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ANALYSIS OF THE DESIGN AND PRODUCTION PROCESS OF PRESSED BRICKS AT UD. WEWIN AS AN EFFORT TO IMPROVE PRODUCT QUALITY

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ABSTRACT

UD. Wewin is the only home industry producing pressed bricks in Laowowaga Village, East Lahewa District, North Nias Regency. Despite its promising business potential, this business faces obstacles in maintaining consistent product quality, particularly in terms of strength, appearance, and uniformity of the bricks. These problems are thought to be related to the manual production process, suboptimal mixing of raw materials, and suboptimal work and supervision systems. This study aims to analyze the design and production process of pressed bricks at UD. Wewin, and to identify factors that influence product quality. The method used is a qualitative approach with a descriptive research type. Data collection techniques were carried out through in-depth interviews, direct observation, and documentation. The results of the study indicate that the product design process is still simple and does not follow industrial design standards. In the production stage, challenges faced include limited tools, inconsistent material mixing, and lack of workforce training. Efforts to improve quality are carried out through direct supervision by the business owner and gradual improvements to work procedures. This research provides an in-depth understanding of the dynamics of concrete block production in small-scale industries and recommends improvements in production equipment, design innovation, and partnerships with external parties to increase business competitiveness.

Keywords: Design Process, Pressed Brick Production, Product Quality

ANALISIS DESAIN DAN PROSES PRODUKSI BATA TEKAN DI UD. WEWIN SEBAGAI UPAYA PENINGKATAN KUALITAS PRODUK

ABSTRAK

UD. Wewin adalah satu-satunya industri rumahan yang memproduksi batu bata tekan di Desa Laowowaga, Kecamatan Lahewa Timur, Kabupaten Nias Utara. Meskipun memiliki potensi bisnis yang menjanjikan, usaha ini menghadapi kendala dalam menjaga kualitas produk yang konsisten, terutama terkait kekuatan, penampilan, dan keseragaman batu bata. Masalah-masalah ini diduga terkait dengan proses produksi manual, pencampuran bahan baku yang kurang optimal, serta sistem kerja dan pengawasan yang kurang optimal. Penelitian ini bertujuan untuk menganalisis desain dan proses produksi bata tekan di UD. Wewin, serta mengidentifikasi faktor-faktor yang mempengaruhi kualitas produk. Metode yang digunakan adalah pendekatan kualitatif dengan tipe penelitian deskriptif. Teknik pengumpulan data dilakukan melalui wawancara mendalam, pengamatan langsung, dan dokumentasi. Hasil penelitian menunjukkan bahwa proses

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desain produk masih sederhana dan tidak mengikuti standar desain industri. Pada tahap produksi, tantangan yang dihadapi meliputi keterbatasan alat, pencampuran bahan yang tidak konsisten, dan kurangnya pelatihan tenaga kerja. Upaya peningkatan kualitas dilakukan melalui pengawasan langsung oleh pemilik usaha dan perbaikan bertahap pada prosedur kerja. Penelitian ini memberikan pemahaman mendalam tentang dinamika produksi bata beton di industri skala kecil dan merekomendasikan perbaikan pada peralatan produksi, inovasi desain, serta kemitraan dengan pihak eksternal untuk meningkatkan daya saing usaha.

Kata Kunci: Proses Desain, Produksi Bata Press, Kualitas Produk

INTRODUCTION

The building materials industry is a fundamental sector supporting infrastructure and housing development in Indonesia. The need for quality building materials is increasing in line with population growth and rapid development in various regions. The availability of reliable building materials plays a crucial role in ensuring the sustainability and safety of construction. One of the building materials widely used in Indonesia is pressed brick. Pressed brick is an alternative building material that offers several advantages over conventional red brick, including greater strength, high durability, and cost-effective production. Pressed concrete blocks are a building material that is gaining popularity, especially for small- to medium-scale construction projects. This is due to their easy availability, relatively affordable price, and ease of installation. However, in some areas, particularly rural and suburban areas, the quality of pressed concrete blocks produced by home industries remains a frequent issue. Non-compliance with quality standards, whether in terms of strength, durability, or uniformity of shape, is a recurring issue that directly impacts the construction results of those using them.

