UNIVERSITY MALAYSIA TERENGGANU
FACULTY OF COMPUTER SCIENCE AND MATHEMATICS

[CSM3114]
FRAMEWORK – BASED MOBILE APPLICATION DEVELOPMENT

INDIVIDUAL PROJECT 2 – HAULIER TRACKING APP

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1.0 EXECUTIVE SUMMARY

The "Haulier Tracking" project is a comprehensive solution designed to streamline the logistics and delivery management system for a fleet of trucks. The primary goal of this project is to enhance the efficiency of truck utilization, delivery tracking, and driver management within a logistics company. The system incorporates a user-friendly mobile application to provide real-time insights into truck activities, and delivery statuses.

The key features of the system include:

1. Truck Utilization Monitoring:
   - Real-time tracking of truck movements and delivery statuses.

2. Data Storage and Retrieval:
   - Utilization of Firebase Realtime Database for efficient data storage and retrieval.

3. User-Friendly Interfaces:
   - Intuitive interfaces for mobile application, ensuring ease of use.
   - Visualizations and icons for quick interpretation of delivery statuses.

The system enhances overall operational efficiency, providing real-time insights into truck activities, reducing manual errors, and improving decision-making capabilities. The inclusion of Firebase Realtime Database ensures seamless data synchronization across platforms, fostering a connected and agile logistics management environment.

Thus, the "Haulier Tracking" project is poised to revolutionize the logistics industry by providing an integrated solution for efficient truck utilization, delivery tracking, and driver management. The combination of real-time tracking, comprehensive data visualization, and user-friendly interfaces positions this project as a powerful tool for logistics companies aiming to optimize their operations and improve overall performance.

2.0 USE CASE

Use case diagrams is an easy way to identify the interactions between the system and its actors. It describes the high-level functions and scope of a system.

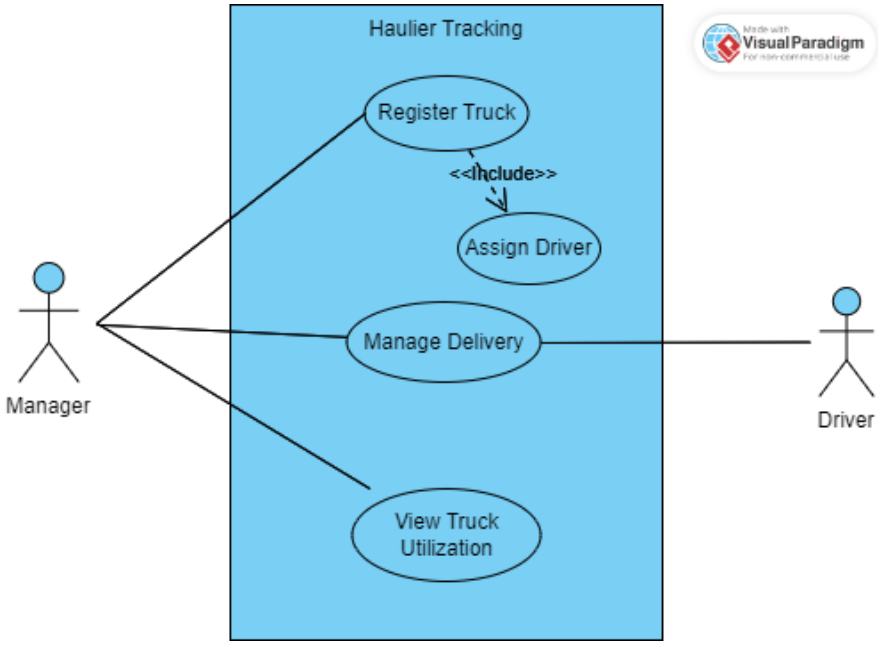

Figure 1- Haulier Tracking Use Case Diagram

The diagram captures the XYZ Haulier Tracking System, highlighting the roles of 'manager' and 'driver.' The 'manager' actor oversees three key functionalities which he can register a truck like initiating truck registration, manage delivery like the manager will be able to monitor and manage the entire delivery process and lastly, view truck utilization where the manager will be provided insights into truck utilization for any additional information. The 'driver' actor can only manage delivery like enable the driver to update status of any deliveries.

