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Increasing Production Capacity Through Automatic Forging Machinery for Blacksmith Msmes in Sumberpasir Village

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Abstract

Sumberpasir Village, Pakis Subdistrict has various types of MSMEs, one of which is a blacksmith MSME. The products produced include agricultural tools such as knives, hoes, sickles (scythes), and other iron products. In both quality and quantity, the blacksmith MSMEs of Sumberpasir village have not been able to meet the demands of the market. This is because the production process still relies on human labor, especially in the forging process. Community service activities aim to increase the production capacity of blacksmith MSMEs in Sumberpasir Village through the use of iron forging machines. This community service activity was conducted in the Sumberpasir Village Office Hall. This activity includes socialization of the application of iron forging machines. The method used is discussion and counseling related to how to work and how to maintain machines for blacksmith MSMEs. This activity has 2 stages, starting from designing an automatic blacksmith machine, then continuing with machine socialization. In this socialization, MSME actors are expected to be able to understand, use, and maintain iron forging machines properly and correctly. The result of this activity is that MSME actors can meet market needs with quality products with adequate quantity.

Keywords: *MSMEs; Blacksmiths; Automatic Forging Machines*

Introduction

In order to achieve growth and change at the level of social welfare, a number of businesses' operations must be organized. Economic development planning was expected to have better the output of local businesses, which might potentially have an impact on rising wages and the level of productivity within the community. The advancement of technology that made it much easier for humans to complete

their tasks goes hand in hand with the growth of the economy (Satito et al., 2022). When labor was performed manually by relying on human power, technology offers an alternative in the form of an option to switch to using machines (Darmanto, Purwadi, et al., 2020). It has been demonstrated that utilizing this innovation into the manufacturing process could minimize costs while also speed up operations, and enhance output (Darsan et al., 2022). MSMEs (Micro, Small and Medium Enterprises) were productive economic business activities that are conducted by people, small businesses, or other business entities on a medium to small scale (Edelia & Aslami, 2022). The existence of MSME management was a form of driving the progress of the community's economy (Kusumawardhani & Nurani, 2019).

Sumberpasir is one of the villages in the Malang Regency's Pakis District. Sumberpasir Village's location in the lowlands makes it an ideal place for agricultural and plantation sectors. In addition, because the location was strategic and close to Malang City, Sumberpasir Village was suited for an industrial area for large, medium, or small enterprises. The transformation of Sumberpasir Village into an industrial area was supported by Local Regulations (refers to PERDA) No. 3 of 2010 regarding the 2009-2029 Malang Regency Spatial Planning and the 2016-2036 Pakis District Detailed Spatial Plan (refers to RDTR), which state that the area in Pakis District was designated as an industrial area in Malang Regency. In addition to being a huge industrial region that is home to manufacturers producing plastic and concrete, Sumberpasir Village is also home to a wide variety of industries that are either medium or small in scale.

Several craftsmen were spread around the Sumberpasir area. The majority of the goods produced includes iron agricultural tools such knives, hoes, sickles, and other items. Different production strategies were used by the blacksmith MSMEs in Sumberpasir Village; some MSMEs mass created tools while others only produced tools as requested by customers.

Literature Reviews

Blacksmith MSMEs

In the manufacturing process, blacksmiths MSMES have been unable to match market demands in terms of both quality and quantity. This was caused by the production process that still uses human or manual labor, especially in the iron forging section. For manual iron forging, at least 2-3 workers were needed with a maximum production of 1 score or the equivalent of 20 pieces per day, depending on the size of the industrial business (Nurbarokah & Utami, 2019). In addition to requiring a large number of workers and being an exhausting operation, the quality and quantity of the products produced were also dependent on the skills of each employee (Darmanto, Ridwan, et al., 2020).

Iron Forging Machine

The use of iron forging machines is one of the efforts to increase blacksmith production capacity (Dukomalamo, 2012). With the use of machines, the product will become more stable both in terms of shape (size) and quality. In addition, the use of machines can help MSMEs to be able to compete with other blacksmith industries that have previously applied machining equipment (Sukardi & Najamuddin, 2020).

