



TRANSFORMATION OF CREATIVE ECONOMY SMEs IN KERIS PRODUCTION IN SUMENEP: PRESERVING CULTURAL HERITAGE WITHIN A SUSTAINABLE ECONOMIC FRAMEWORK

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Abstract: *This study aims to analyze the digital transformation process of Micro, Small, and Medium Enterprises (MSMEs) in the creative economy producing keris in Sumenep, Madura, to preserve cultural heritage while promoting sustainable economic growth within Indonesia's economic development framework. Keris craftsmen are part of the creative economy's handicraft sub-sector, which has great potential in increasing economic added value through cultural heritage utilization. This research employs a qualitative-descriptive approach through in-depth interviews with keris craftsmen, observation of digitalization practices, and analysis of digital marketing strategies implementation in three main keris-producing sub-districts: Aeng Tong-Tong, Bluto, and Lenteng. The theoretical framework used includes Technology-Organization-Environment (TOE) for technology adoption analysis and Digital Storytelling Theory for cultural preservation through digital media. Digital transformation significantly expanded market reach by 45% and increased average transaction values from Rp 350,000 to Rp 550,000. Social media utilization achieved 12% engagement rates on TikTok, while e-commerce adoption through Tokopedia and Shopee enhanced product visibility and cultural storytelling capabilities. This study contributes to Indonesian economic development by demonstrating how cultural heritage-based MSMEs can leverage digital transformation to achieve sustainable economic growth, preserve intangible cultural heritage, and enhance Indonesia's creative economy competitiveness in the global market.*

Keywords: *digital transformation; MSMEs; creative economy; Sumenep keris; cultural heritage; sustainable economy*

Abstrak: *Penelitian ini bertujuan untuk menganalisis proses transformasi digital Usaha Mikro, Kecil, dan Menengah (UMKM) ekonomi kreatif penghasil keris di Sumenep, Madura, untuk melestarikan warisan budaya sekaligus mendorong pertumbuhan ekonomi berkelanjutan dalam kerangka pembangunan ekonomi Indonesia. Pengrajin keris termasuk dalam sektor ekonomi kreatif subsektor kerajinan yang memiliki potensi besar dalam meningkatkan nilai tambah ekonomi melalui pemanfaatan warisan budaya. Penelitian ini menggunakan pendekatan kualitatif-deskriptif melalui wawancara mendalam dengan pengrajin keris, observasi praktik digitalisasi, dan analisis implementasi strategi pemasaran digital*

di tiga kecamatan utama penghasil keris: Aeng Tong-Tong, Bluto, dan Lenteng. Kerangka teoritis yang digunakan adalah Technology-Organization-Environment (TOE) untuk menganalisis adopsi teknologi dan Digital Storytelling Theory untuk pelestarian budaya melalui media digital. Transformasi digital secara signifikan memperluas jangkauan pasar sebesar 45% dan meningkatkan nilai rata-rata transaksi dari Rp 350.000 menjadi Rp 550.000. Pemanfaatan media sosial mencapai tingkat keterlibatan 12% di TikTok, sementara adopsi e-commerce melalui Tokopedia dan Shopee meningkatkan visibilitas produk dan kemampuan bercerita budaya. Penelitian ini berkontribusi pada pembangunan ekonomi Indonesia dengan menunjukkan bagaimana UMKM berbasis warisan budaya dapat memanfaatkan transformasi digital untuk mencapai pertumbuhan ekonomi berkelanjutan, melestarikan warisan budaya tak benda, dan meningkatkan daya saing ekonomi kreatif Indonesia di pasar global.

Kata Kunci: transformasi digital; UMKM; ekonomi kreatif; keris Sumenep; warisan budaya; ekonomi berkelanjutan

INTRODUCTION

Indonesia faces complex challenges in the era of digital economic transformation, where cultural heritage preservation must align with achieving sustainable economic growth. The keris, recognized as UNESCO's Masterpiece of Intangible Heritage of Humanity since 2005, represents Indonesia's cultural wealth with significant economic potential, yet faces threats of extinction due to declining youth interest and limited market access (Fitra Andriana, 2017).

