

# Enhancing the Competitiveness of Knitted Products through Design and Packaging Education at Sentra Rajut Nogosari, Bantul, DIY

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## **Abstract.**

*The International Community Service Program implemented in Sintra Rajut Nogosari serves as a platform for learning and empowering the local knitting craft community. This activity aims to strengthen the implementation of the higher education Tri Dharma and support the achievement of the Main Performance Indicators (IKU) for lecturers and students through active engagement in off-campus activities that have a direct impact on society. Through a series of educational activities and limited technical guidance, the artisans gained practical knowledge on the principles of product design, packaging strategies, and the importance of visual branding to increase the selling value of knitting products. The introduction of digital knitting machines and examples of creative designs based on industry catalogs opened new insights for partners to develop more modern and competitive products. Positive changes in the understanding and participation of artisans indicate that the participatory approach has been effective. Artisans began to respond actively by planning brand development, designing informative packaging, and exploring digital marketing opportunities through e-commerce platforms and social media. In the future, there is a need for continuous assistance in the form of intensive training on digital marketing, micro-business management, and creative product development based on technology. This support is expected to strengthen the program's initial achievements and help the community achieve economic independence based on competitive local potential.*

**Keywords:** *Community empowerment; Digital marketing; Knitting crafts; Product design; MSMEs.*

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## **I. INTRODUCTION**

Micro, small, and medium enterprises (MSMEs) are the backbone of Indonesia's economic structure. According to data from the Ministry of Cooperatives and SMEs (2023), MSMEs contribute more than 60% to the national Gross Domestic Product (GDP) and absorb around 97% of the total workforce. The role of MSMEs in supporting economic growth, income distribution, and poverty alleviation has been widely recognized. In the creative industry sector, MSMEs have a strategic role in developing products based on local culture and wisdom, one of which is knitting crafts.

Knitting products hold significant potential to support the creative economy in Indonesia. The knitting industry, included in the fashion sub-sector, is part of the creative industry that contributes to the national GDP and has a major role in job creation (Kemenparekraf, 2021).

Sentra Rajut Nogosari, located in Wukirsari Village, Imogiri District, Bantul Regency, Yogyakarta Special Region (DIY), is one of the community-based knitting craft centers. Managed traditionally by local female artisans, this center produces various products such as knitted bags made from a combination of synthetic yarn and batik fabric, shoes, wallets, dolls, flower bouquets, decorative pillows, keychains, and children's clothing. These products are generally marketed locally, but have great potential to grow digitally.

In the context of MSME product marketing, the marketing mix theory by Kotler and Keller (2016) states that product packaging and design are part of the “product” element that influences consumer perceptions of value, quality, and product attractiveness. Attractive product design creates uniqueness and differentiation while supporting brand identity, while functional and aesthetic packaging serves as an effective communication medium between producers and consumers (Underwood & Klein, 2002).

Furthermore, consumer perception theory also explains that the visual appearance of a product, including shape, color, and packaging layout, significantly influences purchasing decisions because it forms emotional associations and perceptions of quality (Schiffman & Kanuk, 2015). Therefore, understanding design and packaging becomes crucial in the empowerment strategy of MSMEs, especially in the craft sector such as knitting, which is traditionally managed by local communities, particularly productive women.

However, based on initial observations and field findings, the knitting product designs in Sentra Nogosari tend to be homogeneous, not following market trends, and use less representative packaging. This makes it difficult for the products to compete in modern markets that demand aesthetics, functionality, and strong brand identity. Research by Maharani and Hidayat (2020) shows that innovative product designs that align with consumer trends can increase perceived value and customer loyalty toward MSME products. Meanwhile, a study by Farhanah and Suryani (2021) revealed that packaging is not merely a product protector, but also an effective brand communication medium and a tool for product differentiation in the market. Similarly, Harti et al. (2024) confirmed that packaging developed through a participatory approach (MSMEs–consumers–stakeholders) increases MSMEs’ adaptive capacity to market needs, strengthens product narratives, and ultimately enhances competitiveness.

In line with this, research by Wibowo et al. (2022) on knitting MSMEs in West Java proved that education in product design and packaging could increase sales volume by up to 30% after the intervention, especially when integrated with digital marketing strategies. Therefore, it is important for MSME actors in the knitting sector to understand the basic principles of product design, trends in colors and patterns, and modern, economical, yet aesthetic and informative packaging techniques.

