



Empowerment of The Boni Hat Home Industry in Sidoarjo through Productivity Optimization and Financial-Marketing Management Based on Green Economy Principles

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Abstract: This community service program aims to strengthen the business capacity of a home-based industry producing school apparel and accessories by enhancing its production processes, financial management, and digital marketing skills. Implemented over an eight-month period, the program included a needs assessment, training, technology adoption, and mentoring activities. The training covered operation and maintenance of an automatic pneumatic hat molding machine, structured financial recording using accounting software, and digital branding through social media platforms. The program partner, U.D. International is a home-based MSME in Sidoarjo that produces school uniforms and related accessories. Evaluation employed a pretest–posttest questionnaire using a 4-point Likert scale to assess changes in participants' knowledge, skills, and attitudes across production, finance, and marketing. Comparative descriptive analysis measured performance improvements, while direct observation validated production gains through reduced cycle time and increased daily output. The pneumatic machine reduced production time from 60–80 seconds per unit to approximately 15 seconds, increasing daily production capacity by about 50% and improving product quality consistency. Financial management practices shifted from unrecorded and mixed personal–business transactions to a structured system with clear cash flow and profit–loss reporting. In marketing, the program facilitated brand identity creation, online presence, and social media content strategies, which significantly increased audience engagement and market reach. The results indicate that integrated interventions in technology, management, and branding can substantially enhance productivity, professionalism, and market competitiveness among MSMEs. This community empowerment model is expected to be replicable for similar small-scale industries pursuing sustainable growth.

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Introduction

In the era of the digital economy and Industry 4.0 transformation, Micro, Small, and Medium Enterprises (MSMEs) hold a strategic role in Indonesia's economic structure (Hidayat et al., 2024; Tatik & Setiawan, 2025). According to data from the Ministry of

Cooperatives and MSMEs, this sector contributes more than 60% to the Gross Domestic Product (GDP) and absorbs up to 97% of the national workforce (Diliana et al., 2023; Mun'im et al., 2024). Nevertheless, the competitiveness of Indonesia's MSMEs still faces various structural constraints, such as limited production technology, low financial literacy, and inadequate adaptation to digital marketing technologies (Kuningan et al., 2025). These issues create a gap between local communities' economic potential and MSMEs' actual capacity in responding to increasingly competitive and digitally integrated market dynamics.

One concrete example of this gap can be seen in the home industry U.D. International, located in Punggul Village, Gedangan District, Sidoarjo Regency. Since its establishment in 2008, this enterprise has produced various school supplies such as uniforms, school caps, scout berets, and boni caps. Although the partner already has a fixed market network, including wholesale centers in Surabaya such as PGS and ITC, they can only produce 7,500 boni caps per month, far below the total market demand of 10,000 pieces. To understand the partner's condition comprehensively, the service team conducted direct observation and interviews with the owner and workers in early March 2025.



Figure 1. Problems in The Boni Cap Molding Process

A highly conventional process causes the partner's limited production capacity. One of the main bottlenecks lies in the boni cap molding stage, which is carried out manually. This takes longer and results in inconsistent product quality (Figure 1).



Figure 2. Problems in The Boni Cap Heating Process



Figure 3. Problems in The Boni Cap Drying Process

In addition, the heating process still uses a manual stove, and material drying relies heavily on sunlight. The absence of automatic heating and drying equipment leads to uneven heat distribution, often requiring repeated molding. This condition also affects workspace efficiency and slows the production flow (Figure 2 and Figure 3).



The challenges faced by partners also highlight the importance of implementing green economy principles to optimize energy use, reduce production waste, and promote sustainable business practices (European Union and United Nations Inter-Agency Task Team, 2021; Ministry of National Development Planning, 2019). Shifting from manual heating and drying methods to more energy-efficient technologies can minimize fuel consumption while improving heat consistency. Furthermore, reducing reprinting and material waste contributes to resource efficiency (Castro Oliveira et al., 2020). Integrating these environmentally friendly approaches not only improves production efficiency but also guides the cottage industry toward sustainable textile practices and community-based ecological resilience.

Overall, the partner's current condition still reflects the characteristics of a small-scale home industry, from the equipment and production layout to traditional operational strategies. With a monthly turnover of approximately IDR 112,500,000, the partner can grow further if supported with appropriate technological and managerial improvements.

