

IMPLEMENTATION OF DYNAMIC CAPABILITIES TO ADDRESS DIGITAL TRANSFORMATION AND ENHANCE INNOVATION IN ISLAMIC MICROFINANCE INSTITUTIONS

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Abstract: Islamic Microfinance Institutions (IMFIs), particularly Baitul Maal wa Tamwil (BMT), face significant challenges in enhancing competitiveness and innovation amid digital transformation. This case study explores how the dynamic capabilities of sensing, seizing, and transforming facilitate digitalization adoption across three BMTs in Yogyakarta. Findings indicate that digital sensing enables BMTs to identify opportunities through community engagement and market research, digital seizing facilitates the incremental adoption of digital financial technologies, and digital transforming drives organizational restructuring to improve digital readiness. Major obstacles include limited digital literacy, resistance to change, and resource constraints. This study highlights the importance of innovation strategies, collaboration, and human resource preparedness in ensuring successful digital transformation within this sector.

Keywords: Digital transformation, dynamic capabilities, innovation, BMT, Islamic microfinance.

Introduction

Digitalization, specifically referring to the process of converting analog information into digital formats, has become a fundamental cornerstone in the digital transformation across various sectors, including Islamic microfinance. This process enables efficient data management and standardization while creating opportunities for implementing digital technologies to enhance business processes and outcomes. Digital technology, defined as the integration of information technology, computing, communication, and connectivity (Bharadwaj et al., 2013), constitutes the core of this transformation.

In the business sector, the adoption of digital technologies drives operational efficiency, business model innovation, and customer engagement (Tretyakova et al., 2024). This necessitates Islamic microfinance institutions such as Baitul Maal wa Tamwil (BMT) to transform in order to maintain competitiveness, particularly when facing disruption from fintech companies and conventional banks offering more innovative digital services.

Digitalization in the financial sector has transformed traditional methods and business models, introducing innovations that enhance efficiency, accuracy, and service quality (Marino-Romero & Folgado-Fernández, 2024). BMTs have significant opportunities to leverage digital technologies to streamline business processes while expanding service reach. The shift toward a digital economy underscores the importance of digital transformation in supporting economic growth and competitiveness (Junaedi, 2020). Consequently, conventional business models must be updated to anticipate and capitalize on opportunities presented by digital technologies (Titis Sri Wulan et al., 2024). Digital transformation impacts organizational restructuring, creating more flexible and collaborative environments while fostering a culture of innovation that enables organizations to become more adaptive to technological changes (Olorunyomi Stephen Joel et al., 2024). Additionally, digitalization drives changes in business strategies, including enhancing customer experience and strengthening innovation capabilities (Arif Mustofa & Ansori, 2024).

Entering the Industry 4.0 era, BMTs are compelled to adopt digitalization to remain competitive by leveraging information technologies such as e-banking (Tambunan & Padli Nasution, 2022). This transformation extends

beyond the mere transition to digital platforms, representing a paradigm shift from product-centric to customer-centric approaches (Castrawijaya & Wirianisa, 2024). BMTs, as Islamic microfinance institutions with a mission to empower low-income communities, now face intense competition from fintech companies. Consequently, BMTs must establish digitalization as a key driver for enhancing service delivery and customer reach, including developing strategic partnerships with Islamic fintech providers to strengthen competitive positioning (Gomber et al., 2018).

Digital transformation encompasses not only product innovation but also process innovation, involving significant changes in production and service delivery methods (Andika et al., 2020). BMTs need to adopt management information systems and integrate human elements with technology to develop digital ecosystems that maintain emotional connections with members (Teichert, 2019). Fintech, as an innovator in the financial sector, offers solutions that transform conventional value chains by emphasizing service efficiency and convenience (Andika et al., 2020). However, successful digital transformation requires fundamental changes in mindset, strategy, and organizational culture (D. Teece et al., 2016).

Consequently, BMTs must develop dynamic capabilities, defined as the ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing and uncertain environments (Knight, 1921). These capabilities enable organizations not only to adapt but also to navigate uncertainties arising from technological opportunities and market dynamics. In this context, strategic decision-making becomes significantly more critical than mere operational efficiency (Weill & Woerner, 2015). Entrepreneurial management and long-term vision are crucial in supporting sustainable digital transformation processes. Although the vital role of dynamic capabilities in digital transformation has been acknowledged, understanding of how to develop and manage these capabilities remains limited, particularly in Islamic microfinance institutions. Yet, continuous innovation is the key to competitive advantage in digital markets that are constantly evolving due to technological disruption and social dynamics (Thurik et al., 2007). For BMTs, innovation extends beyond creating new products or services to improving business processes with digital technology support.

However, the primary challenge for BMTs is resource constraints, both financial and human. Innovation requires substantial investment in technology, training, and capacity development, which is often beyond the reach of small to medium-scale BMTs (Kotter, 2009). Additionally, limited digital capacity constitutes a significant barrier to adopting new technologies (Bharadwaj et al., 2013). Organizational cultures that insufficiently support innovation, characterized by resistance to change and rigid management practices, further exacerbate challenges in the digital transformation process (D. J. Teece et al., 1997). To survive and thrive, BMTs must establish inclusive innovation cultures, enhance digital capacity through human resource development, and forge strategic partnerships to overcome resource limitations. This approach will enable BMTs to maintain relevance in the digital era while delivering added value to communities. Future research should further explore the roles of organizational culture, leadership, and other external contexts in supporting the development of dynamic capabilities in BMTs during the digital era.

