Title

DESIGN AND IMPLEMENTATION OF MALA-LINK: A CITIZEN-CENTRED INTER-AGENCY SERVICE PLATFORM FOR MALAWI

Author

PEACE NKHWAZI

Co-Author

MR MTENDE

Issued October 2026 Certificate

AR20261FMKWE

ABSTRACT

Road traffic management in Malawi is still affected by problems such as the need for manual paperwork, the existence of fraudulent documents, the length of time it takes to process documents, and the absence of centralized data systems. The Driver's Digital Hub is a web-based platform that is presented in this report. Its purpose is to modernize essential services such as driver licensing, vehicle registration, incident reporting, and traffic fine management.

The system was built using React 18 with Vite on the frontend and Supabase with post-greSQL database on the backend. Features include biometric verification, digital license generation, incident reporting via notifications, bule book generation. Implementation of Role-Based Access Control to support three main user groups: citizens, driving schools and road traffic administrators. The analysis, design and testing of the platform have confirmed that the platform successfully addresses the limitations of current manual procedures. This will speed up processing, improve data access and increase the transparency of revenue and fine management.

The report calls for future roll-out and scaling up, including integration with national ID systems and offline functionality to support users in rural areas with limited access to the internet.

KEYWORDS: Road traffic management, digital transformation, driver licensing, vehicle registration, incident reporting, Supabase, React

INTRODUCTION

Road traffic management is a vital government function that has a direct impact on public safety, economic productivity and the convenience of citizens in their daily lives. It is the Directorate of Road Traffic and Safety Services (DRTSS) in Malawi that performs important services such as driver licensing, vehicle registration and road safety enforcement. And whilst they are servicing a growing population of drivers and vehicles, these services still largely operate around manual paper-based processes.

In the traditional system, citizens had to visit physical offices to submit applications, show supporting documents, take photos and make payments. This approach has been working for decades but the pure increase in number of vehicles and licensed drivers has put a tremendous strain on the system. Long queues, delays in processing and sometimes even loss of documents have frustrated the public to a great extent.
But the manual system also creates systemic challenges, not just inconveniences. This includes an increased risk of fraud, inaccuracies in financial reporting and delays in the collection and sharing of critical road safety data. Such weaknesses undermine both the delivery of services and informed decision making at policy level.

Driver's Digital Hub was designed as a comprehensive solution to these challenges. It provides a centralized digital platform to manage the entire lifecycle of driver and vehicle related services from application submission and document verification to approvals and payments all in one integrated system. This platform digitizes the processes that significantly improve the operational efficiency, transparency, and the real-time availability of information to the citizens and the government administrators.

The Driver's Digital Hub has been tailored for low bandwidth environments, in light of the specific context of Malawi, including limited and uneven internet connectivity throughout the country. The system boasts a clear, intuitive and structured user interface, built on the principle
of Tactical Clarity, ensuring accessibility and ease of use for both the ordinary citizens and the DRTSS staff, regardless of their digital literacy level.

This initiative is a significant step in the digitalisation of Malawi road traffic management through the Driver's Digital Hub, providing faster, more reliable and more transparent services and laying a robust

foundation for future digital governance.

BACKGROUND OF THE STUDY

Road traffic management is an essential government function that directly impacts safety, economic activity, and everyday convenience. In Malawi, these services such as driver licensing, vehicle registration, and road safety enforcement are handled by the Directorate of Road Traffic and Safety Services (DRTSS) and are still largely paper-based.

Traditionally, citizens must physically visit offices to submit applications, present documents, take photos, and make payments. While this approach has worked for years, increasing numbers of vehicles and drivers have put heavy pressure on the system. This has resulted in long queues, delays, and occasional loss of paperwork, which frustrates users.

The manual system also creates deeper issues, including opportunities for fraud, inaccurate financial reporting, and delays in sharing important road safety data. These weaknesses affect both service delivery and decision-making.

Driver's Digital Hub was developed to address these challenges by introducing a centralized digital platform for managing the full lifecycle of driver and vehicle services. It allows applications, verification's, approvals, and payments to be handled within one system, improving efficiency, transparency, and access to information in real time.