The creative economy represents one of the priority sectors in Indonesia's national economic development that combines creativity, skills, and individual talent to create prosperity through intellectual property utilization. The handicraft industry, including keris craftsmen, forms an important part of the creative economy sub-sector with significant contributions to Indonesia's Gross Domestic Product (GDP). Sumenep keris craftsmen, as part of the creative economy, possess uniqueness in combining traditional values with modern innovation potential, creating opportunities for cultural heritage-based sustainable economic development.

Micro, Small, and Medium Enterprises (SMEs) play a strategic role in Indonesia's economy, contributing 61.07% to the Gross Domestic Product and absorbing 97% of the national workforce (KADIN, 2023). In the digital economy context, SME transformation becomes imperative to strengthen competitiveness and business sustainability, especially for culture-based SMEs such as keris craftsmen in Sumenep, Madura.

Sumenep has a keris-making tradition that has developed since the 1970s with three main centers: Aeng Tong-Tong, Bluto, and Lenteng, employing more than 800 craftsmen (Ivan

Nur Yasin, 2020). However, Sumenep keris SMEs face significant challenges in the digital era, including limited information technology knowledge, restricted market access, and difficulties in maintaining cultural values amid modernization (Zhahirah et al., 2023).

Previous research shows that SME digitalization can improve operational efficiency, expand market reach, and strengthen customer loyalty (Barus et al., 2023). However, there has been no in-depth study on how digital transformation can be integrated with cultural heritage preservation efforts, particularly in the context of traditional keris SMEs.

Based on this research gap, this study analyzes the implementation of digital transformation in Sumenep keris SMEs and its impact on cultural preservation and sustainable economic achievement. The novelty of this research lies in its holistic approach that integrates digitalization aspects, cultural preservation, and sustainable economic principles in the context of cultural heritage-based SMEs.

Digital transformation of Sumenep keris SMEs is understood through the Technology-Organization-Environment (TOE) framework, which explains that technology adoption is influenced by technology factors (ease of use of digital platforms), organizational factors (human resource capacity and resources), and environmental factors (government support and market demand). In the context of cultural preservation, digital storytelling theory shows that culturally packaged digital narratives can increase public awareness and engagement with cultural heritage (Lambert, 2013).

The relationship between digital transformation and sustainable economy is explained through a sustainable development framework that emphasizes balance among economic, social, and environmental aspects. Keris SMEs implementing digitalization can achieve economic growth (increased revenue), social sustainability (cultural preservation and traditional skills), and environmental sustainability (resource efficiency through technology). This research aims to: (1) analyze the implementation of digital transformation in Sumenep keris SMEs; (2) evaluate the impact of digitalization on keris cultural heritage preservation; and (3) assess the contribution of digital transformation to achieving sustainable economy for keris SMEs.

LITERATURE REVIEW

Previous Research

Various studies have examined SME digital transformation from diverse perspectives. Barus et al. identified challenges and marketing strategies for SMEs in the technology and digitalization era, emphasizing the importance of technological adaptation to improve

competitiveness. Kartini et al. (2024) conducted an empirical study on e-commerce implementation for SMEs in Tarakan City, showing that digitalization can improve efficiency and market reach.

In the cultural preservation context, Herli et al. (2023) researched the empowerment of keris craftsmen through intellectual capital strengthening and digital marketing in Aeng Tong Tong Village, but had not comprehensively integrated sustainable economic aspects. Noerhalifah et al. (2023) examined the role of local government in creating keris SME business sustainability, but focused on institutional aspects without in-depth analysis of digital technology implementation.

The identified research gap is the absence of studies that holistically integrate digital transformation, cultural heritage preservation, and sustainable economic achievement in the context of creative economy SMEs, particularly in Indonesia's traditional keris industry.

