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Bridging Tradition and Technology: Digital Business Transformation in Indonesian Pesantren

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Abstract:

This study analyzes the digital transformation of entrepreneurship among santri as a strategy to commercialize pesantren products and reach a broader market. The research uses a qualitative, multi-site study design. The study collected data through in-depth interviews, observations, and documentation, and analyzed them using data reduction, data display, and conclusion drawing. The study reveals three key findings: the formation of a digital entrepreneurship ecosystem for *santri* through the integration of education, pesantren business units, mentorship, and digital capacity building; the transformation of product downstreaming through quality enhancement, brand identity strengthening, and commercialization strategies; and the development of digital business innovations through the utilization of digital platforms, promotion, consumer interaction, and the adaptation of business strategies. This research offers a conceptual contribution by introducing the perspective of "Digital Transformation of *santri* Entrepreneurship," which positions the pesantren as an entrepreneurial ecosystem rooted in education, technology, and community values. The study's implications highlight the importance of strengthening institutional capacity, santri digital literacy, product innovation, and technology-based marketing strategies. Pesantren need to integrate entrepreneurship education with digital business practices so that *santri* can develop their own businesses independently and sustainably. Furthermore, the government and relevant stakeholders should expand mentorship, access to technology, and marketing networks to enhance the competitiveness of pesantren products.

Keywords: *Digital Transformation, santri Entrepreneurship, Product Commercialization, Pesantren*

Abstrak:

Penelitian ini bertujuan untuk menganalisis transformasi digital kewirausahaan santri sebagai strategi komersialisasi produk pesantren guna menjangkau pasar yang lebih luas. Penelitian ini menggunakan pendekatan kualitatif dengan desain studi multisitus. Data dikumpulkan melalui wawancara mendalam, observasi, dan dokumentasi yang dianalisis melalui reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian mengungkap tiga temuan utama, yaitu terbentuknya ekosistem kewirausahaan digital santri melalui integrasi pendidikan, unit usaha pesantren, pendampingan, dan peningkatan kapasitas digital; transformasi hilirisasi produk melalui peningkatan kualitas, penguatan identitas merek, dan strategi komersialisasi; serta pengembangan inovasi bisnis digital melalui pemanfaatan platform digital, promosi, interaksi konsumen, dan adaptasi strategi bisnis. Penelitian ini memberikan kontribusi konseptual melalui perspektif Transformasi Digital Kewirausahaan Santri yang memosisikan pesantren sebagai ekosistem kewirausahaan berbasis pendidikan, teknologi, dan nilai komunitas. Implikasi penelitian menunjukkan pentingnya penguatan kapasitas kelembagaan, literasi digital

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santri, inovasi produk, dan strategi pemasaran berbasis teknologi. Pesantren perlu mengintegrasikan pendidikan kewirausahaan dengan praktik bisnis digital agar santri mampu mengembangkan usaha secara mandiri dan berkelanjutan. Pemerintah serta pemangku kepentingan juga perlu memperluas pendampingan, akses teknologi, dan jejaring pemasaran untuk meningkatkan daya saing produk pesantren.
Kata Kunci: *Transformasi Digital, Kewirausahaan Santri, Komersialisasi Produk, Pesantren*

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INTRODUCTION

The development of the digital economy has driven a paradigm shift in entrepreneurship, including within community-based educational institutions (Li et al., 2024; Moya & Camacho, 2024). Digital transformation is no longer understood solely as the use of information technology, but as a comprehensive process of change that encompasses business model innovation, strengthening human resource capacity, using data, and creating new value through digital ecosystems (Ngo et al., 2023; AL-Zoubi, 2023). In the context of entrepreneurship, digital transformation enables businesses to expand market access, improve operational efficiency, and build more adaptive relationships with consumers. This change is increasingly important for the community-based business sector, which faces limitations in market penetration and developing product commercialization strategies.

