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Implementation of Fiscal Decentralization in the Digital Era: Effectiveness and Challenges in Indonesia

I Made Arie Widyasthana Wartana Putra[1*], Dwi Suharnoko[2], Faradian Salsabila[3], Dina Dwi Utami Putri[4]

[1,2,3,4]Department Public Administration, University of Merdeka Malang, Indonesia

Abstract

Fiscal decentralization in the digital era brings new opportunities and challenges for its effectiveness in Indonesia. This article aims to analyze the implementation of fiscal decentralization in the digital context, evaluate its effectiveness, and identify the challenges faced. The methodology used includes a literature review and secondary data analysis. The research findings indicate that implementing fiscal decentralization in the digital era can enhance effectiveness in several aspects, such as financial transparency and accountability, efficiency in regional financial management, and increased public participation. However, this implementation also faces several challenges, including disparities in digital infrastructure between regions, limited human resource capacity in the areas, and insufficient regulations supporting the implementation of fiscal decentralization in the digital era. Therefore, although budgetary decentralization in the digital era holds significant potential to improve the effectiveness of regional financial management, serious efforts are needed to address these challenges. This includes investment in digital infrastructure, enhancement of human resource capacity, and the development of regulations that support the practical and safe application of technology.

Keywords: *digital infrastructure, fiscal decentralization, financial management efficiency, financial transparency*

Abstrak

Desentralisasi fiskal di era digital membawa peluang dan tantangan baru bagi efektivitasnya di Indonesia. Artikel ini bertujuan untuk menganalisis implementasi desentralisasi fiskal dalam konteks digital, mengevaluasi efektivitasnya, dan mengidentifikasi tantangan yang dihadapi. Metodologi yang digunakan meliputi kajian pustaka dan analisis data sekunder. Temuan penelitian menunjukkan bahwa implementasi desentralisasi fiskal di era digital dapat meningkatkan efektivitas dalam beberapa aspek, seperti transparansi dan akuntabilitas keuangan, efisiensi pengelolaan keuangan daerah, dan peningkatan partisipasi publik. Namun, implementasi ini juga menghadapi beberapa tantangan, termasuk disparitas infrastruktur digital antardaerah, keterbatasan kapasitas sumber daya manusia di daerah, dan kurangnya regulasi yang mendukung implementasi desentralisasi fiskal di era digital. Oleh karena itu, meskipun desentralisasi anggaran di era digital memiliki potensi yang signifikan untuk meningkatkan efektivitas pengelolaan keuangan daerah, upaya serius diperlukan untuk mengatasi tantangan ini. Ini termasuk investasi dalam infrastruktur digital, peningkatan kapasitas sumber daya manusia, dan pengembangan regulasi yang mendukung penerapan teknologi secara praktis dan aman.

Kata kunci: desentralisasi fiskal, efisiensi pengelolaan keuangan, infrastruktur digital, transparansi keuangan

http://journal.unismuh.ac.id/index.php/kolaborasi

[*] made.putra@unmer.ac.id

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INTRODUCTION

The principle of decentralization in Indonesia is a policy implemented by the government since the enactment of Law No. 22/1999 concerning the Regional Government and revised by Law No. 32 of 2004 and Law No. 23 of 2014 (Maria et al., 2019). This principle is believed to be a strategy for managing the country by implementing the concept of division and delegation of power from the central government to regional governments, which manage their regions based on regional autonomy.

In its implementation, the principle of decentralization is intended to reduce the burden of tasks and responsibilities of the central government and increase the number and quality of public services to achieve a prosperous society (Nuradhawati, 2019; Pramusinto et al., 2011; Talitha et al., 2020; Tauda, 2018). It is hoped that in its implementation, decentralization will also improve the quality of regional heads' performance in providing public services and creating closer relations between the government and its people.

Several countries around the world, including Indonesia, have implemented public service bureaucratic reforms (Subekti & Pribadi, 2022). The implementation of autonomous government is expected to increase the efficiency, effectiveness, and accountability of the public sector in Indonesia.

Regional autonomy requires local governments to provide alternatives as sources of development financing without reducing the hope of continued assistance and part of the central government by using public funds by the priorities and aspirations of the community (I. M. A. Wi. W. Putra et al., 2024). The consequence is that with the implementation of regional autonomy, the division of power and authority between the central government and regional governments must be within the scope of the national monetary and fiscal fields, which are decentralized to the regions (Ekawati, 2017).

