



Tarumanagara International Conference on the Applications of Technology and Engineering 2019

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Paper Title: Development of wood carving furniture technology in Jepara

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We look forward to receiving your papers and to welcoming you to the TICATE 2019, Universitas Tarumanagara, Jakarta, Indonesia .

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Preface

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2nd Tarumanagara International Conference on the Applications of Technology and Engineering 2019

Preface

On behalf of the organizing committee of 2nd Tarumanagara International Conference on the Applications of Technology and Engineering (TICATE) 2019, I would like to welcome all delegates to Jakarta, Indonesia with great pleasure. Being held from November 21 to 22, 2019 at Campus I- Jl. Letjen. S. Parman No. 1, Jakarta, the international conference is organized by Universitas Tarumanagara (UNTAR) and technically sponsored by IOP Publisher.

TICATE 2019 has attracted many academicians, scientists, engineers, postgraduates and other professionals from many countries. This conference accepted 215 papers from 7 different countries, those are Australia, Taiwan, India, Malaysia, Japan, Peru and Indonesia. The aim of the conference is to promote exchange of ideas among engineers, researchers, and scientists active in the related areas of technology and engineering.

Our special thank goes to our Rector, Prof. Dr. Agustinus Purna Irawan, who has initiate this international conference, to our Plenary Speakers, Dr.-Ing. Joewono Prasetijo from Universiti Tun Hussein Onn, Malaysia, Prof. Dr. Tjokorda Gde Tirta Nindhia from Udayana University, Indonesia, Prof. Dr. Srikantappa A.S. from Cauvery Institute of Technology, India, and Prof. Dr. Mohd. Zulkifli Abdullah from Universiti Sains Malaysia, Malaysia, and Prof. Yasuyuku Nemoto, Ph.D. from Ashikaga University, Japan.

Our special thank also goes to Tarzan Photo and PT. Astaguna Wisesa as our patrons. Also to all individuals and organizations such as the members of international editorial board, the conference organizers, the reviewers and the authors, for their contribution in making TICATE 2019 as a successful international conference and a memorable gathering event. I am also grateful for the support of publication service of IOP Publisher. We hope that the conference could present you wonderful memories to bring home in addition to new insights and friendship congregated during the event.

We truly value your participation and support for the conference. We hope that you will enjoy TICATE 2019 and culture and tradition in Jakarta.

Dr. Hugeng, S.T., M.T. (SMIEEE)



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Development of wood carving furniture technology in Jepara

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Abstract. The majority of wood carving technology in Jepara is still conventional. The production process is done traditionally and manually (handmade), especially in wood carving that is applied to furniture. The impact is the production process becomes slow and the quality of the product cannot be achieved optimally. Optimization of production is needed to match the demands of the export market. Therefore, production technology is needed to meet the wants and needs of the export market. In this context, wood carving furniture that is designed for the export market should be realized with mass-processed machine technology solutions. The current development in Jepara that is happening is the production process in a modern way, but the product does not use carvings or decoration. Though wood carving can be made using a CNC router. Thus in the era of globalization, the development and design of wood carving furniture production technology in Jepara should properly use processes based on modern technology, machinery, skills, and mind-set changes as industrial products, including the development of human resources. In this case: training, coaching and mentoring should be done continuously, both by the government, universities and associations. This qualitative research uses a multidisciplinary approach, namely: technology, marketing, and design. **Keywords:** technology, design, export, furniture, and engraving.

1. Introduction

Furniture designs that have developed in Jepara have a tendency to follow the universal tastes of the global market. Jepara carved furniture designs are influenced by Western and Chinese culture. In this case, the designs that develop mostly only follow the wishes of their consumers, so the development of designs in Jepara tends to be static. Until now, the design has not changed much in terms of model and appearance. The local cultural elements of the archipelago, especially Java, have not yet been utilized as a value for the competitiveness of export markets. This study aims to formulate the characteristics of wood carved furniture design based on local wisdom in the form of ornaments as an added value device for the export market. The results of research and design creation will be realized in the form of prototypes as a model that will be developed further. The product produced will be a case study in international exhibition activities to assess consumer responses to designs that have been developed [1-4].

