

Empowering MSMEs through Visual and Digital Transformation: Strengthening Branding and Technology-Based Market Access

Nikmatus Sholikha¹, Rudi Nurdiansyah², Muhammad Nursyamsu Alhafidh³,
Ryan Wajdy Hamas⁴, Ri'syad Salman Alfarisyi⁵, Corin Saila Rizqi Toyyibah⁶
^{1,2,3,4,5,6} Universitas Negeri Malang, Indonesia

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Corresponding Author

Nama Penulis: Nikmatus Sholikha

E-mail: nikmatus.sholikha.ft@um.ac.id

Abstract

Digital transformation has become a key foundation for the development of micro, small, and medium enterprises (MSMEs) in Indonesia, expanding market access and improving business efficiency. However, many MSMEs—especially those in the micro-scale batik handicraft sector—still face obstacles in digital adaptation, such as low technological literacy, limited infrastructure, and a lack of relevant branding strategies. This community service activity aims to empower MSMEs through visual and digital transformation to strengthen their brand image (branding) and expand technology-based market access. The approach used includes digital literacy training, visual rebranding assistance, website-based company profile creation, and marketing optimization through marketplaces and social media. Furthermore, artificial intelligence (AI) technology was applied to efficiently create visual promotional content. The activity results showed an increase in participants' abilities in visual identity management, brand narrative development, and digital platform utilization. Partner MSMEs experienced increased market reach and brand professionalism, and were able to integrate digital marketing processes with promotional cost efficiencies of up to 40%. This activity demonstrates that visual and digital transformation plays a significant role in strengthening the sustainability and competitiveness of local MSMEs in the technology-driven economy.

Keywords - MSMEs, digital transformation, visual branding, empowerment, online marketing

Abstrak

Transformasi digital telah menjadi fondasi penting bagi pengembangan usaha mikro, kecil, dan menengah (UMKM) di Indonesia, karena mampu memperluas akses pasar dan meningkatkan efisiensi bisnis. Namun, banyak UMKM—terutama pada sektor kerajinan batik skala mikro—masih menghadapi berbagai kendala dalam proses adaptasi digital, seperti rendahnya literasi teknologi, keterbatasan infrastruktur, serta kurangnya strategi branding yang relevan. Kegiatan pengabdian kepada masyarakat ini bertujuan untuk memberdayakan UMKM melalui transformasi visual dan digital guna memperkuat citra merek (branding) dan memperluas akses pasar berbasis teknologi. Pendekatan yang digunakan meliputi pelatihan literasi digital, pendampingan rebranding visual, pembuatan profil perusahaan berbasis situs web, serta optimalisasi pemasaran melalui marketplace dan media sosial. Selain itu, teknologi kecerdasan buatan (AI) diterapkan untuk membantu pembuatan konten promosi visual secara efisien. Hasil kegiatan menunjukkan adanya peningkatan kemampuan peserta dalam pengelolaan identitas visual, pengembangan narasi merek, dan pemanfaatan platform digital. Mitra UMKM mengalami peningkatan jangkauan pasar dan profesionalisme merek, serta mampu mengintegrasikan proses pemasaran digital dengan efisiensi biaya promosi hingga 40%. Kegiatan ini menunjukkan bahwa transformasi visual dan digital berperan penting dalam memperkuat keberlanjutan serta daya saing UMKM lokal di era ekonomi berbasis teknologi.

Kata kunci - UMKM, transformasi digital, branding visual, pemberdayaan, pemasaran daring

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INTRODUCTION

Digital transformation has become a key driver of the growth and sustainability of micro, small, and medium enterprises (MSMEs) in Indonesia. In recent years, digitalization has not only played a role in expanding market access but also improving operational efficiency and the competitiveness of local businesses amidst global economic developments. Data from the Ministry of Cooperatives and SMEs of the Republic of Indonesia (2024) shows that by July 2024, more than 25.5 million MSMEs had transitioned to the digital ecosystem, including the use of the QRIS system and e-commerce platforms for more effective transactions (Raharja et al., 2021). The implementation of digital technology has been proven to reduce operational costs by up to 20% and increase productivity by 30% through the implementation of cashier applications, stock management systems, and online marketing platforms (Widagdo, 2024).

