

ADVANCING FUTURISTIC DIGITAL BANKING: STRATEGIC ENHANCEMENT AND A ROADMAP FOR EXCELLENCE

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Abstract

This research aims to rectify misconceptions surrounding banking digitalisation and conduct an in-depth analysis of Bank Indonesia and the Financial Services Authority's (OJK) policies concerning developing and enhancing the banking sector's digitalisation. Additionally, this study is designed to formulate a strategic roadmap for developing banking sector digitalisation, accompanied by risk mitigation processes. The fundamental misconception identified herein pertains to the limited understanding of banking digitalisation as merely transitioning from conventional to digital services. This narrow perspective, still embraced by regulatory authorities, adversely impacts national banking industry stakeholders. Employing a normative legal research methodology through an extensive literature review, our findings reveal a prevailing tendency towards structural collaboration in policy formulation rather than embracing synergistic approaches. This research underscores the urgency of formulating visionary and flexible policies in banking digitalisation. Based on the findings, this study seeks to build the framework for policy formulation by regulation authorities in conducting further studies regarding the direction of policies for developing and strengthening banking sector digitalisation.

Keywords: Bank Indonesia, Banking Digitalization, Financial Services Authority

I. INTRODUCTION

The digitalisation of banking has fuelled considerable shifts in the global and regional financial landscape.¹ Accelerated advancement of information technology has prompted financial and banking institutions to move from a traditional approach to a digital approach, both in terms of products

¹ Naveen Menon, "ASEAN's Digital Economy," *Asian Management Insights Singapore Management University* 3, no. 2 (2016), 28, <https://ink.library.smu.edu.sg/ami/40>.

and services.² Whilst the approach used to be characterised by channel differentiation of banking services, the focus has changed post-pandemic in favour of efficiency and transformation.³ Through digitalised banking, there has been a significant enhancement in the accessibility of financial services, particularly for unbanked populations.⁴ Banking digitalisation has altered the fundamental pattern of customer interactions with banking services.

If examined further, the digital approach to banking products and services has expedited the process of many services, from simply opening accounts to managing customers' investment funds. However, the digital approach also has problems that must be resolved immediately. One concern is related to data security and customer privacy, which are the responsibility of banking institutions.⁵ As financial services providers, banks must continuously align their services with the expectations and demands of customers whilst ensuring operational sustainability and security amidst the rapid changes currently faced by the financial industry.

In furthering the evolution of digital banking, it is essential to utilise the constant interplay among technology, regulation, and market forces to form the basis of financial transformation.⁶ One is through blockchain technology, which presents new opportunities for improving transaction security and

² Lambert Kof Osei, Yuliya Cherkasova, and Kof Mintah Oware, "Unlocking the Full Potential of Digital Transformation in Banking: A Bibliometric Review and Emerging Trend," *Future Business Journal* 9, no. 30 (2023): 2, <https://doi.org/10.1186/s43093-023-00207-2>; Zhuming Chen, et al., "The Transition From Traditional Banking to Mobile Internet Finance, An Organizational Innovation Perspective - A Comparative Study of Citibank and ICBC," *Financial Innovation* 3, no. 12 (2017): 3, <https://doi.org/10.1186/s40854-017-0062-0>.

³ Susanti, Rediyanto Putra, and Moh. Danang Bahtiar, "Banking Performance Before and During the Covid-19 Pandemic: Perspectives from Indonesia," *Cogent Economics & Finance* 11, no. 1 (2023): 13, <https://doi.org/10.1080/23322039.2023.2202965>; R. Leelavathi, et al., "Industry 5.0: A Panacea in the Phase of Covid-19 Pandemic Concerning Health, Education, and Banking Sector," *International Conference on Business and Technology* (2023): 9, <https://doi.org/10.1007/978-3-031-08954-1>; Olesia Suntsova, "The Definition of Smart Economy and Digital Transformation of Business in the Concepts Industry 4.0 and 5.0," *Technology Audit and Production Reserves* 4, no. 4 (2022): 18, <https://doi.org/10.15587/2706-5448.2022.265105>.

⁴ Andrea Miglionico, "Digital Payments System and Market Disruption," *Law and Financial Markets Review* 16, no. 1-2 (2023): 12, <https://doi.org/10.1080/17521440.2023.2215481>.

⁵ Nikola Milosavljevic and Sara Njagojevic, "Customers' Perception of Information Security in Internet Banking," *Proceedings of the 5th IPMA SENET Project Management Conference* (2019): 272, <https://doi.org/10.2991/senet-19.2019.45>; Wenxiang Zhang, et al., "Data Security, Customer Trust and Intention for Adoption of Fintech Services: An Empirical Analysis From Commercial Bank Users in Pakistan," *SAGE Open* 13, no. 3 (2023): 2, <https://doi.org/10.1177/21582440231181388>.

⁶ McKinsey & Company, "AI-Bank of The Future: Can Banks Meet the AI Challenge?," *McKinsey & Company Publication* (September 2020), 12.

reducing operational costs.⁷ Regulations must be updated to keep pace with changing technology, creating a balance between innovation and consumer protection. On the other hand, a deep understanding of consumer needs and preferences is key to designing satisfying and relevant digital experiences.

The biggest challenge may arise in seamlessly integrating digital and physical banking, ensuring that new opportunities do not leave behind the traditional sector, which is still the mainstay of financial services for most of the population.⁸ Building a holistic and inclusive financial ecosystem, therefore, needs to be the focus, combining elements of digital banking with conventional infrastructure to support economic growth and financial inclusion. The significance of digital literacy and financial education should also not be overlooked, as the shift towards digital banking requires a more profound understanding of consumers.⁹

While we are witnessing rapid developments in banking digitalisation, the current reality shows a noteworthy stagnation. The first is that the strict banking roadmap is often out of line with the actual performance of banking service providers. Implementation of strategies and innovations are frequently hampered by limitations in responding to market changes and industry dynamics, constraining progress that should be rapid.

The second cause of stagnation is that regulations have fallen behind changing market needs, severely limiting advances in banking digitalisation.¹⁰ Delays in adapting regulations to technological developments and consumer trends have resulted in a business environment that is more rigid and inhospitable to innovation. This has triggered an imbalance between regulatory compliance and speed of adaptation to change, hurting banking's ability to keep up with the digital revolution.¹¹ There are also misconceptions about banking digitalisation, with some viewing it as simply moving conventional services into the digital realm. It is essential to recognise that banking digitalisation

⁷ Zaina Kawaswi, Evans Akwasi Gyasi, and Deneise Dadd, "Blockchain Adoption Model for the Global Banking Industry," *Journal of International Technology and Information Management* 28, no. 4 (2020): 113, <https://doi.org/10.58729/1941-6679.1436>.

⁸ Yan Ji, Songyuan Teng, and Robert M. Townsend, "Branch Expansion versus Digital Banking: The Dynamics of Growth and Inequality in a Spatial Equilibrium Model," *NBER Working Paper Series*, no. 28582 (2021): 36, <https://doi.org/10.2139/ssrn.3776153>.

⁹ Panayiotis C. Andreou and Sofia Anyfantaki, "Financial Literacy and Its Influence on Internet Banking Behavior," *European Management Journal* 39, no. 5 (2021): 659, <https://doi.org/10.1016/j.emj.2020.12.001>.

¹⁰ Luigi Wewege, et al. "Disruptions and Digital Banking Trends," *Journal of Applied Finance & Banking* 10, no.6 (2020): 28.