In addition to production challenges, the partner also faces financial management and marketing constraints. The financial recording system is still conducted manually and inconsistently, making it difficult to compile accurate income analyses and financial reports. Meanwhile, marketing strategies are limited to word-of-mouth promotion and personal contacts via WhatsApp, without any brand identity or use of digital platforms for branding purposes. This condition lowers business efficiency and restricts market reach during competition that increasingly relies on digital images and online promotion strategies (Sunni et al., 2025).

Based on the results of observations and joint analysis with the partner, the service team designed a technology-based and business digitalization empowerment program. The proposed solution consists of three main approaches. First, the intervention will involve implementing a pneumatic-based boni cap molding machine in the production aspect. Second, in financial management, training and assistance will be provided on using the Electronic Financial Accounting (EFA) software, enabling the partner to record transactions, monitor cash flows, and conduct real-time income analysis. Third, in marketing, the program will create a brand identity (logo) and conduct training on using social media as a promotional channel and a means to enhance product image. This program will involve students and lecturers from mechanical engineering, electrical engineering, and business and marketing education in a collaborative and participatory framework with the partner.

Several previous studies and community service practices have proven the effectiveness of technology-based approaches in improving the efficiency and competitiveness of small businesses. Implementing pneumatic-based machines and simple engineering designs as alternative non-conventional technologies has accelerated production processes, improved product quality consistency, and reduced reliance on manual labor. Hidayatullah et al. (2023), through a Community Service (PKM) program for a 3-in-1 tempeh processing machine, demonstrated that integrated technology application can increase productivity in food MSMEs while strengthening marketing training functions. In a follow-up PKM activity, Hidayatullah et al. (2023) also showed that a simple waste pressing machine significantly improved production efficiency at the village scale.

Meanwhile, approaches involving financial management training and digital marketing have strengthened the capacity of MSME actors and vocational educators. Cahya et al. (2021) reported that improving online business competence for MGMP business and marketing teachers in Surabaya positively impacted their mastery of digital platforms and e-commerce strategies. Rafida et al. (2023) found that marketplace-based training successfully

expanded participants' access to a more competitive online business ecosystem. A similar approach was applied by Cahya et al. (2024) in a social media marketing training program for MSMEs among flower farmers in Batu City, resulting in increased marketing reach and improved understanding of digital branding strategies.

The program aligns with national and global development goals, particularly SDGs 8, 9, and 12, by improving production efficiency, adopting molding machine technology, and promoting sustainable practices. It also supports higher education Key Performance Indicators (IKU 2, 3, and 5), the Indonesian Government's Asta Cita priorities (3, 4, and 6), and the National Research Master Plan (RIRN) Focus 5 and 9 through the development of pneumatic-based textile molding technology and integration of engineering with local business management.

In conclusion, this community service program aims to enhance production efficiency, strengthen financial management, and expand market reach through digital-based branding strategies. The program is expected to improve production efficiency, enhance financial management systems, and expand market reach through more measurable branding strategies. Furthermore, this initiative can serve as a replicable model for technology-based and interdisciplinary MSME empowerment, contributing to strengthening the people's economy at the national level.

Method

This community service activity was carried out using an applicative participatory approach, emphasizing the partner's direct involvement at every stage of implementation. The program was conducted over eight months, with a total of 12 meetings. Each stage was designed to address the partner's production, management, and product marketing challenges directly.

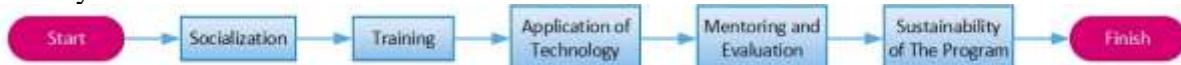


Figure 4. Problems in The Boni Cap Molding Process

A) Socialization and Problem Identification (Meeting 1)

B) Structured Training

The training was provided in three areas production, financial management, and digital marketing with the following details:

1) Production



Figure 5. Automatic Pneumatic Molding Machine



- Meeting 2: Training on operating the pneumatic-based automatic boni cap molding machine.
 - Meeting 3: Training on machine maintenance to ensure optimal performance and equipment durability.
- 2) Financial Management
- Meeting 4: Training on financial recording using the Electronic Financial Accounting (EFA) application.
 - Meeting 5: Assistance in preparing simple financial reports using EFA.
- 3) Marketing
- Meeting 6: Training on trademark registration and developing value-added product attributes.
 - Meeting 7: Workshop on promotional strategies through social media platforms such as Instagram and WhatsApp Business.

