

Digital Transformation of BUMDesa Bicak Makmur: Accounting Application Innovation for Optimizing Production Costs and Marketing of Ecoprint Fabric as the Village's Flagship Product

*Tatas Ridho Nugroho^{a)}, Ani Wilujeng Suryani, Adrian Hartanto Darma Sanputra,
Mifta Ria Oktaviana, Izzatul Mu'thoyyah*

Accounting Study Program, Universitas Negeri Malang, Malang, Indonesia

^{a)}Corresponding author: tatasridho.feb@um.ac.id

ABSTRACT

The community service program focuses on strengthening the management of BUMDesa Bicak Makmur in Bicak Village, Mojokerto Regency, particularly in cost control and marketing of its flagship product, ecoprint. The main problems identified include the absence of a standardized financial recording system, low product quality due to limited technical skills, and insufficient utilization of digital marketing. To address these challenges, the program provided training on Excel-based accounting applications, digital marketing strategies, and ecoprint production techniques delivered by experienced practitioners to enhance product quality and competitiveness. The approach adopted is Participatory Action Research (PAR), developed by Kurt Lewin (1946), which emphasizes active collaboration between the service team and BUMDesa managers. The results show significant improvements in cost efficiency, accurate pricing, and increased confidence among managers in promoting their products online through platforms such as Shopee, Instagram, and TikTok, thereby expanding market reach both nationally and internationally.

ARTICLE INFO

Article History:

Submitted/Received: 21-09-2025

First Revised: 09-09-2025

Accepted: 25-09-2025

First Available online: 31 October 2025

Publication Date: 31 October 2025

Keyword :

BUMDesa
Management Accounting
Accounting Application
Ecoprint
Digital Marketing

INTRODUCTION

BUMDesa Bicak Makmur in Bicak Village, located in Trowulan District, Mojokerto Regency, is a business entity established by the village as an effort to manage the local economic potential independently and sustainably. As the driving force of the village economy, this BUMDesa aims to improve community welfare through the development of productive business units based on local potential (Fitriyani, 2025). BUMDesa has the ability to identify and manage the village's potential to produce high-quality products. It acts as an entrepreneur, creating business opportunities and increasing the village's income (Muh. Syata, 2024). One of the flagship products developed is Ecoprint fabric, which leverages local wisdom by using abundant natural raw materials in the area, such as teak leaves, lanang leaves, and kenikir leaves and flowers, as well as hibiscus flowers. This Ecoprint product features unique patterns and eco-friendly natural colors, aligning with the growing public awareness of the importance of sustainable products. Due to its high quality and environmentally friendly concept, Ecoprint fabric has strong potential to compete in the premium market, which increasingly prioritizes sustainability.

However, despite having great potential, the management of BUMDesa Bicak Makmur still faces several challenges that hinder the achievement of its full potential. One of the main challenges is the lack of a standardized financial recording system, particularly in tracking the production costs of Ecoprint fabric. This has led to suboptimal transparency and accountability in financial fund management. Moreover, the BUMDesa faces difficulties in estimating the budget required for the production process, resulting in inefficiencies in cost utilization. The inability to set competitive selling prices is due to a lack of understanding of how to calculate the Cost of Goods Manufactured (COGM). Several studies have shown that SME operators often set selling prices based on personal estimates rather than proper accounting principles, resulting in inaccurate pricing decisions (Mustika et al., 2024) ; Silviana et al., (2025). This poses a major obstacle to market expansion and profit maximization. Errors in calculating COGM can result in inaccurate selling prices either too low, which reduces profit margins, or too high, which diminishes market competitiveness.

From a marketing perspective, BUMDesa Bicak Makmur faces challenges in reaching a wider market. The marketing strategies implemented are still conventional and have not made optimal use of digital platforms. As a result, Ecoprint products, which have great potential to enter the premium market with high market value, have not succeeded in reaching broader market segments at the national and international levels. The branding of Ecoprint products is also still weak, which limits its ability to attract consumers seeking high-quality, environmentally friendly products. However Yani et al., (2024), it shows that the development of digital marketing can help expand the market reach of ecoprint crafts, offering a potential solution for broader market penetration.

Based on the description of the challenges faced by BUMDesa Bicak Makmur, this study aims to offer practical interventions through training, technical assistance, and the development of technology-based systems. Several other studies have highlighted similar issues and proposed solutions. Gamayuni et al., (2020) and Agustina (2011) emphasized the importance of training in production cost analysis and pricing strategies for individuals engaged in economic activities. These efforts aim to improve operational efficiency, enhance the competitiveness of Ecoprint products, and ensure the sustainability

of BUMDesa Bicak Makmur's business.