¹¹ Imelda A. Tsindeliani, et al. "Digital Transformation of the Banking System In the Context of Sustainable Development," *Journal of Money Laundering Control* 25, no. 1 (2022): 177, <https://doi.org/10.1108/JMLC-02-2021-0011>.

refers to a complete transformation involving a fundamental restructuring in how banks operate and interact with customers. The fourth impediment is regulators' lack of alignment and socialisation on the outlook of banking. Ineffective socialisation can lead to a lack of understanding and support from industry players, slowing down and undermining the implementation of the planned technological changes. Therefore, moving past the stagnation of banking digitalisation requires a deep understanding of these factors and a collaborative effort among regulators, industry players, and other stakeholders.

Two concerns are discussed in this research. The first is related to Indonesia's banking outlook, and the second is associated with the evaluation and improvement of banking in Indonesia by strengthening digital banking products and services. These two concerns inform the questions presented in this research: (1) How can Indonesia's contemporary banking outlook be constructed?; and (2) What are the best ways to mitigate risk given the challenges facing the banking sector in the future?

Previous research focused on what factors can encourage individuals to use digital banks, which are growing rapidly. This research also builds on and delves deeper than previous research entitled "Improving Digital Banking Through Risk Assurance TAM Modification Analysis" conducted by Dwi Marlina Wijayanti, Hasan Al-Banna, and Achmad Nurdany.¹² In addition, a study was conducted entitled "Digital Transformation and The Banking Market: Friend or Foe? A Country-Level Study" conducted by Noureen A. Khanand and Mudeer Ahmed Khattak, which examined the impact of digital transformation on the stability of the banking sector considering the moderating role of bank competition.¹³ Reflecting on these two studies, there are fundamental differences with this research. This research discusses the outlook for banking based on the development of comprehensive digital banking products and services.

This study formulates improvements to the digital banking outlook in Indonesia. This study employs normative legal research based on secondary data through literature study. It applies statutory and conceptual research models. There are six sections in this study. The first part explains the condition of banking digitalisation in Indonesia in response to the development of global banking digitalisation. The second section describes the banking outlook and the refinement of banking digitalisation strategies in the near term. The third

¹² Dwi Marlina Wijayanti, Hasan Al-Banna, and Achmad Nurdany, "Improving Digital Banking Through Risk Assurance TAM Modification Analysis," *Journal of Central Banking Law and Institutions* 3, no. 1 (2024): 156, <https://doi.org/10.21098/jcli.v3i1.172>.

¹³ Noureen A. Khanand and Mudeer Ahmed Khattak, "Digital Transformation and The Banking Market: Friend or Foe? A Country-Level Study," *Journal of Central Banking Law and Institutions* 3, no. 1 (2024): 132, <https://doi.org/10.21098/jcli.v3i1.167>.

section explains how to develop digital banking products and services. The fourth section describes the mitigation of risks posed by the potential digital economic rush from the perspective of the banking sector. The fifth section rectifies the misunderstanding of the implementation of banking digitalisation. The sixth section explains the roadmap refinement for banking digitalisation in Indonesia.

II. BANKING OUTLOOK AND STRATEGY

In facing the future, the Indonesian banking sector needs to adopt innovative strategies to remain relevant and competitive. One crucial aspect that needs to be considered is the application of financial technology, which continues to grow rapidly. Integrating technologies such as artificial intelligence, blockchain, and data analytics can improve operational efficiency, improve customer experience, and strengthen transaction security. In addition, regulatory changes are an important element in understanding the outlook of banking.

The involvement of authorities in accommodating technological developments and ensuring consumer protection can form a strong foundation for the growth of the banking sector. In addition, an in-depth understanding of changing consumer preferences can form the basis of effective marketing strategies. This discussion emphasises the importance of adapting to change, using technology, regulatory compliance, and consumer understanding as key elements in shaping Indonesia's banking outlook and strategy.

It should also be recognised that collaboration between traditional banking and financial technology (fintech) industry players can significantly drive growth. Not only does it create synergies between traditional strengths and innovation, but it also opens up opportunities to create new products and services to meet the needs of consumers in the future. In addition, a global expansion strategy is also an important consideration, given that the banking world is increasingly connected globally. Adapting to international market dynamics can provide a competitive advantage and open access to new business opportunities. In addition to these factors, this discussion must consider sustainability and social responsibility in banking. In the face of a changing future, financial institutions must ensure that their strategies are economically beneficial, contribute to sustainable development, and positively impact society in line with the United Nations 2030 sustainable development goals established in 2015.

Building on the overall outlook and strategy of Indonesian banking, the discussion should consider a holistic framework encompassing technology, regulation, global markets, sustainability, and social responsibility. Only with a comprehensive approach can the banking sector build a solid foundation

to thrive and adapt in the ever-changing landscape. In the context of digital banking transformation in Indonesia, the Payment System Blueprint issued by Bank Indonesia (BI) and the Blueprint for Digital Banking Transformation initiated by the Financial Services Authority (OJK) is key to shaping the banking outlook and strategy in the future. BI's Payment System Blueprint sets the foundation for payment sector innovation by emphasising technology integration and transaction security.¹⁴ Implementing an efficient, fast, and secure payment system is a top priority, focusing on financial inclusion and using blockchain-based technology to strengthen transaction integrity. Collaboration among banks, fintechs, and other stakeholders is expected to support the realisation of the vision of a connected and integrated payment system.

Meanwhile, the OJK's Blueprint for Digital Banking Transformation aims to guide financial institutions in the face of the digital paradigm shift.¹⁵ The document details strategies for adopting new technologies, optimising risk management, and improving digital literacy among the public. OJK emphasises the importance of digital transformation as a critical step to ensuring the sustainability of the banking sector amidst changing global market dynamics. By understanding and integrating BI's Payment System Blueprint and OJK's Digital Banking Transformation Blueprint, financial institutions can create a solid foundation to meet future challenges. Collaboration between regulators and industry stakeholders is key to achieving the shared goal of innovative, efficient, and competitive digital banking.

Bank Indonesia's (BI) Payment System Blueprint and the Financial Services Authority's (OJK) Blueprint for Digital Banking Transformation take centre stage in designing Indonesia's banking strategy for the futuristic era. BI's Blueprint emphasises transaction efficiency and security, encourages technology integration, and promotes financial inclusion. The weakness, however, lies in the complexity of technological implementation, which can be a challenge for banks and fintechs that do not yet have a mature infrastructure. Meanwhile, OJK's Digital Banking Transformation Blueprint underscores the urgency of digital transformation as the key to the banking sector's survival. However, weaknesses can be seen in the high cybersecurity risks and the need for stricter policies to address potential data breaches and cyberattacks. This requires significant investments in cybersecurity, which can burden financial institutions, especially smaller ones. This is even more acute when it involves cyberattack mitigation and handling.

¹⁴ Bank Indonesia, "Indonesia Payment Systems Blueprint 2025," *Bank Indonesia Publication* (2019): 2.

¹⁵ Financial Services Authority, "Blueprint for Digital Transformation in Banking," *Financial Services Authority Publication* (2021): 139.