The 'Register Truck' use case includes 'Assign Driver,' emphasizing the mandatory driver assignment during truck registration. This ensures a systematic approach to fleet management. The seamless integration of truck registration, delivery management, and utilization analysis optimizes logistics and enhances decision-making.

3.0 TREE WIDGET STRUCTURE

truckInfoPage.dart

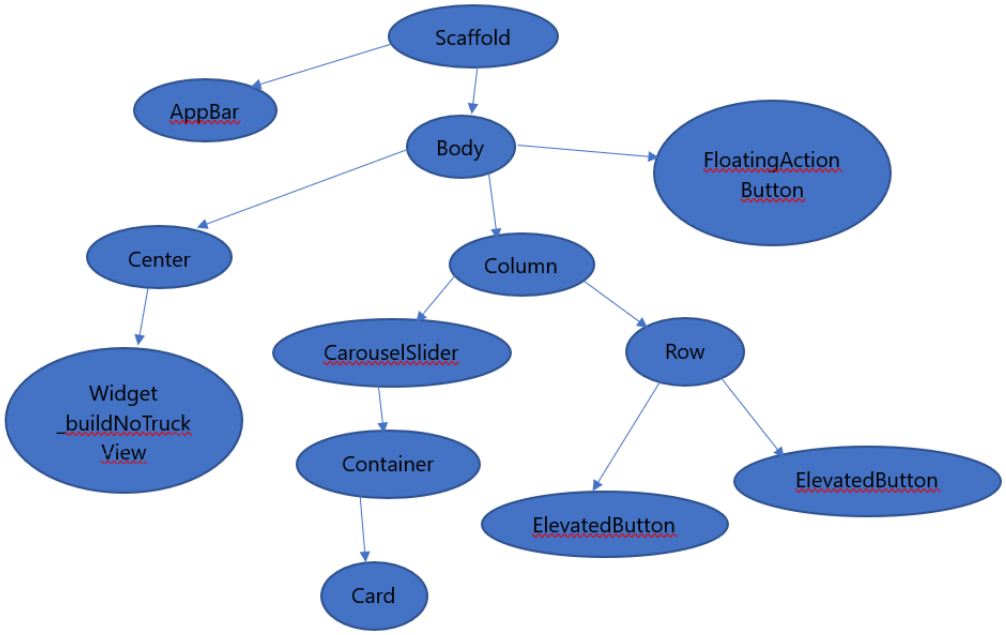

Figure 2 - TruckInfoPage Widget Tree

truckRegister.dart

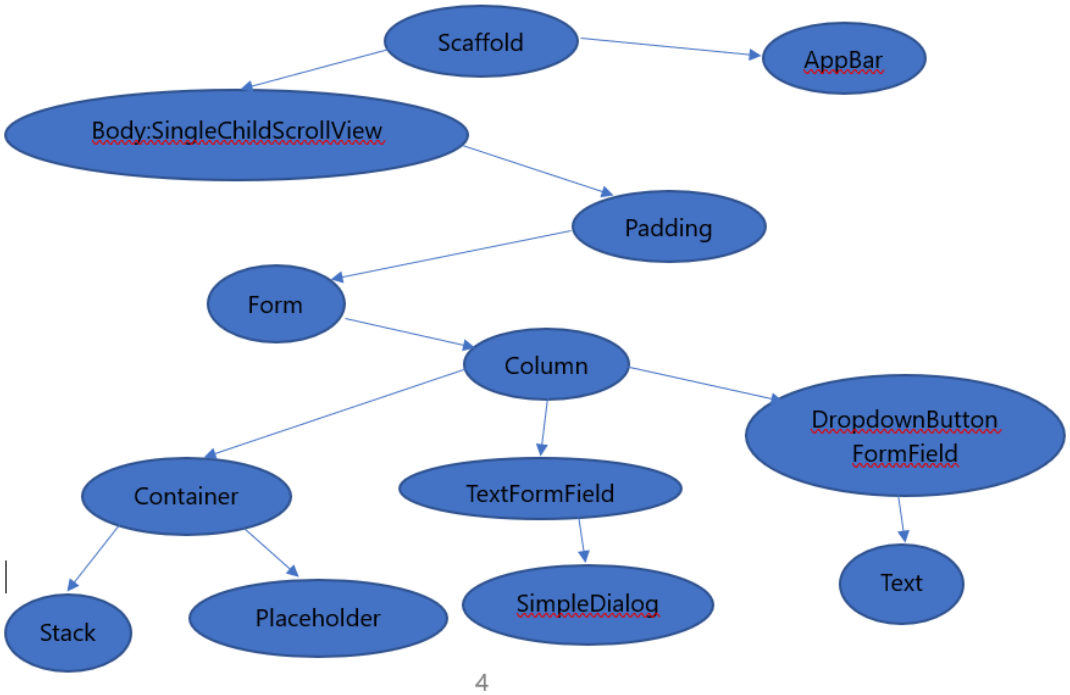

Figure 3 - TruckRegisterPage Widget Tree

delivery_history_page.dart

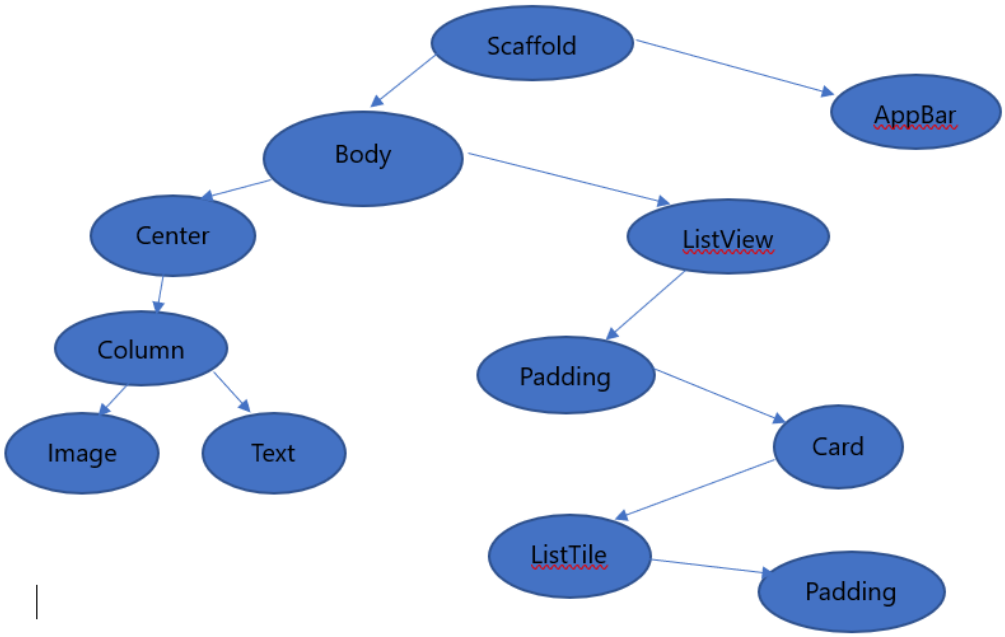

Figure 4 - DeliveryHistoryPage Widget Tree

login.dart

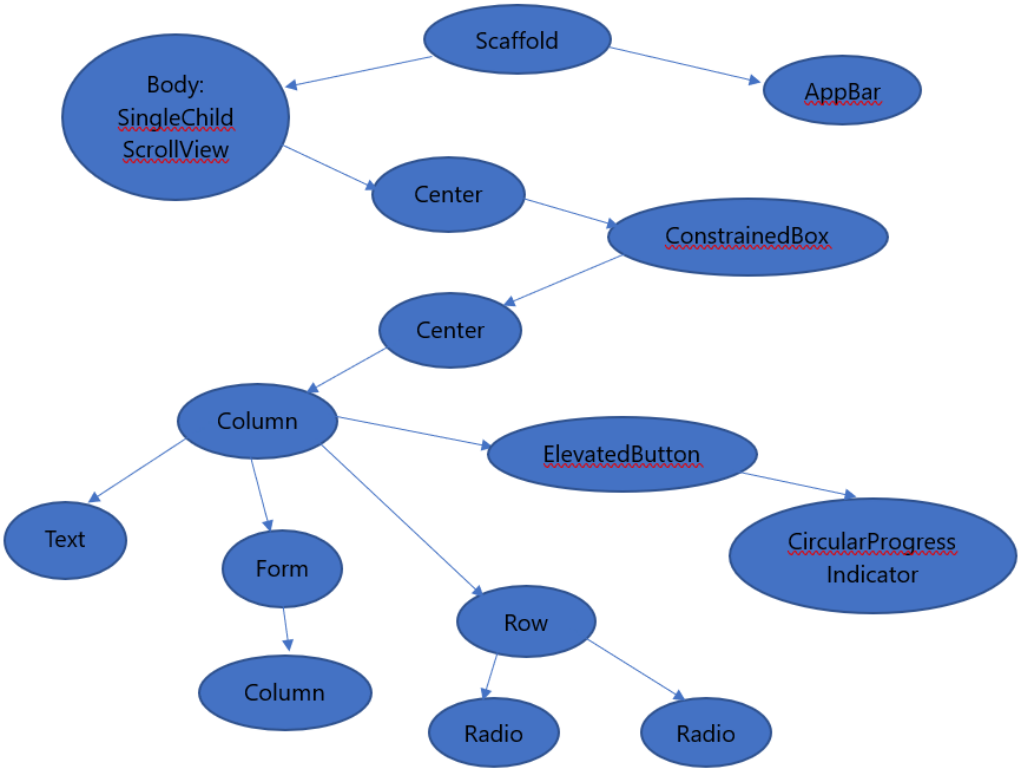

Figure 5 - LoginPage Widget Tree

4.0 FLUTTER WIDGET AND FEATURES ADOPTED IN THE APPLICATION

The XYZ Haulier Tracking application adopt many flutter widgets and features that would aid in the usage of the application.

The key widgets including:

1. Form Components:
    - TextFormField: Employed for user input within forms, offering real-time validation and a smooth input experience.
