



WEB-BASED MONITORING SYSTEM ON THE PRODUCTION PROCESS OF YOGYAKARTA BATIK INDUSTRY

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ABSTRACT

This paper presents a web-based monitoring system on the production process of Yogyakarta Batik industry. The quality determining steps of batik design are obtaining the design idea, the concrete pattern or patterns drawing on a paper, and the transfer to a blank cloth. The results are then fed to a computer in the forms of text and image for further inspection by the experts and the batik products inspection. The challenging part is the design of the needed information system which covers the software architecture, algorithm data structures, and the representing interface. The results showed that the web-based monitoring system design in this study has been implemented successfully. An online access to the information systems can be useful for accessing the status of the design division procedure. The result shows that response of the user for the information systems are Reliability: excellent 92%, Usability: excellent 94%, and Maintainability: excellent 91%.

Keywords: *Information System, Design Division, Web-Based, Yogyakarta Batik, Image.*

1. INTRODUCTION

One important part of the Yogyakarta batik industry, particularly in the production process, is the design division. The division does some activities from the beginning design, then through several processes according to the procedure, until the resulting design is ready to be applied to the cloth. For large batik industry, design is the main characteristic of which is able to attract customers in both domestic and from abroad.

In today's era of Information and Communication Technology (ICT) has become a necessity for most industries, including the monitoring of the production process. The ICT system is a combination of information technology and human activities that use information technology to support management and decision-making [1]–[3]. Information and communication technology has become a very important requirement in many fields, especially for the purposes of analysis and decision-making to a problem, because it is the ease in obtaining information becomes the main thing that continues to be developed.

Recent technological developments have been able to minimize the time and costs in the development of information systems, and help system designers and planners to manage the data, which can lead to conclusions and right decisions [4]–[10]. Many industrial fields utilizing web technology, especially in information systems related purposes. Many industries both small industry, medium, large industry are taking advantage of the Internet media in the purposes of promotion, sales, communication with business relations, production monitoring, and others [11]. In terms of the development of a database of information systems, applications of web-based technology has been widely carried by major industry, especially industry, due to its complexity from the process of production, database management, to marketing processes [12].

Application of web technology for information systems used in medium and small industries is very important, because with the right information systems can help improve productivity, both quality and quantity. Likewise, it is the local culture-based industries leading in Yogyakarta province, the batik industry.

Batik is one of the original indigenous industries which have existed since the first on Indonesian soil, which is rich in style and typical batik patterns [13]–[14], and had preserved its existence. Therefore it is obligatory for all parts of Indonesia, including from the college to maintain and preserve batik industry which is the ancestral heritage of Indonesia and is an excellent product that has the potential of high competitiveness in the world. This is supported by the fact that the UNESCO has recognized that batik is the capital of the Indonesian nation.

2. FUNDAMENTAL

Study of previous information system, as was done in [15], is non-adaptive system. In [16], the relationship between inter-organizational information systems (IOIS) with its environment and the relationship between industry and country is investigated. This research is expected by the relationship between industry characteristics and country characteristics or the environment will have a significant influence on the development of information systems IOIS. Similarly, if applied to the batik industry in Yogyakarta, industrial relations course with local characteristics both in terms of culture and HR will provide a very significant influence to the development of information systems that will be built this. In [17], the management of databases in the medical field with the data that is mostly text data has been focused.

In our study, the application of web-based information system in industry batik of Yogyakarta, Indonesia, has been implemented. The information system is to manage text data, image, and the data link between the design and the staff person in charge of each process in the Design Division.

The information system is a set of components to build a system that has a relationship between one component and the other components that aims to produce information in a particular field. In a system of classification of information needed flow of information, this is due to the need for a diversity of information by the user information.

Model of information system development can be carried out by the following methods:

- a) Sequential Linear Models; requires a systematic approach and sequential steps of analysis, design, coding, testing, and maintenance.
- b) Prototype models; a method by presenting a complete picture of the system, the user can

see the side view of the system modeling and procedural techniques to be built.