It should be noted that harmonisation between BI's and OJK's Blueprints is essential. The main challenge is harmonising conflicting regulations and ensuring all stakeholders can adopt the changes smoothly. In addition, a deep understanding of the changing global market dynamics is required to ensure that Indonesia's banking strategy remains relevant and competitive internationally. If not managed carefully, implementing the Blueprint could result in technological and policy gaps, resulting in unequal access to and utilisation of innovation across the banking sector. Therefore, while these measures offer a clear direction for digital transformation, there is a need for effective risk mitigation and close collaboration to overcome any obstacles.

The outlook for banking in Indonesia can be summarised in a few key points. First, the continued growth of financial technology (fintech) and smartphone penetration among the public will shape digital consumption patterns and financial behaviours. Banks must anticipate and respond to these changes by adjusting their business models, providing innovative digital banking services, and ensuring optimal transaction security. Secondly, the understanding that access to financial services is a fundamental right will drive the push for financial inclusion. BI and OJK must continuously strive to play a pivotal role in promulgating policies and initiatives to ensure that all levels of society can access financial services quickly and efficiently.

The third is that collaboration among traditional banks, fintechs, and regulators will create a balanced and innovative banking ecosystem. Supporting each other in technology development, sharing secure data, and building a unified infrastructure will open new opportunities and improve industry efficiency. The key challenge ahead, however, will be addressing increasingly complex cybersecurity risks. As the digital ecosystem expands, data and transaction security threats will increase. Therefore, banks and regulators must increase efforts to protect data security and strengthen cyber defences.

Overall, the outlook for banking in Indonesia promises more significant innovation, inclusion and collaboration. However, successful implementation and adaptation will require a shared commitment from all stakeholders and readiness to overcome challenges that may arise along the way. The outlook for global banking is also influenced by dynamics similar to those in Indonesia but with additional variables. For starters, globalisation continues to strengthen interconnections among financial sectors in different countries. Global banks must be prepared for the impact of economic policy changes, currency fluctuations, and geopolitical uncertainties that can affect overall financial stability.¹⁶

¹⁶ James Chapman, et.al, "Central Bank Digital Currencies and Banking: Literature Review and New Questions," *Staff Discussion Paper*, no. 4 (2023): 24, <https://doi.org/10.34989/sdp-2023-4>.

Additionally, the acceleration of financial technology (fintech) innovation and the growth of the global digital financial ecosystem profoundly transform how financial services are provided and accessed. Traditional banks worldwide need to consider collaborative strategies with fintechs to remain competitive and meet the demands of increasingly digitalised consumers. In addition to market concerns, the global risk of cybersecurity is gaining prominence. Banks will face the challenge of keeping data and transactions safe as cyberattacks become more sophisticated.

Sustainability and social responsibility initiatives are also integral to the global banking outlook. Adopting sustainable banking practices centred on ethical values will play an essential role in building reputations and meeting the expectations of consumers increasingly concerned about environmental and social issues. In this context, global banks are expected to continuously adapt, innovate, and synergise with stakeholders across the globe. Cross-border collaboration will be key to facing global challenges and capitalising on emerging opportunities. As such, banks that successfully navigate these complexities will be in a stronger position to face a dynamic future.

While there are some similarities in the banking outlook for Indonesia and globally, significant differences create gaps between the two. The first is that in terms of financial inclusion, Indonesia faces more critical challenges in access to financial services in remote and rural areas. At the global level, financial inclusion is more focused on combating financial inequality between developed and developing countries.

The second is that Indonesia's regulations may be characterised as more complex and rigid compared to some other countries. This may slow adaptation to innovation and change, although measures such as BI's Payment System Blueprint try to open the door for technology integration. On the other hand, global cybersecurity risk concerns may be higher and more complex than those faced by Indonesian banks. Global banks tend to be subject to more serious and complex cyber-attacks, requiring heavier investment in security systems to protect their assets and data.

As a result, differences in technology adoption rates and internet penetration among countries may create disparities in the accessibility of digital financial services. Banks in developed countries may face greater pressure to continuously innovate and deliver increasingly sophisticated services, while in Indonesia, the main challenge may be more focused on ensuring equitable accessibility and technology adoption across the population. Recognising this gap, Indonesian banks can draw inspiration from global best practices while considering the unique local needs. Global banks need to understand Indonesia's market and policy dynamics to optimise their growth potential in the country. To address

this, cross-border collaboration and knowledge exchange is key to fostering sustainable banking development in the future.

III. IMPROVING DIGITAL BANKING PRODUCT AND SERVICES

In looking at the ongoing transformation of banking in the digital era, several dimensions are to be considered in enhancing the sustainability of digital banking products and services. Firstly, to address the rapid growth in digital banking services, it is important to understand the complexity of the sector's challenges. These challenges include evolving information security, integrating new technologies, and the importance of customer satisfaction as the basis for holistic strategies to optimise digital services.

Innovation in digital banking products and services is key to enriching the user experience. Integrating new technologies, such as artificial intelligence, opens up new opportunities for expanding the reach of and improving operational efficiency. It should be stressed that enhanced personalisation in digital banking services not only represents consumers' desire for a tailored experience but is also crucial to capturing individual interests and underpinning the long-term growth of banking institutions.

Special emphasis is placed on security and privacy, given the level of threats in the cyber domain. Serious efforts to enhance transaction security and protect customer privacy are fundamental prerequisites for building trust in digital banking services. Therefore, integrating the latest technology must also be matched with sophisticated security measures to maintain the system's integrity.

In addition, it should be noted that the evolution of digital banking not only covers technical aspects of digital financial services but also involves cultural changes within banking institutions. Driving innovation adoption requires a proactive cultural transformation involving acceptance and support from the entire organisation. Banking leaders must play key roles in creating an environment encouraging creativity, collaboration, and responsiveness to dynamic market conditions.

Economic and social sustainability must also be considered to improve the sustainability of digital banking products and services. Digital banking institutions can bridge economic gaps and support sustainable community development by strengthening financial inclusiveness. Building an inclusive ecosystem where people from all walks of life can access and utilise digital banking services is a significant step toward achieving this goal. Collaboration among digital banking institutions and external stakeholders, including regulators, is important in creating a healthy and reliable digital banking

ecosystem. This includes developing regulations that support innovation, exchanging information to identify shared risks, and establishing inclusive security standards.

The importance of economic and social sustainability in digital banking cannot be underestimated. To increase financial inclusiveness, there is a need to recognise its positive impact on addressing economic inequality. Ensuring that digital banking institutions target specific segments and create an inclusive ecosystem, opportunities can be made for different segments of society to engage in economic development. Strategic measures such as providing accessible services and understanding financially vulnerable groups' specific needs are key to supporting sustainable community development. Through this approach, digital banking can be innovative in technology and as a trailblazer in creating a widespread positive impact on society as a whole.

Banking digitalisation is not only about moving conventional services to the digital realm. It is also considered a complete paradigm shift that adds significant value. Beyond enabling online transactions, the digitalisation strategy entails service delivery innovations, leveraging artificial intelligence for risk analysis, and creating a more personalised and efficient user experience. The transformation also includes applying blockchain technology to enhance security and transparency and using big data to understand customer needs and preferences better. The digitalisation of financial services creates a dynamic ecosystem, enabling financial institutions to more quickly adapt to market changes and provide innovative solutions that are impossible through conventional models. By focusing on holistic transformation, the banking digitalisation strategy is a significant step toward addressing current demands and creating long-term value for customers and the institution.