    - DropdownButtonFormField: Facilitates dropdown selection, crucial for picking drivers and truck types in the 'Register Truck' form.
2. Buttons:
    - ElevatedButton and IconButton: Used for various actions like triggering file uploads, user logout, and initiating truck registration.
3. List Components:
    - ListView and ListTile: Enable the structured display of delivery history, providing a clean and organized user interface.
4. Dialongs and Snackbars:
    - AlertDialog and SnackBar: Employed for user interactions such as logout confirmation and displaying notifications.
5. Animation:
    - Lottie Package: Integrated for visually appealing animations.
6. Carousel Slider:
    - CarouselSlider Package: Implements a dynamic and visually appealing image slider for an enhanced user experience.
7. State Management:
    - StatefulWidget and Provider Package: Utilized for managing state across screens, ensuring real-time updates and synchronization of data.

Key features including:

1. Firebase Integration:
    - Realtime Database (FirebaseDatabase): Used for storing and retrieving truck, driver, and delivery data, ensuring seamless data synchronization.
2. Firebase Storage:
    - FirebaseStorage: Employed for storing and retrieving images and files related to trucks, such as vehicle registration and insurance documents.
3. File Handling:
    - FilePicker Package: Integrated for smooth file selection and upload, improving user experience when attaching documents.
4. Image Handling:
    - Image Widget: Incorporated for displaying images, supporting dynamic loading from Firebase Storage in truck registration.
5. Sorting:
    - Sorting and Styling: Uses Flutter's ListView to sort deliveries by date, highlighting completed in green and pending in grey.

The XYZ Haulier Tracking application harnesses the power of Flutter widgets to provide a feature-rich logistics management platform. With elements like real-time data updates and visually engaging animations, Flutter, along with the CarouselSlider package, ensures a user-friendly and efficient experience for logistics professionals.