Literature Review

Dynamic Capabilities

Dynamic capabilities refer to an organization's capacity to adapt to changes in the business environment through the integration, development, and reconfiguration of internal and external resources. This capability enables organizations to survive and thrive in dynamic conditions by implementing three core processes: sensing (identifying opportunities and threats), seizing (leveraging existing opportunities), and transforming (transforming the organization to maintain competitiveness) (D. J. Teece et al., 1997).

In the context of digital transformation, dynamic capabilities emerge as a critical factor for Baitul Maal wa Tamwil (BMT) to enhance its competitive advantage. Through digital sensing, BMT can more accurately identify relevant technological developments and comprehend market needs. Subsequently, digital seizing enables BMT to promptly capitalize on digital opportunities, such as developing technology-based financial products. Conversely, digital transforming plays a crucial role in ensuring organizational readiness to address changes by conducting internal restructuring, expanding market reach, and developing digital infrastructure that aligns with industry

demands.

Dynamic Capabilities as a Means of Sustainability Amidst Digital Transformation

Dynamic capabilities are frequently regarded as a critical factor in organizational success, enabling rapid and effective responses to technological changes and market dynamics. This concept refers to an organization's capacity to create, develop, and innovate in resource management (Carolyn Marx et al., 2021). Moreover, dynamic capabilities exhibit a close relationship with business model innovation, reflecting the process of integrating, developing, and reconfiguring internal competencies within an organization (D. J. Teece, 2018).

In the context of digital transformation, dynamic capabilities emerge as a crucial element in managing internal and external resources that support organizational change. Structures supporting dynamic capabilities enable organizations to adapt to increasingly digital and competitive environments (Carolyn Marx et al., 2021). These capabilities also provide a foundation for companies to achieve digital maturity through the design and maintenance of adaptive mechanisms that can track the continuously evolving waves of digital innovation (Vial, 2019). Consequently, digital transformation management must prioritize the development of dynamic capabilities aligned with emerging technological landscapes, increasingly disruptive competition, and unpredictable consumer behavior patterns. As illustrated in Figure 1, the microFoundations of dynamic capabilities targeted at digital transformation are synthesized, considering the scope of emerging technologies (Warner & Wäger, 2019).

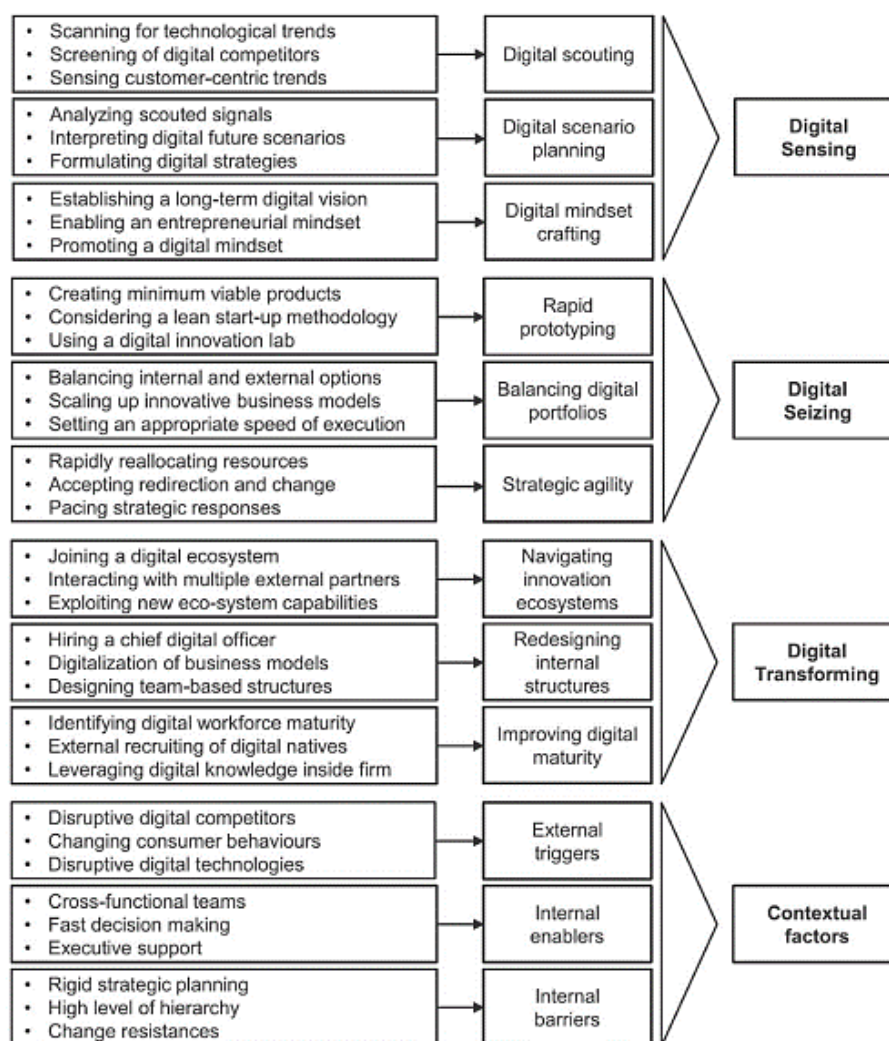


Figure 1. Dynamic Capabilities for Digital Transformation

Source: (Warner & Wäger, 2019)

The three-level process of dynamic capabilities in digital transformation encompasses digital sensing, digital seizing, and digital transforming. These processes are categorized based on their roles in supporting the digital transformation environment. This model serves as a complementary framework to the original concept and is designed to assist organizations in developing business model innovations that can adapt to emerging demands within the continuously evolving digital ecosystem.