C) Technology Implementation (Meetings 8–9)

After the training sessions, the partner was guided to implement the technologies and skills acquired directly:

- Meeting 8: Integrating the pneumatic-based automatic molding machine into the partner's production process.
- Meeting 9: Application of the EFA-based financial recording system.

D) Mentoring and Evaluation (Meetings 10–12)

To ensure successful implementation, ongoing mentoring and program evaluation were conducted. The evaluation process involved:

- Pretest and posttest questionnaires.
- Interviews with the partner to obtain direct feedback.
- Observation of machine operation practices and financial management system usage.
- Data analysis was conducted using a quantitative descriptive approach using a Likert-based pretest and posttest model. Each aspect (knowledge, technical skills, and attitudes) was measured using 10 statements, which were answered by partners before and after the training. Respondents' scores on a Likert scale (1–4) were tabulated and percentages calculated to assess changes in levels of understanding, skills, and confidence. Comparisons between pretest and posttest scores were used to identify improvements in partner performance in aspects of digital marketing, application-based financial management, and automated production machine operation. The results of the analysis are presented in tables and descriptive narratives to illustrate the measurable impact of the intervention.

E) Program Sustainability

To ensure that the program outcomes extend beyond the implementation period, the following strategies were applied:

- Gradual capacity building of the partner to achieve independence in production, financial management, and marketing.
- Strengthening networks and collaborations with local entrepreneurs and MSME support institutions.
- Regular post-program monitoring to ensure the continuous application of the training outcomes and technologies provided.

Result and Discussion

After the designed stages were carried out, the entire community service was designated, and significant changes emerged among the partners. The empowerment program, implemented through training, technology adoption, and continuous mentoring, has produced measurable impacts in production, financial management, and marketing. This section presents the results descriptively, based on field data, observations, and pretest–posttest evaluations. The presentation focuses on analyzing the partners' conditions before and after the program intervention to demonstrate the effectiveness and achievements of the implemented activities.

Result

After eight months, the community service program significantly improved partners' capacity in production, financial management, and digital marketing. Evaluation data and observations confirmed its success in solving prior issues, with results covering capacity building, production tools, financial management, and digital market access.

1) Capacity Improvement of Partners Based on Training Results

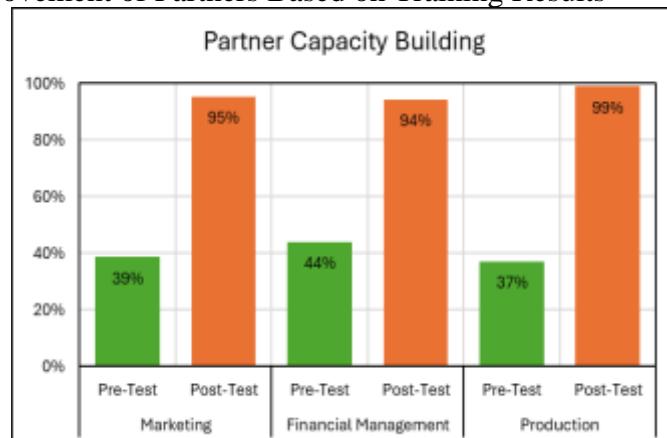


Figure 6. Diagram of Partners' Capacity Improvement

In the marketing aspect, the pretest score indicated an initial mastery of 39%, while after the training, this score increased significantly to 95%. This reflects the partners' increased understanding of digital marketing concepts, trademark registration, and the use of social media as a promotional tool.



Figure 7. Implementation of Training in Financial Management and Marketing

In the financial management area, the pretest score increased from 44% to 94% in the posttest. This improvement indicates that partners have successfully grasped simple financial record keeping, the use of Electronic Financial Accounting (EFA) applications, and the preparation of basic financial reports.



Meanwhile, in the production area, capacity increased from 37% to 99% after the training. This demonstrates that the technical training on the operation and maintenance of pneumatic-based automatic bonnet printing machines is highly effective in improving partners' technical capabilities.

In general, this data shows that all training activities carried out in the community service program have succeeded in providing a real and significant impact on increasing the capacity of partners, both in terms of knowledge, skills, and technical readiness to run their businesses more professionally.

2) Impact of Production Technology Implementation

The adoption of a pneumatic-based automatic bonnie cap printing machine has significantly impacted the partners' efficiency and production capacity. Before the intervention, the printing process was carried out entirely manually, taking approximately 60–80 seconds per unit. This process was time-consuming and physically demanding, as it relied heavily on manual labor, producing inconsistent product quality between units.

