



Integration of Appropriate Technology and Digital Marketing in Written Batik Msmes: A Case Study of Socio-Technical Transformation of Assyafa Lampung Batik

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ABSTRACT

This study analyzes the integration of feeder technology and digital marketing in Batik Tulis Assyafa Lampung MSMEs as a socio-technical transformation linking production change, market communication, competitiveness, and artisan empowerment. Using a qualitative case study, data were collected through production observation, semi-structured interviews with nine informants, documentation, and limited analysis of digital traces. The findings show that feeder technology was accepted because it supported controlled dyeing, material efficiency, and quality consistency. Program documentation indicated reduced production time from 14 to 8 days, waterglass use from 100 to 40 liters, and product defects from 5% to 2%. Digital marketing strengthened visibility, cultural storytelling, and consumer understanding of Lampung-based handmade batik value within competitive creative industry markets.

INTRODUCTION

Batik is a cultural product as well as a creative economy commodity that has an important role in strengthening regional identity, job creation, preservation of traditional skills, and local economic development. In the context of MSMEs, batik not only functions as a clothing product, but also as a space for the production of knowledge, art, skills, cultural narratives, and community empowerment. The strategic value of batik can be seen from its contribution to culture-based small and medium industries. The Ministry of Industry of the Republic of Indonesia (2025) noted that the value of Indonesian batik exports in the first quarter of 2025 reached USD7.63 million, an increase of 76.2 percent compared to the same period in 2024 of USD4.33 million. The Ministry of Industry also noted that based on the 2020 BPS Center Directory, there are around 5,946 batik industries and 200 batik IKM centers spread across 11 provinces. The data shows that batik still has economic prospects, but these prospects must be followed by the ability of MSMEs to maintain production efficiency, product quality, design innovation, and market expansion.

At the MSME level, the challenge of batik does not only lie in marketing, but also in the production process. Written batik requires time, precision, skill, and high-quality control. The manual dyeing process often causes problems such as the use of inefficient materials, uneven colors, the risk of defective products, and limited production capacity. These conditions affect costs, order completion times, consumer satisfaction, and product competitiveness. Therefore, strengthening batik MSMEs is not enough to be done through promotion, but it is necessary to touch on the aspect of appropriate technology that can help the production process without eliminating the character of written batik as a handmade product.

Changes in consumer behavior encourage batik MSMEs to be actively present in the digital space. DataReportal (2025) noted that Indonesia has 212 million internet users in January 2025 with a penetration of 74.6 percent, as well as 143 million social media user identities or equivalent to 50.2 percent of the total population. This condition shows that social media has become an important space for consumers to find information, compare products, see testimonials, and interact with business actors. For batik MSMEs, digital marketing is not only a means of selling products, but also an educational medium to explain the batik process, the meaning of the motif, the quality of the material, cultural values, and the reason why written batik has a higher price than printed batik products.

Fakhrurozi (2023) findings show that marketing strategies, promotion through social media, and participation in exhibitions or events can increase sales while expanding the MSME marketing network. The relevance of these findings to Batik Tulis Assyafa Lampung lies in the similarity of character as creative MSMEs based on cultural products and manual skills. Products such as batik and ecoprints are not enough to be marketed through price information, but need to be communicated through product stories, process visuals, local identity, and emotional connections with consumers.

Warsiyah et al. (2023) emphasized that after changing consumption behavior from offline to online, MSMEs need to utilize digital media as a means

of marketing products sustainably in order to become superior products that can be marketed more widely. The study also shows that MSME obstacles in digitalization are generally related to low digital literacy, limited online marketing knowledge, and lack of optimal technical assistance. Thus, the digitization of MSMEs cannot be understood only as an activity of creating social media accounts, but as a process of increasing business capacity, strengthening content, customer management, and expanding market access. MSME digitalization is not only related to product promotion but also to strengthening transaction systems and business competitiveness. Sari et al. (2024) emphasize that QRIS has the potential to help MSMEs expand access to digital financial services, improve transaction efficiency, and enhance competitiveness.

