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Utilization of Technology as a Strategic Tool for Developing BPRS in North Sumatra in the Digital Era

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Abstract

This study aims to analyze the use of technology as a development strategy for Islamic Rural Banks (BPRS) in North Sumatra in the digital era. Using a qualitative approach, this study explores the adoption of digital technologies such as mobile banking, management information systems, and digital payment platforms by six BPRS in North Sumatra. The results of the study indicate that several BPRS have begun to adopt digital technologies such as mobile banking applications, digital risk management systems, and integration with Islamic fintech, although the level of adoption is highly dependent on the financial capacity and strategy of each BPRS, while others are still in the early stages of digital transformation. However, although several BPRS have begun digital transformation, significant challenges such as limited technological infrastructure, low capital, and lack of skilled human resources are still major obstacles. In addition, collaboration with fintech and the implementation of digital marketing strategies have not been fully optimized. This study highlights the importance of improving technological infrastructure, strengthening capital, and developing human resources to increase the competitiveness of BPRS amidst the tight competition in the Islamic financial sector. These findings provide practical contributions to BPRS management in designing technology-based development strategies and supporting financial literacy in the community in North Sumatra.

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Introduction

Since the development of the sharia banking system in Indonesia, in two decades of national sharia financial development, there have been many achievements, both in terms of institutions and supporting infrastructure, regulatory instruments and supervisory systems, as well as public awareness and literacy of sharia financial services. Our sharia financial system is one of the

best and most complete systems that is internationally recognized. As of June 2015, the sharia banking industry consists of 12 sharia commercial banks, 22 sharia business units owned by conventional commercial banks, and 162 BPRS with total assets of Rp. 273.494 trillion with a market share of 4.61%. Specifically for the DKI Jakarta Province, the total gross assets, financing, and third-party funds (BUS and UUS) are, respectively, Rp. 201.397 trillion, Rp. 85.410 trillion, and Rp. 110.509 trillion.

Of the several types of Islamic financial institutions in Indonesia, BPRS is a financial institution that plays an important role in supporting financial inclusion among rural communities and small business actors. BPRS offers sharia-based banking services that are more affordable and in accordance with the needs of local communities. The existence of BPRS not only provides alternative financing that is in accordance with sharia but also encourages regional economic growth through financing for MSMEs and community businesses. The BPR/BPRS industry does have characteristics of a fairly limited business scope compared to commercial banks, such as having a more limited scope of intermediation functions compared to commercial banks, not being able to open branches outside their domicile area/province, and BPR/BPRS also cannot participate in foreign exchange transaction services and insurance.

Despite these limitations, BPR/BPRS have several advantages compared to commercial banks. First, although BPR/BPRS have a smaller business size, BPR/BPRS have a larger number and are spread throughout Indonesia, including areas with low financial access. With a specific retail market segment, BPR/BPRS have contributed to financial inclusion, including financing for micro, small, and medium enterprises (MSMEs), especially MSMEs that are still oriented towards the informal sector and do not receive credit from commercial banks. Second, with a narrower operational reach (limited to one province), BPR/BPRS can become local banks that adjust their business models to the needs of the local community, which will facilitate increasing market penetration in the areas where they operate. This flexibility allows BPR/BPRS to continue to grow amidst the transformation of the regional economy. Given the important role of BPR/BPRS in the economy, optimization of the function of BPR/BPRS is very necessary to be realized in order to increase financial inclusion and regional development. The number of BPRs in Indonesia in June 2024 was 1,557 banks, consisting of 1,384 conventional BPRs (89% of total BPRs) and 173 sharia BPRs (11% of total BPRs). In the last 6 months, the number of BPRs participating in the guarantee has experienced a downward trend. Based on the nominal deposit tiering, the largest total deposits in BPRs in June 2024 were in the deposit tiering of up to IDR100 million ($N \leq 100$ million), which was IDR46.62 trillion or 27.9% of total BPR deposits. In line with the nominal deposit data, the largest number of accounts in BPRs in June 2024 were in the deposit tiering of up to IDR 100 million ($N \leq 100$ million), which was 15,815,259 accounts, or 98.2% of total BPR accounts. Details of BPR deposits in June 2024 based on nominal deposit tiering are presented in Figure 3 below:

Distribusi Simpanan Berdasarkan Nominal Simpanan				
Segmen Nominal	Total Simpanan (Rp Triliun)	% Total Simpanan	Jumlah Rekening	% Rekening
$0 < N \leq 100$ jt	46,62	27,91%	15.815.259	98,22%
$100 \text{ jt} < N \leq 200 \text{ jt}$	18,81	11,26%	128.871	0,80%
$200 \text{ jt} < N \leq 500 \text{ jt}$	36,63	21,92%	105.539	0,66%
$500 \text{ jt} < N \leq 1\text{M}$	27,52	16,48%	35.838	0,22%
$1 \text{ M} < N \leq 2\text{M}$	18,50	11,07%	12.381	0,08%
$2 \text{ M} < N \leq 5\text{M}$	9,98	5,97%	3.346	0,02%
$N > 5 \text{ M}$	9,00	5,39%	758	0,00%
Total	167,06	100%	16.101.992	100,00%

Figure 1. Nominal Tiering Amount of BPR/BPRS Deposits Source: LPS, 2024

Based on business principles, conventional deposits have a larger total nominal proportion than sharia deposits in all nominal deposit tiers. This is due to several factors such as: Wider Accessibility and Network. Conventional banks have a wider network of branches and ATMs, both in urban and rural areas. Product Diversity Conventional banks tend to offer a wider variety of savings, deposit, and investment products with more competitive profits. Low

Sharia Financial Literacy Many Indonesians do not fully understand the concept of sharia banking, such as the prohibition of usury and sharia contracts. The lack of public understanding regarding sharia banking has led to a higher preference for conventional banking. Currently, sharia banking is still in the development stage, both in terms of product innovation and market penetration. Therefore, customers with large nominal deposits often prefer conventional banks because the yields (interest) are considered more competitive than sharia banking products.

The above conditions are experienced by almost all BPRS in Indonesia, including in North Sumatra. Currently, there are six BPRS operating in North Sumatra Province, namely 1) BPRS Alwashliyah, 2) BPRS Amanah Bangsa, 3) BPRS Amanah Insan Cita, 4) BPRS Gebu Prima, 5) BPRS Puduarta Insani and 6) BPRS Sindang Laya. Despite having the potential to grow, the condition of these BPRS faces various challenges and opportunities. The first challenge faced is related to the financial performance of BPRS in North Sumatra which varies, with several banks showing positive growth in terms of assets and financing. However, in general, many BPRS are still struggling to achieve optimal growth targets. Increasing Third Party Funds (DPK) and sharia financing are the main focus, but challenges in risk management and asset quality remain. Furthermore, most BPRS in North Sumatra face low capital problems. Insufficient paid-in capital often limits the ability of BPRS to expand services and attract more customers. This is exacerbated by the need to meet the provisions of OJK regulations regarding minimum capital which continues to increase. Not only capital problems but corporate governance in BPRS is often not optimal. Many of BPRS need improvements in management structure and implementation of *Good Corporate Governance (GCG)* principles, implementation of good governance is very important to increase customer trust and ensure operational sustainability.