Strategic Innovation and Adaptation as Keys to Addressing Emerging Market Challenges

In this context, it is crucial for Baitul Maal wa Tamwil (BMT) to focus not only on financial product and service innovation but also on strengthening human resource capacities as the primary support for strategy implementation. Dynamic capabilities become critical in driving strategic innovation and adaptation, enabling organizations to reconfigure their resource base to maintain competitive advantage (Land et al., 2022). For BMT, this encompasses the continuous development of adaptive capacities to respond to economic environmental dynamics and changing consumer needs, while simultaneously leveraging dynamic capabilities in Islamic financial business model and product innovation.

Continuous training and capacity-building programs for BMT human resources are essential to deepen understanding of Shariah principles and effective risk management practices. These efforts are anticipated to drive overall institutional performance improvement (Musfiroh et al., 2023). Furthermore, collaboration with local communities and strategic organizations can create synergies in micro-enterprise empowerment, reduce societal dependence on informal financial institutions, and strengthen trust in the Islamic financial system (Nurfathonah, 2023). Through optimizing dynamic capabilities, which encompass opportunity and threat sensing processes, opportunity exploitation, and resource reconstruction, BMT can maintain competitive positioning amidst increasingly complex market dynamics (Pitelis, 2022; Yudistira et al., 2022).

A holistic approach that integrates human resource development, dynamic capability-based innovation, and community collaboration not only strengthens the market position of Baitul Maal wa Tamwil (BMT) but also provides a significant contribution to enhancing economic stability at the grassroots level. Consequently, dynamic capabilities become increasingly essential in managing assets and creating new capabilities required for BMT to adapt in continuously evolving environments (Ahmadi & Arndt, 2022).

Research Method

This study employs a multiple case study approach utilizing qualitative methods, focusing on analyzing the application of dynamic capabilities in addressing digital transformation and promoting innovation across three Baitul Maal wa Tamwil (BMT) institutions in Yogyakarta: BMT UMY (Case Study A), BMT At-Ta'awun (Case Study B), and BMT Mitra Usaha Ummat (Case Study C). The case study method was selected because it enables researchers to examine phenomena in-depth within specific organizational contexts, considering background, current conditions, and ongoing dynamics (Yin, 2009). According to (Yin, 2009), several crucial aspects determine research quality in case studies, including the primary research objective, population or sample selection, case selection criteria, applied research methods, data collection techniques, and data analysis strategies. Consequently, this research ensures that each stage, from subject determination to findings analysis, is systematically designed in accordance with established scientific standards.

The research design utilizes a multiple case study approach to obtain a more comprehensive understanding of the investigated phenomenon. (Eisenhardt, 2021) emphasizes that employing multiple case studies can minimize the emergence of overly simplistic alternative theories, thereby strengthening research finding validity. This approach allows researchers to conduct inter-case comparisons to identify significant patterns and understand the distinct contexts of each microfinance institution. (Volmar & Eisenhardt, 2020) explain that multiple case studies are particularly relevant in theory-development-oriented research. This process involves a series of systematic stages, from case selection and data collection to findings analysis, aimed at generating more robust theoretical generalizations. The comparative case study in this research is expected to provide significant contributions in enriching understanding about the application of dynamic capabilities in addressing digitalization challenges and promoting innovation in the Islamic microfinance sector.

Data collection in this research was conducted through in-depth interviews with General Managers, Managers, and Support System Coordinators, complemented by direct observation and document analysis. Research questions were formulated in "how" and "why" formats to explore causal relationships within the studied phenomena (Meredith, 1998). Moreover, data triangulation techniques were implemented to enhance research finding validity by comparing results from multiple data sources. The application of triangulation aims to reduce potential biases and limitations that might emerge when relying solely on a single method or data source (Yin, 2016).

As a foundational basis for analysis, individual case study profiles are presented to clarify the organizational context, business scale, market targets, and digitalization conditions of the three BMT institutions. Presenting these profiles is crucial for understanding the background and diversity of BMT characteristics that influence digital transformation strategies and implementation. Table 3.1 below summarizes the key information from the three case studies examined.

Tabel 3.1. Profil Studi Kasus

Attribute	Case Study A	Case Study B	Case Study C
Establishment Year	2011	2004	1995
Organizational Type	Islamic Microfinance Institution with Two Primary Functions: Social Sector: Manages social funds (zakat, infaq, sadaqah, and waqf), Distributes social funds to mustahik (zakat recipients), Supports community empowerment activities. Commercial Sector: Finances micro, small, and medium enterprises (MSMEs) based on Shariah principles, provides savings and financing services with Shariah contracts including murabahah, mudharabah, musyarakah, and ijarah.		
Data Collection Methods	Observation, Semi-structured Interviews, Public Data, social media, and Website		
Organizational Size	Medium-Large	Small-Medium	Small-Medium
Market Target	UMY Students, Academic Community, General Public in Yogyakarta.	University Students, UII Academic Community, Alumni, Expanding beyond campus.	MSMEs, Local Cooperative Members in Sleman.
Digitalization Status	Most Mature, Mobile Application, Virtual Account, Vendor Collaboration, Full Digital Integration	In Development, Digital Community Application, Focus on social media, Student Internship Engagement	Limited, E-BMT, Online Payment Services, Minimal Digital Integration in Financing
Informant	Hasan Ismail (Support System Coordinator) Face to face	Mochammad Rizal Nasrullah (Manager)	Agus Sulistiyono (General Manager)
Tenure	< 1 Year	10 Years	10 Years
Interview Duration	1 Hour 53 Minutes	1 Hour 19 Minutes	2 Hours 28 Minutes
Interview Topics	Elemen-elemen kapabilitas dinamis dan transformasi digital		