- c) Rapid Application Development (RAD); rapidly have high adaptable, can be made quickly with component-based development approach.
- d) Revolutionary or spiral models; the method is designed as a revolutionary with clear phases, but is open to the participation of users to participate in determining the modeling system.
- e) Engineering b4GT; constructed using non-procedural languages for database queries, report generation, data manipulation, definition and interaction on the monitor screen, and spreadsheet capabilities

3. BATIK DESIGN OF INFORMATION SYSTEMS FOR BATIK INDUSTRY

The design stages of a web-based information systems for batik industry is described as follows. The design of the information system will be carried out in this study are:

1. Analysis phase

At this stage, identifying and finding solutions is done to overcome the problems. Steps taken begins with collecting information and knowing the existing conditions, by means of field surveys to several branches of industry, and in coordination with industry partners to understand the current state and what are the future needs. Information on the design and the development of information systems is also derived from the literature and journals.

2. Design phase

The design of information systems has focused on the various stages of the program are clear attributes, namely: software architecture, detailed procedure (algorithm), a data structure and interface representations. The design phase begins from the researcher, and then coordinated with the needs of the industry, if there are things that do not match then the improvement and refinement of the design.

3. Coding phase

Coding phase is a stage that results in the design of programming languages are translated into physical form or table form, function and procedures. At this stage of coding need high accuracy, because both processes occur, data link, and application

usage will determine the quality of the resulting information system.

4. Testing

Stages of Testing done by Black-box Testing method. Black-box testing conformance testing results with the application of the system function or functional ability. Tests were conducted for each part, and then analyzed on the problems that arise or deficiencies that exist, so it can be repaired and improvements. If the test for each section would suffice, followed by a test of the overall information system. From the test results are then analyzed and synthesized well.

5. Maintenance phase

Maintenance phase will continue the current information systems are already successfully working properly. Maintenance phase here is including the improvement and development of the system.

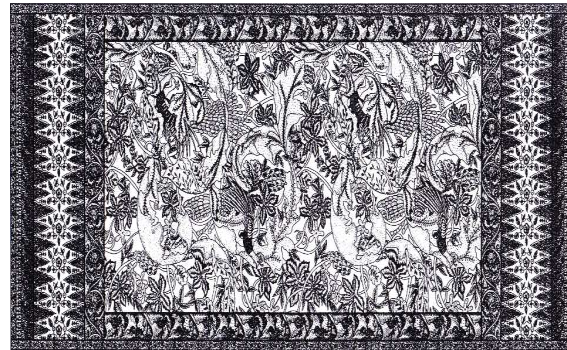


Fig. 2. Batik Design

Being in a relationship schema database structure design is shown in Fig. 1.

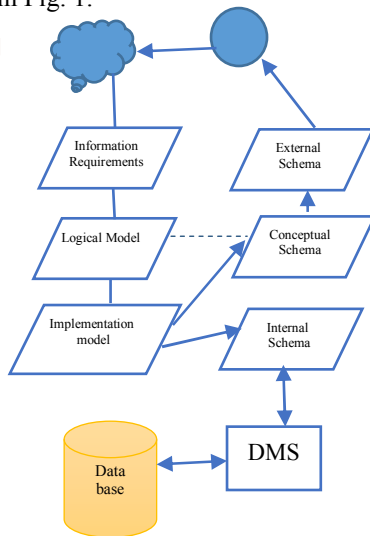
INFORMATION

Cognitive model

Semantic model

Structural model

Implementation model



DATA

Fig.1. Scheme in Relation Design of Database Structure

Fig. 2 shows an example of batik design after design division is complete. Stages of the production process of the design division at the batik industry partners have standard procedures and quality control has been implemented. At each stage will be corrected, if it does not meet the standard to be repaired, and if it is appropriate standards will be validated so that it can proceed to the next process. The process that includes in the Design Division is shown in Fig. 3.