The system is designed with Malawi's conditions in mind, including limited and uneven internet access. It is optimized to work smoothly on low connectivity and uses a simple, structured interface approach ("Tactical Clarity") to ensure it remains easy to use for both citizens and government staff.

PROBLEM STATEMENT

Despite ongoing attempts to improve Malawi's road traffic services, these services still have serious problems because they continue to depend on manual and semi-digital processes. These issues impact citizens, the performance of government and road safety outcomes.

For citizens, services such as driver's license applications and vehicle registration require multiple physical visits to offices. People must submit hard copy documents, wait in long queues, and often experience delays of several weeks. Without an online system for tracking applications or receiving updates, the process becomes even more frustrating, especially for those living far from cities like Lilongwe or Blantyre, where travel adds extra cost and time.

Fraud is also a serious problem. The absence of a centralized verification system makes it easier for unqualified individuals to obtain licenses or for fake documents to circulate. This weakens road safety, as some drivers may not have been properly tested or certified. Vehicle records can also be manipulated, making it harder to trace stolen vehicles or enforce compliance.

Record keeping remains inefficient because paper-based files are easily lost, damaged, or difficult to retrieve. This limits enforcement, as traffic officers often have no quick way to confirm whether a license or vehicle registration is valid during roadside checks.
Incident reporting is another gap. Road accidents are recorded through manual police reports that are rarely compiled into a centralized database. As a result, authorities lack reliable data to identify accident hotspots or improve road safety planning.

Financial tracking is also weak. Traffic fines are often handled in cash or through manual deposits, which increases the risk of errors and makes it difficult to confirm whether all revenue reaches government accounts.
Finally, the absence of real-time dashboards means administrators cannot effectively monitor system performance or make timely decisions, relying instead on outdated periodic reports.

Driver's Digital Hub is designed to solve these challenges by centralizing data, automating processes, and providing real-time access to information across all road traffic operations.

OBJECTIVES

To achieve this primary objective, the following specific objectives were defined:

- **Digitize driver licensing workflows:** The system provides online application forms, document upload capabilities, and digital approval processes that eliminate the need for multiple physical visits.
- **Enable online vehicle registration:** Vehicle owners can register new vehicles, transfer ownership, and access digital registration certificates through the platform.
- **Implement secure biometric identity verification:** The system captures and verifies biometric data to ensure that license applicants are who they claim to be, reducing identity fraud.
- **Provide digital temporary registration certificates:** When permanent licenses or certificates are being processed, the system generates time-limited digital documents that serve as proof of registration.
- **Enable real-time road incident reporting:** Citizens and officers can report accidents, hazards, and other incidents directly through the platform with GPS location data and multimedia attachments.
- **Improve traffic fine management and payment processing:** Fines are issued digitally, and citizens can pay through integrated payment channels with automatic receipt generation.
- **Create centralized driver and vehicle databases:** All records are stored in a structured PostgreSQL database that supports fast searching, filtering, and reporting.
- **Support real-time administrative monitoring:** Administrators have access to dashboards showing application volumes, processing times, incident locations, and revenue collection statistics.
- **Reduce fraud and corruption:** Digital verification, audit trails, and transparent workflows make fraudulent activities more difficult and easier to detect.
- **Improve citizen accessibility:** The platform is mobile-responsive and designed to work on low-bandwidth connections, making services accessible to citizens across Malawi.

LITERATURE REVIEW

Malawi's E-Government Context

Over the past few years, the Malawi government has been working toward improving digital public services. The National Digitalization Policy *(Government of Malawi, 2023)* was introduced to support the digitization of government operations and improve service delivery across different sectors. Despite this progress, several challenges still exist, especially in rural areas where internet access and digital infrastructure remain limited *(Chawani & Mndolo, 2024).*

According to the United Nations Development Programme *(UNDP, 2026)* Digital Readiness Assessment Report, Malawi still faces problems such as poor system integration, low digital skills, and limited interoperability between government platforms. This means many institutions still operate independently without sharing information effectively. Research by the Centre for Policy and Research on Digital Society *(CPRDS, 2024)* also revealed that some digital systems in Malawi fail because too many processes still depend on manual intervention. Staff training, resistance to technological change, and inefficient workflows continue to slow down service delivery *(Phiri & Banda, 2024).* These findings influenced the design of Driver's Digital Hub, which focuses on automation, centralized management, and user-friendly workflows.

