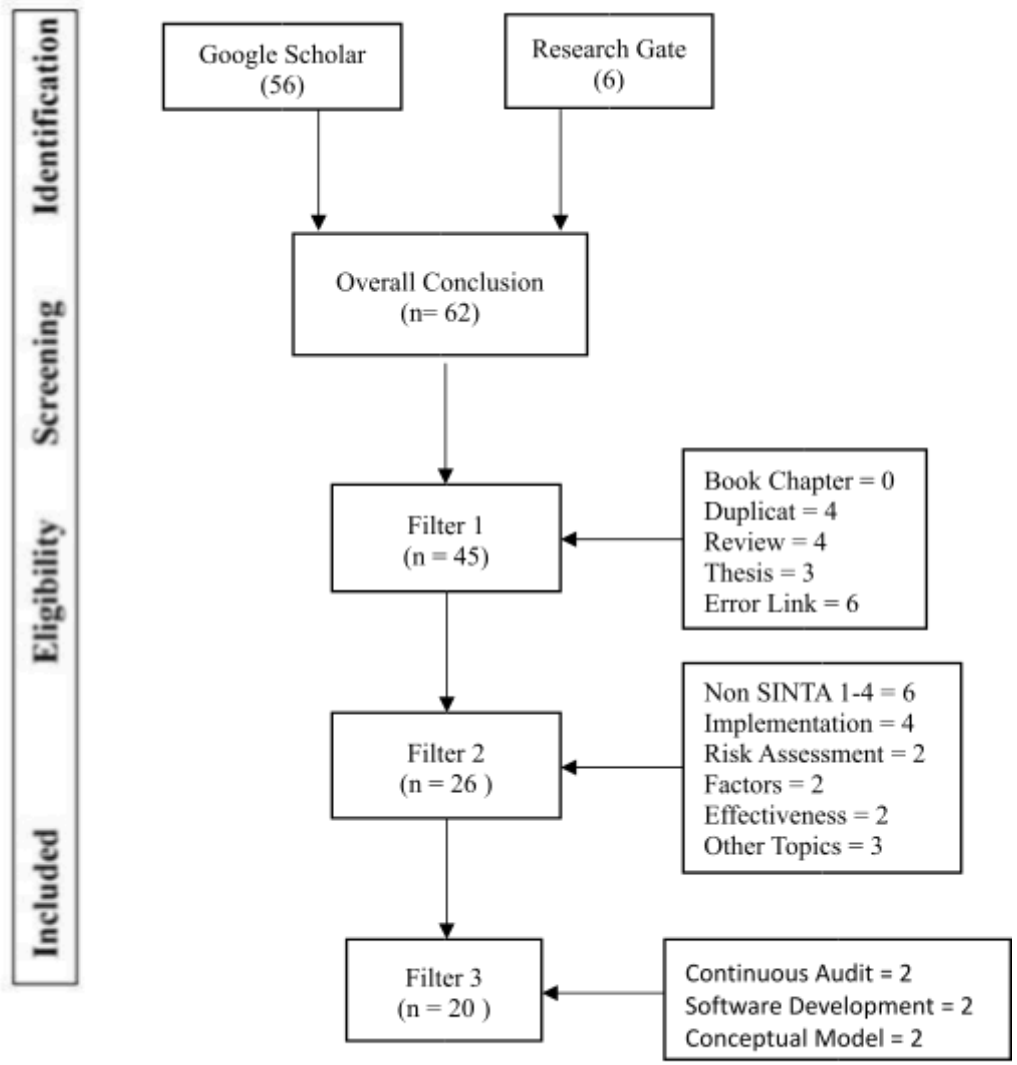

Figure 1
Literature Review Methodology

Data Mapping

VOSViewer software was used to map the data gathered from the articles. VOSViewer is a computer application developed to design, construct, and visualize bibliometric maps. The publications were then categorized into subtopics and research techniques to determine the popular fields and approaches of the study. This process helps in identifying the key issues in the research area, as well as indicating the trends and showing the relationship between different studies.