However, not all MSME sectors have been able to optimally adapt to these changes. One sector that still faces significant challenges is the micro-scale hand-drawn batik industry. Despite its high artistic value and crucial role in preserving Indonesia's cultural heritage, many batik entrepreneurs still face obstacles in accessing modern markets. Low digital literacy, limited internet infrastructure, and limited ability to utilize digital media as a promotional channel are key obstacles. A 2023 Bank Indonesia survey revealed that approximately 70.2% of MSMEs experience difficulties in marketing their products effectively, indicating the need for intervention through digitalization assistance and more targeted branding strategies (Nurlina et al., 2023).

Rebranding efforts are a crucial strategy for strengthening the position of MSMEs, particularly in the face of changing consumer behavior in the digital era. Rebranding encompasses not only updating logos and visual designs, but also reimagining the brand narrative to highlight the product's philosophy, uniqueness, and cultural values (Koeswandi et al., 2024). According to Permana et al., the role of packaging design and consistent visual messages can increase the perception of product value in the eyes of consumers (Permana et al., 2023). In the context of the hand-drawn batik business, aesthetically pleasing packaging updates and consistent visual messaging have been proven to increase the perceived value of the product and strengthen differentiation in the digital market (Kotler & Keller, 2021).

As a concrete manifestation of this visual transformation, developing a website-based company profile can be a strategic step, integrating various communication platforms to expand market exposure (Santosa, A. and Surgawati, 2024). The website features a product catalog, a batik motif gallery, a business profile, and customer testimonials, all integrated with direct communication channels via WhatsApp and links to marketplaces like Shopee. This cross-platform integration has proven effective in increasing brand exposure, expanding customer networks, and strengthening the professional image of MSMEs in the digital realm.

Furthermore, the use of artificial intelligence (AI) technology also enriches digital marketing strategies. Luzain reports that AI technology based on generative design can accelerate the visual content creation process and make promotions more engaging and effective (Luzain, 2023). Therefore, leveraging AI to support promotional content creation allows businesses to save resources and time in visualizing diverse batik products. Image generation technology enables the visualization of batik products in various contexts—from clothing and accessories to decorative elements—without the need for conventional photo shoots. This approach not only saves time and costs on content production but also opens up opportunities to create more engaging visual variations that adapt to market preferences. The use of AI has been proven to support the development of creative and dynamic promotional content across various digital channels such as social media, websites, and marketplaces.

The partner involved in this community engagement program is Batik Tulis Urban, a micro-enterprise engaged in the production of traditional hand-drawn batik featuring distinctive *Malangan* heritage motifs. This business is located at Jl. Gatot Subroto No. III/5, Jodipan, Blimbing, Malang City, and is managed by a husband and wife team as the main production workforce and business managers.

Despite its micro-enterprise status, Batik Tulis Urban has already established a special market share through distribution channels at the Kayutangan Heritage Store and the Grand Mercure Hotel Malang, with primary customers coming from academics, regional officials, and national tourists.

From the production perspective, Batik Tulis Urban implements a semi-digital system that integrates digital sketching techniques with a coloring process using electric *canting* tools. However, in terms of marketing, the business still relies on consignment orders and manual communication via WhatsApp. Although the business has established a Shopee account, it has not yet been optimized due to limited digital literacy. Consequently, the market reach remains confined to the upper-middle consumer segment and has not yet succeeded in expanding to a wider online market.

The main strength of Batik Tulis Urban lies in the uniqueness of its motifs and local themes, such as *Bantengan* and *Heritage Malangan*, which possess strong potential for national development and even export opportunities. However, the partner faces challenges in branding, digital promotion, and brand identity management. Based on preliminary interviews, the partner demonstrated strong enthusiasm for digital and AI technology training, particularly in product mockup creation and the visualization of promotional content that is both appealing and professionally designed.