As Islamic educational institutions, Islamic boarding schools have significant potential to develop community-based entrepreneurship. Beyond their educational and character-building functions, Islamic boarding schools are shifting toward becoming institutions that contribute to economic independence through various productive business units. Islamic boarding school entrepreneurial activities not only provide students with practical experience but also serve as a strategic instrument for creating alternative funding sources to support institutional sustainability (Kıyak & Kononowicz, 2024; Trittin-Ulbrich & Böckel, 2022). However, the various products produced by Islamic boarding school business units still face downstream challenges, particularly in brand strengthening, marketing strategies, broader market access, and adapting to developments in the digital economy.

Islamic boarding school entrepreneurship differs from conventional entrepreneurship models because it is fostered within an educational environment that integrates religious values, character building, and productive skills (Jetha et al., 2023; Xu et al., 2022). The entrepreneurship development model in Islamic boarding schools is oriented not only toward economic gain but also toward fostering independence, a work ethic, and social benefits (Vieira & Joia, 2024; Porkodi et al., 2023). However, digital technology-based commercialization strategies have not yet fully realized this enormous potential. Many Islamic boarding school products remain locally produced with limited consumer reach, so they need a digital transformation approach that connects production, innovation, marketing, and market expansion.

Digital transformation offers Islamic boarding schools opportunities to increase the competitiveness of their students' products through technologies such

as generative artificial intelligence, consumer behavior analysis, digital commerce platforms, and data-driven marketing strategies (Maulidizen et al., 2026; Widyastuti et al., 2026). Digital technology can help businesses develop product identities, produce more effective marketing content, understand market preferences, and build broader consumer connections (Badr et al., 2024; Islamiyah, 2025). However, technology adoption in Islamic boarding schools depends not only on infrastructure readiness but also on a management model that integrates the educational values of Islamic boarding schools with the needs of modern business innovation.

Previous studies have extensively discussed digital transformation in micro, small, and medium enterprises through digital marketing technology and entrepreneurial capacity development (Novitasari et al., 2025; Kaimara, 2026). However, most studies have focused on the general business sector and have not examined how digital transformation is applied within the Islamic boarding school education ecosystem (Cahyono et al., 2026; Chen et al., 2024). Studies on Islamic boarding school entrepreneurship have focused more on aspects of economic independence, business unit management, or student entrepreneurship education. At the same time, the digitalization of product downstreaming has received relatively little attention (Muktirrahman et al., 2025; Vaio et al., 2023). This gap highlights the need for research examining how Islamic boarding schools can develop digital transformation strategies to increase the economic value of student products.

In this context, the Nurul Jadid Islamic Boarding School and the Zainul Hasan Islamic Boarding School in Genggong, Probolinggo, are relevant research contexts because both have experience developing Islamic boarding school business units and empowering students' economic potential. Both Islamic boarding schools represent institutional-based entrepreneurship development that not only produces products but also aims to build a productive learning system for students. Studying these two Islamic boarding schools offers an opportunity to understand how Islamic boarding school entrepreneurial practices can shift from production activities to digital-based commercialization systems capable of reaching broader markets.

This research's novelty lies in developing a digital transformation perspective on Islamic boarding school entrepreneurship as a downstream model for Islamic boarding school products, rather than simply implementing digital marketing technology. This research offers a conceptual approach that connects three main elements: the Islamic boarding school education ecosystem, the development of Islamic boarding school entrepreneurial capacity, and a digital technology-based commercialization strategy. Unlike previous research that tends to view digitalization as a marketing instrument, this study views digital transformation as an integrative process that transforms the value chain of Islamic boarding school products, from product innovation and brand identity strengthening to market strategy and expanding global consumer access. This approach is expected to contribute to research on community-based entrepreneurship and the development of Islamic boarding school economies in the digital era.

Based on this background, this study aims to analyze the digital transformation process of Islamic boarding school entrepreneurship in supporting the downstreaming of Islamic boarding school products into the global market. Specifically, this study aims to identify the digital strategies used to develop and commercialize Islamic boarding school products, analyze the supporting and inhibiting factors in the Islamic boarding school entrepreneurial ecosystem, and formulate a digital transformation strategy model that strengthens Islamic boarding schools' economic independence through innovation and technology.

