ONLINE BUSINESS DESIGN AND INFORMATION SYSTEM DEVELOPMENT OF WEBSITE ZAURA HIJAB USING THE WATERFALL METHOD

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Abstract

Hijab is currently a mood of mode that is quite developed in Indonesian society, where according to data of the Central Statistics Agency of Indonesia 87% or estimated to reach 229.62 million people from the Indonesian community is Muslims (The Future of World Religions: Population Growth Projections, 2010-2050, 2019). Muslim clothing for women each year has a significant increase, namely in 2017 is in the rank (49.8%), 2018 (50.55%), and followed in 2019 by (52.5%). The sales system that takes place in Zaura Hijab is still done manually, namely the owner and the customer directly using social media and directly. Then with the development of information systems carried out a review and improvement on existing businesses. Both in existing business processes and proposals are classified based on Real Value Added, Benefit Value Added, and Non Value Added. So that the proposed business process can be described using several tools such as Use Case Diagram, Activity Diagram, Sequence Diagram, Class Diagram. Obtained comparison of activities based on activity based on the cycle time of the bsinis process of the proposed business process with a total of 660.01 minutes in the system, faster than the existing business process with the amount of 1369.75minute. By comparing the efficiency of each business process, it is obtained for value in existing businesses of 0.6905 or 69.05% while for businesses proposed get 0.8073 or 80.73% . this indicates that the proposed system can have advantages based on its efficient level of cycle time. By doing multiple regression analysis it can be concluded that there is an effect of website appearance and efficiency factors on customer satisfaction. With the coefficient of determination of 64.8%, the effect of website appearance and efficiency factors on employee satisfaction is 94.5%, and the rest are factors that influence outside not included in the model.

Keywords: System Information, Waterfall, Customer, Website, Labor, Efisiensi.

1. Introduction

Hijab is currently a mood of mode that is quite developed in Indonesian society, where according to data of the Central Statistics Agency of Indonesia 87% or estimated to reach 229.62 million people from the Indonesian community is Muslims (The Future of World Religions: Population Growth Projections, 2010-2050, 2019). The presence of various hijab brands creates intense competition in cementing its brand at the top of the hijab market. With the development of the era in the millennial era tencourages information technology to provide access to information on the development of hijab for Muslim women in Indonesia. Many Muslim women get inspired to wear the hijab through the internet. Online businesses are growing rapidly without limited time and place. Buying and selling with the internet as a connecting medium and website as a marketing catalog, more practical and efficient By implementing a website-based sales information system will be able to increase sales information 2 and can make it easier for businesses to know the information needed. Hijab developed into a commodity that can satisfy consumerism and is an important concern for most women. So that the veil marketing opportunity can still be developed even greater given the demand received by Zaura Hijab from customers who are veil consumers.

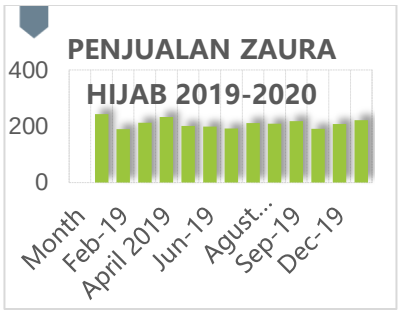

Figure 1 Zaura Hijab Sales Data Chart
January 2019 - January 2020
(source : Zaura-Hijab)

The sales system that takes place in Zaura Hijab is still done manually, namely the owner and the customer directly using social media and directly. The way it causes the system that is running is not as effective and efficient as expected as well customers and labor Customers who want to place an order in the transaction process must provide a list of goods orders and detailsTherefore it is necessary to hold a mature business process design to develop business both in online and offline business so that the results can be known whether the business development of Zaura Hijab is feasible to be developed or not feasible to be developed, so that the results of this study can be a reference for investors who will invest their capital in Zaura Hijab so that they can develop properly. in this study using the website as an information system with the waterfall method.

2. Literature Review

2.1 Business Processes

A business process is a series of instruments for organizing an activity and to increase understanding of the interconnectedness of an activity (Weske, 2007). There is another sense of business process is a set of activities or activities designed to produce a certain output for a particular customer (System, 2007). According to Hammer and Champy the business process is a set of activities that take one or more inputs and create an output that is useful to customers (Weske, 2007).