All of the above studies show that innovative product designs and packaging are not just aesthetic functions: they serve as brand communication vehicles, tools for differentiation, and determinants of consumer buying decisions.

Meanwhile, an international study by Mokhtar et al. (2021) involving 150 snack MSME actors in Selangor found that brightly colored packaging designs, informative labels, and ergonomic

structures positively influenced perceptions of quality and customer loyalty. Unprofessional designs make consumers doubt the product's quality. Likewise, research investigating the relationship between product design and the growth of craft MSMEs in Dhaka, Bangladesh by Khairuzzaman et al. (2023) showed that aesthetic designs that adapt to global trends expanded export markets and created added value of up to 35%, thereby enhancing competitiveness.

From the findings above, it can be concluded that:

- Design and packaging are not merely aesthetic functions but strategic tools for building MSME brands.
- MSMEs that develop innovative product designs and professional packaging experience improved market perception, customer loyalty, and sales growth.
- International studies reinforce that packaging and design are key differentiation strategies, increasing brand awareness, emotional connections, and export prospects.

Supported by this international empirical evidence, interventions at Sentra Rajut Nogosari through the improvement of innovative product design and packaging are based on marketing strategies that have been proven effective and relevant in the global creative MSME context.

The objective of this community service activity is to enhance the capacity and skills of knitting MSME actors in Sentra Rajut Nogosari to develop product designs and packaging that meet market needs. This activity began with direct observation of production processes, product design appearances, and the forms of packaging that have been produced by business actors.

The originality of this activity lies in its participatory approach, placing the community as the main subject throughout the entire process. This activity not only involved the community at the implementation stage, but from the outset included an in-depth identification of partner needs through direct observation of production activities, design patterns, and packaging used by MSME actors in Sentra Rajut Nogosari.

Furthermore, the approach was strengthened through exploratory interviews to explore their perceptions, obstacles, and experiences in developing knitting products. The next stage was intensive discussion through the deep interview method, aimed at gaining a more contextual understanding of aspirations, visual needs, and branding strategies appropriate to local capacity.

Through this series of processes, the community actively participated in formulating problems, determining priority needs, and agreeing on the forms of education and technical guidance that were appropriate. The results of this participatory process formed the foundation for preparing a technical guidance curriculum that is practical and relevant to the real needs of knitting MSME actors. Thus, the intervention carried out was not top-down but based on actual needs identified directly from the root of problems in the community, involving the community directly in identifying needs, technical guidance processes, and independent application of the guidance outcomes.

This approach is in line with the principles of community-based empowerment, which emphasizes the active involvement of the community as the subject of change. Active community participation is expected to create independence in managing knitting products that are more competitive in the market, and to serve as a replicable model for other craft centers with similar characteristics in development

## **II. METHODS**

### **2.1. Field Observation and Problem Identification**

This community service activity was a collaboration between lecturers from Universitas Komputer Indonesia (UNIKOM) who have expertise in management and marketing, and the Sentra Rajut Nogosari community in Wukirsari Village, Imogiri District, Bantul Regency, Yogyakarta Special Region.

The initial stage of implementation began with direct field observation by the community service team. This observation aimed to understand the production activities, design appearances, as well as the forms and functions of the product packaging produced by the knit artisans. During this process, the team noted tendencies toward homogeneous design, a lack of visual innovation, and the use of plain packaging that did not yet reflect brand identity.



Figure 1. Various knitted products created by PkM partners at Sentra Rajut Nogosari

This observation also examined the local potential, such as community-based knitting skills and the use of combination materials (like batik and synthetic yarn), which had not been optimized to meet modern market demands. From the results of these initial observations, several data points were obtained regarding the artisans' understanding at Sentra Rajut Nogosari, which then formed the basis for designing the educational material.

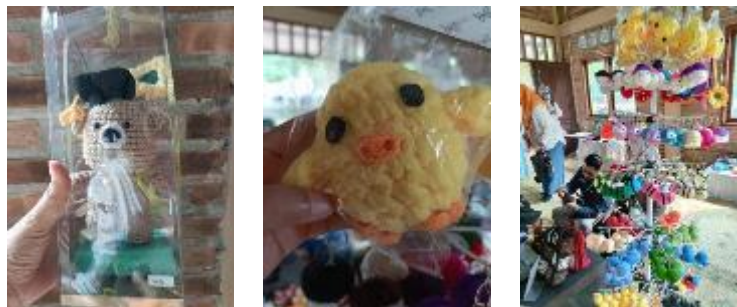


Figure 2. Example of knitted products that have not yet been optimally packaged

## 2.2. Exploratory Interviews and Deep Interviews

Following the initial observation, the activity continued with exploratory interviews with the knit artisans as the main partners. These interviews aimed to uncover their perceptions, obstacles, and experiences in the processes of designing and packaging products.