However, many studies on the digitalization of MSMEs still place digital marketing as a stand-alone issue. Meanwhile, production technology innovations are often discussed separately from market strategies. In written batik MSMEs, the separation is inadequate because the quality of digitally promoted products is highly dependent on the stability of the production process. If production is inefficient and quality is not consistent, the increase in digital promotion can create new pressures because market demand is not kept up with production capabilities. On the other hand, improving the quality of production will not have an optimal impact if it is not connected to branding, digital content, events, product catalogs, and online marketing channels.

Lampung Batik Tulis MSMEs are a relevant case because they integrate feeder technology in the coloring process with digital marketing. Warsiyah et al. (2024) explained that the application of feeder technology in Assyafa Written Batik is directed to improve production efficiency and marketing strategies. Feeder technology helps the dyeing process become more measurable, while digital marketing helps introduce products to consumers through social media, catalogs, activity documentation, and narratives of the batik making process. Assyafa's social media footprint also shows an effort to display the batik making process and the figure of craftsmen, so that products are not only marketed as fabrics, but also as the result of cultural work.

The gap in this research lies in the limited qualitative case studies that explain the relationship between appropriate technology, digital marketing, local cultural identity, and artisan empowerment in one integrative framework. Some MSME studies focus more on digital marketing, while production technology studies often emphasize technical efficiency. Different from the previous study, this study places feeder and digital marketing as part of the socio-technical transformation of handicraft MSMEs. The novelty of this research lies in the effort to explain how production technology, craftsmen's skills, Lampung's local cultural identity, and digital market communication are interconnected in shaping production efficiency, quality stability, product visibility, competitiveness, and artisan empowerment.

Based on this background, the main question of this research is how the integration of feeder technology and digital marketing shapes changes in production, marketing, competitiveness, and artisan empowerment practices in Lampung Written Batik MSMEs. The purpose of this study is to analyze the

adoption process of feeder in the production of written batik, explain the role of digital marketing in strengthening the visibility and competitiveness of products, and identify the socio-economic impact of this integration for business owners and artisans. Theoretically, this research is expected to enrich the study of MSME technology adoption, process innovation, local culture-based digital marketing, and artisan empowerment. Practically, this research can be a reference for MSME actors, universities, local governments, and MSME facilitators in designing a business transformation program that not only emphasizes tool assistance, but also mentoring, quality strengthening, branding, events, and sustainable digital marketing.

LITERATURE REVIEW

Appropriate Technology and Process Innovation in Handicraft MSMEs

Appropriate technology in MSMEs can be understood as technology that is in accordance with production needs, resource capacity, user skills, operational costs, and the social context of the business. In handicraft MSMEs, technology is not always present as a big machine that replaces human labor. Technology often serves as a process aid that improves accuracy, speeds up certain stages, reduces material waste, and maintains quality consistency. In written batik, handmade characters remain the main source of value, so the relevant technology is the technology that strengthens the work of the craftsman without losing the authenticity of the creative process.

The concept of process innovation is important to read the application of feeders in Assyafa Written Batik. Process innovation refers to updating the way of working, production flows, using inputs, or quality control methods that make processes more efficient and more reliable. Radicic and Petkovic (2023) show that digitalization and the use of technology in SMEs can drive product and process innovation, especially when they are connected to operational needs and business value chains. In the context of batik, feeders can be seen as a process innovation because they help dyeing more stable, reduce material waste, and minimize the risk of defective products.

Akpan et al. (2022) emphasized that the adoption of technology in small businesses in emerging markets is influenced by business actors' awareness of the benefits of technology, resource readiness, the need to survive market pressures, and limited capital and competence. Thus, the success of appropriate technology is determined not only by the sophistication of the tool, but by the suitability between the tool, the user, the production process, and the accompanying support. In batik MSMEs, technology that is not in accordance with the work rhythm of artisans can cause resistance. On the other hand, technologies that are simple, easy to learn, and provide immediate benefits tend to be more readily accepted.