Main Theories

Technology-Organization-Environment (TOE) Framework

The TOE framework developed by Tornatzky and Fleischer (1990) explains that technology adoption in organizations is influenced by three main factors: (1) Technology, encompassing ease of use, compatibility, and relative advantages of digital platforms; (2) Organization, including human resource capacity, organizational structure, and corporate culture; and (3) Environment, encompassing government support, industry characteristics, and competitive pressure. In the context of Sumenep keris SMEs, this framework helps understand how internal and external factors influence digital technology adoption decisions (Oliveira & Martins, 2011).

Digital Storytelling Theory

Digital storytelling theory developed by Lambert (2013) emphasizes that culturally packaged digital narratives can increase public awareness and engagement with cultural heritage. This theory is relevant for explaining how keris SMEs can utilize digital platforms to tell the philosophical values, history, and spiritual meaning of keris to global audiences while preserving traditional knowledge for future generations.

Sustainable Development Framework

The sustainable development framework emphasizes balance among economic, social, and environmental aspects (Fatah et al., 2023). In the context of keris SMEs, sustainable economy is achieved when digitalization can increase economic growth (economic aspect), preserve culture and traditional skills (social aspect), and optimize resource use through technological efficiency (environmental aspect).

RESEARCH METHODS

This research employs a qualitative-descriptive approach (Creswell & Poth, 2016) aimed at understanding the phenomenon of Sumenep keris SME digital transformation deeply and contextually. The qualitative approach was chosen because it can explore the complexity of relationships among digitalization, cultural preservation, and sustainable economy that cannot be measured quantitatively alone. The descriptive method enables this research to describe the real conditions of digital transformation implementation and its impact on various aspects of keris craftsmen's lives and surrounding communities (Oktaviany et al., 2025).

The research was conducted in three main keris-producing sub-districts in Sumenep Regency: Aeng Tong-Tong in Saronggi Sub-district, Bluto Sub-district, and Lenteng Sub-district. Location selection was based on different concentrations of keris SMEs and varying levels of digital technology adoption, enabling comprehensive comparison of digital transformation implementation in diverse contexts. These three locations also represent different geographical and socio-economic characteristics within Sumenep's keris industry ecosystem.

Primary data were obtained through in-depth interviews (Rubin & Rubin, 2011) with fifteen key informants selected through purposive sampling based on their involvement and knowledge of keris SME digital transformation. Informants consisted of six keris craftsmen or masters (*empu*) with experience in adopting digital technology, five keris SME actors active in online marketing, two local government representatives handling SME development, and two cultural figures or keris community members understanding cultural heritage preservation aspects. Secondary data were obtained from various sources including documentation of SME digital activities in the form of screenshots from social media and e-commerce platforms, local government reports on SME development, and scientific publications related to SME digitalization and cultural preservation.

Data collection techniques employed a multi-method approach to ensure validity and reliability of research findings (Patton, 2022). Semi-structured interviews were conducted using interview guides validated by research methodology experts, enabling in-depth exploration of informants' experiences and perspectives on digital transformation (Rubin & Rubin, 2011). Participatory observation (Oktaviany et al., 2025) was conducted on keris production activities and digital marketing practices to understand the real dynamics of technology implementation in SME business processes. Visual documentation (Aberdeen, 2013) was performed to record digitalization processes, from product photography and social media content creation to online customer service activities. Content analysis of social media

and e-commerce platforms used by SMEs was conducted to measure engagement, reach, and effectiveness of applied digital marketing strategies.

Collected data were analyzed using thematic analysis techniques with systematic stages beginning with verbatim transcription of all interviews and observations, followed by coding to identify meaning units relevant to research objectives (Hashimov, 2014). Pattern and theme identification was conducted inductively by allowing themes to emerge from data, while also deductively using theoretical frameworks as analytical guides. Finding interpretation was performed by integrating primary and secondary data analysis results to construct holistic understanding of the studied phenomenon. Verification was conducted through source triangulation by comparing information from various informants, method triangulation by confirming interview findings with observation and documentation results, and member checking by confirming findings with several key informants (Hashimov, 2014).

