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Integration of VSD-Based Spinner Machines to Increase Efficiency and Product Quality at Alfin Kripik Seboro UMKM

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Abstract

Alfin Seboro Kripik is a Micro, Small, and Medium Enterprise (UMKM) that is engaged in the production of Seboro chips, a traditional Indonesian snack made from cassava. Alfin Seboro Kripik strives to uphold its heritage while adapting to modern market demands. This UMKM uses manual and traditional methods to make its chips, relying on a manual process involving frying and seasoning. Despite its commitment to tradition, Alfin Seboro Kripik faces challenges related to product quality and efficiency in its production line. One important issue is the adhesion of oil to the chips after frying, which affects the taste and texture of the final product. Additionally, the lack of advanced machinery limits the company's ability to meet rising consumer expectations and compete effectively in the marketplace. Realizing the need for innovation and improvement, Alfin Seboro Keripik hopes that there will be efforts to integrate modern technology such as the Variable Speed Drive (VSD) Based Spinner Machine system into its production process. The introduction of VSD-driven spinning machines aims to improve oil removal efficiency, improve product consistency, and optimize production workflows. By embracing innovation, Alfin Seboro Kripik aims to improve quality standards, expand market reach, and contribute to the economic development of local communities.

Keywords: Spinner Machines, VSD-Based Spinner, Product Quality

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INTRODUCTION

Alfin Kripik Seboro is a Micro, Small, and Medium Enterprise (UMKM) that is engaged in the production of Seboro chips, a traditional Indonesian snack made from cassava. Alfin Kripik Seboro strives to uphold its heritage while adapting to modern market demands. This UMKM uses manual and traditional methods in making its chips, relying on manual processes involving frying and seasoning (Aini, Muktasam, & Hayati, 2023; Aliyah, 2022; Ariyandani, Rivai, & Fitriani, 2023; AYUNDA, 2023; Zakka, 2020).

Despite its commitment to tradition, Alfin Kripik Seboro faces challenges related to product quality and efficiency in its production lines. One important issue is the adhering of oil to the chips after frying, which affects the taste and texture of the final product (Pramono dkk., 2022; Vinatra, 2023). Additionally, the lack of advanced machinery limits the company's ability to meet rising consumer expectations and compete effectively in the marketplace (Nasution, Bukit, Hasugian, & Hasibuan, 2021; Prasetya dkk., 2023; Saputra, Muzakki, Prasetya, Rohman, & Kurniawan, 2024).

Alfin Kripik Seboro aims to integrate current technologies, including the Variable Speed Drive (VSD) system, into their production process to drive innovation and progress. The introduction of spinning machines that drive VSDs is intended to improve oil removal efficiency, product uniformity, and production workflows. By embracing innovation, Alfin Kripik Seboro hopes to increase quality standards, broaden market reach, and contribute to the economic development of local communities (Manurung, Nugroho, & Apriliyanto, 2020; Putri, Saputro, & Panjaitan, 2023; Putro dkk., 2023; Rahmiyati & Rachmawati, 2024).

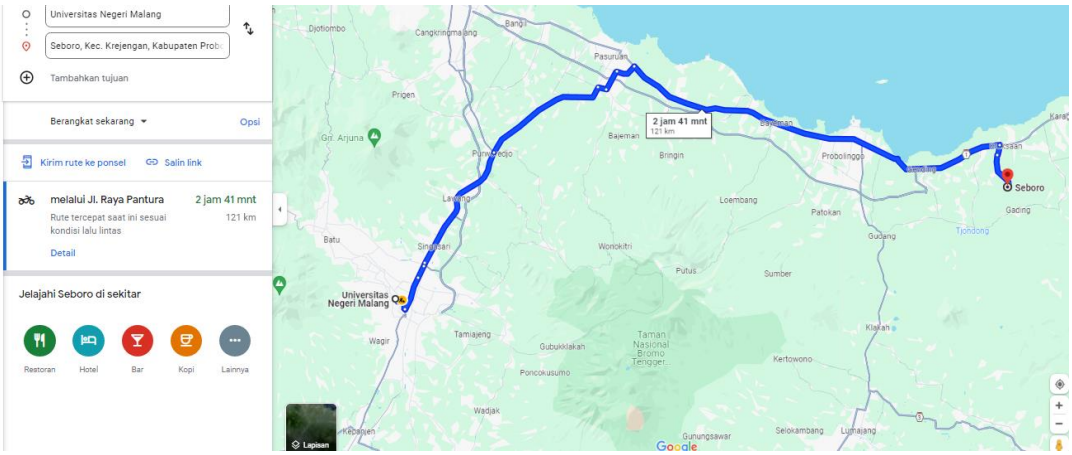

Figure 1. Partner Locations

Small and Medium Enterprises (UMKM) contribute significantly to global economic growth and societal development. In the Alfin Kripik Seboro UMKM community, increasing efficiency and product quality is critical to maintaining competitiveness and meeting market demand. Alfin Kripik Seboro, a local UMKM, is having difficulty optimizing its manufacturing process due to restricted machine capabilities and operating procedures.