Technology Adoption in the Perspective of TAM and Innovation Diffusion

The Technology Acceptance Model or TAM explains that technology acceptance is influenced by perceived usefulness and perceived ease of use (Davis, 1989). Perceived usefulness refers to the extent to which users believe that technology will improve their job performance, while perceived ease of use refers to the extent to which technology is considered easy to understand and use.

Although TAM is a classic theory, this framework is still relevant for reading the adoption of technology in MSMEs because the decision to use tools is often influenced by the benefits that are directly felt and the ease of use by business actors and workers.

The diffusion of innovation complements TAM by emphasizing that innovation will be more easily accepted if it has relative advantage, compatibility, low complexity, trialability, and observability (Rogers, 2003). Relative advantage is related to the advantages of innovation over old practices. Compatibility is related to the suitability of innovation with the values, needs, and habits of users. Complexity refers to the level of difficulty of innovation. Trialability shows the opportunity for users to try innovations before using them fully, while observability shows the ease of seeing the results of innovation. In the context of feeders, the compatibility aspect is very important because written batik has an authentic value inherent in the craftsman's manual skills.

In handicraft MSMEs, technology adoption cannot be separated from the social dimension. Craftsmen need to understand that technology does not take over their creative role, but helps technical work to be more controlled. Therefore, training, demonstration of use, mentoring, and proof of benefits are important factors. When craftsmen see that feeders do not remove the value of written batik, but rather help dyeing to be neater and more material-efficient, the acceptance of technology becomes stronger.

Digital Marketing, Cultural Storytelling, and Customer Engagement

Digital marketing in MSMEs is not just about moving promotions from the offline space to the online space. Digital marketing includes the ability to create content, manage communication channels, build interactions with customers, leverage testimonials, display catalogs, and read market responses. Dwivedi et al. (2021) affirm that digital media and social media have become an important part of marketing communication because they allow for two-way interaction, rapid dissemination of information, and the formation of electronic word of mouth. In batik MSMEs, social media allows business actors to display the batik process, motifs, materials, testimonials, events, and stories of artisans.

Sunggara (2024) explained that the implementation of digital marketing in MSMEs can expand market reach, increase customer engagement, strengthen brand visibility, and support competitiveness. However, these benefits do not appear automatically. MSMEs need digital literacy, content consistency, visual quality, fast communication response, and easy-to-understand product narratives. In cultural products such as written batik, effective digital content is not only a photo of the fabric, but also a story about motifs, processes, local values, cultural meaning, and the role of craftsmen.

Cultural storytelling is an important element in batik marketing. Batik is not only valuable because of its functional function, but because it contains identity, symbols, meanings, and creative processes. Siger, tapis, Lampung elephant motifs, coffee, and pepper can be the visual language that distinguishes Assyafa Batik from other regional batik. Through Instagram, WhatsApp Business, digital catalogs, and event documentation, these motifs can be packaged into a narrative that explains the origins of design, the uniqueness of Lampung, and the value of

manual work of artisans. Thus, digital marketing can build customer engagement because consumers feel they understand the story behind the product.

MSME Digital Transformation, Competitiveness, and Artisan Empowerment

Verhoef et al. (2021) distinguish digital transformation into digitization, digitalization, and digital transformation processes. Digitization is concerned with the conversion of analog information into digital. Digitalization is related to the use of digital technology to improve business processes. Digital transformation represents broader changes in business models, value structures, and relationships with customers. In this article, the transformation of Batik Tulis Assyafa is not positioned as a large-scale digital transformation, but as a process of digitizing MSMEs that connects production improvement with digital market communication.

Purnomo et al. (2024) through a systematic literature review show that the digital transformation of MSMEs in Indonesia is related to technology adoption, implementation benefits, human resource readiness, as well as obstacles such as digital literacy, capital limitations, and lack of mentoring. The findings are relevant to batik MSMEs because many business actors already have social media accounts, but do not yet fully have a content strategy, digital catalog, customer data management, and promotional evaluation. Therefore, the digitalization of MSMEs needs to be understood as an organizational learning process, not just the use of digital devices.