One crucial aspect suspected of contributing to these problems is the suboptimal and standardized design and production processes. In small-scale industrial environments, such as home businesses, production is generally carried out manually and relies on the practical experience of workers without the support of clear standard procedures. As a result, variations in product quality are unavoidable. In this context, it is important to examine more deeply how the design and production of pressed concrete blocks are carried out, as well as the factors that influence product quality. UD. Wewin is a home industry engaged in the production of pressed bricks in Laowowaga Village, East Lahewa District, North Nias Regency. Research conducted by researchers revealed that there are still a number of challenges in maintaining the quality and consistency of the bricks produced by the business. Some of the obstacles that arise include uneven mixing of raw materials, variations in the size and shape of the bricks, and weak supervision of the work process. In some cases, the quality of the bricks produced is relatively low and easily brittle due to the use of manual presses, which has implications for declining consumer confidence.

Furthermore, human factors also influence production quality. The mixing process is often carried out carelessly, especially when the business owner is not on site. The absence of operational standards and weak production management also increase the likelihood of product quality discrepancies. This situation highlights the need to further examine the dynamics of the production process, the roles of workers and business management in ensuring quality, and how business actors perceive the importance of quality standards in press-made concrete block

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production. Another study by Mahmuddin et al. (2023) found that implementing quality control procedures in a home industry can reduce production defects by up to 30%. In this study, they observed that systematic design, which includes testing the strength and durability of concrete blocks, has a positive impact on product quality consistency. These two studies confirm that a structured and standardized design and production process is key to improving the quality of pressed concrete blocks, especially in a home industry like UD. Wewin.

Efforts to improve the quality of pressed concrete blocks align with government initiatives encouraging higher building material quality standards. This is expected to ensure construction safety, particularly for public and residential buildings that require durable and strong building materials. By improving product quality, UD. Wewin also has the opportunity to expand its market share and increase its competitiveness in the building materials industry. The purpose of this research isTo understand the design process of pressed brick products, to understand and analyze the challenges faced by UD. Wewin in the production process of pressed bricks, and to understand the efforts to improve the quality of pressed brick products at UD. Wewin.

LITERATURE REVIEW

In the context of industrial design, product design is inseparable from design principles that prioritize user-centered design. According to (Mufidah et al., 2023), this approach ensures that every design decision is based on a deep understanding of the user and their context of use. This is reinforced by research by (Nasrun et al., 2021), which states that applying user-centered design principles in digital product design increases product usage efficiency by 35% and accelerates consumer adaptation to new technologies. Thus, the integration of technical aspects and user needs is a crucial foundation for producing relevant products. In addition to technical and user aspects, aesthetics and symbolic value are also important considerations in the product design process. Products must not only function well but also be visually appealing and provide an emotional experience for users. Research conducted by (Jawa et al., 2020) found that attractive product visual design can increase consumer purchasing interest by up to 40% in the household product category. Therefore, visual design cannot be separated from the product design process but is an integral part that must be designed harmoniously with the product's function.

According to Otto in(Azara, 2020), product design principles must encompass simplicity and production effectiveness, meaning product design must consider ease and efficiency in the production process. A simple design will minimize production complexity and costs, which can increase productivity and reduce costs. In economic activity, production plays a crucial role because it is directly related to the creation of goods and services to meet human needs. According to the Big Indonesian Dictionary (KBBI), production is defined as "the process of producing or producing something; the activity of processing raw materials into finished goods." Therefore, production is not limited to the industrial sector but also encompasses the service sector, which creates utility for consumers. (Widyantara & Hadining, 2022) explain that "production is the creation of goods and services by transforming inputs into outputs through a value-adding process." This means that production is the process of transforming inputs (raw materials, labor, capital) into outputs (goods/services) through a specific work system that produces added value. Production quality is a crucial aspect of the production process, determining customer satisfaction, operational efficiency, and product competitiveness in the market. According to Tjiptono (2021:221) in his book "Operations and Production Management," there are four main indicators used to measure the quality of a product. These indicators are as follows:*Performance*(Product Performance), Conformance (Conformity to

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Specifications), Durability (Durability), Reliability (Reliability).

RESEARCH METHODS

The type of research used in this study is descriptive qualitative. This study aims to describe and analyze in depth how the design and production of pressed bricks are carried out at UD. Wewin, and how these processes contribute to improving the quality of the resulting product. This study does not focus on numbers or statistical data, but rather emphasizes direct observation, interviews, and documentation of the production process, from raw material selection and manufacturing stages to evaluation of the final brick product.