The decentralization policy in Indonesia will make regions more responsive and flexible in providing public services (Handayani et al., 2020). Still, on the other hand, the implementation of the decentralization policy also does corrupt practices that occur not only centered in the national government but also spread to local governments and even to village administrative areas (Darmayasa, 2017; Shara Ningsih et al., 2023; Zulkenedi et al., 2023). Based on a report from the Indonesia Corruption Watch (ICW),

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throughout 2023, there were 791 corruption cases recorded in Indonesia, with the number of suspects reaching 1,695 people and dominated by cases from regional governments (Anandya & Ramadhana, 2024). The total state loss due to corruption cases in 2023 reached IDR 28.4 trillion (ICW, 2024). The large number of corruption cases at the regional level helps regional heads to harm the meaning of implementing decentralization and causes state losses.

Fiscal decentralization is a crucial component of the governance system that aims to give local governments greater authority in managing their financial resources (Rosyida & Sasaoka, 2018; Winengan, 2020). Decentralization is a process in which government authority and responsibility are transferred from the central government to local governments so that regions have greater autonomy in managing their finances and resources (Hastuti, 2018).

In Indonesia, fiscal decentralization began to be implemented significantly since the 1998 reforms to increase the efficiency and effectiveness of public services, as well as strengthen community participation in the regional development process (Saragih, 2003). In this context, fiscal decentralization involves transferring authority and responsibility from the central government to local governments in managing local revenues and expenditures. Fiscal decentralization refers to transferring government authority and accountability from the center to the regions, giving regions greater autonomy in managing their finances and resources (K. A. Simanjuntak, 2015).

This fiscal decentralization policy transfers government authority and responsibility from the center to the regions, giving regions more freedom to manage their finances and resources. Fiscal decentralization is expected to increase the ability of areas to manage finances independently and reduce dependence on assistance from the central government (Savaşkan, 2021). In addition, fiscal decentralization aims to reduce vertical fiscal inequality between the central government and regional governments and reduce the horizontal fiscal capacity gap between regions (Graff et al., 2018; Mogende & Kolawole, 2016).

In its implementation, fiscal decentralization in Indonesia is characterized by transferring significant financial resources from the central government to regional governments. This is realized through transferring funds to the regions and increasing Regional Original Income (PAD). This fiscal decentralization is expected to improve the quality of public services, strengthen the ability of areas to manage their finances and improve public welfare. Fiscal decentralization in Indonesia is characterized by transferring significant financial resources from the central government to regional governments through the transfer of funds and the increase in Regional Original Income (Ginting et al., 2019).

This policy aims to improve the quality of public services, strengthen the ability of regions to manage their finances and improve public welfare. (Papadopoulou & Yirci, 2013) Fiscal decentralization can increase the Human Development Index (HDI) by providing more funds for public spending in the education and health sectors. Fiscal decentralization aims to improve the efficiency and effectiveness of regional financial management and strengthen community participation in decision-making.

Research on acts of corruption in Indonesia has been studied by (Arifin & Irsan, 2019; Fatkhuri, 2019; Guntara, 2020; Maria et al., 2019) the majority of this research discusses the analysis of Cressey's (1953) fraud triangle theory, which is used to identify factors that encourage fraud or corruption in regional governments in Indonesia. From the analysis of this theory, corruption fraud occurs around regional governments if there is pressure, opportunity, and rationalization.

The pressure to commit corruption is stated and found by measuring the performance ratio of the budget (Maria et al., 2019), from local revenue and accountability of regional financial performance. This results in an excellent opportunity for regional officials to carry out complex acts of corruption (Fatkhuri, 2019; Guntara, 2020). The above research has not analyzed and mapped the relationship between fiscal decentralization and corruption. This makes research that examines the relationship between fiscal decentralization and corruption in local governments attractive. Therefore, this research was conducted to obtain empirical evidence of the relationship between fiscal decentralization and local governments' corruption by utilizing digital technology's development in regional financial accountability.

The development of digital technology has brought significant changes in various aspects of life, including in the implementation of fiscal decentralization in Indonesia. Digital technology increases transparency and accountability in regional financial management through more sophisticated and easily accessible information systems. In addition, digital technology can also support efficiency in managing financial resources, such as through e-budgeting and e-audit applications that simplify the process of financial planning, supervision, and reporting. However, the development of this technology also presents challenges, such as the need for adequate technological infrastructure and increasing human resources capacity in local governments to utilize this technology optimally. In this article, we will discuss further the definition and explanation of fiscal decentralization, the expected goals, and the implications of the development of digital technology on fiscal decentralization.