The last factor is the most important in the current digital era 5.0 where digital transformation is one of the important aspects in the development of BPRS. However, many BPRS in North Sumatra are still lagging behind in terms of adopting information technology. Limited IT infrastructure hinders BPRS in providing better services to customers and competing with other financial institutions. Sharia Rural Banks (BPRS) in North Sumatra are currently facing major challenges that have caused a decline in performance in various aspects. This condition is a serious concern for sharia financial industry players, related authorities, and the community who pin their hopes on the sharia-based financial system.

Bank Perekonomian Rakyat Syariah (BPRS) in North Sumatra faces challenges in utilizing technology to compete in the Islamic banking industry. Where BPRS in North Sumatra is still lagging behind in the development of digital banking and mobile banking services. Although several BPRS have started implementing, many have not provided user-friendly mobile applications or complete features such as real-time transactions, online credit applications, and balance information services via applications. Until now, many BPRS do not have a well-integrated core banking system. Existing systems often cannot communicate with other systems, thus hampering operational efficiency and customer service. The use of modern and integrated core banking technology can increase transaction speed and customer data accuracy.

The use of e-wallets and digital payment systems such as *QRIS (Quick Response Code Indonesian Standard)* is still low among BPRS. This service is very important to meet the needs of customers who increasingly want non-cash transactions. BPRS needs to develop partnerships with digital payment service providers to make it easier for customers to make transactions. The use of data analysis and big data to understand customer behavior and develop appropriate products is still minimal. By leveraging analytical data, BPRS can offer more personalized and relevant products to customers, as well as improve their marketing strategies. Digital marketing strategies such as the use of social media, SEO (*Search Engine Optimization*),

and online advertising have not been utilized optimally by BPRS. Digital marketing can help BPRS reach more potential customers, especially the younger generation who are more familiar with technology. In addition, BPRS needs to collaborate more closely with fintech companies to develop new, innovative products and services. This collaboration can help BPRS accelerate digital transformation and expand their service reach without having to make large investments in technology infrastructure. Overall, although several BPRS in North Sumatra have started to move towards digitalization, there are still many aspects of technology that need to be strengthened to compete effectively in the Islamic banking industry. The application of modern technology will not only improve operational efficiency but also improve customer experience, thereby attracting more customers and strengthening their position in the market. Referring to the problems above, this study aims to analyze how technology is utilized as a strategy for developing BPRS in North Sumatra.

Literature Review

The use of technology in Islamic banking is an important aspect that supports operational efficiency and service innovation. In this context, information technology serves to increase accessibility and convenience for customers, as well as speed up transaction processes that were previously carried out manually. For example, the use of internet banking and mobile banking allows customers to make transactions anytime and anywhere, which is very important in today's digital era (Billytona et al., 2024). Islamic fintech, as part of this innovation, combines modern technology with sharia principles that avoid usury and detrimental practices. This creates financial services that are not only efficient but also in accordance with Islamic values (Yudih et al., 2024). The application of technologies such as big data and cloud computing in Islamic banking also helps in risk management and faster decision making, thereby increasing the competitiveness of the industry (Hasnita et al., 2016).

Thus, the use of technology in Islamic banking not only provides operational benefits but also expands the reach of Islamic financial services to the wider community, including in remote areas. This shows that technology integration is key to the growth and sustainability of Islamic banking in Indonesia. Some of the benefits of implementing technology in Islamic banking are for operational efficiency, improving customer service, and developing new products and services (Mohamed & Ali, 2022). Therefore, banking digitalization is a very potential business opportunity and an inevitable necessity in the banking sector in the digital era. In addition to increasing the efficiency of bank operational activities, banking digitalization can improve the quality of bank services to customers in transactions.

Grand Theory: Diffusion of Innovations

Diffusion of Innovations Theory developed by Everett M. Rogers (Everett M. Rogers, 2010) explains how innovations are introduced, adopted, and disseminated in a social system. The diffusion of innovation theory was proposed by EM Rodgers in 1962. According to (Everett M. Rogers, 2010), the diffusion of innovation theory seeks to explain the way in which innovations and financial ideas cross populations in society through market or non-market channels or simply through companies. Diffusion according to language is the spread of something (culture, technology, ideas) from one party to another. While innovation according to language is a new discovery that is different from what already exists or what was previously known (ideas, methods, or tools). If the understanding of diffusion and innovation is combined, it means the spread of new discoveries from one party to another (Al-Aufi & Al-Suqri, 2015).

It is noted that innovation plays a major role in achieving development and sustainability because it must be adopted by companies to improve the company's financial performance. It states that through technological development and network effects, new financial innovations spread to other competing firms. The theory argues that new technological or product developments are not adopted by all individuals and firms at the same time, but spread over time. After introduction, the product is marketed to gain a larger market share. Other individuals and firms then adopt the technology in sequence (Stacks & Salwen, 2014).

(Everett M. Rogers, 2010) Rogers introduced his new concepts from various perspectives, including criticizing his previous research. For Rogers, the diffusion of innovation is defined as a social process that communicates information about new ideas that are viewed subjectively. The meaning of innovation is thus slowly developed through social construction. The more a product has a network effect, the more innovations are adopted and the less product competition in an industry. This will lead to cost reductions and more profitability and therefore better financial performance. It has been noted that the theory of diffusion of innovation positively affects financial performance, (Charles & Dr. Ambrose, 2019). The theory of diffusion of innovation is a supporter in this study. This is because using the theory of diffusion of innovation is considered capable of answering this study, namely regarding how an idea and technology from financial innovation spreads within a banking sector company (Rogers, 2012).

In the context of BPRS, this theory provides a framework for understanding how new technologies can be integrated into development strategies. Key factors in this theory include: 1) Innovation: The technology introduced, such as mobile banking applications. 2) Communication Channels: How innovation is introduced to customers and employees. 3) Adopters: The readiness and ability of BPRS and customers to adopt technology. 4) Social Systems: The environment in which innovation is implemented, including local regulations and culture.