2.2 Information Systems

According to Alter (2002) information systems are a combination of work procedures, information, people and information technology that are organized to achieve goals in an organization. While the definition of information systems according to Turban et al. (2004) in the book Information Technology for Management Making Connections for Strategies Adventages is an information system as a system that collects, processes, stores, analyzes and disseminates information for specific purposes. Information system is a man-made system that generally consists of a set of computer-based components and manuals that are created to collect, store and manage data and provide output information to users (kadir, 2005).

2.3 Webserver

In general, web servers act as servers that provide services to components that request information related to the web, in the web that has been designed in the Internet. a web server is a computer consisting of hardware and software (Sibero, 2012) . From the explanation of the theory above, the author concluded that the web server is a computer used to store documents by accessing and displaying the web page from the client computer.

2.4 Web Programming Languages

2.4.1 PHP (Hypertext Prepossesor)

PHP (Personal Home Page) is the programming interpreter that is the process of translating the source line into machine code that the computer understands directly at the time the line of code is executed (Sibero, 2012). PHP is defined as a programming language that serves to build a desired program such as a website, PHP is directly connected to HTML.

2.4.2 HTML (Hypertext Markup Language)

HTML is the language of markup or tagging of a text document, it is used to determine the format or style of the marked text (Sibero, 2012). HTML is used as a method to implement the concept of hypertext in a document.

2.4.3 Stages of Waterfall Method System Development

Waterfall method is a method often used by system analysts in general. The essence of the waterfall method is the implementation of systems performed sequentially or linearly (Bassil, 2012). The advantage of using the waterfall method is that it can determine the steps in developing the system more systematically (Bassil, 2012). Waterfall method there are several stages, namely requirement, system and software design, implementation and unit testing,

integration and system testing, operation and maintenance (Bassil, 2012).

2.5 Efisiency

Efficiency as a measure used to compare input usage plan with realized use or actual use (Mulyamah, 1987). Assuming that the utility and effectiveness goal are fulfilled, efficiency is the next usability goal to take into consideration. Efficiency of the tools introduced into the website is just as important as the presence of the tools themselves.

2.6 Programming Linear Test

The problem of linear programs is a problem to determine the amount of each variable value that optimizes (maximum or minimum) the value of objective functions by paying attention to the existing restrictions expressed in the form of linear equations or inequalities. Programming Linear Test is an important tool for evaluating the performance of a business or service. The tool used how efficiently with input utilization to produce maximum output. an attribute or trait or value of a person, object or activity that has a certain variation set by the researcher (Sugiyono, 2010).

2.7 Conseptual Model

In this section a conceptual model is explained which is a research concept carried out by looking at the environment, its research in information systems and its scientific basis (Hevner, 2004). This concept is expected to help in providing solutions to existing problems. The conceptual model of this study is illustrated in Figure III.1 below: plus existing,measuringefficiency.

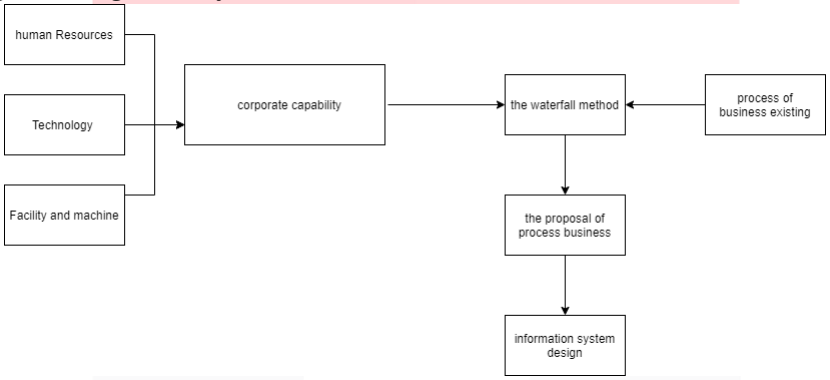

Figure 2 Conseptual Model

From the picture of the conceptual model it can be seen that the problems involved inthe environment is technology in presenting information about a more efficient and effective sales system. This research uses programming language and the waterfall method in developing information systems. For concepts that are used so that data retrieval is more valid then for data retrieval is done by interviewing directly to the Zaura Hijab. For the whole development of this information system using the waterfall method because this method is considered to be able to maintain product quality because testing will be done at the end of the phase and each phase of development takes place regularly according to a predetermined schedule. This research will produce an online business design and website information system.