The competitiveness of handicraft MSMEs is formed from a combination of production efficiency, product quality, design differentiation, consumer trust, and the ability to build a market. The feeder strengthens the production side through material efficiency and staining stability. Digital marketing strengthens the market side through visibility, interaction, and storytelling. The integration of the two is important because strong digital promotion must be supported by consistent product quality. On the contrary, good production quality needs to be communicated effectively in order to be accepted by the market.

The empowerment dimension also needs to be considered. In batik MSMEs, women are often involved in canting, dyeing, finishing, packaging, and promotion. Rosepti and Niasari (2022) show that digitalization can be a strategy for women's empowerment when women are not only placed as production workers, but also involved in business value creation and digital marketing. In the context of Assyafa, empowerment means not only additional income, but also increased skills, confidence, and participation in the creative economy value chain.

Table 1. Synthesis of Literature and Its Relevance to Research

Literature Focus	Key Findings	Reference Sources	Relevance to Research
Adoption of MSME technology	Technology is accepted when the benefits are clear, easy to use, and according to business needs.	Davis (1989); Rogers (2003); Akpan et al. (2022)	Explain the acceptance of feeders by owners and craftsmen.

Process innovation	Technology can improve efficiency, process quality, and consistency of production results.	Radicić and Petković (2023)	Reading feeder as an innovation in the writing batik dyeing process.
Digital marketing	Social media expands market reach, customer engagement, and brand visibility.	Dwivedi et al. (2021); Squirting (2024)	Describe the role of Instagram, WhatsApp Business, catalogs, and process content.
Digital transformation of MSMEs	Digitization of MSMEs requires human resource readiness, mentoring, and organizational learning capabilities.	Verhoef et al. (2021); Purnomo et al. (2024)	Placing the integration of feeder and digital marketing as socio-technical changes.
Women's empowerment	Digitalization can strengthen women's roles when they are involved in production, added value, and marketing.	Rosepti and Niasari (2022)	Describe the skills, employment, and participation opportunities of women artisans.

Conceptual Framework of Research

Based on a literature review, this study uses an integrative framework that views the transformation of batik MSMEs as a relationship between process innovation, quality stability, digital marketing, competitiveness, and artisan empowerment. Feeders are positioned as an appropriate technology that affects the production process. The immediate impact is time efficiency, material savings, and reduced risk of defects. Quality stability then becomes the basis for digital marketing because products can be displayed through photos, process videos, catalogs, event documentation, and more credible cultural narratives.

Digital marketing is positioned as a value communication mechanism. Digital content that displays the batik process, local motifs, testimonials, and event activities can strengthen visibility, consumer trust, and product differentiation. In the next stage, increasing competitiveness opens up job opportunities, skill building, and the participation of artisans, especially women, in the written batik MSME value chain. Thus, the relationship between feeder and digital marketing is not a separate technical relationship, but rather a mutually reinforcing socio-technical relationship.



Figure 1. Conceptual model of integration of feeder technology and digital marketing in MSMEs Tulis Batik Assyafa Lampung

METHODOLOGY

This study uses a qualitative approach with a case study design. This approach was chosen because the research seeks to understand the integration of feeder technology and digital marketing as a social, technical, and cultural process in the context of MSMEs of Batik Tulis Assyafa Lampung. Case studies are used to look at how technology is received, used, interpreted, and linked to marketing strategies and artisan enablement.

Informants are selected purposively based on direct involvement in production, marketing, technology assistance, and product consumption. Interviews are conducted in a semi-structured manner so that researchers get targeted answers, but still provide space for informants to explain their experiences naturally. Observations are carried out in the production process, especially dyeing, drying, checking results, finishing, and packaging. Social media analysis is used as supporting data to see how products, batik making, events, and local identities are displayed in the digital space.

Data collection will be carried out in January 2025 at the production site of Batik Tulis Assyafa Lampung. Observations are carried out on production

activities, especially the process of dyeing, drying, checking results, finishing, and packaging. Semi-structured interviews were conducted with nine informants consisting of MSME owners, 4 (four) craftsmen, digital marketing managers, technology assistants, and 2 (two) consumers. Each interview lasts about 20 to 30 minutes. Interview data is recorded in a field log sheet and, with the informant's consent, is partially recorded to assist in the preparation of transcripts. The results of the interviews are then summarized, coded, and reconfirmed to key informants through member checking.

