Optimizing Public Policy in Developing Digital-Based Pension Funds in Indonesia

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Abstract

The increasing elderly population in Indonesia shows the urgent need for effective pension fund development. The gap between pension needs and fund availability adds to the urgency to improve the conventional pension system. The development of digital technology in Indonesia provides an opportunity for transformation in pension fund management, despite challenges in cybersecurity and digital literacy. This study investigates strategies for optimizing public policy in developing digital-based pension funds in Indonesia. The research method used is a qualitative approach, with data obtained from current literature and thematic analysis to understand key issues in policy implementation. The study results found that adaptive policies, government support, and stakeholder collaboration are crucial in accelerating the adoption of digital technology in the pension fund sector. Increasing accessibility and digital literacy are needed to ensure broad inclusion in digital pension services. The use of innovative technologies such as blockchain and big data can improve the efficiency and transparency of the system, while careful monitoring is needed to assess the success of public policies.

Keywords: *Public Policy, Pension Fund, Digitalization.*

A. INTRODUCTION

Public policy plays a very crucial role in directing the economic and social development of a country. In Indonesia, public policy related to the pension fund system is an important focus considering the high growth in the elderly population. An effective pension fund system not only ensures the welfare of the community when they enter retirement age but also contributes to long-term economic stability. However, in the increasingly advanced digital era, some new challenges and opportunities need to be anticipated and optimized by the government (Bakroh & Hiilamo, 2024).

The development of digital technology has brought significant changes in various sectors, including the financial sector. The digitalization of financial services has opened up wider and more efficient access to the community. In Indonesia, the application of digital technology in the financial sector is growing rapidly, including digital banking services, fintech, and digital insurance (Gupta & Kanungo, 2022). This digital transformation offers various advantages such as operational efficiency, cost reduction, and increased access and financial inclusion. In the context of pension funds, digitalization has the potential to improve the management, supervision, and transparency of funds, thereby increasing public trust in the pension system (Abdulquadri et al., 2021).

However, despite the many potential benefits, the adoption of digital technology in pension fund management also presents several challenges. Cybersecurity issues, personal data protection, and technological risks are the main issues that must be faced. In addition, the readiness of digital infrastructure and digital literacy among the Indonesian people are still obstacles that must be overcome to ensure that all levels of society can feel the benefits of this digitalization. These challenges require serious attention from policy makers to ensure that the implementation of digital technology in the pension fund system can run well and safely

(Hentzen et al., 2022).

The Indonesian government has made various efforts to encourage digitalization in various sectors, including the financial sector. However, public policies related to the development of digital-based pension funds still require further optimization. Existing regulations must be able to accommodate rapid technological changes while protecting the interests of the community. The importance of adaptive and proactive policies is very clear in facing the dynamics of technology that continues to develop (Santoso et al., 2021).

In addition, the development of digital-based pension funds in Indonesia also requires cooperation between various parties, including the government, financial institutions, technology companies, and the community. This synergy is important to create an ecosystem that supports the growth and management of better pension funds. The government has a role in creating conducive regulations, while financial institutions and technology companies must be able to provide safe, efficient, and easily accessible services. The community also needs to be given adequate education to improve their digital and financial literacy (Huda & Kurnia, 2022).

Indonesia's demographic conditions with an aging population add to the urgency of developing an effective and sustainable pension fund system. As the elderly population increases, the pressure on the conventional pension system increases. Therefore, innovation through digitalization is not only an option but also a necessity to ensure that pension funds can be managed properly and can meet the needs of retirees in the future (Alavi et al., 2022).

In recent years, various countries have shown that the adoption of digital technology can strengthen pension fund systems. Case studies from other countries show that digitalization can speed up administrative processes, reduce manual errors, and improve accuracy and transparency. Indonesia can learn from the experiences of other countries to develop better public policies in digital-based pension fund management (Sarker & Datta, 2022).

