Point Of Sales Application Design Based On The Toguide Website Case Study Of Laundry MSME Using Iterative And Incremental Methods

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Abstract: Micro small and medium enterprises in this era of globalization continue to experience changes and improvements. This is supported by the existence of information technology that is developing very fast. Therefore information technology can be accessed accurately, precisely, up to date, and quickly. ToGuide is a Start-up company in the field of services engaged in developing small and medium micro-businesses using applications and consulting services. ToGuide has a Point of Sales application product that aims to help solve problems faced by MSMEs. But the Point of Sales website is still not widely used by Laundry MSMEs because of the lack of information. This website is very helpful in managing the operational management of Laundry SMEs. By using the Iterative Incremental methodology, a website-based Laundry Point of Sales application is made. This methodology also made business model analysis, business feasibility analysis, business plan analysis, competitor analysis, market potential analysis, and technical plan analysis. The design phase, business process design, data design, interface design, and infrastructure design are then made in the design phase. Based on black-box testing and user acceptance testing results, validating all sources of MSMEs needs to get a good and correct application and is user-friendly.

Index Terms: Iterative, Incremental, MSMEs, Point of Sales

1 Introduction

Micro, Small, and Medium Enterprises, or commonly known as MSMEs, is one of the businesses that can boost the Indonesian economy. This is evidenced by the decline in unemployment with the presence of this MSME sector [1]. The MSME sector can increase economic growth by two percent and is predicted to have revenue growth of between 23 to 80 percent if MSME owners can optimize the use of information technology [2]. The progress of the world of information technology from year to year continues to experience development and improvement. This is supported by the existence of information technology that is developing very fast. Therefore information technology must be accessed accurately, precisely, up to date, and quickly [3]. But the limited information about all management and risk becomes a problem for MSME entrepreneurs. Therefore ToGuide can provide solutions to solve these problems to benefit MSME actors [4]. ToGuide is expected to help and develop MSME businesses in Indonesia and facilitate business people in managing their businesses to be more efficient. A website is a visual display of important information, which is needed to achieve one or several goals by combining and managing information technology in one screen (Single screen) so that organizational performance can be monitored as a whole [5]. ToGuide is a startup company in services engaged in developing micro, small, and medium enterprises using websites and consulting services. ToGuide has a Point of sales website product that aims to help solve MSMEs' problems [6]. The design phase, business process design, data design, interface design, and infrastructure design are then made in the design phase. Based on black-box testing and user acceptance testing results, validating all MSME sources needs to get a good and correct application and user-friendly [7]. Using the application on ToGuide is useful for controlling the business processes of MSMEs. The application is also useful to help users analyze and find problems quickly and accurately to make decisions and strategies to improve business performance by providing clear graphics to users. This paper discusses the "TOGUIDE" Startup Application design in managing the management of MSMEs with Iterative and Incremental methods [8].

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2 Literature Study

2.1 Unified Modelling Language (UML)

UML (Unified modeling language) is a visual modeling language that describes business process flow and design analysis and documents a structured software system framework. This facilitates the programmer in understanding the system framework built and minimizes the risk of misinterpretation of the software design framework [9].

1. Use Case Diagram: Provides understanding through the functional visualization of a software system, including relationships with humans (users) who will interact with the system (actors).
2. Activity Activity Diagram: Provides an understanding of business flow through the flow of control that describes the business process system's workflow or business processes.
3. Class Diagram: Provides an understanding of the structure of software systems by showing classes, attributes, and relationships between classes.
4. Sequence Diagram Sequence: Provides an understanding of the flow of interactions between objects and messages sent.
5. Deployment Diagram: Provides an understanding of how to visualize and document a business process that occurs on a system using Object Oriented-based software that has been built.

2.2 Business Model Canvas (BMC)

Business model canvas is a tool that allows business people

to be able to understand the business model they use and the elements that exist in their business model. Thus, the business process is easily communicated to others and easily amended or improved with the business model, thus accelerating the learning process to find out business opportunities [10]. Several elements will be explained as follows, Customer Segment, Value Proposition, Channels, Revenue Stream, Key Resources, Key Activities, Cost Structure, Key Partner, Customer Relationship.