METHOD

The research approach used in this article is a literature study with a qualitative research type. Literature study is a method that relies on the collection and analysis of data from various relevant literature, such as books, scientific journals, research reports, and other documents (Sajida & Kusumasari, 2023; Sugiharti et al., 2021). The unit of analysis in this study is the policy and implementation of fiscal decentralization in Indonesia, especially in the context of the digital era. The analysis focuses on the effectiveness and challenges faced in implementing fiscal decentralization by considering the development of digital technology. This literature study collected data from various secondary sources previously published. The data analysis process involves the interpretation and synthesis of information from various literature to gain a deep understanding of the topic discussed (I. M. A. W. W. Putra & Sajida, 2023). With this approach, the article aims to provide a comprehensive overview of the implementation of fiscal decentralization in the digital era in Indonesia, evaluate its effectiveness, and identify the challenges faced. In the context of the selected unit of analysis, fiscal decentralization policy and implementation, the literature study provides a strong foundation for understanding the dynamics in the field.

This way, the article relies on new findings and extends previous discussions and theories on how digital technologies can optimize fiscal decentralization (Bur & Hajri, 2018; Guntara, 2020). Secondary data collected from various sources can include case studies from different regions in Indonesia, providing diverse perspectives that support the generalization of research results. Through careful interpretation and synthesis of information, the article's author can describe the prospects and challenges local governments face in implementing this initiative effectively. In addition, this desk study approach allows researchers to compare best practices implemented in various countries or other similar contexts. Thus, this study is relevant to public policy in Indonesia and can significantly contribute to the global literature on public administration and fiscal decentralization. An in-depth understanding of critical issues such as data security, supportive regulations, and community participation can provide valuable input for future policy formulation, especially in utilizing the potential of digital technology to improve local financial governance holistically.

RESULTS AND DISCUSSION

Decentralization Fiscal

This study analyses the potential and challenges of implementing fiscal decentralization in the digital era, focusing on its effectiveness in Indonesia. The study collected data from relevant literature, including books, scientific journals, research reports, and other documents.

In reality, the implementation of decentralization policies on access to public services in the regions has continued to expand since Indonesia adopted the era of fiscal decentralization, especially in education, health, and infrastructure (Smith & Sya'diyah, 2023). Data shows that school participation rates across primary and secondary education, the proportion of births assisted by health workers, and household access to water and sanitation facilities have all increased over the past two decades (Nurfauziya et al., 2018).

However, progress in improving the quality of public services in the regions has been less favorable. In education, between 2006 and 2022, Indonesia's performance in the OECD's Program for Student Assessment (PISA) declined by 19 and 12 points in reading and mathematics, respectively, and increased by only 3 points in science. Until 2022, Indonesia's average PISA score (382 points) was lagging behind the OECD average (488) by a significant margin. Indonesia was ranked 71st out of 77 participating countries in PISA 2022 (Pramesti et al., 2024). Basic health facilities such as Puskesmas in Indonesia at the district level provide low-quality services. They fail to secure critical

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supplies of medicines and lack basic diagnostic and treatment capabilities. A survey showed that 96% of community health centers in Indonesia claim to provide services for diagnosing and treating diabetes, for example. Still, only 34% of medical staff at these centers can diagnose the disease accurately, and only 35% of diabetes patients are under control (Ernita, 2024). The clean water supply accessed through the state-owned water company is still far from what is needed.

The distribution of regional income, spending and access to services is uneven across regions. Per capita, local revenue is quite similar across regions. Still, transfers and per capita spending are highly biased towards certain regions, such as districts in Kalimantan and Papua in particular and towards districts in Java/Bali. Per capita fiscal resources for districts in Sumatra, Sulawesi and Eastern Indonesia are in the middle range.

Implementing in the Digital Era

Over the past three decades, governments worldwide have undertaken reforms to decentralize. These reforms are based on the belief that more democratic participation in local governance will yield better outcomes for rural development, public service delivery, and environmental management.