Optimizing public policies in the development of digital-based pension funds in Indonesia is an important step that must be taken immediately. Against this background, this study aims to explore how public policies can be optimized to support digital transformation in pension fund management in Indonesia, as well as identify the challenges and opportunities in this process.

B. LITERATURE REVIEW

1. Public Policy

Public policy is an instrument of government, not only in the sense of "government" which only concerns state apparatus, but also "governance" which concerns the management of public resources. The term "policy" in English "policy" which comes from Latin, namely the word polis which means community or association (association) of human life, society, or city (city-state).

Etymologically, the term policy comes from Greek, Sanskrit, and Latin. "The root words in Greek and Sanskrit are polis (city-state) and pur (city) developed in Latin into politia (state) and finally in Middle English policie which means handling public problems or government administration".

Public policy According to Dye, public policy is what the government chooses to do or not to do. Anderson explains that public policy is "A series of activities that have a specific purpose or goal that are followed and implemented by an actor or group of actors related to a problem or something that is being considered".

According to Frederich, public policy is "A series of directions proposed by someone, a group of governments in a particular environment that provides obstacles and opportunities for the proposed policy to use and overcome to achieve a goal or realize a target or a specific purpose" (Glyptis et al., 2020).

According to Heinz Eulau and Kenneth Prewitt, public policy is "a permanent decision characterized by consistency and repetition of the behavior of those who make it and those who comply with it." According to Bridgman and Davis, explaining public policy generally contains the meaning of "whatever government chooses to do or not to do". This means that public policy is "whatever the government chooses to do or not to do" (Karjalainen et al., 2020). Meanwhile, according to Hogwood and Gunn, public policy is a set of government actions designed to achieve certain results. This does not mean that the meaning of "policy" only belongs to or is dominant by the government. Non-governmental organizations, such as Non-Governmental Organizations (NGOs), Social Organizations (For example Karang Taruna, Family Welfare Education/PKK), and other voluntary institutions also have policies (Straßheim, 2021).

Bridgeman and Davis explain that public policy has at least three interrelated dimensions, namely as an objective, as a legal or legally valid choice of action (authoritative choice), and as a hypothesis (hypothesis).

a. Public policy as an objective
   Public policy ultimately concerns public achievement. This means that public policy is a series of government actions designed to achieve certain results expected by the public as government constituents (Schmidt & Stenger, 2024).
b. Public policy as a legal choice of action
   The choice of action in policy is legal or authoritative because it is made by an institution that has legitimacy in the government system. The decision binds civil servants to act or direct the choice of actions or activities such as preparing draft laws or government regulations for consideration by parliament or allocating a budget to implement a particular program (Saputra et al., 2023).
c. Public policy as a hypothesis
   Policies are created based on theories, models, or hypotheses regarding cause and effect. They always depend on assumptions about behavior. Policies always include incentives to encourage certain actions. They also include disincentives to discourage certain behaviors. Policies must be able to integrate predictions of success and methods for addressing potential failures (Espinosa et al., 2022).

Based on the definitions provided, several key characteristics of public policy can be identified. First, public policy typically focuses on actions with a specific purpose or goal, rather than on changing or random behavior. Second, it comprises patterns of activities carried out by government officials, rather than isolated decisions (Chater & Loewenstein, 2023). Third, public policy represents what the government actually does in areas such as regulating trade, controlling inflation, or providing public housing, rather than what is intended or planned. Fourth, public policy can be either positive or negative. Positively, it includes clear government actions to address a problem; negatively, it involves decisions by government officials to refrain from action, even when government intervention might be necessary. Fifth, public policy, at least in a positive sense, is grounded in law and entails authoritative actions (Mueller, 2020).

2. Pension Fund

Retirement is a term used for someone who is no longer working because of their advanced age and must be dismissed, or at their request (early retirement). A person's cessation of work automatically also means the cessation of income which is a source of income during the working period. Pension benefits are the amount of money paid by a pension fund to its participants after the participant retires. Money from this pension fund can be a source of passive income that can be received after stopping work or retiring (Wilson et al., 2020).

