INTRODUCTION

Information technology is increasingly advancing and developing all the time and has a crucial role in all aspects of life, one of which is for service providers, including computers [1]. Computers are a form of advances in electronics and information technology, the function of the computer itself functions as a tool for writing, drawing, editing images or photographs, or as a means of storage [2]. The computer may encounter several problems when operating both in software and hardware. To overcome the obstacles faced, users prefer to repair the unit rather than buying a new unit. The repair itself attempts to restore the condition and function of objects or tools that are damaged due to use; in this case, the repair does not require a new condition again [3]. Sometimes some computer products on the market provide official service places that are difficult to reach so that users are reluctant to repair them, which in the end, users prefer public service places. However, some users know that if their computer is repaired in a public place, it is risky because there is no clear information on repair costs and damage information.

Android is an application with smart-phone technology that is currently being discussed. This operating system is based on a modified Linux kernel so that it is suitable for use on cell-phones or other handheld devices [4]. This system has various advantages as computer code-based software that can be openly licensed (open source) to create applications or develop them. This makes Android suitable for supporting mobile-based ordering applications [5]. If seen, on the other hand, the development of the telecommunication industry is experiencing problems in a vast territory scope with the availability of mobile broadband infrastructure, especially in Indonesia [6].

Previous research adopted was the success of system development using object-oriented vehicle service information systems at KFMP workshops that can process data, make reports easier and more efficient, and present accurate, relevant, and timely information to make management decisions [7]. The success of the weighted product method applied to the recruitment of CNC machine operators results in a more objective and accurate system [8]. Classification of damage with backpropagation neural networks on the surface of Solar Panels with
a statistical method that is applied to the Artificial Neural Network by testing samples with an accuracy of 90 percent, so it is hoped that it can be detected earlier to see the occurrence of damage from the solar panel [9].

Some of the problems identified include user difficulties in overcoming computer damage to determine whether to repair or buy a new unit, difficulty in reaching authorized service providers, risks when deciding to repair at a public service place, and limited access to information and costs repairing computer damage. With the above background and prior research, this research specifically designs an Android application-based computer service application that makes it easier for people to get service services. The above research results formulate computer repair services using an Android-based platform with Android Studio and MySQL as the database for this study. This application is expected to be useful for customers in terms of time and cost.

LITERATURE REVIEW

System design is done to describe, plan, and make sketches or arrangements of several separate elements into one complete and functional unit. Hereinafter, information system design could apply to various types of specific company industries [10,11]. Specifically, application design is a set of modeling conventions used to define or describe a software system associated with objects, as is done in the service field of computer repair. Application design is a set of modeling conventions that are used to define or describe a software system associated with objects.

Use case diagrams to explain what the system and actors will do concerning the processes in the system. In designing the use case diagram, this will explain the things that users can do [12,13]. Activity diagrams that describe the various activity flow in the system are designed, and how each system flow begins, decisions occur, and how they end [14]. Sequence diagrams are one of the interaction diagrams that explain how an operation is performed [15].

Android is an operating system for Linux-based mobile devices, including an operating system, middleware, and applications. Android provides an open platform for developers to create their applications. Initially, Google Inc. bought Android Inc., which is a newcomer to make software for smartphone phones [16]. Then, to develop Android, the Open Handset Alliance was formed, a consortium of 34 hardware, software and telecommunications companies, including Google, HTC, Intel, Motorola, Qualcomm, T-Mobile, and NVidia [17].

Hypertext Preprocessor is an open source programming language that is very suitable or specifically for web development and can be embedded in an HTML thesis. PHP language can be said to describe several programming languages such as C, Java, and Perl and is easy to learn [18]. The working system of PHP begins with requests that come from web pages by the browser. Based on the URL or website address in the internet network, the browser will find an address from the web server, identify the desired page, and deliver all the web server's information. MySQL is a database containing one or several tables. A table consists of some rows, and each row contains one or some tables. The table consists of some rows, and each row contains one or some tables [18].

RESEARCH METHOD

This research method uses an approach to qualitative research. Data collection was carried out to analyze the information system running to identify users' needs whose information is obtained through observations and interviews with key-informant (user): this is because several procedures feel very burdensome for the user and admin because they still apply manual procedures.

The research methodology used and applied in this research includes (Fowler, F.J., 2004):

1. Library research is a data collection technique that is the priority.
2. Observation (field study) is a direct observation of the workplace. The goal is to find out the problem and what is needed by the community to solve the problem.
3. Literature study attempts to study all scientific findings that are documented in written form to support and strengthen arguments from new research or further research that we are currently doing [19].

