

# The Use of Technology and Excellent Human Resources in the Development of Batik Giriloyo Bantul Yogyakarta

N.Yeffa Afnita Apriliyani<sup>1,\*</sup>, Sigit Widiyanto<sup>2</sup>, Taufik<sup>3</sup>, Anjah Akhmad Ullinuha<sup>4</sup> Rahmawati Dwi Retnoasih<sup>5</sup>

<sup>1</sup> Management Retail, Faculty of Education and Social Studies, University of Indraprasta PGRI, Indonesia

<sup>2</sup> Management Retail, Faculty of Education and Social Studies, University of Indraprasta PGRI, Indonesia

<sup>3</sup> Education of Bahasa Indonesia, Faculty of Post graduate, University of Indraprasta PGRI, Indonesia

<sup>4</sup> Postgraduate Education in Social Sciences, , University of Indraprasta PGRI, Indonesia

<sup>5</sup> Management Retail, Faculty of Education and Social Studies, University of Indraprasta PGRI, Indonesia

\* Corresponding Author: [yefaafnita@gmail.com](mailto:yefaafnita@gmail.com)

---

## **Abstract.**

*The batik industry in Giriloyo Bantul, Yogyakarta faces major challenges related to low technology adoption and uneven human resource capabilities. Although batik is a cultural heritage of Indonesia with great potential for commercial development, both nationally and internationally, these obstacles hinder growth. This research employs a systematic method including problem mapping, focus group discussions, in-depth interviews, and strategic solution implementation for batik entrepreneurs during July 2025 in Bantul. The activities revealed that modern technologies such as stamp machines, electric heating tools, and digital design devices can improve efficiency and product quality. Moreover, enhancing human resource competencies through training in batik techniques, management, and digital marketing is crucial to support innovation and competitiveness. The findings emphasize the importance of collaboration among entrepreneurs, government, and private sector to strengthen marketing and HR development efforts. The utilization of digital platforms and waste management technology are also key factors in ensuring sustainable batik business practices in the region. In conclusion, the success of developing the batik industry in Giriloyo depends on the integration of appropriate technology and improved human resource quality. Recommendations include increasing technological innovation, continuous training, and strengthening multi-sector collaboration to foster growth and sustain the competitiveness of the batik industry in the global market.*

**Keywords:** *Technology; Human resources; Superior; Giriloyo batik.*

---

## **I. INTRODUCTION**

As one of Indonesia's cultural heritages, batik has great potential to be developed into a leading product capable of competing at national and international levels. However, stagnation and the lack of digital innovation hinder efforts to improve competitiveness and market expansion for batik entrepreneurs in the area.

One major factor influencing the progress of the Giriloyo batik industry is the weak implementation of technology across various business aspects. As Dewanti et al. (2013) state, the use of electronic systems can strengthen organizations and support business sustainability by

increasing operational efficiency and expanding marketing networks through digital communities and systems. However, in reality, financial reporting and administrative processes are still carried out manually and on a relatively short cycle, such as weekly. This results in data inaccuracies and difficulties in strategic decision-making, thereby necessitating better technological integration and information systems.



Figure 1. Giriloyo Batik

Furthermore, the aspect of human resources remains a significant obstacle. Data shows that the competency level of HR in Giriloyo is uneven; most workers are still high school graduates, with only a small percentage holding university degrees. According to Rachmawati et al. (2022), the success of developing the batik business heavily depends on high-quality HR, particularly in adopting technology and innovation in production and marketing processes. Limited knowledge and skills restrict innovation, making batik products less competitive and primarily targeting the domestic market.

In the context of global competition, digital innovation is essential so that the batik industry does not fall behind and can expand its markets more effectively. Digital innovation and creativity, such as blending traditional and modern motifs, can enhance the attractiveness of products, meeting consumer demand for unique ethnic designs aligned with current fashion trends. Developing these innovations requires HR that can understand and apply technology, as well as possess broad insights into market trends and high creativity.

Addressing human resource development as a key driver of business growth must not be overlooked. According to Faisal (2015), organizations must improve HR competence through training, knowledge enhancement, and managerial skill development. This is crucial so that entrepreneurs do not rely solely on luck in marketing but can manage and develop products innovatively and professionally. The variation in HR in Giriloyo, mostly high school graduates, needs competency improvements to keep pace with technological advances and market trends.

