Android Based 'Aroma' Coffee Sales Application

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Abstract:

The need for e-commerce is primarily for business actors such as Anugerah PC, which is engaged in PC repair and sales services. Since the COVID-19 pandemic devastated the industrial world, more time has passed, and ideas have emerged to build digital-based applications, even mobile-based ones. Digital-based, for example, is the existence of an application website that is very user-friendly but needs development, such as the development of an Android mobile or iOS mobile application, depending on the operating system used by the mobile device. This research is one of the answers to this problem. Anugerah PC built a mobile-based application to answer the challenges in the current 5.0 industrial revolution era. So, with this application, Anugerah stores can get a lot of followers, especially customers who are ready to buy at Anugerah stores. Anugerah PC shop can be the best in sales through e-commerce with a very flexible Android Mobile system.

Keywords: industrial revolution 5.0, digitization, mobile applications, iOS platform, Android platform

1. INTRODUCTION

Mobile technology is now something that all people must own. Car technology is now reaching from the school level to industry, e-commerce, and education, dominating human life, especially in Indonesia. The application being built now is a car-based application specifically built for e-commerce at the computer shop 'Anugerah.' This computer shop sells all types or brands of computers and wants to make a breakthrough in customer quantity and boost the store so that it has higher income through e-commerce. This is to answer these questions and realize the dream of a gifted computer store. This system was created from programming and design planning to upload APKs or applications installed on IoS mobile and Android Mobile [1,2,3]. To be able to build this mobile-based application, it is necessary to have basic knowledge of programming and design languages, such as HTML, CSS, Javascript, frameworks, and databases needed to build this mobile-based application.

This system will be applied to the Anugerah computer shop as the admin, and the users are all customers who want to shop online at the Anugerah computer shop via mobile. This system is equipped with e-commerce to assist customers or prospective buyers in choosing quickly and quickly determining purchases that can be made on mobile. This will undoubtedly speed up the process of selling computers, PCs, or laptops with brands that are available quickly. This is the same thing done by Tokopedia and

other desktop-based e-commerce sites. Anugerah-PC Mobile is expected to become a mobile tool or software to help the public. Each mobile application is also added with security for data and application security as a whole. This is to maintain performance, data speed, access speed, and internet network communication starting from internal to external systems, namely on the server, it is necessary to have data security [4]. Android-based smartphones and IoT Platform-based devices [16, 17] also need a security system or security and data transmission settings on the server.

2. THEORY

2.1 Typescript

Microsoft is a multinational technology company that has developed a variety of products. One of the products they designed was TypeScript. Typescript is one of the various types of programming languages used to create a website or application. Typescript is also one of the most popular. What makes TypeScript popular among website and application developers? TypeScript is an open-source programming language built on top of JavaScript. Currently, TypeScript is one of the most widely used programming languages. Anders Hejlsberg designed the programming language from Microsoft and was also the C# programming language designer. The first version of TypeScript was introduced in 2012. Apart from being a programming language, TypeScript is also a tool. TypeScript encapsulates the existing programming language JavaScript. In other words, TypeScript is JavaScript with a few extra features. TypeScript uses two modules, namely internal and external.

TypeScript's internal modules are similar to namespaces as they are available in C#. This allows assigning symbols (variables, functions, classes) outside the global scope. Internal module declarations can be split into multiple files. This encourages development teams to have well-structured projects with small single-purpose files. Meanwhile, external modules are TypeScript's way of defining asynchronously loaded modules for either the node.js (commonjs) or require.js (AMD) module loading system. TypeScript also uses modules to declare APIs exposed by third parties. It does this through "internal or external ambient modules," which contain only the code and interface. This way, providing the same IDE/type checker support for code available in pure JavaScript as if it were written in TypeScript is possible. Such ambient declarations are stored in ".d.ts" files. To understand more about TypeScript and what it looks like, you can see the example code of Typescript 1 and 2:

```
interface User {
  name: string;
  id: number;
}
const user: User = {
  username: "Anugerah",
Type '{ username: string; id: number; }' is not assignable
to type 'User'.
```

```
      Object literal may only specify known properties, and
    'username' does not exist in the 'User' type.
      id: 0,
};
    ----------- Example code 1 of Typescript -----------
```

```
    interface User {
      name: string;
      id: number;
    }

    class UserAccount {
      name: string;
      id: number;

      constructor(name: string, id: number) {
        this.name = name;
        this.id = id;
      }
    }

const user: User = new UserAccount("Anugerah", 1);


    ----------- Example code 2 of Typescript -----------
```

Moreover, the data types used in Typescript are shown in table 1:

Table 1. Typescript data type

No	Type	Predicate
1	string	typeof s === "string"
2	number	typeof n === "number"
3	boolean	typeof b === "boolean"
4	undefined	typeof undefined === "undefined"
5	function	typeof f === "function"
6	array	Array.isArray(a)

2.2 Vue. Js

Currently, the website is one of the media used by various businesses in the digital era. Programming languages such as HTML, CSS, and JavaScript are needed to make the web look more modern. In addition, a framework is also required to create an interface or User Interface (UI), one of which is Vue. JS. This framework is quite popular and can be said to be quite progressive for building UIs. Vue.js is a JavaScript framework commonly used by developers to create UIs and single-page applications (SPAs). Google developer Evan you 2013 made Vue.js. Vue supports sophisticated SPA when combined with modern tools and library support. Vue.js is also lighter than other frameworks. Although a newcomer to the world of front-end development, Vue.js has succeeded in rivaling the popularity of other frameworks such as React and Angular.

```
<script src="https:///cdn.jsdelivr.net/npm/vue"></script>
<div id="root">
<p> Nama Website: {{name}}</p>
<p> Link Website: {{website}}</p>
</div>
<script>
Let app = new Vue ({
El: "#root",
data: {
Name: "Anugerah PC",
Website: "https://www.anugerahpc.co.id"
}
})
</script>
        --------------------- vue.js example ----------------------
```

