

Prototype Innovation of Online Tire Patching Application (BalBan) As an Effort to Learn from Experience: Case Study of Bantul Regency and its surroundings

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ABSTRACT

When a tire is damaged, vehicle owners need to repair it immediately to maintain the safety and performance of their vehicle. Traditionally, people have to go to a repair shop or physical tire shop to repair damaged tires. However, in reality not all incidents of punctured tires are in accordance with the plans that are already available, there are many moments that inevitably make us have to walk far to find the existence of a conventional tire patch service. We took the initiative to create a prototype of an online tire patch service, namely BalBan. BalBan is an online tire patch service enabling vehicle owners to order tire patch services online through a mobile application or website. The system development method used in this study is the prototype method. To achieve success, Online tire patching applications need to focus on their strengths, such as developing a good user experience, strong partnerships with repair shops and mechanics, and building user trust through positive ratings and reviews. It is also important to continuously monitor market trends and adapt to changes in the tire patch service industry.

Keywords: Online application, tire patch, prototype, development

Introduction

Motorized vehicles have an important role in everyday life in Indonesia. As a country with a large population and rapid economic growth, motorized vehicles are the main means of transportation for Indonesians. Motorized vehicles are not only used for individual mobility, but also for business purposes and distribution of goods. The growth of the motorized vehicle population in Indonesia has experienced a significant increase in the last few decades. This is influenced by various factors, such as economic growth, urbanization, and an increase in people's purchasing power. However, this growth also raises a number of challenges and problems that need to be properly addressed. In Indonesia, motorized vehicles play an important role in population mobility and the country's economy (Danang, 2008)

The growth in the number of motorized vehicles in Indonesia has had a complex impact. On the one hand, motorized vehicles provide flexibility and convenience in individual mobility, increasing accessibility to workplaces, education, and public services. Motorized vehicles also play a role in the distribution of goods and support the economic sector. However, the growth of motorized vehicles also has a significant negative impact. One of them is traffic congestion which is a serious problem in many big cities in Indonesia. Congestion leads to longer travel times, high operational costs and increased air pollution. In addition, motorized vehicles also contribute to the emission of greenhouse gases and other pollutants, which contribute to climate change and environmental problems. Besides that, another challenge faced by

motorized vehicles in Indonesia is the lack of adequate transportation infrastructure. Limited roads, limited parking, and the lack of an efficient public transportation system are obstacles to managing quality mobility (Agus, 2010)

Regardless of all the positive and negative impacts of motorized vehicles, privately owned motorbikes are still a favorite among most people. This, of course, has pluses and minuses in any way. The limitations that we will discuss this time are about the unpleasant incidents that have been experienced by many people who have private vehicles. This incident is a flat tire, in the automotive industry, damaged or flat tires are a common problem faced by vehicle owners. When a tire is damaged, vehicle owners need to repair it immediately to maintain the safety and performance of their vehicle. Traditionally, people have to go to a repair shop or physical tire shop to repair damaged tires. However, in reality not all incidents of punctured tires are in accordance with the plans that are already available (Andramawan, 2018).

Several reasons why finding tire fillings can be difficult: limited access: it is sometimes difficult to find a facility or repair shop that provides tire repair services in a certain area. Especially if we are in remote areas or far from urban centers, access to tire repair facilities may be limited. Time and cost: finding the nearest tire repair shop or facility that suits your needs may take time and effort. In addition, repair costs can also be a factor that affects a person's ability to find tire patches. Emergencies: when a flat tire occurs in the middle of a trip, the situation can be even more difficult. We may not have access to a repair shop or

tire repair facility, and finding tire fillings quickly becomes an urgent priority. Skills and equipment: not everyone has the knowledge and skills to repair tires on their own. If you don't have the necessary skills or tools, finding tire patches can be even more difficult (Irwansyah, 2020)

With this background, we as researchers want to develop a few ideas that we think are very useful for the wider community, especially people who have experienced similar incidents regarding motorized vehicles that have punctured tires. We took the initiative to create a prototype of an online tire patch service, namely BalBan. BalBan is an online tire patch service enabling vehicle owners to order tire patch services online through a mobile application or website. Technicians connected to this platform will be sent to the location of the owner's vehicle to repair damaged tires. This concept offers advantages such as convenience, more efficient time, and higher mobility for vehicle owners (Janis, 2020)