RESEARCH METHODS

This research uses a qualitative, multi-case study approach. This approach was chosen to gain an in-depth understanding of the digital transformation process in Islamic boarding school entrepreneurship that supports the downstreaming of Islamic boarding school products to the global market. A multi-case study allows researchers to explore the same phenomenon across different contexts and identify patterns, characteristics, and strategies that develop in each location (Miller et al., 2023; Tarannum, 2023). This study focuses on management practices in entrepreneurship, digital transformation strategies, the use of technology in product commercialization, and factors that support and hinder the development of digital markets.

This research was conducted at Nurul Jadid Islamic Boarding School and Zainul Hasan Islamic Boarding School in Genggong, Probolinggo, East Java. The two research locations were selected purposively because they are Islamic boarding schools with productive business units and student economic empowerment programs. Both Islamic boarding schools were chosen for their experience in developing student-led products and their potential to develop digitalization strategies for downstream product processing. The study aimed to provide a comparative overview of entrepreneurship management patterns and adaptation strategies in Islamic boarding schools for developing the digital economy.

The study collected data through in-depth interviews, observation, and document analysis. The study purposively selected informants, including Islamic boarding school administrators or leaders, managers of Islamic boarding school business units, administrators of student entrepreneurship programs, student entrepreneurs, and parties involved in product marketing and development. Interviews were conducted to obtain information regarding the vision for entrepreneurship development, the digital transformation process, marketing strategies, and experience in product commercialization. The study observed production activities, business unit management, digital media use, and product marketing activities. Documentation supplemented the research data, including business unit profiles, entrepreneurship program documents, promotional materials, and other supporting information.

We conducted data analysis interactively through the stages of data reduction, data presentation, and drawing conclusions, following the concept of qualitative data analysis (Wadi et al., 2023; Zebua & Anwar, 2022). We analyzed data from each case individually (within-case analysis) to understand each Islamic

boarding school's characteristics and digital transformation strategies. We then conducted a cross-case analysis to identify similarities, differences, and patterns in the development of the digital transformation model for Islamic boarding school entrepreneurship. The study maintained data validity through triangulation of sources and techniques, comparing information from various informants and confirming findings through observation and documentation. This method is expected to produce a deep understanding of digital transformation strategies for downstreaming Islamic boarding school products to the global market.

RESULTS AND DISCUSSION

Results

Santri Digital Entrepreneurship Ecosystem

The digital entrepreneurship ecosystem in Islamic boarding schools is an institutional system that integrates entrepreneurship education, productive activities, and digital capacity building among students to support business development in pesantren. This ecosystem links learning to business activities through several key components, including institutional support, entrepreneurship training, student involvement in production processes, business mentoring, and the introduction of digital technology in business management. Through this system, students not only acquire religious knowledge but also help develop economic activities and gain practical entrepreneurial experience.

The business unit manager explained that the institution developed the entrepreneurship program as part of its strategy to foster student independence through direct business experience. "Students are not only equipped with religious knowledge, but are also given the opportunity to develop their skills through business units managed by the Islamic boarding school. They learn how products are made, managed, and introduced to the community." (dbc_09, 2026)

Interview results indicate that student entrepreneurship develops through direct involvement in business unit activities. These activities include production, product management, packaging, and basic marketing. Observational data show that students participate in various stages of business management based on their fields and abilities. As a result, business units serve as practical learning environments where students gain experience managing real-world economic activities.

Mentoring programs involving institutional administrators also support students' entrepreneurial development. An administrator explained that students are gradually introduced to business activities based on their abilities and interests. "We provide mentoring so that students understand that entrepreneurship requires discipline, creativity, and adaptability. They are involved gradually according to their individual abilities." (ec_09, 2026)

The findings indicate that mentoring supports the development of entrepreneurial competencies by guiding students on production processes, business management, and marketing strategies. Observations show that students gain practical experience through participation in business activities, while institutional documents identify entrepreneurship as part of broader efforts to strengthen student independence.