2.3 Ionic Framework

A framework is a set of resources and tools for software developers to create and manage web applications, web services, and websites. Web development frameworks can be built on top of predefined infrastructures such as Linux, Apache, MySQL, and PHP stacks. Ionic is one of the best frameworks for building Android and iOS applications. Ionic framework is a free, open-source front-end SDK framework that allows you to build mobile-based apps for iOS, Windows, and Android [5,6,7,8,9,10] phones using the same code base. This proves that Ionic can be a cross-platform mobile development tool. This tool lets you create hybrid Android and iOS apps. With this platform, you can create web and mobile applications using languages such as HTML, CSS, Javascript, Angular, and TypeScript. Ionic has a collection of components that provide mobile platform functionality. Apart from functionality, Ionic offers different behaviors. Ionic provides efficient performance with minimal DOM manipulation. This framework includes a command-line interface that lets you build Android [11,12,13,14,15] and iOS apps, saving you the hassle of programming. The Ionic framework mainly focuses on the front-end user experience or UI interactions that take care of the overall look and feel of the App. Ionic is easy to learn and integrates with other libraries and frameworks like Angular and Cordova. The framework can also be used independently without a front-end framework by including simple scripts.

Fig 1. Ionic Framework

2.4 Cascading Style Sheet (CSS)

CSS is the Cascading Style Sheet language and is usually used to control the appearance of elements written in a markup language, such as HTML. CSS serves to separate content from its visual appearance on the site. CSS was created and developed by the W3C (World Wide Web Consortium) in 1996 for a simple reason. In the past, HTML was not equipped with tags that functioned to format pages. It would help if you wrote the markup for the site. Labels, like <font>, were introduced in HTML version 3.2, and when they did, they caused many problems for developers. Because websites have various fonts, background colors, and styles, rewriting code requires a very long and challenging process. Therefore, W3C created CSS to solve this problem. HTML and CSS are closely related. Because HTML is a markup language (website foundation) and CSS fixes style (for all aspects related to website appearance), these two programming languages must go hand in hand.

```
<!DOCTYPE html>
<html>
<head>
  <title>Contoh Internal CSS</title>
  <!-- penulisan internal css dalam tag head -->
  <style type="text/css">
    p{
      font-family: serif;
      line-height: 1.75em;
      font-size: 18px;
    }
```

```
        i {
          font-family: sans;
          color: orange;
        }
      </style>
    </head>


    <body>
      <!-- penulisan internal css dalam tag body -->
      <style type="text/css">
        h2 {
          font-family: sans;
          color: #333;
        }
      </style>
      <h2>Ini judul artikel</h2>
      <p>Toko   Komputer   dan   Service   Anugerah   <i>internal
    css</i>.  Seperti namanya, <i>inline CSS</i> adalah kode
    CSS yang ditulis langsung dalam file HTML.</p>
    </body>
</html>
----------------------------------- CSS Example -----------------------------------
```

2.5 Mobile App Performance

Figure 2 shows the 3 Pillars of Mobile App Performance; the first is device performance. The better the performance of the devices or mobile phones, the faster the devices work. e.g., having large RAM, ROM, large VGA, and other components such as Display/ Screen (Display), Battery, 'System-on-a-chip' or SoC, Memory (RAM), and Storage (ROM), Modem, Camera, Sensors, and other Components.
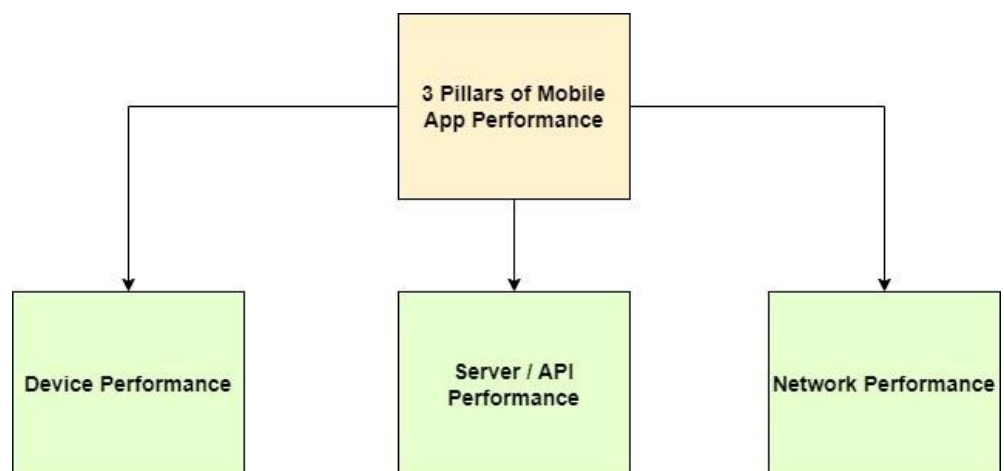

Fig 2. Pillars of Mobile App Performance

In addition to hardware or devices, the API server and network influence the quality of using Android OS [18,19] or iOS OS software. The greater the available bandwidth, the faster the performance of the mobile system. For components inside the cellphone, we are familiar with the WiFi module. WiFi is usually used to receive internet signals.