RESULTS AND DISCUSSION

The Design Process for Pressed Concrete Blocks at UD. Wewin

The design process for pressed concrete blocks at UD. Wewin is empirical and practical, starting from the business owner's personal needs and evolving into local market opportunities. The design process does not adhere to formal technical procedures but is exploratory and iterative, without blueprints, standard operating procedures, or technical specifications. The dimensions and quality of the concrete blocks are adjusted based on customer comfort and work experience, so that, while informal, they still reflect user-oriented design principles. Employee involvement in providing input demonstrates internal collaboration, but product quality still varies due to manual mixing without standardized measurements. This has led to consumer complaints about inconsistent sizes and quality, highlighting weak quality control and the absence of standardization. The production process is also inefficient due to the lack of aggregate planning and supply chain management, contrary to findings from other studies on similar MSMEs. While informal approaches demonstrate experience-based innovation, without systematic documentation and evaluation, product quality is difficult to maintain. Supporting factors include local labor and the owner's experience, while barriers include a lack of technical understanding, manual tools, and the absence of written procedures. The results of this study emphasize the need for implementing quality management (Juran, Goetsch & Davis) through raw material monitoring, workforce training, and continuous evaluation. Quality improvement not only reduces defects but also builds consumer trust and brand image in the local market (Kotler). Human resources are key through training and a disciplined work culture (Schuler).

Challenges Faced by UD. Wewin in the Pressed Brick Production Process

The main challenge in press-made brick production at UD. Wewin lies in the inconsistent quality of local raw materials, particularly sand and water, which often results in unstable mixes and easily broken bricks. Furthermore, the use of worn-out manual presses leads to uneven dimensions and demonstrates weak production risk management. External factors such as weather also significantly influence the drying process, as it still relies on sunlight without any supporting systems. Regarding labor, the lack of standard operating procedures (SOPs) and poor work discipline lead to uncontrolled mixing of ingredients. This results in quality instability, which triggers consumer complaints. Limited capital hinders innovation, equipment improvement, and production planning. Other issues include unorganized distribution, informal business record-keeping, and a lack of technical training for employees. These factors indicate weak quality control, internal management, and human resource capacity. This study concludes that production challenges at UD. Wewin are multidimensional, encompassing both internal (materials, tools, labor, capital) and external (weather, logistics, market) aspects. Consequently,

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systemic improvements are needed through simple standard operating procedures (SOPs), regular training, and external support in the form of technology, capital, and mentoring. With appropriate intervention, UD. Wewin has the potential to develop into a more reliable and competitive small industry.

Efforts to Improve the Quality of Pressed Concrete Block Products at UD. Wewin

UD. Wewin faces various challenges in press-clay brick production but has taken simple adaptive measures. The business owner implements manual material measurement using buckets, while employees rely on experience and informal learning. Despite awareness of the importance of quality, the lack of standard operating procedures (SOPs) and standardized measuring tools leads to inconsistent results. During the molding stage, workers strive to maintain the density of the mold, but quality is highly dependent on human labor because the press is still manual. The drying of the bricks is also entirely dependent on the weather, increasing the risk of damage. For quality control, the owner performs visual sorting, but this system is reactive and does not guarantee consistent quality. From a human resources perspective, formal training has never been conducted, so competency development still relies on learning by doing. Nevertheless, social capital among workers is quite strong through open communication. Other opportunities are evident in consumer suggestions for product branding, as well as simple recording of production quantities and experiments with the addition of fine gravel as early innovations. Overall, quality improvement efforts at UD. Wewin have been initiated through raw material control, worker awareness, and owner initiatives. However, major weaknesses remain the lack of a documented system, limited technology, and minimal training. Consequently, the implementation of simple standard operating procedures (SOPs), increased human resource capacity, and external support are necessary to enable the business to grow more professionally and be more competitive in the local market.

CONCLUSION

Research shows that the press-clay brick production process at UD. Wewin remains rudimentary and informal, with quality control performed manually and relying on the experience of the owner and workers. Despite awareness of the importance of quality, limited raw materials, manual production tools, dependence on weather, and the lack of standard operating procedures (SOPs) and formal training often lead to inconsistent product quality. On the other hand, there are strengths in the form of owner commitment, social capital among employees, and improvement initiatives such as simple record-keeping, experimenting with mixed innovations, and attention to customer needs. However, major weaknesses lie in minimal documentation, technological limitations, and a lack of managerial support. Therefore, improving the quality and competitiveness of UD. Wewin requires a gradual approach through the implementation of simple standard operating procedures (SOPs), human resource training, improvements to production equipment, and external support from supporting institutions. This approach is expected to help UD. Wewin transform into a more professional, adaptable, and competitive small industry in the local market.

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