



Digitization of Cooperatives and the Utilization of Technology to Increase Economic Competitiveness in the Madurese Written Batik Sector

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Abstract. : Digitization of cooperatives and the use of technology are strategic steps in increasing economic competitiveness in the Madura handwritten batik sector, especially in Central Pakandangan Village, Sumenep Regency. This program aims to empower handwritten batik artisans through technology integration and digital capacity building. Some of the main activities include Search Engine Optimization (SEO) training, digital financial management through Accountable Digital Financial Management, digital cash book preparation, as well as Social Media Officer training and social media management strategies. The participants were also trained to create creative content, carry out digital branding of batik through logo design and visual branding, as well as build digital partnerships and cooperation. In addition, technological innovations are introduced through the use of night blasting machines to support production efficiency. This approach is expected to be able to increase the visibility of Madura written batik products, expand the market, and strengthen the competitiveness of artisans in the digital era. With a combination of training and the application of technology, this program contributes to the transformation of the digital-based economy in the Madura batik sector.

Keywords: Digitalization of Batik Cooperatives; Increasing Economic Competitiveness; Madura Written Batik Sector

1. INTRODUCTION

Digitalization has become a fundamental need in the modern era, especially for the small and medium enterprises (SMEs) sector such as handwritten batik craftsmen. In Indonesia, batik is a cultural heritage that not only has aesthetic value, but also high economic potential. One of the biggest challenges faced by batik artisans, especially in Madura, is competitiveness in local, national, and global markets.

Central Pakandangan Village, Sumenep Regency, is one of the centers of handwritten batik craftsmen that has great potential to develop, but still faces limitations in access to technology and digital marketing strategies. The existing condition of the area which is a coastal area with an area of 2.37 Km² or equivalent to 236.78 Ha of dry land and 178.53

agricultural land area (B. P. S. K. Sumenep, 2021). The population of Central Pakandangan Village is 1,761 with a population density of 743, a sex ratio of 94.80 divided into 857 males and 904 females (B. P. S. K. Sumenep, 2021). The percentage of people who are batik artisans \pm 40% and the rest are farmers and do not have a fixed income. Including people with low incomes below per capita income because in Sumenep Regency the poverty line is set at Rp.203,000,- (Darsyah & Wasono, 2013), while the average per capita income of the people in Central Pakandangan Village is \pm Rp.50,000 per day and is included in the Head Count Index (HCI-P0) which is the percentage of poor people who are below the Poverty Line (GK) (B. K. Sumenep, 2024) or it is said to be an extreme poor area. Therefore, the digitization of cooperatives and the use of technology are important solutions to increase economic competitiveness in the Madura batik sector, especially in improving the economy of villages that are classified as extreme poor.

Along with the rapid development of information technology, the management of traditional businesses such as batik needs to adopt a digital approach. One strategy that can be applied is the use of Search Engine Optimization (SEO) on the website to increase the visibility of batik products in search engines. This allows Madura written batik products to be known more widely and reach a more diverse market. In addition, accountable digital financial management training through the preparation of digital cash books can help cooperatives or small business actors to record and manage finances more transparently and efficiently.

Efforts to strengthen digital marketing capabilities, training Social Media Officers, and social media management strategies are very relevant in solving this problem. Social media is one of the most effective platforms for promoting products and building direct interaction with consumers. The practice of creating creative content is also an important component to increase the attractiveness of written batik products, both in the form of photos, videos, and graphic design. By utilizing social media and engaging content, batik artisans can improve branding and expand their marketing network.

The digitization of batik branding also includes logo design and visual branding that is able to reflect the unique identity of Madura written batik. Professional logos and visual designs can strengthen consumers' first impression of a product, as well as increase the credibility of a business. Selain itu, kemitraan dan kerja sama digital menjadi elemen kunci dalam memperluas akses pasar. Through this strategy, batik artisans can collaborate with other parties, such as e-commerce platforms, creative communities, and digital marketing partners.

Not only in terms of digitalization, innovation in production technology is also needed to improve the work efficiency of craftsmen. One of the innovations implemented is the use of

a night roller machine. This machine is designed to speed up the night removal process on batik fabrics without damaging the quality of the final result. With this technology, artisans can save time and effort, resulting in more efficient and competitive production.

