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Utilization of machining technology in the production process of Jepara wood carving furniture

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Abstract. The wood carving furniture design that develops in Jepara, always tries to keep up with the universal global market demand. The production process of Jepara wood carving requires accuracy and speed without leaving good artistic value and beauty. Therefore, production machine technology is needed to be able to realize the results of research into the development of wood carving furniture design in accordance with global market expectations. This study aims to obtain an overview of production technology that can be implemented in the Jepara wood carving furniture production process, so as to produce a high quality product, an effective and efficient production process in accordance with consumer needs. The results of this study will be one of the references in the development of production facilities for making Jepara wood carving furniture. Keywords: furniture, Jepara wood carving, machining technology.

1. Introduction

The furniture industry in Jepara has existed since hundreds of years ago, starting from the work process manually, handmade, in the form of handicraft arts, and now it has reached the use of production machinery technology. The design developed was obtained from the orders of local and foreign buyers, so that the selling value of the product as a producer has not yet comprehensively calculated costs, still focused on costs for the production process, less attention to various other costs that are actually needed [1-4].

The craftsmen and business owners often duplicate, reproduce or mimic the designs carried by these buyers. Among Jepara furniture business owners, the ability to integrate consumer demands with product design development capabilities has yet to be fully realized. One contributing factor is the furniture production process, only a few are using modern production machinery. On the other hand, the production process has not yet fully begun with the development of designs that are able to meet the needs of the global market. In this case, efforts are needed to transform conventional processes into more modern processes, without leaving the uniqueness of Jepara wood carving products. This research aims to develop and create wood carved furniture designs that are suitable to the global market, using the value of competitiveness in the form of local wisdom values in Indonesia. The production process developed in this study uses modern machining technology so that it can keep up with competitors in foreign countries [5-6].

2. Method

The development and creation of wooden carved furniture designs in Jepara refer to the following models:



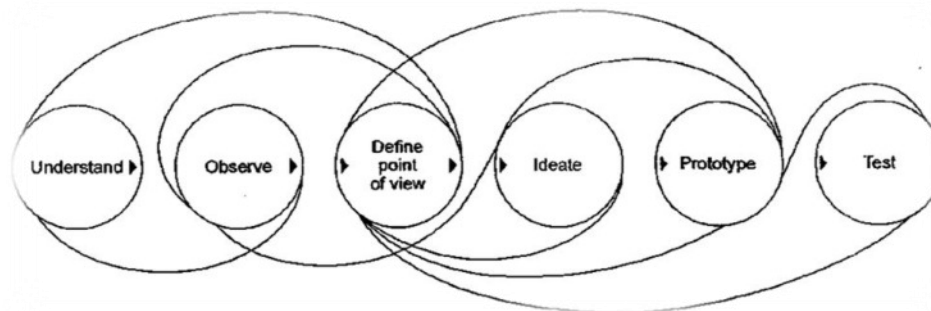


Figure 1. Flowchart of design process [7]

The design model starts from understanding the problem of design research, field observation, determining the theoretical point of view, the idea of creating designs, making prototypes and market trials. Based on this model, it can be processed and developed as a process of developing and creating wooden carved furniture designs in Jepara. The results of the production process of wood carving furniture in Jepara as the main outcome were tested at the exhibition and Forum Group Discussion that will accommodate the responses, input, criticism and perceptions of respondents as an evaluation process for the development of wood carving furniture design in Jepara [8-10].

3. Result and Discussion

The results of field studies show that the production process of wood carved furniture still has a tendency to use manual methods and conventional machines. Therefore, to realize the design into a finished product often experiences obstacles, especially special forms and mass production. As a result, producers have not fully been able to meet consumer demand both in terms of design and in terms of the number of products. This is certainly not profitable for producers and consumers to be less satisfied [8-10].