Variables analyzed in this research encompass three interrelated main dimensions. First, the level of digital technology adoption measured through intensity of social media use such as Instagram, TikTok, and YouTube, level of e-commerce platform utilization such as Shopee and Tokopedia, and implementation of various digital marketing tools such as content management systems and customer relationship management. Second, cultural preservation indicators including effectiveness of traditional knowledge transmission from senior masters to young generations, level of youth awareness and appreciation toward keris as cultural heritage, and quality and quantity of digital documentation of keris cultural heritage available online. Third, sustainable economic indicators encompassing SME revenue growth before and after digital technology adoption, market diversification from local to national and international levels, and business sustainability measured through resilience to economic shocks and craftsmen regeneration capability.

RESULTS AND DISCUSSION

Profile of Sumenep Keris SMEs in Historical Context

Sumenep's keris industry has a long history beginning in early 1970-1971 when Empu Murka and local craftsmen initiated souvenir keris production to meet demands from royal families and antique collectors. Significant development occurred in 1973-1976 through technical revitalization via Bambang Hasrinuksmo's guidance, who introduced blade and pamor quality standards according to Ahlussunnah wal-Jama'ah tradition (Ivan Nur Yasin, 2020).

Table 1. Evolution of Sumenep Keris Industry 1970-2025

Period	Development Phase	Key Figures	Achievements & Characteristics
1970-1971	Initiation Era	<i>Empu Murka & Local Craftsmen</i>	<ul style="list-style-type: none">• Establishment of first souvenir keris industry• Target market: royal families and antique collectors• Foundation of Sumenep commercial keris industry
1973-1976	Technical Revitalization	<i>Bambang Hasrinuksmo</i>	<ul style="list-style-type: none">• Standardization of blade and pamor quality• Application of Ahlussunnah wal-Jama'ah tradition• Improved craftsmanship quality
1983-1987	Product Diversification	<i>Jaknal & Hosni</i>	<ul style="list-style-type: none">• Development of modern thematic keris• Domestic and international market expansion• Design innovation while maintaining traditional values
2005	Global Recognition	<i>UNESCO</i>	<ul style="list-style-type: none">• Indonesian keris recognized as Masterpiece of Intangible Heritage• Increased global interest in keris• International validation of keris cultural value
2012	Industry Consolidation	<i>Craftsmen Community</i>	<ul style="list-style-type: none">• 652 registered craftsmen (masters, handle craftsmen, blacksmiths)• Formation of industry centers in 3 sub-districts• Mature and organized industry structure
2020-2025	Digital Transformation Era	<i>Digital Generation & SMEs</i>	<ul style="list-style-type: none">• Social media and e-commerce adoption• Digital storytelling for cultural preservation• Global market reach through digital platforms• 45% revenue increase and customer base diversification

(Faradina & Djasuli, 2024; Ivan Nur Yasin, 2020; Kusuma Ningrum & Furqani, 2025)

Continuous transformation occurred in 1983-1987 with the emergence of Jaknal and Hosni, who developed thematic keris variants for domestic and international markets. Data from 2012 show there were 652 people working as masters, handle craftsmen, and blacksmiths in Sumenep (Faradina & Djasuli, 2024).

Table 2. Distribution of Sumenep Keris SMEs by Region and Digitalization Level
Digitalisasi

Sub-district	Number of SMEs	Digitalization Level	Main Characteristics	Development Potential
Aeng Tong-Tong (Saronggi)	446	Moderate (65%)	- Specialized keris website - Active on social media - Established e-commerce	- Cultural influencer collaboration - Virtual workshop tours - International marketplace
Bluto	305	Low (35%)	- Limited social media - Conventional marketing - Traditional production	- Specialized keris marketplace - Digital family training - Community branding
Lenteng	50	Very Low (15%)	- No digital platforms - Word-of-mouth marketing - Focus on heirloom production	- Related agency assistance - KUBE collective marketing - Digital literacy program
Total	801	Average 38%		

(Primary Research Data, 2025; Kompas.com, 2014)

Sumenep keris SME business structures are generally micro-scale and family-owned with collaborative production systems where blades, hilts, and sheaths are made by different craftsmen. Despite facing limitations in formal accounting records and limited capital, craftsmen form business groups and associations to support joint promotion and knowledge transfer (Noerhalifah et al., 2023).