- A. Formulation of the problem
 1. What are the features and working mechanisms of the BalBan application?
 2. SWOT analysis of the BalBan app?
- B. Objective
 1. Know the features and working mechanisms of the BalBan application
 2. Knowing the SWOT Analysis of the BalBan application
- C. Benefit
 1. For Writers
Research on online tire patching applications can encourage the development of innovations in tire patching services as a whole. By understanding user needs and preferences, as well as the latest market trends, research can drive the development of new features, more sophisticated technology integration, and overall improvement of the user experience.
 2. Public
Research on online tire patching also contributes to industry knowledge. This research can provide better insight into market trends, user behavior, customer needs, and challenges faced by tire patch service providers.
- D. Research Limitations
This research was conducted in the area of Bantul Regency and its surroundings due to the limitations of our physical, material and spiritual capital. But with these limitations, we

will continue to make every effort to develop the BalBan application even better.

LITERATURE REVIEW

1. Online Application

Applications are computer programs or software designed to perform specific tasks or provide services to users. Applications can be installed and run on electronic devices such as smartphones, tablets or computers. The goal of application development is to provide useful functionality and make it easier for users to perform various activities or gain access to information.

2. Tire Patch Online

Patching tires by some people still considers his work trivial and underestimated. Sitting on the side of the road while waiting for a vehicle with a flat tire to just fill up or patch. But behind the simplicity of a patchworker, hundreds and even thousands of road users need their services. You can imagine even though a branded car or motorbike costs hundreds of millions without air stored in the tires that carry it, then what is the use of the car or motorcycle. The only way is with the help of a patchworker who is ready to fix it. (Sudrajat, 2021)

Online tire patching is a service that allows users to order tire patching services through a digital platform, such as a mobile application or website. This service allows users to get tire patching assistance quickly and efficiently without having to go to a physical repair shop.

Online tire patch provides various benefits to users. Some of these benefits include:

- Ease of access: Users can easily access online tire patching services via a mobile application or website.
- Time efficiency: This service allows users to get tire repair assistance quickly without having to go to a physical repair shop.
- Security: Users can get tire patching services safely and reliably through a verified online platform.
- Pricing transparency: This service provides clear information regarding tire patch prices so users can compare and choose the service that suits their needs and budget.

Literature Gaps

No	Author(year)	Title	Data/variables	Method	Conclusion
1	Janis, Janiver W. et al (2020)	Design and Build an Online Application Ordering System for Location-Based Builder Services	Android Studio, Builders, Customers, Java, Rapid Application Development, Workers, Services.	Rapid Application Development Method	The purpose of this study is to design an online location-based construction service ordering system application to serve the needs of the community and builders in their construction work.
2	Syahroni, Abd. Wahab and, Slamet Slamet (2020)	Design and Build Mobile-Based Online Service Applications	services, applications, mobile, blackbox.	Ionic framework and laravel methods and MySQL as the database	This research aims to make it easier for residents to find information on service owners, in addition to making it easier for service owners to introduce their services to service users with good quality and according to the wishes of service users. From the results of testing system functionality using the blackbox testing method, all system functionality can be implemented and running well.
3	Rahayu, Sri (2018)	Online Barbershop Application Design	Design, Barbershop, Service, Online	Rational Unified Process method from the Requirements, inception, elaboration construction and testing stages	The purpose of this study is to design a Barbershop Application that can be used by customers to book barber services at home by adding a fare calculation based on the distance traveled from the Barbershop to the customer's home. The results of this study are in the form of a Barbershop application design with a web-based platform that can be used by customers to book barber services at home.
4	Ahmad, Imam., Agung Tri Prastowo, Emi Suwarni, Rohmat Indra Borman (2021)	Development of Online Delivery Applications as an Effort to Help Increase Revenue	Online Delivery; Marketing; Revenue	Methods of community service, assistance in the form of socialization and training in using the system	application development carried out can increase revenue and simplify partner business processes. During the five months of using the application, there was an increase in transactions of 28.13% and an increase in income of 21%.
5	Susanto, Ardi., SharfinaFebbiHan dayani (2022)	Application for Searching Barber Services in Bandar Lampung Using the Android-Based A-Star Algorithm	Barbershop, Android Studio, Web Services, JAVA, PHP, MySQL	Extreme programming methods and UML as well as JAVA programming, XML, PHP and	According to the findings of system testing, the application for searching for barber services in Bandar Lampung utilizing the Android-based A-Star algorithm was usable.