Quantitative data such as production time, waterglass use, and defective product levels are treated as program documentation data that serves to reinforce the qualitative narrative, not as experimental results. The validity of the data is carried out through source triangulation, triangulation techniques, and member checking to key informants. In terms of research ethics, informants were given an explanation of the purpose of the research, willingness to interview, use of data, and protection of personal identity.

Data analysis is carried out thematically through several stages. First, the researcher re-read observation notes, interview transcripts, activity documentation, and MSME digital footprints to gain a comprehensive understanding of the context of the case. Second, the researcher conducted open coding by coding informant statements related to feeder adoption, production efficiency, coloring quality, digital marketing, consumer response, local identity, and artisan empowerment. Third, codes that have a close meaning are grouped into several main themes. Fourth, the theme is interpreted by connecting it to the theory of technology adoption, innovation diffusion, digital marketing, process innovation, and MSME empowerment. Fifth, the validity of the findings is strengthened through source triangulation, technical triangulation, and member checking to key informants.

Table 2. Informant Profiles and Research Data Mining Focus

Code	Informants	Information Focus
I1	MSME Owners	Business history, feeder adoption decisions, typical designs, costs, orders, revenue, and events.
I2-I5	Batik artisans	Production experience, difficulties before feeders, tool adaptation, work quality, and women's empowerment.
I6	Digital marketing manager	Promotional media, content types, consumer responses, constraints, and digital marketing plans.
I7	Technology companion	Purpose feeder, installation, training, efficiency recording and model replication.
I8-I9	Consumers	Sources of information, motive assessments, product quality, prices, and promotional suggestions.

RESEARCH RESULT

Profile and Characteristics of Assyafa Lampung Written Batik

Batik Tulis Assyafa Lampung develops as an MSME that raises the local cultural identity of Lampung. The characteristic of the product can be seen in the use of motifs such as siger, tapis, Lampung elephant, coffee, and pepper. The motif not only serves as an ornament, but also as a marker of origin, cultural story, and product differentiation.

The owner of MSMEs stated: "Batik Tulis Assyafa Lampung stands as a batik business that raises the local cultural richness of Lampung. Its characteristic is written batik with regional motifs such as siger, tapis, elephant, coffee, and pepper" (I1, owner of MSMEs). The statement shows that local identity is the main source of value. Consumers not only buy fabrics, but also buy stories about Lampung. In the context of the creative economy, local motifs are symbolic capital that can strengthen the position of products in the market.

Adoption of Feeder Technology in the Staining Process

Before the use of the feeder, the coloring process is done manually and depends heavily on the experience of the craftsman. These conditions pose several obstacles, such as the flow of dyes that are difficult to control, the use of less efficient materials, colors that are not always even, and the risk of defective products. MSME owners explained that feeders were chosen because they can help regulate the flow of dye materials more stably.

The MSME owner stated: "The main obstacle is that the dyeing process is still manual, takes a long time, the use of materials is not efficient, and the color results are not always even. Feeder technology was chosen because it can help regulate the flow of dye materials more stably" (I1, owner of MSMEs). One craftsman also explains: "Previously, the dyeing process was more difficult to control, the colors were sometimes uneven, and more materials were wasted. At first it was necessary to learn and adjust, but after a few attempts, it was quite helpful to the work" (I3, craftsman).

These findings show that the acceptance of technology does not happen automatically. Artisans need a learning process, training, and immediate proof of benefits. In practice, feeders are accepted because they help work without eliminating the character of written batik as a handmade product.

Production Efficiency and Product Quality

Data on changes in production time, waterglass use, and defective product levels in this study are positioned as MSME operational documentation data, not as the result of quantitative experiments. The data is obtained from production records, assistance documentation, and business owner confirmations. The decrease in production time from about 14 days to 8 days, the use of waterglass from about 100 liters to 40 liters, and the decrease in defective products from about 5 percent to 2 percent are understood as an indication of efficiency that strengthens the qualitative findings, not as a statistical generalization.