3. Analysis

3.1 Analysis of Existing and Proposed Time Cycle Test Results

Table 1 Analysis of Existing and Proposed Time Cycle Test Result

No	Activities	Time (minutes)		Efficiency (%)	
		Existing	Proposal	Existing	Proposal
1	The process of purchasing materials from suppliers	252.7 minutes	164.93 minutes	77,99%	84,46 %
2	Warehouse checking	371.9 minutes	146 minutes	78,16%	82,19%
3	Production	177 minutes	101.3minute	73,44%	84,20%
4	Distribution time to store	147 minutes	103.3 minutes	74,14%	89,06%

5	Administration	369.6 s minute	104.19minutes	73,21%	83,17%
6	Transaction	51.55 minutes	40.29 minutes	37,36%	61,34 %
Total cycle time (seconds)		1369.75minutes	660.01 minutes		
Efficient average(%)				69,05%	80,73%

In the calculation of efficiency can be seen the final result of the total circumclus of existing business processes with a proposal with selisish 709.74 minutes or about 11 hours. The amount of time span reduced is from the process of material pemelian from the supplier to the transaction process. Furthermore, when viewed from the percentage of efficient levels shows the average of existing businesses is 69.05% in business processes. As for the ususlan business, it reached 80.73%.

3.2 Information System Test Results

3.2.1 Admin Test Results

The following is the result of testing of zaura hijab website information system design that has been run on testing or testing can be done by testing each item or activity by showing the feature is running according to the expected purpose function.testing on the admin system can be seen in the following table:

Table 2 Supplier Data Admin Test Results

Activity	Results
Supplier data	
Sign up	Successful
Registration	Successful
Log in	Successful
Input new supplier	Successful
Supplier data input	Successful
Enter payment confirmation from supplier	Successful

Table 3 Werehouse Data Admin Test Results

Activity	Results
werehouse data	
Werehouse data input	Successful
Logging material out	Successful

Table V.4 Production Data Admin Test Result

Activity	Results
Production data	
Production data input	Successful

Table 5 Results of Admintration Data Admin Test Result

Activity	Results
Data administration	
Employee data input	Successful
Specify the username and password of the operator data	Successful
Input salary and employee status	Successful

Table 6 Store Data Admin Test Result

Activity	Results
Store data	
Data input and product description	Successful
Determine product discounts	Successful
Input detailed product data	Successful

Product image input	Successful

Table 7 Transaction and Payment Data Admin Test Results

Activity	Results
Transaction and payment data	
Confirm payment	Successful
Enter confirmation that the item has arrived	Successful
Input detailed transaction and customer data	Successful

3.2.2 User Test Results

Information system provided for users or prospective customers to be accessed and rationalized in ordering products and product settings. The system provided is registration, login, booking order, and other transaction arrangements. Can be seen in the following table.

Table 8 User Test Results and Account Management

Activity	Results
Account registration and management	
Registration	Successful
Login	Successful
Booking order	Successful
Edit profile	Successful
Change password	Successful
Logout	Successful

Table 9 User Test Results, Booking Orders, Payments

Activity	Results
User test results, booking orders, payments	
Most recent booking	Successful
Payment confirmation	Successful
Confirm the item or package has arrived	Successful

3.3 Analysis Comparison of Convention Business with Proposed Business Process

Errors in the company's business processes can be summarized and printed based on business processes so as to provide the right solutions to design new business processes.

Table 10 Comparison of Conventional Business Processes with Proposed Business Processes

No	Activity	Offline	Online
1	Marketing Capital	Pay advertising service fees and reduce printing costs	Doing website-based online marketing includes fees on system design
2	Marketing reach	Coverage is too narrow, channeling to the customer	The reach of marketing can be accessed globally and widely through the internet. So have pontensi get a wide customer.
3	Service time	Service time is limited by change operating hours for 7 hours	24-hour access facility and can be accessed anywhere
4	Number of payment system	Payment can only be made by cash or cash	payment method can be done using the transfer
5	Labor and labor division	Workers who serve the operation are hired to one labor only	The number of workers is needed only one

			employee, but there is no overwork buildup in the portion of work
6	Reporting and documentation	Admin records manually/handwritten ledbook, then recaps on each data	There are reports on each transaction, such as the number of customer data themselves, transactions from product shipments, digital photos / traces as publications etc.