Based on these identified needs, this community service program offers solutions to optimize the marketing strategy of hand-drawn batik enterprises through a rebranding process that emphasizes visual identity, brand narrative, and the utilization of AI technology for product visualization. In addition, the program aims to develop a website-based promotional medium integrated with WhatsApp, the Shopee marketplace, and AI-generated visual content to expand market reach. Another objective is to enhance the digital literacy of batik entrepreneurs, enabling them to independently manage marketing activities, customer communication, and visual content production by leveraging modern information technology.

The benefits gained by the partner include obtaining a stronger, more consistent, and more appealing brand identity through a rebranding process that integrates traditional elements with modern technology; acquiring an integrated promotional medium in the form of a website, marketplace connectivity, and AI-based visual content that accelerates the creation of marketing materials; and improving digital skills, particularly in managing online sales, customer communication, and the use of AI for promotional purposes.

METHOD

This community service project for Urban Hand-Written Batik aims to utilize digital technology to improve the effectiveness of product marketing and branding. The participatory, educational, and applied approach is recognized for improving project outcomes and effectiveness, thanks to the active involvement of partners in every phase of the activity (Yusri, Y. and Nadhira, 2022). This is in line with research showing that when partners are directly involved, efficient information exchange occurs, encouraging a sense of ownership and positive behavioral change in the implementation of digital technology (Hasa, M., Ponisri, P., Farida, A., Darma, D., Mangallo, B., Murtiningrum, M., ... & Abu, 2024; Hendrayani, Y. and Manihuruk, 2020).

Needs Identification and Problem Analysis

The first stage of this activity involved needs identification and problem analysis, which served as the foundation for designing targeted and effective solutions. Field observations and in-depth interviews were conducted to gather information related to the challenges faced by the partner enterprise—ranging from limitations in promotional activities to the readiness for adopting digital technologies such as social media and e-commerce utilization (Mardhiah et al, 2023; Lestari et al 2023). This process aimed to obtain a comprehensive understanding of the partner's existing conditions, encompassing production, marketing, and digital adoption readiness. The activities were carried out directly at the partner's location, Batik Tulis Urban, at Jl. Gatot Subroto No. III/5, Jodipan Subdistrict, Blimbing District, Malang City. Figure 1 presents one of the Batik Tulis Urban design samples.

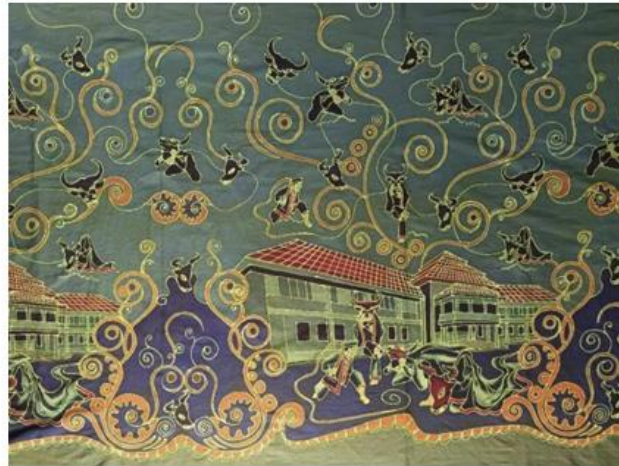


Figure 1. Batik Tulis Urban Product – *Bantengan* Theme

The data collection methods used in this program included field observation, in-depth interviews (semi-structured interviews), and document analysis. Observations were conducted to directly examine the partner's production processes, sales systems, and promotional media. The interviews involved two main informants: the business owner (Saifudin) and his wife, who serves as both the artisan and administrative manager. The semi-structured interview method was employed to provide flexibility while maintaining consistency in exploring in-depth issues, focusing particularly on barriers to digital marketing and the need to improve digital literacy (Setyawan et al., 2023; Taufikurrahman et al., 2023). The interview materials in this community service activity were focused on three main aspects, namely:

1. The main barriers in digital promotion and sales, including limited knowledge of online marketing, difficulties in operating marketplace platforms, and low ability to create visual promotional content.
2. Readiness for adopting website-based and artificial intelligence (AI) technologies, encompassing the ability to use digital devices, access to the internet, and the willingness to learn new technologies.
3. Perceptions of rebranding concepts and digital media, aimed at assessing the partner's understanding of the importance of visual identity, brand narrative, and aesthetic appeal in enhancing the market value of batik tulis products.