- App Start-Up: How long does it take for your application to start up? This is the first performance parameter that users assess. As a rule of thumb, the first screen displays within 1-2 seconds once the user taps on the app icon.
- Battery Time when using apps With constant use, some mobile apps consume a lot of battery life and heat up the phone. This factor dramatically adds to the performance of any mobile app and can usually occur when your App uses more resources than needed. Excessive resource usage loads the processor, and the phone heats up.
- Memory Consumption When Testing apps, memory consumption by apps should be checked. By implementing certain functionality in the application, memory consumption also increases. For example, when push notifications are implemented in an Android application, memory consumption increases. In some cases, it has been observed that the memory usage by the whole OS is only 14%, but new apps are consuming 11%. So, these factors must be addressed before deploying the application to the real world or providing it to clients.
- Hardware/Software Variations When testing mobile applications, checking the application on different devices is mandatory. It could be that the App runs smoothly on one device but not on another. As for various Android device vendors [20,21,22,23], we could check the App on Samsung, HTC, and Lenovo phones. Similarly, apps need to be tested with different RAM and processor specifications, like 1GB or 2GB.
- Use with Other Applications When the application under test runs in parallel with another application, there should be no interference. The best way to check is to replace the App under test with another app.
- Applications in the background: Applications running in the background are retrieved. They must remain in the same state as before. If this scenario is not handled properly, data will be lost. Again, you have to enter data from scratch when fetching the App.

Furthermore, regarding mobile app and website use, it turns out that mobile app use has reached 23.1%, exceeding the website's 19.6%. Indeed, it is not significantly controlled by the mobile App. But this is possible because the Mobile App is more flexible than the website regarding flexibility, interface display, and dynamic. Figure 4 is the Top Application Data downloaded by users around the world.
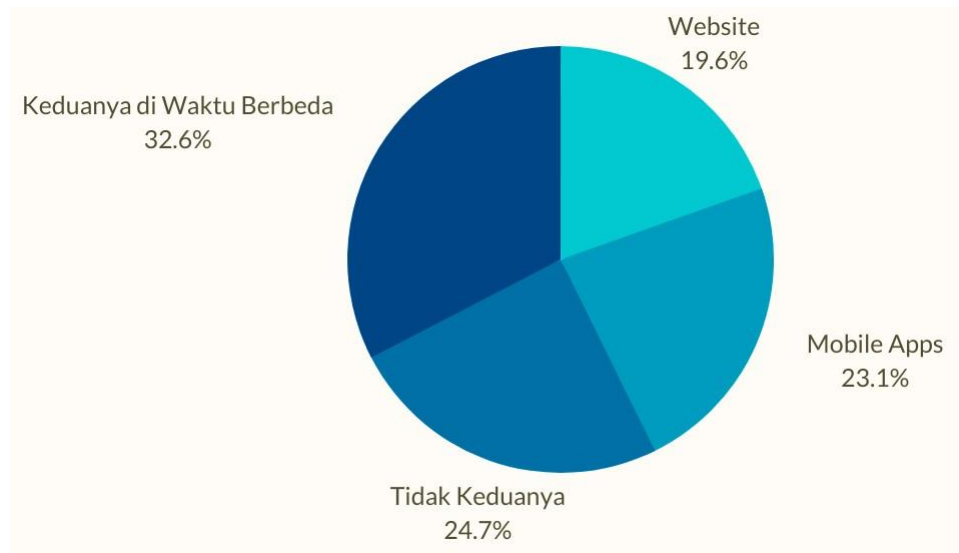
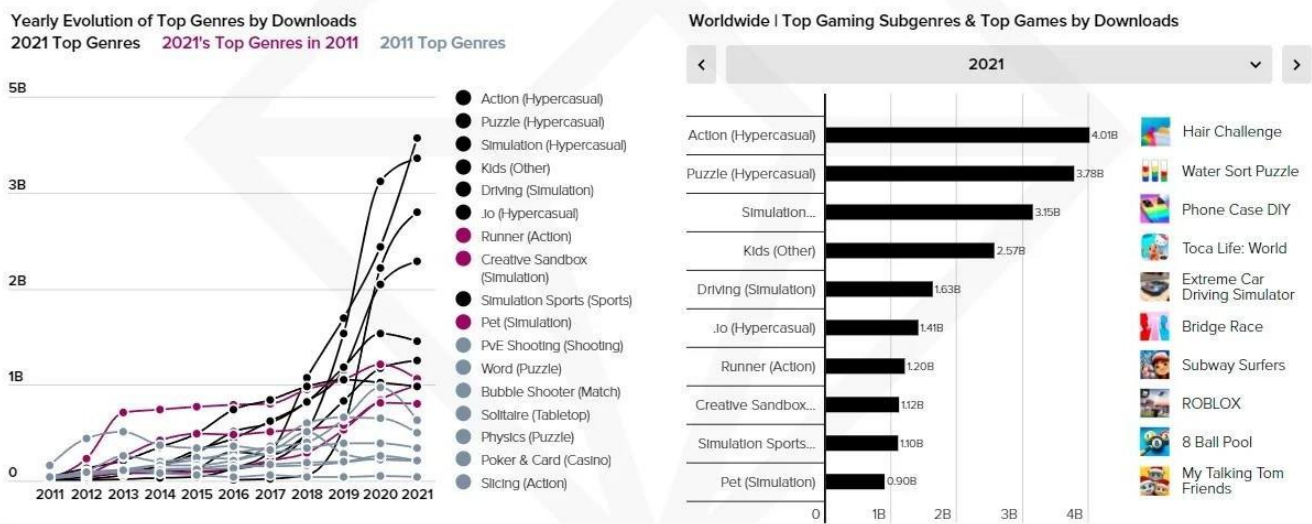**Fig 3.** Percentage of Mobile App and Website usage