METHOD

This community service program employs the Participatory Action Research (PAR) approach developed by Kurt Lewin (1946) in Adelman (1993), which emphasizes active collaboration between the implementation team and the community. This approach was chosen because it is relevant for addressing issues related to financial recording and the marketing of Ecoprint products in a participatory manner. As shown by Wiranda et al., (2025) and Khafsoh (2024), PAR has proven effective in fostering meaningful engagement between academics and community partners. The community service team consists of 3 lecturers and 2 students who collaborate with 9 residents of Bicak Village. These residents were selected based on recommendations from BUMDesa Bicak Makmur, considering their willingness and active involvement in the production and marketing of Ecoprint.

Community Service Project Sequence

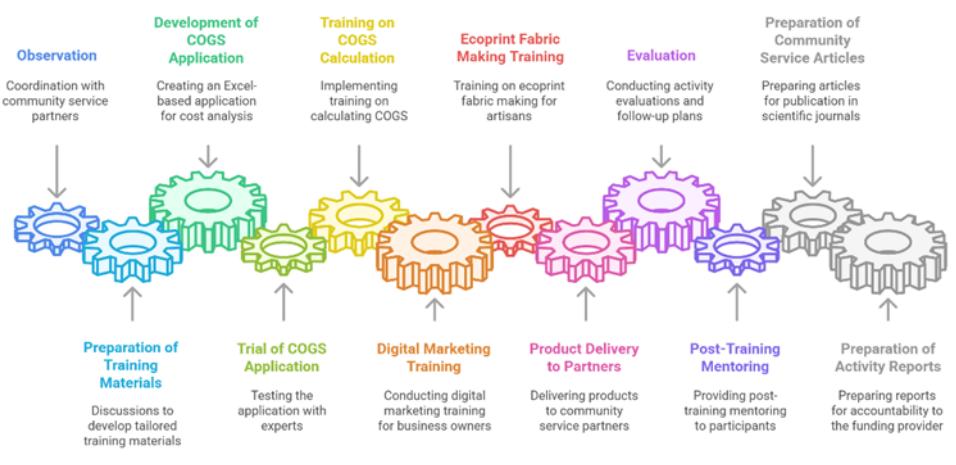


FIGURE 1. Stages of Program Implementation

In this program, active collaboration between the service team and BUMDesa Bicak Makmur began with field observations to identify problems faced by the partner, such as the absence of a standardized production cost recording system, limited understanding of fixed and variable cost classifications, inaccuracies in determining selling prices, limited technical skills in Ecoprint production, and suboptimal use of digital platforms as marketing tools. Based on these findings, the team prepared appropriate training materials and developed a simple Excel-based financial application tailored to the partner's needs, including calculating the cost of goods manufactured (COGM), conducting break-even point (BEP) analysis, and performing sales price simulations. The developed application was then tested in collaboration with experts to ensure accuracy and ease of use prior to its implementation in the training program.

The next stage involves the implementation of technical and managerial training conducted directl

for the partners. The core training took place in June and lasted one day, with a total duration of approximately four hours. The BUMDesa managers were trained to operate the financial application to improve record-keeping efficiency and accuracy in production cost calculations. Meanwhile, the female partners received hands-on training in Ecoprint production from experienced practitioners to enhance product quality in terms of visual appearance, color durability, and design uniqueness. The training also covered digital marketing strategies, focusing on managing visual content and promotion through platforms such as Shopee, Instagram, and TikTok. After the training, the team provided assistance and monitoring to ensure that the applications and strategies were implemented independently by the community partner. Evaluation is conducted through skill observation and structured interviews with BUMDesa managers. Data are collected from documentation, discussion notes, and post-training monitoring to assess the effectiveness of the intervention and develop a follow-up action plan. The entire series of activities concluded with the preparation of a report and the writing of a scientific article to disseminate program results and contribute academically to the development of applied knowledge.