				MySQL databases	
6	Latifah, Noor., Diana LailyFithri, Dianing Ratna Wijayani (2019)	DATA MANAGEMENT APPLICATIONS AND ONLINE LAUNDRY SERVICES	application; laundry; on line; service; waterfalls	The waterfall method consists of the stages of analysis, design, implementation and system testing	The results of the analysis carried out, it is known that the data management process in the laundry business is still not optimal and there are several problems such as accumulation of files and reports, slow information flow, slow data search process, and recap of transaction reports.
7	Rizaldi, Alfian., Viktor HandrianusPranat awijaya, Putu BagusAdidyanaA nugrah Putra (2021)	Implementation of Online Queues and Orders in the Mobile-Based Pearl Salon AndBarberShop Application	Online application, pearl screen printing and screen printing, barbershop, database	software development methodology extreme programming (xp) method	With the development of the Pearl Salon and Barbershop application, it can produce a queuing and ordering system that makes it easier for salon and barbershop customers, as well as realizing optimal service, so that owners can increase the trust and income of the salon and barbershop customers themselves.
8	Iisnawatia, AslamiaRosab, DessyYunitac, Hartati (2019)	Consumer Decisions Using Online Food Delivery Services in Palembang	e-Marketing mix, Consumer decision, Online food delivery	multiple linear regression analysis with SPSS	This study examines the effect of the marketing mix, namely price, product, promotion and distribution with a digital concept that is different from previous studies which still used the traditional marketing mix concept.
9	Wardianto, Muhammad (2011)	Design of an online revenue application for multimedia-based medical services at Siti Aksar Main Clinic, Depok	Online Registration Application, Multimedia, Siti Aksar Main Clinic, Rapid Application Development (RAD), Unified Modeling Language (UML)	This application uses RAD and UML	In general, the results of the application made are an online registration application for multimedia- based medical services which assists in conveying information on medical services at the Siti Aksar Depok Main Clinic and online registration specifically for dentist queues which provides queue numbers and estimated turn times.
10	Setiawan, Fair (2022)	Android-Based Online Job Ordering Application System Design	Online Job Services, Ordering, Android	waterfall method	In this application, a payment transaction report has been made for ordering work services quickly and safely. This application can also make it easier for workers and can help people who need work, and can help someone who has difficulty finding job services that can come

					directly to the location
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Framework of thinking