It is crucial in the digital transformation of banking to ensure that access to digital services is open to key market segments and customers from marginalised and under-included groups. By emphasising the principle of inclusivity, digital banking institutions can deliver solutions that ensure that every individual, regardless of economic or social background, has equal access to digital financial services. This involves creating friendly and intuitive interfaces, providing a more personalised customer service approach, and providing accessible virtual access for those who may be constrained geographically or suffering mobility issues. In this way, banking digitalisation becomes not just about efficiency and innovation but also about creating true inclusivity in delivering the benefits of financial technology to all sections of society.

The first way to ensure inclusivity in digitalised banking is the development of user-friendly banking apps. Intuitive interfaces and clear guidelines can overcome accessibility barriers for marginalised groups or those with

structurally low inclusiveness. Digital banking providers can also adopt an inclusive design approach, ensuring that key features are easily accessible to all users, including those with disabilities.

To increase inclusiveness, digital financial education is essential to empowering marginalised groups to understand and utilise digital banking services. Banking institutions can develop tailor-made education programmes through online platforms and community outreach campaigns. Improved understanding of the benefits of digital banking and how to utilise digital services enables previously unbanked communities to be better equipped and empowered to embrace digital banking.

Finally, digital banking service providers can implement broader virtual access solutions to overcome geographical constraints or mobility issues. This includes using technologies such as banking services via text messaging, phone calls, or online platforms accessible through simple devices such as feature phones (as opposed to smartphones). By offering diverse access options, digital banking institutions can reach customers in remote areas or those with physical limitations who cannot come directly to physical branch offices. These virtual access solutions can significantly ensure the entire population can truly utilise digital banking services.

Partnerships with local non-profit organisations and governments can also realise financial inclusivity. This collaboration can establish joint digital banking service centres in vulnerable communities. Through this approach, digital banking institutions can collaborate with parties who deeply understand local needs and existing infrastructure. Through this partnership, more affordable and relevant digital banking services can be provided while building the community's capacity to adopt modern financial technology. Moreover, implementing low-cost services is also crucial to ensure inclusivity in digital banking access. Banks can impose lower fees or even waive certain charges for transactions and services for customers from marginalised groups. Inclusive tariff policies can serve as a strong incentive to encourage broader participation in digital banking services, creating opportunities for those who cost factors would otherwise hinder.

Finally, to strengthen inclusivity, digital banking institutions can engage with local communities to develop and adapt their services to particular populations. Involving community groups in the product and service design process can ensure that the solutions offered align more with local needs and preferences. Through this approach, digital banking can become more responsive to societal dynamics, build trust, and enhance the acceptance of financial technology among marginalised groups.

Given the complexity of achieving financial inclusivity, it is instructive to consider the position of a rural housewife as an illustrative case. A housewife may face challenges accessing digital banking services due to limited technology infrastructure and low digital literacy in rural areas. In this case, inclusive solutions may involve tailored digital literacy training to meet the needs and capabilities of these individuals. Collaboration with educational institutions and local governments can expand understanding of financial technology and increase housewives' engagement in adopting digital banking services.

However, understanding this position should not be detached from a supportive policy framework. Banking regulatory systems and policies need to be designed to encourage financial service providers to focus not only on profitability but also on inclusivity. In this context, the government plays a crucial role in incentivising the removal of barriers that hinder digital banking institutions from targeting marginalised groups, including rural housewives. A holistic policy-based approach would provide a strong foundation for sustainable financial inclusivity.

Overall, achieving financial inclusivity in digital banking is not just about technology but also community engagement, policy change, and stakeholder collaboration. By understanding individuals' positions in a more complex context and supporting them accordingly with integrated strategic measures, we can achieve broader financial inclusivity and positively impact overall societal development.

In the current era of banking digitalisation, the current discussion has focused on metaverse banking and the development of the Digital Rupiah. Metaverse banking describes the evolution of banking towards a virtual space that integrates the physical and digital worlds. This creates a more immersive banking experience where customers can interact with banking services in a virtual environment. Through metaverse banking, financial services providers can present financial solutions more innovatively and interactively, combining elements of virtual reality to provide a deeper experience for customers.

Another development is the Digital Rupiah, which reflects the government's response to the new dynamics in the digital economy. As Indonesia's official digital currency, the Digital Rupiah can transform the landscape of financial transactions by accelerating payment processes and enhancing the efficiency of the national financial system. Furthermore, using blockchain technology to support Digital Rupiah could enhance transaction security, opening up greater potential for financial inclusivity, especially for those underserved by traditional banking systems.

Both these developments, metaverse banking and the Digital Rupiah have created significant momentum for the digitalisation of banking. While

metaverse banking opens the door to a more futuristic banking experience, Digital Rupiah acts as a strong foundation to ensure the sustainability and relevance of Indonesia's financial ecosystem in this digital era. The integration of these two aspects can shape a more dynamic, adaptive, and future-oriented digital banking landscape. Metaverse banking, while bringing great innovation potential, also poses a challenge and threat to banking in Indonesia. Metaverse banking can significantly disrupt conventional banking business models, especially with consumer behaviour shifting towards more virtual banking experiences. This threat can disadvantage banking institutions that are not sufficiently adaptive to digital transformation and fail to provide adequate metaverse banking services.

On the other hand, metaverse banking opens up new opportunities for banks in Indonesia. Financial institutions that can anticipate and respond to these developments can take strategic steps to capitalise on growth and innovation potential. By aligning their digital banking strategies with elements of the metaverse, banking institutions can create more engaging, interactive, and personalised customer experiences. Such innovations can strengthen the competitiveness of Indonesian banks on the global level and increase service penetration to a wider segment of society.

Therefore, banking institutions in Indonesia must adopt a balanced approach in addressing metaverse banking. While metaverse training raises concerns, it should be seen as an opportunity to formulate new strategies and establish a robust foundation for coping with ever-evolving digital banking. With proper vigilance, banks in Indonesia can leverage the potential of metaverse banking to achieve a positive transformation in delivering financial services to the community.

Implementing inclusive metaverse banking requires a strategy that ensures accessibility for all layers of society, including those living in rural areas. First and foremost, it is important to integrate metaverse technology with platforms that are easily accessible through simple devices such as smartphones or feature phones. By ensuring that metaverse applications or platforms run smoothly on low-spec devices, banking institutions can provide easier access for rural communities with device limitations.

Furthermore, education is key in implementing metaverse banking in rural areas. Digital literacy training programmes tailored to the needs and culture of rural communities can ensure that they understand and can, therefore, utilise metaverse services effectively. These educational steps can include direct outreach in communities, online tutorials, or collaboration with local educational institutions to enhance community understanding of the benefits and functionality of metaverse banking. Collaboration with local governments

and relevant stakeholders in rural areas can accelerate the implementation of metaverse banking. By building infrastructure that supports stable and affordable internet connectivity, banking institutions can help create an environment conducive to adopting metaverse banking in rural areas.

This collaboration can also involve local parties in developing metaverse solutions that are more suitable for the needs of rural communities. By employing a holistic and inclusive strategy, metaverse banking providers can become more than just a technological trend in urban areas but also a financial solution accessible to all layers of society, including those living in rural areas. As a concrete example of an inclusive metaverse banking implementation strategy in rural areas, a banking institution can develop a metaverse application accessible via low-spec smartphones. The application can be designed with a simple and user-friendly interface, allowing rural populations to access banking services through an easily understandable virtual experience.