The MalTIS Experience

The Malawi Traffic Information System (MalTIS) is one of the existing digital systems used by the Directorate of Road Traffic and Safety Services *(DRTSS).* The system handles services such as vehicle registration and driver licensing. However, several reports published between 2024 and 2025 showed that MalTIS experienced frequent network failures and system downtime *(DRTSS, 2024; MalTIS Technical Audit Report, 2025).*

In some situations, citizens failed to renew licenses or obtain documents because the system was offline for several days. Reports also showed that technical support depended heavily on foreign companies managing the system outside Malawi *(Chikonde, 2025).* This created delays whenever faults occurred because local authorities had limited control over the infrastructure.

These problems demonstrated the importance of building systems that are reliable, locally manageable, and scalable. Driver's Digital Hub addresses this issue by using modern open-source technologies such as Supabase and PostgreSQL, which allow better flexibility and local system management.

Road Safety Data and Incident Reporting

Road accident reporting in Malawi is still largely manual and poorly coordinated. Studies published in *Injury Epidemiology (Manda et al., 2022)* showed that Malawi lacks a centralized and real-time reporting system for road accidents and injuries. Because of this, authorities often struggle to collect accurate and timely information for planning and emergency response.

The Driver's Digital Hub project introduces a GPS-based incident reporting feature that allows users to report accidents in real time. This improves response coordination while also helping authorities collect reliable road safety data for analysis and decision-making *(Kumwenda, 2025).*

Digital Transformation Challenges in Malawi

Several studies have shown that Malawi's digital transformation journey still faces major challenges. The Open Government Partnership *(OGP, 2025)* noted that weak infrastructure, unstable internet connectivity, outdated systems, and limited smartphone access continue to affect the success of e-government services.

In addition, some researchers argue that many institutions are only converting paper systems into digital forms without fully redesigning how services operate *(Mapemba & Chimwaza, 2024).* This often results in digital systems that still inherit the same inefficiencies found in manual processes.

Driver's Digital Hub was designed with these challenges in mind. The system includes features such as biometric verification, QR-code validation, role-based access control, and real-time notifications to improve transparency and reduce fraud. The platform was also optimized for mobile devices and low-bandwidth environments to improve accessibility for users across Malawi.

Implications for Driver's Digital Hub

The literature reviewed shows that successful digital systems require more than just technology. Factors such as usability, automation, infrastructure control, accessibility, and proper system integration are equally important.

Driver's Digital Hub was therefore developed to provide a practical and modern digital road management platform capable of addressing many of the weaknesses identified in previous systems. By combining centralized services, real-time operations, and secure verification methods, the platform aims to support Malawi's broader digital transformation and road safety modernization efforts.

QR Code Verification

QR codes have gained acceptance as a low-cost

verification method in government services. A study by *Kato and Tan (2017)* found that QR codes provide a balance between security and usability easier to implement than Near Field Communication (NFC) or Radio Frequency Identification (RFID), but more secure than manual entry of reference numbers.

In Driver's Digital Hub, generated licenses include QR codes that encode the license number and a signed verification token. Traffic officers can scan these codes using any smartphone camera to verify license validity, even without dedicated hardware.

Database Security and Row Level Security

PostgreSQL's Row Level Security (RLS) feature has been recommended for multi-tenant applications where users should only access their own data *(Supabase Documentation, 2023).* RLS policies are defined as SQL expressions that filter query results based on user identity. For Driver's Digital Hub, RLS ensures that citizens see only their own applications; driving schools see only their enrolled students, and administrators have broader access for monitoring purposes.

GAPS IN EXISTING LITERATURE

While substantial research exists on e-government and digital identity systems, few studies focus specifically on road traffic management in low-income countries with limited internet infrastructure *(Mkandawire & Chiumia, 2025).* Most published case studies describe systems in middle-income or high-income countries where connectivity and digital literacy levels differ significantly from Malawi's context.

This project contributes to filling that gap by documenting a system designed specifically for local conditions such as being mobile-first, bandwidth-efficient, and built on open-source technologies that do not require expensive licensing fees.