Furthermore, the digital entrepreneurship ecosystem includes developing students' digital competencies. The business unit manager explained that digital media now supports product introduction and marketing communication. "Students are beginning to be introduced to digital media because marketing today isn't just about direct sales. They need to understand how social media and online platforms can help introduce Islamic boarding school products to a wider audience" (ac_09, 2026).

The findings indicate that digital skills are increasingly becoming part of entrepreneurship development. These include managing institutional social media, creating promotional content, and communicating with consumers through digital platforms. However, digital technology adoption varies across business units depending on resource availability, management support, and students' digital competencies.

Table 1. Findings of the Santri Digital Entrepreneurship Ecosystem

Informant	Interview Quotes	Indicator
Business Unit Manager	"Students are given the opportunity to develop their skills through business units managed by the Islamic boarding school."	Involvement of students in business activities
Islamic Boarding School Administrators	"Students are given guidance in stages according to their respective abilities."	Entrepreneurship mentoring system
Business Unit Coordinator	"Students need to understand the use of social media and online platforms to introduce products."	Entrepreneurial digital literacy
Santri Entrepreneurs	"We learned to make products and promote them through digital media."	Practice-based entrepreneurship learning

Table 1 shows that the digital entrepreneurship ecosystem for Islamic boarding school students integrates entrepreneurship learning, institutional support from Islamic boarding schools, mentoring systems, and digital skills development. Research findings indicate that Islamic boarding schools provide an environment where students can gain practical experience by participating in digital-based business units and promotional activities. This ecosystem lays the foundation for developing entrepreneurship in Islamic boarding schools and supporting the downstreaming of their products.

Downstream Transformation of Islamic Boarding School Products

The transformation of downstream Islamic boarding school products refers to the process of shifting students' products from internal production activities toward broader commercialization through improvements in product quality, brand identity, marketing strategies, and digital channels. This process is carried out through the development of Islamic boarding school business units that connect students' production activities with market needs. Products previously marketed primarily within the Islamic boarding school environment and surrounding communities are developed to create added value through improved packaging, brand development, and the use of digital media for promotion. Thus, product downstreaming represents an institutional strategy to expand market reach while increasing the economic value of students' products.

The business unit manager explained that product development focuses not only on production capacity but also on increasing product attractiveness to compete in broader markets. "Initially, our products were mostly known within Islamic boarding schools and the surrounding community. Now, we're improving our packaging, product identity, and promotional methods to ensure our products reach a wider consumer base" (mx_09, 2026).

Interview results indicate that product downstreaming involves improvements in product presentation and marketing strategies. These changes include packaging redesign, the inclusion of product identity, and the development of promotional materials. Observations show that several products have more informative packaging and utilize digital media to introduce products to consumers.

The development of student products is also supported by efforts to strengthen quality and expand marketing channels. A business unit manager explained that products must be developed beyond internal consumption to compete in broader markets. "We strive to ensure that the products our students make meet higher standards. Everything from product quality and packaging to how we introduce them to the public must be considered, as market competition is intensifying" (aci_09, 2026).

Research findings indicate that product downstreaming encompasses quality improvement, brand identity development, and marketing adaptation. Observations reveal innovations such as updated packaging, product logos, digital product documentation, and online communication platforms. Institutional business program documents also identify product development as part of efforts to strengthen students' economic independence.

Digital media further supports market expansion. One student entrepreneur explained that social media enables products to reach consumers beyond the institutional environment. "Now we don't just sell directly to people who come to the Islamic boarding school. We also promote our products through social media so more people know about the products made by the students." (ac_09, 2026). The findings demonstrate that digital marketing contributes to the transformation of product downstreaming by shifting distribution from predominantly local sales toward broader market access. However, digital strategies remain under development, and not all business units have integrated digital marketing systems.