Source: Processed Data, 2024

Data analysis was conducted systematically through within-case analysis to identify specific characteristics of each BMT in the context of digitalization adoption and dynamic capabilities implementation. Subsequently, cross-case analysis was performed to uncover common patterns and strategic differences across cases in addressing digital transformation. This approach generates a comprehensive understanding of BMT internal dynamics and provides empirical contributions to Islamic Microfinance Institutions (LKMS) in effectively responding to digitalization challenges.

Results and Discussion

Empirical Findings: Within-Case Analysis

This section presents an in-depth analysis of each case study to examine how dynamic capabilities are applied in addressing digital transformation. The analysis focuses on three primary dimensions digital sensing, digital seizing, and digital transforming to illustrate the strategies, responses, and challenges encountered by each institution during the digital innovation process.

Case Study A

Case Study A demonstrates the most advanced digital sensing capabilities compared to the other two case studies. The institution actively conducts technology scanning through internal market research, partner needs surveys, and observations of digital financial industry trends. They have established a comprehensive digitalization vision targeted for full implementation by 2025. The primary sensing focus is the development of branchless and paperless virtual account (VA) services, responding to emerging digital Shariah market demands.

In terms of digital seizing, Case Study A exhibits robust capabilities through the launch of the BMT UMY Mobile application. This application continues to be developed using agile methodologies aligned with partner requirements. The organization implements a lean start-up approach through vendor collaborations to accelerate innovation while minimizing development costs. Additionally, Case A demonstrates the ability to rapidly allocate resources for expanding digital services, including the implementation of digital donation features and inter-bank transfers. The digitalization business model has been effectively implemented through VA services and digital payment systems.

Regarding digital transforming, Case Study A has also developed strong organizational capabilities. While not yet establishing a Chief Digital Officer (CDO) position, the institution maintains an internal team that regularly receives training and undergoes evaluation for digital service management. They have successfully leveraged the digital ecosystem by establishing partnerships with vendors for VA and inter-bank transfer services. The organizational culture is progressively being oriented toward change-readiness, although challenges such as vendor dependency and operational burdens remain significant considerations in the ongoing digital transformation process.

Case Study B

Case Study B is initiating digital sensing capabilities by leveraging campus networks and intern students to identify technological trends and market behaviors. Social media is utilized as a digital channel to reach younger market segments. However, the sensing approach remains unstructured due to the absence of a systematic market data collection and analysis system. Nevertheless, these initial steps reflect the organization's emerging awareness of market dynamics and digital financial technology developments.

In the domain of digital seizing, Case Study B demonstrates relatively progressive efforts through plans to develop a community-based digital application. The organization has begun adopting a lean start-up approach by utilizing student resources to minimize costs in digital application design. The primary focus is currently on building a Minimum Viable Product (MVP) to test the digital market among younger generations. Despite these efforts, the designed digital business model remains in the planning stage and has not been fully implemented.

Regarding digital transforming, Case Study B has initiated light organizational restructuring by integrating intern students into the digitalization team. The institution has also begun establishing collaborations with external vendors to support future digital application development plans. However, the organizational structure remains centralized and not entirely flexible in supporting required changes. Nonetheless, there is a management commitment to driving digital transformation as part of the organization's long-term strategic approach.

Case Study C

Case Study C demonstrates a predominantly passive digital sensing process. The organization primarily relies on national associations such as the Indonesian BMT Association (PBMTI) to obtain information and access to the latest technologies. Digital scouting activities tend to be reactive, waiting for vendor and association proposals without actively monitoring relevant technological developments. Although the institution has adopted e-BMT

applications and Payment Point Online Bank (PPOB) services to enhance transaction capabilities, customer data collection and analysis processes remain poorly structured. This approach creates difficulties in rapidly and accurately interpreting market needs and changes.

In terms of digital seizing, Case Study C's capabilities remain largely reactive. Innovation is limited to basic digital service adoption, such as PPOB, without active efforts to design or test new digital products. Digital business model development is minimal, with the primary focus on simple transaction services that are not integrated into core Shariah financing operations. Limited human resources and infrastructure represent the primary challenges impeding execution speed and willingness to experiment with novel digital services.

Regarding digital transforming, the digital transformation undertaken by Case Study C remains extremely constrained. The organizational structure has not undergone significant modifications to support comprehensive digitalization. There are no initiatives for digital workforce recruitment or intensive training to enhance technological human resource competencies. Ecosystem digital utilization is also extremely limited, extending only to basic services without integration into Shariah financing systems. This condition indicates that Case Study C remains in the initial stages of developing the transforming capabilities necessary to drive more comprehensive and sustainable digital innovation.

Cross-Case Analysis: Identifying Pattern Similarities Across Cases

The cross-case analysis aims to explore patterns, similarities, and differences among the various cases analyzed in the previous chapter. This method enables researchers to obtain a more profound understanding of the studied phenomenon through comparative analysis of outcomes from each case. The primary objective of this analysis is to present a comprehensive interpretation of research findings and address research questions by connecting the various variables emerging in each case. The cross-case approach is employed to investigate the interrelationships between components influencing research outcomes across different contextual settings.