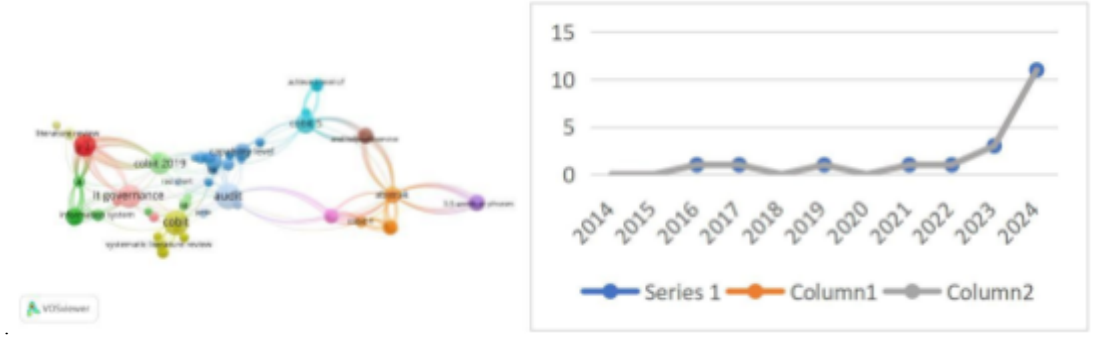

Figure 2
Data Mapping

The above diagram presents the relations among the different expressions or concepts relating to IT audit and governance. At the center is COBIT 5 with the key concepts linked: Abstract, Helpdesk Service, and Capability Level. To this are linked COBIT 2019 and the audit versions through different sets of ideas represented as linked balloons. Literature reviews and systematic literature reviews also outline linkages to other sources of information and research. The focus of the diagram on the integration of IT governance with information systems is further enforced by terms such as IT Governance and Information System, which denote its crucial role in the effective management and decision-making of IT.

Figure 2. Distribution of publications across the time: years before 2014 through 2023. Data points to a rather considerable increase in COBIT research. The rising slope of the trend testifies to the fact that COBIT has come under increasing attention from scholars and researchers over the past years. This would suggest that COBIT is still a relevant and growing subject within IT governance, and it should be further researched and analyzed given the evolution of published publications and the sample of studies analyzed.

Results and Discussion

The results and discussion present the findings and analysis of the literature review according to the predetermined study objectives, which is then followed by discussions on the subjects associated with such findings.

Table 1. Methods & Techniques for Information Security Auditing

No	Methods & Study Topics	Article
1.	COBIT Implementation for E-Government	(Dhiaaul Kusnaa Washilatul Arba'ah, 2023), (Jingga et al., 2019),
2.	Maturity Level Evaluation	(Zai et al., 2023), (Salwa Alipia Fadillah Tambunan, Putri Natasya Adelia & Anggy Permata Sari, 2024), (Ekadjaja, 2022)
3.	Gap Analysis	(Salwa Alipia Fadillah Tambunan, Putri Natasya Adelia & Anggy Permata Sari, 2024), (Surya et al., 2022), (Putri et al., 2023)
4.	Development of COBIT Evaluation System and Tools	(Chotijah, 2023), (Budiarta et al., 2016)
5.	Integration of COBIT Framework with Other Practices	(Oluwatosin Ilori et al., 2024), (Zai et al., 2023)
6.	Case Studies of COBIT Implementation in Organizations	(Astuti et al., 2017), (Suryana & Sulianta,2024), (Muhasim, 2024)

Application of COBIT for E-Government

The articles by (Dhiaaul Kusnaa Washilatul Arba'ah, 2023) and (Jingga et al., 2019) Talk about how the COBIT framework is being used to assist IT governance for e-government, with an emphasis on planning, evaluating, and improving public sector IT process skills

In the article by (Dhiaaul Kusnaa Washilatul Arba'ah, 2023), When applying e-government, the importance of IT audits is emphasized to ensure that IT processes support organizational goals. This study, using the SLR method, reached the conclusion that COBIT 2019 is superior to previous versions because of its flexibility and coverage of 40 domains. APO (Align, Plan, Organize) and DSS (Deliver, Service, Support) are two of the more frequently used domains because they directly apply to the delivery of public service and management of IT strategy. COBIT helps in assessing capability in IT processes, identifying weaknesses, and providing recommendations for improvement.

(Jingga et al., 2019) Also applied the SLR approach to examine the most adopted framework of IT governance in Indonesia, COBIT was the most applied specifically for e-government IT audit and evaluation models. It focuses on the analysis and recommendations toward a better framework of IT governance. Their approach gives an evaluation matrix that assures the successful implementation of e-government and alignment with the organization's strategic objectives. This paper addresses how

COBIT will offer a solid framework for public service delivery in the areas of continuous improvement and provides evidence-based decision-making.