Digitalization and technological innovation in the Madura handwritten batik sector is an effort that is expected to be able to encourage sustainable local economic empowerment. The target of this program is batik artisans who are members of cooperatives. Through training and mentoring, artisans are equipped with relevant digital skills, so that they are able to face challenges in the digital economy era. This capacity increase not only has an impact on increasing individual income, but also strengthens the role of cooperatives as a driver of the local economy. With the digitization of cooperatives and the use of integrated technology, Central Pakandangan Village can be a successful example in developing technology-based local potential. In addition, this approach can also be a model adapted by other regions with similar characteristics. The transformation that occurred not only strengthens the local economic sector, but also preserves the nation's cultural heritage through innovations that favor batik artisans.

The night throwing machine is one of the technological innovations designed to increase the efficiency of written batik production, especially in Central Pakandangan Village. In the process of making batik, night swatting is an important stage that is carried out to remove the wax layer (night) that covers the fabric after dyeing. Traditionally, this process is done by boiling the fabric in hot water. While the method is effective, the process is time-consuming, requires a lot of energy, and can cause damage to the fabric if not done carefully. This innovation is offered to priority areas of extreme poverty with a low economic level in Central Pakandangan Village to improve product quality, increase product quantity, so that it can improve marketability, increase turnover, and increase community income.

2. METHODS

The implementation of the activity began with the identification of the needs of handwritten batik artisans in Central Pakandangan Village, especially in the aspects of cooperative digitalization and production technology. The activity began with digitalization training which included the use of Search Engine Optimization (SEO) on the cooperative website to increase visibility on search engines. Furthermore, participants were given Accountable Digital Financial Management training to compile digital cash books using simple financial applications to increase transparency and efficiency of cooperative financial management.

The activity continued with training on social media management and digital branding. Participants are trained to become Social Media Officers, covering social media management strategies, creative content creation, and branding digitization techniques, such as logo design and visual branding. In addition, the practice of establishing digital partnerships and cooperation through marketplaces and business networks is also carried out to expand the written batik market. This training was strengthened by a simulation of creating promotional content based on unique stories of local batik products.

In the production aspect, an environmentally friendly Night Pelorot Machine innovation was introduced to improve the efficiency of the batik production process. The training includes demonstrations of use, production simulations, and machine maintenance. The final stage is evaluation and mentoring to ensure that the implementation of the technology and skills acquired runs effectively. The results of this activity are expected to be able to increase the competitiveness of Madura written batik cooperatives through the synergy of digitalization and innovative technology.

3. RESULTS

The result obtained from community empowerment activities in Central Pakandangan Village is an increase in the visibility of batik products. Search Engine Optimization (SEO) training on the cooperative website has succeeded in increasing the visibility of Madura written batik products on search engines. This can be seen from the increase in the number of visits to the cooperative website after the implementation of SEO techniques, which expands the market reach to national and international scales. The improvement can also be seen from the efficiency of Financial Management. The implementation of Accountable Digital Financial Management and the use of digital cash books have a significant impact on the efficiency of cooperative financial management. Participants are able to record income and expenses accurately and transparently, which helps in better financial planning.

The ability to manage social media by conducting training can equip members of batik cooperatives and also craftsmen with the skills to manage social media effectively. As a result, the cooperative's social media accounts actively publish interesting content, increase interaction with customers, and generate product orders online. By managing social media, it will affect the progressiveness of increasing digital branding. Through logo design and visual branding training, Madura handwritten batik products now have a more professional identity. The branding built is Batik "Malathe" with a logo that reflects the local culture enhances the brand image, while the consistent visual design strengthens consumer trust.

The results that can also be seen are by establishing partnerships and digital networks with several agencies of the Sumenep Regency Regional Government. The strategy of establishing digital partnerships and cooperation allows batik artisans to partner with e-commerce platforms and creative communities. This helps to improve market access and establish collaborations to expand product distribution. The wider target market will further spark creativity in promotional content. Members of the Batik Cooperative in producing creative content not only increase the attractiveness of the product, but also promote the cultural heritage of Madura written batik to a wider audience.

Batik Cooperatives, as financial institutions, have a very important role for the community. Batik Cooperatives for the general public, financial institutions are a place to save or obtain loans. Meanwhile, for the business world, financial institutions function as a source of capital. Ideally, financial services should be available and accessible to all levels of society without exception, as part of efforts to improve welfare. Access to adequate financial services is also a step towards achieving financial inclusion.(Wardani, Dewi, Widiastuti, & Rachmawatie, 2021) But in this case, the Al-Qomar Batik cooperative is also a place for buying and selling batik produced by batik craftsmen.