Fig 4. Top Application Data downloaded by users around the world

3.   METHOD

3.1 Design Process

The design process is essential in building mobile-based applications. Layout positions consist of 2, i.e., Portrait and Landscape. This can be seen in Figure 1 in more detail. This standard must be used for positions on phones or mobile devices that are used later. Building mobile-based applications for IoS and Android has five essential components: Design, Colors, Features, Application, and Publication process. These five parameters should be a complete system.
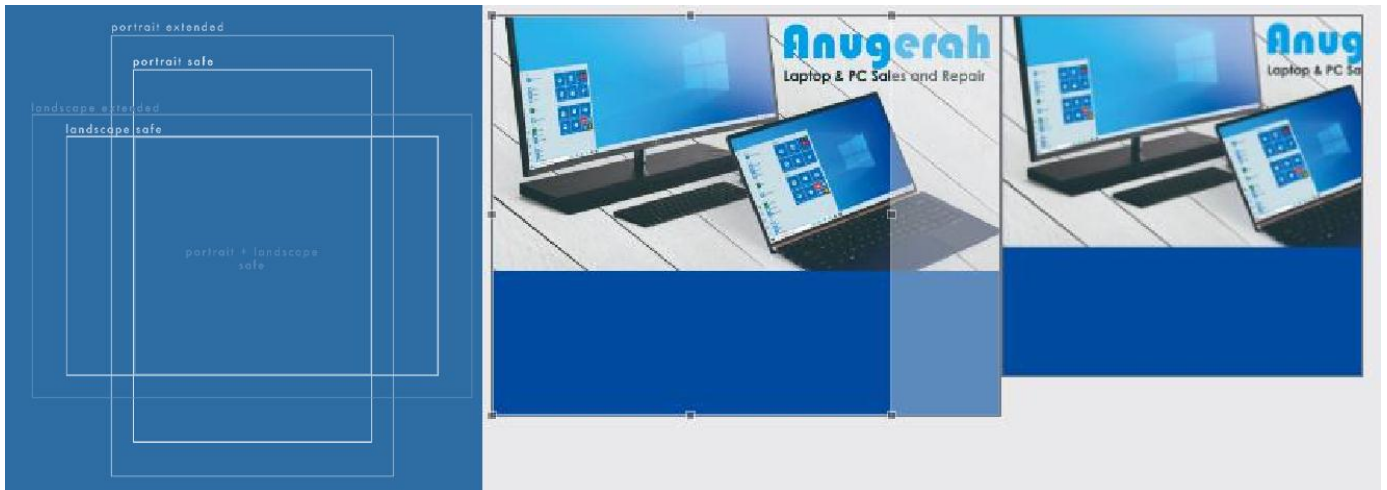
Fig 5. Layout and design background position of the mobile application
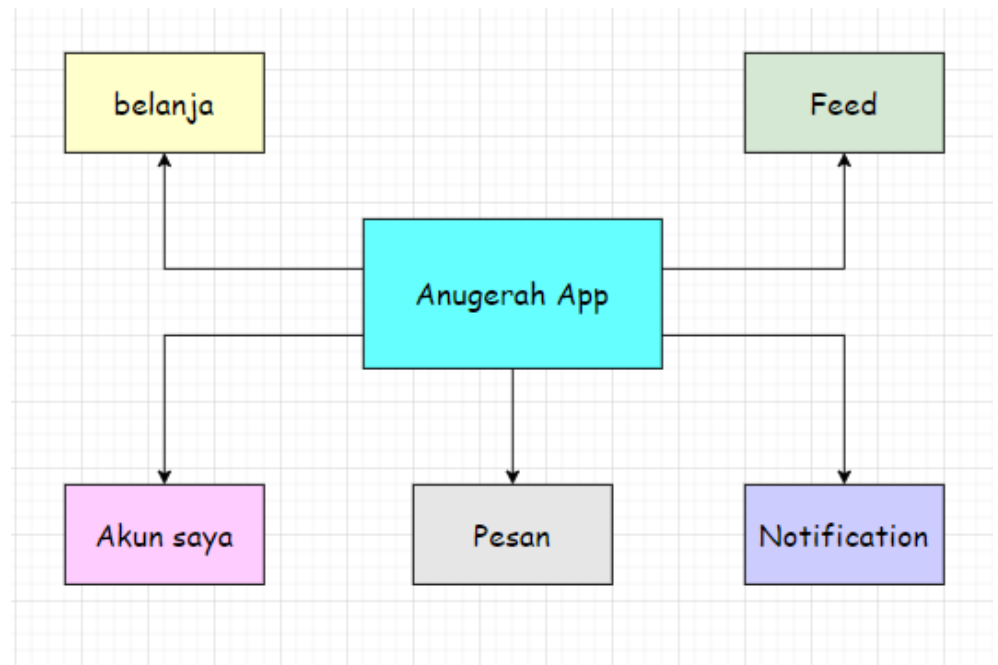

Fig 6. Connection *Anugerah* App between entities

Before moving on to the design process, things that need to be prepared to be read before creating a design are connections between entities, as shown in Figure 4. For example, the Anugerah App has several connected entities: shopping, my account, messages, notifications, and feeds. All these entities are connected for decision-making, connection, menus, and sub-menus on the Anugerah App.