The next stage was a more intensive discussion using the deep interview method, in which the team engaged in thorough dialogue to understand their visual preferences, branding challenges, and technical limitations. This approach aimed to explore relevant visual needs in line with local capacity, as well as aspirations to develop more attractive and competitive knitting products.

### 2.3. Formulation of Needs and Educational Design

Based on the results of observation and interviews, the team and partners jointly formulated the main problems, developed a priority needs list, and designed a practical educational curriculum focused on:

1. The basic principles of product design (color, shape, visual function);
2. Aesthetic and informative packaging techniques;
3. Differentiation elements and brand identity reinforcement.

This material was developed to be easily understood and relevant to actual production conditions in the field, without requiring high-level technical skills.

### 2.4. Implementation of Technical Guidance

The intervention was carried out in the form of technical guidance delivered over two days directly at the partner's location on Monday and Tuesday, June 19 and 20, 2025. The activities included interactive explanations, group discussions, and hands-on exploration of product visuals through concrete examples.

All stages were participatory in nature, involving the community from the needs identification stage through to implementation. In this way, the educational process was not top-down, but rather built on strengthening the internal capacity of the community itself.

### 2.5. Documentation and Evaluation

Throughout the activity, the entire process was documented in the form of photos, field notes, and participant feedback sheets. The results were analyzed descriptively to assess changes in the partners' understanding of the importance of design and packaging for developing more competitive knitted products.



Figure 3. Interviews, in-depth discussions, and limited technical guidance for knit artisans at Sentra Rajut Nogosari

The flow of this community service activity is summarized in the form of a flowchart shown in Figure 4. The diagram visualizes the systematic stages from field observation to documentation and evaluation. This process demonstrates that the method used is structured, participatory, and contextual, positioning the partners as the main subjects actively involved from the beginning to the end of the activity.

The activity begins with identification through direct observation, followed by in-depth interviews to explore the aspirations and needs of the artisans. The data obtained forms the basis for preparing educational materials and strategic interventions. Next, limited technical guidance was

carried out in a dialogical atmosphere for three days, and concluded with documentation and evaluation to assess changes in perception and improvements in participants' understanding.

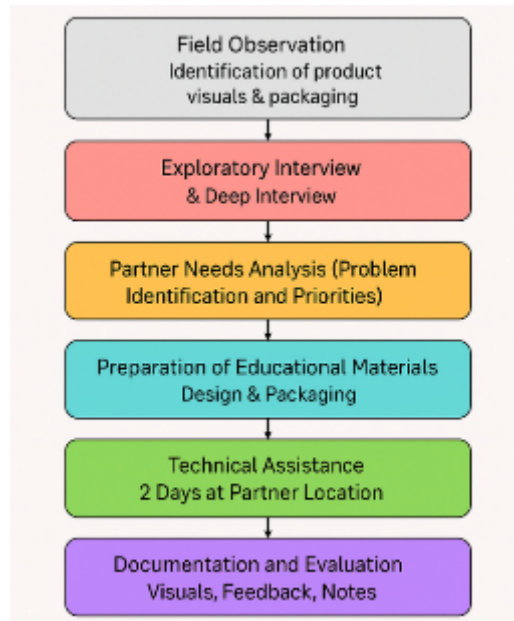


Figure 4. Flowchart of Community Service Activities Method at Sentra Rajut Nogosari

### III. RESULT AND DISCUSSION

This community engagement program was carried out directly at Sentra Rajut Nogosari, Wukirsari Village, Imogiri Subdistrict, Bantul Regency, Yogyakarta Special Region, from Monday to Wednesday, May 19–21, 2025. All stages of the program ran according to plan, involving lecturers from Universitas Komputer Indonesia (UNIKOM) with expertise in management and marketing, together with the knitting artisans as the main partners.

The implementation process used a participatory approach, where the artisans were actively involved in all stages, starting from observation, problem identification, limited technical guidance, to discussion and final evaluation.

The activity began with field observations and exploratory interviews to gain a comprehensive understanding of production activities, design, and existing knitted product packaging. The results of the observation and interviews showed that the artisans had high knitting skills, but still faced obstacles in terms of visual product design and packaging strategies. Most products still used homogeneous designs, with limited color variation, and plain packaging without a strong visual identity.