RESULT

The implementation of the Excel-based accounting application at BUMDesa Bicak Makmur has made a significant contribution to the management of production costs and the determination of Ecoprint product selling prices. This application automatically calculates raw material, direct labor, and overhead costs, making it easier for managers to set appropriate selling prices and avoid prices that are either too low, which reduce profit margins, or too high, which diminish competitiveness. Its flexibility in adjusting raw material prices according to production needs enables more accurate and efficient price determination. In addition, the application simplifies production cost calculations and enables managers to quickly identify the break-even point (BEP), allowing more precise adjustments to selling prices. Cost recording, which previously took 6 to 7 days to complete, can now be finished more quickly, in about 2 to 3 days, after using the application. Thus, the application is highly beneficial for simplifying the production cost recording process at the BUMDes—which was previously time-consuming and prone to errors—while also improving speed and accuracy in cost management and product pricing.

TABLE 1. Cost Efficiency

Cost Component	Before (Rp/fabric)	After (Rp/fabric)	Reduction (Rp)	Reduction (%)
Main raw materials	80.000	60.000	20.000	25,0%
Direct labor	30.000	25.000	5.000	16,7%
Overhead (electricity, water, add materials, equipment depre.)	20.000	15.000	5.000	25,0%
Total (COGS) per fabric	130.000	100.000	30.000	23,1%

The community service activities carried out through socialization and direct training have had a significant positive impact, not only on financial management but also on the quality and marketing of Ecoprint products. During the training sessions, the BUMDes gained an understanding of how to use the

application and also provided Ecoprint artisans in Bicak Village with the opportunity to learn directly from an experienced practitioner from Malang City. The results of the training demonstrated notable improvements, as the Ecoprint products produced by participants were of higher quality compared to those of the previous year. In terms of design and coloration, fabrics that previously lacked vibrancy now display stronger and more contrasting colors. On the production side, efficiency has also improved, as production capacity increased from producing three fabrics per boiling session to six fabrics in one session. This improvement reduces production costs by approximately 23% per fabric and also speeds up order completion time. This improvement has made the production process more time- and cost-efficient, while also enhancing product competitiveness. The enthusiasm of the women artisans was remarkable; they expressed happiness at gaining new knowledge and pride in their Ecoprint creations, which are now more beautiful and of higher quality.



FIGURE 2. Comparison of Ecoprint Fabric Results Before and After Training

TABLE 2. Sales Increase

Indicator	Before (May–Jun)	After (Jul–Aug)	Change
Units sold (fabrics)	6 (3/bln)	12 (6/bln)	+6 (+100%)
Average selling price	Rp150.000	Rp150.000	–
Total revenue	Rp900.000	Rp1.800.000	+Rp900.000 (+100%)
Total COGS	Rp780.000	Rp1.200.000	+Rp420.000
Gross profit	Rp120.000	Rp600.000	+Rp480.000 (+400%)
Gross margin	13,3%	33,3%	+20 pp

The implementation of the application and digital marketing strategies also played an important role in enhancing the competitiveness of Ecoprint products. Previously, BUMDesa Bicak Makmur had developed a digital marketing platform through a community service program the previous year, and this year the managers received guidance on actively managing and utilizing it. The service team also assisted in creating promotional videos and product documentation featuring more appealing visuals to attract consumers. Initial results showed a significant increase in product exposure, with more consumers becoming aware of and interested in Ecoprint. This was evidenced by the growing number of followers on social media platforms such as Shopee, Instagram, and TikTok. Although long-term evaluation is still needed, this digital strategy has proven effective in expanding the market and

introducing locally based products to both national and international markets. The impact is evident in a 20% increase in sales compared to the previous month, with most customers learning about the product through content on BUMDesa's social media and placing orders via the provided contact details. This demonstrates that online marketing through social media plays a crucial role in supporting BUMDesa's product sales.



FIGURE 3. Group photo with UM lecturers, an Ecoprint practitioner, and Ecoprint artisans from Bicak Village