3.2 Work system flowchart

The overall work system can be seen in Figure 7. The essential thing is setting the HTML, CSS, JavaScript, and Framework platforms, then components such as the design process, color, application of features, application settings, the review process, export to APK, and review process again.
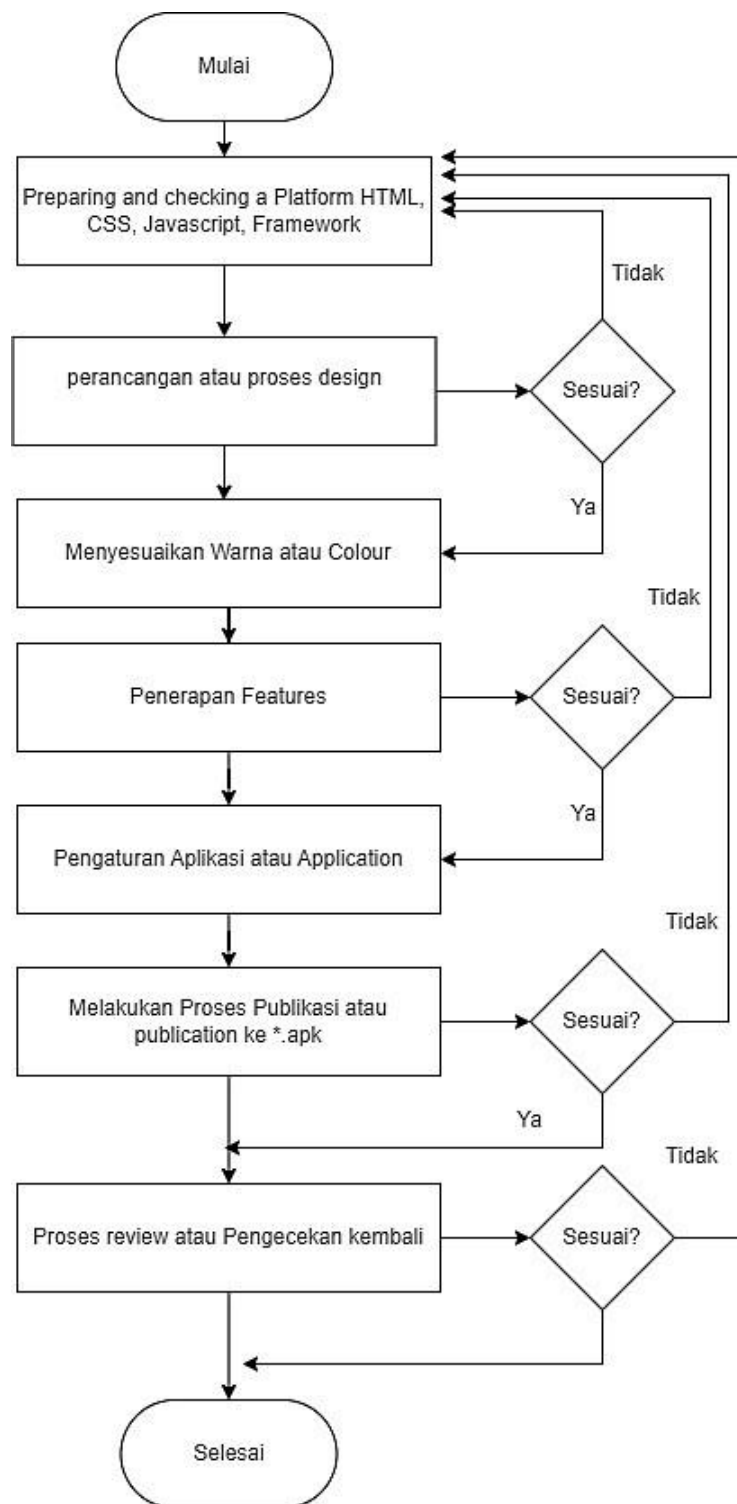
Fig 7. Work system flowchart

4. RESULT AND ANALYZE

After the Framework, CSS, and HTML sections are ready, the next step is to create the layout and design settings. Figure 4 is an example of creating a design from Anugerah PC. This is an example of a plan that could be redeveloped, but the concept is important here. The images used have pixels above 1500 px. This is to maintain the quality of the resulting images, meaning they have a good enough resolution if the pixel value exceeds 1500 px. In this example, the image uses 2000 px.

An online or mobile-based computer sales system with the name Anugerah PC Mobile can be started by registering at PlayStore. Playstore is an Android mobile platform whose function is to record new applications. An Android application's successfully running format can be saved in the *.apk format and downloaded on the Play Store. Play Store is a digital distribution service operated and developed by Google. It's no wonder that someone calls it Google Play. Previously, this platform was called the Android Market. Its function is as the official app store for all devices with the Android operating system. With Google Play, we can browse and download applications developed with the Android SDK or Software Development Kit published by Google. For the first step, we register the Anugerah PC Mobile app in the Play Store.

After the registration process and finally, the *Anugerah* PC Mobile can be registered and downloaded via the Playstore application. The Playstore logo can be seen in Figure 7. After the registered application has completed the registration process, we can automatically use it, and the Anugerah PC Application image can be seen in Figure 8. Not all of these Play Store applications are free; there are also paid applications. Examples are Poweramp Media Player, Cameringo, FlightRadar24, Afterlight, VivaVideo Pro: Video Editor, Link2SD Plus, etc. These applications are produced because they have sophisticated features and can provide accurate predictions of real-time information. For example, FlightRadar24 also has Poweramp software for a complete music player.