2. Method

The research objective is to test the design of wood carving furniture in Jepara that suits the demands of the export market, especially to China. A multidisciplinary approach using a qualitative research model is a tool for assessing, developing, and creating wooden carved furniture designs in Jepara. The methods used in this research are: field research, conducting a



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survey of Jepara carving furniture manufacturers, carrying out focus group discussions with all stakeholders involved in the management and development of Jepara carving furniture, developing Jepara carving furniture designs, making product prototypes and analyzing to produce further research recommendations. Products are designed and engineered for the purpose of export markets to several countries in Asia, especially China, Japan and Korea, based on an analysis of furniture design characteristics. Manual wood carving is a strength of traditional Jepara competitiveness with a combination of machine processes using CNC router as a modern production process technology. The knockdown system is a demand of export product requirements, to be more concise and efficient in packaging, shipping and storage [2], [4-7].

3. Result and discussion

In the context of the development and creation of furniture designs, it was revealed that furniture design refers to beauty ideas, design principles, theories, materials, fabrication technology, business economics, environmental issues, 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. The goal in designing furniture is to consider all aspects of design in a comprehensive and integrated manner, while maintaining a critical focus and involvement on the main concepts and ideas that inspire the design. The essence is that development through the creation of furniture designs is not only aesthetic value, but can also be in contact with local cultural arts such as Javanese-style furniture design [1-2], [8-12].



Figure 1. Traditional carvings from Jepara

Values of competitiveness can also be processed based on history even in modern contexts. In the context of modern furniture design, design selection can deviate from historical chronology and can present the most contemporary furniture, and classic style furniture is also included in relation to its historical context. So not only the history of modern furniture design, but the creation can also be done with a classical furniture design history approach or the cultural history of the archipelago or the history of cultural arts in Java, in the form of ornaments can come in contact with wood carved furniture designs in Jepara. In addition, furniture designs in Jepara are also influenced by Chinese design styles, such as the Ming and Qing styles [2], [9], [11-15].

The combination of form, function, and ornamentation becomes the strength of furniture style with new aesthetics. The essence is that ornaments can be applied in contemporary furniture designs, without worrying about the application of ornaments referred to as criminals in design (ornament and crime). Six construction systems in universal furniture have also been found, namely (1) easy to disassemble to get knocked-down systems models; (2). easy to stacked get model stacking systems; (3). easy to carry get a model of transportable systems; (4). easy to stored get storage systems; (5). ready to be installed get ready to assembled systems; (6). ready to wear get a ready to use system model [9], [11], [13-15].

Product prototype. Product name: Java Multidrawer; type: MD-19002; ornamental variety: symmetrical flora (stylized traditional Javanese style); function: multifunction drawer, push-table and push-up rack; material: a combination of teak wood and rosewood; construction: knockdown system (joint connecting bold); finishing: natural; size: 70 cm x 35 cm x 150 cm; IPR Industrial Design: A00201903722.



Figure 2. Concept design of Java multidrawer



Figure 3. Manufacturing proses of Java multidrawer

Based on this analysis, the resulting formula for the development of wood carved furniture design is as follows: production-oriented design includes: wood-based design (local wisdom), collaboration of manual and mass production processes, utilization of wood waste made of laminating boards, natural raw materials (wood and combinations rattan), natural and environment friendly. Marketing-oriented design includes: global market-based design, minimalist modern style, practical and economical products. The design formula of wood carving furniture in Jepara includes: simple form, ornamental variety as a characteristic of carving in Jepara, knock down, stacking or modular construction system, multifunctional use, natural color, natural material (wood and rattan combination). The implementation of the design development of furniture designs that are designed and made into production prototypes include: multirack 1, multirack 2, multirack 3 and multidrawer.

Based on research in the field, it was identified that the furniture industry in Jepara is as follows: (1) the design development program is barely done, (2) the design tends to only accept from buyers, (3) the furniture design center in Jepara is not active, (4) research and development has not been done much, (5) designers are underappreciated, (6) the results of wood carving relief art are still very good and smooth, (7) the potential for wood carving is still relatively large, (8) mass production machines are still rarely used in the furniture industry. Jepara has the potential to produce classic furniture with ornaments as a value of its competitiveness. Design development and creation is very necessary when market competition gets tougher and designs are tailored to the wants and needs of consumers and the potential of the local culture of the maker [8-10], [13-15].

4. Conclusion

Based on the results of research and development of Jepara carving furniture design, obtained several things related to the development of Jepara carving furniture products include: the design development program is barely done, the design tends to only accept from buyers, the results of wood carving relief art are still very good and smooth, and wood carving potential is still relatively large. Jepara has the potential to produce classic furniture with ornaments as a value of its competitiveness. Design development and creation is very necessary to win global competition. Design tailored to the wants and needs of consumers and the potential of the local culture of the maker. This research has also produced a prototype of Jepara carving furniture products that are adapted to the needs of the export market. The prototype of the product design that has been developed becomes one of the references for further research.

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