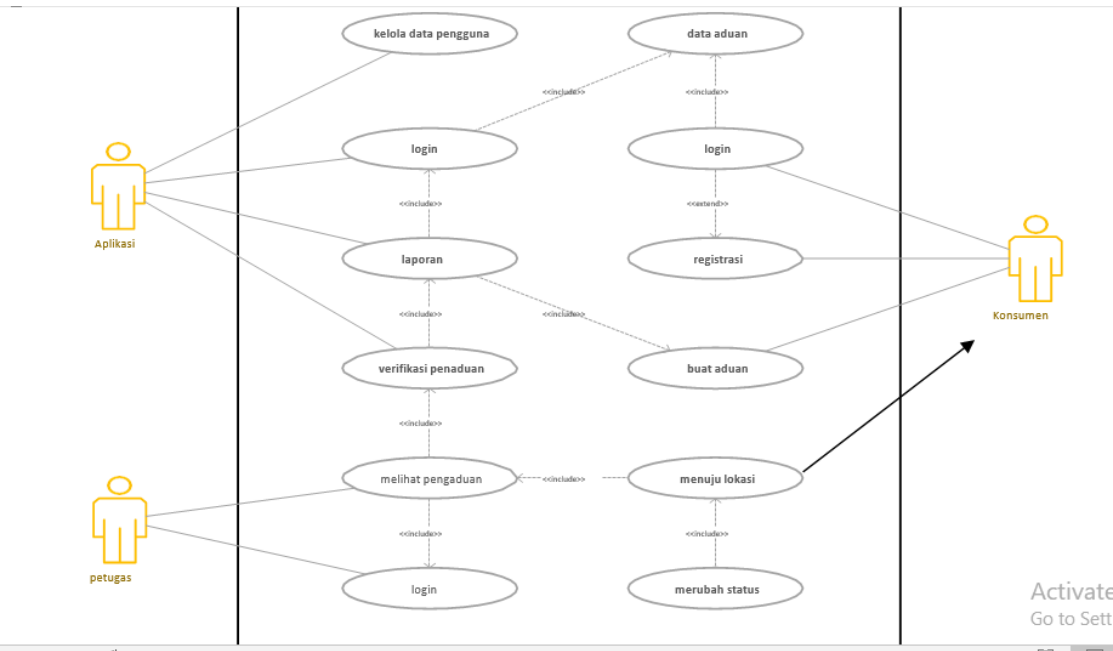


Figure 1. Framework of Thinking

RESEARCH METHODOLOGY

A. Application Development

In making the Balban application requires several aspects that must be considered, which include data collection methods and system development methods and system design as follows.

1. Method of collecting data

Data collection in this study involved two aspects, namely:

a) Literature review

In the data collection stage through literature study, the author reads and researches relevant references such as papers, theses, and books. The internet is also used as a source of information and data published online relating to research objects. Theories related to this research include application concepts based on Android, Java, XML, JSON, GPS, Google Maps, MySQL DBMS, and data modeling in the form of UML (Unified Modeling Language).

b) Observation

In the data collection stage through observation, the authors made direct observations of the research object samples, namely looking for a tire repair shop.

2. System Development Method and System Design

The system development method used in this study is the prototype method. This method involves three stages of the development cycle, namely data analysis, code implementation, and testing and evaluation. The choice of this method is based on the aim of creating a system design that is acceptable to users and easy to develop. In system design, flowcharts, DFD, and database design will be discussed.

3. Data Processing Techniques

In this study, researchers used a qualitative descriptive analysis. Qualitative descriptive analysis is an analytical approach used to understand and describe qualitative data in detail. This method involves interpreting and presenting qualitative data in the form of in-depth narratives or descriptions, without making statistical generalizations or submitting hypotheses.

B. SWOT analysis

As this study aims to access, analyze, and synthesize the SWOT literature to provide an overview of the SWOT knowledge base, combine insights and perspectives from various fields, and expand the theoretical foundations of SWOT, an integrative review method was deemed appropriate. SWOT analysis is used to assess business aspects by developing four strategies, namely SO (strengths - opportunities), ST (strengths - threats), WO (weaknesses - opportunities) and WT (weaknesses - threats). SWOT is an easy tool to use at the evaluation stage to get an initial idea of possible future consequences. SWOT analysis is a simple analytical method that can provide a realistic

interpretation of the strengths and weaknesses of a business. Besides that,

RESULTS AND DISCUSSION

A. BalBan Features and Mechanisms

1. Features and services offered

The BalBan application has several features that we designed to make it easier for users to fulfill their needs practically and efficiently. Some of these features are:

1) Splash Screen page

The Splash Screen page is usually used as the first page that appears when the user opens the application. The goal is to give the user a visual impression that the app is loading. Some of the common elements on a Splash Screen page are the app logo and loading animation. As long as the Splash Screen page is displayed, the application can



Figure 2. *Splash Screen page*

perform several preparatory processes, such as loading initial data, checking network connections, or performing initial settings. After the preparation process is complete, the application will continue to the next page, such as the main page or login page. The Splash Screen page can also be used to enhance the user experience by displaying motivational messages, inspirational quotes, or tips on using the app.