Table 1. *Business Model Canvas Element*

Element	Function
Customer Segment	A way to assess and determine the target customer of the business system to be developed.
Value Proposition	A product or service that will be offered to the customer usually includes the advantages or value of a produced and developed product.
Channels	A facility to promote and convey the value and benefits of a product to the customer segment.
Revenue Stream	A representation in business for the lines of receiving money, for example, in the use of advertising costs, customer fees, licenses, and so on.
Key Resource	The company's primary resource aims to realize values such as people, brands, equipment, or technology and focus on human resources.
Key Activities	According to a mutual agreement, an activity was undertaken to produce products and services, usually in branding, packaging, and others.
Cost Structure	An estimate of the cost coverage incurred in manufacturing the product from the smallest to the largest ensures that the cost structure has been appropriately implemented and correctly.
Key Partner	Stakeholders who determine the success of the business. Good business does include relationships between customers and all parties concerned, such as suppliers and marketing teams, and partners.
Customer Relationship	A scope of understanding and discussing how to build relationships with customers to be interested in the company's business and not interested in other companies' businesses.

2.3 Micro, Small and Medium Enterprises (MSMEs)

Micro, Small, and Medium Enterprises (MSMEs) are types of industries in Indonesia that are classified as small and medium industries [11]. Industrial Business itself is a business in the form of economic activities to produce goods and services that have a place and administrative records written in a complete and organized manner. The difference between small and medium-sized industries is that the amount of labor is used. The medium industry has a workforce of around 20-99 people, while the small industry has a small workforce of around 5-19 people.

2.4 Point of Sales

Point of sales (POS) can be interpreted as a cashier's place that has a cash register. Following its name, a point of sale is a point of sale where users can enter into transactions. This is meant where buyers or sellers can make payments for goods/services obtained [12].

3 METHOD

System development with an iterative and incremental model is a system development that iterates at each stage. When one iterative stage has been completed, an evaluation will be carried out. The evaluation results will be used as material for development in the next iteration stage, called incremental. The iterative and incremental development phase can be seen in the image below.

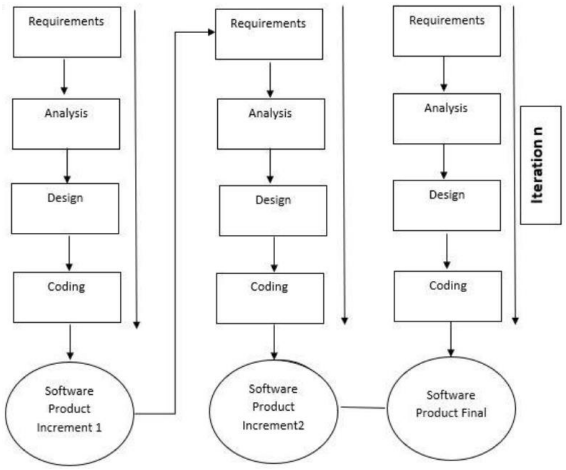

Figure 1. *Iterative and Incremental Method*

3.1 Systematic Problem Solving

This research was carried out through five stages: identification, business identification, product development, testing, and conclusions. The following is an explanation of each stage.

1. **Identification Stage**

The identification stage determines the formulation of the problem based on background research conducted through field observations. The formulation of the problem will determine the purpose of the research that will produce a solution. Then the resulting solution will determine the boundary of the problem from research. Field observations were made with speakers from one of the MSME business owners, laundry. The topic being observed is related to building a startup ToGuide website.

2. **Business Identification Stage**

At this stage, the analysis is carried out using Business Model Canvas tools to identify business models into nine sections.