After analyzing the system that is currently running, several problems were identified as follows:

1. Customers find it difficult to repair computers due to the lack of affordable service places.
2. Customers need time to do computer repair because computer repair services are far away and cannot be ordered online.
3. Customers find it difficult to find available services because of the lack of available information.
4. Admin has difficulty making reports.

The system design stage is described as a design for building a system and configuring
software and hardware components to produce a good system. The designed system becomes one component. This stage is done using a case diagram, activity diagram, sequence diagram, then the design of the interface, and implementing the system.

RESULTS AND DISCUSSION

Use Case Diagram of the proposed system, as follows:

![Use Case Diagram](image)

The following is a system description in the use case proposed:

1. **Actor: Customer**
   *Description: Manage accounts*
   a. Customers can see the admission
   b. Customers can change; if the data is changed, the customer will need a login password when changing the data
   c. If there is a field that does not suit your needs when you press the save button, it will be returned to the customer edit form with a certain error message
   d. Customers can change the old password with a new password

2. **Actor: Customer**
   *Description: Make an Order*
   Customers can place orders by filling in the required fields such as type, brand, type, complaint, date to meet, address to meet, and the customer will see the estimated price of the order

3. **Actor: Customer**
   *Description: Customer Info*
   a. When the system receives the order, the customer will also receive an SMS reminder on the date specified above
   b. The customer can see the status of the order he has placed
   c. If the technician has processed the unit and the customer has agreed to the price given by the technician, the customer can make a payment in the application

4. **Actor: Customer**
   *Description: Manage Payments*
   a. Orders that have been completed will send an SMS notification to make a payment
   b. There is a Payment menu, which is a menu for customers to make payments. It includes several payment methods
   c. Customers can see the status of the payment they have made

5. **Actor: Admin**
   *Description: Manage Payments*
   a. When the order is complete, the admin can see the customer’s payment status
   b. There are several payment statuses in the admin menu; if the payment status is the failure or deny, the admin can confirm the customer to make a new payment for him

6. **Actor: Admin**
   *Description: Manage Orders*
   a. Admin can change, view or delete orders at any time if needed
   b. Admin can see the order list
   c. The admin can change the customer’s order status to be carried out to the next process

7. **Actor: Admin**
   *Description: Manage Customers*
   a. Admin can see a list, change, and delete of customer data
   b. Admin can change customer data
   c. Admin can delete customer data

8. **Actor: Admin**
   *Description: Manage Technicians*
   Admin can see a list, change, delete, and add of technician data

9. **Actor: Admin**
   *Description: Manage Service Data*
   Admin can see a list, change, delete, and add of service data

10. **Actor: Admin**
    *Description: Manage Area Data*
    Admin can see a list, change, delete, and add of area data

   The following is the design activity diagram proposed, as follows:
The following is the design of a sequence diagram for repair service applications proposed, as follows:

![Sequence Diagram: customer register](image)

Figure 2. Activity Diagram: admin change password

The following is the design of a sequence diagram for repair service applications proposed, as follows:

![Sequence Diagram: customer register](image)

Figure 3. Sequence Diagram: customer register

In designing the application interface for ordering computer repair services, there are several screen display designs that will later be displayed in this application, including the following:

![Splash Screen Display Design](image)

Figure 4. Splash Screen Display Design

### Implementation

The Implementation Stage is an advanced stage of system design that will be carried out if the program system that has been made is ready to operate optimally according to needs, among others, is to implement interface design into the form of the main page, along with the scope of the application that used in its application [20]. Database stored in the cloud can allow users to accesses such as laptops, or smart-phones which are connected to the internet network [21]. The author uses a web view layout or a hybrid application, an application that is opened on any platform as long as the platform supports the browser, but the author uses the Android Studio software so that this application only opened on the Android platform. To meet the hardware specification standards for manufacturing this system, the following hardware specifications are required:

### Table 1. Laptop Hardware Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel(R) Core i7</td>
</tr>
<tr>
<td>Hard Disk</td>
<td>1000GB</td>
</tr>
<tr>
<td>RAM Memory</td>
<td>12 GB</td>
</tr>
<tr>
<td>Monitor</td>
<td>14&quot;</td>
</tr>
<tr>
<td>Mouse, Keyboard</td>
<td>-</td>
</tr>
</tbody>
</table>

### Table 2. Smart-Phone Hardware Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kernel Version</td>
<td>4.4.111-16139119</td>
</tr>
<tr>
<td>Android Version</td>
<td>9 Pie</td>
</tr>
<tr>
<td>RAM Memory</td>
<td>3 GB</td>
</tr>
</tbody>
</table>

The software used in making this system are as follows:

### Table 3. Software Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Systems</td>
<td>Windows 10 Pro</td>
</tr>
<tr>
<td>Web Server</td>
<td>- Hosting Admin rumahweb.com (PHP 5.6) - Hostinger VM Database and User Hosting (Cent OS, Lampp)</td>
</tr>
<tr>
<td>Web Browser</td>
<td>Google Chrome</td>
</tr>
<tr>
<td>Platform</td>
<td>Android Studio 3.2.1 Visual Studio Code 1.35.1 Visual Paradigm 15.2 PHP Maker 2017 Balsamic Mockup Codeigniter Framework Cyberduck FTP Xshell Midtrans payment gateway (free) Medansms SMS gateway (free)</td>
</tr>
</tbody>
</table>

Here are some interface in this application:

1. Splash screen display
The splash screen display design describes the initial appearance of the application, which contains the store logo when a new application is run.

2. Login member display

The login form display is the initial display after the splash screen for users to log in with their account.

3. Member list display

Member list form to register new users using this application.

4. Main display

The main page is an application shortcut key. This page contains main page shortcuts such as order, history, account, payment, help, and about for admin.

4. Service ordering display

The order form for reserving services determines the need, date, and determines...
the complaint of damage, and determines the address to meet.

At this stage, it is a process that is used in conducting a test analysis to suit the user's requirements. The program tested to determine possible errors in this test using White-Box and Black-Box.

Table 4. Admin Black-Box Testing

<table>
<thead>
<tr>
<th>Activity</th>
<th>Testing Scenarios</th>
<th>Expected Results</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Login</td>
<td>Clear fields</td>
<td>Login failed!</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>Fill in only the Username</td>
<td>Login failed!</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>Fill in only the Password</td>
<td>Login failed!</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>Fill in the Username and Password wrong</td>
<td>Login failed!</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>Fill in the Username and Password with the registered account</td>
<td>Enter the Dashboard Menu</td>
<td>Valid</td>
</tr>
<tr>
<td>User management</td>
<td>Add user data</td>
<td>Failed to add user data and displays the message &quot;Please enter required field&quot;</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>(the fields to be filled in are incomplete)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(completely filled fields)</td>
<td>Successfully added users and returned to the user list menu</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>(edit user by clicking the pencil icon then enter the 'Edit' menu, after editing and click 'Save')</td>
<td>The edit was successful and returned to the user list menu</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>(delete User by clicking the trash icon then the user will be deleted)</td>
<td>Delete successfully and return to the user list menu</td>
<td>Valid</td>
</tr>
<tr>
<td>Technician Management</td>
<td>Add technician data</td>
<td>Failed to add technician data and displays the message &quot;Please enter required field&quot;</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>(the fields to be filled in are incomplete)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Order Management

<table>
<thead>
<tr>
<th>Activity</th>
<th>Testing Scenarios</th>
<th>Expected Results</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If there is a new order and click the &quot;accept&quot; button and then the &quot;save&quot; button by entering the technician's name</td>
<td>Redirected to the page to confirm receipt of the order, the order status becomes &quot;waiting.&quot;</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>(complete filled fields)</td>
<td>Successfully added technicians and returned to the technician list menu</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>(edit technician by clicking the pencil icon then enter the 'Edit' menu, after editing and click 'Save')</td>
<td>The edit was successful and returned to the technician list menu</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>(delete technician by clicking the trash icon then the user will be deleted)</td>
<td>Delete successfully and return to the technician list menu</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>If there is an order with the status of &quot;process&quot; and then the technician in question provides the completed passport, then click the &quot;Finish&quot; button and redirected to the page to confirm completion of the order and then fill in the fields with the reference letter of travel</td>
<td>Redirected to the order list page, and the order status is complete</td>
<td>Valid</td>
</tr>
</tbody>
</table>
White-Box testing focuses on checking design details. Thus the White-Box testing is based on the source code of the system, which fully uses structural requirements.

Based on the test results, with the above test cases, it can be concluded that the application created is free from syntax errors and functionally produces results that the user expects.

**CONCLUSION**

With the use of an Android-based computer repair service ordering application design, the authors can conclude that: (1) The mobile applications will be able to shorten customer time in performing computer services and streamline customer time. (2) This mobile application can display the estimated cost to estimate the damage or spare parts customers need. (3) With this computer service mobile application with a dynamic display of computer service via a smartphone, it will make it easier for users to order computer services.
Suggestion for this research that: (1) this application add direct notifications to the technician to speed up the service waiter. (2) this application does not cover a large area, so only customers in certain areas can only use this application. (3) this application is basically web-based, so this application completely requires a connection to the internet.

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REFERENCES


