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Mudik Assistance Application Using Android-Based Scrum Method

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ABSTRACT

Homecoming is an activity undertaken by nomads and migrant workers to return to their hometowns. In Indonesia, going home is synonymous with annual traditions starting from religious and national holidays such as Eid al-Fitr, Eid al-Adha, Christmas and New Year. However, going home is often accompanied by traffic jams and confusion, which can be a nuisance for travelers. Therefore, a possible solution to overcome this problem is to develop a mobile application to support homecoming. This research focuses on developing an Android-based homecoming assistance application using the Scrum methodology. The aim is to create technological solutions that make it easier for Indonesian people to return home every year. The development process is divided into sprints, and each sprint lasts two weeks. Each sprint includes planning, developing, and evaluating features such as real-time maps, traffic information, stop locations, and emergency response systems. The development team works closely with stakeholders to ensure that the application meets user needs. The research results show that the use of the Scrum methodology increases development efficiency and improves the quality of the final product. The resulting application prototype received a positive response in user testing. 90% of participants found the app useful when returning home. In conclusion, the development of homecoming assistance applications using the Scrum methodology has produced an effective and user-friendly solution to help travelers. This research opens up opportunities for further development and large-scale implementation in the future.

Keywords: Application; Homecoming; Homecoming Assistance; Mobile android; Scrum Method

INTRODUCTION

Apart from advances in information technology, developments in information technology have had many positive impacts on everyday life. Therefore, information technology has undergone many changes to make it easier for everyone to use, both in form and function (Rambe & Suendri, 2023). Information technology is a method of delivering information, including information elements, using tools that are easy to use by users (Kurniawan et al., 2019)(Arsyad & Hadi, 2021).

Homecoming is an annual tradition for Indonesian people who return to their hometowns during the holidays. However, returning home is often accompanied by traffic jams and confusion, which can be a hassle for travelers. Therefore, developing a mobile application to support homecoming can be a solution to overcome this problem (Alda et al., 2023). This application helps tourists plan their return, starting from looking for nearby tourist attractions, looking for information on road conditions and rest areas to displaying emergency telephone numbers if something undesirable happens to tourists returning home. Apart from that, this application can also provide a more comfortable homecoming experience and reduce the risk of accidents and traffic jams on the highway during the homecoming tradition (Hanafri et al., 2019).

PT.Taxi Kita Bersama is a taxi transportation service provider company that was founded in 2015 in the city of X. This company was founded with the aim of providing safe, comfortable and affordable transportation services for the community. PT Taxi Kita Bersama's main service is the provision of taxi transportation services. This company has a taxi fleet consisting of various models and types of vehicles, ranging from sedans, MPVs, to minibuses. All taxis are operated by trained and experienced drivers. However, currently PT. Taxi Kita Bersama has problems in operating, namely the lack of integrated information regarding various aspects of travel, such as travel routes, traffic conditions and available public facilities. When the homecoming season arrives, traffic congestion and uncertainty in travel planning often cause stress and discomfort. Many travelers find it difficult to plan their trips efficiently due to a lack of real-time information and comprehensive tools. In addition, lack of access to up-to-date information about road conditions, rest areas and emergency services makes traveling more challenging.

The Scrum method is a software development approach that focuses on managing projects in an iterative and incremental manner. This process ensures that the product is continuously refined and improved based on direct

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feedback from users and team evaluations (Eryc, 2021). By using Scrum, Mudik Assistance application development can be more responsive to changing needs and problems that arise during the development process (Warkim et al., 2020). This approach allows the team to iterate quickly and adapt to changing conditions or feedback from travelers. Each sprint produces a version of the application that can be tested and evaluated, allowing the team to adjust the application's features and functionality in real-time. In this way, applications can be designed and developed to meet travelers' needs more precisely and effectively, providing greater benefits during the homecoming season.

In a similar research "Design and Build a Web-Based Online Sales Application Using the Scrum Method" conducted by (Andipradana & Dwi Hartomo, 2021). The result of this research is a sales application that can market products online and assist in managing transactions and reporting using existing systems. The web-based online application development uses the PHP programming language with the CodeIgniter framework and MySQL database. Disadvantages System development is limited to a web base only. It needs to be re-designed using a mobile base as an attraction for users to buy and sell using the UPTD SPNF SKB Salatiga sales application.