Equally important is the development of technology and infrastructure to support business success. Listiyaningrum et al. (2020) suggest that batik entrepreneurs and community groups in areas like Giriloyo should collaborate with the government and private sector to improve

infrastructure and adopt suitable technology. Developing a well-managed and digitized financial system will facilitate monitoring and financial management, thus enhancing business sustainability and efficiency. This success will strengthen economic positions and improve the welfare of entrepreneurs.

Ultimately, the sustainability of the batik industry in Giriloyo will not be realized without improving HR quality and optimizing the use of technology. According to Suci Nur Imelda & Simangunsong (2024), an appropriate business strategy is one that simultaneously develops and nurtures internal organizational aspects, including HR and technology. This approach will strengthen the position of batik businesses, foster product innovation and creativity, and expand markets both locally and globally.

Considering these factors, this research is essential to formulate concrete solutions that can enhance HR quality and utilize technology optimally in developing the Batik Giriloyo industry in Bantul, Yogyakarta. It is hoped that with improved, evenly distributed HR competencies and the application of modern technology, the batik industry in the region will not only survive but also thrive and compete healthily in the global market. Through the integration of digital innovation, HR development, and adequate infrastructure support, Giriloyo's batik industry can become an example of successful cultural and artistic development focused on economic sustainability at the village level.

## **II. METHODS**

The activity methods in this community service program are designed systematically and structured to ensure effective solutions in advancing the batik industry in Giriloyo, Bantul, Yogyakarta. The participants consist of seven people, including one project leader, four staff members, one finance officer, and one batik training staff. The activities will be carried out in July 2025 in Bantul, Yogyakarta.

The first stage is problem mapping, which is conducted by comprehensively identifying various obstacles faced by batik entrepreneurs in the area, particularly related to technology use, human resources, as well as marketing and financial aspects. Initial data collection will be done through field observations and preliminary interviews with entrepreneurs and the management of Batik Giriloyo.

The second stage is problem discussion, in which participants hold a forum involving various relevant parties and entrepreneurs. This discussion aims to understand the root causes of problems and identify key factors that need to be addressed. Next, the third stage is in-depth interviews, conducted directly with entrepreneurs and management to gather more detailed data and their perspectives on the necessary solutions.

In the fourth stage, participants will provide strategic solutions and recommendations directly to the management of Batik Giriloyo. These solutions include enhancing technology use, HR training, and product innovation. As the final stage, participants will compile and deliver final input in the form of strategic suggestions to the management as a guide for future business development. This activity is expected to make a tangible contribution to the development of the batik industry in Giriloyo, making it more competitive and innovative.

### III. RESULT AND DISCUSSION

There are several important aspects that must be undertaken by the management of Batik Giriloyo to ensure that the batik business in the area develops optimally and remains competitive at both the national and international levels. Based on interviews and discussions held during this activity, one key point is the importance of implementing appropriate technology to improve production efficiency and product quality. One proposed solution is to introduce modern tools such as batik stamping machines, electric heating devices, and digital design tools. The use of batik stamping machines has proven to speed up the motif printing process while maintaining motif consistency, which helps preserve product quality and increase production volume (Andarwati et al., 2018). Electric heating tools also enable faster and more uniform dyeing processes, reducing dependency on traditional methods that are time-consuming and prone to errors.



Figure 2. Batik

In addition, developing digital design as a priority in the effort to innovate batik motifs is essential. Training artisans to use graphic design software will simplify the process of creating new, more varied, and market-attractive motifs aligned with current trends. The application of digital design also facilitates the dyeing and pattern arrangement process, ultimately increasing product appeal and accelerating production (A. R. Pratiwi, 2022). The use of digital platforms is highly relevant for expanding markets, considering the importance of social media and digital marketing for batik sales today. With social media and marketplaces, entrepreneurs can promote their products more broadly and efficiently, even reaching international markets (A. A. Pratiwi et al., 2024).

Waste management is another crucial aspect. Batik waste processing technology can help reduce environmental impacts and generate value-added derivative products, such as crafts made from leftover batik fabrics. The implementation of this technology is eco-friendly and also increases income from waste that was previously underutilized (Andarwati et al., 2018). By integrating waste processing into the production process, entrepreneurs can foster innovation while strengthening the sustainability of their business.

From the perspective of human resource development, this activity emphasizes that improving competence should be a primary focus . Through routine training on modern batik techniques, business management, marketing, and technology usage, batik artisans and entrepreneurs in Giriloyo are expected to enhance product quality and competitiveness. Formal education in fine arts and design should also be promoted to produce a new generation of artisans skilled in modern techniques and capable of creatively and innovatively interacting with others (A. R. Pratiwi, 2022).