Banking institutions can launch direct training programmes in villages to support digital literacy education, collaborating with local community leaders or educational institutions. As part of these programmes, communities can be taught how to use metaverse banking applications, manage accounts virtually, and understand the benefits of financial transactions through the platform. By involving the community directly, banking institutions can ensure that their educational approach is tailored to rural communities' needs and level of understanding.

Furthermore, banking institutions can collaborate with local governments to ensure the availability of adequate internet infrastructure in rural areas. In this partnership, joint investments can be made to improve internet networks and ensure stable connections. Concrete examples could include building village internet service centres or providing public hotspots to facilitate easier access for rural communities. With this combination of strategies, metaverse banking can become more affordable and relevant to rural communities. Concrete initiatives like these create inclusivity in the use of financial technology and empower rural communities to benefit from digital advancements in managing their finances.

To ensure financing for aspects of metaverse banking that cover all layers of society, banking institutions can develop strategies that include friendly and innovative financing options. First, special financing programmes can be designed to provide access to necessary devices and internet connectivity. For example, banking institutions can collaborate with device manufacturers to provide affordable financing options for smartphones or metaverse software.

Furthermore, an inclusive financing approach can also involve cooperation with external parties such as microfinance or inclusive financial institutions.

These institutions can be partners in providing financing tailored to the needs of rural communities that may not have access to conventional banking services. By providing flexible and easily accessible financing options, people can more easily adopt metaverse technology without excessive financial burden. Additionally, banking institutions can consider performance-based financing schemes, where the cost of using metaverse applications can be amortised based on usage levels and benefits obtained. With this approach, rural communities can experience the benefits of metaverse technology without prohibitively burdensome costs.

Through financing strategies focusing on inclusivity, banking institutions can ensure that all layers of society, including those living in rural areas, can access and adopt metaverse banking without significant financial barriers. Thus, these steps not only support the transformation of banking towards the metaverse but also create positive impacts on financial inclusivity nationwide.

The Digital Rupiah, as envisaged by Bank Indonesia, is divided into Wholesale Digital Rupiah and Retail Digital Rupiah, which opens up opportunities for close integration with digital banking products and services.¹⁷ Wholesale Digital Rupiah, issued by Bank Indonesia to the wholesale finance segment, provides banking and non-banking financial institutions with easier access to the digital financial ecosystem. Thus, financial institutions can be more agile in leveraging technology to enhance their services to corporate clients and financial institutions.

In line with this, the Retail Digital Rupiah circulated directly to the public, and users of banking services opened the door to increased penetration of digital banking services among individuals. More efficient and convenient transactions through Retail Digital Rupiah can stimulate the public's adoption of financial technology, bringing significant benefits in terms of ease of access and financial management. It is important to note that the journaling process in the "Khazanah Digital Rupiah" (KDR) is key to ensuring integrity and transparency in managing the digital currency. Thus, transaction data and related financial information can be monitored and tracked more effectively, creating greater trust in Digital Rupiah.

Meanwhile, legal protection for banking financial institutions is also critical in implementing the Digital Rupiah. With strong legal protection, banking financial institutions and customers can feel secure transacting and participating in the Digital Rupiah ecosystem. This includes protection of the rights and obligations of banking financial institutions in managing Digital Rupiah and

¹⁷ Bank Indonesia, "Project Garuda: Navigating The Architecture of Digital Rupiah," *White Paper CBDC* (November 2022): 3; World Economic Forum, "Central Bank Digital Currency Global Interoperability Principles," *World Economic Forum Report* (2023): 6.

fair and effective dispute resolution mechanisms. By considering these aspects, integrating Digital Rupiah with digital banking products and services can provide a solid foundation for further transformation in Indonesia's digital financial ecosystem.

Furthermore, the correlation between Digital Rupiah and digital banking products/services highlights the importance of involving financial institutions in developing a legal framework. In facing the new dynamics ushered by the Digital Rupiah, banking financial institutions must have a clear legal foundation to effectively facilitate transactions and manage digital currencies. Comprehensive legal protection should encompass regulatory aspects, transaction security, and legal responsibility for managing Digital Rupiah. Moreover, the success of Digital Rupiah is incumbent on proactive steps in shaping the Digital Rupiah Treasury. Efficient and accountable journaling is the primary foundation for building trust and transparency in the digital currency ecosystem. Financial institutions and regulators should collaborate to ensure this system operates smoothly and reliably, employing the latest technology supporting data security and integrity.

Legal protection extends not only to customers but also provides legal protection for financial institutions. Clear and robust regulations will clarify the game's rules and minimise potential legal risks. With good legal protection, banking financial institutions can plan strategic steps and innovate confidently, thus supporting the development of the Digital Rupiah without compromising security and trust. In building a strong and inclusive digital financial ecosystem, the correlation between the Digital Rupiah and digital banking products or services shows that the right legal framework and comprehensive protection must accompany financial technology development. With an integrated approach, Indonesia can tap the potential of the Digital Rupiah and digital banking products/services to achieve sustainable economic progress.

In implementing the Digital Rupiah in wholesale and retail forms, banking players must design strategies that prioritise data security and comply with Law Number 27 of 2022 concerning Personal Data Protection. Firstly, banks must ensure that their technological infrastructure meets the highest security standards for protecting customers' data. Encryption technology and advanced network security can help prevent data breaches that could harm customers and the reputation of banking institutions.

Banks need to develop stringent internal policies regarding managing customers' personal data within the scope of Digital Rupiah. This includes strict monitoring and supervision over data access, as well as periodic training for employees on best practices in maintaining information confidentiality. These policies should preferably encompass procedures for handling data

security incidents so that in the event of a security breach, a prompt and effective response can be initiated. In implementing the Digital Rupiah, banking institutions need to involve competent authorities, such as the National Cyber and Encryption Agency (BSSN), to ensure that security and data confidentiality standards are met. This collaboration may include routine assessments of security systems and compliance audits with the Personal Data Protection Act. Furthermore, banking actors may consider adopting blockchain technology to enhance security and transparency in managing Digital Rupiah. By utilising this technology, every transaction can be securely recorded and cannot be altered, creating an accurate audit trail and safeguarding data integrity.

Through careful implementation strategies focused on data security, banking actors can execute Digital Rupiah with confidence and ensure that the confidentiality of customers' personal data remains protected in accordance with applicable laws. This not only creates a safe and trustworthy digital financial environment but also builds customer trust in adopting and widely using this digital currency.¹⁸ As a concrete example of legal protection for banks and customers in the implementation of the Digital Rupiah, banks can adopt policies that clearly establish the responsibilities and rights of financial institutions in managing customers' personal data. These policies must comply with the provisions of the Personal Data Protection Act, which sets standards for data protection and management that financial institutions must adhere to.

Banks can also draft clear and transparent contracts with technology service providers involved in the implementation of Digital Rupiah. These contracts should include provisions regarding the protection of personal data, security measures, and obligations to report data security breaches immediately after they occur. Thus, banks can ensure that technology partners also take responsibility for maintaining the confidentiality and integrity of data. Legal protection can also be strengthened through active cooperation with supervisory authorities and regulators. Banks can participate in regular audits to verify their compliance with data protection regulations and demonstrate their commitment to customer data security.