According to Law Number 11 of 1992 concerning Pension Funds, a Pension Fund is a

legal entity that manages and runs programs that promise pension benefits. Pension Funds can be established by employers, governments, banks, or life insurance. Referring to the Law, the definition of a Pension Fund is also further explained in POJK Number 8/POJK.05/2018 article 1, a Pension Fund is a legal entity that manages and runs programs that promise pension benefits, including Pension Funds that organize all or part of their business based on sharia principles (Giesecke & Rauh, 2023). Quoted from OJK Financial Literacy regarding Pension Funds in 2016, 3 functions must be carried out by the Pension Fund Institution, namely recording participant data and collecting Pension Fund contributions, developing or investing the money it manages, paying pension benefits according to the rules and rights of each participant (Kajwang, 2022).

The basic theory that is the reference in the development of pension funds built by Arrow-Debreu is the state preference theory which states that preferences for commodities can be distinguished not only based on physical attributes and their location in space and time but also considering conditional aspects. This means that decision-making is based on the individual's view of the value of a commodity under certain conditions. According to this theory, individuals in the economy will choose a claim basis based on time that maximizes each of their utilities or each individual will plan their future to maximize the fulfillment of their long-term needs, especially during retirement (Rathgens et al., 2020).

Arrow-Debreu's basic theory cannot reach a dynamic, long, and sustainable period, so Merton tried to overcome the shortcomings of this theory by providing a bridge through the theory of continuous-time finance where individuals in the economy can maximize their utility dynamically and sustainably based on Arrow-Debreu's state preference theory. With this bridge from Merton, individuals can determine the amount of income set aside while the individual is still actively working to later receive benefits during retirement (James et al., 2020). The existence of two theories underlying the formation of this pension fund has shifted the view of prosperity from the accumulation of wealth to the continuous consumption of goods and leisure. Merton provides an expansion of the basic theory of Arrow-Debreu from static (one-time), to dynamic (multi-time), the formation of pension funds shifts from the need for savings and diversification to the need for savings, diversification, hedging, and also insurance (Beckert, 2022).

Another relevant theory is Modigliani's Life-cycle Hypothesis theory which states that individuals/households in the economy will postpone consumption by saving. These savings will be accumulated until the individual/household reaches retirement age and will start using their savings for the consumption of goods and leisure (Zhu & Lin, 2022).

From the perspective of pension fund managers, the shift in the allocation of pension funds from static to dynamic requires dynamic portfolio management. The goal is for pension fund managers to be able to provide results according to the expectations of pension fund participants and on the other hand so that the investment results can also be used to finance the operational funds of pension fund companies. In this case, the principles of Asset Liability Management (ALM) are important in dynamic pension fund management (Baltas et al., 2022).

C. METHOD

This research will be conducted using a qualitative approach. Through this approach, research data will be obtained from various good sources such as research results and previous studies that are still relevant to the content of the research. Data quality will be maintained by ensuring the relevance and accuracy of the information used in the analysis. When the research data has been successfully collected, the research data will be immediately processed using the right analysis method, such as thematic analysis to understand the main issues that arise from this study. This step will allow researchers to explore in depth how optimizing public policy can increase the effectiveness of digital-based pension funds in Indonesia (Nartin et al., 2024).

D. RESULT AND DISCUSSION

1. Context and Urgency of Developing Digital-Based Pension Funds in Indonesia

The increasing elderly population in Indonesia is a significant demographic phenomenon that requires special attention in the context of public policy. Based on data from the Central Statistics Agency (BPS), the number of people aged 60 years and above is expected to continue to increase in the coming decades. In 2020, the elderly population in Indonesia reached around 26.82 million people, and this figure is projected to increase to more than 40 million people by 2035. This trend places great pressure on the existing pension system, given the increasing number of individuals entering retirement age and requiring adequate financial support to ensure their well-being in old age. This increase in the elderly population also highlights the urgent need for pension system reform that can adapt to these demographic changes.