3. **Development Stage**

This phase consists of four phases that refer to Iterative Incremental software development methods: inception, elaboration, construction, and transition. The steps taken are:

a. The inception phase, in this phase, focuses on the initial creation of a website, publishing a business background, compiling a business problem, identifying critical risks, defining the project scope to understand a problem.
b. The elaboration phase, in this phase, focuses on design analysis and design, builds the basic architecture for a project that is being worked on, creates a framework plan that supports the achievement of the project's goals.
c. The construction phase focuses on progressive software development to produce prototypes.
d. The transition phase focuses on introducing the product to the user, performing beta testing, completing performance tuning, conducting user training, and testing user acceptance.

4. **Testing**

At this stage of testing, the user evaluates the product by sur-

veying website users, namely the internal ToGuide and MSME entrepreneurs. If it is not appropriate, iterates back to the initial stage, and if it is appropriate, the website will be released to users. This testing phase uses the user acceptance test (UAT) and black-box testing.

5. Conclusion

At this stage, the process of providing conclusions and suggestions for development using an iterative and incremental method using 7 Menus is logging in, adding orders, adding customers, adding services, adding expenses, analyzing reports, and logging out. When logging in, the user only needs to enter their username and password. When adding the order, the customer must first add the customer data in the menu, add the customer, after adding the customer, continue to add the order to input customer data to make a laundry order transaction, then print the receipt for payment receipt and retrieval, the service added menu is used by the user when he wants to add service data to meet customer demand. The user adds expenditure data on the menu plus expenses to operational costs incurred in managing operational management. Then, the user can see the overall report in the report analysis menu, and the last logout menu for the user leaves the application page.

4 Result and Discussion

4.1 Business Model Analysis

Analysis of the business model uses a tool in the form of a Business Model Canvas (BMC). BMC aims to analyze, explain, and assess the elements prepared in visual form. Therefore, it is intended to simplify and speed up the analysis process and produce efficient performance later because the Business Model Canvas is made in the form of a framework that is easy to understand and implement. In the Business Model Analysis, components will be discussed, for example, Customer Segments, Value Prepositions, Key Activities, Key Resources, Key Partners, Channels, Customer Relationships, Cost Structures, Revenue Streams. An explanation of the Business Model from Startup ToGuide can be seen in Figure 2.

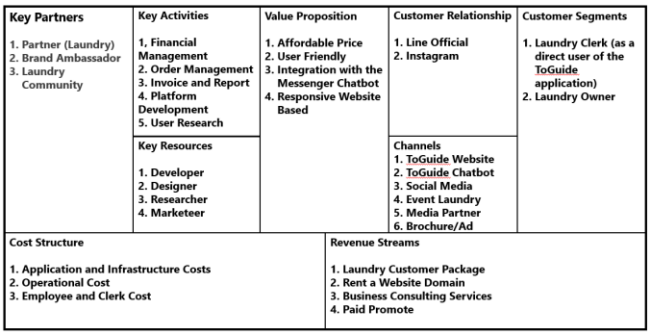

***Figure 2**. Business Model Canvas*

4.2 Functional Requirement Analysis

To Know the Analysis of Functional Requirements of the Product, there are several tables of analysis of the system's functional requirements to be summarized. Analyze system functional requirements from startup ToGuide.

***Table 2**. Functional Requirement Analysis*

Requirements Details	Description	Actor
Login	The process of entering username and password	User
View dashboard website	The process of inputting the required data or requirements	User
Customer feature	The process of filling in the customer's name, filling in the customer's cellphone number, filling in the customer's address, and pressing the save button	User
Order Feature	The process of recording the order date, selecting the customer name, pressing the save button, selecting the service type, entering the order weight and viewing the price	User
Expense Feature	The process of selecting the type of expense, writing the date of expense, pressing the save button, writing a description of the expense	User
Service feature	The process of writing service prices, service types, save services	User
Report analysis	View reports, print receipts, view data in tables.	User
Logout	The process of leaving the website and account	User

4.3 Use Case Diagram

To Know the Analysis of Functional Requirements of the Product, there are analyses of the system's functional requirements to be summarized. Use case diagrams to illustrate the interaction between actors and systems. Here are some functions using a use-case.

