
Web-Based Measuring Instrument Calibration Scheduling Information System

(Case Study of One of the Textile Companies in Bandung City)

Fika Amalia¹, Asep Ririh Riswaya²

STMIK Mardira Indonesia^{1,2}

Email: ffikamalia@gmail.com¹, asepririh@stmik-mi.ac.id²

ABSTRACT

The production method has prioritized guaranteeing excellent manufacturing quality in response to the increasing competitiveness in the clothing industry. Utilizing a fabric roll meter measuring instrument dramatically enhances the overall quality of the product by guaranteeing precise measurements. Roll meter fabric measuring equipment in the garment industry evaluates product accuracy based on customer specifications, ensuring exceptional quality. Effective regulation is essential for the management and upkeep of cloth roll meter measuring instruments. Therefore, it is necessary to develop a system that can evaluate the level of urgency for calibrating various equipment and identify those that need recalibration despite having already been calibrated. This project created a web-based system for scheduling the calibration of fabric roll meters. The system was designed using the PHP programming language and MySQL for database management. Use cases delineate how the user interacts with the system, whereas an activity diagram represents the sequence of user activities. Furthermore, a sequence diagram illustrates the user's participation in chronological order. The information system implements maintenance schedules, oversees the calibration of fabric roll meter measuring instruments, stores calibration certificates, and effectively handles calibration data to guarantee precision and efficiency.

Keywords: PHP, MySQL, Measuring Instrument, Calibration Schedule, Website

INTRODUCTION

Scheduling determines the sequence or timing of activities or tasks inside a system or process. Resource allocation is distributing resources, such as time, labor, machinery, or materials, to optimize efficiency, achieve optimum performance, and fulfill particular limitations or requirements. Scheduling is utilized in diverse domains such as manufacturing, transportation, construction projects, operational systems, equipment maintenance, and other areas. (Weemaes, Martens, Cuypers, Van Elslande, Hoet, Welkenhuysen, Goveia, 2020; Taghvaeian, Andales, Allen, Kisekka, O'Shaughnessy, Porter & Aguilar, 2020)

Efficient scheduling is vital in a company with significant routine operations to ensure the flawless execution of planned tasks. The process is demanding and requires precision to avoid any omissions or overlapping tasks. (Cross, Yedulla, Ziedas, Elhage, Guo, Hessburg & Makhni, 2022)

A *fabric roll meter* is a precision instrument utilized for measuring the length of completed garments. Utilizing this technology allows for the precise assessment of garments to ensure adherence to the requirements established by the buyer. Hence, it is crucial to exercise control and upkeep over the fabric roll meter by using a calibration procedure in order to validate the precision of this significant measuring device. (Storch, Honold, Alonso, Pato, Mücke, Basili & Fischer, 2020; Roy, Misra, Raghuwanshi & Das, 2020)

Fabric roll meter measuring equipment that has been calibrated obtains a calibration certificate, which serves as confirmation that it meets the required quality standards. An efficiently structured calibration certificate simplifies retrieving the document when required by the purchaser. (Fung, Chan, Lee, Yau, Chung & Ross, 2020; Townsend, Kobak, Kearney, Milham, Andreotti, Escalera & Kaufman, 2020)

Currently, a textile firm in Bandung needs an efficient information system to manage the quality control of fabric roll meter measurement equipment. The management of the calibration schedule is conducted using Microsoft Excel, resulting in issues such as duplicate coding, inefficient recalibration filtering, and challenges locating certificate papers among archived files. (Haryani & Saputra, 2021; Souvignier, Förster, Hebbecke & Schütze, 2021; Abbas, Schultebrucks & Galatzer-Levy, 2021)

Calibration guarantees the precision and dependability of measuring devices by comparing them to a recognized standard and rectifying any inaccuracies. Processed data, which is information that has been analyzed and organized, is valuable and readily comprehensible. A *system* is a cohesive entity composed of interconnected components that work together to form a coherent entity.