Middle Theory: Resource-Based View (RBV)

The Resource-Based View (RBV) theory focuses on how organizations utilize their resources to achieve competitive advantage (Madhani, 2009). *The Resource-Based View (RBV)* theory is recognized as a theory that looks at the ability of a company's internal resources to exploit internal resources to create competitive advantage. The company's internal resources consisting of all assets, capabilities, competencies, organizational processes, information, and knowledge can be controlled by the company in order to implement the formulated strategy (Sparrow et al., 2014).

Resource Based View theory discusses how a company can achieve sustainable competitive advantage based on the resources they have. Companies can gain sustainable competitive advantage by implementing strategies that exploit their internal strengths, respond to opportunities in the surrounding environment, and neutralize external threats and avoid internal weaknesses (Lockett et al., 2019). The assumption of *the Resource Based View (RBV)* theory is about how a company can compete with other companies, by managing the resources owned by the company concerned according to the company's ability to achieve the company's competitive advantage. A company that is able to utilize its resources well, so that it can create something that is an advantage for the company compared to other companies.

Company resources in RBV are described as tangible resources or intangible resources (Lockett et al., 2019). Tangible resources include: company physical assets such as machinery,

factories, real estate, raw materials, inventory, patents and trademarks, including financial resources and human resources. Meanwhile, intangible resources in the company include knowledge, culture, reputation, customer relationships, and relationships with other stakeholders. In a resource-based view, both are very valuable because they can provide benefits for the company to use resources According to (Jay B. Barney, 2007), RBV considers organizations as a combination of physical resources, human resources and organizational resources. The resources in question are valuable, rare, not perfectly imitable and cannot be replaced by other resources so that they can support the company in realizing competitive advantage. In the case of BPRS, the main resources include technology, human resources, and market knowledge. The relevant key elements of RBV are: 1) Resource Uniqueness: Digital technology as a strategic tool that is difficult for competitors to imitate. 2) Dynamic Capabilities: BPRS's ability to adjust strategies according to changes in the digital environment. 3) Competitive Advantage: The positive impact of technology utilization on performance and competitiveness.

Methodology

Based on problems studied, research This use approach studies qualitative. According to Bogdan & Taylor, (2010), qualitative research is research that produces descriptive data in written form of a word or expression from individuals under consideration. Research qualitatively aiming to explain phenomena as deeply as possible through in-depth data collection. The emphasis is on depth or data quality, compared to data quantity (Semiawan, 2019). Research This use approach is qualitative. Because exploring how technology is utilized by BPRS (Sharia People's Financing Bank) as a strategy for development. Study This is aiming to understand the perspective of perpetrators, such as BPRS management, employees, and customers, related to the experience they have in using technology. Approach qualitative can disclose views, interpretations, and the underlying values strategy. Utilization technology as a tool strategy involves a complex process that is dynamic. Approaching qualitative can help to browse steps, challenges, and innovation in implementation technology in BPRS.

A study was carried out at 6 BPRS branches in North Sumatra with BPRS details as follows:

Table 1. Location Study

No	BPRS Name	Addres
1	BPRS Al- Washliyah	Jl. Gunung Krakatau No.28, Glugur Darat II, Kec. Medan Tim., Kota Medan, Sumatera Utara 20238.
2	BPRS Amanah Bangsa	Jl. Medan - Pematang Siantar, Dolok Ulu, Kec. Tapan Dolok, Kabupaten Simalungun, Sumatera Utara 21154.
3	BPRS Amanah Insan	Jl. Williemi Iskandar Komp. Mmtc Blok Aa-5 Medan Estate, Cita KAB. Deli Serdang
4	BPRS Gebu Prima	Jl. AR. Hakim/ Bakti no.139B, Kota Medan, Provinsi Sumatera Utara.
5	BPRS Puduarta Insani	Jl. Besar Tembung No.13 A, Hutan, Kec. Percut Sei Tuan, Kabupaten Deli Serdang, Sumatera Utara 20371.
6	BPRS Sindanglaya	Jl. Perintis Kemerdekaan No 14 A Kotanopan, Kab. Mandailing Natal, Provinsi Sumatera Utara.

Election informant on study This is done purposefully with consideration of the informant's understanding of the problem that becomes the focus of the study. Amount informant in study This consists of 6 (six) people; in ANP analysis, the number sample/respondent No. is used as a benchmark for validity. Condition valid respondents in ANP are that they are people who are experts in their fields. Because of that, the informant was

selected for expert Islamic economics and practitioners/professionals involved in BPRS, the informant in the study. This is:

Table 2. List of Informants/Respondents in the Study

No	Initials Informant	Work
1	TAY	Dirut BPRS Al- Washliyah
2	RS	Dirut BPRS Amanah Bangsa
3	AW	Dirut BPRS Amanah Insan Cita
4	IP	Dirut BPRS Gebu Prima
5	MW	Dirut BPRS Puduarta Insani
6	FHN	Dirut BPRS Sindanglaya
7	MYN	Dewan Pengawas Syariah
8	AS	Dosen
9	FT	Pakar Digital
10	MS	OJK
11	SS	Praktisi Perbankan Syariah

Furthermore, technical data collection was used in the study. This is observation, interview, and studies documentation. In this matter, this researcher does direct observation of the utilization of technology as a tool for the development of BPRS in North Sumatra in the digital era. Furthermore, interviews were conducted in a way deep (Sujarweni, 2015). Interviews were done with the manager and BPRS staff, the head of the Division of Technology, and related staff with implementation technology, as well as with customers, to understand their experience and perception of customer utilization of technology in BPRS services. Besides that, studies documentation Also done in the study, this is what it includes: document policy and BPRS internal procedures regarding technology use and procedure operational-related standard operating procedures (SOP) implementation technology in services, projects, technology adoption in BPRS, and other related documents. Then method data analysis is used for answer formulation problems. The second and third are qualitative descriptive, while for answer formulation, the first problem uses the qualitative descriptive method with a quantitative approach. Tool analysis was used for the answer formulation problem, namely ANP. Analytic Network Process (ANP) is a generalization of the Analytic Hierarchy Process (AHP), with consideration of dependence between elements in the hierarchy. Lots of problems are not structured in a way that is hierarchical because they involve interaction and dependence on higher-level elements that are tall in the hierarchy on higher-level elements that are low (Jharkharia & Shankar, 2017; Mulawarman, 2023; Saaty & Vargas, 2013)

