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ANALYSIS OF THE PRODUCTION PROCESS IN INCREASING THE PRODUCTION CAPACITY OF RED BRICKS AT UD ALWIN, HILINA'A VILLAGE GUNUNGSITOLI DISTRICT

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Abstract

This study aims to analyze the production process in increasing the production capacity of red bricks at UD. Alwin, located in Hilinaa Village, Gunungsitoli District. The focus of the study is directed at the production stages starting from clay processing, molding, drying, to firing, as well as improvement efforts made to increase production capacity. The research method used is a qualitative method with data collection techniques through observation, interviews, and documentation. The results of the study indicate that the production process implemented by UD. Alwin is still dominated by the use of manual tools and traditional methods. This has an impact on limited production capacity and high dependence on weather conditions, especially in the drying stage. The main obstacles faced are weather factors, limited labor, and minimal modernization of production equipment. However, the synergy between the owner and employees in identifying problems and formulating solutions is a major strength in maintaining business continuity. Overall, improvements in the production process have been proven to have a positive impact on increasing production capacity, although not optimal. Thus, this study concludes that the increase in red brick capacity at UD. Alwin is greatly influenced by the effectiveness of production process management. The recommendations given are the need for innovation in the use of appropriate technology, improving workforce skills, and more efficient work time management to support business desires and competitiveness.

Keywords: *Production Process, Production Capacity, UD Alwin*

INTRODUCTION

In the business world, increasingly fierce competition demands that every company continuously innovate and improve in various aspects, including production. Companies must be able to meet increasing market demand while maintaining product quality. Failure to meet consumer needs in a timely manner can result in lost business opportunities and a decline in customer trust. Therefore, companies must continuously strive to increase their production capacity to meet the ever-growing market demand. One way to do this is by optimizing existing production processes to make them more effective and efficient. Through a well-planned and structured production process, companies can increase production volume in line with market demand. Good production process management can

also reduce waste and reduce unnecessary production costs. In this way, companies can increase their competitiveness in the market.

Increasing red brick production capacity can also be achieved through a more organized production process flow and the utilization of a skilled workforce. By restructuring the production flow and adjusting work schedules appropriately, production can proceed more quickly and be well-coordinated. Brick makers also need to provide training to their workforce to enable them to operate equipment effectively and efficiently. The use of quality raw materials and proper firing techniques are also crucial factors in increasing red brick production capacity. By regularly evaluating and improving each stage of the production process, brick makers can significantly increase their output.

Several phenomena were found where the red brick production process at UD Alwin, Hilinaa Village, Gunungsitoli District, still faces various obstacles. In daily production activities, it is apparent that the mixing process of raw materials such as clay, sand, and water is not carried out optimally, often resulting in imperfect dough. In addition, the use of brick molding tools is still manual, resulting in long molding times and inefficiencies. Brick drying also still relies on sunlight, so that during the rainy season production capacity decreases drastically because many bricks are not dried on time. Furthermore, the firing process is often uneven due to limited kiln capacity and a lack of proper temperature control, resulting in many products being broken or unsaleable. Another phenomenon observed is the limited number of workers and the lack of organized division of tasks, resulting in production times that take longer than planned.

In terms of production capacity, UD. Alwin is unable to meet all customer demand, especially for large orders, resulting in some customers having to wait quite long. This indicates that the current production process is not yet capable of maximizing production capacity. If this situation persists, it will be difficult to achieve broader market opportunities and customer satisfaction levels may decline.

2. THEORY

Production

According to Sutrisno (2020:21), production is a process of transforming inputs into outputs aimed at producing goods and services to meet human needs. Ismail and Wibowo (2021:51) define production as an activity carried out to create added value in goods or services through the processing of raw materials using human resources, technology, and capital. Rahmawati (2022:41) defines production as an economic process oriented towards creating benefits or uses for a product. Santosa and Lestari (2022:35) state that production is an activity involving the conversion of various economic resources into goods or services using certain effective and efficient methods. Production in the digital era, they argue, is heavily influenced by the integration of information technology and automation systems that can accelerate work processes and minimize human error.

According to Fadilah and Nasution (2021),"The goal of production is not just to produce goods and services, but to sustainably meet market needs, create economic value,

and strengthen a business's position in global competition."They emphasized that in the era of Industry 4.0, production activities must be directed towards providing added value that not only impacts company profits, but also improves community welfare and maintains environmental sustainability.

According to Yulianto (2021:31), production can be classified into several types based on its results orientation and work process. He explained that in the Industry 4.0 era, the separation of production types is not only based on the physical form of the product but also takes into account added value, production scale, and level of automation.According to Andrianto (2021:20), the production process is a series of systematic and sequential steps designed to create a product, from raw materials to finished goods ready for marketing. He believes the production process is ideally divided into five main stages: production planning, material processing, assembly, quality control, and packaging and distribution.