In addition to technical training, efforts to regenerate artisans by involving the younger generation in batik activities and providing intensive training to them should be prioritized. This approach is crucial to ensure the sustainability of the business, so it does not depend solely on one generation, and the capacity of human resources can continue to grow. Improving HR quality through training and education significantly influences the success of marketing strategies and business development.

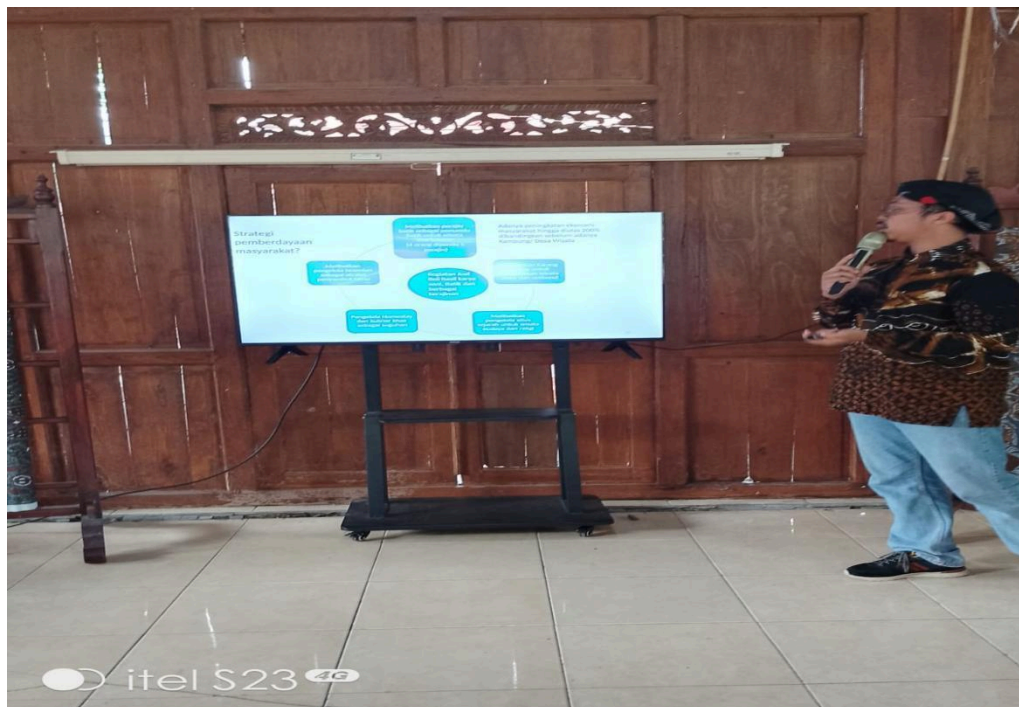


Figure 3. Presentation

Regarding marketing, digital marketing is identified as an effective solution that needs to be further optimized (Engström & Elg, 2015). Utilizing social media, websites, and marketplaces allows entrepreneurs to promote their products more widely and directly to consumers. A. R. Pratiwi (2022) suggests that developing digital marketing applications and providing training on online marketing techniques should be part of empowerment programs. This activity is also supported by the results, which include the implementation of AV production digital marketing applications as examples and references for batik entrepreneurs in the Masaran Batik Industry Center.

Discussions also reveal that collaboration among entrepreneurs, the government, and the private sector is essential to strengthen marketing and business development efforts (Homburg et al., 2017). Support in funding, training, and equitable human resource distribution will enhance the success of micro, small, and medium enterprises (MSMEs) like Batik Giriloyo. Apriliyani et al.

(2025) state that a combination of adequate workforce, business capital, and effective marketing strategies will accelerate business success and create expansion opportunities. Overall, this community service activity underscores that the success of developing the batik industry in Giriloyo heavily depends on the implementation of appropriate technology and the improvement of human resources.

#### IV. CONCLUSION

The conclusion of this community service activity indicates that the development of the batik industry in Giriloyo requires the implementation of appropriate technology and the development of high-quality human resources. The use of modern tools such as batik stamping machines, electric heating devices, and digital design tools can improve production efficiency, product quality, and motif innovation. Furthermore, digital marketing through social media, websites, and marketplaces is crucial for expanding markets and increasing sales, including international markets. Waste management and sustainability of the business must also be prioritized to support environmental and economic aspects. HR development through regular training, formal education, and regeneration of the younger generation must be ongoing to ensure business sustainability. Close collaboration among entrepreneurs, the government, and the private sector is essential for the effective implementation of these development strategies and to enhance the competitiveness of Giriloyo batik at both national and global levels.