However, the impact of these efforts has varied widely in practice. In India, for example, the decentralization design of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), the most significant downward resource transfer to elected local governments to date, has interacted with local histories of social and institutional change, leading to different trajectories of political transformation. While the devolution of resources under MGNREGA has increased access to state resources and increased participation in overall development planning, the intensity, equity, and degree of influence have varied according to the nature of local political relations. By offering a relational and processual understanding of how local governance has evolved, the public domain provides new insights into how decentralization is redefining citizenship through new articulations of the public in local democracy (Fischer & Ali, 2019).

Meanwhile, in Indonesia, the focus is on the Regional Government Information System (SIPD), which is one form of innovation formulated by the Central Government to assist the regional government in regional financial management, especially at the regional budget planning stage. The scope of SIPD includes regional development information systems, regional financial information systems and other government systems. The Central Government hopes that this system will create good governance.

In the digital era, fiscal decentralization offers excellent potential to improve the efficiency and effectiveness of financial management at the regional level. Fiscal decentralization transfers part of the authority to manage finances from the central government to regional governments (Muñoz, 2018), this step aims to increase efficiency and effectiveness in using public resources and strengthen local government's accountability to local communities.

The potential for implementing fiscal decentralization in the digital era refers to the opportunities and benefits of applying digital technology to support fiscal decentralization. Fiscal decentralization transfers part of the financial management authority from the central government to local governments. Information and communication technology can increase transparency, efficiency, and public participation in regional financial management in the digital era.

Digital technology in regional financial administration can accelerate the recording and reporting process, reduce manual errors, and enable more transparent monitoring. This makes it easier to manage the budget and ensures that public funds are used optimally and on target.

The potential for implementing fiscal decentralization in the digital era is vast, especially in increasing transparency, efficiency, and public participation in regional financial management. Digital technology can open access to information more widely and in real time so that the public can monitor regional budgets more effectively (Saputra & Setiawan, 2021). In addition, automated and integrated administrative processes through digital systems can reduce operational costs and speed up public services.

This potential includes increasing access and distribution of information in real-time, reducing administrative costs through process automation, and improving local government accountability through better reporting systems and more effective community oversight. Implementing digital systems such as e-tax and e-government also allows for innovation in public services and optimization of local revenue management.

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To realize this potential fully, firm commitment and cooperation are needed from all parties involved, including the central government, local governments, the private sector, and the community. The development of adequate digital infrastructure is also a key factor. This includes increasing internet access throughout the region, developing a reliable financial management information system, and training and increasing the capacity of human resources at the regional level to operate this new technology effectively. With the synergy between shared commitment and adequate infrastructure support, digital-based fiscal decentralization can be essential in realizing better governance responsive to community needs.

Research conducted by Sayekti & Putarta (2016) related to the application of the Technology Acceptance Model (TAM) in testing the acceptance of the Regional Financial Information System (SIPKD) in the Special Region of Yogyakarta Province. This study emphasizes two main aspects: perceived usefulness and ease of use. The study results indicate that perceived benefits significantly affect the acceptance of SIPKD, while ease of use does not. This is also reinforced by the discussion by Dewi Mimba (2014), which indicates that users of the Regional Financial Information System (SIPKD) prioritize the benefits of using the system over its convenience. The implications of this study highlight the importance of increasing the perceived benefits of SIPKD to encourage user acceptance.

In the context of fiscal decentralization in the digital era, these results indicate that the success of implementing financial technology in local governments depends on the perception of straightforward and significant benefits for users, so strategies to increase the use of technology must focus on improving the efficiency and effectiveness of the system in supporting regional financial tasks.

An example of the Regional Financial Information System (SIPKD) application is a system implemented in local governments to improve efficiency, transparency, and accountability in regional financial management. SIPKD allows financial managers in each Regional Work Unit (SKPD) to record and report finances digitally. This implementation aims to accelerate the financial administration process and ensure that economic data can be accessed quickly and in real-time. Yogyakarta has implemented this system in its regional financial management (Rosita & Rosalina, 2023).

Transparency and Accountability of Regional Finances

Transparency and accountability in regional financial management are two main pillars in achieving optimal governance. These two aspects ensure that public funds are managed effectively and efficiently according to the community's needs and interests. Regional financial transparency refers to the openness of regional governments in conveying information related to financial management to the public. This includes information on budget planning, implementation, and reporting on the use of funds (Jubaedah, 2021).