The pension gap is one of the main challenges faced by the conventional pension system in Indonesia. Many workers in the informal sector do not have access to adequate pension programs, which in turn causes them to not have sufficient savings for their retirement needs. According to a report from the Financial Services Authority (OJK), only around 16% of the workforce in Indonesia is enrolled in a formal pension program. This gap creates a situation where many individuals have to rely on their children or relatives for financial support as they age. This not only exacerbates poverty among the elderly but also places an economic burden on the younger generation who must support their parents. Therefore, significant efforts are needed to address this retirement gap and ensure that more workers can access and participate in sustainable retirement programs.

The development of digital technology in Indonesia provides a great opportunity for more effective and efficient pension fund system reform. Digital technology, including the internet, smartphones, and fintech, has changed the way people interact with financial services. The application of digital technology in pension fund management can offer various benefits such as increased accessibility, operational efficiency, and greater transparency. For example, digital platforms can make it easier for pension participants to monitor and manage their contributions in real-time, as well as receive relevant information regarding investment and fund management. In addition, technologies such as blockchain can be used to improve the security and reliability of the pension fund management system, reducing the risk of errors and fraud. By utilizing digital technology, the pension fund system can be improved to be more responsive to participant needs, and better prepared to face future challenges.

The Indonesian government's policies regarding the digitalization of the financial sector play an important role in supporting the development of digital-based pension funds. The government has taken steps to encourage digital transformation in various sectors, including the financial sector. One important initiative is the National Non-Cash Movement (GNNT) which aims to increase the use of non-cash transactions and expand financial inclusion. In addition, the OJK has issued various regulations that support the development of fintech and encourage digital innovation in the financial services sector. However, to ensure that digitalization can be widely adopted in the pension fund system, more specific and comprehensive policies are needed. This includes the preparation of regulations governing the use of digital technology in pension fund management, providing incentives for companies that develop digital solutions, and increasing digital literacy among the public. Government support in the form of appropriate policies can accelerate the adoption of digital technology and ensure that the pension fund system in Indonesia can develop better and more inclusively.

To face challenges and take advantage of existing opportunities, the development of digital-based pension funds in Indonesia requires a holistic and coordinated approach. This includes close cooperation between the government, financial institutions, technology companies, and the public. With an integrated approach, various parties can contribute to

creating a more inclusive, efficient, and sustainable pension system. Digital transformation in pension fund management will not only improve the welfare of retirees but also have a positive impact on the economy as a whole. Therefore, optimizing public policies in the development of digital-based pension funds must be a top priority to ensure a better future for all Indonesian people.

2. Challenges in Implementing Pension Fund Digitalization

The challenges in implementing pension fund digitalization in Indonesia are very complex and multifaceted, covering various aspects ranging from cybersecurity, digital infrastructure, and digital literacy, to regulation and compliance. Cybersecurity and data protection are among the biggest challenges. In the digital era, pension fund participants' data must be protected from various cyber threats such as hacking, data theft, and malware attacks. Inadequate cybersecurity can result in significant financial losses and reduce participant trust in the digital pension system. This challenge requires the implementation of sophisticated security technology and strict data protection policies to ensure that pension fund participants' data remains safe and confidential.

In addition, the condition of digital infrastructure in Indonesia is still a major challenge in implementing digital-based pension funds. Although there has been significant development in recent years, there is still a significant gap in terms of access and quality of digital infrastructure, especially in remote areas. The availability of fast and stable internet, as well as high smartphone penetration, are important prerequisites for accessing digital pension services. This uneven digital infrastructure can hinder the implementation of digital pension funds widely and evenly. Therefore, improving and equalizing digital infrastructure must be a priority to ensure that all levels of society can easily access and utilize digital pension services.

The digital literacy of the Indonesian people is also a significant challenge in the process of digitizing pension funds. Many people still have a limited understanding of digital technology and how to use it effectively and safely. This lack of digital literacy can hinder the adoption of digital pension services, as participants may feel uncomfortable or insecure in using digital platforms. Comprehensive education and training are needed to improve digital literacy so that the public can understand the benefits and how to use digital pension services properly. In addition, awareness campaigns on the importance of digital security and personal data protection must also be encouraged to reduce the risk of errors and data misuse.