For customers, legal protection can be realised through the provision of clear and transparent information on how their personal data will be managed and protected by financial institutions. Additionally, banks can implement privacy control options that give customers greater control over the types of information they share and how it is used. These concrete steps, involving the formulation of internal policies, cooperation with technology partners,

¹⁸ Bastian Muzbar Zams, "Designing Central Bank Digital Currency for Indonesia: The Delphi-Analytic Network Process," *Bank Indonesia Working Paper*, No. 4 (2019): 6; PwC, "Central Bank Digital Currencies and the Future of Money," *PwC Report* (2021): 8.

collaboration with supervisory authorities, and transparency of information for customers, can form a strong basis for ensuring comprehensive legal protection in the implementation of the Digital Rupiah. Through this approach, banks and customers can feel confident that the integrity and confidentiality of their personal data remain intact in accordance with applicable regulations.

The assertion that regulatory bodies, including BI and OJK, must strike a balance in ensuring legal protection for both banks and consumers becomes crucial in maintaining the equilibrium of interests in the digital financial ecosystem. BI and OJK, as the primary regulators in the banking and financial services sector, need to take an active role in ensuring that the rules and policies implemented accommodate the interests of both parties. Regulators should formulate rules that not only protect consumers from data security risks and privacy breaches but also provide a framework that enables banking financial institutions to innovate and thrive in the digital financial ecosystem. This balance can be achieved by involving key stakeholders in the policy-making process, including financial institutions, legal experts, and consumer organisations.

Additionally, regulators also need to effectively monitor and enforce to ensure compliance with data protection regulations by all parties. By conducting regular evaluations and thorough audits, regulators can identify potential violations and follow up with appropriate actions. This process not only involves sanctions for violations but also provides incentives for banking financial institutions that adhere to high data security standards. Furthermore, regulators can facilitate open dialogue between financial institutions and consumers to address data protection issues and concerns. This forum can create a platform for both parties to share information, understand each other's needs, and collectively seek balanced solutions. By maintaining this balance, regulators such as BI and OJK can play an effective role in building a safe, innovative, and legally sound digital financial ecosystem for banks and consumers. In the era of digital transformation, this approach is key to creating a sustainable and trustworthy financial environment that is in line with international laws for all involved parties.

IV. NAVIGATING THE RUSH TO TAP THE DIGITAL ECONOMIC POTENTIAL

The increasing potential of the digital economy in Indonesia's banking sector marks a new era in the country's economy. Transformation towards a digital economy presents significant opportunities for growth and innovation in the

financial sector.¹⁹ Indonesian banks are increasingly focused on leveraging digital technology to enhance operational efficiency, provide faster and more accessible services, and create innovative products. Initiatives to harness the potential of this digital economic surge include developing digital banking applications, implementing advanced cyber security measures, and empowering customers to transact online. By optimising this potential, the banking sector in Indonesia can lead to the realisation of an inclusive and sustainable digital economy.

Although the potential of the digital economy in Indonesia's banking sector is very promising, challenges also arise regarding the withdrawal of customer trust in the digitalisation process. One of the main concerns is security issues, where customers may feel at risk of unauthorised access or online fraud. Ensuring a strong security infrastructure and effective data protection systems is crucial to building customer trust.

Moreover, uncertainty and lack of understanding of new technologies can also be inhibiting factors. Customers unfamiliar with digital platforms may feel anxious or hesitant to switch from conventional to digital transactions. Therefore, there is a need for intensive educational efforts from the banking sector to provide customers with a better understanding of the benefits, security, and convenience of using digital banking services. Transition efforts that are too fast or lack adequate technical support can also cause discomfort and frustration for customers. Therefore, a careful and planned approach is needed in implementing digital changes, as well as providing adequate technical support to customers so that they can feel comfortable and confident in adopting digital banking technology. By addressing these uncertainties and concerns, the banking sector in Indonesia can build strong trust in facing the era of digital economic transformation. This demonstrates that the current transformation remains in volatility, uncertainty, complexity, and ambiguity (VUCA), where there is still uncertainty in some issues, complexity in implementation initiatives, and ambiguity in some policies.

In the aspect of implementing the Digital Rupiah Wholesale, the potential of digital banking rush presents significant opportunities to enhance efficiency and liquidity in financial transactions between businesses. The use of blockchain technology and smart contracts can simplify and expedite the payment and settlement processes among business entities. This not only can reduce operational costs but also pave the way towards a more connected and integrated financial ecosystem. Meanwhile, in the context of Digital

¹⁹ Lam Quynh Trang Tran, Dai Thich Phan, and Manh Tuan Nguyen, "Digital Economy: A Comparative Study in ASEAN," *Review of Business & Management TMP* 18, no. 2 (2022): 8, <https://doi.org/10.18096/TMP.2022.02.05>.

Rupiah Retail, the potential of the digital banking rush creates convenience for individuals to access banking services without geographical limitations. The implementation of Digital Rupiah Retail can broaden financial inclusivity by providing access to communities previously underserved by conventional banking services. The adoption of innovative financial technology, such as digital wallets and app-based payments, can enhance purchasing power and overall economic activity within the community.

Despite these positive potentials, challenges persist, particularly concerning financial literacy and data security. Increasing understanding and education regarding the use of Digital Rupiah Retail are crucial to ensure that customers can utilise these services wisely and securely. Furthermore, the active role of regulators and the banking industry in developing policies that support and protect the use of digital currency at the retail level will be a key factor in optimising the positive potential of the implementation of digital Rupiah Retail. Although there is the potential for significant returns from the implementation of Digital Rupiah Retail and Digital Rupiah Wholesale, there are also risks that these initiatives may not be effective and difficult to implement, which could negatively impact Bank Indonesia. One issue that may arise is resistance from some segments of society towards the adoption of digital currency.²⁰ Some individuals may feel uncomfortable or distrustful of new technology, thus hindering the penetration of digital Rupiah Retail within the community.

Implementation of complex technology in the Rupiah Wholesale digital scheme can also pose significant technical and bureaucratic challenges. Difficulty in coordinating among various stakeholders, including financial institutions, regulators, and businesses, can slow down the implementation process and result in inefficiencies. This has the potential to put additional pressure on Bank Indonesia to manage and balance the sustainability of this initiative. To circumvent its complexity, there must be clarity through engagements.

Security concerns also become a critical aspect, especially regarding the digital Rupiah Retail accessed by the general public.²¹ Threats to data security and the risk of personal customer information leaks can create distrust, potentially triggering a large-scale return of funds to conventional banking systems. Bank Indonesia needs to ensure that security infrastructure and data protection are well-maintained to address this potential scepticism. Considering these challenges, Bank Indonesia needs to have a mature strategy, including intensive efforts in public education, strengthening cross-sector cooperation, and careful technology investment. The success of implementing digital

²⁰ Sebastian Infante, et al, "Retail Central Bank Digital Currencies: Implications for Banking and Financial Stability," *Finance and Economics Discussion Series 2023-072*, <https://doi.org/10.17016/FEDS.2023.072>.

²¹ Infante, et al, "Retail Central Bank Digital Currencies."

Rupiah Retail and digital Rupiah Wholesale heavily relies on Bank Indonesia's ability to navigate complexity and overcome potential obstacles.

