Website-Based E-Pharmacy Application Development to Improve Sales Services Using Waterfall Method
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Abstract- An online shop is a way of trading and shopping online via the internet. Online sales in the business sector will significantly help reduce operational costs, especially for customer activities; in its contribution to commerce, online sales can also increase selling power and widely facilitate the marketing of a product. “Seger Waras” Pharmacy is an agency engaged in the business of selling medicines and medical equipment. “Seger Waras” Pharmacy requires an online sales website or online store, which is intended to maximize service to existing or new customers. Therefore, the authors research the design of web-based drug sales systems at the “Seger Waras” Pharmacy. This study aims to increase the revenue of the relevant agencies and provide complete information about drug use to customers. Data collection methods use observation and interview methods for system modeling using Data Flow Diagrams, Entity Relationship Diagrams, and Context Diagrams. The software used by MySQL as a database server, Apache as a web server, Sublime Text 3 for writing PHP and HTML programming languages, and Bootstrap as a framework. The result of the system that has been completed is an online store application that makes it possible to sell and purchase drugs online; the online shop at the “Seger Waras” Pharmacy can increase sales turnover and promote business.

Keywords: augmented reality; education; engineering; mobile learning; technology acceptance

I. INTRODUCTION
There are many technology applications in the business sector, one of which is e-commerce[1]. E-commerce in the health sector was developed with an online pharmacy (e-pharmacy) [2]. One of the pharmacies currently developing is the Pharmacy “Seger Waras” that sells medicines and medical equipment, where every day there are conventional (manual) buying and selling transactions. The increase in the number of requests and transactions makes the Pharmacy “Seger Waras” maximize service performance to customers and improve its work scheme by creating an Online Pharmacy. As with previous studies related to the development of online pharmacies [3] - [6]. Today’s online pharmacies (pandemic COVID-19 [7], [8]) are very useful and necessary [9] - [11]. The development of an online pharmacy uses PHP programming and MySQL database [12], [13], which adopts the concept of System Development Life Cycle (SDLC). The development carried out starts from analysis, design, implementation, and maintenance [14], [15]. The online application of this system can impact the buying and selling process in particular pharmacies. However, each pharmacy has different rules and business processes, so that when implementing it, it has procedures and guidelines that are tailored to the place.

II. METHODOLOGY
This study uses a website-based design on the information system development method. The objects used are the sale and purchase transactions of drugs and the storage of drug stocks from the Pharmacy “Seger Waras”. Data collection was carried out using three concepts, namely: interviews, observation, and literature study. Thus, the result is a research process with system design, database design, interface design, and implementation.

System design aims to provide a general and precise description or modeling of a system to make it easier for users to process the created and implemented data. The online pharmacy process flow is explained using the Data Flow Diagram (DFD) method and an overview of database design using the Entity-Relationship Diagram (ERD). Database design discusses entity-relationship diagrams, relationship tables, and table structures. In the drug stock itself, the table is needed for the product, category, type, stock, purchase, date, and needs using sales reports, purchases, and invoices.

Process Design is processing input data into information or knowledge. Once processed, the resulting data must have informative value when stated and packaged in an organized and neat manner. The drug data is processed into inventory information. Output design is the result of data processing that has been done in the form of reports that will be addressed to the user. Implementing the system is expected to make it easier for users to monitor drug supplies in pharmacies.
Program testing in this web application is carried out by the developer and the user to provide data to be processed. The things that are of concern in testing are as follows:

1. Website can make input based on drug code, the same type, and name of goods may have different drug code with attention to the first in first out and validity period of the drug.
2. Test the data structure and access the database with valid data.
3. Discussion process with users so that the system can run properly according to field needs.

In this study, the method used is the waterfall method, where this method is a classical model that is systematic, sequential in building software. The waterfall model or Linear Sequential Model is often called the "Classic Life Cycle" [18]. Winston Royce first introduced this model around 1970, so it is considered outdated, but it is the model most widely used in Software Engineering to date. The waterfall method's essence is that the work of a system is carried out sequentially because it is completed step by step, which must wait for the completion of the previous stage (Figure 1).

![Image: The waterfall method process flow from Pressman (2010) [18].](image)

Interface design uses an API (Application Programming Interface). API is an interface built by system developers so that part or all of the system functions can be accessed programmatically [21]. API can also be analogous to software with an interface, where the interface is used to access all resources or instructions in the software. With the API, the software can interact with other software with specific instructions or rules to access resources through an existing interface.

### III. RESULTS AND DISCUSSION

#### 3.1. System Analysis

In system analysis, there are two analyzes, namely the running system and requirements. The Pharmacy "Seger Waras" only serves the purchase of products directly with customers coming to the pharmacy or order via WhatsApp messages. All data on sales and purchase transactions of drugs are even recorded in books.

During its development, the pharmacy owner requested a web-based sales application for "Seger Waras" Pharmacy. This website hopes that the marketing of products from the Pharmacy Seger Sane can be more widespread and can increase sales. In developing the online pharmacy, the system requires several functional and non-functional requirements, as shown in Table 1.
3.2. System Design

The system design was carried out by designing the ERD and DFD. ERD is a tool used to model data structures by describing entities and relationships between entities (relationship) abstractly (conceptually). ERD is used to describe the relationship between data in the database, as seen in Figure 3. Data Flow Diagram (DFD) Level 1 describes the data flow and data storage flow from the system to the database. The data flow diagram (DFD) level 1 describes the access rights of the admin and customer of the Pharmacy Seger Sane. Admin can process master data, transaction data, access reports, while customers can access drug information, make orders and pay transactions, as shown in Figure 4.

![Figure 3. ERD online pharmacy “Seger Waras”](https://www.edxjl.com/ijiar)
Data flow diagram (DFD) level 2 process 1 is a master data processing with 6 data processes. The first process is admin data processing, second product data collection, third customer data collection, fourth category data collection, fifth type data collection, and finally supplier data collection. The master data is stored and displayed by the system later. DFD level 2 process 1 is shown in Figure 5.
CONCLUSION

This research produces a prototype and design of an online pharmacy development using a website. Based on the discussion that has been conveyed, the application developed can make it easier to search for drugs and their descriptions such as content, uses, how to use, and visuals of the drug being searched. Besides, the “Seger Waras” Pharmacy Website can make payment transactions with a payment gateway service. Thus, the customers can choose to pay online via bank transfer or offline via Indomaret or Alfamart. Likewise, in reporting, pharmacies can know the details of sales clearly and accurately. This prototype will still be developed with the concept of mobile application and additional features for calculating profit and loss and prediction.

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