

Design and Build a Website-Based Word Template Automation System Using the Prototype Method

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Abstract

In administrative and banking environments, the use of Word templates that must be adapted to specific data before use is often necessary. The manual process of replacing data in these templates requires significant time and effort. Therefore, this research aims to design and implement an automation system that allows for the automatic replacement of data in Word templates. The method used in this research is the prototype method, enabling developers to create system prototypes that can be tested by users before further development is carried out. In the design stage, frequently used Word templates in business and administrative environments are identified and categorized. An efficient and accurate data replacement algorithm is then designed and implemented using a suitable programming language. The resulting automation system is designed in the form of a website, allowing users to input data to be filled into the template. Users can also preview the input data before downloading the customized Word file. The results of this research are expected to reduce the time and effort required to replace data in Word templates manually. The implemented automation system in the form of a website provides flexibility and ease of use for users who want to replace data in their Word templates. The prototype method allows for iteration and adjustment of the system based on user feedback, thereby increasing satisfaction and effectiveness in system use.

Keywords: Automation system, Word template, Website, prototype method, data replacement

1. Introduction

The development of information technology has significantly impacted the world of business and administration. Technology plays a crucial role in various human activities, particularly with the widespread use of computers for document typing and internet access due to its user-friendly applications [1]. One continuously evolving aspect is the use of Word templates in daily activities, especially in the banking environment, particularly for customer letters. However, the manual process of replacing data in a Word template often consumes a considerable amount of time and effort. To overcome this challenge, there is a need to develop an automation system capable of swiftly and efficiently replacing data in Word templates.

In this context, this research aims to design and implement a website-based automation system using the prototype method. The prototype method was chosen because it allows developers to create a system prototype that can be tested by users before carrying out further development. This allows for iteration and adjustment based on user feedback, thereby increasing satisfaction and effectiveness in system use.

The system produced in this research is designed to allow users to input the required data and then automatically replace the data. An efficient and accurate data replacement algorithm has been designed and implemented using the PHP programming language with the help of the PHPWord library. This system also provides services for managing files resulting from data replacement, which in research are claim letters, and users can download letter files based on adjusted data.

The implementation of a system developed using CodeIgniter can also facilitate users in accessing all information from organizations or agencies [2]. Moreover, it can be utilized to streamline data processing [3].

The research aims to reduce the time and effort needed for manual data replacement in Word templates. The automation system implemented in the form of a website provides flexibility and ease of use for users who want to replace data in their Word templates. The prototype method provides the opportunity for better testing and adjustment of the system, thus improving its quality and effectiveness of use.

2. Research Methodology

2.1. Data Collection

Data is a fundamental aspect of research as it significantly influences the quality and outcomes of the study [4]. Data collection is a systematic and standardized procedure for obtaining the required data [5]. In this research, data collection is conducted using three methods:

- Studies Literature:** This technique involves collecting data based on literature related to the research object as the theoretical foundation. The focus was on the automated creation of letters using a template.
- Direct Practice Method:** This technique involves collecting data directly. Direct data collection occurred at Bank BRI Branch Kendari Samratulangi, Anduonohu Unit.
- Interview Method:** This technique involves interaction between the researcher and respondents. Including CS KUR employees and the Head of Bank BRI Branch Kendari Samratulangi, Anduonohu Unit, discussed activities in the office.

2.2. System Development

The development method employed in this research to create a website-based Word template automation system is the prototype method. This method serves as an effective means to gather feedback on the proposed system and elucidate how the system is designed to meet user information needs [6]. Figure 1 illustrates several stages in software development using the prototype method.

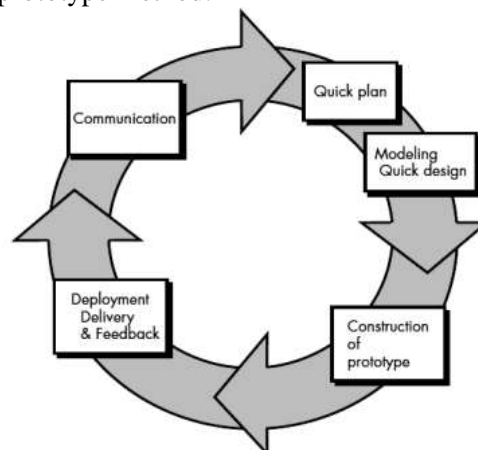


Figure 1. Prototype Method

Based on the stages of the prototype method presented in Figure 1, this research will undergo several stages, including:

- Communication:** This stage collects user needs and problems to obtain a comprehensive outline of the system to be created.
- Quick Plan and Modeling Quick Design:** Focus is placed on the system's appearance and the outputs used by the user.
- Construction of Prototype:** In this stage, the planning model from the previous steps is constructed.