Following the implementation of the automatic machine, production time per unit was drastically reduced to an average of 15 seconds per cap, resulting in over 75% time efficiency. This improvement had a direct effect on daily production volume. Previously, the partners could produce only around 250 bonnie caps per day under full working conditions; after the intervention, production capacity increased to approximately 375–400 caps per day an increase of about 50%.

In addition to increasing quantity, the automatic pneumatic machine improved product quality through more precise shapes, consistent pressure and temperature, which enhanced dimensional uniformity and reduced defects. It also lessened reliance on physical labor, enabling partners to focus on packaging and marketing, while boosting efficiency, confidence, and readiness to expand market reach and meet higher demand.

3) Impact of Financial Management Improvement

The partners operated their businesses before the program was implemented without a structured financial recording system. All transactions were conducted informally, with no clear separation between personal and business finances. This made it difficult for them to determine net profits, calculate production costs, or make data-driven decisions. The absence of financial reports also hindered access to funding from banks or business partners.

After intensive training and mentoring provided through the program, the partners understood the importance of transaction recording, simple report preparation, and the use of the Electronic Financial Accounting (EFA) software. The training was conducted in stages, starting with daily transaction logging and categorization and ending with the preparation of cash flow statements and income statements.

Posttest results showed an increase in the partners' understanding of financial management, from 44% to 94%. This improvement was also reflected in their behavioral changes in managing finances. The partners began to use the EFA application independently, maintain separate records, and regularly monitor their business's financial progress. Additionally, they started setting monthly sales targets and production budgets practices that had never been done before.

The intervention enhanced partners' awareness and skills in structured financial strategies, fostering long-term habits of proper recordkeeping and professional management. With improved ability to prepare financial statements, they are better equipped for audits, securing funding, and making informed decisions advancing their businesses toward becoming stronger, well-managed SMEs.

4) Impact of Marketing and Digital Branding Improvement

Before the program, the partners faced significant challenges in marketing, including weak strategic planning, limited use of digital media, and underdeveloped brand identity. The bonnie caps they produced lacked legal registration, strong branding, and quality visual documentation. Social media was also underutilized as a platform for promotion and customer interaction, limiting their market reach and visibility.

Through targeted training and mentoring, the program team equipped the partners with essential branding skills from creating product names, logos, and packaging designs to crafting brand stories. They also learned to apply digital marketing strategies using platforms like Instagram, Facebook, and WhatsApp Business to strengthen their online presence. As a result, marketing knowledge scores rose from 39% to 95%, reflected in the creation of official social media accounts with consistent branding and engaging content, including product catalogs, production process highlights, customer testimonials, and order information.



Figure 8. Brand Logo of Product

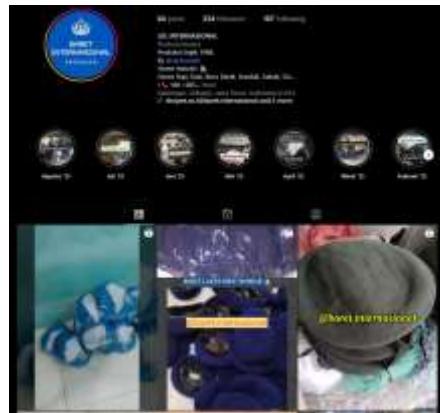


Figure 9. Social Media

As part of branding efforts, the partners have also designed a product logo, created visual packaging designs, and initiated trademark registration with the Directorate General of Intellectual Property. This step not only strengthens the product's position in the local market but also opens opportunities for expansion into broader market segments, including online marketplaces.

The direct impact of these activities is increased product visibility on digital platforms and higher engagement from potential customers. In the long term, strong brand identity and consistent digital presence will become key factors in building customer loyalty and expanding the market share of Bonnie Cap products.

Discussion

The program significantly improved the partner's production, financial management, and digital marketing through training, technology adoption, and continuous mentoring, effectively addressing challenges faced by small enterprises. Pretest–posttest results confirm that applied, context-driven training with direct mentoring enhances MSME capabilities more effectively than theoretical approaches (Dutta & Kannan Poyil, 2024; Rosalina et al., 2025), leading to measurable knowledge gains, behavioral change, and better business practices.