These findings were reinforced through in-depth interviews, revealing that the majority of artisans did not fully understand the importance of visual aesthetics, packaging appeal, and brand identity in influencing consumer purchasing decisions. Factors such as limited access to information, minimal design training, and a lack of market trend references were the main causes of stagnation in design and packaging innovation.

Based on these interviews, the artisans also conveyed that they were still using traditional tools, did not yet have modern knitting machines, and had not mastered the theory or practice of contemporary knitted product design. This condition indicated the need for further targeted interventions to improve both production capacity and the visual quality of the products.

In addition, this activity also served as limited technical guidance to provide instruction on using design software in the knitted digital printing process. Participants were introduced to the basics of visual design by utilizing laptops with design applications, as an initial step toward transforming the local knitting industry digitally.

In general, the community engagement and empowerment program was carried out quite effectively despite several obstacles during the limited technical guidance sessions, such as the lack of teaching aids and differences in participant understanding of visual design materials. Out of approximately 200 artisans registered at Sentra Rajut Nogosari, only about a dozen attended and actively participated in this program. The absence of supporting media such as laptops and design software on-site was also a challenge in optimally practicing the material. However, participant enthusiasm remained high, especially when they were introduced to examples of creative product designs currently trending in the market.

The products previously produced by the partners included knitted bags, knitted shoes, coin purses, dolls, flower bouquets, decorative pillows, keychains, and children's clothing. All these products were originally produced manually. However, in this community engagement activity, the partners were also introduced to the use of digital knitting machines, which are expected to increase production efficiency and the precision of knitted results.



Figure 5. Results of digital knitting machines as modern production tools.

As an effort to strengthen design capacity and visual branding, the community engagement team also introduced various examples of modern knitted products. These examples of knitted fashion products included sweaters, cardigans, pencil skirts, unisex outerwear, as well as tote bags and laptop bags made of premium acrylic knit. It is hoped that the partners can adopt this design style to improve the competitiveness of their products, both in the national market and in export opportunities. Going forward, the product designs developed are expected to become increasingly adaptive to market trends, to have high aesthetic value, and to maintain strong local identity, so that they can compete in both national and international markets.



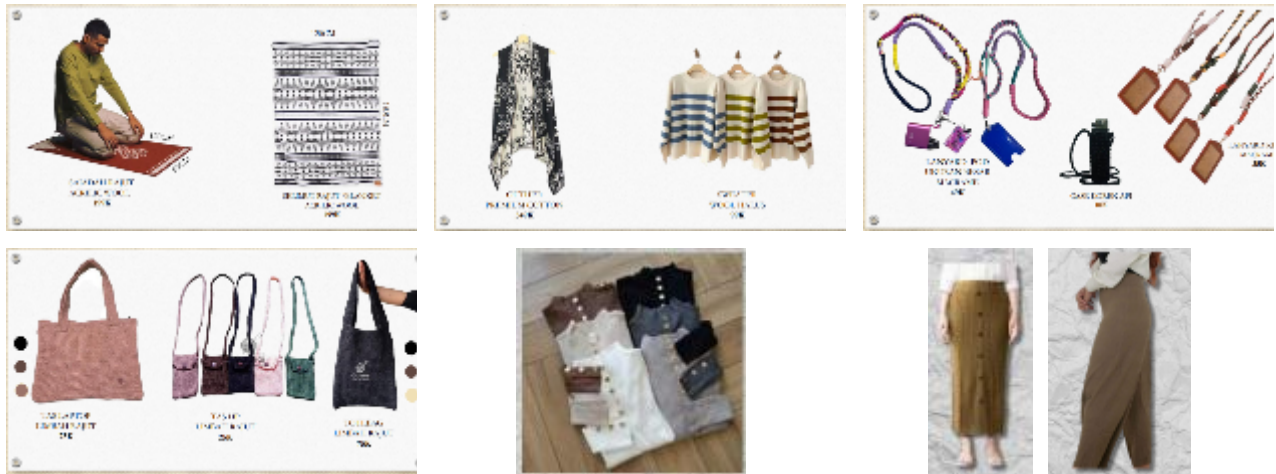


Figure 6. A variety of inspiring modern knitted product and design examples.