Table 2. Findings of Downstream Transformation of Islamic Boarding School Products

Informant	Interview Quotes	Indicator
Business Unit Manager	"We started improving the packaging, product identity, and promotional methods so that the product could be accepted by a wider consumer base."	Strengthening product identity and quality
Business Unit Manager	"Product quality, packaging, and how to introduce the product must be considered because market competition is increasing."	Product standardization and innovation
Santri Entrepreneurs	"The products are introduced through social media so that more people know about the products made by students."	Utilization of digital media for marketing

Islamic Boarding School Administrators	"Product development is part of the Islamic boarding school economic empowerment program."	Product integration with Islamic boarding school economic programs

Table 2 shows that the transformation of downstream Islamic boarding school products is characterized by a shift in orientation from internal production to developing products with economic value and broader market reach. Research findings indicate that the downstreaming strategy is implemented through improving product quality, strengthening brand identity, and utilizing digital media as a promotional tool. This process illustrates the efforts of Islamic boarding schools to develop student products so that they function not only as entrepreneurial learning activities but also as products with commercial potential.

The transformation of downstream Islamic boarding school products at both research locations indicates that product development is carried out through a combination of product innovation, marketing enhancement, and the use of digital technology. Interview, observation, and documentation data indicate that Islamic boarding schools are beginning to direct student business units toward a more market-oriented management system. However, the level of readiness for downstreaming varies among business units, particularly in terms of branding consistency, digital marketing management, and the ability to expand distribution networks.

Digital Business Innovation Practices

Digital business innovation practices refer to the systematic process by which Islamic boarding school business units integrate digital technology into product development, business communication, and commercialization. These practices involve several stages, including developing digital capabilities, utilizing digital platforms, creating promotional content, interacting with consumers, and adapting business strategies to market developments. The initiatives aim to improve the competitiveness of Islamic boarding school products by enhancing promotional effectiveness, expanding access to product information, and supporting more adaptive business management.

However, digital innovation is implemented gradually because business units differ in technological readiness, human resource capabilities, and digital management capacity. Therefore, digital business innovation represents a strategic process that enables Islamic boarding school entrepreneurship to respond to changes in the digital economy.

The business unit coordinator explained that digital innovation began with introducing digital platforms for product promotion and consumer communication. According to the informant, digital media has changed how products are introduced to potential consumers. "Previously, product promotion was mostly done directly through Islamic boarding school networks. Now, we've started using digital media so that information about Islamic boarding school products can reach a wider audience beyond the Islamic boarding school environment" (abc_09, 2026).

Interview results indicate that digital business innovation begins with a shift from conventional promotion to digital communication. Social media serves as a primary channel for disseminating product information, highlighting product features, and building relationships with consumers. However, digital technology is still used mainly for basic promotional activities rather than for more advanced digital business management systems.

Students also develop digital innovation through participation in promotional activities and digital product information management. The business unit manager explained that involving students in these activities helps develop practical competencies in contemporary business management. "Students are involved in creating promotional materials, managing product information, and learning about how digital media can support business development." (dbc_09, 2026)

These findings indicate that digital business innovation involves not only adopting technology but also developing human resources. Observations show that students create promotional content, document business activities, and manage online consumer communication. Documentary evidence also indicates that students use digital media to promote and introduce products.

Based on the research findings, digital business innovation comprises interconnected stages, beginning with digital capability development, followed by platform utilization, digital promotion, consumer interaction, and business strategy adaptation based on market responses. These practices show how digital technology and student competencies can support Islamic boarding school entrepreneurship, though implementation depends on institutional readiness and available resources.

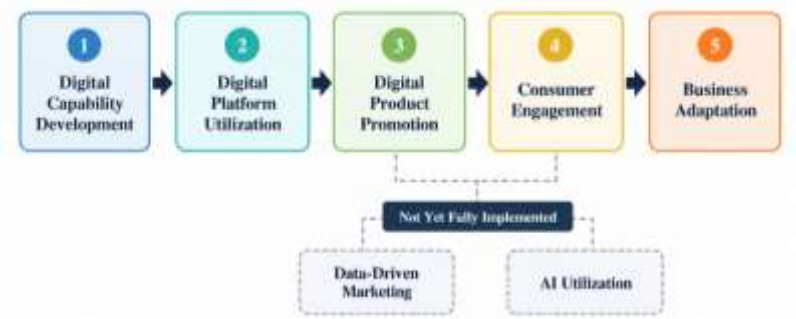


Figure 1. Digital Business Innovation Process

The results show that digital business innovation practices in Islamic boarding school entrepreneurship unfold gradually, starting with digital capability development, then moving to digital platform use, digital product promotion, consumer engagement, and business adaptation. This flow emphasizes that digital transformation in Islamic boarding school entrepreneurship does not stop at using digital media as a promotional tool; it becomes a broader process of building market communications, strengthening consumer relationships, and adapting business strategies to changing market needs. Thus, digital business innovation is understood as a continuous process that connects human resource capacity building with changes in business management practices. Two aspects have not been fully implemented: data-driven