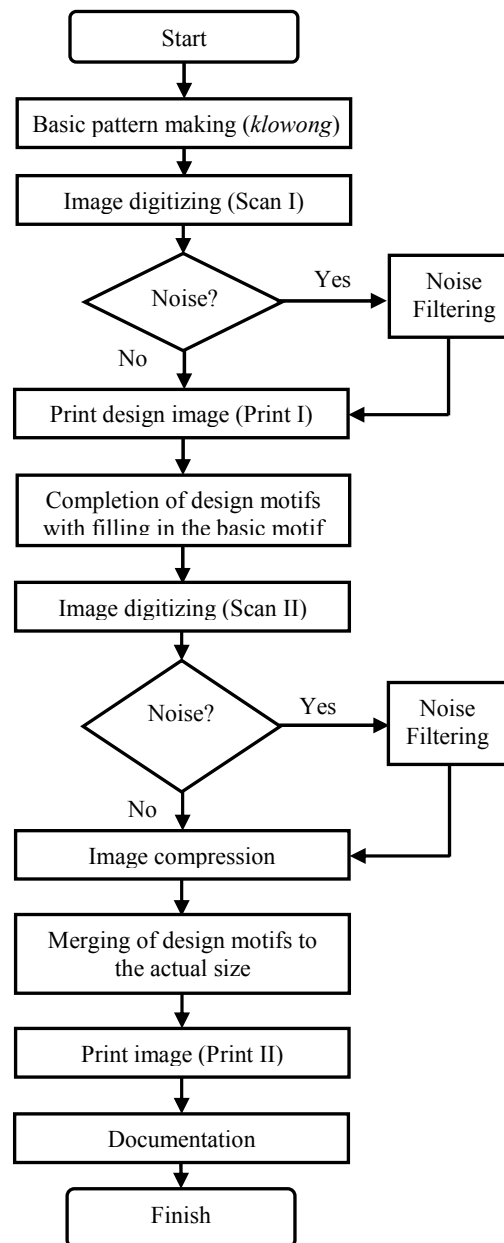


Fig. 3. The Flow Chart of Batik Image Motif Design

4. RESULTS AND DISCUSSION

The results of the study for the design division of the production process can be explained in advance with the motif design process flow diagram in Fig. 3. One of the design of the production process-monitoring software that is on the division of the design is done in order to change the current conventional system, the data storage and system monitoring through face to face and paper-based, leading web-based online monitoring system.

With the establishment of information systems is then performed well overall digitizing image data batik, evidence of goods in and out, memorandum, and the person in charge of each on each process. Results for Web-Based Information System login page on division of production process design is shown in Fig. 4.