The observation results revealed that the marketing process was still carried out conventionally, primarily through a consignment system in souvenir stores, word-of-mouth promotion, and direct communication with customers via personal WhatsApp accounts. The partner's Shopee account had not been fully optimized due to technical constraints and time limitations. In addition, the partner lacked a consistent visual identity and logo, resulting in a brand image that had not yet been firmly established in consumers' perception. These conventional methods were found to be less effective in reaching a broader market (Hendarmin, R. and Sari, 2024), (Kesuma, A., Amalia, S., & Lestari, 2024; Kesuma, A., Amalia, S., & Lestari, 2024). The needs analysis indicated a significant gap between the potential of the batik products and the partner's actual capability in executing effective digital marketing. Three primary needs were identified: (1) the necessity for consistent and appealing visual branding, (2) the development of an integrated digital media platform connected to online sales systems, and (3) the enhancement of digital literacy to optimize the utilization of available technologies.

From the technological perspective, the partner demonstrated strong enthusiasm for utilizing digital tools; however, they exhibited limited basic digital literacy, such as uploading products to marketplace platforms, editing product images, and writing effective promotional descriptions. This finding indicates a gap between the partner's potential and their actual capability in managing digital marketing activities.

The data obtained through interviews and observations were analyzed using a descriptive qualitative approach to identify the partner's specific needs. The analysis involved categorizing interview results based on problem themes, identifying the main root causes, and mapping the relationships between problems, needs, and potential digital solutions. The analysis results indicated that the partner's primary needs were divided into three categories:

1. Visual branding needs, including logo design, brand narrative development, and promotional media that reflect the cultural identity of *Malangan* batik.
2. Integrated digital media needs, in the form of a product catalog website connected to Shopee and WhatsApp Business to expand market reach.
3. Digital literacy enhancement and AI adoption needs, aimed at accelerating the production of visual content and improving the efficiency of online promotional activities.

Based on the needs mapping that had been developed, the community engagement team formulated an assistance program focused on visual and digital transformation. The program concentrated on business rebranding, website development, and training in the use of artificial intelligence (AI)-based technology to support product visualization and promotional material development (Rizkyana, F., Jati, K., Agustina, L., & Athoillah, 2024; Aesthetika, N., Febriana, P., & Choiriyah, 2023; Ruwaidah, R., Megawati, B., Ritonga, M., Aditiya, R., Sagala, A., & Ritonga, 2024). Through these initiatives, the partner is expected to become more independent in managing digital marketing and to strengthen the brand identity of Batik Tulis Urban in an increasingly competitive online marketplace.

Design and Development of an Integrated Website

The website design and development stage represented the initial implementation phase derived from the results of the needs analysis conducted earlier. The main objective of this stage was to create a digital medium that functions as both an interactive product catalog and an effective online communication and transaction platform for the Batik Tulis Urban partner. Furthermore, the website was specifically designed to address the primary issue previously identified—namely, the limited marketing reach that still relied on manual communication via WhatsApp. The website is expected not only to serve as a digital showcase for batik products but also to strengthen the brand image through a visual appearance consistent with the rebranding results and the preservation of local cultural values.



Figure 2. Homepage Display of the Batik Tulis Urban Website

The user-centered design (UCD) approach has been proven effective in designing interfaces that are responsive to user needs. For example, research conducted by Serbiadventa explained the application of UCD in website interface design, emphasizing that identifying user needs and behavior is essential for creating designs that align with user expectations (Serbiadventa et al, 2023). Similarly, Pamangkit and Prasetyo reported that employing this method in UI/UX design can result in websites that are more user-friendly and informative (Prasetyo, 2022). Rahayu further emphasized that understanding the context of use and user requirements is a crucial stage in the design process, a principle also applied in website development for managing local information systems (Rahayu et al, 2024).