- d) Deployment, Delivery, and Feedback: The results from the previous stages are submitted to the user for testing and evaluation. Feedback received serves as a reference for refining the prototype to produce a system that aligns with user needs [4].

3. Result & Discussion

3.1. System Design

Following the analysis of requirements in the first stage, developers proceed to design the system rapidly based on the information received.

3.1.1. Use Case Diagram

The use case diagram designed by the author serves as a visualization of the interactions between actors and the system under construction. This diagram specifically illustrates what actions actors can perform within the system [7].

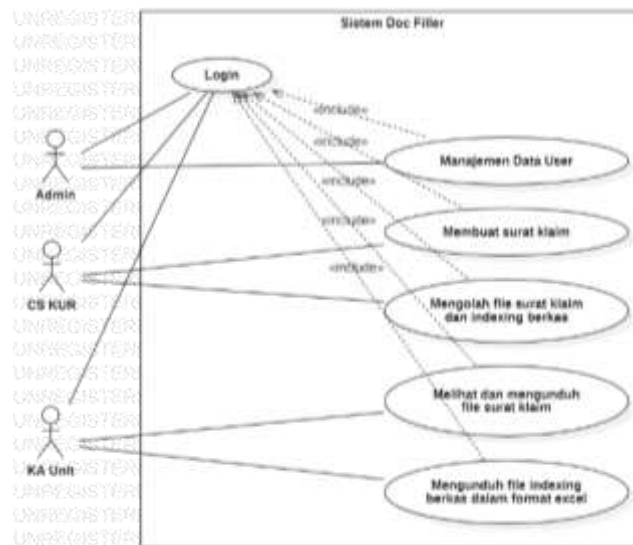


Figure 2. Use Case Diagram

3.1.2. Activity Diagram for Login

The Activity Diagram is a workflow in the operation of a system and is used to describe the visual flow of the system [8].

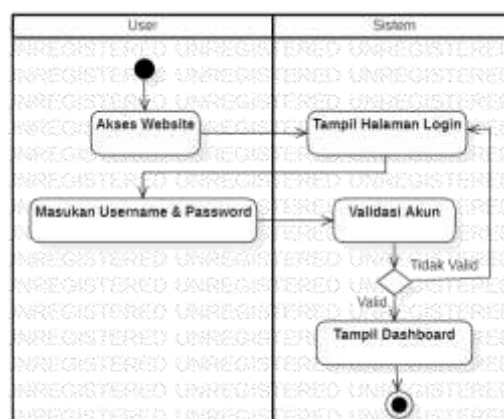


Figure 3. Activity Diagram for Login

3.1.3. Activity Diagram for User Data Management

In the development of this system, users are divided into three levels. The first level is the admin, who in this case can manage user data.

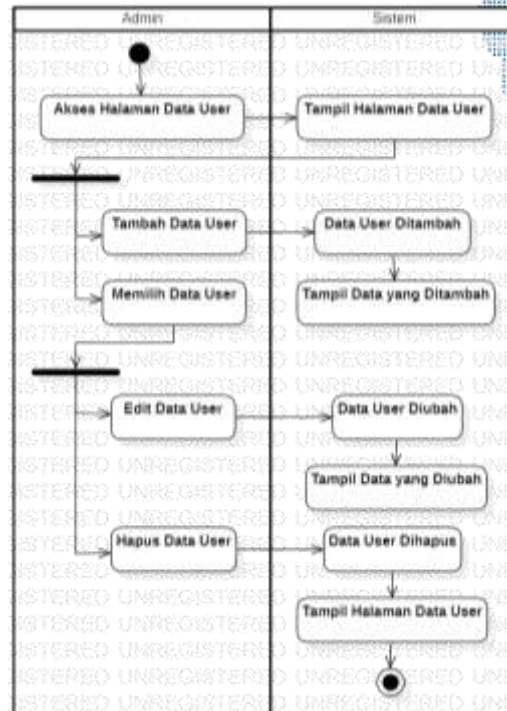


Figure 4. Activity Diagram for User Data Management

3.1.4. Activity Diagram for Processing Claim Letter

The second level of system users is the CS KUR, who can manage claim letter data. In this activity diagram, the automation system for Word template on claim letters is implemented.