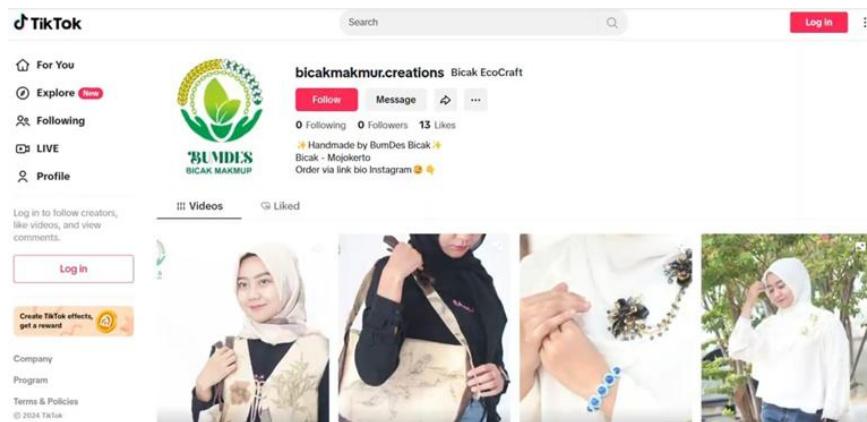


FIGURE 4. BUMDes Bicak Makmur TikTok Social Media Account

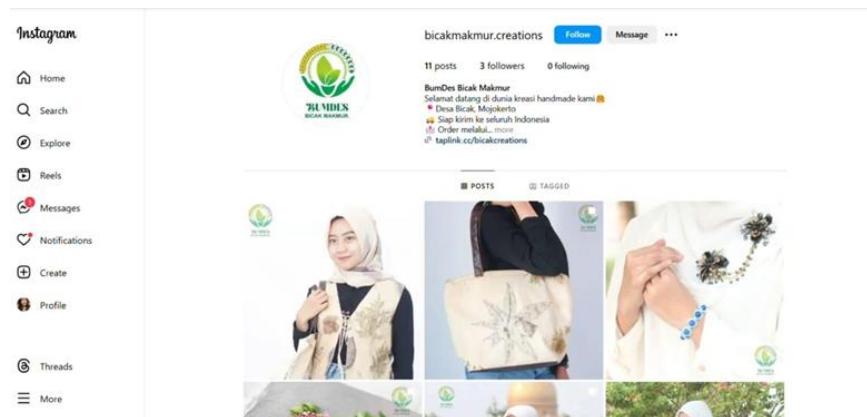


FIGURE 5. BUMDes Bicak Makmur Instagram Social Media Account

The response from the BUMDesa managers indicated a highly positive reaction to the implementation of the application. They considered the application helpful in determining raw material prices more accurately and in reducing errors in setting selling prices that could harm the business. The Head of Bicak Village also expressed appreciation for the contribution of Universitas Negeri Malang. According to her, the implementation of this application has brought real changes, as seen in the more organized administration of the BUMDesa, the training results, which were considered satisfactory, and the increased confidence of village women in digitally creating and marketing their products. This feedback emphasizes that the benefits of this application are not limited to financial management but also play a crucial role in enhancing the capacity of the village community to utilize technology to expand market access at both national and international levels.

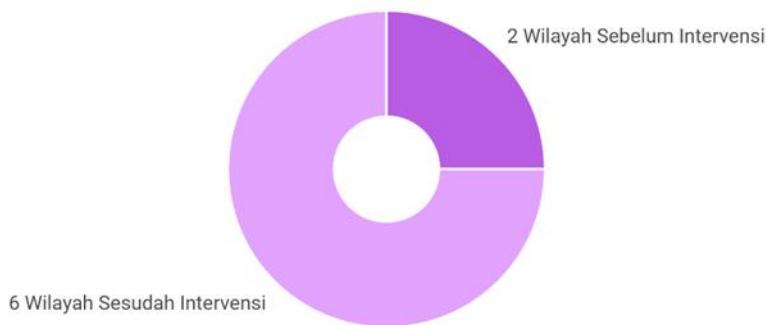


FIGURE 6. Comparison of market expansion before and after the training.

Overall, the implementation of the accounting application and digital marketing strategies at BUMDesa Bicak Makmur has had a positive impact on operations and on the marketing of Ecoprint products. The application not only simplifies production cost management, accelerates selling price calculations, and provides more accurate information on production costs and profit margins, and also enhances the competitiveness of Ecoprint products in broader markets. This is evidenced by the fact that, previously, BUMDesa Bicak could only reach the local market, limited to the Mojokerto area. However, it has now expanded to a broader market across East Java. Although further evaluation of cost savings and time-efficiency improvements is still required, the positive impacts already recorded demonstrate strong potential for ensuring the sustainability and supporting the future development of BUMDesa Bicak Makmur's business.

DISCUSSION

The success of this community service program largely depends on the appropriate application of technology for cost management and product marketing. Sadat et al., (2025) It demonstrates that the implementation of digital technology can enhance operational efficiency and reduce production costs, thereby increasing profit margins and improving product competitiveness. The developed application has helped BUMDesa Bicak Makmur manage production costs more efficiently, reduce errors in selling price calculations, and accelerate decision-making. Through automated cost calculations and more accurate pricing, the BUMDesa can now monitor its operational efficiency more effectively. This demonstrates that technology-based applications can provide significant benefits for small and medium enterprises (SMEs), particularly in cost management and the marketing of locally based products (Parmuji et al., 2023).