2) Home page

The main page in the online tire patch application. The goal is to give users access to relevant features and information. Here are some common elements that can be found on the Home page:

- App Logo: Displays the app logo to introduce the brand and provide a visual identity.
- Username: Displays the username currently using the app to provide a personalized experience.
- Vehicle Information: Displays information about the user's vehicle, such as the vehicle type, license plate number, or other technical information.
- Location Search: Provides a location or address search feature where users want to get tire patching services. Users can enter an address or use the current location.
- Nearest mechanic list: Displays a list of nearby tire repair mechanics based on the

user's location. This list can contain information such as the mechanic's name, distance, rating, and previous customer reviews.

- Message Button: Allows the user to order a tire patch service by calling or sending a message to the selected mechanic.
- The Home page may also usually include menu navigation or icons to provide quick access to other features within the application, such as order history, settings, or additional information.

Figure 3. home page

- 3) The Map page in the online tire patch application provides a visual display in the form of a map showing the user's location, the location of the nearest tire patch mechanic, and mechanic details. Here are some of the elements that can be found on the Map page:

- Back Button: Allows the user to return to the previous page, such as the Home Page or the Search Page.
- Map with Location: Displays an interactive map showing the user's location and the surrounding area. These maps are usually equipped with zoom controls and navigation features to make it easier for users to view and explore the map.
- Nearest mechanic marker: Mark the location of the nearest tire repair mechanic on the map using a special marker. This marker can be an icon that distinguishes one mechanic from another.
- Mechanic Details: When the user clicks or taps on a mechanic marker, detailed information about that mechanic is displayed. This can include the mechanic's name, rating, customer reviews, distance from the user's location, contact number and other relevant information.

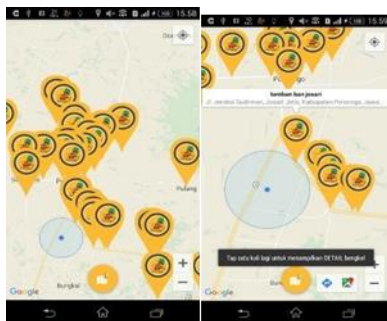
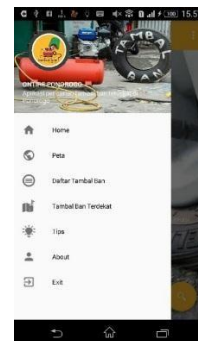


Figure 4. The Map Page

- 4) Tire Patch List page is a page that displays a complete list of tire patch mechanics available in the application. The purpose of this page is to make it easier for users to choose and view information about the mechanic that suits their needs. Here are some of the elements that are usually present on a Tire Patch List page:

- Back Button: Allows the user to return to the previous page, such as the Home Page or the Search Page.
- Page Title: Displays a title that describes the page content, for example "Tyre Patch Mechanic List" or "Choose a Mechanic".
- Filter and Search: Provides a feature for users to filter or search for tire repair mechanics based on certain criteria, such as location, rating, or specialization.
- Tire Patch List: Displays a list of available tire patch mechanics. Each mechanic is usually represented by a card or entity that contains important information such as the mechanic's name, rating, distance from the user's location, and specialization.
- View Details Button: Allows the user to view detailed information about the selected



mechanic. When this button is clicked, the user will be redirected to the Mechanic Details page.

The Tire Patch List page may also provide features such as sorting the list by rating or distance, as well as the option to save the user's favorite mechanics.

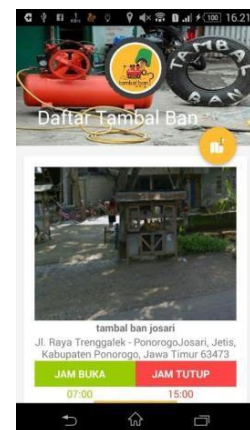


Figure 5. Tire patch list page

- 5) Workshop and Mechanic Information Pages

This page displays detailed information about the tire repair mechanic or repair shop registered in the application. This page provides users with the important information they need to make an informed decision about which mechanic or repair shop they want to choose. Here are some of the elements that can be found on the Workshop and Mechanic Information page:

- **Back Button:** Allows the user to return to the previous page, such as the Tire Patch List Page or the Map Page.
 - **Mechanic/Workshop Picture:** Displays a representative picture of the mechanic or repair shop to give the user a visual picture.
 - **Mechanic/Workshop Name:** Displays the full name of the mechanic or repair shop currently displayed.
 - **Ratings and Reviews:** Displays ratings and reviews from previous customers to provide feedback on the quality of the mechanic's service or the reputation of the repair shop.
 - **Contact Information:** Provides mechanic or repair shop contact information, such as a phone number or email address, which allows users to contact them.
 - **Mechanic/Workshop Location:** Displays the address or location of the mechanic or repair shop on a map or in text format.
 - **Working Hours:** Provides information about the mechanic or repair shop hours, including days and hours of operation.
 - **Specialties:** Shows the specialties of a mechanic or repair shop, such as the types of vehicles they can work on or the types of tire repair services they provide.
 - **Mechanic/Workshop Description:** Provides a brief description of a mechanic or repair shop, providing additional information about their experience, expertise, or strengths.
 - **The contact to be contacted can be via telephone or wa**
- Workshop and Mechanic Information Pages usually also include features such as a message button to contact a mechanic or a navigation button to get directions to a repair shop.

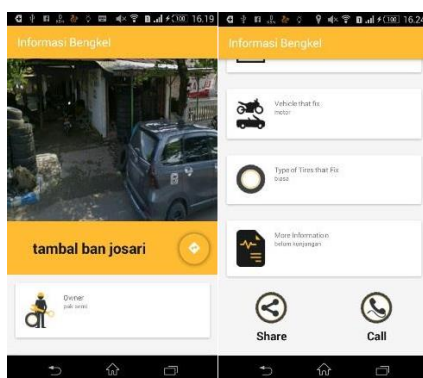


Figure 6. Workshop and Mechanic Information Pages

- 6) The Tips page in the online tire patch application provides users with useful information, tips, or advice regarding the care and maintenance of their tires and vehicles. The aim is to assist users in maintaining the condition of tires and vehicles to keep them safe and in good condition. Here are

some of the elements that are typically on a Tips page:

- **Back Button:** Allows the user to return to the previous page, such as the Home Page or Settings Page.
- **Page Title:** Displays a title that describes the page content, for example "Tire Care Tips" or "How to Prevent Flat Tires".
- **Tips List:** Displays a list of tips or articles related to tire and vehicle maintenance. Each tip is usually represented by a card or entity that contains the tip's title and summary. Tips pages may also provide features such as searching by tips category, a bookmark feature to save a user's favorite tips, or the option to share tips with others.

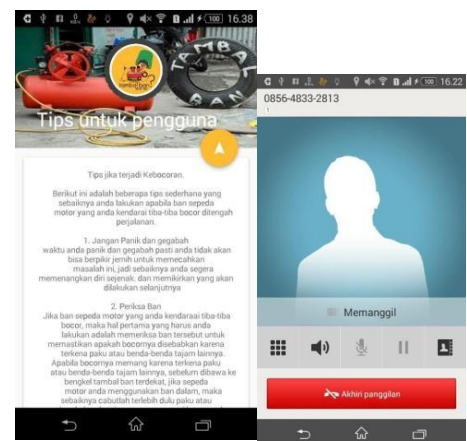


Figure 7. Tips page

- 7) The Emergency Phone page of the online tire patching application is designed to provide quick and easy access to the emergency telephone numbers associated with tire patching services. Here are some of the elements that are typically on an Emergency Phone page:

- **Back Button:** Allows the user to return to the previous page, such as the Home Page or Settings Page.
- **Emergency Telephone Number:** Displays an emergency telephone number that can be contacted in an emergency situation related to a tire or vehicle problem.
- **Call Button:** Allows the user to instantly call emergency phone numbers with a single tap or click on this button. When this button is pressed, the user's cell phone will initiate a call to the listed emergency telephone number.

An Emergency Phone page usually includes an official emergency phone number that can be used in an emergency, such as the number for a highway emergency services or a tire patch help hotline number. The minimum number listed in our application is the number of the police, fire department and BPBD.