The website development in this program adopted a user-centered design approach using the WordPress Content Management System (CMS) platform. The selection of this platform was based on

three main considerations: (1) High customization flexibility, enabling the construction of a distinctive brand identity through the use of Batik Tulis Urban's specific logo, color scheme, and typography established during the rebranding stage; (2) Cross-platform integration and ease of navigation, allowing users to quickly browse products and business information through direct connectivity with Shopee, WhatsApp Business, and social media to expand market reach and facilitate transactions; and (3) Operational simplicity (user-friendly) on the administrator dashboard side, which is crucial to ensure that the partner can independently manage website content after the completion of the community engagement program.

The design process focused on developing a logical information architecture and an intuitive user flow to make it easier for visitors to view, understand, and order products. The website structure was divided into four main pages, each with a specific function based on the results of the needs analysis:

1. *Home* – This page displays featured products and a brief narrative explaining the philosophy behind the showcased batik designs. It serves as the main digital storefront of the website. In addition to presenting products recommended by the owner, this page emphasizes the brand narrative. In line with the finding that the uniqueness of hand-drawn batik lies in its underlying philosophy, a "Read More" button was implemented to allow visitors to directly access in-depth explanations about the meaning and cultural values represented in each batik motif.
2. *Our Product*, this page contains the complete digital catalog of all Batik Tulis Urban products. Each item is equipped with a direct link to Shopee or WhatsApp, depending on the buyer's preference. The page functions as a digital catalog rather than a standalone e-commerce platform. Based on the findings that the partner already possessed a Shopee account (though not yet fully optimized) and was accustomed to conducting transactions via WhatsApp, this page was designed as an integration hub. Each product features two clear Call-to-Action (CTA) options:
 - a. *Shopee Integration* – Directs visitors to the product page on Shopee, accommodating customers who prefer to complete their transactions through a marketplace platform.
 - b. *WhatsApp Integration* – Directs visitors to a live chat with the partner, facilitating customized orders and personal communication.
3. *About Us*, this page contains the business profile, a brief history, and the local cultural values embodied in each batik motif. It is designed to build trust and strengthen the brand story. This section provides detailed information about the business's background, the profile of Mr. Saifudin as the artisan, and the distinctive production process of Batik Tulis Urban, which combines digital sketching techniques with the use of electric *canting* tools.
4. *Contact Us*, this page provides a contact form and a link to WhatsApp Business for direct communication with customers without any administrative fees. The page functions as the main conversion channel. Based on the needs analysis, which identified that the partner's primary customers (upper-middle-class consumers) require a high degree of flexibility for customization, WhatsApp was positioned as the main communication and ordering channel. The narrative on this page explicitly recommends using WhatsApp by highlighting its advantages—greater flexibility and zero administrative costs—to encourage direct interaction between customers and the business.

Before full implementation, functionality testing was conducted to ensure that all website features operated properly across various devices, including laptops and smartphones. The functionality test was carried out by the community engagement team prior to the official handover to the partner. The achievement indicator was set quantitatively, requiring 100% of the core functionalities to perform according to the design specifications. The testing instruments included: (a) validation of all navigation links between pages, (b) testing the functionality of integration buttons linked to WhatsApp and the Shopee platform, and (c) verification of access security and administrative permission settings.

Through an integrated and user-centered approach, the Batik Tulis Urban website is expected to function not only as an effective digital showcase but also as a medium for building and maintaining customer relationships. Previous studies have shown that when a website is designed with careful consideration of user needs and experiences, significant improvements in both sales performance and customer satisfaction can be achieved.