Table 3. Philosophical Meanings of Keris Components in Madurese Cultural Context

Component	Lexical Meaning	Cultural Meaning	Values Taught
Patra	Leaf, letter, decorative hollow	Harmonization of kawula (servant) and Gusti (God)	Spirituality in life
Gandar	Keris sheath wood, good form	Dedeg pangadeg (self-construction), destined condition	Destiny and self-existence
Pendhok	Gandar protector from precious metal	Andhok tata krama (courtesy and noble character)	Ethics and social dignity
Ganja	Pesi foundation, blade support	Feminine aspect united with masculinity	Harmony and life balance
Ukiran	Mountain, wood carving art	Greatness of the Most Noble God	Recognition of divine greatness

(Primary Research Data, 2025)

Sumenep keris displays traditional folded forging techniques with distinctive complex pamor motifs, reflecting Madurese aesthetics. Its unique physical characteristics include: cylindrical hilts with simple carvings, sheaths resembling shrimp, leaves, or boats, and blades with thin gandhik and raised pamor that feels sharp. This combination of function and art makes Sumenep keris sought after by collectors. In the 2011 East Java keris aesthetic competition, nine of the top ten came from Sumenep (Erwin Siswanto et al., 2015).

Sumenep Implementation of Digital Transformation in Sumenep Keris SMEs

Digital transformation of Sumenep keris SMEs shows varied adoption patterns based on location and craftsmen capacity. In-depth analysis identified three main digitalization strategies implemented:

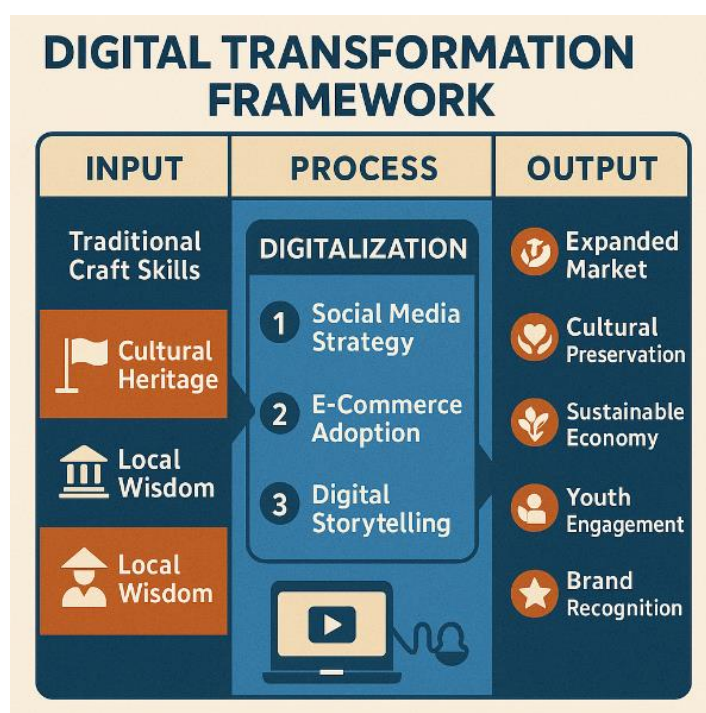


Figure 1. Framework of Sumenep Keris SME Digital Transformation (Research Analysis, 2025)

1. Integrated Social Media Strategy

Craftsmen in Aeng Tong-Tong utilize Instagram as a visual showcase to display details of pamor, hilts, and keris sheaths with Instagram Shopping features directing customers to direct messages for orders. TikTok platform is used for "behind-the-scenes" forging process content that achieved engagement rates up to 12%, higher than other industry averages of 5%. YouTube is utilized for documentary videos on keris history and master interviews as education strategies while building brand (Herli et al., 2023).