The Alfin Kripik Seboro UMKM community faces quite a big challenge related to the quality of its products and the presence of oil residue on the chips. The existing production process does not have an efficient spinner mechanism, resulting in inadequate oil removal and decreased product quality. As a result, the chips exhibit undesirable characteristics, including unattractive appearance and poor taste, thereby reducing customer satisfaction and weakening market competitiveness. Additionally, the absence of a robust spinning mechanism hampers the efficiency of the production line, leading to increased operational inefficiency and wastage of resources (Aleffin, Imaningsih, & Fadil, 2023; Cantikasari dkk., 2022; Faiz dkk., 2022; Zakka, 2020). Therefore, overcoming the problem of oil residue and less-than-optimal product quality through the integration of a spinner mechanism driven by Variable Speed Drive (VSD) technology is an important necessity to increase the effectiveness and competitiveness of the Alfin Kripik Seboro UKM community as a whole.

The integration of Variable Speed Drive (VSD) based spinning machines presents a promising solution to overcome these challenges (Adiningrat, 2021; Ryantara & Diari, 2024; Taufiq & Wijaya, 2023; Wardono, Ginting, & Utami, 2022). VSD technology enables precise control of the spinning machine rotation speed, offering flexibility in the production process and enabling customization to meet a wide range of product specifications and demands. By integrating VSD technology into the spinning machines used by the Alfin Kripik Seboro UKM community, significant increases in efficiency, productivity, and product quality can be achieved.

This research initiative aims to explore the feasibility and practicality of integrating VSD-based spinning machines in the Alfin Kripik Seboro UKM community. By conducting a thorough assessment of existing production infrastructure, operational workflows, and technology requirements, this research seeks to identify the most appropriate VSD integration approach tailored to the specific needs and constraints of society (MURPHY, t.t.; Witjaksono dkk., 2023).

Figure 2. Road conditions that lack lighting accessibility

Additionally, this research seeks to evaluate the anticipated benefits and impacts of VSD integration, including increased production efficiency, reduced energy consumption, increased product consistency, and increased market competitiveness. Through collaborative efforts involving researchers, and members of the Alfin Kripik Seboro UMKM community, this research aims to facilitate knowledge exchange, capacity building, and technology transfer initiatives to empower local entrepreneurs and encourage sustainable growth in the UMKM sector.

In short, the integration of VSD-based spinning machines represents a transformative opportunity for the Alfin Kripik Seboro UMKM community to simplify operations, improve product quality, and strengthen market presence. Through systematic research, innovation, and collaborative partnerships, this initiative seeks to catalyze positive socio-economic outcomes and encourage inclusive development in the local UMKM ecosystem.

METHOD

Metodologi kegiatan penelitian dan pengabdian kepada masyarakat ini meliputi beberapa langkah utama:

For problem-solving and solutions offered to Alfin Kripik Seboro, Krejengan, Probolinggo UMKM partners, a problem-solving framework has been prepared as follows:

1. Design of TTG spinner machine based on VSD
2. TTG testing of VSD-based spinner machines on partners.
3. TTG installation and maintenance training for VSD-based spinner machines
4. Evaluation is carried out in stages within 1 month.

The methodology for research and community service activities includes several main steps:

1. Needs Assessment and Stakeholder Involvement: The first step is to conduct a complete needs assessment to determine the unique issues and requirements that the Alfin Kripik Seboro UMKM community faces while draining frying oil on chips. Stakeholder engagement meetings were held to obtain insights from local entrepreneurs, workers, and community leaders, ensuring their active participation and sense of ownership of the research endeavor.

2. Literature Assessment and Technology Evaluation: A thorough assessment of existing literature and pertinent technology breakthroughs in cooking oil production was done to inform the design and execution of a VSD-based spin machine. Efficiency, dependability, cost-effectiveness, and adaptability to local conditions are among the evaluation criteria used to ensure that relevant technologies are chosen to satisfy the demands of target areas.

3. Prototype Development and Testing: Working with local engineers and craftsmen, we built a VSD-Based Spinner Machine prototype that blends an inverter-based motor system with a traditional oil drain mechanism. These prototypes were rigorously tested and refined to enhance performance, durability, and ease of use, taking comments from end users and technical specialists.