The MSME owner stated: "The most noticeable change is that the production process becomes faster, the colors are more even, and the use of materials is more economical. Feeders help shorten production time, reduce material waste, and reduce the number of defective products because the dyeing process is more controlled" (I1, MSME owner). The craftsman adds: "The feeder makes the work

faster, more organized, and the staining results neater. There are changes, colors look more even and motifs appear clearer" (I4, craftsman).

Digital Marketing, Events, and Consumer Response

Digital marketing is done through Instagram, WhatsApp Business, digital catalogs, WhatsApp status, and activity documentation. Frequently used content includes product photos, videos of the batik process, the latest motifs, customer testimonials, and event documentation. The marketing informant emphasized that the batik process is deliberately displayed so that consumers understand that written batik has the value of work, time, and skill.

The digital marketing manager said: "The content that is often created is in the form of product photos, videos of the batik process, the latest motifs, customer testimonials, and documentation of activities. The batik process is displayed so that consumers know that the product is made manually and requires skills" (I6, digital marketing manager). He also added: "The consumer response has been quite good. Many ask about the motif, price, size, fabric material, and how to order. Digital marketing makes the product more recognizable and improves communication with potential buyers" (I6, digital marketing manager).

Events and exhibitions are also important spaces to expand the network. The informant mentioned that Assyafa participated in MSME exhibitions, creative product bazaars, campus activities, training, and promotional events for batik and the creative economy. The event documentation is then published through social media to increase consumer trust. One consumer stated: "I found out about Batik Tulis Assyafa from social media, friend recommendations, and exhibition activities. I am interested because the motifs are typical of Lampung, the colors are attractive, and the products are made in writing or manually" (I8, consumer).

Economic Advantages for Owners and Craftsmen

For business owners, the benefits of feeder integration and digital marketing can be seen in cost efficiency, order fulfillment, and revenue increase opportunities. For artisans, the benefits are seen in new skills, more organized work, and job opportunities as orders increase.

MSME owners stated: "Production costs have become more efficient. Because production is faster and quality is better, orders are easier to fulfill and business income has the opportunity to increase" (I1, MSME owner). Craftsmen said: "If production and orders increase, craftsmen also get more job opportunities and better income. We gained new skills in using tools and maintaining the quality of the coloring" (I2, craftsman).

These findings show that technology is appropriate to provide economic benefits when followed by market expansion. Production efficiency without a market only lowers costs, while digital marketing without stable production quality can lead to consumer dissatisfaction. The integration of the two is the key to competitiveness.

Social, Environmental, and Women's Empowerment Impacts

Assyafa Tulis Batik MSMEs have a social impact because they open up job opportunities, increase community skills, and help preserve Lampung's typical batik. Women have a big role in production, especially in the process of tinkering, dyeing, finishing, packaging, and some promotions.

Female artisans said: "Women play a big role in tinkering, dyeing, finishing, packaging, and sometimes helping with promotion. This business provides opportunities for women to work as artisans and helps the family economy" (I5, women artisans). She also asserts: "The most pronounced social impact is the opening up of employment opportunities, the increase in women's skills, and the growing pride in local culture" (I5, women artisans).

The environmental impact in this study is limited to the efficiency of using materials. The feeder helps to regulate the dye and backing materials more measurably, so that the remaining material can be reduced. This study has not conducted laboratory tests on liquid waste, so environmental claims are not directed at proving pollution reduction, but at material efficiency and waste reduction potential.