Sensing Dimension

Table 4.1. Sensing Dimensions Comparison

Aspect	Case Study A	Case Study B	Case Study C
Scanning for technological trends	Actively monitors technological trends such as fintech and Shariah-based financial service digitalization.	Explores digital trends to reach younger demographics through social media and planned applications.	Utilizes national associations to obtain latest financial technology information.
Screening of digital competitors	Monitors digital competitors, including other Islamic financial institutions on social media.	Uses competitor analysis of BMT UMY and Sidogiri as references for digital service development.	Identifies competitors such as fellow BMTs, rural banks, and other financial institutions for comparison.
Sensing customer centric trends	Understands customer needs through digital services like BMT UMY Mobile application.	Focuses on young demographic (under 40 years) and develops programs like student and university savings.	Service focus remains manual due to predominantly lower-middle-class membership.
Analyzing scouted signals	Uses partner profile data for digital needs and market preference analysis.	Begins analyzing market needs based on digital trends and member requirements.	Utilizes association input to understand digitalization needs in operational systems.
Interpreting digital future scenarios	Targets full digitalization (paperless) with internal server and system by 2025.	Develops plans to launch application by 2025 as a strategic digitalization step.	Lacks strategic planning for technology-based future scenarios.

Formulating digital strategies	Possesses digital strategy to reach broader markets without opening multiple branches.	Has long-term strategic plan to reach wider segments through digitalization.	No formal digital strategy developed by management.
Establishing a long-term digital vision	Focused on becoming "branchless" with virtual account-based technology services.	Aims to enhance digital services through application and social media approach.	Digital transformation limited to basic services without clear long-term vision.
Enabling an entrepreneurial mindset	Motivates innovation by providing incentives and monthly performance targets for digital team.	Involves intern students as innovators to support content and digitalization development.	No specific programs to develop innovation mindset among human resources.
Promoting a digital mindset	Conducts internal training and periodic human resource evaluation to enhance digital readiness.	Provides in-house training to improve digital capabilities of internal team.	Begins providing basic technology training to staff, though not yet optimal.

Source: Processed data, 2024.

Based on the cross-case analysis of the Sensing Dimension (Table 4.1.), Case Study A demonstrates the most superior capabilities compared to Case Studies B and C. Case Study A actively monitors technological developments, including fintech and the digitalization of Islamic financial services, while leveraging data from internal applications and surveys to understand member needs. This superiority is reflected in the vision of full digitalization targeted for achievement by 2025 through the development of branchless and paperless virtual account services.

Case Study B is still in the early stages, relying on academic collaborations and student internships to reach the youth segment through social media and plans for developing a community application. Although it does not yet have a structured data system, digitalization initiatives are being pioneered as part of a long-term strategy. Conversely, Case Study C exhibits the weakest sensing capabilities. Reliance on national associations without an independent strategy renders the sensing process suboptimal. Services remain manual, focusing on the lower-middle segment without a clear digital transformation vision, thus weakening the ability to respond to opportunities and threats in the digital era.

Seizing Dimension

Tabel 4.2. Seizing Dimensions Comparison

Aspect	Case Study A	Case Study B	Case Study C
Creating minimum viable products	Launched BMT UMY Mobile application with features continuously developed based on partner needs.	Focused on social media and plans for application development as MVP to reach customers.	Uses simple applications such as PPOB to support member transaction services.
Considering a lean start-up methodology	Utilizes vendor collaborations to reduce development costs and increase agility.	Adopts a cost-effective approach through student internships and gradual application evaluation.	Adopts technology through associations to reduce internal development costs.
Using a digital innovation lab	Does not have a dedicated laboratory; innovation is carried out through the	Does not yet have a dedicated laboratory facility to test digital innovations.	Lacks an innovation laboratory facility to test new digital services or products.

	Support System (SS) team.		
Balancing internal and external options	Internally manages social media, while vendors are used for application development.	Uses a combination of internal human resources and external support, such as application developers.	Utilizes a combination of internal (staff) and external (associations) to run digital services.
Scaling up innovative business models	Digitalization business model applied to VA payment services and interbank transfers.	Digitalization business model not yet fully implemented.	Digitalization business model not yet comprehensively applied.
Setting an appropriate speed of execution	Involves vendors for accelerated implementation of new ideas such as digital donation features.	Determines a gradual digitalization plan based on market capacity and needs.	Technology adoption process is slow due to limited resources and internal resistance.
Rapidly reallocating resources	Shifted focus from traditional markets to wider markets through digitalization since 2018.	Not yet able to allocate resources rapidly due to limited human resources.	No adaptive resource allocation mechanism to support digitalization.
Accepting redirection and change	Flexible in adapting new services, such as priority partner services currently being designed.	Management and board fully support digitalization and continue to encourage service development.	Resistance to change is quite high, especially from staff who lack technological understanding.
Pacing strategic responses	Rapid response to market trends with performance-based innovation incentives for teams.	Starting to respond to market needs with a digitalization strategy based on young customer needs.	No formal mechanism to respond to opportunities or threats strategically.

Source: Processed data, 2024

Based on the cross-case analysis of the Seizing Dimension (Table 4.2), Case Study A demonstrates the most superior capabilities compared to Case Studies B and C. Case Study A successfully developed a minimum viable product (MVP) in the form of the BMT UMY Mobile application, which is continuously refined according to member needs. The virtual account payment and interbank transfer features exhibit flexibility in responding to market demands. The application of the lean start-up methodology and collaboration with vendors accelerate innovation while reducing development costs. Since 2018, they have also shifted most services from traditional markets to digital platforms.

