

Digital Transformation of Refillable Water Services Using the Easy Galon Android-Based System

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ABSTRACT

The advancement of technology in this period has been exceedingly swift. The plethora of emerging innovations compels individuals to remain current. The selling of gallons constitutes a significant and prevalent industry, prompting numerous gallon enterprises to transition to an online sales model via mobile applications. Consequently, the researchers choose to develop an innovative and user-centric Gallon Refill Water Sales Application. This article elucidates how the Gallon Refill Water Sales Application has enhanced efficiency and ease in the purchasing process. This program enables consumers to swiftly and effortlessly order gallons via their mobile devices. Users can see the inventory of available products, preferred brands, and execute payments using the COD (Cash On Delivery) method.

Keywords: *Gallon business, Mobile application, Easy Gallon, Refill water, Efficiency*

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I. INTRODUCTION

The development of technology in this era has reached an extraordinary level of sophistication and advancement. This fact is evidenced by the emergence of various innovations, both simple and complex. Meeting daily needs, including the minimum water requirement, is contingent upon convenience and efficiency in this fast-paced and dynamic era[1]. One of the basic human needs is clean water, and the use of gallons has become a common solution to ensure an adequate water supply at home, in the office, or elsewhere[2].

However, the conventional process of ordering gallons often takes time and presents various obstacles for customers[3]. Starting with the search for the appropriate gallon depot contact number, the subsequent communication, the anticipation of order confirmation, and the coordination of delivery, each of these stages can become burdensome and problematic[4]. Therefore, we understand the importance of providing practical and efficient solutions for consumers. With that goal in mind, we decided to create an innovative and user-friendly gallon ordering application.

One of the platforms that is often used is the Android platform. Android is a popular operating system widely used by smartphone users around the world[5]. By using the gallon ordering application on the Android platform, customers can easily place gallon orders directly from their smartphones without the hassle of searching for the depot's contact number or contacting them manually[6,7]. This application is expected to make the process of ordering gallons faster, more efficient, and more convenient for customer[8]s. In addition, this application can also help gallon depots improve their service and operational efficiency.

Our Refill Water Sales Application (Easy Galon) aims to eliminate the hassle of ordering gallons by providing a platform that is convenient, fast, and accessible anytime and anywhere. By using this application, consumers can easily refill their gallons, view available product options, place orders, choose a suitable delivery time, and even track the status of their orders in real-time. With the presence of the Refill Water Sales Application (Easy Galon), we hope to provide convenience, comfort, and satisfaction to consumers. We are committed to continuously developing and improving this application according to user feedback and needs.

II. METHODS

This research employed the literature review methodology. The literature review method is an efficient approach for collecting information from many sources pertinent to the research subject[9]. This strategy enables us to provide a thorough comprehension of the research issue and substantiate our conclusions with credible references. The phases involved in the creation of the Android-based Refillable Water Sales Application (Easy Galon) are as follows:

A. Planning

Planning Stage, which includes the foundation of research and the formulation of application development strategies.

B. Analysis

During the Analysis Stage, the researcher identifies relevant information by sourcing data, including magazines associated with the sale of replenishing water.

C. Design

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D. Coding

The Program Coding Stage necessitates that the researcher constructs the program code in accordance with the previously defined design.

E. Implementation

Implementation During this phase, the researcher incorporates the application into the employed program. A trial is thereafter conducted by installing the application on a mobile device.

III. RESULT AND DISCUSSION

A. Requirement Analysis

1) User Interface

The user interface of the application is developed using GUI standards. Each user (admin and customer) will be taken directly to the login page the first time they open the application to authenticate by entering the username and registered password in the application. On the login page, there will be a register button to switch to the register page where users who

are not yet registered can create an account. Then, proceed to the homepage for each user level. The homepage will display a catalog of gallon brands that can be ordered along with price information. There is a transaction page that will contain the order history and the estimated delivery status of the gallon by the driver. There is also a profile page that will contain settings related to the user's account.

2) Hardware Interface

Positioning Figures and Tables: Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation "Fig. 1", even at the beginning of a sentence.

