Design and Development of Automotive Workshop Application Based on Android and IOS Using Dart Programming Language

Baiq Andriska Candra P¹, Ramli Ahmad²
¹,²Universitas Hamzanwadi, Lombok, Indonesia

*email: andriska.cp@gmail.com@gmail.com

Abstract. During this time, most vehicle service can only be done in a garage where every customer who wants to make repairs to their vehicle must bring the vehicle directly to the service shop. Under these conditions it need the use of the latest technology that can facilitate two-way communication between vehicle service providers with consumers. The solution offered in this study is in the form of applications based on Android and IOS that are connected to the internet and GPS (Global Positioning System) for vehicle repair services. With the development of the application services can be done anywhere, and users who need services can easily find out the nearest location of the vehicle service to the point of position of consumers at that real time. With the existence of this application the user does not have to go to the vehicle service shop, but the service can be done at the office, at home even in an emergency on the road though. So the application making it easier to service the user's vehicle also helped in terms of time.

Keywords: Automotive Repair, Vehicle, Application, Android, IOS, Internet, GPS.

1. Introduction

IT includes the management information systems (computers, hardware, software, networks) used to automate and support business tasks and decision-making. Technological advances in the past few decades have greatly increased the competitive nature of the economic business world. Companies have used software, computers and the Internet to transform their businesses from local places of business to national and global market competitors. During recent years, globalization and computerization have redefined the industry, politics, culture, and social order. This reflects the great opportunities that Information Technology and the Internet provide as an important tool for implementation in organizations and public institutions [1]–[4]. Android is a mobile operating system (OS) based on the Linux kernel. Android devices ultimately ship with a combination of open source and proprietary software, including proprietary software developed and licensed by Google [5]. Google released Android which is an open-source mobile phone operating system with Linux-based platform. It consists of the operating system, middleware, and user interface and application software [6]. Nowadays global positioning system and wireless communication system became the most usable techniques all over the world, due to their many advantages and applications [7]. GPS technology embedded in devices to determine the current user location. GPS can measure the time, altitude,
longitude, and latitude using available satellite signals [8], [9]. Dart is a general purpose programming language[10]. Dart is intended to provide a platform that is specifically crafted to support future needs and emerging software or hardware platforms. It is an open source, structured programming language for creating complex, browser-based web applications. The useful features of the Dart programming language that enables the programmer to build the next generation web apps [11], [12].

With the advancement in technology, this study intends to provide solutions between customer and vehicle service by developing and application that connected to internet and GPS[13]. With this application the user does not have to go to the vehicle service shop, but the service can be done at the office, at home even in an emergency on the road though and customer the application can help customer to know the nearest vehicle service in real time.[14]

2. Method

The applications that have been built work with the following systems; the consumer will first enter the coordinates of the location point which will be automatically detected by GPS,[15] this service requirements data and location coordinates will be received later by a workshop or technician who is ready to serve and perform vehicle services to the location of consumers or customer who need helps. If the request does not get a response from the workshop or technician, the application will automatically provide a new location nearest from customer. With this system to be built, vehicle users no longer need to come to the location service or confused looking for the nearest location to service them vehicle when experiencing emergency problems on the road related to the condition of the transportation to use to the location.

2.1 Data Need

a. User Data Needs
   This user data will be used to identify the user during the service order process so that technicians or repair shops can see the details of ordering service. The user data required by the application is as follows: - Full Name, Cellphone Number, Photo, Email, Address, User Account Password

b. Workshop Data Needs
   The workshop data will be used to determine the workshop that is responsible for the service order process so that users can see the details of the workshop that has received an order for service services. The workshop data required by the application are as follows: - An owner or Chief's Name, Workshop Name, Workshop Address, Coordinate Point of Workshop Location On Google Maps, Workshop Photo

c. Technician Data Needs
   Similar to user data, this technician data will be used to identify the technician when the service order process is carried out so that the user can see the details of the technician who will provide service to the user's vehicle. The technician data needed by the application is as follows: - Full Name, Cellphone Number, Address, Photo, Repair Shop, Technician Account Password

d. Item Data Needs
   This item data will function when there is a sale and purchase transaction of goods or vehicle parts when performing service services or when the user only wants to buy parts without doing vehicle service. The data items needed by the application are as follows: - Item Name, Item Code, Price, Goods Supplier Workshop, Item Photo

The following flowchart below is a form of process description of the proposed system as seen on Figure 1:
Figure 1. Flowchart system

Relations between tables as shown in the figure below:

Figure 2. Tables Relations

3. Result and Discussion

Based on the planning of implementing a new system on the research object that has been determined, the following can be seen below the form and process of the application or implementation of the new system. The system produced here is a new system in the field of automotive service that makes the workshop as a research object where this new system will be able to help consumers when they want to service their vehicles to the workshop easily and quickly and time efficiency, and vice versa the workshop will be easier for looking for consumers and expand their marketing area.
3.1 Register Menu
Before using this application user need to do register and login to the application. The form as shown below on figure 3:

![Register menu](image)

Figure 3. Register menu

3.2 Dashboard Menu
This menu showing some menu on this application or information management tool.

![Dashboard menu](image)

Figure 4. Dashboard Menu

3.3 Service Menu
This menu is used when customer need to repair them vehicle, so customer can get information about the nearest vehicle service that time from this menu as shown on Figure 6:

![Service menu](image)

Figure 5. Service Menu
3.4 Profile Vehicle Service Shop
In this menu user can see how much star of the vehicle service shop have based on the service they give to the customer. And customer can read about the profile of the customer service shop in this menu as shown on figure 7:

![Vehicle Service Shop Profile](image)

Figure 6. Vehicle Service Shop Profile

4. Conclusion

The existing vehicle service system at an automotive workshop is still monotonous and there is still a lack of breakthroughs to make it easier for vehicle users or consumers when they want to service vehicles, both maintenance and improvement, especially in the use of technology and communication tools that are very advanced and growing. The Online Automotive Workshop application is created using a platform flutter with a platform-targeted while it is currently only for Android devices and the database used is Firebase which is one of the services of the Google Technology Company so that the data security itself is using Google's security standards. Making the application of Online Automotive Workshop is intended to overcome the problems that exist in the field of motor vehicle servicing services in automotive workshops, especially motorcycle and car workshops. With this application, vehicle users no longer have to come to a garage when they want to service a vehicle, but from this application the vehicle owner can order a vehicle service by calling a technician to the location of the vehicle user, so that the vehicle user or consumer can save more time and energy than having to look for or come to the garage.

References
[1] P. K. Nikoloski, “The Role of Information Technology in the Business Sector,” vol. 3, no. 12, pp. 303–309, 2014.
[2] A. Berisha-shaqiri, “Impact of Information Technology and Internet in Businesses,” vol. 1, no. 1, pp. 73–79, 2015.
[3] C. Lindh and D. Ph, “How Does Information Technology Impact on Business Relationships? The Need for Personal Meetings Research Question and Aim of Study,” pp. 1–14.
[4] O. Ciobanu, “The impact and importance of new technologies in business development in context of economic diversity,” 2017, doi: 10.1515/picbe-2017-0074.
[5] S. Mukherjee, P. J. Prakash, and D. Kumar, “Android Application Development & Its Security,” vol. 4, no. 3, pp. 714–719, 2015.
[6] S. Holla and M. M. Katti, “ANDROID BASED MOBILE APPLICATION,” vol. 3, pp. 486–490, 2012.
[7] Y. S. H. Khraisat, M. A. Z. Al-khateeb, Y. K. Abu-alreesh, A. A. Ayyash, and O. S. Lahlouh, “GPS NAVIGATION AND TRACKING DEVICE GPS Navigation and Tracking Device,” vol. 5, no. 4, pp. 39–41, 2011.
[8] R. Islam and J. Kim, “An Effective Approach to Improving Low-Cost GPS Positioning Accuracy in Real-Time Navigation,” vol. 2014, 2014.
[9] Z. Hoque, “Basic Concept of GPS and Its Applications,” vol. 21, no. 3, pp. 31–37, 2016, doi: 10.9790/0837-2103023137.
[10] P. Godfried, N. Klarlund, and K. Sen, “DART: directed automated random testing,” in Proceedings of the 2005 ACM SIGPLAN conference on Programming language design and implementation, 2005, pp. 213–223.
[11] S. Mohanty, “DART Evolved for Web - A Comparative Study with JavaScript DART Evolved for Web - A Comparative Study with JavaScript,” no. January 2014, 2015.
[12] A. M. Hassan, “JAVA and DART programming languages: Conceptual comparison,” vol. 17, no. 2, pp. 845–849, 2020, doi: 10.11591/ijeecs.v17i2.pp845-849.
[13] K. Siau and Z. Shen, “Mobile communications and mobile services,” Int. J. Mob. Commun., vol. 1, no. 1–2, pp. 3–14, 2003.
[14] J. J. Davies, A. R. Beresford, and A. Hopper, “Scalable, distributed, real-time map generation,” IEEE Pervasive Comput., vol. 5, no. 4, pp. 47–54, 2006.
[15] C. Prabha, R. Sunita, and R. Anitha, “Automatic vehicle accident detection and messaging system using gsm and gps modem,” Int. J. Adv. Res. Electr. Electron. Instrum. Eng., vol. 3, no. 7, pp. 10723–10727, 2014.