Previous Research

Based on previous research entitled "*Peningkatan Produktivitas UKM Pande Besi melalui Penerapan Ipteks Mesin Tempa Besi*", the use of iron forging machines was able to have a positive impact

on craftsmen such as fixed product selling prices, increased productivity, and more efficient and professional business management (Nurbarokah & Utami, 2019). This increase in productivity was evidenced by the results of monitoring carried out for 1 month, MSMEs have succeeded in increasing time and labor efficiency by a difference of 50% using iron forging machines. If initially it takes 24 minutes to produce 1 product with 2 workers, after using a forging machine, the completion of 1 product only takes 12 minutes using only 1 worker (Nurbarokah & Utami, 2019).

Based on the description that has been described, a community service program was carried out with the application of automatic blacksmith forging machines aimed at increasing quality and production capacity. Based on the observations that have been made, it can be seen that the main problem faced by partners is the forging process that still uses human or manual labor. This was considered less effective considering the market demand is quite high. This community service program aimed to improve the quality and production capacity of the blacksmiths in Sumberpasir Village so that they can meet the high market demand.

Research Method

The method used in this community service program was done through socialization of the application of automatic blacksmith forging machines, namely through discussion and counseling to blacksmith MSME actors in Sumberpasir Village. The discussion will be carried out with an explanation of how the machine works and how to maintain the machine. The stages of this activity were as follows:

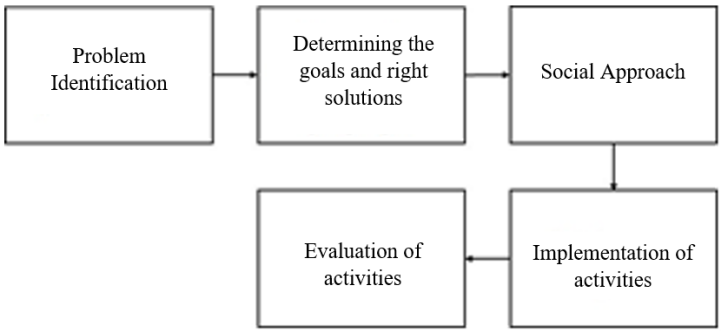

Figure 1. Activity Implementation Method

Problem Identification

This problem identification activity was done by examining and researching the problems faced by partners. With the same goal, the proposing chairman, service members, and partners will have the same desire and focus for this community service program.

Determine the Goal of Service and Solutions

After knowing the problems faced by partners, the goal of this community service was to implement an automatic blacksmith machine to improve the quality and production capacity of the blacksmith MSME actors in Sumberpasir Village.

Social Approach

The social approach aimed to convince partners that the solutions offered, namely changing work methods from manual to automatic, will increase production capacity and even better product quality. In addition to production capacity, time efficiency is also very necessary given the high market demand.

Implementation of Activities

The implementation of this activity began with the design and design of tools that have been agreed upon by partners. The results of the design and coordination with partners will be followed by making tools and testing the tools after the tools have been made. Tool delivery to partners was carried out through outreach and tool recognition training so that partners can understand the tools that have been given. In addition, continuous training and monitoring of tools was needed. The training was provided such as : 1) SOP training on tool use, 2) tool maintenance training, 3) troubleshooting training, and 4) training and mentoring on the use of automatic blacksmith forging machines.

Monitoring was carried out periodically to find out the progress of production using an automatic blacksmith forging machine and also monitoring if there were problems faced by partners when operating the machine.

Activity Evaluation

Evaluation was carried out to determine whether the community service program was running according to the initial objectives that have been set. Evaluation was very essential to improve program sustainability.

Results and Discussion

This community service activity aims to help increase the production of Blacksmith MSMEs in Sumberpasir Village. This community service activity was carried out through socialization of automatic blacksmith machines, followed by a blacksmith machine grant to one of the small-scale blacksmith actors in Sumberpasir Village. By this community service, it was expected that with this automatic blacksmith machine it can simplify and speed up the production process of farming tools and can reduce production costs. Thus, it can increase time efficiency and labor wages (Wardani, 2018). Some of the stages carried out in this community service activity were as follows:

Automatic Blacksmith Machine Design

This automatic blacksmith machine operated by using electricity to rotate the motor. The motor functions as a driving lever instead of a hammer. Manually, this hammer was used by humans to make farming tools. But in this automatic blacksmith machine, human power can be replaced by a motor that can move a lever that is connected to a hammer. The manufacture of this automatic blacksmith machine requires several machines and iron, including angle iron which is used as a frame for hammer holders in forging iron, steel used as a beater and a substitute for a manual hammer, an 8pk pulley-pully motor used to control the speed when the hammer hits workpiece/iron, and a handlebar so that the forging machine can go up and down and forge the iron according to the desired shape.