Fig 8. Play Store or Google Play application

Fig 9. *Anugerah* PC Application Icon
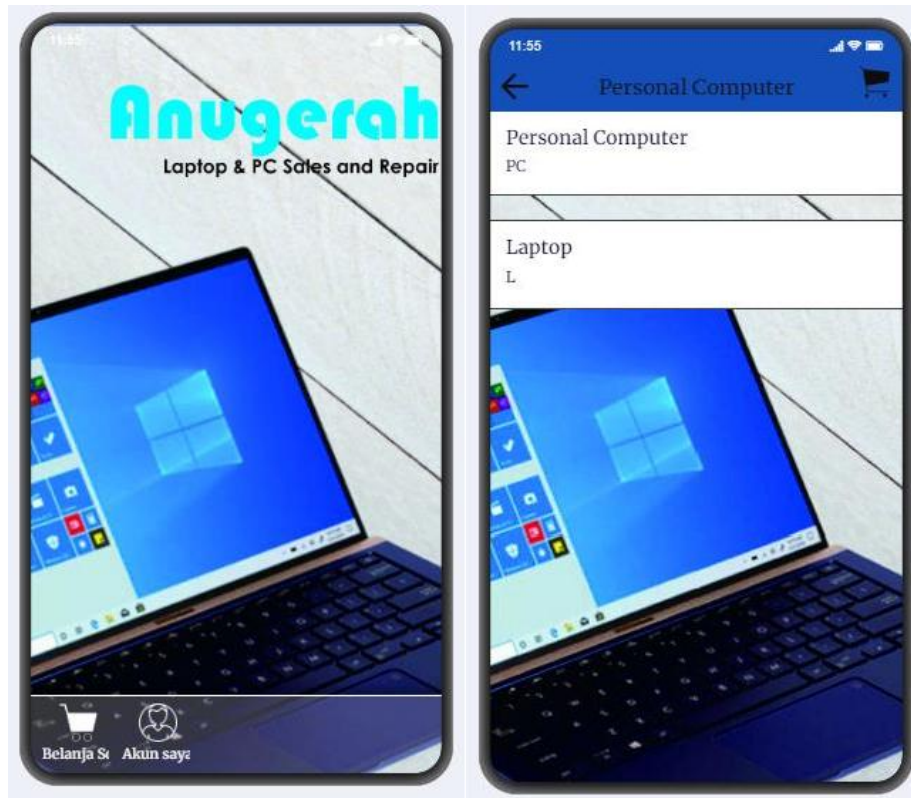
(a) (b)

(c) (d)

Fig 10. (a,b,c,d) *Anugerah* PC Categories on Phone

(a)   (b)