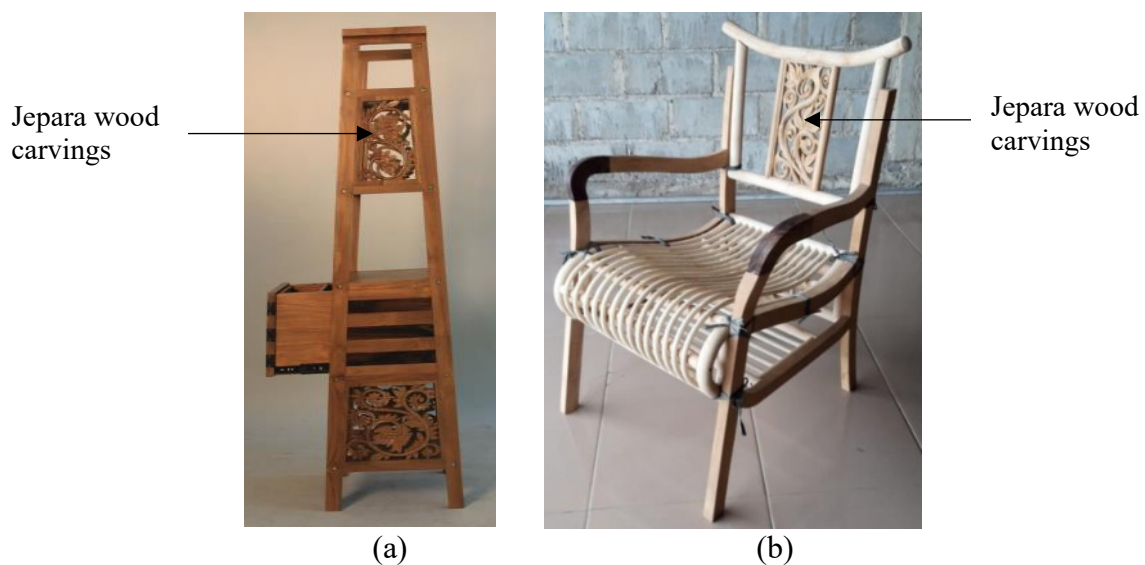
One effort to improve competitiveness can be done through the development of furniture designs in accordance with the culture and traditions that grow in the community. Design development and creation is very necessary to win market competition. Various countries in the world have placed design as a market advantage in order to be able to compete. The design can be realized when the production process by using machine technology in accordance with the expected shape configuration.

In the context of the development and creation of furniture designs, it was revealed that furniture design refers to aesthetic ideas, design principles, theories, materials, fabrication technology, business economics, environmental problems, and the surrounding spatial context. Considerations in designing furniture include aspects of aesthetics, historical context, design principles, functions and social uses, design processes, from sketches to prototype studies, material characteristics, fabrication processes, to professional practices related to economics, law, and business decisions. In this context, design can be achieved when technology is able to support it to turn it into a finished product [11-13].

Therefore, we need a variety of production machines that can be used by producers and craftsmen in producing the results of the development of wood carving furniture designs in Jepara. The development of machining facilities, especially those related to the knock down

construction process, is needed, including multi boring machines and CNC router machines. Furniture product design configurations require at least 2 main machines, so that quality and precision furniture products can be produced.

The goal in designing furniture is to consider all aspects of design in a comprehensive and integrated manner, while maintaining focus and critical involvement in the main concepts and ideas that inspire the design. The essence is that development through the creation of furniture design is not only aesthetic value, but can also be in contact with local wisdom, such as Javanese style furniture design that is very complex and discussed in a multidisciplinary manner, technology as a supporter of the production process [9-10, 14-15].



- a. Multifunction cabinet using knock down construction with wood carving
- b. Restaurant chairs with backrest using wood carving and knockdown construction systems combined with rattan material

Figure 2. Traditional Jepara wood carving products [8-10]

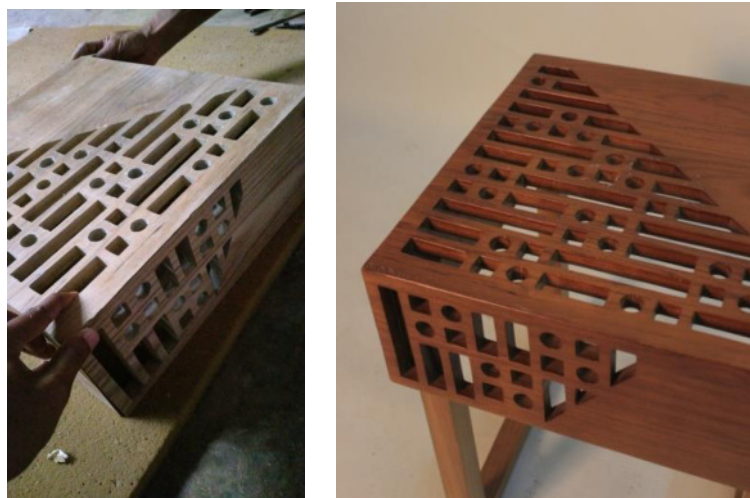


Figure 3. Examples of products made with a CNC Router for chairs and tables use knockdown construction [8-10]

From the example of furniture products above, it appears that products made using traditional methods (manual), will produce good products, but cannot be produced in large quantities in a fast time (Figure 2). Products made using CNC routers produce more precise products, faster production processes and more products that are produced in a shorter time (Figure 3). The forms produced are also more varied, can follow the design development and follow the needs of consumers [8-10].

4. Conclusion

Based on the results of the research that has been done, it can be concluded that in order to realize the results of research into the development of wood carving furniture design in Jepara, production technology to achieve optimal configuration and construction requires a production machine that is in line with the needs of the global market. The use of modern production machines can increase production capacity and be able to produce products that have complex designs and can meet the needs of the global market. Therefore, synergy between all stakeholders is needed including business owners, craftsmen, universities and the government to realize Jepara wood carving products that are of higher quality and able to meet the demands of international consumers, while still having a uniqueness and local wisdom.

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