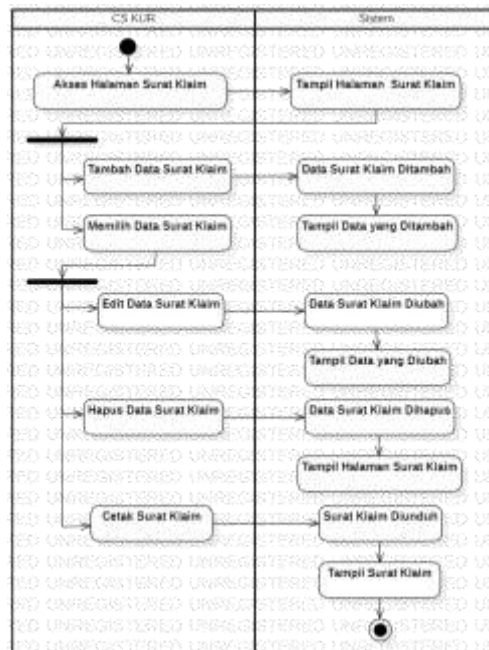


Figure 5. Activity Diagram for Processing Claim Letters

3.1.5. Activity Diagram to View and Download the Claim Letter

The third level of system users is the Head of Unit, who can only download claim letters in Word format, which are the results of input from CS KUR.

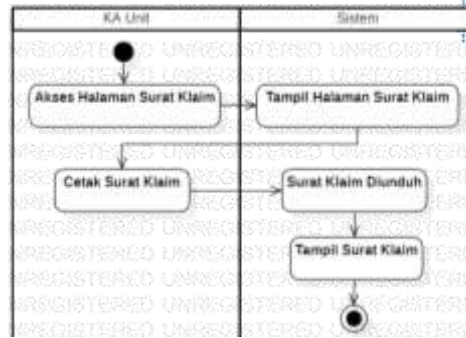


Figure 6. Activity Diagram to View and Download the Claim Letters

3.1.6. Class Diagram

Class Diagram describes the structure of a specific system through the modeling of classes, attributes, and their relationships [8]. The developer creates a Class Diagram designed based on the previously designed Use Case Diagram.

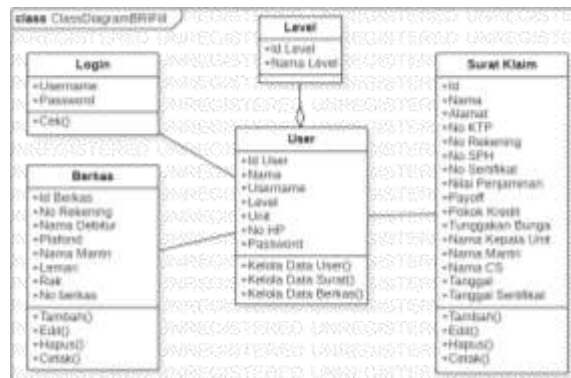


Figure 7. Class Diagram

3.2. System Display

3.2.1. Login Page

The login page is the page used by users to log into the system, which will then be directed to the dashboard page.

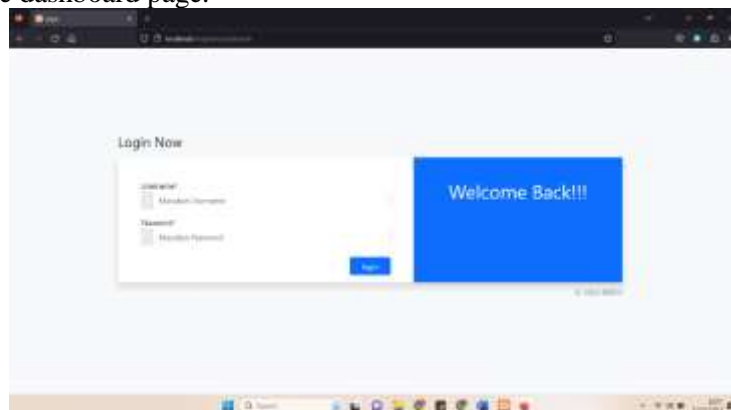


Figure 8. Login Page Display

3.2.2. Dashboard Page

The dashboard page contains information about the purpose and benefits of this automation system. This page can be accessed by users at all levels.



Figure 9. Dashboard Page Display

3.2.3. User Data Page

The user data page will only appear after the login process for user level 1, which is the admin. This page contains user information.



Figure 10. User Data Page Display

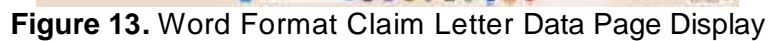
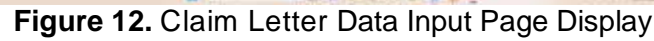
3.2.4. Claim Letter Data Page

In the form menu, there are 2 options. The first option is the claim letter data page, which can be accessed by user level 2.