Fig 11. (a,b) Categories and sub-Categories of *Anugerah* PC on Phone

Moreover, Figure 9 is the icon after installing from PlayStore, and it will automatically appear on the Android system. This application can be run online. Next, Figures 10 and 11 display this application's menu features and sub-menus, which, if continued, will lead to the purchase process, as shown in Figure 12. In this purchase process, there are several parameters such as price, discount, tax, type of transfer, and type of delivery, and this is the essence of e-commerce. The total price is calculated from all these parameters: discount, tax, and delivery location. E-commerce applications that are preferred in the future have a star system, so they need to add stars like Tokopedia and other e-commerce. This star has the highest score of 5, which results from reviews from visitors, customers, or people who are experienced in transactions and give excellent ratings to the application program. The preferred application can indicate a lower price compared to the cost of goods in other applications. This means that the greater the discount given, the greater the number of times the customer will visit this mobile application. The next important thing is promotion; promotion can be done by posting bug information on the WEB page or advertisements on YouTube. The Anugerah Application manager must be able to calculate the ROAS side.
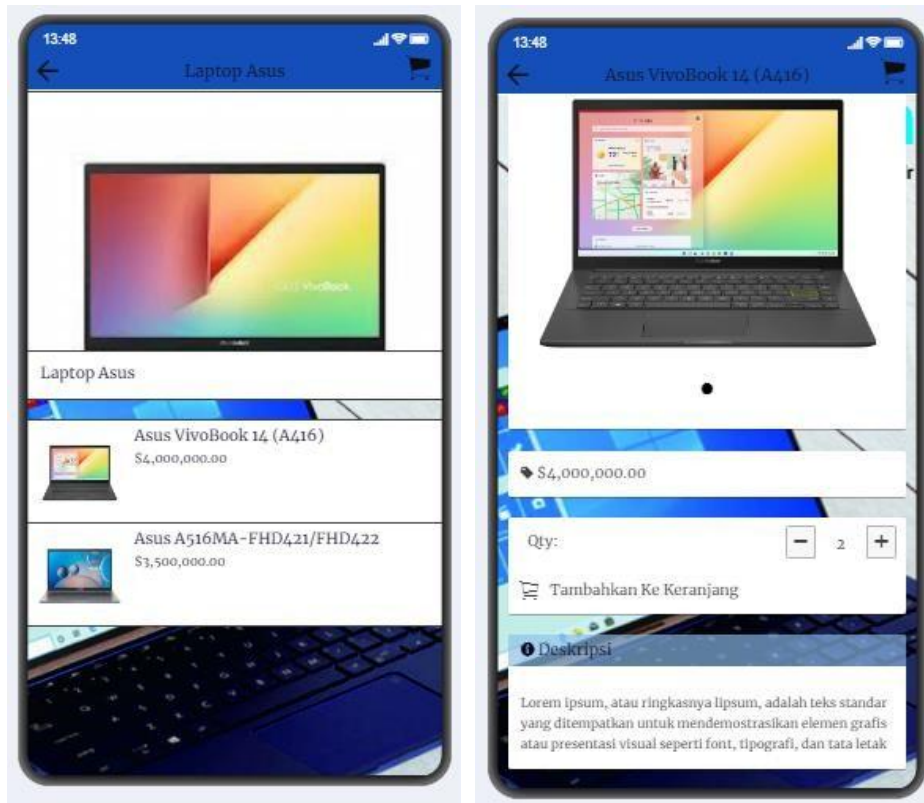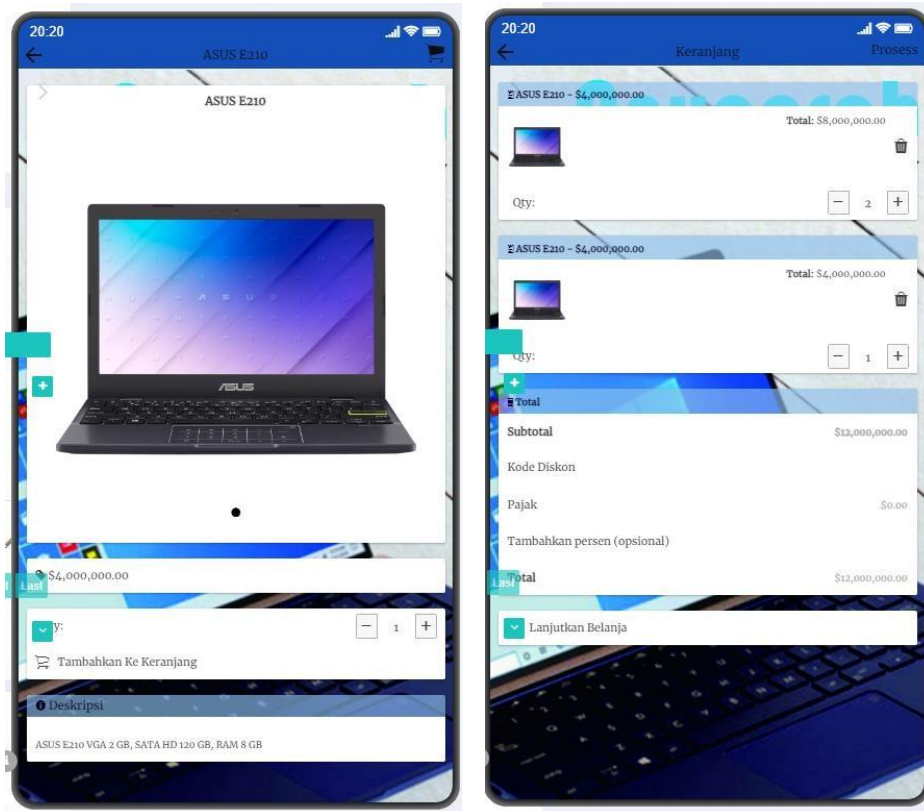
(a)   (b)

Fig 12. (a,b) Sub menus that are more specific to prices and product details

(a)   (b)

Fig 13. (a,b) Entering the shopping cart

In Figure 13, because the price of the ASUS E210 Laptop is 4000,000 IDR because of buying three laptops, the total automatically shows a value of 12,000,000 IDR. After that, proceed with payment. We must specify the payment type via Paypal, Debit Card, ATM Transfer, Credit Card, Come to the store, and other payment types.
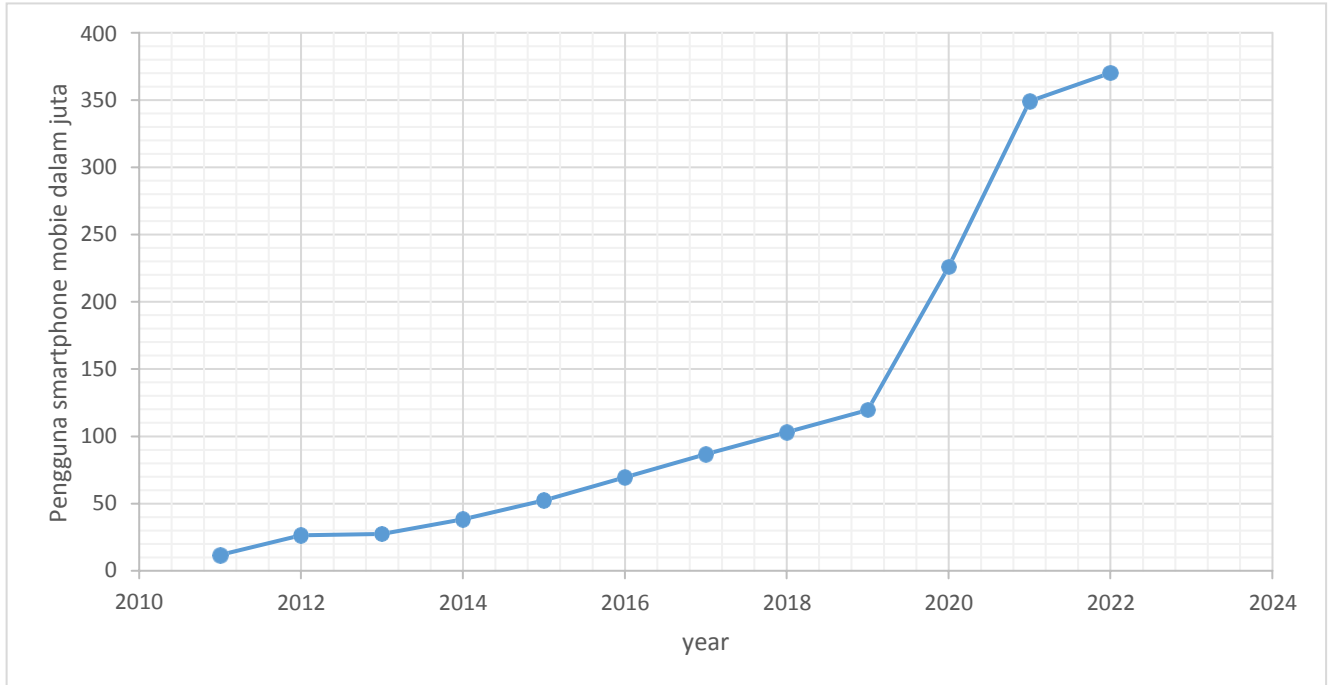