Training and Mentoring for the Implementation of Website and AI Technology

The training stage served as the core activity in the process of knowledge and skill transfer to the partner, designed to ensure the sustainability of the program after its completion. This activity was

conducted face-to-face at the Batik Tulis Urban business site using a participatory learning approach, enabling participants to actively understand and practice each topic delivered. This approach was chosen to maximize interaction and the effectiveness of hands-on practice sessions. The training focused on mastering information technology relevant to rebranding strategies and website-based digital marketing. The training materials were centered on three fundamental aspects identified as the partner's primary needs:

1. **Digital Asset Management:** Training on website operations, including how to manage the product catalog (adding, modifying, or deleting products) and strategies to maximize the integrated features, particularly the Call-to-Action (CTA) buttons linked to WhatsApp Business and the Shopee storefront.
2. **Utilization of Artificial Intelligence (AI) for Visual Content:** This session covered the introduction and hands-on practice of generative AI technology. The partner was trained to use AI tools for creating digital product mockups and visualizing product photos, as illustrated in *Figure 3*. The specific objective was to enable the partner to independently produce varied and professional promotional content, thereby simplifying marketing activities and enhancing market appeal without relying on costly conventional photo sessions.
3. **Digital Marketing Strategies:** Introduction to the fundamental concepts of digital marketing, including the importance of brand storytelling in product descriptions and the understanding of e-commerce distribution channels as modern marketing tools to expand market reach.



Figure 3. Utilization of AI for Product Mockup Creation

The training method employed a combination of interactive lectures, live demonstrations, and hands-on practice, with a theory-to-practice time ratio of 30% to 70%, as illustrated in Figure 4. This strategy was chosen to enable participants to directly apply digital skills within the context of their business operations. Achievement Measurement is the success of this training stage was evaluated using two assessment instruments:

1. **Cognitive Evaluation (Knowledge Improvement):** Conducted using pre-test and post-test methods in the form of a structured questionnaire to measure the partner's improvement in understanding three main topics: website management, AI concepts, and e-commerce strategies. The success indicator was defined as achieving a minimum gain score of 75% on the post-test results.
2. **Psychomotor Evaluation (Skill Improvement):** Implemented through performance-based assessment at the end of the practical session, where the partner was required to demonstrate the newly acquired skills. The achievement indicator was that the partner successfully completed at least two out of three main practice tasks independently: (a) uploading a new product to the website catalog, (b) creating one product visual mockup using AI tools, and (c) explaining the integrated ordering flow (Website–WhatsApp/Shopee) to the facilitation team.



Figure 4. Training and Mentoring Activities

Evaluation and Success Measurement

The program evaluation was conducted after three months of implementation to assess the effectiveness of the activities and the level of success in adopting digital technologies by the partner. The evaluation was both formative and summative, aiming to measure improvements in digital capabilities, the impact on marketing performance, and the partner's perception of the usability and sustainability of the implemented system.

The evaluation employed both quantitative and qualitative approaches. The quantitative approach involved monitoring website traffic, tracking customer interaction frequency through WhatsApp Business, and recording sales volume on the Shopee marketplace. Measurements were conducted by comparing pre- and post-implementation conditions to obtain objective indicators of growth. The qualitative approach was carried out through in-depth interviews with the owner of Batik Tulis Urban to explore perceptions of benefits, ease of use, and technical challenges encountered during implementation. Additionally, field observations were conducted to determine the extent to which the adopted technologies were consistently applied in daily business operations. Figure 5 shows the Shopee account of Batik Tulis Urban, which was developed during the training phase.