Fiscal decentralization in the digital era has excellent potential to increase transparency and accountability of regional finances. Regional financial accountability is the responsibility of the regional government to report, explain, and be accountable for every use of public funds to the community and related parties (Ludani et al., 2015). By using digital technology, such as web-based financial information systems, local governments can provide easier access for the public to monitor budgets and expenditures. This increases public trust in local government and encourages better financial management practices.

Digital technology, such as the Regional Financial Information System (SIFD) and the Regional Financial Management System (SPKD), can increase transparency and accountability in regional financial management. This system allows for using more accurate and faster data in financial management and strengthens regions' ability to manage finances independently. (Patrisia et al., 2021). Local governments that adopt digital technology can utilize various tools to publish detailed and real-time financial information. For example, a publicly accessible financial dashboard lets citizens view budget details, expenditures, and regional revenue sources.

This transparent information not only facilitates public oversight but also encourages active participation from citizens in the decision-making process. When the public can see how public funds are managed, they trust and support government policies. In addition, digital technology also allows for more efficient and accurate auditing and reporting. This system can track every transaction automatically and provide financial reports that are easily accessible to auditors and supervisors.

There are several steps that local governments can take to implement transparency. First, budget publication must be carried out correctly. Local governments must publish budget plans and financial reports through media that are easily accessible to the public, such as official websites. Second, public participation needs to be encouraged.

The government can involve the public in budget planning and monitoring through discussion forums, public consultations, and development planning meetings (Musrenbang). Third, the use of open information systems is crucial. Information technology can be used to provide open access to regional financial data and information so that the public can easily access and understand the information. Implementing these steps will help realize adequate transparency in regional financial management. Meanwhile, accountability ensures that local governments are responsible for every use of public funds, encourages more careful financial management, and prevents corruption and misuse of funds.

To realize optimal transparency and accountability, commitment and cooperation are needed from various parties, including the central government, local governments, the private sector, and the community. The development of information technology infrastructure, increasing human resource capacity, and bureaucratic reform supporting openness and responsibility are essential steps to be taken.

Thus, transparency and accountability are tools to monitor public funds' use and become the foundation for sustainable development and government responsiveness to the community's needs. With a clear digital footprint, cases of misuse of funds can be identified and handled more quickly. Implementing technologies such as blockchain in regional financial systems can also strengthen the security and integrity of economic data, ensuring that all transactions are recorded transparently and cannot be changed.

Efficiency of Regional Financial Management Using Data Analysis

Implementing digital technology allows various financial administration processes to automate, thereby reducing workload and increasing efficiency. Financial applications and computer-based management systems can speed up the process of recording and reporting finances and minimize human error. This contributes to more effective budget management that is responsive to local needs. Data analysis can help regions manage finances more effectively (R. Simanjuntak, 2003). Data analysis can be used to study regional financial trends, identify revenue potential, and optimize the use of economic resources.

Using analytical data in the efficiency of regional financial management is a critical step in improving the often complex and time-consuming financial administration process. In this context, digital technologies such as financial applications and computer-based management systems are crucial in automating financial recording, reporting, and analysis. With an integrated and data-based system, local governments can reduce the workload of employees and increase the accuracy and speed of producing financial reports (Putri & Aswar, 2022). Data analysis can monitor income and expense trends, identifying patterns that might lead to savings or more efficient resource use.

In addition, using technologies such as machine learning can help predict budget fluctuations, allowing local governments to take preventive measures more timely. In this way, regions can make more informed decisions in managing their finances. Data analysis technology also enables local governments to adopt a more proactive approach to financial management. For example, with machine learning algorithms and data-based predictions, the government can anticipate fluctuations in income or expenditure and prepare appropriate mitigation measures.

This helps maintain regional financial stability and ensures public services run without interruption. Thus, integrating data analysis in regional financial management improves efficiency and effectiveness and supports the sustainability of better regional development.

A hybrid analysis model that integrates fiscal decentralization, technology adoption, and local political dynamics requires an interdisciplinary approach that includes elements of economics, technology, and political science. The general structure of such an analysis model is as follows.

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Table 1.
Multi-Dimensional Approach

Multi-Dimensional Approach	Economics of Fiscal Decentralization: Analyzing how the distribution of fiscal authority between central and local governments affects resource allocation, efficiency of public spending, and quality of services.
	Digital Technologies: Evaluating the impact of technologies, such as e-governance, big data, and blockchain, on transparency, accountability, and increased efficiency of fiscal management.
	Local Political Dynamics: Understanding the influence of local political actors, patterns of relations between the center and regions, and how political legitimacy influences the implementation of fiscal policy.