5.0 SAMPLE OF INTERFACE WITH EXPLANATION

To get a better look and understanding of the application, a sample of interface is provided:

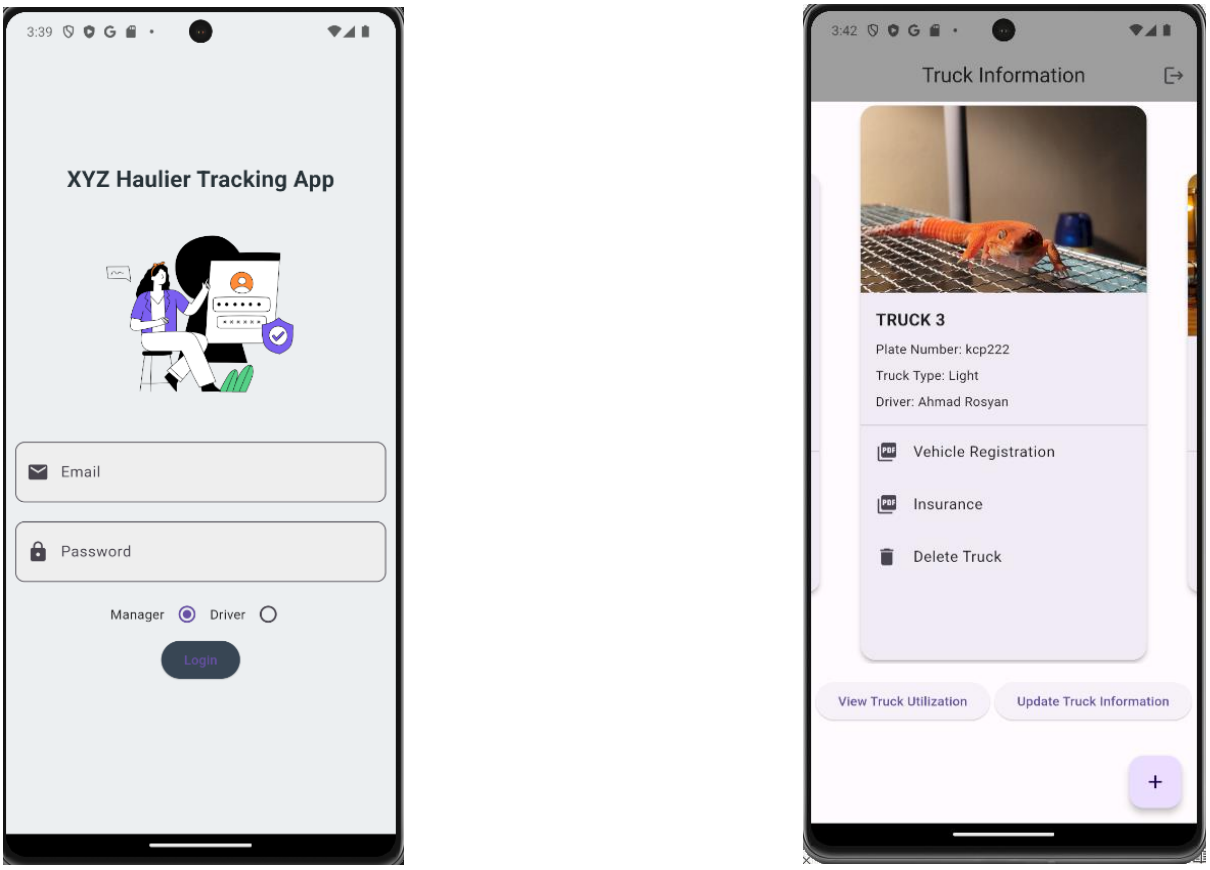

Figure 6 - Login and Truck Info Pages

Figure 6 indicates the Login and Truck Information pages for the application. The LoginPage boasts an intuitive and visually appealing interface with Lottie animation. A row of Radio Buttons enables users to select their role (Manager or Driver). A responsive design is ensured through ConstrainedBox and SingleChildScrollView.

The TruckInfoPage provides an overview of registered trucks, allowing users to manage and view detailed information. The main content utilizes a CarouselSlider to showcase each truck's details. Additional functionalities include tapping on PDF icons to view vehicle registration and insurance documents. The FloatingActionButton at the bottom allows users to easily register a new truck.