Regulation and compliance are other crucial aspects in supporting the implementation of safe and effective digital pension funds. The complexity of regulations required to regulate the use of digital technology in pension fund management cannot be ignored. Regulations must cover various aspects, ranging from data security requirements, and consumer protection, to monitoring and audit mechanisms. Effective regulations must be able to balance technological innovation with adequate protection for pension fund participants. This requires close cooperation between the government, supervisory authorities, and industry to ensure that the regulations made not only support technological developments but also protect the interests of pension fund participants. The regulatory drafting process must also be transparent and involve various stakeholders to obtain comprehensive input and ensure broad compliance.

Overall, the challenges in implementing pension fund digitalization in Indonesia require an integrated and comprehensive approach. Cybersecurity, digital infrastructure, digital literacy, and regulation and compliance are key aspects that must be considered and addressed simultaneously. Only then can pension fund digitalization run successfully and provide optimal benefits for all participants. Success in addressing these challenges will not only improve the efficiency and transparency of the pension system but will also strengthen public trust in the digital pension fund system, as well as make a positive contribution to financial inclusion and public welfare in the future.

3. The Role of Public Policy in Optimizing Digital Pension Funds

The role of public policy in optimizing digital pension funds in Indonesia is crucial. Adaptive policies are an urgent need in facing the dynamics of ever-evolving technology. In this context, flexible and adaptive policies must be able to accommodate rapid and diverse technological changes. Public policies must be designed to not only keep up with technological developments but also to lead and direct emerging innovations. This requires a proactive approach, where the government continues to monitor technological developments and adjust regulations periodically to ensure that policies remain relevant and effective. In addition, adaptive policies must also consider various future scenarios and provide a framework that allows for rapid adjustment to unexpected changes.

Government incentives and support play an important role in encouraging the adoption of digital technology in pension fund management. The government can provide various forms of incentives, such as tax incentives, subsidies, or other financial support, to encourage financial institutions and technology companies to develop and adopt digital solutions. In addition to financial incentives, the government can also provide support in the form of training and capacity building to ensure that these institutions have the resources and skills needed to implement digital technology effectively. This government support should focus on removing barriers that hinder technology adoption, such as high initial costs or the risk of innovation failure. By providing the right incentives and support, the government can create an environment conducive to innovation and spur technological growth in the pension fund sector.

Collaboration between various stakeholders is essential for the successful optimization of digital pension funds. The government, financial institutions, technology companies, and the public must work together synergistically to achieve common goals. The government must play the role of facilitator and regulator, creating policies that support collaboration and innovation. Financial institutions must play a role in providing safe and efficient services, while technology companies must develop innovative solutions that can be integrated with existing pension systems. The public, as end users, must be encouraged to actively participate in the digital pension fund system through education and increasing digital literacy. This collaboration requires effective communication and good coordination between all parties involved to ensure that all voices are heard and all needs are met.

Monitoring and evaluation are key elements in ensuring that public policies are implemented as planned and deliver the expected results. Without an effective monitoring and evaluation mechanism, it is difficult to assess the success of the policy and make necessary adjustments. The government must establish clear and specific performance indicators to measure the effectiveness of public policies in promoting the digitalization of pension funds. The evaluation process must be carried out regularly and transparently, involving all stakeholders to provide constructive input and feedback. In this way, the government can identify areas that need improvement and take appropriate actions to address emerging issues. Monitoring and evaluation are also important to build public trust, as they demonstrate the government's commitment to accountability and continuous improvement.

The role of public policy in optimizing digital pension funds is very important and complex. The formation of adaptive policies, the provision of incentives and government support, cooperation between stakeholders, and effective monitoring and evaluation are key elements that must be considered. With a comprehensive and coordinated approach, the government can create an environment that supports innovation and ensures that the digital pension fund system can develop well, providing optimal benefits for all Indonesian people. Success in overcoming these challenges will not only improve the welfare of retirees but will also strengthen long-term economic and social stability.