In the research "Designing an Android-Based Tow Car Application Using the Scrum Method" conducted by (Raharjo et al., 2022). The results of the research using the Scrum method, this tow car search application is designed to be able to make orders by displaying maps to find out the pick-up location, point destination location, and tow truck location and can display the availability of tow trucks around the customer. The downside is adding a feature for customers to choose the type of tow truck they want, and not using maps.

The focus of this research is to develop a mobile application that supports travelers by providing real-time information about routes, traffic conditions, public facilities and emergency services as a whole as well as features that can be further improved to provide a more optimal user experience. The Homecoming ASSISTANCE application is mobile-based so it is easier to use and can provide significant benefits for Indonesian people who are returning home (Afthori et al., 2022). Apart from being able to help overcome traffic jams and overcrowded roads when going home, this application can also provide a safer, more enjoyable homecoming experience and reduce the risk of accidents on the road (Fadilah et al., 2023)(Bagus et al., 2023).

METHOD

Research Methods

The method used in this research is the Research and Development (R&D) research method. The R&D research method is a research method used to produce certain products and test the effectiveness of these products (Maudi Pangestu et al., 2023)(Asbullah & Samsudin, 2024).

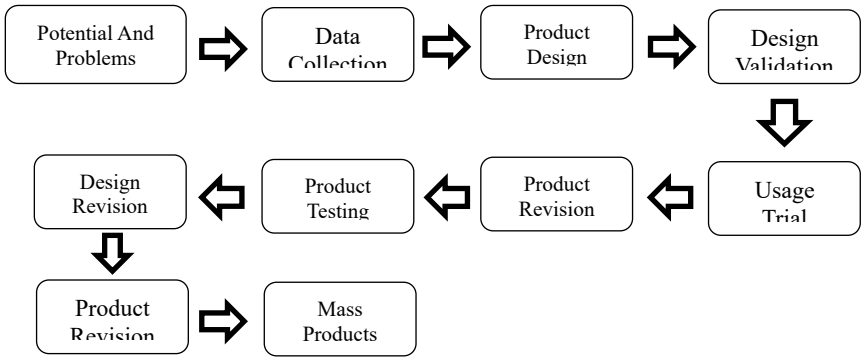

Fig. 1 Method Research and Development (Adi et al., 2022)

The stages or steps in this method are as follows (Devega et al., 2022):

a. Potential and Problems
   At this stage the author conducted pre-research at Lesehan Panembahan to obtain potential and problems.
b. Data Collection
   Data collection will be carried out in three stages, namely as follows:
   1. These observations or observations are carried out systematically. In this case the author made direct observations at PT. Taxi Kita Bersama to obtain information.

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2. Interviews were conducted to obtain the required data. In this case the author conducted an interview with the manager of PT Taxi Kita Bersama.
3. Literature study was carried out by studying a lot of previous research, both in the form of journals, theses and also by studying books related to this research problem.

c. Product Design

At this stage, the author uses a system development method, namely Scrum, for product design which will produce a product in the form of a system.

System Development Methods

This research uses the Scrum method as a system development method. *Scrum* is a software development methodology that applies agile concepts and creates teams that create value and benefits for the software being developed (Aldisa & Azizah, 2022)(Prasetyo et al., 2023). The advantage of using the Scrum methodology is adaptability. The steps contained in the Method *Scrum* consist of: *Product Backlog, Sprint Planning, Sprint Backlog, Daily Scrum, Sprint Review, Sprint Restropestive* (Iskandar et al., 2023).