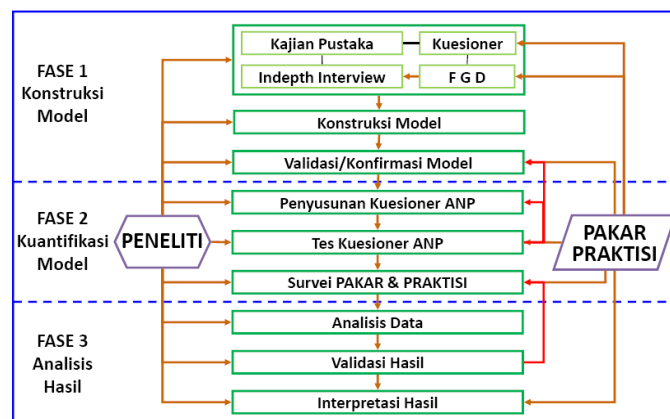


Figure 2. Analytic Network Process (ANP) Stages
Data source: (Mulawarman, 2023)

Step furthermore is synthesizing results. The questionnaire that has been filled out by the respondent is done on the Super Decision software. Before the data is processed, analyzed, and validated, do a test for consistency. Data that is considered consistent if the consistency ratio (CR) is more small from 10% or 0.1. If mark ratio consistency is above 10% or $CR > 1$, then considered inconsistency occurs. Solutions taken are repeat assessments (judgments) of informants or respondents. If the answer given is consistent, then the weight priority element can be used as a base for data analysis and interpretation results.

Weight priorities that have been fulfilled in consistency, then searching for the average value of answers from every respondent. The results have been There is counted Kendall's Coefficient of Concordance value for count mark agreement between respondents (rater agreement). Kendall's Coefficient of Concordance is Wrong One tool used for measuring agreement between a number of giver values (judges) that examine or evaluate a bunch of the given object. After the synthesis results, the final step is to interpret the results to study for a conclusion.

Result and Discussion

Development of BPRS in North Sumatra

The Sharia People's Credit Bank (BPRS) in North Sumatra is part of the government's efforts to increase access to capital for the community, especially among micro, small, and medium enterprises (MSMEs). Since the issuance of regulations supporting the establishment of microfinance institutions, BPRS has begun to grow and develop to meet the financing needs of the community. The establishment of BPRS in North Sumatra began in 1994 with the establishment of PT. BPRS Puduarta Insani. This bank officially started operating on June 18, 1996, after obtaining permission from the Ministry of Finance. At first, this BPRS experienced challenges in gaining public trust and sufficient capital. However, over time, BPRS Puduarta Insani began to show positive growth, with total assets increasing from Rp 1 billion in 1999 to Rp 5 billion at the end of 2003. Despite experiencing significant growth, BPRS in North Sumatra faces various challenges. The problems of low capital and less than optimal governance are the main issues. In addition, the quality of information technology infrastructure and human resources are also factors that influence BPRS performance.

However, with the support of the government and cooperation with other institutions such as Bank Sumut and Perbarindo, many BPRS have succeeded in increasing their operational capacity and expanding their service reach. Currently, there are several BPRS operating in North Sumatra. According to the latest data, North Sumatra has six active BPRS. Although this number is smaller compared to other provinces such as West Sumatra, BPRS in North Sumatra still plays an important role in providing sharia banking and financing services to the community. The growth of BPRS in North Sumatra shows positive developments even though it still faces various challenges. With the support of regulations and cooperation between financial institutions, it is expected that BPRS can continue to grow and provide significant contributions to the local economy and welfare. Currently there are six BPRS in North Sumatra, including: 1) BPRS Alwashliyah, 2) BPRS Amanah Bangsa, 3) BPRS Amanah Insan Cita, 4) BPRS Gebu Prima, 5) BPRS Puduarta Insani, and 6) BPRS Sindang Laya.

Dependency Relationship Between Alternatives and Criteria (Using ANP)

In this study, the ANP method was used with the help of *Super Decision software* in determining the Utilization of Technology as a Strategy Tool for Developing BPRs in North Sumatra through five alternatives, namely 1) development of mobile banking applications, Integration with Finetch Syariah, 3) Implementation of AI for Data Analysis, 4) Digitalization of Financing Processes and 5) Digital risk management systems. The results of the ANP data

analysis using super decision can be seen in the image below:

Here are the priorities.

Icon	Name		Normalized by Cluster	Limiting
No Icon	Meningkatkan Daya Saing BPRS di SUMUT Melalui Pe~		1.00000	0.333333
No Icon	1. Efisiensi Operasional		0.06084	0.020279
No Icon	2. Kemudahan Akses Bagi Nasabah		0.47325	0.157751
No Icon	3. Keamanan Sistem		0.09701	0.032335
No Icon	4. Peningkatan Kepuasan Nasabah		0.23657	0.078855
No Icon	5. Kesesuaian Prinsip Syariah		0.13234	0.044113
No Icon	1. Pengembangan Aplikasi Mobile Banking		0.52212	0.174041
No Icon	2. Integrasi Dengan Fintech Syariah		0.07604	0.025347
No Icon	3. Implementasi AI untuk Analisis Data		0.10889	0.036298
No Icon	4. Digitalisasi Proses Pembiayaan		0.25186	0.083954
No Icon	5. Sistem Manajemen Risiko Digital		0.04108	0.013694

Figure 3. Strategic Priorities to Increase BPRS Competitiveness
Source: Data processed by SuperDecision, 2025

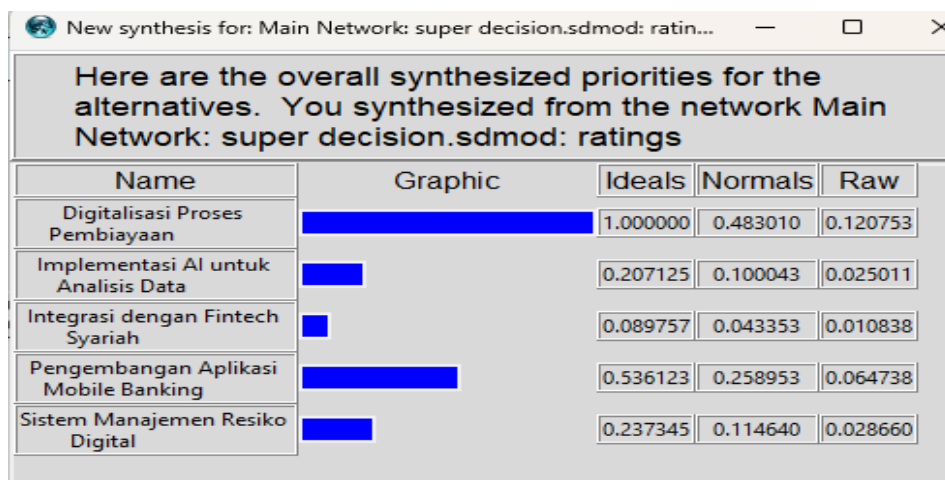
Based on the image above, the strategy that must be used by BPRS in North Sumatra in utilizing technology as a competitive strategy tool can be concluded from the priority analysis in clusters related to technology. The following are strategies that can be carried out by BPRS in North Sumatra