Fig 14. Graph of the growth of smartphone users in Indonesia
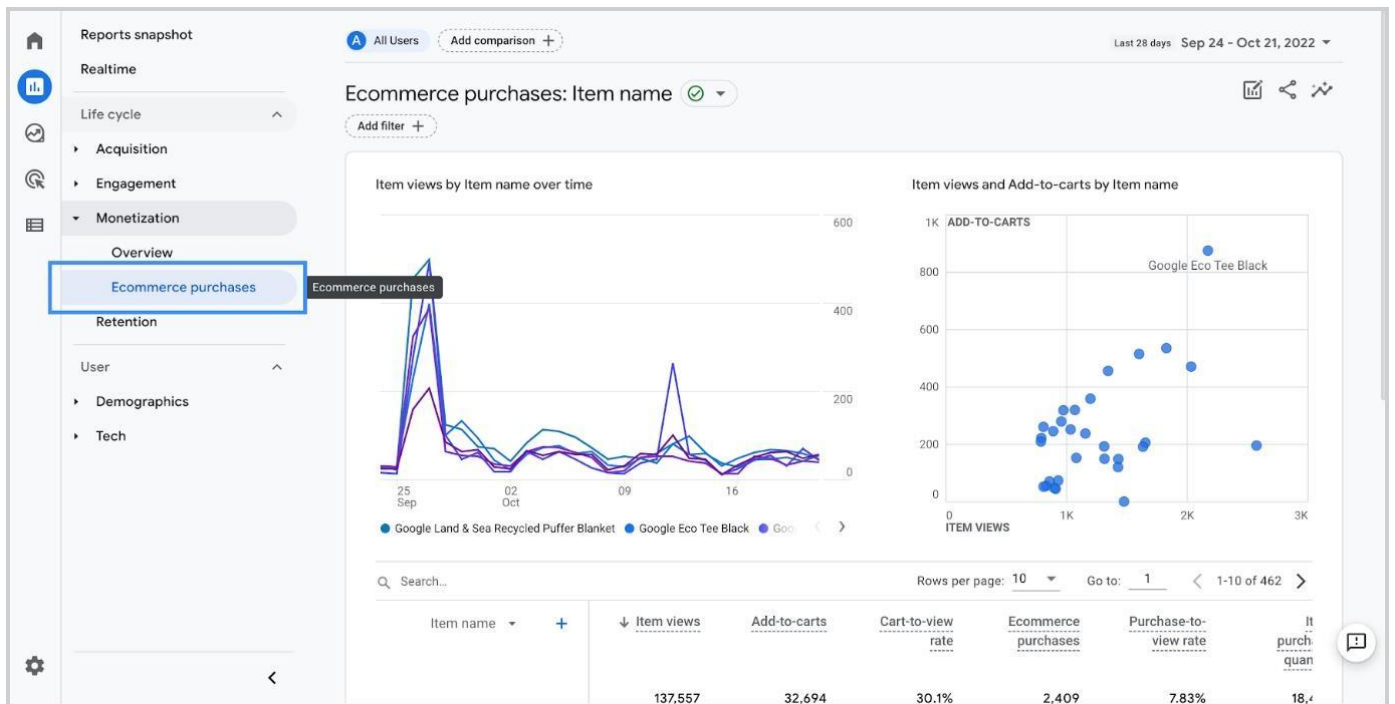

Fig 15. Example of e-commerce report

5. CONCLUSION AND SUGGESTION

E-commerce systems based on the Android and iOS platforms are the answer to an increase in buyers. This is due to a person's flexibility in interacting one-on-one, for example, with a shop. Buyers can review, buy the desired item in advance, have the specifications they want, and give an assessment in the form of stars after receiving the goods in the hands of the buyer. This is a breakthrough in the era of the Industrial Revolution 5.0, where the Internet of Things, Artificial Intelligence, and Web-based and Mobile-based technologies can handle all goods and services activities and real-time monitoring. The Android OS platform is considered very easy to apply in society, and besides being affordable compared to iOS mobile, Android OS is also easy to operate. Mobile-based e-commerce in Indonesia has increased yearly; mobile smartphone users reached 370 million in 2022, but there has not been an increase in 2023; this is extraordinary. Hopefully, this writing will serve as a review and provide the latest updates regarding mobile smartphone applications, especially Android OS. We in Indonesia can continue to create mobile smartphone applications to support the Indonesian economy during the 2023 recession.

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AUTHOR CONTRIBUTIONS

All Authors are responsible for building Conceptualization, Methodology, analysis, investigation, data curation, writing—original draft preparation, writing—review and editing, visualization, supervision of project administration, funding acquisition, and have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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