Table 3. Matrix of Themes, Subthemes, Data Sources, and Empirical Evidence of Research

Main Themes	Subtheme	Data Source	Empirical Evidence
Adoption of feeder technology	Ease of use, production benefits, craftsman adaptation	Interviews I1, I2, I3, I7, production observations	The informant stated that the feeder helps the dyeing more stable and reduces the waste of materials.
Production efficiency and quality	Production time, waterglass, defective products, color neatness	Operational records, owner interviews, companion documentation	The production time decreased from 14 days to 8 days, waterglass decreased from 100 liters to 40 liters, defective products decreased from 5 percent to 2 percent.
Digital marketing	Instagram, WhatsApp Business, digital catalog, event documentation	I6 interviews, social media reviews, consumer interviews	The content of the batik process increases consumer understanding of the value of written batik.
Local cultural identity	Siger motifs, tapis, Lampung elephants, coffee, pepper	Owner interviews, product observations, visual documentation	Local motifs are the differentiators of digital storytelling products and materials.
Artisan empowerment	New skills, job opportunities, the role of women	Interviews I2 to I5	Female artisans are involved in production, finishing, packaging, and promotion.

Based on the results of coding and data categorization, the research findings are grouped into five main themes, namely the adoption of feeder technology, production efficiency and quality, digital marketing, local cultural identity, and artisan empowerment. The five themes show that the transformation of Assyafa Lampung Batik Tulis MSMEs is not only related to the use of production tools, but also related to changes in work practices, strengthening product quality, digital market communication, cultural differentiation, and increasing the role of craftsmen in the business value chain.

DISCUSSION

The findings of this study show that the adoption of feeder technology in Batik Tulis Assyafa Lampung MSMEs needs to be understood as a socio-technical process. Technology does not stand alone as a mechanical tool, but is connected to the work habits of the craftsman, the structure of production, training, the acceptance of the user, and the benefits felt in daily activities. . In the perspective of the Technology Acceptance Model or TAM, technology acceptance is greatly influenced by two main aspects, namely perceived usefulness and perceived ease of use (Davis, 1989). In the case of Batik Assyafa, the feeder was accepted because the craftsmen saw immediate benefits, such as a more controlled dyeing process, more economical use of materials, neater work, and shorter production times. This shows that appropriate technology is more readily accepted when its benefits can be felt concretely by users.

In the perspective of innovation diffusion, the application of feeders also shows the importance of compatibility, namely the suitability of innovation with local values, needs, and work practices (Rogers, 2003). The feeder is not understood as a substitute for the skill of the craftsman, but as an aid that strengthens the coloring stage. This is important because written batik has an authentic value inherent in manual skills, precision, and cultural expression. Technology that replaces handmade elements too much can cause resistance because it is considered to reduce the value of batik art. Instead, technology that helps with technical processes without eliminating the identity of the craft will be more readily accepted. In Assyafa's case, the feeder serves as a process innovation that maintains production stability, not a tool that removes the role of the craftsman.

The findings of this study also show that the transformation of handicraft MSMEs cannot be understood only as a process of adopting production tools or using social media. Feeder technology plays a role as a process innovation that strengthens efficiency and quality stability, while digital marketing acts as a value communication mechanism that connects products with consumers. Both form a value ecosystem as more consistent production quality provides more credible visual and narrative materials for digital promotion, while digital interactions with consumers provide input for the development of motifs, services, and marketing strategies.

These findings are in line with Purnomo et al. (2024) who emphasized that the digital transformation of MSMEs in Indonesia is related to technology adoption, resource readiness, implementation benefits, and internal barriers such

as digital literacy. Thus, the transformation of Batik Tulis Assyafa MSMEs is not enough to be understood as the use of feeders or social media separately. Both must be seen as one ecosystem of business change. Feeders strengthen the production side, while digital marketing strengthens the market communication side. A more stable product quality is a key ingredient for convincing digital promotion, while the response of the digital market provides input for improvements in design, color, catalog and service.

In terms of marketing, the findings of this study are strengthened by Fakhrurozi (2023) that marketing strategies, promotion through social media, and participation in exhibitions or events can support increased sales while expanding the MSME marketing network. The relevance of these findings is strong for Batik Tulis Assyafa because written batik and ecoprint are both creative products based on skills, visuality, manual processes, and cultural narratives. Products like this are not enough to be marketed through price information, but need to be communicated through stories about the motifs, manufacturing processes, craftsmen, and local values inherent in the product.