Based on this analysis, the team then prepared educational materials focusing on three main aspects, namely: (1) the basic principles of product design, including color, shape, and visual function; (2) aesthetically pleasing and informative packaging techniques; and (3) brand strengthening through simple but meaningful visual elements. This material was delivered in a limited technical guidance series over three days, through interactive discussion methods, group dialogues, and direct exploration of visual product examples.

During the implementation process, partner participation was observed to be highly active. The artisans gave positive feedback and were directly involved in redesigning their products and packaging. They began to realize that product visualization and brand identity are not just additional elements, but an integral part of marketing strategy.

In addition, the community engagement team had previously carried out training activities at Sentra Rajut Binong Jati in Bandung City, which is one of the largest knitting centers in Indonesia. Most of the product, design, and packaging examples shown to the artisans at Sentra Rajut Nogosari were adapted from that previous training. The success of Binong Jati artisans in expanding their market to neighboring countries such as Malaysia and Singapore, and even penetrating the European market, is expected to serve as inspiration for Nogosari artisans to improve product quality and strengthen their marketing strategies.

During the activity, several main components were covered:

1. Socialization and explanation of visual branding material, introducing the basic principles of design (color, shape, function), product packaging techniques, and brand identity strengthening.
2. Simulation of design and packaging, where participants were invited to explore color and design shapes based on current product trends.
3. Open discussion and idea brainstorming, to encourage participants to express creative ideas based on the available materials and local capacity.
4. Technical assistance, which was carried out directly on-site, so that participants could practice packaging techniques using labels, hang tags, and informative packaging.

The following is visual documentation of the activities that were implemented:

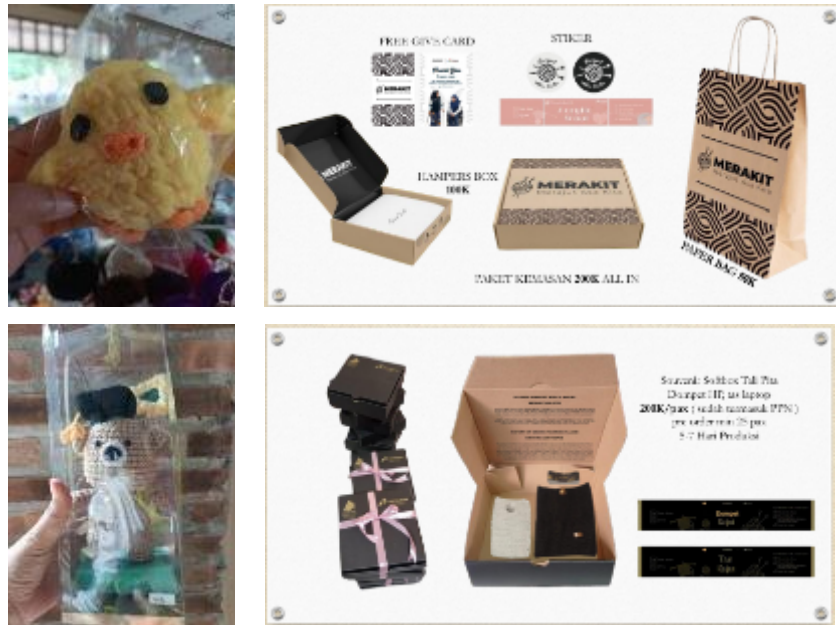


Figure 7. Examples of packaging before and after limited technical guidance.

In general, the results of this community service program showed an increase in partner understanding of the role of design and packaging in strengthening product competitiveness. The artisans began designing labels, developing design variations, and trying to modify their previously conventional packaging to become more visually appealing.

Furthermore, this activity also raised collective awareness among the artisans about the importance of community identity reflected in their products. By incorporating local cultural elements, such as batik motifs or traditional place names, the artisans began to plan strategies to strengthen the local value of their products in both digital and offline markets.

An analysis of changes before and after the limited technical guidance showed positive developments in various aspects. Before the program, knitted product designs at Sentra Nogosari tended to be homogeneous, with limited color variation. After the intervention, designs became more varied and began to pay attention to aesthetic elements. In terms of packaging, products initially used plain packaging without labels or supporting information. After the technical guidance, the artisans began to include labels and brand visual elements in their packaging.

Branding understanding also improved. Previously, the artisans had minimal knowledge and did not understand the importance of product identity. After the program, they began to realize the value of branding and even showed interest in designing their own logos or trademarks. The level of partner participation also changed significantly. Initially, they tended to be passive in marketing strategies. However, after the technical guidance, the artisans became more actively engaged in discussions and began trying new approaches in marketing their products.