However, implementing this technology is not without its challenges. One major challenge is the limited human resources, which still require training to operate the application optimally. The solution was to provide direct training for the BUMDesa managers and the Ecoprint craftswomen. The use of a user-friendly application that integrates with existing devices in the village, such as Excel, helps overcome technical barriers. Another challenge is the lack of understanding of more in-depth financial analysis, which takes time to learn and fully implement. Therefore, the proposed long-term solution includes adding financial analysis features to the application and strengthening the capacity of the managers through continuous training focused on financial report analysis and data-driven decision-making.

The positive impact of implementing digital marketing has been significant, resulting in an increase in sales. Platforms like Shopee, Instagram, and TikTok have helped BUMDesa's Ecoprint products reach a broader market. Challenges in digital marketing include consistent content management and improving human resources' ability to create more engaging content while understanding the algorithms of digital platforms. This indicates the importance of sustaining digital marketing to introduce local products to a broader range of consumers, which in turn can enhance product competitiveness in larger markets. Digital marketing enables local businesses to introduce their products to a wider audience, as demonstrated by community programs that successfully taught local producers how to leverage online marketing strategies (Amananti, 2024). However, the comparison between conventional marketing and digital marketing requires a longer evaluation period, and more substantial changes may emerge in the coming months.

This program demonstrates great potential for expansion to other BUMDesa with similar characteristics. The scalability of this application is highly feasible, especially with minor adjustments to meet the specific needs of each BUMDesa. The application can also be adapted for other sectors, such as handicrafts or agricultural products, by adding tailored features. This program is also in line with previous research by Irfan et al., (2025), which, in the context of MSMEs, found that the use of modern technology, such as application-based management systems and digital marketing platforms, makes significant contributions to enhancing operational efficiency and expanding customer reach. The utilization of technology in product marketing and packaging, including social media and attractive design features, can increase the added value and competitiveness of MSME products (Rijal et al., 2024)

Sustainability beyond the intervention period is crucial to ensure that the application remains relevant and beneficial for BUMDesa managers. Therefore, sustainability planning includes engaging BUMDesa managers in the maintenance and development of the application, as well as forming partnerships with local educational or technology institutions to provide ongoing technical support. Looking ahead, the application holds strong potential for further development. Additional features such as advanced financial analysis, profit-and-loss reports, and integration with digital platforms could enhance its role in supporting BUMDesa's management. Enhancing the application's analytical capacity can help managers make better decisions based on more comprehensive and accurate data. In addition, integration with digital platforms such as Tokopedia and Bukalapak could expand market reach and boost sales, thereby further strengthening the competitiveness of Ecoprint products.

Theoretically, this program has significant implications for rural development, particularly in improving rural access to technology and digital markets. Community-based development and SME empowerment theories highlight the importance of using technology to empower communities and create greater, more sustainable economic opportunities at the local level.

CONCLUSION

The implementation of the Excel-based accounting application at BUMDesa Bicak Makmur has had a significant positive impact on the management of production costs and the determination of selling prices for Ecoprint products. The application simplifies the calculation of raw material, direct labor, and overhead costs, while enabling managers to set appropriate and efficient selling prices. In addition, BUMDesa managers can now quickly calculate the BEP and reduce calculation errors that frequently occurred with manual methods. The community service activities, which also included Ecoprint-making training from experts and the use of digital platforms for product marketing, yielded highly positive outcomes. The village women involved in the training felt more confident in producing and marketing their products online, with improved product quality compared to previous production. Overall, the application plays a crucial role in enhancing operational efficiency and strengthening the competitiveness of Ecoprint products in broader markets.

Based on the results of this program, several recommendations can be made to enhance its sustainability. First, further development of the accounting application to include comprehensive financial reporting features, such as profit-and-loss statements and balance sheets, would provide BUMDesa managers with deeper insights for financial decision-making. Second, continuous assistance in the use of the application and digital marketing is necessary to ensure that managers continue optimizing both aspects in line with market and technological developments. Third, integrating this application with digital platforms such as Tokopedia and Bukalapak could help BUMDesa expand its market reach, increase sales, and strengthen the potential of Ecoprint products in international markets. Thus, the sustainability and success of BUMDesa Bicak Makmur's business will be further ensured and may serve as a model for other villages in utilizing technology to manage businesses grounded in local wisdom.

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