3.4 Analysis of Usability Testing Results Using Programming Linear Test

3.4.1Analysis of Operator Labor and Customer Usability Testing Results

Here are the results of the survey method by distributing questionnaires to 10 respondents from zaura hijab labor who have used the website and 15 respondents from customers who have tried the transaction process using the website.

Table 11 Result Questionnaire of Labor

	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8	Q.9	Q.10	Q.11	Q.12	Q.13	Q.14
R1	5	5	5	5	5	5	5	4	5	4	4	5	4	5
R2	4	4	5	4	5	5	5	3	5	3	4	4	4	4
R3	2	3	4	3	4	2	3	1	3	1	2	3	2	1
R4	4	4	5	5	5	4	5	4	5	4	4	5	4	4
R5	5	5	5	5	5	5	5	4	5	3	4	5	4	5
R6	5	3	5	4	4	5	5	4	3	3	4	4	4	3
R7	5	5	5	5	5	5	5	5	5	5	5	5	5	5
R8	5	5	5	5	4	4	5	4	3	4	5	5	5	4
R9	4	3	4	2	2	5	5	2	3	3	5	5	4	2
R10	5	5	5	4	4	5	5	4	4	3	3	5	4	3

Table 12 Result Questionnaire of Customer

	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8	Q.9	Q.10	Q.11	Q.12	Q.13	Q.14
R1	3	4	5	3	4	5	4	5	5	3	4	4	5	5
R2	5	5	5	4	5	5	5	5	4	5	4	3	5	4
R3	4	4	5	4	3	4	4	4	5	4	4	4	4	5
R4	4	5	5	5	3	5	4	5	4	3	4	4	5	4
R5	4	5	4	4	3	4	4	5	4	5	4	4	5	4
R6	3	4	5	4	4	4	4	4	5	4	4	4	5	5
R7	5	5	5	5	5	4	5	5	5	4	5	5	5	5
R8	5	5	5	5	4	5	5	5	4	5	4	5	5	4
R9	4	5	5	5	3	3	4	5	5	5	4	4	5	5
R10	4	4	4	4	3	3	4	4	3	4	3	4	4	3
R11	3	4	4	5	4	3	3	4	3	3	4	3	4	3
R12	4	4	5	5	5	5	4	4	5	4	5	4	4	5
R13	5	5	5	5	5	4	5	5	5	4	5	5	5	5
R14	4	5	4	4	4	4	4	5	4	3	4	4	5	4
R15	4	5	4	4	4	3	4	5	4	4	4	4	5	4

Total statement items in the questionnaire as many as 14 item statements, consisting of 5 items statement regarding website display, 5 questions about efficiency, 4 items questions about satisfaction. Questionnaires are conducted from January 7, 2021 to January 18, 2021.

3.4.2 Instrument Testing Technique

Here are the variables used to know the results of instrument testing techniques:

Table 13 Variable

X1	Website View
X2	Efficient
Y	Satisfaction

knowing the results of the questionnaire used in this study can actually measure what you want to measure, can reveal data from the variables studied precisely and the extent to which the collected data does not deviate from the description of the variable in question (Arikunto, 2006: 168).

3.4.2.1 Validity Test

Validity test calculation using product moment correlation formula by correlate item value with total question score, statement is not declared valid (Arikunto, 2006: 169). The validity test results can be stated as follows:

Table 15 Validity Test

No.	Name	Labor(N=10)			Customer(N=15)			Noted
		Person Correlation R Count	R Table	Signifcation Value	Person Correlation R Count	R Table	Signifcation Value	
1.	Display	0,8402	0,632	0,0064	0,6342	0,511	0,0178	VALID
2.	Eficiency	0,7818	0,632	0,0114	0,6468	0,511	0,0164	VALID
3.	Satisfication	0,8127	0,632	0,007	0,7215	0,511	0,0117	VALID

Based on the data shows that all indicators used to measure display variables, efficiency and satisfaction are used from labor and customer model results more than R table, for labor rhitung >0.632 results and Rhitung customer > 0.511. This means that all indicators and statements on each variable in this study are said to be valid, so it is worth using as a data collector and can be analyzed further.

3.4.2.2 Reability Test

The questionnaire reliability test is intended to determine whether the questionnaire instrument can provide a constant size or not.