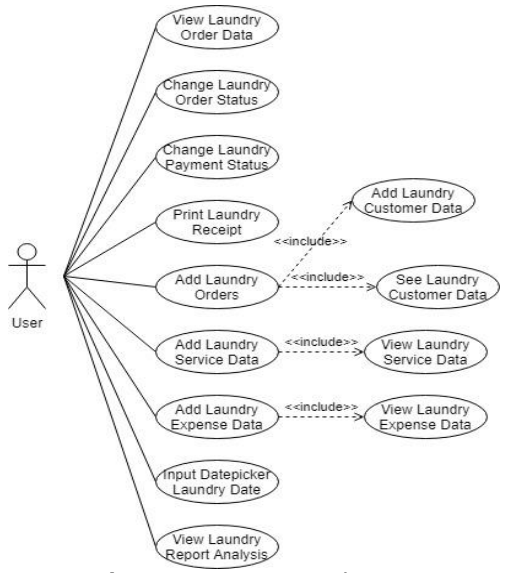

***Figure 3.** Use Case Diagram*

4.4 Implementation Result

The appearance of the existing order page on the ToGuide website which serves to display a list of all orders that have been entered into the website can be seen in below.

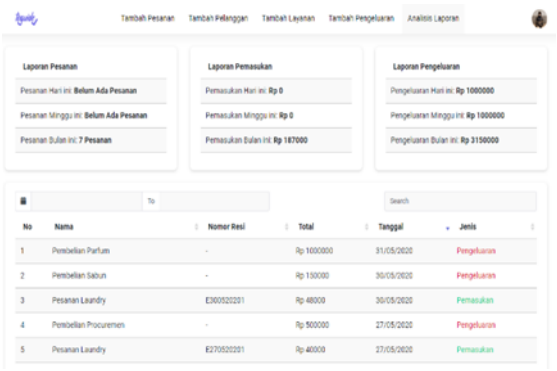

***Figure 4**. ToGuide Report Page*

This application's implementation phase describes the implementation of the plan. By using a point of sales-based website application in the laundry cashier application. Like in figure 4.

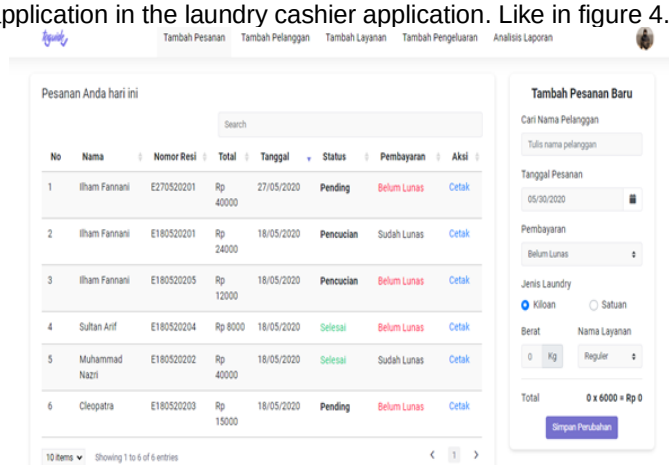

***Figure 5.** ToGuide Order Page*

Initial view when entering the system, in the login form the user can enter as a User. When the username or password is incorrect, the user will not successfully enter the system. Display the menu add to the order, which can access this menu User. Users can view orders, change orders, change order status, change payment status, and print payment receipts on this menu. TestingTesting is used to perform some validation. Testing is a process aimed to find out how to identify the mismatches of the input and output results of an information system software to find out the expected results. Testing is done to validate & ensure quality (quality assurance), namely testing whether the information system produced is following testing or not. Testing this iterative and incremental method uses unit testing, black-box testing, user acceptance testing (UAT).

1. Unit Testing

Unit testing is an initial test of the smallest piece of software. Have one or more inputs and one output. As shown in figure 5.

