

The Role of Technology in Internal Oversight of Public Administration: Improving Efficiency and Transparency

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Abstract

The development of information technology has had a significant impact in various sectors, including internal supervision of public administration. This study aims to examine the role of technology in improving the efficiency and transparency of public administration supervision. The method used in this study is Systematic Literature Review (SLR), which aims to explore various technology applications that can support internal supervision, such as cloud-based management systems, data-based audit applications, and the application of blockchain technology to maintain data integrity. The results of the study show that the application of technology can reduce the potential for abuse of power, increase accountability, and accelerate the decision-making process in the management of public administration. Technology also contributes to creating a more transparent and effective surveillance system, making it easier for the public to access information, and speeding up the identification of problems. This research makes an important contribution to the understanding of the role of technology in strengthening good public governance, with the hope of improving the quality and efficiency of public administration through the proper use of technology.

Keywords: Internal Control, Public Administration, Technology

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1. Introduction

Internal supervision in public administration is one of the fundamental elements in ensuring that government activities run with accountability, transparency, and efficiency (Zein, MHM, et al. 2023). Through an effective oversight mechanism, public officials can be held accountable for every decision and action taken, which in turn increases public trust in the government. (Mulyawan, W. 2024). Internal supervision also supports transparency by ensuring that government policies and programs are accessible and understood by the public. In addition, this supervision plays a role in maintaining the efficiency of the use of state resources, so that the existing budget and policies can be implemented optimally without waste. (Rosidah, I., et al. 2023). Not only that, internal supervision also prevents the practice of corruption, collusion, and nepotism, and ensures that the government operates in accordance with applicable laws and regulations. With internal supervision, every government policy and program can be evaluated and improved continuously, creating a more responsive and responsible government. Overall, internal oversight is key to maintaining the integrity and effectiveness of public administration. This oversight task is often assigned to certain government institutions, such as audit bodies, inspectorates, and various other oversight committees. However, with the ever-growing complexity of bureaucracy, internal oversight faces significant challenges in terms of effectiveness, cost, and speed of data processing. In response to these challenges, technology is present as a solution that offers great potential to improve the performance of internal oversight in public administration (Fasluky, A. 2021).

Amidst rapid technological advances, various information technology innovations, such as cloud-based information systems, automated audit software, and blockchain technology, offer new ways to conduct supervision. These technologies enable more efficient data



collection and analysis and support transparency in public financial management and administrative policies. Information technology can also reduce human error which is often the main cause of data inaccuracy in internal supervision (Hasanah, U., et al. 2024). Cloud-Based Information Systems enable centralized data storage and access, which facilitates real-time information collection and allows stakeholders to monitor government performance or budget use more quickly and accurately. With a cloud system, data can be accessed by various stakeholders, such as auditors, supervisory institutions, or the public, thereby increasing transparency in the management of public resources (Arie, G. 2023)

Automated Audit Software is an increasingly popular tool used to automate financial and operational audit processes in government. This software can analyze large amounts of data at a much higher speed compared to manual methods (Raharjo, B. 2022). This allows for more thorough and comprehensive monitoring of financial transactions or policy implementation without having to rely entirely on error-prone manual audits. This automation can also speed up the audit process, so that findings and recommendations for supervision can be obtained more quickly. Blockchain technology offers a solution to increase transparency and accountability in public financial management and administrative policies (Falah, AS, SE, M., et al. 2024). With its decentralized and encrypted nature, blockchain can be used to record every transaction or decision taken in the government administration process in a way that cannot be changed or manipulated once recorded. This is very useful in preventing corruption, misuse of budgets, or data falsification, because every entry made can be easily tracked and verified by all parties involved. In addition, information technology can reduce human error which is often the main cause of data inaccuracy in internal supervision. These errors can occur due to subjectivity, negligence, or limitations in human capacity to analyze large amounts of data. With the help of integrated and automated software, many errors can be minimized, and the monitoring process becomes more objective, consistent, and measurable. More accurate and valid data also allows for better decision-making in planning and implementing public policies (Hidayat, MS, et al 2023).