4. Digital-Based Pension Fund Development Optimization Strategy

The strategy for optimizing the development of digital-based pension funds in Indonesia requires a holistic and coordinated approach to achieve maximum results. One important aspect of this strategy is increasing accessibility and financial inclusion. To ensure that digital pension services can be accessed by all levels of society, the government and related institutions must focus on developing an equitable digital infrastructure. This includes providing fast and affordable internet access in all areas, both urban and rural. In addition, collaboration with financial institutions and technology companies is also needed to create a user-friendly platform that is easily accessible to all age groups and educational backgrounds. Increasing accessibility can also be achieved through inclusive policies that ensure that digital pension services are not only accessible to those in the formal sector but also to workers in the informal sector who have often been marginalized from the conventional pension system.

The security and reliability of digital systems are crucial aspects that must be considered in the development of digital-based pension funds. Digital systems must be designed with various cybersecurity risks in mind, including hacking, data theft, and malware attacks. Steps to improve system security and reliability can include the implementation of advanced encryption technology, the use of multi-factor authentication, and periodic security audits to identify and address potential vulnerabilities. In addition, it is important to build a technology infrastructure that is resilient to failure, with reliable backup and disaster recovery systems. System reliability can also be improved through proactive monitoring and management, using monitoring tools that can detect and respond to technical issues quickly. This way, pension fund participants can be confident that their data and funds are safe and the system is reliable.

Education and socialization play an important role in supporting the adoption of digital-based pension funds. The level of digital and financial literacy of the Indonesian people is still relatively low, which can be a significant obstacle to the implementation of digital technology in the pension system. Strategies to improve digital and financial literacy can include comprehensive education programs, both through conventional media such as schools and universities and through public campaigns using mass and social media. Training programs and workshops that are specific to certain groups, such as workers in the informal sector or rural communities, can also help improve their understanding of the importance of pension funds and how to use digital services. Effective socialization should also include information on digital security and personal data protection, to build public trust in the digital system.

Utilizing innovative technologies such as blockchain, artificial intelligence (AI), and big data has great potential to optimize pension fund management. Blockchain, for example, can be used to increase the transparency and security of pension fund transactions, because this technology allows for the recording of transactions that cannot be changed and verified by many parties. AI can be used for complex data analysis, helping in making better investment decisions, as well as detecting and preventing fraud. Big data allows for deeper and real-time data analysis, providing better insights into the behavior and needs of pension fund participants. By leveraging these technologies, the pension fund system can become more efficient, responsive, and transparent, providing greater added value to participants.

The strategy for optimizing the development of digital-based pension funds must involve various interrelated aspects. Increasing accessibility and financial inclusion, increasing system security and reliability, comprehensive education and socialization, and utilizing innovative technologies are key elements that must be considered. This coordinated and comprehensive approach will ensure that the digital pension fund system can be successfully implemented, providing maximum benefits to all Indonesian people. Success in this strategy will not only improve the welfare of retirees but will also strengthen long-term economic and social stability in Indonesia.

E. CONCLUSION

Optimizing the development of digital-based pension funds in Indonesia requires an integrated approach that covers various critical aspects. Increasing accessibility and financial inclusion are fundamental steps that require the development of equitable digital infrastructure and inclusive policies that involve all levels of society, including workers in the informal sector. Improving the security and reliability of digital systems is also very important, with the application of advanced technology to protect personal data and ensure a robust and reliable system. In addition, effective education and socialization are needed to improve digital and financial literacy in the community, which will support the widespread adoption of digital pension services. The use of innovative technologies such as blockchain, AI, and big data can optimize pension fund management, and increase efficiency, transparency, and system security. With adaptive public policies, strong government support, cooperation between stakeholders, and comprehensive monitoring and evaluation mechanisms, Indonesia can build an inclusive and sustainable digital pension fund system, providing maximum benefits for all participants and contributing to long-term economic and social stability.

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