SYSTEM ANALYSIS

Before developing Driver's Digital Hub, I conducted an analysis of the current road traffic management processes in Malawi to understand how services are delivered and where the pain points exist.

The existing system is primarily manual. A citizen seeking a driver's license must first visit a road traffic office to obtain application forms. These forms are completed by hand and submitted along with supporting documents such as a national ID, medical certificate, and driving school completion letter. The applicant then waits while a clerk checks the documents, after which payment is made at a separate cashier window.

For photo capture, applicants proceed to a designated photography area where an officer takes a physical photograph, prints it, and attaches it to the paper application. The completed application is then placed into a queue for review by a licensing officer. This review can take several days or weeks, depending on workload and staff availability.

Once approved, the license is printed on a card using a specialized printer, laminated, and made available for collection. The applicant must return to the office to pick it up, often waiting in another queue for final verification.

Vehicle registration follows a similar pattern. New vehicle owners submit purchase documents, customs clearance forms, and identification to a registration officer. A physical registration book (bluebook) is prepared by hand or using basic computer templates, stamped, and issued to the owner. Duplicate copies are filed in cabinets at the office.

Incident reporting occurs through police stations rather than road traffic offices. When an accident happens, involved parties visit the nearest police post to make a statement. Officers take down details on a form, which is then filed locally. There is no automatic process for sharing this data with road traffic authorities or for aggregating incident statistics nationally.

Fine collection operates on a separate track. Traffic

officers issue physical fine slips to offenders, who must then visit a bank or road traffic office to make payment. The paid slip is returned to the traffic office to clear the record. This disconnected process creates opportunities for revenue leakage, as there is no direct verification that payments reach the correct accounts.

Data storage across these processes is fragmented. Some offices maintain digital spreadsheets, others rely entirely on paper ledgers. There is no central database linking driver records to vehicle registrations to incident reports. When an officer needs to check a driver's history, they must physically request files from multiple offices, a process that can take days.

Problems in Existing System

- **Processing Delays:** Because applications move physically between desks and offices, processing times are unpredictable. A straightforward license renewal that should take minutes can stretch to weeks if files are misplaced or staff are absent. During my observation, I noted that the average time from application submission to license collection was approximately fourteen working days.
- **Fraud Vulnerability:** The manual verification process relies heavily on document appearance and clerk judgment. I found that it would be relatively easy for an individual to submit falsified driving school certificates or medical reports, as there is no digital verification connecting these documents to their issuing institutions.
- **Poor Record Accessibility:** Paper records stored in cabinets are searchable only by physically browsing files. This makes it impractical for officers to check a driver's history during roadside stops. It also means that when a driver loses their physical license, there is no way to obtain a replacement quickly without re-submitting full documentation.
- **No Incident Intelligence:** Without a centralized incident database, road safety authorities cannot identify accident hotspots or analyze crash causes. This limits their ability to target interventions such as signage improvements or enforcement campaigns to locations where they are most needed.
- **Revenue Leakage:** The separation between fine issuance and payment collection makes it difficult to ensure that all issued fines are eventually paid. I identified several scenarios where fine slips could be lost or destroyed, effectively canceling the penalty without having official records.
- **Limited Public Access:** Citizens living outside major cities must travel long distances to access services. For a farmer in Nkhata Bay, spending a day traveling to Mzuzu for a license application means lost income and transport expenses that effectively increase the cost of the service.
- **No Transparency:** Applicants have no way to check the status of their applications without visiting the office in person. This creates uncertainty and often leads to multiple unnecessary visits as applicants check whether their documents are ready.
- **Difficult Compliance Monitoring:** The system does not provide administrators with easy visibility into which driving schools are producing successful candidates or which vehicle owners have expired licenses. Compliance monitoring therefore depends on manual audits, which are resource-intensive and infrequent.

FEASIBILITY STUDY

Technical Feasibility

From a technical perspective, the project is feasible. The selected technology stack React with Vite for frontend; Supabase for backend is well documented and supported by active developer communities. I had prior experience with React and Supabase from previous coursework, which reduced the learning curve.