Case Study B is still in the early stages. Seizing efforts are focused on social media and plans for developing a digital application targeted for release in 2025. Intern support is utilized for content production, but limited human resources hinder rapid execution. Despite management's commitment to digitalization, resource allocation remains limited.

Meanwhile, Case Study C exhibits the weakest seizing capabilities. The use of technology is still limited to basic services such as PPOB, which have not been integrated with a digital business model. The technology adoption process is slow due to internal resistance and resource limitations, making it difficult for them to strategically respond to market opportunities.

Transforming Dimension

Tabel 4.3. Transforming Dimensions Comparison

Aspect	Case Study A	Case Study B	Case Study C
Joining a digital ecosystem	Collaborates with vendors to provide services such as VA and interbank transfers.	Partners with application developers to support digital service migration.	Actively participates in national associations to share technology and innovation with other BMTs.
Interacting with multiple external partners	Cooperates with fintech institutions and BMT associations for technology integration.	Collaborates with external developers for website management and application planning.	Partners with PPOB providers to support member digital transactions.
Exploiting new ecosystem capabilities	Utilizes collaborations to develop innovative digital features such as post-transaction donations.	Leverages social media platforms and simple digital systems to reach young markets.	Ecosystem utilization is limited to simple transactions, not yet in other aspects.
Hiring a chief digital officer	Has not specifically recruited a CDO; digital roles are still managed by internal teams.	No specific recruitment for digital roles, only utilizing intern resources.	No specific recruitment for CDO or digital transformation leader roles.
Digitalization of business models	Digital-based services (VA) enable more efficient operations without additional branches.	Business model digitalization is still in the planning stage for a 2025 application.	Digitalization only covers a small portion of services such as payments, not yet Islamic financing.
Designing team-based structures	Organizational restructuring is carried out to support more flexible HR development.	Organizational structure is not yet flexible to fully support digital transformation.	Organizational structure has not been changed to support digital transformation.
Identifying digital workforce maturity	Conducts regular evaluations and training to improve workforce readiness in the digital field.	Involves student interns to support digitalization operations and content production.	Provides basic training for staff, although still limited to a few individuals.
External recruiting of digital natives	Has not significantly recruited external digital workforce.	No specific recruitment of digital professionals.	No effort to recruit specialized workers in technology or digital fields.
Leveraging digital knowledge inside firm	Internal teams actively utilize technology for operations and digital service innovation.	Starting to utilize internal capabilities through self-learning for content and service development.	Available digital knowledge has not been utilized for significant innovation.

Source: Processed data, 2024

Based on the cross-case analysis of the Transforming Dimension, Case Study A demonstrates the most mature digital transformation capabilities compared to Case Studies B and C. The organization exhibited optimal digital ecosystem utilization through strategic vendor collaborations, particularly in virtual account services and inter-bank transfer mechanisms. A significant organizational restructuring was implemented to enhance human resource flexibility, despite the absence of a formally appointed Chief Digital Officer (CDO). Digital functions are managed by an internal team that consistently undergoes training and performance evaluation, reflecting a high level of preparedness for digital challenges.

Case Study B remains in a transitional phase of digital transformation. Transforming efforts are primarily concentrated on digital application development and social media utilization to expand market reach, with a specific focus on younger demographic segments. Collaborations with external application developers have been initiated, though the organizational structure has not yet comprehensively supported holistic digital

transformation. The engagement of intern students represents an initial strategy for digital capacity development, while the digital business model is currently in the planning stage, with projected launch scheduled for 2025.

In contrast, Case Study C exhibits the most constrained transforming capabilities. Digital ecosystem engagement is limited to basic services such as online bill payments, with no substantive technological integration within the Islamic financing system. The traditional organizational structure remains largely unchanged, and efforts to enhance digital competencies are minimal. The absence of professional recruitment in digital domains has consequently impeded technology-driven innovation capacity.

Overall, Case Study A occupies the leading position in the digital transformation process, followed by Case Study B, which remains in the initial planning stages. Conversely, Case Study C requires a more targeted and comprehensive strategy to strengthen its digital transformation process. The analysis reveals that digital transformation within Islamic microfinance institutions does not follow a uniform pattern. Each case study encountered distinct challenges and opportunities, consequently resulting in varied approaches to sensing, seizing, and transforming processes. The analysis in Table 4.4, examining the Sensing, Seizing, and Transforming Dimensions, comparatively assesses how each case study adopted digital strategies, identifying patterns of similarity and divergence in innovation implementation and technological development.

Tabel 4.4. Sensing, Seizing, and Transforming Dimensions Comparative Analysis

Dimension	Indicators	Organizations		
		Case Study A	Case Study B	Case Study C
Sensing	Scanning for technological trends	√	√	√
	Screening of digital competitors	√	√	√
	Sensing customer-centric trends	√	√	
	Analyzing scouted signals	√	√	√
	Interpreting digital future scenarios	√	√	
	Formulating digital strategies	√	√	
	Establishing a long-term digital vision	√	√	
	Enabling an entrepreneurial mindset	√	√	√
	Promoting a digital mindset	√	√	
Seizing	Creating minimum viable products	√	√	√
	Considering a lean start-up methodology	√	√	√
	Using a digital innovation lab			
	Balancing internal and external options	√	√	√
	Scaling up innovative business models	√	√	
	Setting an appropriate speed of execution	√		
	Rapidly reallocating resources	√	√	
Transforming	Accepting redirection and change	√	√	
	Pacing strategic responses	√		
	Joining a digital ecosystem	√	√	√
	Interacting with multiple external partners	√	√	
	Exploiting new eco.system capabilities	√	√	√
	Hiring a chief digital officer			
	Digitalization of business models	√		
	Designing team-based structures	√		
	Identifying digital workforce maturity	√	√	√
	External recruiting of digital natives			
	Leveraging digital knowledge inside firm	√	√	