1. Mobile Banking Application Development
The "Mobile Banking Application Development" criterion has the highest value in the technology-related cluster (0.52212 in Normalized by Cluster). Mobile banking applications can be the main solution to improve customer accessibility and convenience, while strengthening BPRS competitiveness. Invest in developing a mobile banking application that is user-friendly, secure, and in accordance with sharia principles. Recommended features: online payments, balance checks, financing simulations, and sharia financial consultations.
2. Digitalization of Financing Process
"Digitization of Financing Process" has a high priority value in technology (0.25186 in Normalized by Cluster), ranking second after mobile banking. This plays a role in accelerating the process of submitting and disbursing financing, which will increase customer satisfaction. By implementing technology to automate financing data processing. Integrating digital systems with risk analysis to make financing decisions faster and more accurately.
3. Ease of Access for Customers
This criteria has a value of 0.47325, indicating a high priority in providing a better user experience. Technology accessibility is a primary need for modern customers. Ensuring digital platforms (applications, websites) are easily accessible and usable by various age groups, especially customers who have just switched to technology-based services. Provide support services, such as chatbots, to help customers understand how to use the

- application.
4. Integration with Sharia Fintech
This criterion has a value of 0.07604, which although lower than mobile banking, is still an important part of technology utilization. This integration enables collaboration with fintech platforms to expand the reach of sharia financial services. By partnering with sharia fintech to provide features such as e-wallets, sharia investments, and sharia-based payment services.
 5. AI Implementation for Data Analysis
Although the value is 0.10889, AI technology for data analysis can support business processes and provide competitive advantages. Using AI to analyze customer behavior, financing application patterns, and risk detection so that it can provide more personalized and effective services.

Based on the explanation of the results of the ANP analysis test using SuperDecision, it can be concluded that the Main Priority that can be done by BPRS is the Development of Mobile Banking Applications to increase competitiveness by providing modern services that are easily accessible. Digitalization of the Financing Process as the next step to increase efficiency and customer satisfaction. Integration with Sharia Fintech to expand the reach of technology-based financial services. Leveraging AI to support data analysis and strengthen technology-based decision making.

Based on the results of ANP data analysis using Superdecision, the alternative priorities are known based on the weight in this study. The following is an explanation of the elements in the image:



Source: Data processed by SuperDecision, 2025

Figure 4. Alternative Priorities Based on ANP Network Analysis Results

The figure above shows that based on the ideal weight obtained, Financing Process Digitalization is the highest priority with an ideal value of 1,000 and a normalization of 0.483. This confirms that digitalization efforts in the financing process are considered the most important to increase efficiency, convenience, and competitiveness. Furthermore, Mobile Banking Application Development is in second place with an ideal value of 0.536, indicating the importance of mobile technology-based innovation to provide more practical and easily accessible services to customers. Implementation of AI for Data Analysis is in third priority with an ideal value of 0.207, indicating that the use of artificial intelligence technology to support data-based decision making also has strategic relevance, although not as important as the previous two priorities. On the other hand, the Digital Risk Management System with an ideal value of 0.237 and Integration with Sharia Fintech with an ideal value of 0.089 have lower

priorities. Although important, both are considered less urgent than core process digitalization efforts such as financing and application development. These results reflect that the main focus of the digitalization strategy should be directed at aspects that can have a direct impact on core services and customer needs, while still paying attention to the development of other supporting elements for the long term. This analysis helps in making more focused and objective strategic decisions in accordance with the priorities that have been set.

Discussion

The criteria for technology utilization in BPRS in North Sumatra determine 5 sub-criteria or the largest factors for increasing BPRS competitiveness. And based on the results of testing carried out on the ANP method with Super Decision *software*, the following criteria sectors were obtained:

Table 3. Priority Table of Factors or Criteria	
Criteria	Rank of Importance
Operational Efficiency	1
System Security	2
Ease of Access for Customers	3
Compliance with Sharia Principles	4
Increasing Customer Satisfaction	5

Source: Data processed by the author, 2025

Based on the table above, it can be explained that: *First*, increasing customer satisfaction with the highest value (5) indicates that increasing customer satisfaction is the main priority in utilizing technology in BPRS. The focus is to ensure that the services provided are in accordance with customer needs and expectations, such as speed, reliability, and convenience. Technology that improves customer experience will be the key to building loyalty and competitiveness. *Second*, the conformity of sharia principles with a value of 4 indicates that technology must support sharia principles in all operational aspects. Compliance with Islamic values, such as avoiding usury and gharar (uncertainty), is essential to maintaining customer trust and the bank's legitimacy as a sharia financial institution.

Third, ease of access for customers, this criterion is in third place with a value of 3, which shows the importance of ease of access for customers through technology. Digital services such as mobile banking, applications, or online platforms allow customers to access banking services anytime and anywhere, increasing convenience and practicality. *Fourth*, system security with a value of 2, although important, this aspect is considered complementary to support secure technology services, preventing threats such as cyber attacks, fraud, and data leaks. Security remains a fundamental element in building customer trust. *Fifth*, operational efficiency, this criterion has the lowest value (1), indicating that operational efficiency is considered less important than other criteria. While efficiency is needed to reduce costs and increase productivity, the primary focus is to ensure satisfaction, safety and sharia principles first.

Referring to the above value acquisition, the main priority of BPRS is increasing customer satisfaction, followed by compliance with sharia principles, ease of access, system security, and finally operational efficiency. Technology development strategies must focus on creating an optimal experience for customers, in line with sharia principles, and supported by ease and security of service.

Based on the results of *interviews* and questionnaires, the alternatives that can be used as the utilization of technology in BPRS in North Sumatra determine the 5 largest sub-alternatives to

increase BPRS competitiveness. And based on the results of testing carried out on the ANP method with Super Decision *software*, the following criteria sectors were obtained:

Table 4. Alternative Priority Table

Alternative	Rank of Importance
Digitalization of Financing Process	5
Mobile Banking Application Development	4
AI Implementation for Data Analysis	3
Digital Risk Management System	2
Integration with sharia fintech	1

Source: Data processed by the author, 2025

The results of the study show that the use of technology by BPRS in North Sumatra has become a key strategy to increase competitiveness in the digital era. Digitalization of the financing process and the development of mobile banking applications are the main focus, with the aim of accelerating services and providing easy access for customers. Technologies such as artificial intelligence (AI) and digital risk management systems have also begun to be implemented, although on a limited scale. However, significant challenges such as limited funds, gaps in the quality of human resources (HR), and resistance to technological change still hinder wider implementation. Expert opinions, such as (Ascarya, 2005), emphasize that the application of technology in Islamic banking must be supported by the development of qualified HR and strategies that are in line with the needs of the modern industry, so that Islamic financial institutions can remain relevant and competitive.