Through the multidimensional model approach explained in Table 1 in the implementation of fiscal decentralization, several vital variables are needed to ensure the approach's success. For example, in fiscal decentralization, several variables are needed, such as the ratio of central to regional fund transfers, the proportion of PAD to APBD, and fiscal policies related to subsidies or assistance. Furthermore, a regional digitalization index (for example, the level of e-budgeting use) is needed and supported by adequate technological infrastructure. Finally, the relationship between actors and local elites in decision-making, especially in building harmonization in regional institutions, can increase local political competition.

With this approach, the hybrid analysis model can provide comprehensive insights into the interactions between fiscal decentralization, technology, and local political dynamics and their implications for public governance.

Increasing Community Participation

The digital era opens up great opportunities for increasing public participation in the fiscal decision-making process at the regional level. Digital platforms such as government portals, mobile applications, and social media make it easier for citizens to provide input, ask questions, and monitor the use of public funds. More active participation from the community increases transparency and accountability and encourages policies that are more targeted and in line with local needs. More active public participation can also be measured by increased citizens' involvement in budget monitoring activities. Programs such as the development planning meeting (Musrenbang), which can now be accessed online, allow more citizens to participate without being physically present (Salsabela & Darmawan, 2024).

This increased participation is beneficial in terms of transparency and enriches the decision-making process with diverse perspectives that may have previously been unheard of. As a result, the resulting policies become more inclusive and relevant to local conditions. Local governments must ensure that these digital initiatives are accompanied by efforts to improve the community's digital literacy. Training and workshops are essential to educate citizens on using these digital platforms.

Only then can technology truly empower communities and ensure that all levels of society can actively participate in managing local finances. This will create a positive cycle where increased community participation drives increased transparency, accountability, and effectiveness of local finance management.

Digital Infrastructure Gap Between Regions

Implementing digital decentralization in the digital era faces several strategic issues requiring comprehensive handling. Some of these challenges are listed below. The first challenge in implementing fiscal decentralization in the digital era is the digital infrastructure gap between regions (Lestari, 2023). Uneven digital infrastructure can be a severe barrier to harnessing technology's potential to improve local financial management's efficiency. Some regions may still face limited internet access, slow connection speeds, or a lack of adequate digital communications infrastructure. For example, rural or remote areas often have more limited technology access than more developed urban areas.

This gap can affect the ability of local governments to adopt digital-based financial management applications and systems effectively. Financial recording, reporting, and analysis processes can be hampered or suboptimal without adequate access to technology. To overcome these challenges, significant investment is needed in developing digital infrastructure across the region, including remote areas.

The central government and local governments need to work with the private sector and financial institutions to expand the reach of digital infrastructure, such as providing stable and cheap internet networks and technology education for local communities. In addition, initiatives to

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increase digital inclusiveness and digital literacy in disadvantaged areas are also significant. Training in the use of information and communication technology (ICT) can help improve the skills of communities and local governments in managing finances effectively by utilizing advances in digital technology. Thus, the gap in digital infrastructure between regions can be gradually overcome so that all local governments can access and use the full potential of fiscal decentralization in the digital era.

Limited Human Resource Capacity in The Region

The limited capacity of human resources in the regions, especially related to technological competence, is a severe challenge in implementing fiscal decentralization in the digital era. An article compiled by Sihombing et al. (2024) Highlighted that many local government employees still do not have adequate skills in utilizing digital technology for financial management. This situation slows down the adoption of the regional financial information system (SIFD) or regional financial management system (SPKD), reducing efficiency and effectiveness in economic administration.

Without adequate technological capabilities, local governments may have difficulty tracking budgets, managing payments, and reporting finances in a timely and accurate manner. Efforts to overcome these limitations require investment in training and capacity building. Regular training programs must be held to improve employees' digital literacy and technical skills.

In addition, given the sensitivity of financial data managed by local governments, training should also include aspects of information security and data protection. Collaboration with technology education and training institutions at the regional level can be an effective solution to providing relevant and up-to-date curricula for local government employees. Thus, employees can be equipped with the knowledge and skills to manage and optimize existing financial information systems.