#### V. ACKNOWLEDGMENTS

The author expresses their sincere gratitude to the Rector of Universitas Indraprasta PGRI, Prof. Sumaryoto, for the support and valuable input provided in the implementation of ICS 2025. Without the support and guidance of Mr. Prof. Sumaryoto, this event could not have run smoothly and successfully. I also extend my appreciation and thanks to the Chairperson of ICS 2025 for executing their duties diligently and with full dedication. The completion of this task has been 매우 meaningful in supporting the success of this event. Hopefully, the collaboration that has been established can continue to improve the quality of future activities and research. Thank you for all the support and cooperation that has been given.

#### REFERENCES

- Andarwati, M., Subyantoro, E., & Subadyo, T. (2018). Pengaruh Pelatihan dan Penerapan Teknologi Tepat Guna (TTG) Terhadap Keberdayaan Pengrajin Batik Tulis Ramah Lingkungan. *Briliant: Jurnal Riset Dan Konseptual*, 3(3), 280. <https://doi.org/10.28926/briliant.v3i3.189>
- Apriliyani, N. Y. A., Isitiningrum, R., & Widiyanto, S. (2025). Membangun Jembatan Komunikasi: Strategi Meningkatkan Efektivitas Komunikasi Bahasa Indonesia di Perguruan Tinggi. *Prosiding Konferensi Berbahasa Indonesia Universitas Indraprasta PGRI*, 445–451. <https://doi.org/10.30998/28-10-2024.8073>
- Dewanti, R., Melati, I., & Simbolon, F. (2013). Pengembangan Model Daya Saing UMKM Batik Melalui ECS. *Binus Business Review*, 4(1), 41. <https://doi.org/10.21512/bbr.v4i1.1034>

- Engström, J., & Elg, M. (2015). A self-determination theory perspective on customer participation in service development. *Journal of Services Marketing*, 29(6/7), 511–521. <https://doi.org/10.1108/JSM-01-2015-0053>
- Homburg, C., Jozić, D., & Kuehnl, C. (2017). Customer experience management: toward implementing an evolving marketing concept. *Journal of the Academy of Marketing Science*, 45(3), 377–401. <https://doi.org/10.1007/s11747-015-0460-7>
- Listiyaningrum, A., Rustiana, A., & Saeroji, A. (2020). STRATEGI PENGEMBANGAN BATIK BERBASIS EKONOMI KREATIF KAMPUNG BATIK KAUMAN PEKALONGAN. *Business and Accounting Education Journal*, 1(2), 116–127. <https://doi.org/10.15294/baej.v1i2.41012>
- Pratiwi, A. A., Suranto, S., Nurgiyatna<sup>3</sup>, N., Musabbikha, M., & Sofyan, A. (2024). Pendampingan Pelatihan Aplikasi Media Sosial Di Masa Pandemi Covid 19 Pada Batik Av Production. *JURNAL PENGABDIAN TEKNOLOGI TEPAT GUNA*, 5(2), 105–115. <https://doi.org/10.47942/jpttg.v5i2.799>
- Pratiwi, A. R. (2022). PENDAMPINGAN PELATIHAN APLIKASI MEDIA SOSIAL DI MASA PANDEMI COVID 19 PADA BATIK AV PRODUCTION. *JURNAL PENGABDIAN TEKNOLOGI TEPAT GUNA*, 3(1), 74–83. <https://doi.org/10.47942/jpttg.v3i1.831>
- Rachmawati, E., Susanto, B., Hendajany, N., Ratnawati, A., Suaesih, A., & Garnia, E. (2022). PELATIHAN PENGUSAHA BATIK NYERE DALAM MENINGKATKAN SUMBER DAYA MANUSIA YANG UNGGUL DAN KREATIF. *Jurnal Abdimas Sang Buana*, 3(1), 46. <https://doi.org/10.32897/abdimasusb.v3i1.1308>
- Suci Nur Imelda, & Simangunsong, B. A. M. P. (2024). Strategi Bisnis Fashion Batik Tulis Sukabumi untuk Meningkatkan Permintaan Batik Tulis Sukabumi dengan Menggunakan Analisis SWOT. *Jurnal Bisnisan: Riset Bisnis Dan Manajemen*, 6(1), 12–27. <https://doi.org/10.52005/bisnisan.v6i1.202>