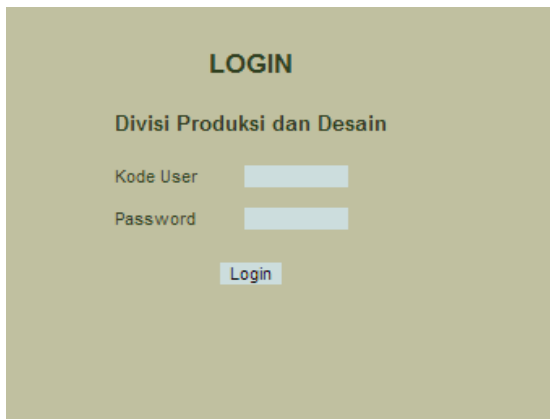


Fig. 4. Login Page

Batik Yogyakarta							
Logout							
DATA PROSES DESAIN							
edit del	144	RT.0054	TUMPAL	Proses Produksi Divisi Desain	18 Mar 2013	lihat proses RT.0054	
edit del	145	GE.0025	GEOMETRIS	Proses Produksi Divisi Desain	07 Mar 2013	lihat proses GE.0025	
edit del	146	GE.0010	GEOMETRIS	Proses Produksi Divisi Desain	05 Mar 2013	16 Apr 2013	lihat proses GE.0010
edit del	147	GE.0012	GEOMETRIS	Proses Produksi Divisi Desain	05 Mar 2013	lihat proses GE.0012	
edit del	148	GE.0017	GEOMETRIS	Proses Produksi Divisi Desain	05 Mar 2013	lihat proses GE.0017	
edit del	149	GE.0018	GEOMETRIS	Proses Produksi Divisi Desain	05 Mar 2013	lihat proses GE.0018	
edit del	150	GE.0019	GEOMETRIS	Proses Produksi Divisi Desain	05 Mar 2013	24 Apr 2013	lihat proses GE.0019
edit del	151	GE.0020	GEOMETRIS	Proses Produksi Divisi Desain	05 Mar 2013	lihat proses GE.0020	
edit del	152	GE.0021	GEOMETRIS	Proses Produksi Divisi Desain	05 Mar 2013	24 Apr 2013	lihat proses GE.0021
edit del	153	GE.0022	GEOMETRIS	Proses Produksi Divisi Desain	05 Mar 2013	lihat proses GE.0022	
edit del	154	RT.0052	TUMPAL	Proses Produksi Divisi Desain	05 Mar 2013	lihat proses RT.0052	
edit del	155	LR.0012	LERENG	Proses Produksi Divisi Desain	03 Mar 2013	lihat proses LR.0012	
edit del	156	RT.0053	TUMPAL	Proses Produksi Divisi Desain	02 Mar 2013	lihat proses RT.0053	
edit del	157	GE.0015	GEOMETRIS	Proses Produksi Divisi Desain	26 Feb 2013	lihat proses GE.0015	
edit del	158	GE.0011	GEOMETRIS	Proses Produksi Divisi Desain	20 Feb 2013	lihat proses GE.0011	
edit del	159	GE.0013	GEOMETRIS	Proses Produksi Divisi Desain	20 Feb 2013	lihat proses GE.0013	
edit del	160	GE.0014	GEOMETRIS	Proses Produksi Divisi Desain	20 Feb 2013	lihat proses GE.0014	
edit del	161	GE.0016	GEOMETRIS	Proses Produksi Divisi Desain	20 Feb 2013	lihat proses GE.0016	
edit del	162	LR.0003	LERENG	Proses Produksi Divisi Desain	13 Feb 2013	lihat proses LR.0003	
edit del	163	LR.0004	LERENG	Proses Produksi Divisi Desain	13 Feb 2013	lihat proses LR.0004	
edit del	164	LR.0005	LERENG	Proses Produksi Divisi Desain	13 Feb 2013	lihat proses LR.0005	
edit del	165	LR.0006	LERENG	Proses Produksi Divisi Desain	13 Feb 2013	08 Mei 2013	lihat proses LR.0006
edit del	166	LR.0007	LERENG	Proses Produksi Divisi Desain	13 Feb 2013	lihat proses LR.0007	
edit del	167	LR.0009	LERENG	Proses Produksi Divisi Desain	13 Feb 2013	lihat proses LR.0009	
edit del	168	LR.0010	LERENG	Proses Produksi Divisi Desain	13 Feb 2013	30 Apr 2013	lihat proses LR.0010
edit del	169	LR.0011	LERENG	Proses Produksi Divisi Desain	13 Feb 2013	lihat proses LR.0011	
edit del	170	GE.0001	GEOMETRIS	Proses Produksi Divisi Desain	06 Feb 2013	12 Feb 2013	lihat proses GE.0001
edit del	171	GE.0005	GEOMETRIS	Proses Produksi Divisi Desain	05 Feb 2013	lihat proses GE.0005	
edit del	172	GE.0006	GEOMETRIS	Proses Produksi Divisi Desain	05 Feb 2013	lihat proses GE.0006	
edit del	173	GE.0007	GEOMETRIS	Proses Produksi Divisi Desain	05 Feb 2013	05 Apr 2013	lihat proses GE.0007
edit del	174	GE.0008	GEOMETRIS	Proses Produksi Divisi Desain	05 Feb 2013	06 Apr 2013	lihat proses GE.0008
edit del	175	RT.0037	TUMPAL	Proses Produksi Divisi Desain	05 Feb 2013	lihat proses RT.0037	
edit del	176	RT.0038	TUMPAL	Proses Produksi Divisi Desain	05 Feb 2013	27 Feb 2013	lihat proses RT.0038
edit del	177	RT.0039	TUMPAL	Proses Produksi Divisi Desain	05 Feb 2013	lihat proses RT.0039	
edit del	178	RT.0040	TUMPAL	Proses Produksi Divisi Desain	05 Feb 2013	lihat proses RT.0040	