An IT-based scheduling information system is essential for efficient data administration, encompassing tasks such as inputting and calibrating fabric roll meter data, eliminating outdated information, organizing testing schedules, and preserving calibration certificate documents to ensure the accuracy of corporate data. This system, which is driven by information technology, tackles the problem of data accuracy. (Ko, Jo, Chang, Lee, Moon, Youm & Ro, 2022; Boggs, Ritzwoller, Beck, Dimidjian & Segal, 2022)

In the age of information technology, this method is invaluable, very effective, and exceptionally efficient in managing and keeping fabric roll meter measuring instruments. The OOAD method is utilized to develop a web-based information system using HTML and CSS to address the abovementioned issues in the research titled "Scheduling Information System For Fabric Roll Measurement Measuring Equipment: A Case Study At A Textile Company In The City Of Bandung."

METHOD

The research methodology involves designing a system using PHP as the primary programming language and MySQL for database processing. This system architecture incorporates functionalities such as the scheduling of calibration, the archiving of calibration certificates, and the management of calibration data. The implementation steps will encompass the development, testing, and maintenance procedures to guarantee that the system operates effectively and fulfills the specified requirements.

The primary objective of user interaction in data collecting is to get up-to-date information about the maintenance and calibration control scheduling for the roll meter fabric

measurement equipment. The calibration data obtained from the measurement tool will be used to verify the accuracy of the results produced by the designed system.

Data analysis will entail the development of use cases, activity diagrams, and sequence diagrams. Use cases illustrate the interaction between users and the system, whereas activity diagrams represent the sequence of user activities within the system. Sequence diagrams offer a comprehensive depiction of interactions, organized by chronological order, to enhance comprehension of user-system interactions.

RESULTS AND DISCUSSION

System Analysis and Design

1. Business Process Analysis

The business procedures of a Textile Company in Bandung City begin with the Laboratory Department providing the calibration list schedule via email.



Figure 1. Business Process Flow

2. Proposed New System

a. Usecase Diagrams

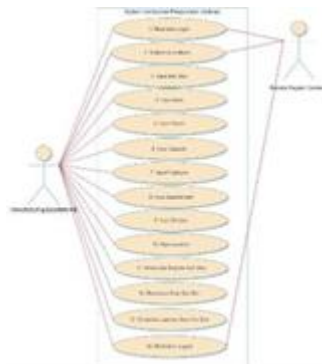


Figure 2. Usecase Diagram

b. Scenario Table

Use Case No 3	
Nama Use Case	Melihat list kalibrasi
Deskripsi	Untuk ME & Kabag melihat list kalibrasi
Aktor	ME & Kabag
Pre-Condition	Berhasil melakukan login
Post-Condition	Melihat list kalibrasi di halaman utama
Basic Flow	
Aktor	System
1. Berhasil melakukan login	2. Menampilkan halaman list kalibrasi

Figure 3. Scenario Table

c. Activity Diagrams

program logic derived from the analysis and design results into an algorithm coded in a programming language to test the system.

1. Login Page Display



Figure 7. Login page

2. Dashboard/Main Page Display

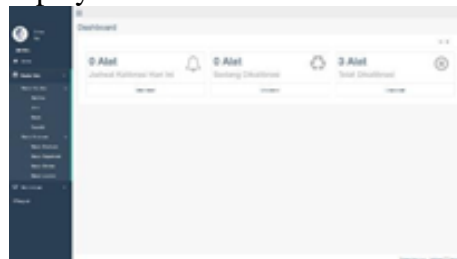


Figure 8. Dashboard/Main Page

3. Display of Measuring Instrument Data Reports



Figure 9. Measuring Instrument Data Report

CONCLUSION AND RECOMMENDATION

The author's trial results in constructing a web-based fabric roll meter calibration scheduling information system, concluding that the system can detect instances of code duplication when issuing new codes. In addition, the system can select and provide any fabric roll meter measuring instruments scheduled for recalibration within a specific month. This feature improves the management of calibration schedules, maintenance procedures for fabric roll meter measuring devices, and the streamlined retrieval of calibration certificate documentation for a textile firm in Bandung City.

In order to attain superior and ideal outcomes, the author suggests implementing additions and upgrades to the website. One of the author's recommendations for enhancing the website is to broaden the information system to encompass fabric roll meter measuring instruments and all other types of measuring instruments calibrated in the Garment Department. The objective is to successfully install and host the system online, assuring its appropriate utilization.

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