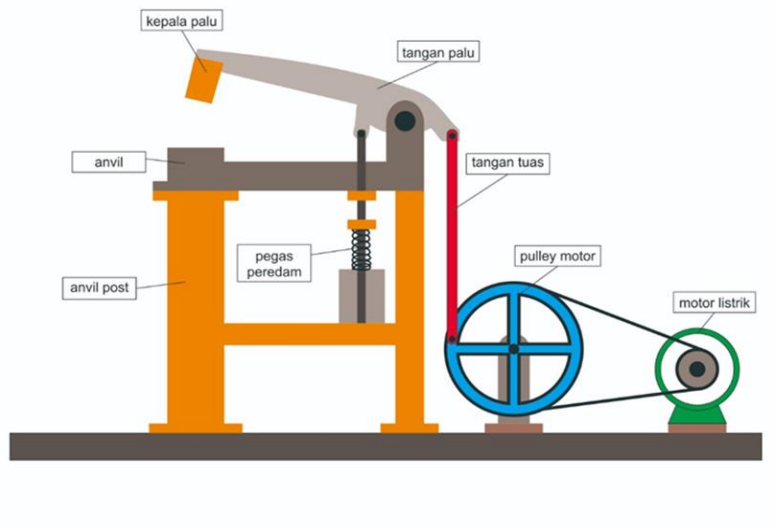

Figure 2. Automatic Blacksmith Machine Design

This automatic blacksmith machine operates as follows: 1) leveling the iron/workpiece, 2) making the iron/workpiece sharp, 3) making the iron/workpiece sharp, 4) making the iron/workpiece by hitting the top, 5) extending or pulling the iron/workpiece, and 5) making the iron/workpiece bend.

Socialization of Automatic Blacksmith Machines

The socialization activity for the automatic blacksmith machine was held in the Sumberpasir Village Hall on July 24 2022 at 09.00. The speakers for this socialization activity were Mr. Erwin Komara Mindarta S.Pd, M.Pd. This activity was attended by several Blascksmith MSMES actors in Sumberpasir Village. In this activity, some material regarding automatic blacksmith machines was explained. Some of the materials presented in this socialization activity were procedures for using automatic blacksmith machines in accordance with SOPs, procedures for maintenance and maintenance of automatic blacksmith machines, procedures for troubleshooting automatic blacksmith machines. This socialization activity was followed with great enthusiasm by the participants.

Figure 3. Automatic blacksmith machine

The speaker explains how this automatic blacksmith machine works. This automatic blacksmith machine only requires one human power as an operator to hold and direct the workpiece to produce the finished tool. Initially, the need for human power was 2-3 people, after the implementation of this automatic blacksmith machine, only 1 human power was needed. This can result in labor savings,

allowing for an increase in the number of tools produced so that the firm can compete with other blacksmiths and become an icon of Sumberpasir Village.

After delivering the material, it was followed by training and mentoring of automatic blacksmith machines to the participants. At this stage participants can find out the use of blacksmith machines directly by the presenters. Further, the activity was continued by granting automatic blacksmith machines to one of the blacksmith business actors in Sumberpasir Village. This automatic blacksmith machine was given to one of the blacksmiths MSME actors in Sumberpasir Village. With the existence of this automatic blacksmith machine, it is hoped that the blacksmith businesses players who were granted the machine can produce more products with good quality.

Conclusion

This community service activity was carried out through socialization and training of automatic blacksmith machines to blacksmith business actors in Sumberpasir Village, followed by grants of automatic blacksmith machines to one of the blacksmith business actors in Sumberpasir Village. The participants showed an extremely high level of excitement for this community service activity, which contributed to the event's successful implementation. This automatic blacksmith machine was donated by Mr. Erwin Komara Mindarta S.Pd, M.Pd to one of the blacksmith MSMEs in Sumberpasir Village. It is expected that with this automatic blacksmith machine, it can increase the production capacity of the blacksmith business of MSMES players.

The advantage of this community service activity is that blacksmith machines can make work easier because it only requires one human worker as an operator. This can save labor costs and also save processing time so that the resulting product will be more and with quality. Consequently, this will increase profits from partner blacksmith businesses. This community service activity has a limited duration; thus, it is uncertain how many products were made before and after the use of an automatic blacksmith machine.

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