According to Andrianto (2021:20), production process indicators include Production Planning, Procurement and Preparation of Raw Materials, Processing, Component Assembly or Assembling, Quality Control, Product Packaging, Warehousing, and Distribution and Delivery.

Production Capacity

According to Putra and Yuliani (2021:34), production capacity is the maximum number of products that can be produced by a company under optimal conditions by utilizing existing resources efficiently. According to Setiawan (2020:21), production capacity is the highest limit of output that can be produced in a production period, taking into account the capabilities of machines and labor. According to Yusuf and Hamdani (2022:51), production capacity is defined as the maximum volume of output that can be achieved by a company under normal conditions and does not exceed the workload limits of machines or humans. According to Lestari and Wijaya (2021:21), production capacity is defined as the ability of a production system to produce a certain number of products according to demand within a predetermined time period.

According to Ramadhan (2020:59),Production capacity is the maximum potential of a production system to produce goods in a single production cycle. He emphasized that production capacity is not only seen in terms of machinery, but also takes into account factors such as system reliability, maintenance time, and workforce effectiveness.According to Lestari and Wijaya (2021:31), production capacity is divided into maximum capacity, planned capacity, and actual capacity.

According to Lestari and Wijaya (2020:21), there are production capacity indicators which include Maximum Output Amount, Production Time, Machine Utilization Level, Raw Material Availability, Labor Availability, Production Efficiency, Percentage of Damaged Products, and Availability of Additional Capacity.

3. RESEARCH METHOD

This study uses a qualitative research approach. All research findings will be summarized and described in a discourse format. This research provides a comprehensive overview of digitalization strategies and educational quality improvement. Qualitative

research employs several data collection techniques, including observation, interviews, and documentation studies.

The data sources in this study consist of two types: primary and secondary data. Primary data were obtained directly from respondents through interviews, observation, and documentation. Meanwhile, secondary data were obtained from official documents related to education policies, school annual reports, and relevant literature on digitalization in education. According to Miles & Huberman (in Mudjiono, 2021), the data analysis used in this study involved three stages: data reduction, data presentation, and conclusion drawing and verification.

4. RESULTS AND DISCUSSION

Red Brick Production Process Implemented by UD. Alwin, Hilina'a Village, Gunungsitoli District

Based on research that has been conducted, the red brick production process at UD. Alwin, Hilina'a Village, Gunungsitoli District, is still dominated by traditional methods that require precision, skilled labor, and a relatively long time. The process begins with collecting raw materials in the form of clay from a nearby location, then the soil is ground and mixed with sand and water until it becomes a ready-to-mold mixture. The next stage is molding the bricks using manual molds, which are done one by one, so that production speed is highly dependent on the skills and physical endurance of the workers. After being molded, the wet bricks are arranged in an open area to dry in the sun for 3–5 days, then enter the firing stage using a traditional kiln fueled by wood and rice husks. The final stage is sorting and packaging before being distributed to the market.

This process echoes Suryana's (2019) findings, which explain that the majority of brick industries in rural areas still use manual techniques with little technological assistance, thus significantly impacting production capacity depending on external factors such as weather. This dependence on weather is also a major obstacle for UD. Alwin, particularly during the rainy season, when the drying process is hampered and results in delays in product delivery to customers.

The red brick production process at UD. Alwin is still carried out traditionally and is highly dependent on natural conditions, particularly the drying stage, which relies on sunlight. Although seemingly simple, all stages of production, from collecting and cleaning the clay, mixing the ingredients, molding, drying, and firing, require precision, skill, hard work, and intensive supervision. Each stage presents its own challenges that must be managed well to produce high-quality red bricks. Production success is determined not only by the tools and materials, but also by the crucial role of workers in maintaining quality throughout the process.

In addition to weather factors, this study also identified other constraints, namely limited equipment and human resources. Because molding is done manually, daily production capacity only ranges from 5,000 to 10,000 bricks, depending on weather conditions and the number of workers. The relatively small number of workers, with specialized skills gained through work experience, makes production sustainability highly dependent on the presence of these workers. Another significant constraint is the availability of raw materials. During the dry season, clay becomes hard and difficult to process, requiring

additional effort and time. This condition aligns with research by Rahmawati & Rudiansyah (2021), which found that brick craftsmen in rural areas often face similar obstacles, with raw material supply and weather conditions being the main determinants of smooth production. Therefore, several constraints can be identified in production planning, which can arise from various factors, including:

1. Limitations of tools and technology

   The production process is still very manual, especially in mixing raw materials and molding, which causes slow and inefficient production. The tools used are still manual, resulting in slow processes. Drying is also highly dependent on the weather, so production is often hampered during the rainy season. Furthermore, the kiln has limited capacity, resulting in uneven results. The workforce is also still small, and there is no organized division of labor. Therefore, improvements in tool use, workforce management, and production facilities are needed to make the work process more efficient and improve results.
2. Weather dependence