Overall, these information technology innovations provide a stronger foundation for internal supervision in public administration. With the right use of technology, financial management and public policy can be more efficient, transparent, and accountable, and can reduce the potential for errors or misuse that are detrimental to the state and society. However, the implementation of technology in internal supervision of public administration is not without challenges. One of the main problems is the high cost of implementation and the lack of adequate skills and human resources in the public sector to operate these sophisticated technological systems. In addition, there are concerns about the protection of personal data managed by technology-based information systems, especially in the face of the risk of hacking and data leaks that can harm the public (Wulandari, M., et al. 2024).

In the context of governance in developing countries, limited technological infrastructure is also a major obstacle. Not all government agencies have adequate access to information technology, and this creates a gap in terms of supervisory efficiency between different sectors or regions. However, with the right investment and increased human resource capacity, technology has the potential to effectively solve these problems. In developing countries, limited technological infrastructure is one of the main obstacles to the implementation of effective internal supervision (Sarjito, A. 2023). Not all government agencies, especially those in remote areas or with limited resources, have adequate access to the necessary information technology. This creates a gap in supervisory efficiency between more developed and less developed sectors or regions. Many regions have difficulty accessing hardware, software, or a stable internet network, which causes supervision to be less than optimal. In addition, the limited human resources skilled in using information technology also exacerbates this problem, as government employees often have difficulty operating existing systems. However, technology still has great potential to address these issues, especially if there is proper investment in infrastructure and human resource capacity development (Zai, LF, et al. 2023). The government can invest in improving technology infrastructure across all levels of government, including underdeveloped regions, and provide training for staff to improve their skills in operating technology. With these steps, information technology can be a

very effective tool in improving oversight, increasing transparency, and reducing human error that often occurs in data management. Over time, the use of this technology can reduce the gap in oversight between sectors and regions, and create a more efficient and accountable government. (Julianti, D. 2024).

One of the technologies that is currently increasingly being applied in internal supervision is the use of a cloud-based management system. This technology allows for more centralized data management and can be accessed from various locations in real-time. The implementation of cloud computing can reduce excessive bureaucracy and accelerate the decision-making process in administrative supervision. Another advantage is its ability to support transparent reporting that can be accessed by the public. The implementation of cloud computing can reduce excessive bureaucracy in data processing and reporting (Abdillah, LA, et al. 2020). Information Technology Applications: Concepts and Implementations. In traditional systems, data is often stored separately in various departments or units, which requires a long and multi-layered process to obtain the information needed. With a cloud-based system, data can be stored in one centralized platform that allows faster and more efficient access. This accelerates the decision-making process in administrative supervision, because the information needed can be obtained in a short time and with a higher level of accuracy (Abdillah, LA, et al. 2020).

Another advantage of cloud technology is its ability to support transparent reporting. With data stored in the cloud, all reports, documents, or audit results can be accessed by various interested parties, be it government employees, supervisory agencies, or even the general public, depending on the level of access granted. This increases transparency in the management of budgets, policies, and government activities, because the reporting process becomes more open and can be directly monitored by relevant parties. In addition, cloud computing also offers better data security with automatic encryption and backup systems, which reduce the risk of losing important data or data manipulation. This is very important in the context of internal supervision that requires high data accuracy and integrity. (Elvianti, D., et al 2024).

Overall, the use of cloud-based management systems in internal supervision provides significant benefits in terms of efficiency, transparency, and data security. This technology allows governments and supervisory institutions to work faster, more openly, and more effectively in managing and supervising administrative activities and the management of public resources. In addition, blockchain technology has also begun to be applied in several public administration supervision projects. This technology is known for its ability to maintain data integrity and transparency through a decentralized system. In the context of public supervision, blockchain can be used to ensure that recorded transactions and administrative data cannot be changed or manipulated, thereby increasing public trust in the government. With these potentials, further research is needed to explore how technology can be applied more optimally in internal public administration supervision. This study aims to provide a clearer picture of the role of technology in increasing the efficiency and transparency of public administration supervision through a systematic analysis of various existing literature.