Source: Processed data, 2024

Based on the Digital Transformation Capabilities Dimensions (Table 4.4), the three case studies demonstrated similar patterns across several digital transformation aspects, particularly in sensing and seizing processes. All

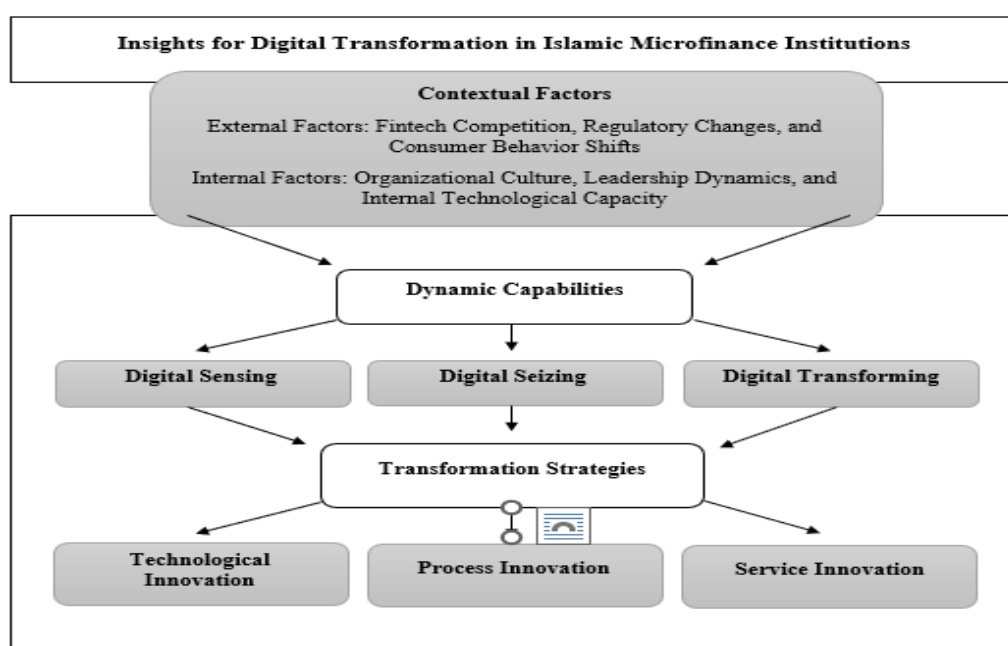
entities conducted technological trend scanning, scrutinized digital competitors, and developed minimum viable products (MVPs). Furthermore, they leveraged emerging digital ecosystem capabilities as part of their transformation strategies. This observation indicates that all three case studies possessed a fundamental awareness of digitalization's importance and had initiated preliminary technology adoption steps to enhance organizational competitiveness.

Notwithstanding these similarities, significant variations emerged in digital transformation readiness and implementation across the case studies. Case Study A demonstrated superior capabilities in holistic digitalization integration, characteristically distinguished by comprehensive long-term vision development, innovative business model creation, and rapid resource allocation. Case Study B remained predominantly dependent on university ecosystem support during its digitalization process, while Case Study C confronted substantial challenges in organizational restructuring and digital workforce limitations. Consequently, although all case studies endeavored to adopt digitalization strategies, their readiness levels and implemented approaches varied considerably, contingent upon each institution's internal conditions and ecosystem characteristics.

Innovation Outcomes of Digital Transformation

Innovation emerges as a critical determinant in maintaining competitive advantage and organizational sustainability for Islamic microfinance institutions. The ultimate outcome of digital transformation manifests in enhanced efficiency and innovation. Efficiency improvements refer to organizational capabilities in streamlining operations, augmenting productivity, and optimizing resource utilization through digital transformation. In the digital transformation era, innovation transcends technological boundaries, encompassing processes and services, necessitating organizational adaptability to consistently deliver optimal member services. Digitalization has transitioned from being a strategic option to an urgent imperative for maintaining business continuity and generating enhanced customer value.

The framework illustrated in Figure 2 on Digital Transformation across Cases reflects a systematic progression that integrates external and internal contextual factors culminating in innovative outcomes. External factors, including fintech competition, regulatory shifts, and evolving consumer behaviors, compel microfinance institutions to adapt to digital technologies. Concurrently, internal factors such as organizational culture, leadership dynamics, and technological capacity fundamentally determine the extent to which these institutions can respond to external changes and leverage opportunities through digital transformation.



Gambar 2. Framework Transformasi Digital di BMT

Source: Processed Data, 2024

In confronting digital transformation challenges, the three studied cases demonstrated diverse innovation approaches to enhance competitive advantage and operational efficiency. The implemented innovations can be categorized into three primary dimensions: Technological Innovation, Process Innovation, and Service Innovation.