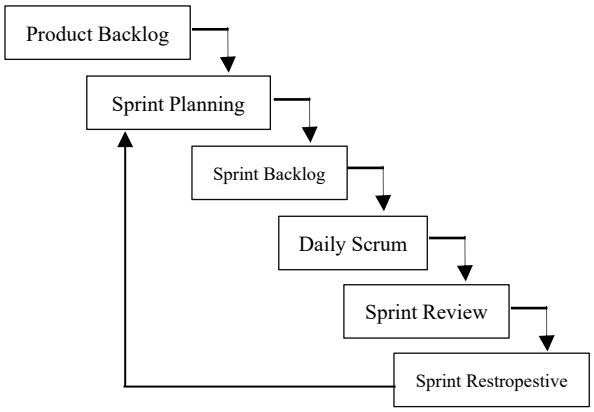

Fig. 2 *Method* Scrum

This method has the following steps:

a. *Product Backlog*

The product backlog consists of user stories that describe the features you want to implement on your app site. The order and contents of the product backlog are up to the product owner.

b. *Sprint Planning*

This is the phase where the product owner delivers product improvements and realizes the sprint goals. During sprint planning, the team decides which tasks from the product backlog they think can be completed within the sprint cycle. The sprint duration ranges from 1 to 4 weeks (Simanjuntak & Sinaga, 2023).

c. *Sprint Backlog*

Contains a list of product backlogs that will be processed at the sprint stage. At this stage, the development team can provide feature design estimates.

d. *Daily Scrum*

Daily Scrum requires the development team to hold a 15-minute meeting to discuss progress reports, issues, and resolution goals.

e. *Sprint Review*

The Scrum Team meeting and the PIC present the program created, and the PIC provides an evaluation of the program carried out during the sprint.

f. *Sprint Restropestive*

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Sprint breaks are conducted by the Scrum Master or Scrum Team members and review not only team performance but also individual performance, as well as tools used during the sprint. This phase aims to make the performance of the team and each team member more effective and efficient in the future (Yarpriransa et al., 2023).

RESULT

Requirements Planning

Making an implementation plan in terms of conducting research and achieving the goals behind the problem. This application allows users to assist in homecoming activities carried out based on Android.

The running system analysis is depicted in the form of a document flowchart using a flowchart, so that problems can be understood according to the flow from start to finish. The following is the running system analysis in Figure 3:

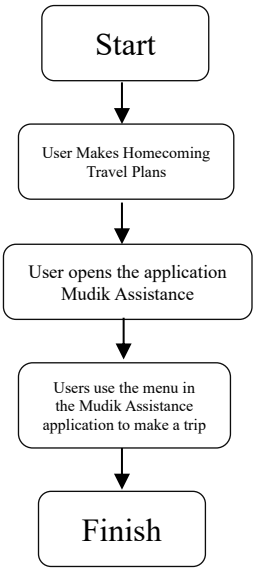

Fig. 3 Running system analysis

Product Design

a. Use Case Diagram

Use Case Diagram is a diagram used to describe system functionality and actor. For this system use case which is used like this:

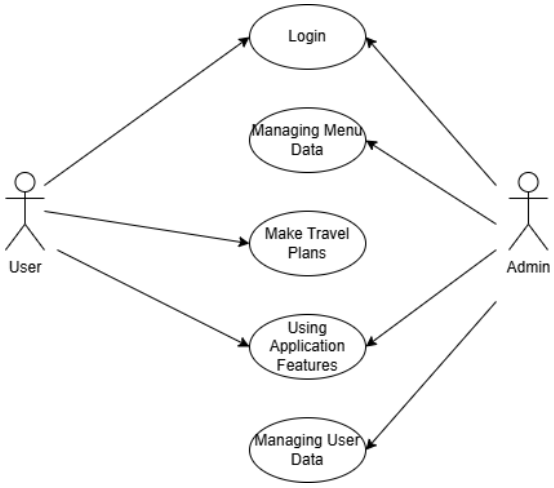

Fig. 4 Use Case Diagram

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b. Activity Diagram

Activity Diagram is the flow in the software that will be built, namely an infrastructure information system. The processes that users go through in infrastructure information systems from use to when the system is used are described in Activity Diagram.