2. Method

This study uses the Systematic Literature Review (SLR) method to review and analyze various relevant literature sources regarding the application of technology in internal supervision of public administration. The SLR approach was chosen because of its ability to comprehensively summarize previous research in a particular field, identify existing research trends, and find knowledge gaps that need further research (Azizah, N., et al. 2021).

The SLR process begins with the selection of literature sources that include journal articles, conferences, research reports, and books that are relevant to the research topic. The search was conducted through several leading academic databases such as Google Scholar, Scopus, and IEEE Xplore. Each selected literature was then assessed for quality using strict inclusion and exclusion criteria to ensure that only relevant and high-quality studies were included in the analysis. Next, the researchers grouped the findings based on the type of technology applied in internal supervision of public administration, for example cloud

computing technology, data-based audit systems, and blockchain. Each technology was analyzed to determine its advantages and disadvantages in increasing efficiency and transparency in the context of public administration. To that end, the data obtained was analyzed qualitatively using thematic synthesis techniques to identify key patterns that emerged from various relevant studies. The results of this SLR are expected to provide clearer insights into how technology plays a role in optimizing internal supervision of public administration and what challenges must be faced in its application in the real world.

4. Results and Discussion

Based on the results of the SLR analysis, it was found that information technology, especially those focused on cloud-based and blockchain systems, has a significant impact on increasing efficiency and transparency in internal supervision of public administration. Cloud computing technology enables more efficient and centralized data management. This system allows supervisors to access data in real time and create more transparent reports. This has an impact on reducing operational costs and speeding up the audit process. Cloud-based management systems also allow government agencies to more easily share information with the public, which in turn increases transparency. The public can access financial reports, policies, and audit results conducted by the government through online platforms. This more open supervision has the potential to increase government accountability, reduce opportunities for corruption, and increase public trust in government performance.

The use of blockchain technology in public administration has also shown encouraging results in terms of data integrity. Blockchain provides a highly secure and decentralized mechanism for storing and verifying data. In the context of public administration, blockchain can be used to record financial transactions, policy decisions, and audit reports, making the data unmanipulated once recorded. This technology is very useful for ensuring that public fund management is carried out with high transparency and without interference from unauthorized parties. In addition, blockchain also speeds up the administrative process by eliminating the need for intermediaries in data verification, leading to higher efficiency in the management of public resources. Thus, this technology not only supports transparency but also increases public trust in the management of government funds and policies (Parung, J., et al. 2021).

However, the implementation of this technology is not without obstacles. Many governments in developing countries face the problem of inadequate infrastructure to support advanced technologies such as cloud computing and blockchain. In addition, there are major challenges in terms of adequate training of human resources to operate this technology. Without adequate training and understanding, the technology implemented may not be used optimally and instead risks increasing the burden of bureaucracy (Samaratunga & Ndubisi, 2022).

Another challenge faced is the issue of data protection and privacy. The use of cloud-based and blockchain technologies involves the collection and storage of large amounts of data, which opens up the potential risk of personal data leakage. Therefore, it is important for the government to ensure that there are strong regulations regarding data protection and privacy to maintain public trust in the existing system. Transparent supervision is important, but there must still be attention to individual rights in the use of this technology (Suryawijaya, TWE 2023).

Overall, despite the challenges, the use of technology in internal supervision of public administration offers great potential to improve efficiency, transparency, and accountability. The application of appropriate technology can help reduce reliance on manual systems that are prone to error and corruption. Although there are challenges in its implementation, such as the need for adequate infrastructure, human resource training, and readiness of the legal system, the benefits that can be obtained are very significant (Nur, MJ, et al. 2024). Technology, such as management information systems, big data, and blockchain, can speed up and simplify the process of monitoring and analyzing data, which previously required a lot of manpower and time if done manually. One of the main advantages of using technology is its ability to reduce reliance on manual systems that are often prone to human error and potential misuse. Manual systems that rely on manual recording or verification often carry the

risk of errors in data input, inaccuracy in budget calculations, and difficulties in monitoring and auditing transactions in real time. Technology allows these processes to be carried out automatically and more accurately, thereby improving the quality of supervision and minimizing opportunities for data manipulation or deviation (Hasanah, U., et al. 2024).