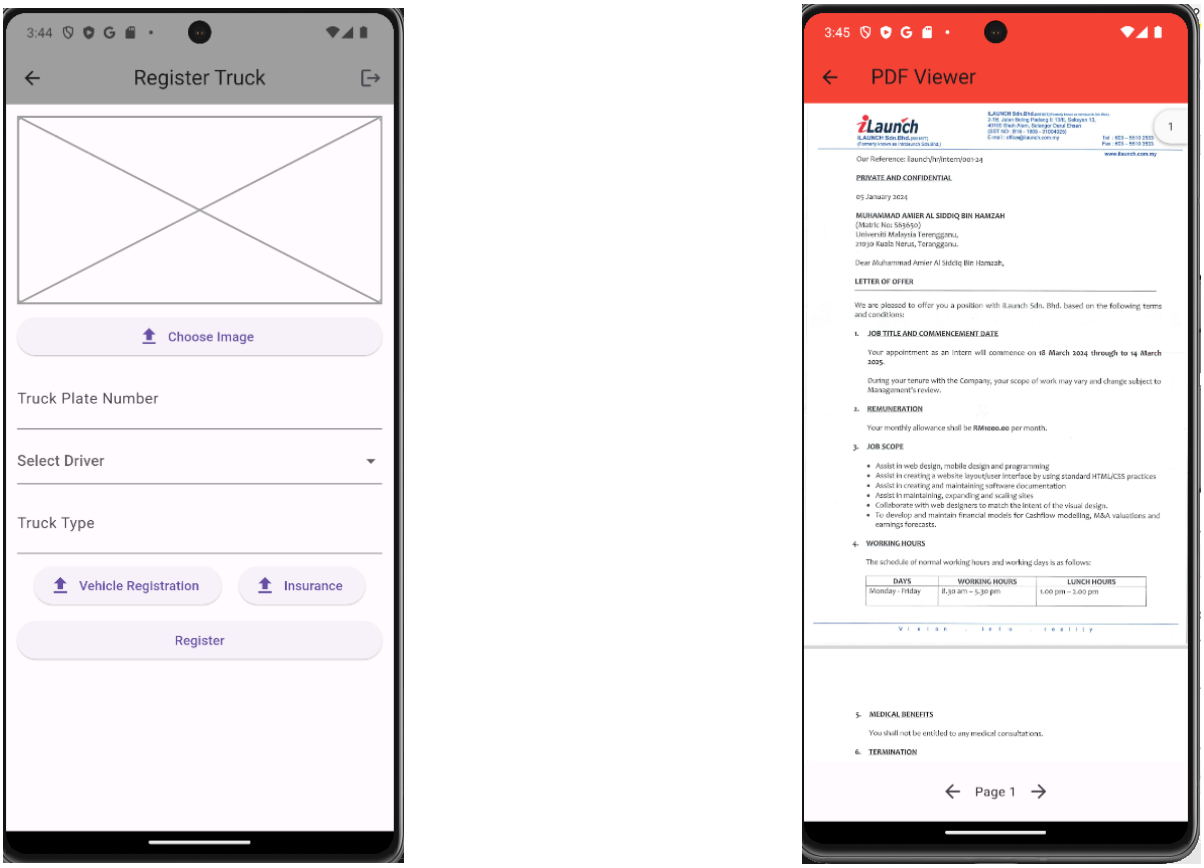

Figure 7- Register Truck and Pdf Viewer Pages

Figure 7 indicates the Register Truck and Pdf Viewer Pages for the application. The RegisterTruckPage facilitates the registration or update of truck information. This Flutter page includes a form allowing users to input or modify details of the truck. If the page is an existing truck, the form fields are pre-filled with the truck's current information. The page supports uploading images and files to Firebase Storage. The page uses Firebase Realtime Database for storing truck information.

The PdfViewerPage is designed to display PDF documents using the Syncfusion Flutter PDF Viewer. This Flutter page takes a PDF URL as a parameter and provides a user interface for viewing and navigating through the PDF pages. Additionally, there's a page indicator displayed at the bottom of the screen and an arrow icon for navigating to the previous and next pages.