The rapid development of technology has brought new colors to the business world. Companies are encouraged to adopt internet-based marketing and business practices (viral marketing)(Purnama Sari, 2016). This article discusses the application of viral marketing to Small and Medium Enterprises (SMEs) of Rumah Batik Tulis Madura which faces obstacles in marketing that are still limited to the local scale. The application of viral marketing to Rumah Batik Tulis Madura SMEs is carried out through email, social networking sites, and e-commerce in the form of an online store (website). The philosophy of viral marketing which is similar to the spread of the virus (in terms of the speed of its spread) allows information (promotion) to spread quickly and massively, so that it becomes an alternative solution so that the batik market can reach a wider global audience. Obstacles in managing an e-commerce online store can be overcome by working with a website developer. This study can be a reference for the wider community, including SMEs, in the development of marketing systems.

Cooperatives that have existed for a long time still exist today. The main factor that encourages the sustainability of cooperatives in Indonesia is the principle of kinship which is the basis for the establishment of cooperatives themselves(Purba et al., 2023). As a business institution, cooperatives aim to achieve justice and prosperity for the community based on Pancasila and the 1945 Constitution. Therefore, cooperatives are a pillar in the Indonesian economy, and this view has been supported by the government since the Old Order period to

the Reform Order. Compared to other business entities, cooperatives are considered the most suitable for the people's economy.

A cooperative is an association of individuals or entities that gives freedom to its members to join or leave, with the aim of working together harmoniously in running a business to improve or improve the welfare of its members (SALAM, Supriadi, & Didi, 2024). Cooperatives also function as an economic forum for the community, where business actors can join to improve the national economy. In addition to cooperatives, Micro, Small and Medium Enterprises (MSMEs) also have a similar role. MSMEs are expected to strengthen Indonesia's economy, especially after the 1998 economic crisis that shook the country. MSMEs are considered a driving force for the national economy, and the government hopes that MSMEs can join cooperatives, so that government supervision and interaction with the community, especially in rural areas, can be more effective. MSMEs have an important role in improving people's welfare, one of which is by creating jobs. Cooperatives and MSMEs have received special attention from the government through various facilities provided to support the progress of both.

For Madura batik craftsmen, the level of production efficiency with a night throwing machine has a significant impact on increasing the efficiency of batik production. The time required for night ploughing is drastically reduced, while the quality of the fabric is maintained. So that the amount of production can meet consumer demand and increase the quantity and quality of production. With the efficiency resulting from the night blasting machine, the amount of batik production increases without sacrificing quality. This allows cooperatives to meet market demand in larger quantities.

The increasing number of batik production, the increase in the income of craftsmen can also be measured and the increase in income in the financial management of the Batik Cooperative is also increasing. Efficiency and market expansion have a direct impact on the income of batik artisans which is also an active role of cooperatives in the local economy. The Madura written batik cooperative now plays an active role as a driver of the local economy. With more modern management, cooperatives are able to provide greater economic benefits to their members.

This form of sustainable digital transformation implementation has succeeded in creating a digital culture among batik craftsmen. Participants showed their commitment to continue to utilize technology in their business management. This transformation not only increases economic competitiveness, but also contributes to the preservation of Madura written batik cultural heritage. This form of sustainable digital transformation implementation has succeeded

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4. DISCUSSION

Madura batik is famous for Madura written batik which has distinctive motifs and colors. The production process of Madura written batik is carried out manually, starting from designing batik designs, drawing motifs on fabric, canting, fixation, to coloring. The authenticity of Madura written batik is maintained thanks to the manual process. However, the batik fabric produced often does not form a symmetrical pattern when used as clothing. The motifs on Madura batik cloth do not form a uniform pattern on the clothes. Therefore, efforts are needed so that batik motifs created by craftsmen can produce symmetrical patterns on clothes. In order to achieve this, the proposed service activity is the creation of Madura written batik motifs which are designed in such a way that the clothes produced have a symmetrical pattern, with the help of software. The first step is to make a clothing template to be produced, then compile this template on the batik fabric design and adjust the batik motif on the fabric to match the existing clothing template (Siradjuddin, Sophan, Kurniawati, & Triwahyuningrum, 2018).

