Design of Furniture Production Monitoring Information System

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Abstract. To maintain good quality furniture, companies need to monitor the production process. The purpose of this research is to design a website-based information system that can assist companies in monitoring the furniture production process following procedures and standards. The system development method used in this research was the prototype method and the system approach method used object-oriented. The results of this research are that companies can see the design of a monitoring system in the form of a prototype that has been adjusted to the user wants. Also, the design of this monitoring information system helps the company to find out the best quality raw material data, estimated production process completion following the specified schedule, and checks at each stage of the production process following company procedures and standards. So that the production of furniture produced by the company has high quality and following the needs of the domestic and foreign markets.

1. Introduction

The furniture and woodcraft industry in Indonesia has great potential to meet the needs of the domestic and foreign markets [1]. Indonesian furniture products are in great demand by the domestic and foreign markets because they have good quality and attractive designs [2,3]. To make furniture with good quality, companies must pay attention to the production process in making furniture [4,5]. The production process in furniture manufacturing consists of several stages, namely logs, sawing, wood drying, basic containment, construction, sanding, assembly and finishing [6-8]. The stages of the production process can be seen in Figure 1, where each stage must be carried out sequentially in accordance with furniture manufacturing standards at the company.
The company's production process is currently in accordance with procedures and standards, only for the estimated time of completion of production is still relatively slow [9]. Estimated completion of each stage of the production process is sometimes slow and sometimes too fast in the process [10]. Delay in the completion of furniture production will affect subsequent furniture production and have an impact on the late delivery of furniture. In the production process, there is a very important part, namely the quality control section. The quality control section is divided into two namely production quality control (PQC) and final quality control (FQC). Production quality control is tasked with checking the procedures and stages of the production process that have been carried out by the production department. While the final quality control has the duty to check the final results or finishing of furniture before shipping to the customer. So that each phase of production is not missed and the estimated production completion schedule is on time, we need a system that can help the monitoring process by adding a schedule for each stage of furniture production.

In research on e-commerce furniture, it is explained that the production process can affect shipping. The study focused on ordering, purchasing, payment and shipping of furniture products [11]. Whereas in the second study it was more towards ordering custom website-based furniture made by customers so that the products produced were by the wishes of the customers [12]. However, the two studies did not discuss monitoring furniture production. Both studies are more focused on furniture sales. Therefore, this research will discuss the design of information systems that are more focused on monitoring furniture production by adding estimates of completion of furniture production schedules. So that the production department and the quality control department can monitor the production process by procedures and determine the quality of furniture that is ready to be marketed.

2. Methods
The system approach method used in this study was the object-oriented analysis design (OOAD) method and system design aids using UML [13]. This method was done by finding problems based on the object being studied, besides this method was very effective for developing complex systems. While the system development method in this study used the prototype method. The method used in this research was to use the prototype method. Prototype method is a process of making software that allows repetition and improvement until the software meets user needs [14]. The prototype development method has several stages, namely collection of user needs, building prototypes, evaluating the prototype, encoding the system, testing the system, evaluating the system and using the system. In this research, because the focus is on the design of the information system, the three initial stages of the prototype method will be carried out, namely the collection of user needs, prototype building, and prototype evaluation.
The first stage in this method was collecting data through a process of observation, interview and literature study. This stage can produce data that will be used in making the system following the wants and needs of consumers. The second stage after getting the data needs of users in analyzing and translating needs and data into a form that is easily understood by users. Data that has been analyzed and translated is then designed into prototype form and presented to users. The prototype design that has been made is then evaluated and tested by the user, if it is appropriate then the process will continue, but if it is not appropriate then the prototype process will be corrected and repeated from stages 1, 2 and 3 until the user's needs are met [15]. Figure 2 shows the stages of the prototype method used in this research.

![Diagram of Prototype Method](image)

**Figure 2. Prototype Method**

### 3. Results and Discussion

#### 3.1. Collection of users needs.
At this stage, the first stage carried out is the process of interviews and observations to users. The results of interviews and observations to the company are data and processes that are by procedures and standards that are often carried out in producing furniture.
3.2. Building of Prototype
System analysis carried out in this study is in the process of logging, sawing, wood drying, basic containment, construction, sanding, assembly and finishing. There are four actors involved in designing this system, including the raw material section, the production section, the quality control section and the owner. The analysis of this system is illustrated in the use case diagram shown in Figure 3.

![Use Case Diagram](image)

**Figure 3. Use Case Diagram**

3.3. User Interface Design
After making the system design, the next step is the implementation of the interface of the design of the furniture production monitoring information system. This interface design plays a very important role in making web design, the interface is built to adjust to user needs [16]. Figure 4 is an interface implementation for the user login process [17,18].

![User Login](image)

**Figure 4. User Login**
Figure 5 shows the main page for the production section, quality control section, and owner. On this page, a production schedule is displayed which can be viewed by furniture category. Also, on the production schedule it can be seen data on furniture production workmanship at any stage.

Figure 5. Dashboard

Monitoring in the production process is carried out by the stages of making furniture that have been determined by the company. Figure 6 below shows the production process page that shows the progress of furniture making to what stage and the processing time at each stage of production.

Figure 6. Production Monitoring
4. Conclusion

The design of the furniture production monitoring information system helps the production department in monitoring every furniture production process, the estimated time of completion of the furniture production process becomes more timely and on schedule. Besides, the design of this information system helps the quality control department in choosing the best quality raw materials to be used in the production process and checks the final furniture production (final quality control) by the standards set by the company. With this furniture production monitoring information system, the company can produce high-quality furniture that is suited to the needs of the domestic and foreign markets.

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