Evaluation of Maturity Levels

The article by (Zai et al., 2023) This study examines how the COBIT 2019 framework is used to assess the maturity levels of IT management. The maturity levels are used to evaluate an organization's IT process development, which ranges from unfinished to ideal phases. According to the study, COBIT 2019 is a comprehensive and flexible framework since it incorporates assessments of both capability maturity levels. According to case studies, IT process maturity lies at the early or intermediate stages, and improvements are recommended to enhance the effectiveness and efficiency of IT management. Due to their importance in data governance, which facilitates IT performance, areas such as APO (Align, Plan, Organize) and APO14 (data management) are considered key focus areas. The results of the evaluation will guide data driven initiatives in improvement. It further aids in identifying gaps between the existing condition and targets. Generally, this article underlines.

The article by (Salwa Alipia Fadillah Tambunan, Putri Natasya Adelia & Anggy Permata Sari, 2024) This study applies the COBIT 5 framework for assessing the maturity level in the implementation of the Student Electronic Letter Information System at the State Islamic University of North Sumatra, with a specific focus on the DSS domain. IT operations management, service and support, security, service quality, incident management, and business continuity are among the elements considered in the analysis. According to the findings, SISELMA is at maturity level 3: Defined, where operational procedures are documented but still need to be enhanced, especially in performance analysis and data security. With suggestions to reach a higher maturity level, the study identifies the need for continuous improvement to ensure that the system is managed efficiently and offers students the maximum possible benefits.

The article by (Ekadjaja, 2022) focuses on information security and discusses how the COBIT 2019 framework is used to evaluate IT governance maturity. The study case of PT Krakatau Steel Tbk performed with a maturity level of 2.56, meaning managed, stating that even though there is management effort, it still needs more development around policies and processes. The author identifies this evaluation as part of the work to optimize IT governance; he recommends changing technology, procedures, and human resources to achieve higher maturity and reduced information security risks.

Gap Analysis

The article by (Salwa Alipia Fadillah Tambunan, Putri Natasya Adelia & Anggy Permata Sari, 2024) The result shows a gap between the expected level (4) and the current maturity level of 3.31 in the DSS domain within UINSU's management of SISELMA using the COBIT-5 framework. Other sub-domains, such as operational management (DSS01), service quality (DSS04), and business continuity (DSS06), have smaller gaps but also require development. The largest gap is in security management (DSS03), amounting to 1.02. The primary areas for improvement for achieving optimum maturity are performance analysis, process efficiency, and data security.

The article by (Surya et al., 2022) Identifies the PO-01 procedure from the COBIT framework to find weaknesses in governance of the Academic Information System (SIAK) at a polytechnic institution in Indonesia. From the results, it has appeared that, based on best practice on COBIT, the level of maturity of IT governance is at level 2, namely "Repeatable but Intuitive", which means that though procedures have been repeated, these remain dependent on people and have not been fully documented. The absence of well documented control indicators and targets, poor communication and socialization of IT governance, and the lack of integration of SIAK into the organization's strategic plans are some of the major weaknesses. Although the value of SIAK as a facilitator of academic activities is widely acknowledged, its current implementation is not yet optimized to enhance IT efficiency and sustainability at a strategic level.

Although processes have been defined at Level 3, the COBIT 5 audit of the inventory system in Toko Cielyn has identified gaps in data conflict between the system and manual records, uneven distribution of tasks, and lack of reporting and control mechanisms. This indicates a need to further improve data integration, monitoring, and continuous evaluation to ensure proper implementation according to procedure and to enhance operational effectiveness (Putri et al., 2023).

System Development and Evaluation Tools

The article by (Chotijah, 2023) IT governance in enterprises is enhanced by creating a system and assessment tools based on the COBIT framework; that is, Control Objectives for Information and Related Technologies. The author identified the value of COBIT as a comprehensive framework that would help

assess and enhance IT procedures to ensure IT and an organization's strategic objectives align. This assessment system was developed through an organized process that involved determination, analysis of procedures, and the development of instruments to measure the level of maturity of IT governance procedures. The essay also talks about implementation issues, which require active participation from stakeholders in terms of resistance to change, knowledge gaps, and resource constraints. It is expected to enhance insight into the effectiveness of IT governance, facilitate decision-making regarding IT investments, and support organizations in realizing their strategic goals.