Table 16 Reability Test

No.	Name	Labor(N=10)		Customer(N=15)		Noted
		rxy	Rtabel	rxy	Rtabel	
1.	Display	0,809	0,632	0,755	0,511	Reliabel
2.	Eficiency	0,801	0,632	0,756	0,511	Reliabel
3.	Satisfication	0,824	0,632	0,803	0,511	Reliabel

Based on the results of the reliability test showed that all variables used in this study obtained alpha value greater than 0.6. This means that all the variables in this study are reliable so that all points of questioning can be trusted and can be used for further research.

3.5 Instrument Testing Technique

3.5.1 Normality Test

The normality test aims to test whether in the regression model, bound variables, free variables or both have normal distributions or not (Ghozali, 2001). Here is a test of normality with Using the Kolmogorov-Smirnov regression method and Normal P-Plot:

Table 17 Normality Test

No.	Model	Asymp, what's going on? Sign	Noted
1.	Labor(N=10)	0,050	Normal
2.	Customer(N=15)	0,200	Normal

So the results of the signification using the Kolmogorov-Smirnov regression method are 0.050 for labor and 0.200

for customer or more than > 0.05, which is normal, then the data or residual values are normally distributed.

3.6 Analysis of Usability Testing Results Using Regression Linear Test

3.6.1 Determination Coefficient Test

Table 18 Determination Coefficient Test

No.	Model	Rsquare	Percent(%)
1.	Labor(N=10)	**0,954**	**95,4%**
2.	Customer(N=15)	**0,648**	**64,8%**

Based on the output above, it is known that the R Square value is 0.954, this means that X1 and X2 simultaneously to the Y variable is 95.4% . Based on the output above, it is known that the R Square value is 0.648, this means that X1 and X2 simultaneously to the Y variable is 64.8%.

4. Conclusion

Mapping Based on The Design of business processes on Zaura Hijab is re-depicted and performed performance based on the activities of existing companies. 2. Designing business processes using website-based applications by building information systems for zaura hijab business processes using PHP programming language and database design using MySQL, then built a website with https://zaura-hijab.com/ site . There is a comparison of activities based on the cycle time of the bsinis process of the proposed business process with a total of 660.01 minutes in the system, faster than the existing business process with the amount of 1369.75minute. By comparing the efficiency of each business process, it is obtained for value in existing businesses of 0.6905 or 69.05% while for businesses proposed get 0.8073 or 80.73% . this indicates that the proposed system can have advantages based on its efficient level of cycle time. based on the results of some techniques using IBM SPSS is acceptable. So the result of signification using the regression kolmogorov-smirnov method is 0.200 or more than > 0.05 that is normal, then the data or residual value is normally distributed to the customer, signification using the regression kolmogorov-smirnov method is 0.050 or more than > 0.05 that is normal. With a coefficient of determination in labor questionnaire results of 95.4% and the remaining 4.6% influenced by other factors not included in the model. Furthermore, with the coefficient of determination on customer questionnaire results of 64.8% and the remaining 35.2% influenced by other factors not included in the model.

Reference

[1] *The Future of World Religions: Population Growth Projections, 2010-2050*. (2019). From Pew Research Center.
[2] Arikunto, S. (2010). *Manajemen Penelitian.* Jakarta: Rineka Cipta.
[3] Bassil. (2012). A Simulation Model For the Waterfall Software Development Life Cycle. *International Journal of Engineering & Technology (iJET)*, 2.
[4] Fowleer, M. (2005). UML distilled panduan singkat bahasa pemodelan objek standar. Yogyakarta: Andi.
[5] Harrington. (1991). *Organizational structure and informationtechnology.* New York: Prentice-Hall.
[6] Hartono, J. (2006). Sistem teknologi. Andi .
[7] Hendri. (2007). SISTEM PEMASARAN BERBASIS WEB DALAM MENINGKATKAN PELAYANAN TERHADAP PELANGGAN. Universitas Raharja.
[8] Hevner, M. P. (2004). Design Research in Information System .
[9] kadir, A. (2005). Pengenalan teknologi informasi . ANDI.
[10] Kotler, P. (2010). Manajemen Pemasaran. In *Edisi tiga belas Bahasa*. Jakarta: Erlangga.
[11] Laohapensang. (2019). factor ibfluencing internet shopping behaviour: a survey of consumers in Thailand.