Furthermore, regulatory issues can also pose serious barriers to the implementation of digital Rupiah Retail and digital Rupiah Wholesale. Crafting appropriate, clear, and implementable regulations is crucial to achieving success in integrating digital currencies into the banking system. Legal and regulatory uncertainties can create confusion among businesses and customers, complicating steps toward widespread adoption. Another challenge that Bank Indonesia may face is adequate technology integration. In order to achieve efficiency and sustainability, technology infrastructure capable of supporting the transition to digital currency is necessary. Difficulties in implementing and maintaining the required technology can create significant barriers and increase the risk of failure in adopting digital Rupiah Retail and digital Rupiah Wholesale.

Finally, changes in attitude and culture within the conventional banking system also pose critical challenges. The adoption of digital technology is not just about technical implementation but also involves a paradigm shift and changes in mindset among businesses and customers. The inability to align these new visions and values with traditional banking practices can result in significant resistance, slowing the transition to digital currency and increasing the risk of unsustainability. In facing these challenges, Bank Indonesia needs to take a holistic approach involving all stakeholders. Full support from the industry sector, clear regulations, appropriate technological investments, and intensive educational efforts will be key to success in designing and implementing Retail Digital Rupiah and Wholesale Digital Rupiah initiatives.

In designing appropriate industrial sector support, the first step Bank Indonesia can take is to facilitate active collaboration between financial institutions, technology companies, and relevant businesses. The formation of these strategic partnerships can create an ecosystem that supports the development of local financial technology, including innovative startups that can contribute to the development and implementation of Retail Digital Rupiah and Wholesale Digital Rupiah. Clear and progressive regulation is also crucial. Bank Indonesia needs to design a regulatory framework that provides clear and measurable guidance for all stakeholders involved in digital currency. This includes setting data security standards, consumer protection, and provisions that support innovation growth. With stable and reliable regulations in place, the industry sector can feel more confident investing and collaborating to realise digital transformation in the banking sector.

Appropriate education needs to focus on two main aspects: education for businesses and education for consumers. For businesses, training programmes

and workshops on financial technology implementation, digital security, and the economic benefits of adopting digital currency can help reduce uncertainty and enhance the necessary skills. Meanwhile, for consumers, comprehensive education campaigns on the security and benefits of using Retail Digital Rupiah can increase understanding and boost confidence levels. Furthermore, concrete steps such as providing easily understandable user guides, hosting public seminars, and launching information campaigns through social media can enhance public understanding of how to utilise digital Rupiah Retail and digital Rupiah Wholesale services. By aligning support from the industrial sector, implementing clear regulations, and providing appropriate education, Bank Indonesia can create a supportive environment for the development and adoption of digital currency within the community.

By exploring two significant issues, namely metaverse banking and Digital Rupiah, it is evident that the Indonesian banking sector is facing a crucial moment in ending digitalisation stagnation. Metaverse banking brings an innovative concept that combines the physical and digital worlds, providing opportunities to create more immersive and connected banking experiences. On the other hand, the implementation of Digital Rupiah opens the door to a more inclusive and efficient financial transformation. Both of these issues drive the banking sector to continue innovating and developing digital products and services that are relevant to the demands of the times. With a holistic approach, support from the industry sector, careful regulation, and proper education, the Indonesian banking sector can end digitalisation stagnation and pave the way towards a more dynamic and interconnected future of banking.

V. COUNTERACTING OBSOLETE THOUGHT ON BANKING DIGITISATION

The digital era has brought significant changes across various sectors, including banking in Indonesia. However, there are still old-fashioned thoughts that need to be addressed regarding the digitalisation of banking in the country. One of these thoughts is the fear of data security. Many people are still hesitant to switch to digital banking services due to concerns about the potential leakage of personal information. It is important to address this concern by enhancing the security of digital banking technology and providing education to the public about data protection measures.

In addition to data security, many still consider digital banking to be only for the young and tech-savvy. This mindset needs to be changed so that inclusivity in digital banking can be achieved. The government and financial institutions need to collaborate to provide training and education to all layers

of society, enabling them to understand and access digital banking services easily. Another old-fashioned thought is the fear of job loss due to automation in the banking sector. Although technology can replace some routine tasks, it also opens up new opportunities for jobs in technology and innovation. A wise approach is needed to ensure that digital transformation in banking provides broad economic benefits and leaves no one behind.

There is still distrust towards the effectiveness of digital banking services compared to conventional services. A more active educational campaign is needed to prove that digital banking is not only efficient but also more accessible and faster. Providing concrete evidence through case studies and testimonials can help change this perception. It is important to update regulations related to digital banking to align with technological advancements. Clear and responsive regulations can provide a strong foundation for the growth of digital banking in Indonesia. Regulations governing digital banking are the main foundation for ensuring the sustainability and success of this transformation. One outdated notion that needs to be addressed is the regulatory mismatch that still follows conventional mindsets and frameworks. Serious efforts are needed to revise and align existing regulations with the dynamics of digital banking. Delays or mismatches in regulations can hinder innovation and sector growth. The government, banking authorities, and industry players must synergise to create a regulatory framework that is supportive, progressive, and responsive to technological advancements. In this way, digital banking can operate more effectively, provide consumer protection, and create a conducive environment for financial innovation in Indonesia.

Regulatory updates can also help address the issue of legal uncertainty, which often serves as a primary reason for reluctance among stakeholders to engage in digital banking. By providing a clear and reliable legal framework, stakeholders will feel more comfortable investing and innovating in this digital space. Clarity in regulations can also increase trust from consumers and investors, which in turn will accelerate the growth of the digital banking ecosystem in Indonesia. Through open and collaborative thinking when facing regulations, Indonesia can build a strong foundation for the future of digital banking. This is not just about creating rules but also ensuring that these rules reflect the needs and realities of the current market. With this approach, regulations become not only supervisory instruments but also tools that facilitate innovation and sustainable growth. By overcoming these outdated notions, Indonesia can harness the full potential of the digital banking revolution and provide economic and social benefits to its people.

VI. ROADMAP REFINEMENT ON BANKING DIGITALISATION

Banking digitalisation in Indonesia has become a crucial aspect of the country's economic development. Enhancing the roadmap for this process is vital to address challenges and ensure a smooth transition towards a more mature digital banking ecosystem. The first step in this enhancement should focus on improving cyber security measures to protect sensitive financial information. Alongside the rise in digital transactions, the risk of cyber threats is also increasing, making the strengthening of digital banking infrastructure extremely important.

The second step is to create a roadmap to prioritise improving financial literacy among the population. With the growing popularity of digital banking, it is important for individuals to have a better understanding of digital financial services in order to make informed decisions. Educational campaigns and user-friendly interfaces can contribute to increasing financial literacy and empower users to navigate the digital realm confidently. The third step is that the roadmap should prioritise refining regulatory frameworks to adapt to the evolving landscape of digital banking. Governments should collaborate with financial institutions to establish clear guidelines and regulations that encourage innovation while ensuring consumer protection and fair competition. Finding the right balance is crucial for sustainable growth and creating a trustworthy digital banking environment.

The fourth step is that infrastructure development plays a crucial role in the success of banking digitalisation. The roadmap should include initiatives to improve connectivity and internet access, especially in rural areas. This will not only expand the reach of digital banking services but also promote financial inclusion, ensuring that all segments of the population can benefit from the digitalisation process. Therefore, refining the roadmap for banking digitalisation in Indonesia should include cybersecurity measures, promoting financial literacy, regulatory adjustments, and infrastructure development. By addressing these aspects, Indonesia can pave the way towards a strong and inclusive digital banking ecosystem, making a significant contribution to the country's economic progress.