marketing and artificial intelligence (AI). These findings indicate that digital innovation in both Islamic boarding schools is still in the development stage, with digital technology used more for product promotion and basic consumer interactions.

Based on the findings, digital business innovation practices have shifted entrepreneurial patterns from conventional approaches to more adaptive, technology-based business management. However, advanced digital systems, such as consumer data analysis and artificial intelligence to support marketing, have not yet been implemented optimally. Therefore, digital business innovation practices at both Islamic boarding schools can be understood as an adaptive strategy that strengthens the commercialization of students' products. However, the maturity of their digital transformation remains gradual and depends on each institution's capacity.

Discussion

The research findings indicate that digital transformation in Islamic boarding school entrepreneurship is fostered by developing a digital entrepreneurship ecosystem that integrates education, economic empowerment, and technological capacity building. This ecosystem demonstrates that pesantren serve not only as religious educational institutions but also as practice-based entrepreneurial learning spaces. Involving Islamic boarding school students in business units is a key way to build entrepreneurial experience through production, business management, product development, and marketing (Bashori et al., 2024; Panxhi et al., 2025). This shift moves entrepreneurship education from a theory-based model to an experiential learning model, where students gain hands-on experience creating economic value.

These findings reinforce the view that education-based entrepreneurship development requires an institutional environment that provides space for practice and ongoing mentoring. In Islamic boarding schools, business units function not only as economic activities but also as learning laboratories that connect educational values, character building, and economic independence (Bashori et al., 2024; Budiyono, 2025). Unlike the common approach to entrepreneurship, which often separates educational institutions from business activities, Islamic boarding schools build an integrative relationship between the student's educational process and business development. This shows that student entrepreneurial success depends not only on individual abilities but also on an institutional ecosystem that provides resources, mentoring, and a culture of innovation.

Furthermore, this study found that the Islamic boarding school entrepreneurship ecosystem is beginning to shift toward a digital entrepreneurship ecosystem that integrates business skills with digital technology (Prokopenko et al., 2024; Trittin-Ulbrich & Böckel, 2022). The use of digital media, students' involvement in creating promotional content, and the introduction of digital platforms indicate that entrepreneurial transformation relates not only to product development but also to increasing adaptive capacity to changes in the digital economy. These findings contribute to the study of Islamic boarding school entrepreneurship, which has previously focused more on economic independence

and business unit management. This study expands this perspective by showing that digital readiness is crucial to building sustainable Islamic boarding school entrepreneurship.

In the next stage, the research showed that the digital entrepreneurship ecosystem is driving a transformation in the downstreaming of Islamic boarding school products. Previously marketed primarily within Islamic boarding schools, Islamic boarding school products are now being directed toward broader commercialization through product quality enhancements, stronger brand identity, improved packaging, and the use of digital media as a marketing communication tool (Sarman et al., 2025; Wardi et al., 2025). These findings suggest that the primary challenge for Islamic boarding school entrepreneurship lies not only in producing products, but also in transforming them into value-added commodities capable of competing in a broader market.

The downstream transformation of products in this study demonstrates a shift from production-oriented entrepreneurship to market-oriented entrepreneurship. Islamic boarding schools no longer focus solely on product production but also consider consumer preferences, product image, communication strategies, and market access (Atmodjo et al., 2025; Khusniyah, 2025). These changes show that downstreaming requires organizational capabilities to link production activities with market dynamics (Sembiring et al., 2025; Hakim et al., 2025). In this context, digital technology helps connect Islamic boarding school students' production capacity with consumer needs through faster, more flexible communication.