Technological Innovation

Digital transformation compels microfinance institutions to adopt technologies aimed at improving efficiency and competitiveness. Innovation enhancement reflects organizational capacity to create and implement novel ideas, products, and processes supported by digital technologies (Seeck & Diehl, 2017). Case A collaborated with fintech platforms like Flip for fund transfer services, developed a mobile application with Virtual Account (VA) features, and implemented more integrated digital payment systems. Case B developed a digital community application targeting younger segments, migrated servers since 2023, and prepared application launch for 2025. Conversely, Case C remains in initial digitalization stages, with Payment Point Online Bank (PPOB) representing its primary innovation and adopting the national association's e-BMT system, despite limited internal technological development.

Process Innovation

Furthermore, digital transformation reconfigured microfinance institutional operations through business process digitalization and integration into digital financial ecosystems to enhance efficiency and reduce transaction costs. Case Study A implemented monthly innovation evaluations to assess technological effectiveness and adapt strategies to market requirements, establishing fintech partnerships and developing server rental plans for other microfinance institutions. Case B optimized intern engagement for digitalization exploration, including social media management, server migration, and developing the At-Ta'awun Mobile application scheduled for 2025 release. Case C primarily relied on e-BMT systems and PPOB services, collaborating with national communities to leverage technology without independently constructing complex systems.

Service Innovation

Beyond technological and process innovations, these institutions also endeavored to enhance service quality to meet customer needs through more flexible and accessible financial products. Case Study A introduced automatic donation features post-transaction and integrated mobile banking with Virtual Account (VA) services for UMY student fee payments, eliminating the necessity for branch office visits. Case B targeted Millennials and Gen Z through interactive community-based applications, offering service personalization features, social media integration, and social assistance applications grounded in Islamic economic principles. Case C remained in preliminary digital service stages, with PPOB representing its primary innovation for bill and installment transactions. However, digital Islamic financing services remained limited, with manual processes for financing applications and member registrations. To address these constraints, they implemented digital sensing, scenario planning, and mindset crafting to develop a digital culture and design long-term strategies toward comprehensive online financing.

Conclusion

Digital transformation within Islamic Microfinance Institutions, particularly Baitul Mal wat Tamwil (BMT), plays a critical role in enhancing operational efficiency, expanding financial access, and strengthening competitive positioning. Research findings reveal that dynamic capabilities through digital sensing, seizing, and transforming emerge as pivotal factors in digital adaptation. However, significant challenges persist, including resource limitations, low digital literacy, and regulatory frameworks that insufficiently support innovative initiatives.

The success of digital transformation across examined cases hinges on strategic collaborations with Islamic fintech platforms, investments in employee digital skill enhancement, and gradual technology adoption to mitigate internal resistance. Strengthening digital ecosystems and optimizing infrastructure are crucial elements in ensuring innovation sustainability within this sector. Overall, the research demonstrates that digital transformation transcends mere technological adoption, encompassing organizational cultural transformation, visionary

leadership, and adaptive business strategies. Through a strategic approach, BMT can optimize digital innovation to provide more inclusive, efficient, and sustainable Islamic financial services to broader societal segments.

Managerial Implications

Research findings demonstrate that digital transformation success is not solely determined by technological adoption, but critically depends on strategic decisions integrated into daily operational processes. Managerial implications necessitate the development of measurable digitalization policies and comprehensive roadmaps to ensure strategic direction and effective digital implementation stages. These strategies must be communicated holistically to encourage comprehensive organizational participation across all institutional elements.

Human resource capacity enhancement emerges as a primary priority, requiring targeted training programs focused on digital literacy, technology-based financial systems, and data security protocols. The objective is to systematically elevate competencies in digital service management. Moreover, digital infrastructure and cybersecurity system investments are imperative to support service continuity and safeguard customer data integrity. Recognizing the digital literacy limitations among members, digital service simplification becomes a crucial consideration, demanding user-friendly application development and comprehensive supportive services.

Strengthening collaborations with fintech platforms and digital ecosystems is anticipated to drive service innovation and accelerate sustainable digitalization processes for microfinance institutions. Conclusively, periodic evaluations of digitalization implementation are essential to ensure program effectiveness, measure performance indicator achievements, and establish foundations for continuous improvement and future innovations.

Recommendations for Future Research

This research opens significant avenues for subsequent scholarly investigations to enrich the understanding of digital transformation within Islamic microfinance institutions (BMT). Quantitative studies are imperative to precisely measure the impact of digitalization on profitability and long-term business sustainability. Furthermore, comprehensive evaluations of implemented digital platforms are crucial to identify their strengths, limitations, and optimal technological implementation strategies.

In-depth research addressing regulatory challenges and legal compliance is essential to comprehensively understand the barriers in digitalizing Islamic financial services while ensuring alignment with Sharia principles and governmental regulations. Moreover, studies exploring the role of digitalization in promoting Islamic financial inclusion emerge as a critical research domain, particularly in accessing underserved population segments traditionally excluded from formal financial services.

Research Limitations

This study encompasses several limitations that merit careful consideration when interpreting the research findings. Administrative constraints in subject selection processes resulted in a limited number and variation of case studies, confined to institutions willing to participate. Consequently, this sampling approach potentially restricts the generalizability of findings across the broader Indonesian Islamic microfinance (BMT) ecosystem.

Furthermore, the disparate levels and scales of digital transformation across examined cases presented significant challenges in conducting balanced comparative analyses. Internal and external contextual variations fundamentally influenced each institution's strategic approaches and encountered obstacles. The diversity in respondents' organizational positions and roles also impacted data collection depth, where perspectival differences between managerial and technical levels could potentially introduce interpretive biases that may not comprehensively reflect the holistic organizational landscape.

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