Warsiyah et al. (2023) on the use of social media in MSMEs Ecoprint Yasmin Wiwid emphasized that social media plays an important role in increasing customer engagement. The research shows that MSME actors are interested in using digital marketing, but still face obstacles in understanding information technology, so they need appropriate strategies and assistance. In the case of Batik Assyafa, social media functions not only as a product storefront, but also as an educational space. The content of the batik making process, event documentation, consumer testimonials, motif catalogs, and artisan stories help consumers understand why written batik has a higher value than printed or mass-produced batik products.

Digital marketing also strengthens competitiveness through customer engagement. When consumers ask about motifs, sizes, materials, prices, production processes, and how to order, those interactions become part of a more personalized market relationship. For MSMEs, customer engagement is important because it can build trust, increase repurchase opportunities, and expand word-of-mouth promotion digitally. Digital marketing is not just moving offline to online promotions, but building new relationships between artisans, products, and consumers. This is very relevant for Assyafa because written batik products require an explanation of value, not just a visual appearance.

In terms of innovation, the integration of feeders and digital marketing can be read as a combination of process innovation and market innovation. Feeders improve the coloring process, while digital marketing improves the way products are introduced and accepted by the market. This integration shows that MSME innovation does not always have to be in the form of large and expensive technology. Simple technology that fits your needs, when coupled with the right marketing strategy, can result in important changes to efficiency, quality, and competitiveness.

In batik MSMEs, female workers are often involved in canting, dyeing, finishing, packaging, and promotion. The integration of feeder technology provides opportunities for the improvement of technical skills, while digital

marketing opens up opportunities for involvement in product documentation, consumer communication, and catalog management. Thus, empowerment in Assyafa's case means not only additional income, but also increased capacity, confidence, and women's participation in the creative economy.

These findings yield both theoretical and practical implications. Theoretically, this article expands the understanding of MSME technology adoption by emphasizing the relationship between process innovation, production quality, and digital market communication. Practically, the batik MSME empowerment program should not only provide tools, but also provide training on use, production SOPs, efficiency recording, digital content training, product catalogs, and branding assistance based on local culture. Mentoring that integrates production and marketing aspects is more likely to result in sustainable business change than an approach that separates tool assistance from market strategy.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that the integration of feeder technology and digital marketing in Batik Tulis Assyafa Lampung MSMEs forms important changes in production, marketing, and artisan empowerment practices. Feeder technology helps the dyeing process become more controlled, reduces material waste, speeds up production completion, and reduces the risk of defective products. Digital marketing helps expand product visibility through Instagram, WhatsApp Business, digital catalogs, event documentation, and batik process content. Digital media provides space for Batik Assyafa to introduce typical Lampung motifs, explain the value of written batik, and build communication with consumers.

For owners, this integration helps with efficiency and market opportunities. For artisans, especially women, this integration increases skills, employment opportunities, confidence, and family income opportunities. Technology adoption in handicraft MSMEs is a socio-technical process that is influenced by perceived benefits, suitability of technology with local practices, mentoring, cultural narrative, and digital marketing capabilities. The limitations of this study are the scope of a single case, limited quantitative data on income, and the absence of laboratory tests on environmental impacts. Subsequent research can use mixed methods design to measure changes in revenue, productivity, color quality, sales volume, and environmental impact more objectively.

The practical recommendation of this study is the need for an integrated assistance package for batik MSMEs that includes production technology, quality SOPs, cost recording, design development, digital catalogs, cultural storytelling, social media management, and consumer response evaluation. Local governments, universities, and MSME companion institutions can use this integrative model as a reference for programs to strengthen creative MSMEs based on local culture.

ADVANCED RESEARCH

This research is limited to a single case study, so the findings are contextual. Efficiency data is still based on documentation and informant confirmation, and has not yet been subjected to experimental measurements. Future research is recommended to use mixed methods, comparing several batik MSMEs, and measuring productivity, turnover, color quality, product defects, digital performance, and environmental impact.

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