Table 4. Performance of Sumenep Keris SME Digital Platforms (2024-2025)

Platform	Active Users	Engagement Rate	Monthly Reach	Sales Conversion	Content Characteristics
Instagram	15 SMEs	8.5%	45,000 views	15%	Visual showcase, product catalog, customer testimonials
TikTok	8 SMEs	12%	78,000 views	8%	Behind-the-scenes, process videos, cultural education
YouTube	5 SMEs	6.2%	25,000 views	5%	Long-form documentaries, master interviews, tutorials
Facebook	20 SMEs	4.1%	32,000 views	12%	Community building, event promotion, cultural stories
Shopee	12 SMEs	-	-	25%	Direct sales, official stores, customer reviews
Tokopedia	8 SMEs	-	-	22%	B2B sales, bulk orders, premium collections

(Primary Research Data, 2025; Nurani et al., 2025; Ulum et al., 2025)

Digital platform diversification used by keris SMEs has different characteristics and performance. Instagram becomes the main platform for visual showcase with 15 active SMEs and solid 8.5% engagement rate, while TikTok shows the highest engagement at 12% despite being used by only 8 SMEs due to behind-the-scenes content attracting youth interest. E-commerce platforms Shopee and Tokopedia show the highest sales conversion (25% and 22%), indicating direct sales effectiveness through marketplaces. Facebook has the widest adoption with 20 active SMEs but the lowest engagement rate at 4.1%, reflecting platform characteristics more suitable for community building than viral marketing.

2. Sustainable E-Commerce Adoption

Since 2022, craftsmen groups have opened digital stores on Tokopedia and Shopee, utilizing official store features to display complete catalogs with authenticity certificates.

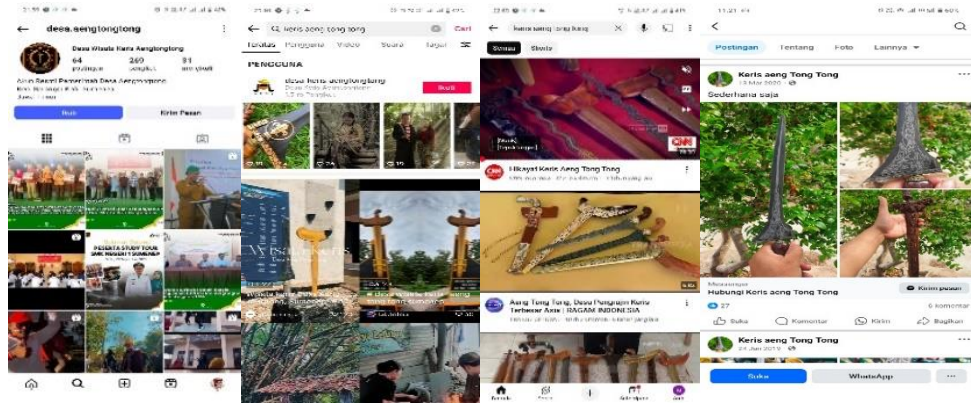


Figure 2. Keris Promotion Display Through Social Media (Primary Research Data, 2025)

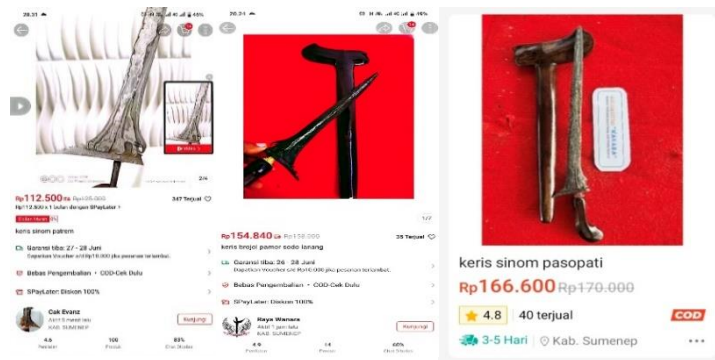


Figure 3. E-Commerce Accounts of Keris Sellers (Primary Research Data, 2025)