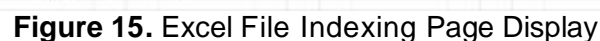
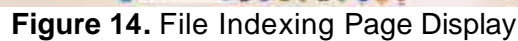


Figure 11. Claim Letter Data Page Display

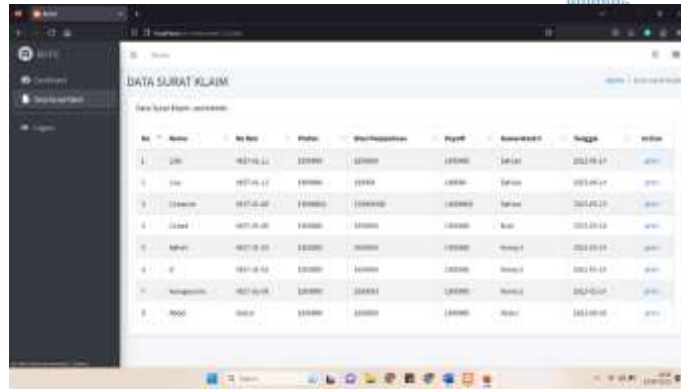
The data on this page will be used in the process of creating a claim letter. It starts with CS KUR entering customer data that will be used in the existing claim letter template. When CS KUR prints one of the customer's data, the result obtained is a claim letter file in Word format that already contains the data of the respective customer.



This page is the second form that can be accessed by user level 2, used to view the location where customer files are stored, facilitating the file search process.



On this page, only user level 3, namely the Head of Unit, can access it. Used to view customer data and download customer claim letters in Word format.



No	Nama	No Sur	Status	Wf/Presidensi	Wf/Pres	Status/Pres	Tanggal
1	CS	167145.11	100000	100000	100000	100000	2023-05-17
2	CS	167145.12	100000	100000	100000	100000	2023-05-17
3	CS	167145.13	100000	100000	100000	100000	2023-05-17
4	CS	167145.14	100000	100000	100000	100000	2023-05-17
5	CS	167145.15	100000	100000	100000	100000	2023-05-17
6	CS	167145.16	100000	100000	100000	100000	2023-05-17
7	CS	167145.17	100000	100000	100000	100000	2023-05-17
8	CS	167145.18	100000	100000	100000	100000	2023-05-17
9	CS	167145.19	100000	100000	100000	100000	2023-05-17
10	CS	167145.20	100000	100000	100000	100000	2023-05-17

Figure 16. Claim Letter Data Page Display for Head of Unit

3.3. Prototype Testing

Testing for this Word template automation system is conducted using the Black Box method by reviewing the execution results through test data and the functional capabilities of the software [9]. The following are the results of the system testing.

Table 1. Black Box Testing

No	Testing Scenario	Test Case	Output	Testing Result	Note
1	Login Admin	Enter the Admin Username and Password	Access the admin dashboard after logging in as an admin	According to expectations	Valid
2	Login CS KUR	Enter the CS KUR Username and Password	Access the CS KUR dashboard after logging in as CS KUR	According to expectations	Valid
3	Login KA Unit	Enter the Head Unit Username and Password	Access the Head Unit dashboard after logging in as the Head Unit	According to expectations	Valid
4	Log Out	Press the Logout Button	Return to the Login Page	According to expectations	Valid
5	Print	Press the Action Print	Automatically download the letter template based on the inputted data	According to expectations	Valid
6	Read	Select one of the data you want to view	Displaying the information page for the data	According to expectations	Valid
7	Update	Press the Action Update	Displaying the information page for the data along with the changes that have been made	According to expectations	Valid
8	Delete	Select one of the data you want to delete	Deleting data	According to expectations	Valid
9	Create	Create New Data	Accessing the Data Input Page	According to expectations	Valid
10	Excel	Press the Action Excel	Automatically downloading the Excel File.	According to expectations	Valid

Based on the Black Box testing results in the above table, it can be concluded that each function included in the testing scenarios has produced results consistent with expectations, indicating that the Word template automation system is ready for use.

4. Conclusion

The results of this research indicate that this automation system provides an effective and automated solution for crafting claim letters, replacing the manual data entry process. The automation system is ready for implementation by relevant users involved in the

claim letter creation process. The testing results align with the envisioned functionalities and user requirements. By integrating user-friendly web-based features with the prototype method, this automation system enables users to quickly and accurately generate claim letter documents. During system testing, some features were still limited. Hence, it is anticipated that future researchers working on similar automation systems will consistently consider user needs.

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