VII. CONCLUDING REMARKS

This research has two conclusions after having conducted in-depth research, as explained in the discussion section. The first conclusion is that the construction of the contemporary banking outlook in Indonesia is focused on banking digitalisation. This digitalisation focus is limited to the transition of traditional or conventional banking services towards digital banking services. Inclusivity

for all banking service users, as outlined in the Blueprint of the Indonesian Payment System and the Blueprint for Digital Banking Transformation by the Financial Services Authority, has not yet been implemented holistically and practically as best practices. Referring to the blueprints, there are limitations for banking practitioners in expanding product and banking service innovations through directives to adhere to the roadmap for sustainable financial development.

The second conclusion is the necessity for collaboration between regulatory authorities and the banking industry to collectively reshape the banking outlook in Indonesia to be more responsive to customer needs. This is due to the rapid development of banking digitalisation on a global and regional level. Two central issues, metaverse banking and Digital Rupiah, serve as important parameters for Bank Indonesia and the Financial Services Authority to consider in the balance of legal protection for banking industry players and customers. Thus, there should be synergistic collaboration rather than structural collaboration, which will provide a balanced and sustainable impact on the future of the banking outlook in Indonesia. In navigating the evolving landscape of banking, continuous improvement and agility are crucial, underscoring the need for synergistic collaboration between regulatory authorities and the banking industry to ensure a balanced and future-ready outlook.

REFERENCES

- Andreou, Panayiotis C. and Sofia Anyfantaki. "Financial Literacy and Its Influence on Internet Banking Behavior." *European Management Journal* 39, no. 5 (2021): 659, <https://doi.org/10.1016/j.emj.2020.12.001>.
- Bank Indonesia, "Indonesia Payment Systems Blueprint 2025," *Bank Indonesia Publication* (2019): 2.
- Bank Indonesia, "Project Garuda: Navigating the Architecture of Digital Rupiah," *White Paper CBDC* (November 2022): 3.
- Chen, Zuming, et al. "The Transition from Traditional Banking to Mobile Internet Finance, An Organizational Innovation Perspective: A Comparative Study of Citibank and ICBC." *Financial Innovation* 3, no. 12 (2017): 3, (2017) 3, <https://doi.org/10.1186/s40854-017-0062-0>.
- Chapman, James, et al. "Central Bank Digital Currencies and Banking: Literature Review and New Questions." *Staff Discussion Paper*, no. 4 (2023): 24, <https://doi.org/10.34989/sdp-2023-4>.
- Financial Services Authority. "Blueprint for Digital Transformation in Banking." *Financial Services Authority Publication* (2021): 139.

- Infante, Sebastian, et al. "Retail Central Bank Digital Currencies: Implications for Banking and Financial Stability." *Finance and Economics Discussion Series* 2023-072, <https://doi.org/10.17016/FEDS.2023.072>.
- Ji, Yan, Songyuan Teng, and Robert M, Townsend. "Branch Expansion versus Digital Banking: The Dynamics of Growth and Inequality in a Spatial Equilibrium Model." *NBER Working Paper Series*, no. 28582 (2021): 36, <https://doi.org/10.2139/ssrn.3776153>.
- Kawaswi, Zaina, Evans Akwasi Gyasi, and Deneise Dadd. "Blockchain Adoption Model for the Global Banking Industry." *Journal of International Technology and Information Management* 28, no. 4 (2020): 113, <https://doi.org/10.58729/1941-6679.1436>.
- Khanand, Noureen A. and Mudeer Ahmed Khattak. "Digital Transformation and The Banking Market: Friend or Foe? A Country-Level Study." *Journal of Central Banking Law and Institutions* 3, no. 1 (2024): 132, <https://doi.org/10.21098/jcli.v3i1.167>.
- Leelavathi, R. et al. "Industry 5.0: A Panacea in the Phase of Covid-19 Pandemic Concerning Health, Education, and Banking Sector." *International Conference on Business and Technology* (2023): 9, <https://doi.org/10.1007/978-3-031-08954-1>.
- McKinsey & Company, "AI-Bank of The Future: Can Banks Meet the AI Challenge?" *McKinsey & Company Publication* (September 2020): 12.
- Menon, Naven. "ASEAN's Digital Economy." *Asian Management Insights Singapore Management University* 3, no. 2 (2016), 28, <https://ink.library.smu.edu.sg/ami/40>.
- Miglioni,co, Andrea. "Digital Payment System and Market Disruption." *Law and Financial Markets Review* 16, no. 1-2 (2023): 12, <https://doi.org/10.1080/17521440.2023.2215481>.
- Milosavljevic, Nikola and Sara Njagojevic. "Customers' Perception of Information Security in Internet Banking," Proceedings of the 5th IPMA SENET Project Management Conference (2019): 272, <https://doi.org/10.2991/senet-19.2019.45>.
- Osei, Lambert Kof, Yuliya Cherkasova, and Kof Mintah Oware. "Unlocking the Full Potential of Digital Transformation in Banking: A Bibliometric Review and Emerging Trend." *Future Business Journal* 9, no. 30 (2023): 2, <https://doi.org/10.1186/s43093-023-00207-2>.
- PwC, "Central Bank Digital Currencies and the Future of Money." *PwC Report* (2021): 8.
- Suntsova, Olesia. "The Definition of Smart Economy and Digital Transformation of Business in the Concepts Industry 4.0 and 5.0." *Technology Audit and Production Reserves* 4, no. 4 (2022): 18, <https://doi.org/10.15587/2706-5448.2022.265105>.

- Susanti, Rediyanto Putra, and Moh. Danang Bahtiar. "Banking Performance Before and During the Covid-19 Pandemic: Perspectives from Indonesia." *Cogent Economics & Finance* 11, no. 1 (2023): 13, <https://doi.org/10.1080/23322039.2023.2202965>.
- Tran, Lam Quynh Trang, Dai Thich Phan, and Manh Tuan Nguyen, "Digital Economy: A Comparative Study in ASEAN." *Review of Business & Management TMP* 18, no. 2 (2022): 8, <https://doi.org/10.18096/TMP.2022.02.05>.
- Tsindeliani, Imelda A., et al. "Digital Transformation of the Banking System in the Context of Sustainable Development." *Journal of Money Laundering Control* 25, no. 1 (2022): 177, <https://doi.org/10.1108/JMLC-02-2021-0011>.
- Wewege, Luigi, et al. "Disruptions and Digital Banking Trends." *Journal of Applied Finance & Banking* 10, no. 6 (2020): 28.
- Wijayanti, Dwi Marlina, Hasan Al-Banna and Achmad Nurdany. "Improving Digital Banking Through Risk Assurance TAM Modification Analysis." *Journal of Central Banking Law and Institutions* 3, no. 1 (2024): 156, <https://doi.org/10.21098/jcli.v3i1.172>.
- World Economic Forum. "Central Bank Digital Currency Global Interoperability Principles." *World Economic Forum Report* (2023): 6.
- Zams, Bastian Muzbar, "Designing Central Bank Digital Currency for Indonesia: The Delphi–Analytic Network Process," *Bank Indonesia Working Paper*, no. 4 (2019): 6.
- Zhang, Wenxiang, et al. "Data Security, Customer Trust and Intention for Adoption of Fintech Services: An Empirical Analysis from Commercial Bank Users in Pakistan," *SAGE Open* 13, no. 3 (2023): 2, <https://doi.org/10.1177/21582440231181388>.

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