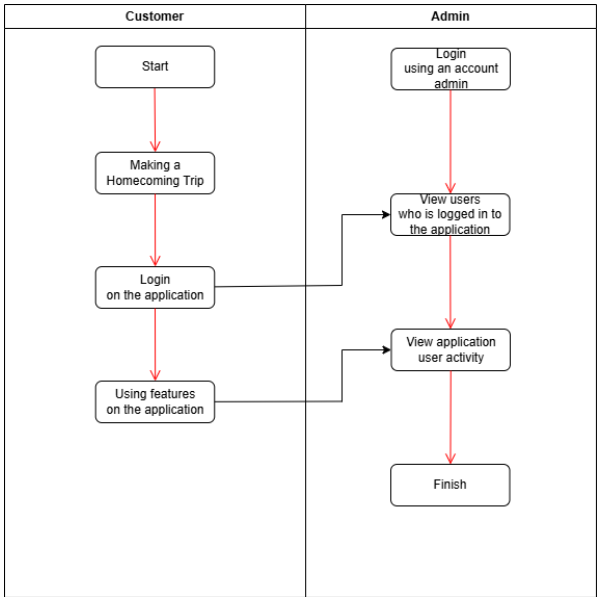

Fig. 5 Activity Diagram

c. Class Diagram

Class diagram is a type of diagram used to model the structure and relationships between classes in a system.

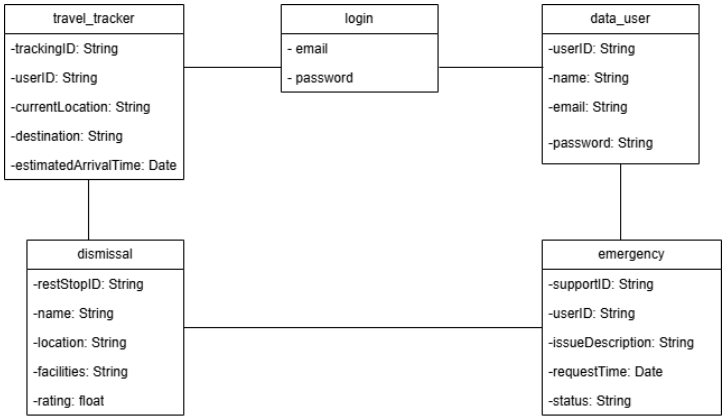

Fig. 6 Class Diagram

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Implementation

a. Login Page

Fig. 7 Login Page

On the login page display in the MUDIK ASSISTANCE application, the user will log in first by entering the username and password, then the user can access the dashboard menu page of the MUDIK ASSISTANCE application.

a. Dashboard Page View

Fig. 8 Halaman Dashboard

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In the dashboard menu display in the MUDIK ASSISTANCE application, there are several menus that can be used to assist users in making their homecoming journey. There is a menu of mosques, gas stations, ATMs, police stations, food, emergency numbers that can help travelers when something happens on the way, hotels, hospitals and pharmacies.

b. Maps display when the mosque menu is clicked

Fig. 9 Nearest Mosque Maps Display

In this maps display, there are the closest mosques around the homecoming travelers, so when homecoming travelers want to perform religious services, they can use this feature to search for the nearest mosques around the homecoming travelers.

c. Maps display when the gas station menu is clicked

Fig. 10 Nearest Gas Station Maps Display

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In this maps display, there are the closest gas stations around the homecoming travelers, so when travelers want to refuel their vehicles, travelers can use this feature to find the nearest gas stations around the homecoming travelers.

d. Display ATM Menu Options

Fig. 11 Display ATM Menu Options

In this ATM menu display, travelers who are in need or looking for an ATM, here the user can use this feature and travelers can select the ATM they are looking for, then the MUDIK ASSISTANCE application will display the nearest ATM that the traveler is looking for.

e. Maps Display When the Police Menu is Clicked

Fig. 12 Nearest Police Station Maps Display

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In this maps display, there are the nearest police stations around the homecomer, so when a traveler is in an emergency and wants to go to the nearest police station, the homecomer can use this feature to find the nearest police station around the homecomer.

f. Maps display when the dining menu is clicked

Fig. 13 Nearest Restaurant Maps Display

In this maps display, there are the closest restaurants around the traveler, so when the traveler is hungry and wants to find a place to eat, the traveler can use this feature to find the nearest restaurant around the traveler.