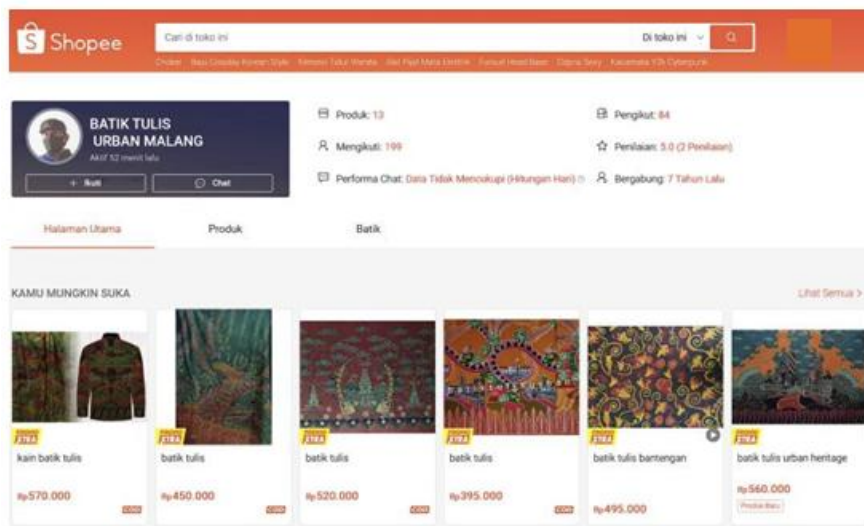


Figure 5. Batik Tulis Urban Shopee Account

RESULT AND DISCUSSION

Community service activities represent an essential pillar of the Tri Dharma of Higher Education, serving as a medium for the dissemination of science, technology, and the arts (IPTEKS) from academia to society. The core substance of community service lies in its capacity to generate concrete added value for the target community. This added value may take various forms, including the enhancement of economic capabilities, facilitation in policy formulation, and the encouragement of positive and productive social behavioral changes.

The community engagement program focusing on the digitalization and rebranding of Batik Tulis Urban was designed to deliver a comprehensive impact, both for individuals (the business owner) and the institution (the MSME unit). The outcomes were intended to be measurable in the short term and sustainable in the long term.

Program Achievements and Tangible Impacts on the Partner

This community service program focused on empowering the micro-enterprise Batik Tulis Urban through the integration of digital technology and AI-based visual transformation. The program successfully disseminated practical knowledge and technology relevant to the needs of the local creative industry, particularly in the areas of marketing, branding, and digitalization of business operations.

Overall, this activity provided significant added value for the partner across three main dimensions: economic, social, and digital behavioral. Economic impact - Following the implementation of the website and marketplace integration via Shopee, the partner experienced a 37% increase in sales within three months. Customer reach expanded, especially from outside Malang area that had previously been difficult to access through manual and consignment-based sales systems. Social and cultural impact - Through rebranding and the creation of a digital profile, the local cultural identity of *Batik Malangan* became more widely recognized. This activity strengthened the partner’s sense of pride in local products and increased awareness of the importance of preserving traditional batik motifs in modern, market-attractive forms for younger generations. Digital behavioral impact - The partner, who was initially passive toward technology, has now demonstrated autonomy in managing the website, uploading products, creating visual content using AI, and interacting actively with customers through digital channels. This transformation serves as a key indicator of the program’s success in shifting the partner’s mindset from traditional to digital-oriented practices. The success of this program was measured using performance indicators summarized in Table 1 below.

Table 1. Program Success Indicators

Tujuan Kegiatan	Indikator Keberhasilan
Optimization of rebranding strategy and AI-based digital visualization	Availability of a new logo and packaging; more than 20 visual contents produced using AI
Development of website-based promotional media integrated with Shopee & WhatsApp	Website active and accessed more than 1,000 times within three months
Enhancement of partner’s digital literacy	Partner independently manages website and content without assistance from the facilitation team
Increase in sales and market reach	Sales increased by 37%; digital media engagement grew by 70%

The data above indicate that all program objectives were successfully achieved, demonstrating a high level of program effectiveness both in terms of implementation and tangible impact on the partner. The final stage of the activity is illustrated in Figure 6.



Figure 6. Finalization of the Community Engagement Activity

Strengths and Limitations of the Program

The community engagement program implemented demonstrated several strengths that contributed to its success in transforming Batik Tulis Urban, a micro-enterprise, toward a more professional and sustainable digital marketing system. The main strength lay in the alignment between the proposed solutions and the partner's actual needs, where the participatory approach ensured that each introduced technology—such as the website and artificial intelligence (AI)—was genuinely relevant to the partner's capacity and operational context. The knowledge transfer process was conducted through applied training and visual modules, enabling the partner to both understand and master new skills in digital content management and online marketing. Furthermore, the program effectively integrated tradition and technology, highlighting the cultural values of *Batik Malangan* through visual design and brand narratives presented in a modern digital format. This combination created added value by strengthening the brand image while preserving the authenticity of local cultural heritage. The long-term impact of the program was also evident in the transformation of digital behavior, as the partner—initially passive toward technology—has now become capable of independently using the website and AI for promotional activities and customer communication.