3) Software Interface

The software used in the application is the Android system with a minimum version of 5. (Lollipop), (Lollipop), while the development of this application uses Windows 10 as the computer operating system and Android Studio as the SDK.

4) Communication Interface

The software to be built will use a communication interface for process security. on several features. The type of communication interface specification in the developed application is client communication interface. On the client side, the process involves making a request to the server to retrieve data. Therefore, the interface needed on the client side is a communication device that allows the client's smartphone to connect to the internet network.

B. Design

After conducting a needs analysis, the next step is software design. To support the effectiveness of the refill water sales application (Easy Galon), a Data Flow Diagram (DFD) is needed. DFD is a diagram that illustrates the flow of data within a system, including processes, the data used, and interactions between those components[10]. DFD will help in designing the communication interface between the client and server, as well as ensuring that the data request process runs smoothly. With the presence of DFD, developers can ensure that the application functions efficiently and meets user needs effectively. Here are the steps in the creation process as follows:

1) Architectural Design

The architectural design of the Easy Galon application delineates the relational dynamics among customers or users, the application system, and gallon distributors during the transactional process facilitated by the Easy Galon application. Clients utilizing the Easy Galon application can execute gallon order transactions, which will be managed by gallon distributors likewise integrated into the Easy Galon application system. The architectural design is presented in Fig. 1

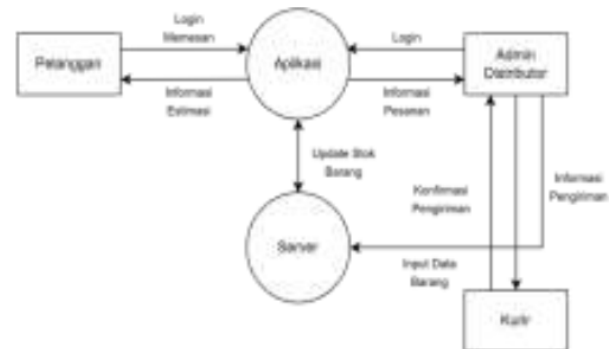


Fig. 1. DFD Level 0

2) Description Decomposition

Description Decomposition is the next step in the process of creating the Easy Galon application. At this stage, the application is divided into smaller components that are easier to manage and develop. Each component has its own tasks and functions, making it easier to develop the application as a whole. With the presence of decomposition, developers can focus on the development of each component separately, thereby improving the efficiency and quality of the Easy Galon application.



Fig. 2. DFD Level 1

C. Implementation

In this section, the application design will be implemented by creating the user interface of the application pages and coding using Android Studio tools. Implementation is the stage of application based on the results of system analysis and design in software where the application is ready to be operated in real conditions so that it can be determined whether the created application can truly produce output that meets the desired objectives.

1) Appearance of the splash screen

The splash screen is created as the initial page that will appear when the application is first launched. This page is set to display for 3 seconds before transitioning to the next page, which is the login page shown in Fig. 3.



Fig. 3. Splash Screen

2) Login page display

On the login page Fig. 4a, users are asked to enter their registered username and password, then click the login button to access the main page of the system/application. On this page, there is also a 'registration' button that will take the user to the registration page to create an account if the user does not already have a registered account. Here is the appearance of the registration page presented in Fig. 4b.



Fig. 4. Display page a) login, b) registration

3) Home page display

The home page is the main dashboard of the application. On this page, 6 features offered by the application are displayed alike Fig. 5.

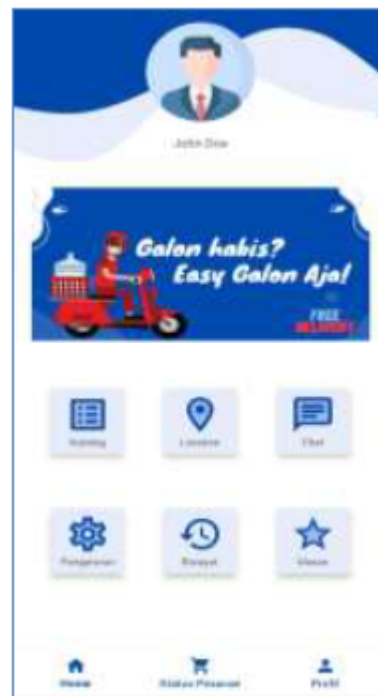


Fig. 5 Home Display

a) Catalog Feature

In the catalog feature, customers can view the details of the gallon products offered by the depot and can place an order directly by pressing the buy button. The response that the system will provide when the user

presses the buy button is to display the order detail form page show on Fig 6.