In addition, technology can also support higher transparency by providing easier and faster access for the public or related parties to monitor policies or management of public funds. For example, the use of digital platforms to report budget expenditures or to publish audit results can provide a clearer picture of how state resources are managed. This strengthens government accountability and increases public trust (Shobri, M. 2024). Technology plays a very important role in supporting transparency in public administration by enabling easier and faster access for the public or related parties to monitor policies and management of public funds. One of the main ways technology supports transparency is through the use of digital platforms that can accommodate real-time data reporting and monitoring. With this digital system, information related to budget expenditures, fund allocations, and audit results can be accessed directly by the public and interested parties (Maritza, DF, et al. 2024).

For example, with the e-budgeting system or technology-based budget reporting application, the government can publish details of the approved budget and the implementation of fund use openly. The public can see how public funds are used, whether according to plan or if there are deviations. This provides a clear picture of how state resources are allocated and used, which was previously difficult to access transparently. This platform also allows for more active monitoring, where the public can directly provide input or report suspected deviations. In addition, technology also supports the publication of audit results openly. Audit reports produced by supervisory institutions or independent bodies can be published on the government's official website or through certain applications, allowing external parties—such as non-governmental organizations, the media, or citizens—to verify and evaluate state financial management. This process not only accelerates the distribution of information but also allows for more in-depth examination by interested parties, increasing accountability and oversight of budget policies and use (Pratama, BAF 2023).

With greater transparency through the application of technology, the government can strengthen its accountability because the public has the opportunity to monitor and supervise every step taken. This in turn can increase public trust, because the public feels more involved in the government process and knows that policies and management of public funds are carried out honestly and in accordance with the rules. Conversely, a lack of transparency in budget and policy management can reduce public trust and create doubts about the integrity of the government. Overall, technology not only makes it easier to access information, but also creates a more open and participatory environment in the management of public administration. By utilizing technology to increase transparency, the government can increase accountability, prevent abuse of authority, and strengthen public trust in the public policies taken (Marwanto, IIGGH, & Nonni Yap, SM 2024).

However, the challenges faced in implementing this technology, such as the need for clear regulations regarding privacy and data security, as well as the readiness of digital infrastructure, must be overcome so that this great potential can be optimally realized. With the application of the right technology, internal supervision of public administration can run more effectively, efficiently, and free from corrupt practices or abuse of authority. Therefore, investment in technology and increasing the capacity of human resources capable of managing these systems is very important. Several studies have shown that in some cases, the application of technology has succeeded in reducing the time and costs required to conduct audits and policy evaluations, as well as increasing the accuracy and precision of public administration reports. However, although technology offers great potential, the challenges in its implementation cannot be ignored. Infrastructure limitations in many regions and government sectors are often the main obstacles. Therefore, to ensure that technology can be applied evenly and effectively, careful planning is needed, including policies that support infrastructure strengthening, human resource training, and strict supervision of the application

of this technology. In this case, collaboration between the public and private sectors can be the key to creating more inclusive and sustainable technology solutions.

Finally, although technology can bring significant changes in the public administration oversight system, the role of humans in this oversight process remains irreplaceable. Technology, although efficient, still requires human oversight and management to ensure that the data and information produced are actually used in a way that supports the goals of government transparency and accountability. Technology and humans must work together to create a better and more effective oversight system.

4. Conclusions

This study shows that technology plays a very important role in increasing efficiency and transparency in internal supervision of public administration. The use of technologies such as cloud computing and blockchain can help reduce costs, speed up processes, and improve the accuracy of data used in supervision. The main advantage of technology lies in its ability to digitize processes that were previously carried out manually, thereby accelerating decision-making and increasing public accountability. However, despite the enormous potential of technology, challenges such as limited infrastructure, data privacy issues, and lack of skills among government employees are major obstacles to its implementation. Therefore, to maximize the benefits of technology in public administration supervision, the government needs to invest in infrastructure, training, and stricter regulations regarding data protection. Finally, although technology can speed up and simplify the supervision process, human supervision remains an irreplaceable element. Technology should be seen as a tool that supports human efforts in creating more effective and efficient internal supervision of public administration, with the main goal of strengthening transparency and accountability in the public sector.

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