The article by (Budiarta et al., 2016) describes the development of a system and assessment instruments based on COBIT to improve the quality of IT service management, particularly for enhancing sub-target level 4 processes. The processes that will be analyzed include: DSS01-Infrastructure Evaluation; DSS02Request/Incident Handling; DSS04- Incident Response and Business Continuity Planning; DSS03-Solution and Cost Analysis; DSS05-System Security Testing and Measurement; DSS06-Access Policies Sensitive Data Management; BAI06-Service Change Documentation. Moreover, there is a focus on comprehensive assessment through documentation and activity analysis as highlighted by MEA01. In conclusion, the discussion highlights that the application of the COBIT framework is very important for enhancing efficacy, efficiency, and goal achievement in IT service delivery.

Integration of COBIT Framework with Other Practices

The article by (Oluwatosin Ilori et al., 2024) Outlines how to increase the effectiveness, efficiency, and alignment of IT projects and programs with business objectives, using the COBIT framework in conjunction with other techniques for IT management, mainly in the financial industry. The integration of COBIT with ITIL is developed through a synergy between governance and best practices in service management, enabling the simultaneous management of risks and IT services. Organizations can better handle risks, compliance, and information security by combining COBIT with standards such as ISO 27001 and the NIST Cybersecurity Framework. This approach to integration involves process and control mappings for gap identification and the maximization of efficiency. By adopting best practices from multiple frameworks, organizations can enhance IT performance and service quality and their ability to respond to emerging challenges in the digital economy.

The research by (Zai et al., 2023) Describes how the efficacy of IT governance may be improved, especially during the process of IT strategic planning (PO-01), integrating the COBIT framework with other practices in Academic Information Systems context at the universities. Based on the findings of this study, the current maturity level of IT governance in SIAK is still at Level 2, meaning that the implementation is still ad hoc and not yet fully integrated with the best practices of COBIT. While SIAK is expected to become an effective tool, it also improves the quality of academic services. Critical elements of governance efficacy include staff competency, policy, and leadership knowledge. Improved integration requires a paradigm shift in SIAK management; the strategic and more participatory approach will allow SIAK to serve best as an enabler in.

Case Studies on COBIT Implementation in Organizations

Literature reviews of case studies about the implementation of COBIT constantly include some key discussion topics, such as the history of an organization, objectives of the implementation, procedures followed, difficulties faced, and the outcomes and advantages attained. A typical description of an organization being investigated would contain a mention of its size, the industry it belongs to, and the IT difficulties being faced before the implementation of COBIT. Traditional objectives that are pursued with this process would include increasing efficiency, controlling risks, and maintaining conformity to regulations. The steps are planning the state of the current IT infrastructure, creating a new policy, training, and mapping procedures against the COBIT framework. Almost in all cases, problems-what was encountered, like the resistance of employees or unsupportive management-are mentioned to provide additional helpful information. In general, typical results are an increased service level, reduced risks, and more transparency. Lessons learned and recommendations for further study are often provided in the literature review. (Astuti et al., 2017).

The literature review also covers the case study of COBIT implementation at SMK Media Informatika, which focuses on the administration of a fingerprint-based attendance information system to enhance IT governance. The company had to support educational objectives in addition to managing IT operations and human resources. Significant gaps were identified in such processes as DSS01 (Manage Operations) and APO07 (Manage Human Resources) due to maturity assessments of COBIT subdomains such as EDM, BAI, APO, DSS, and MEA. Recommendations included improved process controls and staff training based on the findings. Resistance to change and management involvement are the main

challenges. After deployment, the average process maturity level increased to 2.34, reflecting better operational and IT management (Muhasim, 2024).

Conclusion

A critical supportive framework for enabling information technology management in e-government comes from the literature review-the COBIT framework. Through such methods as evaluating process capabilities and risk management, enhancement to public service, the use of COBIT ensures that IT initiatives meet organizational goals. The domains of APO and DSS are very much emphasized since they help in formulating the best IT strategies and ensure that e-government services are delivered reliably and of quality. This approach helps governments to discover weaknesses in IT governance, improve data security, and ensure long-term viability of digital services.

Application and implementation of COBIT to e-government faces challenges with change resistors, resource pressures, and general lack of knowledge in various stakeholders. But with this disciplined implementation and periodic reviews, it will bring in operating efficiency, more transparency, and good accountability within government. Similarly, integration with other established principles standard requirements, like ITIL and ISO 27001 respectively, enhances the risk mitigation and information security capabilities for the e-government ecosystem. Therefore, the use of COBIT contributes significantly to the digital transformation of the public sector and improving service quality

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