Fig. 6 Catalog Feature

b) Location Feature

In the location feature, users can view and add addresses they want to use show on Fig 7..



Fig. 7 Location Feature

c) Chat Feature

In the chat feature, users can send a message directly to the depot admin.

d) Setting Feature

The settings feature will contain configuration options like those in general applications.

e) History Feature

In the catalog feature, customers can view the details of the gallon products offered by the depot and can place an order directly by pressing the buy button. The

response that the system will provide when the user presses the buy button is to display the order detail form page show on 8.



Fig. 8 History Feature

f) Review Feature

In the review feature, a rating bar is provided that can be filled out by users regarding their satisfaction with using the Easy Galon application.

4) Transaction status page display

The order status page will contain detailed information about the ongoing transaction, where the order status will be continuously updated by the server in real time show on Fig. 9.



Fig. 9 Transaction Feature

5) Profile page display

On the profile page, users are given full rights to manage their accounts show on Fig. 10.

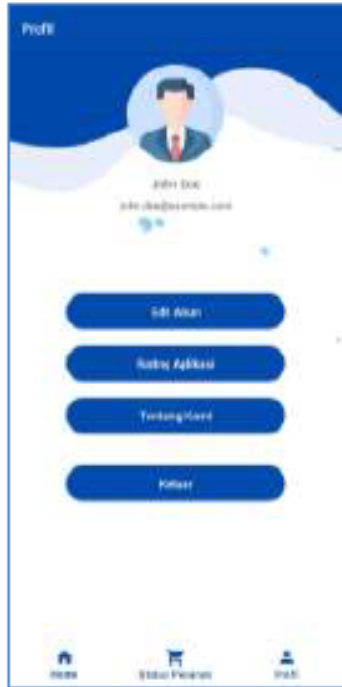


Fig. 10 Profile page display

D. Testing of System by User

The Easy Galon Refill Water Sales Application using direct questionnaires. The results of the questionnaire consist of 20 respondents. The rating scale for the Easy Galon Water Refill Application created is as follows: 1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very Satisfied. The evaluation results from 20 respondents are shown in Table 1.

Table 1. Assessment of the system

No	Items	Assesment Value (%)				
		1	2	3	4	5
1	Interface display	0,15	1,5	1,94	46	50,5
2	Application Response	0,3	0,5	2,5	31,3	69,4
3	Overall application	0,2	0,8	3,6	43,5	51,9

Table 1 illustrates the system evaluation across three criteria: interface display, application response, and overall application. The results reveal strong user satisfaction, particularly in the application response, where 69.4% of users rated it as 5 (very satisfied). This indicates excellent system speed and responsiveness. The interface display also performed well, with 50.5% of users giving it the highest score, suggesting an intuitive

and appealing design. The overall application received 51.9% at level 5, reinforcing a generally positive user experience.

These findings align with those of Li et al. [11], who reported that systems with responsive performance and clear interfaces significantly increase user satisfaction and engagement. In their study, systems with over 60% satisfaction in response time were considered highly efficient. Therefore, this system demonstrates a comparable, if not superior, performance, particularly in responsiveness, which is critical for user retention and usability..

IV. CONCLUTION

This research successfully developed a Refill Water Sales Application (Easy Galon) that facilitates user ordering and refilling of the appropriate gallon via the accessible menu. The procedure for ordering a gallon is straightforward, and the system will do validation prior to processing the user's request. This application has undergone testing to assess its features prior to usage. The recommendation for future study is to enhance the application by offering a broader range of menu selections. Furthermore, the application can be enhanced by integrating a capability to locate the nearest water depots and by including supplementary digital payment methods.

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