Table 1. Analysis of Changes Before and After Limited Technical Guidance at Sentra Rajut Nogosari

| Aspect         | Before Limited Technical Guidance    | After Limited Technical Guidance                      |
|----------------|--------------------------------------|---|
| Product Design | Homogeneous, lacking color variation | More varied, beginning to pay attention to aesthetics |

| Aspect                 | Before Limited Technical Guidance                              | After Limited Technical Guidance                                     |
|------------------------|--|--|
| Packaging              | Plain, without labels or information                           | Has started to use labels and visual brand elements                  |
| Branding Understanding | Minimal, did not understand the importance of product identity | Has started to understand and is interested in creating a logo/brand |
| Partner Participation  | Passive in marketing strategies                                | Actively discussing and trying new marketing approaches              |

Community Impact and Adoption:

1. There was an increase in artisans' understanding of the importance of visual design and packaging in shaping consumer perceptions of products.
2. New ideas emerged among artisans to develop product variations, while also adapting modern designs based on catalog references.
3. The community has begun planning collective purchases of digital knitting machines as an effort to expand production capacity.
4. Some artisans have also started initiatives to use social media and e-commerce platforms to support product marketing.

As a form of appreciation and recognition of the contribution of this community engagement activity, the lecturer team participated in The 1st International Community Service 2025 in Yogyakarta on May 19–21, 2025. Attendance at this forum served as evidence of solid collaboration between higher education institutions and the local community, while also motivating the artisans to continuously improve product quality and expand cooperation networks at national and international levels.

The results of this activity showed that a participatory and educational approach, based on the actual needs of the community, proved effective in comprehensively increasing the artisans' capacity. Although this activity is still in its early stages and has not yet included technical interventions or follow-up training, the changes in perception and the emergence of critical awareness among partners are positive indicators of the program's success. Going forward, similar activities can be expanded through follow-up training or community-based digital marketing facilitation, so that the impact does not stop only at the knowledge level, but also contributes to improving the local economy based on competitive products.



Figure 8. Documentation of the participation of the Sentra Rajut Nogosari PkM team in The 1st International Community Service 2025 in Yogyakarta.

#### **IV. CONCLUSION**

The community engagement program implemented at Sentra Rajut Nogosari has successfully become both a learning platform and an empowerment space for the local knitting artisan community. This activity not only strengthens the implementation of the three pillars of higher education (tridharma perguruan tinggi) but also contributes to achieving the Key Performance Indicators (IKU) of lecturers and students through active involvement in off-campus activities with tangible community impact.

Through a series of educational activities and limited technical guidance, the artisans gained practical knowledge on product design principles, packaging strategies, and the importance of visual branding to increase the selling value of knitted products. The introduction of digital knitting machines and creative design examples based on industrial catalogs also opened new insights for partners to innovate and improve their product competitiveness.

The observed positive changes in the artisans' understanding and participation levels indicate that the participatory approach applied was effective. The artisans have started to respond proactively by designing brand identities, creating informative packaging, and exploring digital marketing opportunities through social media and e-commerce platforms.

For the sustainability of the program in the future, it is recommended to provide continued assistance, especially in the form of intensive training on digital marketing, micro-enterprise management, and creative product development based on technology. In addition, the provision of supporting media such as laptops and visual design software will be very helpful to make the learning process more optimal and practical.

With ongoing mentoring, it is expected that this program will strengthen the economic independence of the community based on local potential, while increasing the competitiveness of Sentra Nogosari knitted products in both regional and national markets. Thus, the contribution of the knitting-based creative economy sector can be further maximized in strengthening the local economy and creating sustainable social benefits.

#### **V. ACKNOWLEDGMENTS**

The Community Service Team would like to express sincere gratitude to the artisans at Sentra Rajut Nogosari, located in Desa Wukirsari, Kecamatan Imogiri, Kabupaten Bantul, for their active participation and full support throughout the implementation of this program. Appreciation is also extended to the local partners and community leaders for their cooperation and openness in accepting the educational program and the limited technical guidance provided.

Special thanks are conveyed to Universitas Komputer Indonesia (UNIKOM) for the academic support and facilities made available throughout the planning and reporting stages of this activity. Particular appreciation is also given to the students who served as facilitators in accompanying participants in the field.

In addition, the team extends its appreciation to *The 1st International Community Service 2025* in Yogyakarta for the opportunity to share the outcomes of this program, as well as for facilitating networking between universities and local communities at both the national and international levels.

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