Local governments also need to ensure that training programs focus not only on the use of specific applications and software but also on a deeper understanding of the implementation of technology in the context of public financial management. These steps must be sustainable and integrated into the region's strategic plan for human resource development. By having skilled and trained human resources, local governments can reduce the gap in competency in financial management and build a strong foundation for digital transformation in public administration.

This will increase financial transparency and accountability and support the efficient use of public budgets, which is the primary responsibility of local governments. Overall, increasing the capacity of human resources to adopt digital technology is critical to maximizing the potential of fiscal decentralization in the digital era. By proactively facing this challenge through appropriate and sustainable training programs, local governments can ensure that digital technology is a tool and a catalyst for the progress of inclusive and sustainable public administration for local communities.

Lack of Regulations

One of the main challenges in implementing fiscal decentralization in the digital era is the lack of regulations governing the use of technology in regional financial management. Inadequate regulations can hinder the implementation of a regional financial information system (SIFD) or a regional financial management system (SPKD) based on digital technology effectively (Simanjuntak et al., 2023).

Unclear and unstructured policies can create legal uncertainty, reduce public trust, and slow down the adoption of technology by local governments. Comprehensive regulations are becoming increasingly important as digital transformation accelerates across sectors, including public administration.

These regulations must not only address the use of technology to improve transparency and accountability of local finances but also data protection and information security (Hastuti, 2018), with a clear regulatory framework, local governments can implement technological innovations with more confidence, ensuring that digital technology maximizes the efficiency and responsiveness of financial management.

Steps towards more mature regulations can involve intensive consultation with legal, technology, and civil society experts to ensure that the interests of all parties are represented in policy formulation. In addition, regular monitoring and evaluation of the implementation of regulations needs to be carried out to adjust to technological developments and the increasingly complex needs of local administration.

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In addition to the challenges of digital infrastructure, limited human resource capacity, and minimal supporting regulations, there are other significant challenges in implementing fiscal decentralization in the digital era. One of them is the issue of data security and protection in regional financial management using digital technology (Siswati & Inayati, 2022).

Using regional financial information systems (SIFD) or web-based applications for recording, reporting, and budget management requires strong protection of sensitive financial and personal data (Supriadi, 2024). Cybersecurity threats like hacking and data theft can threaten the system's integrity and public trust in local governments.

The issue of interoperability between platforms and systems is another equally important challenge. In the digital era, where everything is connected, local governments need to ensure that the various systems used for financial administration can integrate well. This allows for smooth data flow and effective use of information in decision-making. However, interoperability is often a problem in practice due to differences in technical standards, data formats, or incompatible infrastructure between systems used in different regions.

Budget and cost issues are essential to implementing digital technologies for fiscal decentralization. The initial investment required to build adequate digital infrastructure and develop human resource capacity is not always easy for local governments to overcome, especially in areas with limited budgets. In addition to investment costs, operational costs to maintain systems and ensure the security and sustainability of digital technology use also need to be seriously considered. By understanding and addressing these challenges, local governments can optimize the potential of fiscal decentralization in the digital era, ensuring efficiency, transparency, and accountability in better local financial management.

Based on the results of the literature study, it can be seen that the potential for implementing fiscal decentralization in the digital era is enormous, especially in increasing transparency, accountability, efficiency, and community participation. However, the existing challenges cannot be ignored. The digital infrastructure gap, limited human resource capacity, and minimal regulations are obstacles that must be overcome to realize effective

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fiscal decentralization. Table 1 illustrates the potential and challenges of implementing fiscal decentralization in the digital era.

Table 2.
Potential and Challenges of Implementing Fiscal Decentralization in the Digital Era

Category	Implementation Potential	Implementation Challenges
Transparency and Accountability of Regional Finances	1. Improving transparency and accountability through web-based financial information systems (SIFD, SPKD) 2. Use of public financial dashboards for real-time monitoring of budgets and expenditures 3. Reduce manual errors and speed up the reporting process 4. Blockchain technology for financial data security and integrity	1. The digital infrastructure gap between regions hinders technology adoption 2. Limited human resource capacity in technological competence in the region 3. Lack of regulations governing the use of technology in regional financial management
Efficiency of Regional Financial Management Using Data Analysis	1. Automate financial administration processes to reduce workload and increase efficiency 2. Utilizing data analysis to study financial trends and optimize resource use 3. Adoption of machine learning to predict income or expense fluctuations 4. Enables a proactive approach to regional financial management	1. Limited access to technology in remote areas 2. Lack of training and capacity development of employees in the use of digital technology 3. Unclear and unstructured policies can create legal uncertainty and hinder technology adoption
Increasing Community Participation	1. Leveraging digital platforms to increase public participation in fiscal decision-making 2. Government portals, mobile apps, and social media for citizen interaction 3. Online development planning meetings (Musrenbang) allow participation without being physically present. 4. Educating citizens about the use of digital platforms through training and workshops	1. Limited digital literacy among the community 2. Infrastructure gaps that limit access to digital platforms 3. The need for continued efforts to improve digital literacy and technical skills of communities for effective participation