Digitalization is a very important step for Islamic Rural Financing Banks (BPRS) to increase their competitiveness amidst the development of the modern financial industry. With digitalization, BPRS can provide services that are more easily accessible to customers, such as through mobile banking applications or online platforms, thereby increasing customer satisfaction and expanding the reach of services, especially for the younger generation who are more familiar with technology. In addition, digitalization allows for more efficient operational management through automation of manual processes, which not only reduces operational costs but also increases the speed and accuracy of service.

The implementation of digitalization in the financing process at the Sharia People's Financing Bank (BPRS) provides various benefits that are felt by both customers and BPRS itself. The benefits of Digitalization of the Financing Process for Customers are as follows:

1. The financing application process can be done online via an application or digital platform, so customers do not need to come directly to the BPRS office.
2. Financing approval becomes faster because the data verification and analysis process is done automatically.
3. Customers can view application status, financing details, and payment schedules in real-time.
4. Information regarding fees, margins, and applicable sharia provisions becomes clearer.
5. Digitalization makes it easier for customers from various locations, including remote areas, to access financing services without geographical constraints.
6. With easy access, customers who were previously unreachable by formal financial services can feel the benefits.
7. With modern technology such as data encryption, customer transactions become safer from the threat of data leaks or misuse.
8. Customers can arrange submissions, payments, or settlement of financing through the application at any time, without having to adjust office operating hours.

The benefits of digitalizing the financing process for BPRS are as follows:

1. Digitization reduces the need for manual documentation, saving time and resources.

2. Automation of processes such as credit scoring and document management increases staff productivity.
3. With analytics and big data technology, BPRS can conduct more accurate risk analysis to assess customer eligibility and minimize the risk of problematic financing.
4. Other financial institutions that have already used modern technology.
5. With fast, transparent and convenient services, customers tend to be more satisfied and loyal to BPRS.
6. Digitalization can be designed to ensure compliance with sharia principles, such as creating a transparent system and avoiding gharar (uncertainty) or riba.
7. BPRS technology reaches a wider customer segment, including the younger generation who are more familiar with digital technology.

Digitizing the financing process not only provides convenience and satisfaction for customers, but also increases efficiency, competitiveness, and risk management for BPRS. This step is very important for BPRS to survive and thrive in the modern financial era, while maintaining sharia principles in all its operations. Digital technology can also strengthen system security through features such as data encryption and user authentication, which are important for maintaining customer trust. On the other hand, digitalization supports BPRS in competing with other financial institutions, such as commercial banks or fintech, which have already adopted technology.

In the context of sharia, digitalization helps ensure transparency and accountability of financial services, thereby facilitating the fulfillment of sharia principles in every transaction. Furthermore, digitalization opens up opportunities for integration with sharia fintech, which can expand product innovation and improve service distribution. Therefore, digitalization is not just an option, but a strategic necessity for BPRS to remain relevant, competitive, and sustainable in the digital era. Banking digitalization is not directly mentioned in the verses of the Qur'an because the concept of modern technology like this did not exist at the time the revelation was revealed. However, the principles that support the concept of digitalization, such as justice, transparency, efficiency, and ease in muamalah (financial transactions), can be found in several verses of the Qur'an Surah Al-Baqarah Verse 282.

This verse emphasizes the importance of recording transactions to prevent misunderstandings and maintain transparency. Banking digitalization allows all transactions to be recorded automatically, accurately and in an organized manner in an electronic system. This is in accordance with Islamic teachings to record every transaction clearly and honestly. In addition to the above verse, the National Sharia Council of the Indonesian Ulema Council (DSN-MUI) has issued several fatwas that serve as guidelines for the digitalization of Islamic banking in Indonesia. Here are some important related fatwas: Fatwa No. 116/DSN-MUI/IX/2017 concerning Islamic Electronic Money: "Regulating the legal relationship between parties involved in electronic money transactions, including the types of contracts used, such as wadi'ah or qardh contracts between the issuer and the holder of electronic money". Indonesian Ulema Council Objective: Ensure that the use of electronic money is in accordance with sharia principles, avoiding elements of usury, gharar, maysir, and transactions on objects that are forbidden (DSNMUI, 2021).

Fatwa No. 117/DSN-MUI/II/2018 concerning Information Technology-Based Financing Services Based on Sharia Principles: "Establish general provisions of sharia principles in fintech activities, including a variety of products that can be run, such as factoring financing, financing for procurement of goods for online business actors, and community-based financing (DSN-MUI, 2019). The Indonesian Ulema Council Ensures that information

technology-based financing services do not conflict with sharia principles, avoid usury, gharar, maysir, tadlis, dharar, zhulm, and haram.

These fatwas provide a legal basis and guidelines for Islamic financial institutions in implementing digital services that comply with Islamic principles. With this fatwa, it is hoped that the digitalization of Islamic banking can run while still adhering to Islamic values, thereby increasing trust and comfort for customers in using digital-based Islamic banking services.

Based on the basis of the verses of the Qur'an and the DSN-MUI fatwa on banking digitalization, Sharia BPRS must take the following strategic steps to ensure that their operations remain in accordance with sharia principles while increasing competitiveness in the digital era:

1. BPRS must implement digital systems, such as mobile banking applications and internet banking, that support sharia-based transactions. This system must be transparent, secure, and record every transaction clearly in accordance with the principles set out in Al-Baqarah: 282 (the importance of recording transactions) and the DSN-MUI fatwa on sharia electronic money.
2. All digital transactions conducted through the BPRS banking system must be based on clear sharia contracts, such as wadi'ah, qardh, or murabahah. DSN-MUI Fatwa No. 116/2017 concerning Sharia Electronic Money and No. 117/2018 concerning Information Technology-Based Financing Services can be the main guidelines.
3. Digitalization opens up opportunities for better data security, but also poses cyber risks. BPRS must invest in digital security technology to protect customer data and ensure that their systems are safe from potential cybercrime. This is in accordance with the principles of maintaining trust (An-Nisa: 58) and accountability (Al-Isra: 36).
4. BPRS can collaborate with sharia fintech to provide more innovative services, such as technology-based financing or sharia crowdfunding (referring to Fatwa No. 140/2021 on Islamic Securities Crowdfunding). This collaboration can expand the reach of their services.
5. Education is very important to help customers understand the benefits and mechanisms of digital sharia services. It also encourages their trust in the implemented system.
6. With digitalization, BPRS can provide faster, more efficient and affordable services to reach wider segments of society, including those in remote areas.
7. Digitalization must be accompanied by the preparation of internal policies that refer to the DSN-MUI fatwa and sharia regulations, so that every digitalization step remains within the corridor of sharia.