The implementation of Search Engine Optimization (SEO) training on cooperative websites has succeeded in increasing the visibility of batik products on search engines. In digital business, SEO is a very important technique to increase market reach online. With the increasing number of visits to the cooperative site, Madura written batik products can now be reached by consumers at the national and international levels. The use of SEO reflects the application of the basic principles of digital business, namely the use of digital platforms to expand the market and increase competitiveness.

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The implementation of accountable digital financial management and the use of digital cash books show progress in cooperative financial management. Micro, Small and Medium Enterprises (MSMEs) play a vital role in boosting the country's economy. The success of a business reflects the good performance of the business. The research shows that the financial literacy variable has a significant influence on the performance of MSMEs, while the financial technology variable does not have a significant effect on the performance of MSMEs (Laela, Dumadi, & Zaman, 2024).

Accurate and transparent financial management in accordance with cooperative principles that prioritize the welfare of members and accountability. The information technology applied allows for automatic and more efficient recording of income and expenses. This system not only helps cooperatives in better financial planning, but also supports transparency, which is a key principle in cooperative law. The ability to manage social media and digital branding, training on social media management received by cooperative members has a positive impact on interaction with customers and increased online product sales (Syafitri, Nusantara, & ..., 2024). Digital branding, such as logos and consistent visual design, supports the creation of a strong and professional brand image (Setianingrum, Islam, & ..., 2023). "Malathe" Batik products that prioritize local cultural identity show that the success of product marketing depends not only on quality, but also on the value carried by the brand, which can be protected through business laws related to trademarks and intellectual property rights (Firda, Tamaja, Agustin, & ..., 2022).

The strategy to build digital partnerships with government agencies and e-commerce platforms expands market access for Madura handwritten batik products. This partnership allows the cooperative to scale its operations as well as access a wider market through a stronger network. This collaboration is in line with the principle of cooperatives that prioritize cooperation between members for common welfare. Partnerships with e-commerce platforms also open up opportunities for cooperatives to expand product distribution and increase economic potential.

Production Efficiency and Use of Night Roller Machines The application of night roller machines has a big impact on the efficiency of batik production. The time required for the night ploughing process is drastically reduced, while quality is maintained, which in turn increases

production capacity. The use of this night roller machine is a concrete example of the application of technology in traditional industries. This increase in production efficiency allows cooperatives to meet market demand in larger quantities, thereby increasing the competitiveness of products in the global market (Amirullah, Wardoyo, & ..., 2021).

The main function of the night slower machine is to remove the dried night layer on the batik fabric (Ully, Riyadi, Haryati, Mustofa, & ..., 2022). The night screed process is very important in making batik, because the night coated on the fabric must be discarded so that the desired batik motif can be clearly seen after the dyeing and washing process. This machine helps produce batik with better quality, because the process of sagging the night is cleaner and more even, avoiding the possibility of any remaining night that interferes with the batik motif (Amirullah et al., 2021). By using a night slower machine, batik manufacturers can produce batik in larger quantities and faster, so that they can meet the greater market demand.

The increase in income of batik artisans and cooperatives is the result of the integration of various technologies and digital strategies implemented. This is an implementation of the cooperative principle that bases its business activities on the welfare of members. With the increase in the income of cooperative members, the Madura written batik cooperative plays a role as a driver of the local economy, which is in line with the goal of economic empowerment of the extreme poor. Sustainable Digital Transformation has succeeded in creating a digital culture among batik artisans, which shows their commitment to continue utilizing technology in business management by playing a key role in transforming traditional businesses into more modern and competitive. It also reflects the positive influence of digital businesses that are changing the way artisans and cooperatives operate and interact with consumers, as well as contributing to the preservation of Madura's written batik cultural heritage.

5. CONCLUSION

Overall, the community empowerment program in Central Pakandangan Village involving the digitization of the Madura written batik cooperative has a significant positive impact. From the digital business side, cooperative law, to information technology, every aspect contributes greatly to operational efficiency, increased market visibility, and local economic empowerment. The digital transformation carried out at the Madurese Written Batik Cooperative proves that technology can function as an effective empowerment tool for the extreme poor, as well as open up new opportunities in a sustainable creative industry.

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