   Brick drying, which relies entirely on sunlight, makes production highly vulnerable to weather conditions. During the rainy season, production capacity drops drastically because the bricks cannot dry in time. Yuliana (2020) also highlighted the significant influence of weather factors, particularly on the brick drying process.During sunny weather, production runs smoothly and daily targets are met. This indicates that weather dependence is a major obstacle to achieving production time efficiency.
3. Combustion Capacity and Efficiency

   UD. Alwin's owner emphasizes the importance of firing to ensure the strength and hardness of the bricks. However, employees admit that the firing process is sometimes uneven, resulting in some products being over- or under-baked.Although the production process at UD. Alwin is still manual, the quality of the red bricks is maintained through the implementation of standard raw material mixes, precision at every stage of production, and strict supervision during drying and firing. Routine visual inspections are conducted to identify defects, ensuring that only strong, suitable, and high-quality bricks are marketed.
4. Labor Constraints and Division of Tasks

   A limited workforce and an unorganized task allocation system resulted in overlapping workloads and longer production times. The limited workforce and unstructured task allocation sometimes made the production process take longer. Nevertheless, cooperation and mutual assistance among workers were key to achieving production targets.

Efforts Made by UD Alwin to Increase Red Brick Production Capacity Through the Production Process

Recognizing the various obstacles faced in the field, UD. Alwin has undertaken a number of efforts to increase production capacity. One strategic step is to arrange production schedules based on weather forecasts, so that the drying stage can be carried out optimally. In addition, the business owner is also trying to find more efficient fuel alternatives for the firing stage, taking into account cost and availability. The plan to purchase a semi-automatic

molding machine is also a priority, expected to speed up the molding process, reduce reliance on manual labor, and produce bricks with more uniform sizes. Another effort being considered is the construction of a simple solar-powered drying house to reduce reliance on natural drying, as well as increasing the number of workers.

Several efforts have begun to be made to increase production capacity based on the results of interviews and observations. The following are several efforts to increase production capacity that have been made:

1. Work Schedule Settings:

   UD Alwin strives to improve production efficiency by organizing more flexible work schedules. One measure is extending working hours during favorable weather, particularly during summer or sunny days. By taking advantage of favorable weather conditions, the brick drying process can proceed more quickly.
2. Furnace Repair

   Minor improvements to the kiln to improve thermal efficiency. These improvements optimize heat distribution within the kiln, resulting in a more even brick firing process and shorter firing times. Improved thermal efficiency also maintains brick quality and reduces the number of defective bricks.This improvement has an impact on increasing the number of marketable bricks, saving working time, and helping to achieve production targets even though the kiln used is still traditional.
3. Quality Control

   Ensuring the proportions of the raw material mixture meet internal standards and conducting visual inspections at every stage to separate out defective products. UD Alwin minimizes damaged or defective products by implementing strict supervision and proper technical arrangements at every stage of production, especially during the drying and firing stages, which are the most crucial processes. Efforts made include ensuring the dough consistency meets standards, carrying out careful printing and transfer, regulating the firing temperature to ensure evenness, and protecting the bricks from the effects of the weather. Good management at these two stages is key to maintaining brick quality and reducing losses due to product defects.
4. Local Workforce Recruitment

   Recruiting local workers to meet needs. This step not only helps address labor shortages but also provides employment opportunities for residents in the surrounding areas. By involving local workers, the production process is smoother because workers are easily accessible and can be drilled directly as needed.Involving local workers benefits UD. Alwin because they are more adaptable, reduce training costs, exhibit a strong sense of responsibility and loyalty, and contribute to the economic well-being of the surrounding community.

These strategies align with the recommendations of Putra et al. (2020), who asserted that the use of appropriate technology, such as semi-automatic printing machines and solar dryers, can increase production capacity by up to 40% without significantly increasing production costs. Furthermore, research by Handayani (2021) also demonstrated that implementing simple innovations, such as the use of dual molds, can accelerate printing times and increase productivity without compromising product quality.

Thus, this confirms that increasing production capacity in the traditional brick industry, including UD. Alwin, requires a combination of equipment modernization, more

structured production process management, and adaptation to external factors such as weather and raw material availability.

CONCLUSION

1. In the red brick production process implemented by UD. Alwin in Hilina'a Village, Gunungsitoli District, it can be said that the red brick production process at UD. Alwin is still carried out traditionally and manually, starting from mixing raw materials such as clay and water, to the molding, drying, and firing stages.
2. UD. Alwin, Hilinaa Village, Gunungsitoli District, has consistently implemented various improvement measures to increase its production capacity. One of the most significant steps is modernizing its production equipment through the use of a brick-making press, which speeds up the brick-making process and produces more precise shapes than manual methods.

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