Sharia BPRS must utilize digitalization as a means to expand services, increase efficiency, and maintain customer trust. By implementing digital technology in accordance with sharia principles, BPRS can increase its competitiveness in the banking industry and remain relevant in facing the challenges of the digital era. This is also in line with the basis of the Qur'an and the DSN-MUI fatwa, which emphasizes the importance of justice, transparency and accountability in transactions.

Banking digitalization is in line with the values taught in Islam, such as justice, transparency, and accountability. The above verses emphasize important principles that can be applied through modern technology, including in banking services. Digitalization helps financial institutions to:

1. Record transactions accurately and efficiently.
In Islam, fairness in financial transactions is one of the main principles. The Qur'an, in Surah Al-Baqarah verse 282, encourages clear recording of debts to avoid disputes later. Banking digitization helps make this possible through systems that can record transactions automatically and in real-time. Technologies such as blockchain and digital

databases ensure that every transaction is recorded permanently and accurately, minimizing manual errors, data manipulation, or fraud.

2. Providing transparent services to customers.

Transparency is an important element in Islamic finance. Customers must have a clear understanding of the products or services they use. Digitalization supports transparency by providing platforms such as mobile banking applications or internet banking that allow customers to access information directly, anytime and anywhere. Through this technology, customers can view transaction details, balances, fees charged, and financial reports easily. Thus, digitalization removes communication barriers between banks and customers, ensuring that all information is conveyed openly and honestly.

3. Ensuring fairness and accountability in fund management.

In Islamic finance, fund management must be carried out with the principles of trust and justice. Digitalization helps banks to be more responsible in managing customer funds. Digital audit systems enable tracking of fund activity, thus ensuring that its management is in accordance with sharia principles, such as the prohibition of usury and gharar (uncertainty). In addition, digital technology enables transparent and independently auditable financial reporting, thereby increasing the accountability of financial institutions in the eyes of customers and regulators. This ensures that all parties involved are treated fairly in accordance with Islamic principles.

Of the six BPRS in North Sumatra, none have yet fully digitized their services due to several main factors. First, limited resources are a significant constraint. Most BPRS have limited capital and technological capacity, so investment in developing digital infrastructure is considered a significant burden. Second, the lack of knowledge and skills of human resources in terms of digital technology is also a challenge. Many BPRS employees do not yet have adequate skills to manage digital systems, so the technology adoption process takes longer. Third, a conservative mindset in business management often hinders digital transformation steps. Some BPRS are still comfortable with the conventional system that has been running for a long time, without realizing the great potential offered by digitalization. In addition, limited local regulations and technical support in the North Sumatra region can be another obstacle that slows down the process of technology adoption. As a result, many BPRS have not been able to compete with Islamic banks or other financial institutions that have already adopted digital services. For this reason, synergy is needed between the government, regulators, and BPRS associations to provide financial support, training, and infrastructure to accelerate digital transformation in this sector.

From the perspective of maqasid sharia, the application of technology in BPRS supports the principle of *hifz al-mal* (protecting assets), where technology helps protect customer data security, improve operational efficiency, and reduce potential losses due to manual risks. In addition, the implementation of technology also supports *hifz al-din* (protecting religion) by ensuring compliance with sharia principles in every operational process. This is relevant to the word of Allah in Surah Al-Baqarah (2:282) which states the importance of recording financial transactions in an orderly and safe manner, which can now be realized through a digital system. The Prophet Muhammad SAW also said: "*Give the worker's wages before his sweat dries*" (HR. Ibn Majah), which in this context can be interpreted as an obligation to provide fast and efficient service to customers through technology.

BPRS in Sumatra face various obstacles in implementing banking digitalization. One of the main challenges is limited capital and financial resources, as digitalization requires large investments in software, hardware and other technological infrastructure. In addition, the lack of knowledge and skills of human resources is a significant obstacle, where BPRS employees

often do not have adequate competence to operate digital systems. A mindset that is still oriented towards manual or conventional work methods is also an obstacle, because many managers feel comfortable with traditional methods and are doubtful about the benefits of digital transformation. Inadequate technological infrastructure, especially in remote areas in Sumatra, also makes it difficult to implement reliable digital services. On the other hand, the lack of local regulatory support and minimal collaboration with fintech also slow down the adoption of digital technology. BPRS customers, the majority of whom come from the small and micro business sector, are often not familiar with digital services, so BPRS are worried that these services will not be in demand. Fear of cybersecurity threats, such as hacking or data leaks, is also the reason why some BPRS are not yet confident in switching to a digital system.

To overcome these obstacles, several solutions can be implemented. First, the government and regulators, such as OJK, can provide subsidies or financial incentives to BPRS to help them overcome the initial investment costs in digitalization. Second, training and human resource capacity development programs need to be encouraged, in collaboration with educational institutions or technology companies, to improve the knowledge and skills of BPRS employees related to digital technology. Third, BPRS can start collaborating with fintech to provide more affordable and ready-to-use digital platforms. Fourth, the government and internet service providers must ensure that technological infrastructure, such as stable internet access, is available throughout the region, including remote areas. In addition, education for customers on the benefits and how to use digital services must be strengthened to increase technology adoption at the consumer level. Finally, BPRS needs to adopt a reliable digital security system to protect customer data and prevent cyber threats. With these steps, BPRS in Sumatra can accelerate the digitalization process, improve operational efficiency, and provide better services to their customers.

The BPR and BPRS industry will always face challenges, both global and domestic challenges originating from external sources, as well as structural challenges originating from within BPR and BPRS. The increasingly massive adoption of information technology in the financial sector has an impact on changes in behavior, expectations, and needs of the community for financial services from banks, including BPR and BPRS. In addition, BPR and BPRS also face increasingly tight competition, especially in the distribution of credit or financing to the micro and small segments, which is accompanied by the potential for increased credit or financing risks.

Along with the enactment of Law No. 4 of 2023 concerning the Development and Strengthening of the Financial Sector (UU P2SK), BPR and BPRS have gained wider space to develop through institutional strengthening, as well as expanding the business activities and activities of BPR and BPRS. The expansion of business activities and activities of BPR and BPRS is certainly not free from various accompanying risks. For this reason, BPR and BPRS are expected to have a stronger structure to be able to absorb the potential risks so that they can take advantage of the opportunities from the P2SK Law to develop further.