This research's novel contribution lies in interpreting the downstreaming of Islamic boarding school products as a value-transformation process, not simply a product-distribution process. Previous research on downstreaming has focused on the industrial and MSME sectors. Still, this study shows that the concept applies to Islamic boarding school education by integrating student learning, product innovation, and commercialization strategies. Thus, this research offers a new perspective: Islamic boarding schools can build an education-based product development model that not only develops student skills but also creates sustainable economic value.

Beyond ecosystem development and product downstreaming, this study also found that Islamic boarding school students' digital transformation in entrepreneurship occurs through gradual, evolving digital business innovation practices (Hamzah & Rahmatullah, 2026; Ramadan et al., 2023). This process begins with developing digital capabilities, utilizing digital platforms, promoting technology-based products, interacting with consumers, and adapting business strategies to market changes (Hamzah & Rahmatullah, 2026; Wahyuni et al., 2026). These findings show that digital transformation is not instantaneous but an organizational process that requires changes in human capacity, work patterns, and business management strategies.

The results show that the use of digital technology in both Islamic boarding schools is still in its early stages. Digital media has been utilized to increase product visibility, expand communication with consumers, and support business promotion. However, Islamic boarding schools have not fully implemented

advanced aspects of digital transformation, such as data-driven marketing, consumer behavior analysis, and artificial intelligence. These findings indicate that Islamic boarding schools' digital transformation differs from that of commercial companies, as the technology adaptation process must consider human resource readiness, institutional values, and organizational capacity.

This research's main novelty is developing an understanding of digital transformation in Islamic boarding schools as an integrative, gradual process. This research views digitalization not merely as the use of marketing technology, but as a systemic change that connects three main aspects: the development of a digital entrepreneurship ecosystem, the transformation of downstream Islamic boarding school products, and technology-based business innovation. This perspective contributes theoretically by expanding the study of digital transformation beyond the conventional business sector to community-based Islamic education.

Practically, this research offers implications for Islamic boarding school managers: developing student entrepreneurship in the digital era requires a strategy that focuses not only on production but also on strengthening digital capacity, brand development, and sustainable business innovation (Adeoye et al., 2025; Suki et al., 2023). Islamic boarding schools need a development system that integrates entrepreneurship education, digital technology, and business management to help students become adaptive economic actors (Zare & Persaud, 2025; Alnsour, 2024). The digital transformation model identified in this study can serve as a reference for other community-based educational institutions seeking to develop economic independence through innovation and technology.

Overall, this study provides a conceptual contribution through the Digital Transformation of Santri Entrepreneurship model, which demonstrates that the commercialization success of Islamic boarding school products depends not only on the ability to produce products, but also on the ability to build an entrepreneurial ecosystem, increase product value, and carry out sustainable digital adaptation. This model shows that Islamic boarding schools can become centers of community-based economic innovation, connecting education, entrepreneurship, and digital transformation amid global economic change.

CONCLUSION

This study concludes that the digital transformation of Islamic boarding school entrepreneurship develops through three main processes: building a digital entrepreneurship ecosystem for Islamic boarding schools, transforming downstream products, and innovating digital business practices. The digital entrepreneurship ecosystem provides a foundation by integrating education, business units, and mentoring, while strengthening pesantren's digital capacity. This process shifts product downstreaming from internal production to broader commercialization by improving product quality, strengthening brand identity, and leveraging digital media. Furthermore, digital business innovation shows that Islamic boarding schools are beginning to adapt to technological developments through the use of digital platforms, product promotion, consumer interaction, and business strategy adjustments. However, the application of advanced technologies such as data-driven marketing and artificial intelligence remains in the early stages. This study makes a conceptual contribution by developing the

Digital Transformation of Islamic Boarding School Entrepreneurship perspective, which positions Islamic boarding schools as an entrepreneurial ecosystem grounded in education, technology, and community values. These findings confirm that the successful commercialization of Islamic boarding school products depends not only on production capabilities but also on institutional capacity to build an innovation ecosystem and implement sustainable digital adaptation.

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