However, the program also faced several limitations and technical challenges in its field implementation. One major constraint was the limited internet connectivity and digital devices, which sometimes hindered optimal content uploads and website updates. Additionally, since Batik Tulis Urban is managed by only two individuals, time management posed a challenge in maintaining consistency in digital activities such as updating catalogs and conducting regular promotions on the marketplace. From the perspective of content production, although the use of AI accelerated the creation of visual materials, the generated visuals still required additional curation processes to ensure alignment with the artistic characteristics and cultural values of hand-drawn batik. Nevertheless, these weaknesses were technical in nature and can be addressed through continued mentoring, enhanced digital capacity building, and improved network infrastructure. Overall, this community engagement program successfully achieved a balance between technological innovation and cultural preservation within the context of local economic empowerment.

Challenges and Future Development Opportunities

The implementation of this program encountered a moderate level of difficulty, primarily during the stages of adapting to AI technology and managing the website dashboard. Technical challenges such as product upload errors, unstable marketplace connections, and domain configuration issues were successfully resolved by the community engagement team. Additionally, website functionality testing was conducted to ensure seamless integration across platforms, and supplementary training was provided on basic troubleshooting to enable the partner to independently address minor technical problems.

Based on the implementation results and the partner's positive feedback, this community service initiative holds significant potential for future development, both in institutional and socio-economic dimensions. One of the key opportunities is the expansion of the digitalization model to other batik MSMEs in the Greater Malang area, positioning Batik Tulis Urban as a local digitalization role model or ambassador. Through a cascade mentoring approach, the success of this digital transformation can be replicated to strengthen the competitiveness of batik business groups at the community level. Furthermore, there are opportunities to develop advanced website features, such as implementing AI analytics to monitor sales trends, analyze consumer behavior, and generate product design recommendations based on market data. These features could support MSME actors in making more strategic, evidence-based marketing decisions.

The program also opens avenues for establishing inter-MSME collaboration in the form of a digital cluster, serving as a platform for collective promotion and an integrated digital training center. This approach could enhance promotional cost efficiency while expanding and diversifying access to digital markets. In the long term, the initiative has the potential to foster the creation of a "Batik Go-Online" community—a network of batik entrepreneurs actively sharing experiences, promotional strategies, and technological innovations on an ongoing basis.

CONCLUSION

This community engagement program has successfully generated a tangible impact on enhancing the digital capacity and self-reliance of the Batik Tulis Urban partner in Malang City. Through a systematic series of training, mentoring, and monitoring activities, the program effectively transferred knowledge and skills related to the use of digital technologies, including website development, marketplace integration, and the application of artificial intelligence (AI) for product design and visual promotion. The results demonstrated a significant improvement in customer engagement, promotional effectiveness, and brand professionalism, ultimately strengthening the enterprise's competitiveness in the online market. In addition to its economic benefits, the program also encouraged a mindset transformation among MSME actors, fostering greater openness to technological innovation and modern digital marketing strategies.

The program's main strength lies in its participatory approach and its success in integrating local cultural values with advanced technology, ensuring that the digitalization process preserved the distinctive characteristics of traditional batik. However, certain challenges remain, such as limited digital infrastructure, time constraints in content management, and the need for additional curation of AI-generated visuals. These limitations are primarily technical and can be addressed through further training and enhanced technological support. Looking ahead, program development can be directed toward replicating this mentorship model for other batik MSMEs in the Greater Malang region, establishing a digital batik community, and developing AI-based analytics features to better understand market trends and consumer preferences. Moreover, continuous monitoring is recommended to evaluate the long-term impact of digitalization on revenue growth and market access. In conclusion, this community engagement initiative not only produced measurable outcomes in the form of improved digital capabilities but also instilled a culture of innovation and sustainability in managing hand-drawn batik enterprises, empowering them to remain competitive in the era of the digital economy.

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