The observed changes align with key theories of empowerment. The participatory approach is realized through active partner involvement throughout the program from problem identification to evaluation ensuring contextual relevance and ownership (Perkins & Zimmerman, 1995). Experiential learning principles are applied through hands-on training



and intensive mentoring, which have proven more effective than theoretical approaches in driving behavioral change and skill improvement (Pappas et al., 2018). Furthermore, the adoption of digital tools and production machinery reflects elements of the Technology Acceptance Model (TAM), where perceptions of usefulness and ease of use contribute to increased confidence and willingness to utilize technology (Chong & Zhang, 2025).

Implementing a pneumatic-based topi boni pressing machine generated tangible impacts on business efficiency. Reducing production time from 60–80 seconds to just 15 seconds per unit and increasing daily capacity from 250 to 375–400 units illustrate how appropriate technology adoption can serve as a key solution for enhancing MSME competitiveness (Kurniawan & Untoro, 2025; Najib et al., 2025). Beyond technical benefits, this innovation also had a psychological effect, boosting the partner's confidence and readiness to handle larger-scale orders.

The use of a pneumatic bonnet printing machine also contributes to green economy principles. By reducing production time and minimizing manual repetition, the machine lowers energy consumption per unit and reduces material waste due to failed or imprecise printing. This change not only improves operational efficiency but also supports more environmentally friendly production practices, demonstrating that adopting appropriate technology can promote economic and ecological resilience in small-scale industries (Castro Oliveira et al., 2020).

Adopting simple software such as Electronic Financial Accounting (EFA) enabled the partner to establish a structured record-keeping system in financial management. The shift from undocumented manual records to digital bookkeeping demonstrates that financial digitalization in the micro sector can improve transparency, accountability, and data-driven decision-making (Verma et al., 2025). This also increases the partner's eligibility to access formal financial services such as microcredit or other institutional financing.

The most notable transformation was observed in digital marketing and branding. The partner's active presence on social media improved product visibility and fostered emotional connections with consumers (Ohara et al., 2025). Content-driven marketing strategies and a strong brand identity effectively increased engagement and expanded market segments, particularly among digitally connected younger generations (Astri Rumondang Banjarnahor & Endang Hariningsih, 2025). The partner's success in designing a logo, developing product narratives, and initiating trademark registration reflects an increased awareness of legal protection and the strategic value of brand positioning.

The program achieved significant operational, technical, managerial, and strategic improvements, driven by the partner's active participation from problem identification to evaluation, ensuring contextual and sustainable interventions. Its success can serve as a model for similar MSMEs, with continued collaboration among universities, government agencies, and local business communities vital for fostering tailored mentoring and innovation ecosystems.

Conclusion

This community service program has successfully enhanced the partner's capacity in production, financial management, and digital marketing through an integrated approach consisting of training, technology implementation, and continuous mentoring. The adoption of a pneumatic-based automatic boni hat printing machine reduced production time from 60–80 seconds to just 15 seconds per unit and increased daily production capacity by up to 50%. In the area of financial management, training in record-keeping and the use of the Electronic



Financial Accounting (EFA) application drove a significant shift from an informal financial system toward more orderly and structured documentation. Meanwhile, in the aspect of digital marketing and branding, the partner successfully established a brand identity, managed social media accounts for promotion, and initiated the process of trademark registration. These achievements are reflected not only in the improvement of pretest and posttest scores but also in the transformation of the partner's mindset and behavior in managing the business more professionally and competitively. The partner's active participation throughout the activities was a key factor in the program's success, demonstrating the attainment of sustainable empowerment goals based on local potential.

Recommendation

Based on the results of the eight-month community service program, several strategic recommendations were made for developing similar activities in the future. First, partners are advised to continue developing production technologies that prioritize efficiency and sustainability, such as utilizing automatic heating systems based on electricity or solar energy for the drying process, to more comprehensively support green economy principles. Second, the digitalization of business management needs to be continued gradually by integrating additional features into accounting applications, such as stock management, sales analysis, and tax reporting, so that partners can manage their businesses professionally and be prepared for external audits. Third, in terms of marketing, partners are expected to expand their promotional reach through a wider variety of e-commerce and social media platforms, as well as optimize visual content and customer interaction to increase product loyalty and competitiveness. Finally, a structured post-program monitoring and evaluation system is needed, such as regular visits and online discussion forums, to ensure the program's impact is maintained and developed sustainably. Follow-up to this program requires collaborative efforts. Partners are responsible for implementing daily operational and digital system maintenance. Universities play a role in ongoing mentoring and knowledge transfer. Local governments can support approval and access to public programs, while funding agencies are expected to provide financial and institutional support for welfare aspects and the expansion of their impact.

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