Fig. 5. Production



Fig. 6. Data Editing In Design Division Page Process Design Division Page



Fig. 7. Page of Production Process Design Division to See the Details of Batik Data

In Fig. 6 is shown the data page that containing the Design Division which includes the item code, motive, date, and details of the process. To see the details, it can be done by selecting or clicking the item code. In this page can be seen the sample of recapitulation monitoring the production process and sample design division digitizing batik design after design division completed the entire process. That way the detail will be displayed as shown in Fig. 7. Adding Data on Information Systems Design Division is shown in Fig. 8.



Fig. 8. Adding The Data To The Division of Design Page

Data editing in design division page has shown in Fig. 8 while the design and validation of the production process to recap the Design Division has shown in Fig. 9.

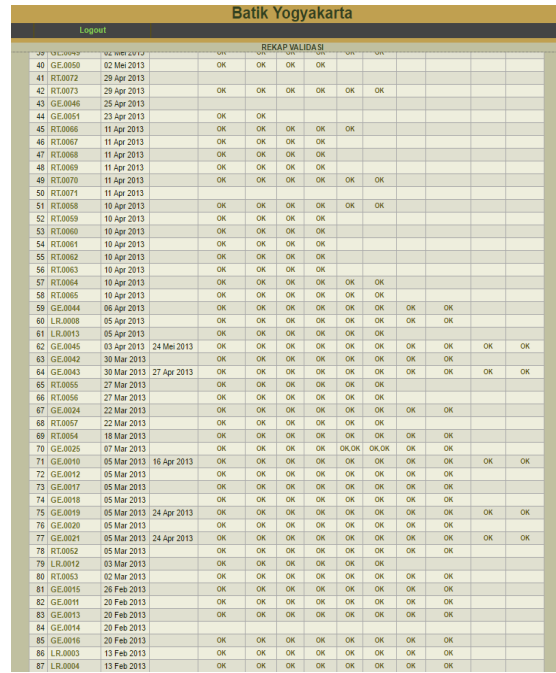


Fig. 9. Production Process Validation in Design Division Page

Table 1. The Result of User Reponses for the Information System

Criteria		Industry A (%)	Industry B (%)	Industry C (%)	Industry D (%)	Average (%)
Reliability	Excellent	88	92	96	92	92
	Average	12	8	4	8	8
	Poor	0	0	0	0	0
Usability	Excellent	92	96	92	96	94
	Average	8	4	8	4	6
	Poor	0	0	0	0	0
Maintainability	Excellent	96	92	84	92	91
	Average	4	8	16	8	9
	Poor	0	0	0	0	0

Web software development managers and practitioners see the seven most important quality criteria for web application success in the frame of ICT system for monitoring purposes, i.e.:

- reliability,
- usability,
- security,
- availability,
- scalability, and
- maintainability

In this research, the information system is reviewed on the most three important quality criteria, i.e., reliability, usability and maintainability. The information system is reviewed by four batik industries in Yogyakarta, Indonesia, each 25 user. The result of the survey is shown in Table 1. The result shows that response of the user for the information systems are Reliability: excellent 92%, Usability: excellent 94%, and Maintainability: excellent 91%.

This results show that the performance of this information system is high. The role of Web-based information system is to help maintain quality control during the production process, so the quality of batik products is increased.

5. CONCLUSION

Web-based monitoring system in the batik industry, which has been designed in this study, has a high performance. The login page, the data division designs, menus plus data, the data detailed menu, edit menu and delete data, all have been successfully tested and is able to provide the needed information in order to monitor production process in batik industry. The result shows that response of the user for the information systems are Reliability: excellent 92%, Usability: excellent 94%, and Maintainability: excellent 91%. This study provides new knowledge about batik production process which is very complex. The role of web-based information system is to help maintain quality control during the production process, so the quality of batik products is increased.

ACKNOWLEDGEMENTS

The author gratefully acknowledges the contributions of The Ministry of Research, Technology and High Education, Republic of Indonesia, for funding this research.

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