RP2B 2024-2027 contains the direction of development and structural strengthening as a response to the conditions and challenges faced by the BPR and BPRS industry in the future, both from the internal and external sides of the BPR and BPRS industry. In general, RP2B consists of 4 (four) main pillars, namely:

1. Strengthening structure and competitiveness,
2. Acceleration of digitalization of BPR and BPRS,
3. Strengthening the role of BPR and BPRS in their regions, and
4. Strengthening regulation, licensing and supervision.

As well as four supporting devices (*enablers*) consisting of leadership and change management, quantity and quality of Human Resources (HR), information Technology Infrastructure, and collaboration and cooperation.

RP2B as a policy roadmap for BPR and BPRS has a primary focus on efforts to improve fundamental issues in BPR and BPRS, so that the BPR and BPRS industry is able to take advantage of opportunities while managing risks with the expansion of BPR and BPRS business activities and activities as regulated in Law Number 4 of 2023 concerning the Development and Strengthening of the Financial Sector (UU P2SK). The primary focus is outlined in the *quick wins* policy, namely through strengthening capital and accelerating consolidation for the BPR and BPRS industry, and then continuing with strengthening the implementation of good governance to support BPR and BPRS businesses with integrity and sustainability.

Previous research Shabri, (2022) entitled "Digital Transformation of the Indonesian Islamic Banking Industry" found that digital transformation is a strategic priority to increase the competitiveness of Islamic banks, resulting in an increase in the number of customers and assets. Several Islamic commercial banks have provided digital services, and there are Islamic banks that operate fully digitally. Research Muzdalipah & Mahmudi, (2023) entitled "Digitization of Islamic Banking: Use of Bsi *Mobile* in the Millennial Generation Era in Yogyakarta City" found that Islamic banking in the 5.0 era faces great opportunities to develop through digitalization, but is also faced with significant challenges. This study emphasizes the importance of adapting technology to compete with other financial institutions, as well as the need to overcome internal and external challenges in the digital transformation process. Research Muhammad Ismail Sha Maulana et al., (2022) entitled "The Development of Islamic Banking in the Digitalization Era" found in his research that Islamic banking can have very big opportunities because Islamic banking also has factual and undeniable appeal. There are several attractions in Islamic banking, such as: non-discriminatory, emphasizing inflation, resistant to monetary turmoil, togetherness, siding with customers, siding with the people's economy, strong emotional ties, psychological relaxation, soft loans, increasing production, facilitating the flow of goods, and transparency.

Research Rozi, (2024) entitled "Transformation of the Role and Challenges of the Islamic Banking Industry in Facing the Development of Digitalization in the 5.0 Era" found in its research that Islamic banking has become a facilitator of sharia-based financial inclusion through the use of advanced technologies such as AI, Big Data, and IoT. The challenges faced in maintaining sharia principles while adapting to digital developments are also emphasized.

Research A'yun & Dwi Aprilia Putri, 2022; Trimulyana, 2024; Yasin et al., 2021 this study discusses the importance of digital transformation in Islamic banking to ensure significant benefits for the Muslim community. It is emphasized that digitalization must be in line with sharia principles and provide easy access to financial services. Previous studies have shown that digitalization in Islamic banking, including BPRS, has great potential to increase operational efficiency, competitiveness, and customer satisfaction. The digitalization carried out by BPRS is a strategic step that not only supports the sustainability of BPRS, but is also in line with OJK regulations and directions. Through digitalization, BPRS can improve efficiency, expand service access, ensure data security, and contribute to broader financial inclusion. By following the OJK digital roadmap, BPRS is expected to play an important role in the development of the sharia financial sector in Indonesia.

This research has implications for the following sectors:

1. Implications for Academics

This research provides an important contribution to the literature on digital transformation in Islamic financial institutions, especially BPRS. By identifying obstacles and solutions to digitalization implementation, this study opens up opportunities for further exploration of technology development strategies in the Islamic banking sector. Academics can use these results as a basis for developing a more effective and sharia-compliant digitalization model or framework. In addition, this study can be a reference for studying the impact of

digitalization on financial performance, customer satisfaction, or sharia financial inclusion in other regions.

2. Implications for Society

This research provides direct benefits to the community by providing an overview of the importance of digital services in facilitating access to Islamic banking products and services. With digitalization, people, especially small and micro business actors, can more easily access financing, savings, or other banking services without being limited by distance and time. This also encourages increased digital literacy among the community, so that they are more confident in utilizing technology in their daily lives.

3. Implications for BPRS

For BPRS, this study provides strategic insights into the steps that need to be taken to overcome obstacles in digitalization, such as investing in technology infrastructure, increasing human resource capacity, and collaborating with fintech. This study also highlights the importance of developing digital-based services to improve competitiveness, operational efficiency, and customer satisfaction. In addition, the recommendations provided can be a guide for BPRS to design digitalization policies and strategies that are in accordance with internal needs and customer expectations.

The implications of this study indicate that digitalization is not only a challenge, but also a great opportunity to improve Islamic financial inclusion in Sumatra. This study opens up space for further development in various aspects, both in academic, social, and practical contexts to encourage the progress of BPRS and Islamic banking services in Indonesia.

Conclusion

The use of technology in six BPRS in North Sumatra shows significant variation, with some having started to adopt digital technology such as mobile banking applications, while others are still in the early stages of digital transformation. Some of the technologies that are used are mobile banking apps, digital risk management systems, and integration with sharia fintech. However, the level of adoption depends on each BPRS's budget and strategy. The application of this technology aims to improve operational efficiency, accelerate the financing process, and provide digital services that are more easily accessible to customers. However, the implementation has not been evenly distributed due to challenges such as limited capital, inadequate technological infrastructure, lack of HR skills, resistance to change, cybersecurity threats, and regulatory constraints and external support. The quality of HR is a crucial factor in supporting the adoption of new technologies, so training and development of HR digital competencies are urgent needs.

However, the application of technology has been proven to improve operational efficiency and service quality and reduce administrative costs, which ultimately contributes to improving financial performance in several BPRS. Digital technology also helps increase third-party funds (DPK) and financing distribution thanks to the ease of access to digital services that attract more customers, as well as increasing customer satisfaction through ease of access, speed of service, and transparency. To create more innovative and competitive services, BPRS develops strategies such as developing mobile banking applications, digitizing financing processes, and collaborating with fintech. However, collaboration with sharia fintech to expand service coverage, increase financial inclusion, and offer technology-based products that comply with sharia principles has not been carried out optimally.

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