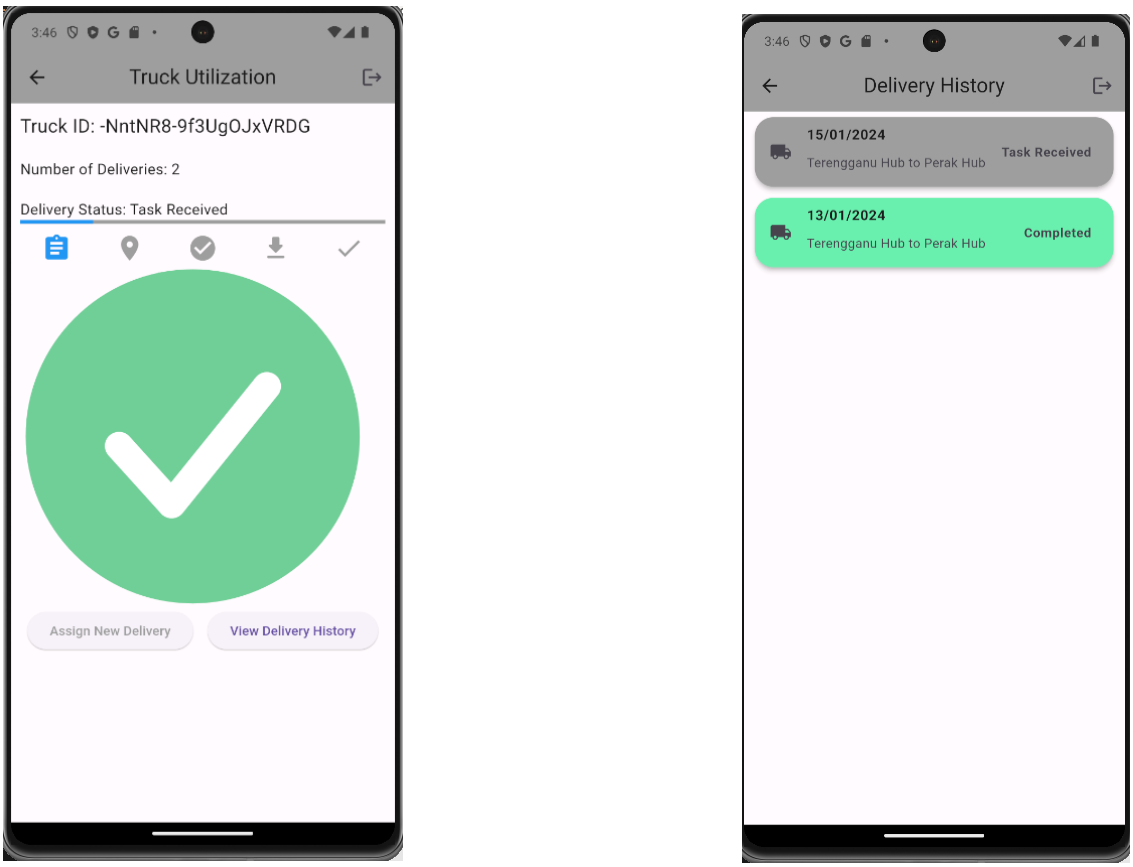

Figure 8 - Truck Utilzation and Delivery History Pages

Figure 8 indicates the Truck Utilization and Delivery History Pages for the application. The TruckUtilizationPage offers comprehensive insights into the utilization of a specific truck. The app provides essential details, the number of deliveries, and the current delivery status. The page employs a linear progress indicator and icons to visually represent the progress of the ongoing delivery. Users can assign new deliveries when the delivery status is set to 'Completed'. There is also a button to view delivery history.

The DeliveryHistoryPage designed to provide a comprehensive overview of the delivery history for a specific truck. The page fetches and displays delivery records in descending order based on their delivery dates. Each delivery is presented as a card within a scrollable list, featuring key details such as the delivery date, source, destination, and status.

6.0 CONCLUSION

The XYZ Haulier Tracking App, developed with Flutter and seamlessly integrated with Firebase services, stands out as a well-executed solution for efficient truck fleet management. With a user-centric design, real-time data updates, and a feature-rich set of functionalities, the app offers an intuitive and visually appealing experience for users. The use of Firebase for user authentication and real-time database operations ensures the reliability and scalability of the system. The codebase reflects a modular and maintainable structure, facilitating future enhancements and feature additions. Responsive UI elements, effective error handling, and a focus on user feedback contribute to a stable and user-friendly application. Overall, the project successfully addresses the complexities of truck fleet management, making it a valuable tool for logistics and transportation industries.

7.0 REFERENCES

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