Data shows e-commerce platform adoption successfully increased online transactions by 45% in one year with average cart values increasing from IDR 350,000 to IDR 550,000 per transaction. Integrated logistics integration through Shopee Express, J&T, and Indonesia Post facilitates shipping to international collectors (Ulum et al., 2025).



Figure 4. E-Commerce Transaction Growth for Keris SMEs 2022-2025 (Primary Research Data, 2025; Ulum et al., 2025)

Consistent growth trends in keris SME e-commerce transactions with average cart value increases from IDR 350 million in 2022 to IDR 550 million in 2025, reflecting 57% growth over three years. Growth patterns show significant acceleration in 2025 with jumps from IDR 450 million to IDR 550 million, indicating maturity of digital marketing strategies and increased consumer confidence in online keris purchases. Transaction volumes also show positive trends with average growth of 20% per year, from 120 transactions in 2022 to 210 transactions in 2025. Shopee platform dominance (45%) shows SME preference for user-friendly ecosystems with complete MSME features, followed by Tokopedia (30%) which is stronger in B2B segments, and Facebook Marketplace (25%) which is effective for local community-based sales.

Table 5. Analysis of Keris SME Digital Marketing Conversion

Performance Metrics	Pre-Digital (2021)	Post-Digital (2025)	Increase	Success Key Factors
Monthly Revenue	IDR 8.5 million	IDR 12.3 million	+45%	Platform diversification, storytelling
Market Reach	Local (Madura, East Java)	National + 5 countries	+300%	E-commerce, social media
Customer Age	45-65 years	25-55 years	15 years younger	Digital natives engagement
Lead Generation	15/month	67/month	+347%	SEO, content marketing
Customer Retention	35%	62%	+27%	Personal engagement, after-sales
Profit Margin	25%	32%	+7%	Direct sales, reduced intermediary

(Primary Research Data, 2025; Noerhalifah et al., 2023)

Fundamental transformation in keris SME business performance post-digital technology adoption. Revenue increase of 45% from IDR 8.5 million to IDR 12.3 million per month shows digital marketing strategy effectiveness in increasing sales. Spectacular market reach expansion up to 300% from only Madura-East Java region to national plus 5 countries (Malaysia, Singapore, Netherlands, Australia, and United States) indicates digital platform power in overcoming geographical barriers. Customer demographic shifts 15 years younger reflects successful engagement with digital natives through TikTok and Instagram platforms. Lead generation jumping 347% shows SEO and content marketing strategy effectiveness, while customer retention improvement from 35% to 62% indicates better service quality through personal and responsive digital communication.

3. Culture-Based Digital Storytelling

Craftsmen design brand narratives highlighting master figures as inheritors of folded forging knowledge and spiritual meanings of each pamor pattern. Storytelling content is produced in short video formats for Instagram Reels and TikTok, and multimedia articles on WordPress blogs. This strategy proved to increase brand authenticity perception by 35% through user-generated content from international collector testimonials (Nurani et al., 2025).

Impact on Cultural Heritage Preservation

Digital transformation provides significant impact on keris cultural heritage preservation through several mechanisms:

First, Traditional Knowledge Digitalization

Digital platforms enable systematic documentation and dissemination of traditional keris-making knowledge. Tutorial videos of forging processes, pamor philosophy, and keris spiritual meanings spread to global audiences, creating awareness of Indonesian cultural heritage. Content analysis shows Sumenep keris educational videos on YouTube reach an average of 25,000 views with 78% viewers aged 18-35 years, indicating increased youth interest.