2. BalBan Application Mechanism

The online tire patch application is an application that allows users to order tire patch services online via a mobile device or other device. The following is a general way of working of an online tire patch application:

6) Service Execution: The mechanic will arrive at the location specified by the user. They will evaluate the condition of the tires and make tire repairs or replacements if necessary. This process may involve on-site



- 1) User Registration: User has to download and install the online tire patch application from the relevant app store. After that, the user must register by filling out the registration form and providing the necessary information, such as name, telephone number, address, and so on.
- 2) Location and Vehicle: After registration, users are usually asked to grant location access permission on their device in order for the app to determine the user's location. In addition, the user must select the type of vehicle that needs to be patched, such as a car, motorcycle or bicycle.
- 3) Service Request: Users can then request a tire patch service by entering details about their needs, such as the address of their current location, the type of tire that needs repair, and the problem they are experiencing. Some apps also allow users to upload photos or provide additional descriptions.
- 4) Mechanic Selection and Confirmation: The application will display a list of available tire repair mechanics around the user's location. Users can view mechanic profiles, previous customer reviews, and their ratings. After selecting the desired mechanic, the user usually has to wait for confirmation from the mechanic regarding availability and estimated time of arrival.
- 5) Payment: Once the mechanic is confirmed, the user will be provided with an estimate of the service fee. Users must make payments through the methods available in the application, such as credit cards, digital wallets, or cash payments when the mechanic arrives.

- work or tire replacement using a spare tire.
- 7) Ratings and Reviews: After the service has been completed, users are usually asked to provide ratings and reviews about their experience with the mechanic and the services provided. This helps other users in choosing a mechanic and also provides feedback to service providers. Those are some general steps in how the online tire patch application (BalBan) works that we are trying to develop.

B. SWOT analysis

SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) is a framework used to evaluate internal and external factors that affect a project, product, or organization. Here is an example of a SWOT analysis for an online tire patch application:

- a) Strengths (Excess):
 - Ease of Access: The online tire patch application provides easy access for users to find the nearest tire patch mechanic without having to search manually.
 - Time Efficiency: Users can save time by using this app as they can find a mechanic quickly and contact them directly.
 - Ratings and Reviews: This app provides ratings and reviews from previous users, helping users to choose a mechanic with a good reputation and quality service.
- b) Weaknesses:
 - Dependence on Internet Connection: This application requires a stable internet connection for users to access and use its functionality. If the internet connection is

lost, the user cannot use the application effectively.

- Geographical Limitations: This app may only be available in certain regions, subject to the availability of a registered mechanic. This can be a drawback if the app does not yet cover a large area or if mechanics are not available in certain areas.
- c) Opportunities:
 - Growth of Online Tire Patching Services Market: The demand for online tire repairing services will continue to increase along with the growth in use of private vehicles. This provides opportunities for applications to reach a larger market share.
 - Partnerships with Repair Shops and Mechanics: The app can forge partnerships with a wider range of repair shops and mechanics to increase the range of services and offer users a variety of choices.
- d) Threats (Threats):
 - Competition with Similar Applications: There may be competition with other existing or emerging online tire patching applications. This competition can affect the market share and growth of this application.
 - User Trust: This app depends on the user's trust in the mechanics listed in the app. Threats to trust, such as negative reviews or bad experiences, can affect an app's image and reputation.

Conclusion

The online tire patch application has the advantage of providing easy access and time efficiency for users to find and contact the nearest tire patch mechanic. Weaknesses of this application include dependence on a stable internet connection and geographical limitations related to the availability of mechanics in certain areas. There is an opportunity for growth in the online tire repair market as the use of private vehicles increases, as well as opportunities to forge partnerships with more repair shops and mechanics. Threats to these applications include competition with existing or emerging similar applications, as well as the importance of building user trust in the mechanics enrolled in the application. To achieve success, online tire patch applications need to focus on their strengths, such as developing a good user experience, strong partnerships with repair shops and mechanics, and building user trust through positive ratings and reviews. It is also important to continuously monitor market trends and adapt to changes in the tire patch service industry.

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