Source: Processed by author, 2024.

The explanation in Table 2 illustrates the great potential of fiscal decentralization in the digital era in increasing regional financial management's transparency, accountability, and efficiency. However, challenges such as the digital infrastructure gap, limited human resource capacity, and minimal regulations must be overcome to optimize the benefits of digital transformation.

The public demand for openness of information has been realized in Law No. 14 of 2008 concerning Openness of Public Information. The explanation of the law states that one of the important elements in realizing an open state administration is the public's right to obtain information through laws and regulations. The right to information is very important because the more open the state administration is to public supervision, the more accountable the state administration can be.

The Law on Openness of Public Information can be said to be a form of transparency that has implications for the government's ability to realize good governance, where the government can provide detailed information on the form of public service activities clearly, so that the public can be involved and supervise these activities directly. In addition, openness of information and transparency can form a check and balance, making it easier for the public to know and supervise its practices in the field. Transparency in the implementation of government duties helps create reciprocity between the government and the public. Some important benefits of transparency include preventing corruption, making it easier to identify weaknesses and strengths of a policy, and increasing accountability in government agencies' implementation of public services.

The rapid development of information technology in today's digital era also requires us to utilize it in implementing governance. The demands of the public to obtain information quickly and easily accessible in line with the implementation of public information disclosure have required all government agencies, both central and regional, to develop electronic-based information systems. Even the electronic-based government system (e-government) has begun to be implemented, namely with the issuance of Presidential Regulation No. 95 of 2018 concerning the Electronic-Based Government System (SPBE). These electronic-based services have invited the public to participate in supervising government officials. Through public

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supervision, it is hoped that public officials and State Civil Apparatus (ASN) in carrying out government duties will be carried out transparently and accountable.

The digital transparency system makes it easier for the public to participate in supervising governance, and they will speak up if they receive information about irregularities from certain public officials or ASN who carry out acts suspected of being fraudulent. For example, e-budgeting will determine whether the budget for an activity or program is determined by the results obtained. Through e-procurement, the public can also assess whether the tender in the procurement of goods/services has been under the rules or perhaps there is collusion between the procurement committee and tender participants, likewise, in the licensing process and the provision of other public services.

Overall, implementing fiscal decentralization in the digital era promises excellent potential to increase the effectiveness of regional financial management. However, to optimize its benefits, solutions are needed to challenges such as equitable digital infrastructure, human resource capacity development, and the preparation of regulations that support the practical application of technology. With the proper steps, Indonesia can use the digital era to achieve greater transparency, efficiency, and community participation in regional financial management.

Ultimately, the attitude of transparency in the digital era should not be just a slogan. Still, it must be implemented consistently in line with the community's demands. On the other hand, it shows that digital traces always leave a mark and are not easily removed, so they can be permanent transparency data that can be used as information material for various interests.

CONCLUSION

Based on the analysis of the potential and challenges of implementing fiscal decentralization in the digital era in Indonesia, digital transformation offers significant opportunities to improve efficiency, transparency, accountability, and public participation in regional financial management. Technology such as regional financial information systems (SIFD), web-based applications, and data analysis can optimize budget management and enable more accurate and real-time monitoring of public spending.

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However, the implementation process is not free from several crucial challenges. The main obstacles are the suitability of digital infrastructure, especially in remote areas, and the limited capacity of human resources to utilize digital technology. The lack of regulations governing the use of technology in regional financial management makes it difficult to apply technology evenly and effectively throughout the region. To overcome this challenge, collaboration is needed between the central government, regional governments, the private sector, and civil society to build an equitable digital infrastructure, improve digital literacy, and formulate supportive and transparent regulations.

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