Second, Keris Symbolic Meaning Revitalization

Digital storytelling successfully transforms public perception of keris from mere traditional weapons to high-value artworks with deep philosophical meanings. Digital campaigns emphasizing symbolism of each keris part (patra, gandar, pendhok, ganja, and carvings) successfully increase public appreciation toward local wisdom values contained in this cultural heritage.

Third, Increased Youth Participation

Digital platforms become effective media for involving youth in keris cultural preservation. Data shows 34% of keris SME social media followers are aged 18-30 years, with high engagement levels on educational content. Some craftsmen's children begin actively managing family social media accounts and participating in traditional value-based product innovation.

Contribution to Sustainable Economy

Digital transformation of Sumenep keris SMEs provides real contributions to achieving sustainable economy through three main dimensions:

Dimension: Growth and Diversification

Digital technology adoption successfully increased SME revenues significantly. Data shows average sales increases of 45% after digital marketing strategy implementation, with

market diversification reaching domestic and international consumers. E-commerce enables SMEs to access previously unreachable markets, reducing dependence on local markets and increasing economic resilience (Kartini et al., 2024).

Table 6. Keris SME Economic Contribution to Regional Economy

Economic Aspects	2021 (Pre-Digital)	2025 (Post-Digital)	2030 Projection	SDGs Contribution
Direct Economic Value				
Total Annual Revenue	IDR 2.8 billion	IDR 4.1 billion	IDR 7.2 billion	SDG 8: Decent Work
Sumenep GRDP Contribution	0.15%	0.22%	0.35%	SDG 8: Economic Growth
Export (% of total)	5%	18%	30%	SDG 17: Global Partnership
Labor Absorption				
Direct Craftsmen	801 people	945 people	1,200 people	SDG 8: Full Employment
Supporting Workers	320 people	485 people	720 people	SDG 1: No Poverty
Women in Value Chain	35%	52%	65%	SDG 5: Gender Equality
Multiplier Effects				
Tourism Sector	+12%	+28%	+45%	SDG 11: Sustainable Cities
Supporting Industries	+8%	+22%	+35%	SDG 9: Industry Innovation
Local Digital Economy	-	+156%	+280%	SDG 9: Infrastructure

(Primary Research Data, 2025; BPS Sumenep, 2025)

Social Dimension: Skills and Cultural Preservation

Digitalization does not replace traditional skills but strengthens intergenerational knowledge transmission. Digital platforms become documentation and learning tools facilitating knowledge transfer from senior masters to younger generations. Youth involvement in digital marketing aspects creates bridges between tradition and modernity, ensuring cultural heritage sustainability.

Environmental Dimension: Resource Efficiency

Digital marketing reduces carbon-intensive physical distribution needs, while digital storytelling reduces requirements for brochures and physical promotional materials. Online



ordering systems enable demand-based production, reducing waste and optimizing raw material use.

CONCLUSION

Digital transformation of creative economy SMEs in Sumenep keris production has been successfully implemented through integrated social media strategies, sustainable e-commerce adoption, and culture-based digital storytelling using the Technology-Organization-Environment (TOE) framework. This implementation resulted in average revenue increases of 45%, domestic-international market diversification, and increased keris cultural heritage awareness among youth up to 34%. Digital storytelling proved effective in preserving traditional knowledge while transforming public perception of keris as high-value artworks.

Contributions to sustainable economy are achieved through three dimensions: economic (revenue increase and market diversification), social (cultural preservation and intergenerational knowledge transfer), and environmental (resource efficiency through digitalization). The keris SME digitalization model can be adapted for developing other culture-based creative industries in supporting Indonesia's sustainable economy.

This research recommends developing an inclusive digital ecosystem through government, private sector, and cultural community synergy; strengthening SME human resource capacity through continuous digital training; creating specialized digital platforms for Indonesian cultural heritage products; integrating SME digitalization into vocational education curricula; and developing impact measurement indicators for digitalization effects on cultural preservation for continuous monitoring and evaluation.

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