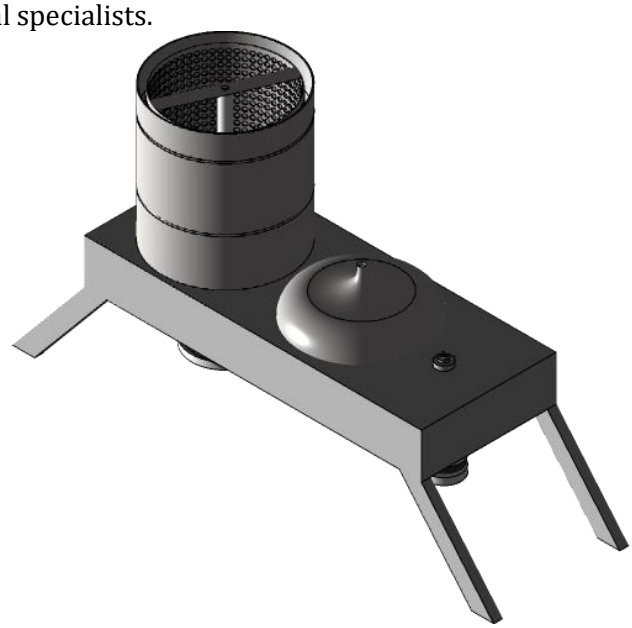

Figure 3. VSD-Based Spinner Machine Design

4. Implementation and Training: Following a successful prototype, the VSD-Based Spinner Machine was installed and operational at the Alfin Kripik Seboro UMKM community. Training seminars and capacity-building sessions were held to educate local employers and workers about the operation, maintenance, and safety regulations for this new technology. Live demonstrations and practical exercises empower participants to exploit the full potential of machines in terms of productivity and product quality.

5. Monitoring and Evaluation: Throughout the implementation phase, constant monitoring and evaluation procedures are employed to analyze the performance, effect, and long-term viability of technological initiatives. Key performance indicators including production output, labor efficiency, product quality, and economic viability are recorded and analyzed to measure the project's efficacy in fulfilling its goals and creating tangible benefits for the Alfin Kripik Seboro UMKM community.

6. Knowledge Sharing and Dissemination: Findings, best practices, and lessons gained from research and community service initiatives are shared via several channels, such as academic papers, policy briefs, workshops, and community forums. Knowledge-sharing programs promote cross-sectoral collaboration, facilitate the replication of successful interventions, and contribute to broader learning and innovation in the fields of sustainable rural development and MSME empowerment.

RESULT AND DISCUSSION

The community service initiative "Integration of VSD-Based Spinner Machines to Improve Efficiency and Product Quality at Alfin Kripik Seboro UMKM" yielded substantial results and received excellent feedback in terms of promoting Alfin Kripik Seboro UMKM. The primary goal of this program is to increase product quality and efficiency. On the other side, this program reduces operational expenses while increasing resource utilization, contributing to long-term sustainability and profitability. The technology used can help improve market competitiveness for products made possible by VSD-based spinner machines.

This community service project from May to June 2024 generated one package of Spinner Machines with Variable Speed Drive (VSD). During the socialization stage of the Variable Speed Drive (VSD) Based Spinner Machine training, the service team coordinated and communicated with all Alfin Kripik Seboro UMKM members, from designing machine tools to handing over the machine (see Figure 4). Communication and collaboration are critical in this activity to create strategies for use, maintenance, and repair.

Figure 4. VSD-based spinner machine handed over to UMKM partner Alfin Kripik Seboro.

Figure 5. Alfin Kripik Seboro UMKM partners received training on using and maintaining spinner machines with variable speed drives (VSDs).

Figure 6. Test Results for Spinner Machines with Variable Speed Drive (VSD).

Figure 5 shows documentation from Alfin Kripik Seboro UMKM's training on using and maintaining Variable Speed Drive (VSD) Based Spinner Machine equipment, ensuring UMKM members understand how to operate it. Aside from that, in this training, procedures were also carried out to develop the use of VSD, which is not just restricted to Spinner Machines but has many other uses.

Figure 6 demonstrates that the Spinner Machine Based on Variable Speed Drive (VSD) is effective, with a strong and rust-resistant installation. The Variable Speed Drive (VSD) spinner machine removes cooking oil from chips and separates them by speeding up the electric motor. By regulating the speed with a VSD, the spinner can drain oil from varied chips. The benefit of utilizing a spinner to drain oil from chips is that it can increase product quality to be more guaranteed, allowing it to compete with other items.

CONCLUSION

Community service activities carried out at UMKM Alfin Kripik Seboro, Krejengan, Probolinggo Regency have been completed very well. The Spinner Machine Based on the Variable Speed Drive (VSD) that has been implemented functions well. The Spinner machine with VSD is capable of draining the remaining oil in fried chips. The positive result is that the Spinner Machine Based on Variable Speed Drive (VSD) can increase the efficiency and quality of chip products so that they can be used for various chips in draining cooking oil. The engagement of UMKM Alfin Kripik Seboro members in this activity fosters collaboration and mutual learning, boosting the impact of technology. As agriculture continues to improve, this initiative is a fascinating illustration of how a harmonious mix of technology, farmer involvement, and sustainable agricultural approaches may bring positive long-term change.

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