g. Emergency Number Menu Display When Clicked

Fig. 14 Emergency Number Menu Display

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In the emergency number display, the MUDIK ASSISTANCE application displays several emergency numbers that travelers can contact if something happens on their journey, so travelers no longer need to be confused about looking for emergency numbers when they have an emergency during the trip.

h. Maps display when the hotel menu is clicked

Figure 15. Nearest Hotel Maps Display

In this maps display, there are the closest hotels around the travelers, so when travelers want to rest or look for the nearest hotel, travelers can use this feature to look for the nearest hotel around the travelers.

i. Maps display when the hospital menu is clicked

Fig. 16 Nearest Hospital Maps Display

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In this maps display there are the closest hospitals around the traveler, so when something happens to the traveler and you want to immediately rush to the hospital, the traveler can use this feature to find the nearest hospital around the traveler.

j. Maps display when the pharmacy menu is clicked

Fig. 17 Nearest Pharmacies Maps Display

In this maps display, there are the closest pharmacies around the traveler, so when a traveler needs medication, the traveler can use this feature to find the nearest pharmacy around the traveler.

3.1 System Testing

System testing uses black box testing to ensure that all functions in the application are running well. The following are the results of testing the MUDIK ASSISTANCE application which are presented in table form:

Testing	Realization of the desired	Test Results	Conclusion
Form *Login*	Enter *username* And *password*	Successfully entered the application	*Valid*
Page *Dashboard*	Select the dashboard menu	Successfully accessed the menu	*Valid*
Click the mosque menu	Displays maps of the nearest mosques	Successfully opened maps of the nearest mosque	*Valid*
Click the gas station menu	Displays maps of the nearest gas stations	Successfully opened the nearest gas station map	*Valid*
Click the ATM menu	Displays the ATM sub menu	Successfully opened the ATM sub menu	*Valid*
Click the police menu	Displays maps of the nearest police stations	Successfully opened the nearest police station	*Valid*
Click the menu	Displays maps of nearby restaurants	Successfully opened the nearest restaurant map	*Valid*

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Click the emergency number menu	Displays emergency no	Successfully displays emergency number	*Valid*
Click the hotel menu	Displays maps of nearby hotels	Successfully displays maps of nearby hotels	*Valid*
Click the hospital menu	Displays maps of the nearest hospitals	Successfully displays maps of the nearest hospitals	*Valid*
Click menu pharmacy	Displays maps of the nearest pharmacies	Successfully displays the nearest pharmacy	*Valid*

DISCUSSION

The "Mudik Assistance Application Using Android-Based Scrum Method" focuses on providing support for people traveling home during the "mudik" season, a peak travel period often seen during religious holidays. This discussion explores the challenges and benefits of developing an Android-based application tailored for this purpose, using the Scrum methodology to streamline the development process. The application's primary goal is to assist travelers with features like real-time traffic information, navigation, emergency contacts, and lodging recommendations. Given the unpredictable nature of travel during mudik, the application must be both user-friendly and responsive. Using the Scrum method allows for iterative development, where feedback from users and stakeholders can be integrated promptly. Each sprint cycle enables the development team to tackle specific functionalities, such as real-time updates and route suggestions, improving the app's adaptability to users' needs. The discussion emphasizes that by using Scrum, the application can be optimized for rapid, iterative improvements, addressing users' needs and enhancing overall user experience, especially under the unique conditions of the mudik travel season. This approach not only facilitates continuous development but also supports the main objective: providing a reliable, accessible, and efficient travel assistance tool for mudik travelers.

CONCLUSION

Based on the research conducted, the following conclusions can be drawn:

a. The use of information and communication technology in homecoming assistance has proven effective in providing real-time information to travelers, helping them make better travel decisions.
b. Coordination between government and private institutions in organizing homecoming assistance results in more organized and integrated management of homecoming flows.
c. The provision of health services and emergency assistance along the homecoming route contributes to reducing accident rates and improving response to emergency situations.
d. The traffic management system implemented as part of the homecoming assistance has succeeded in reducing congestion at critical points.
e. Education and outreach about driving safety and health protocols during homecoming helps increase awareness and compliance of travelers.

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