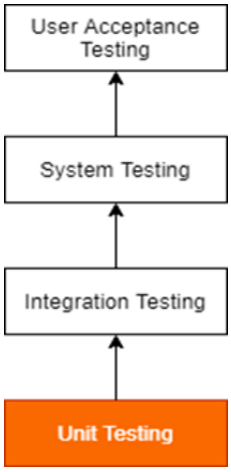

***Figure 5.** Unit Testing*

2. Black-box Testing

Black-box testing is a test of the features and functionality of applications in all applications by providing several test cases.

***Table 3**. Black-box Testing*

Feature	Test Case	Output
Login	Input username and password	Enter the dashboard page
Add Order	View laundry order data	The data in the Laundry order table can be seen
Add Order	Change laundry order status	The data in the order status table has changed
Add Order	Change laundry payment status	The data in the payment status table has changed
Add Order	Print laundry receipts	The data in the printed receipt table has been printed
Add Order	Add laundry orders	Data in tables & orders database has been added
Add Customer	View laundry customers data	Data in tables & orders database has been added
Add Customer	View laundry customers data	Data in customer tables can be seen
Add Service	Add laundry services data	Data in table & service database has been added
Add Service	View laundry services data	Data in table & service database can be seen
Add Expense	Add laundry expenses data	The data in the expense table & database has been added
Add Expense	View laundry expenses data	The data in the expense table & database can be seen
Report Analysis	Input datepicker laundry	The data in the report analysis table has been entered
Report Analysis	View laundry report analysis data	Data in the report analysis table can be seen
Logout	Exit the application	Exit the Application Page

3. User Acceptance Test

User acceptance testing (UAT) is one way to process verification that the solution worked on in the system is suitable for the user. As shown in figure 6.

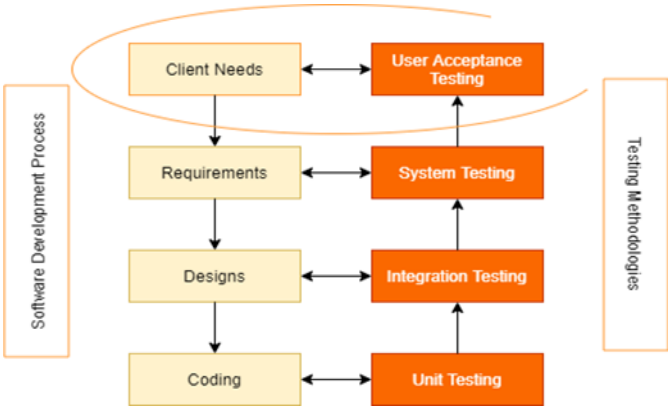

Figure 6. *UAT Testing*

From the application testing using the UAT method, it was concluded that 80% of users agreed that the Point of sales cashier application was made following their wishes, 10% stated strongly agree, and 10% stated less agree. Furthermore, 69% of users stated that the Point of sales cashier application system was as needed, 19% strongly agreed, 11% stated less agree, and 1% did not answer. For system functions, 68% of users stated that as expected, 13% agreed, 14% disagreed, 5% did not answer.

5 Conclusion

Based on the results of research that has been done, the researchers concluded that. The development uses the iterative and incremental method using seven menus, namely login, add orders, add customers, add services, add expenses, analyze reports, and logout. When logging in, the user only needs to enter their username and password. When adding the order, the customer must first add the customer data in the menu, add the customer, after adding the customer, continue to add the order to input customer data to make a laundry order transaction, then print the receipt for payment receipt and retrieval, the service added menu is used by the user when he wants to add service data to meet customer demand. The user adds expenditure data on the menu plus expenses to operational costs incurred in managing operational management. Then, the user can see the overall report in the report analysis menu, and the last logout menu for the user leaves the application page. From testing with the black box method, the results obtained already meet the expected, and from the application testing using the UAT method, it was concluded that 80% of users agreed that the Point of sales cashier application was made following their wishes. Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions. Authors are strongly encouraged not to call out multiple figures or tables in the conclusion—these should be referenced in the body of the paper.

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