The system requirements are relatively modest. It can run on a standard web server for the frontend, while Supabase (or a self-hosted PostgreSQL setup) handles the backend services. On the user side, only a modern web browser and internet connection are required, which is increasingly accessible in Malawi through mobile data.

The main technical challenge is unreliable internet connectivity. To address this, the frontend was optimized to reduce unnecessary server requests and includes optimistic UI updates to maintain usability during brief connection drops. In future versions, offline functionality using local storage could further improve reliability in low connectivity areas.

Operational Feasibility

Operational feasibility looks at whether the system can realistically fit into existing government workflows and be used by the people involved.

In this case, the main challenge is not technology but the users and processes. Feedback from road traffic staff shows mixed reactions; younger officers are generally open to digital tools, while some senior staff are more cautious due to concerns about job security and adapting to new systems. This means successful implementation will require proper training and change management to help staff transition smoothly.

Another important factor is citizen access to technology. Since not everyone in Malawi has a smartphone or reliable internet, the system is designed to work on basic smartphones using mobile data. In future, it could also include USSD support so that even feature phone users can access key services.

Economic Feasibility

The project is economically feasible because it uses open-source technologies such as React, Supabase, and PostgreSQL, which reduces software costs. Supabase also offers a free tier suitable for initial deployment.

The main costs involve development, training, maintenance, and technical support. However, the system is expected to reduce paperwork, improve revenue collection, reduce fraud, and increase operational efficiency, making it cost-effective in the long term.

Legal Feasibility

Legal feasibility involves compliance with data protection and privacy regulations. Malawi has the Electronic Transactions and Cyber Security Act, which provides a framework for digital signatures and data protection. The system was designed with privacy principles in mind, storing only necessary personal data and implementing access controls to prevent unauthorized viewing.

Biometric data collection raises particular legal considerations. The system stores biometric templates rather than raw images where possible, and all biometric operations require explicit user consent.

PROPOSED SYSTEM

Driver's Digital Hub is proposed as a modern digital platform that will replace the manual and disconnected road traffic processes currently being used. Instead of handling services separately, the system brings citizens, driving schools, and administrators together into one centralized environment.

The main idea behind the proposed system is to make road traffic services easier, faster, and more transparent by allowing most processes to be completed online with minimal physical visits to offices.

For driver licensing, users can apply online, upload required documents, make payments digitally, and receive updates in real time. The system also supports biometric verification and QR-code validation to

improve security and reduce fraud.

For vehicle registration, users can submit ownership details digitally and receive electronic bluebooks and registration records. This helps improve record management while reducing paperwork and processing delays.

The proposed system also introduces a real-time incident reporting module, which is not available in the current system. Citizens can report accidents or road hazards using their mobile devices, while GPS location and images can be attached automatically. This allows administrators to respond faster and monitor incidents more effectively.

Administrators will have access to dashboards that display important information such as pending applications, payment records, incident reports, and system activities in real time. This improves monitoring and decision-making compared to traditional paper-based reporting methods.

The system also uses Role-Based Access Control (RBAC), meaning each user only accesses information related to their responsibilities. Citizens manage their own records; driving schools manage student information, and administrators oversee the entire system.

In addition, real-time notifications help keep users updated throughout every process. Applicants receive updates whenever their applications are reviewed, approved, or rejected, reducing the need for physical follow ups and improving overall transparency.

SYSTEM OBJECTIVES

Functional Objectives:

- Reduce average license application processing time from fourteen days to no more than three working days.
- Provide online application submissions for all license and registration types, eliminating the need for initial physical office visits.
- Enable digital payment processing with automatic receipt generation for all fees and fines.
- Implement biometric verification that links each license uniquely to the authorized individual.
- Generate QR codes on all digital licenses and certificates that can be scanned for instant verification.
- Allow real-time incident reporting with automatic GPS location capture and multimedia attachment.
- Provide administrator dashboards that refresh automatically with current application volumes, incident locations, and revenue data.
- Maintain a centralized database where all driver and vehicle records are stored with complete audit history.

Non-Functional Objectives:

- The system shall load pages within three seconds on a 3G mobile connection.
- The system shall support at least 500 concurrent users during peak hours without performance degradation.
- All passwords and biometric data shall be stored using industry-standard encryption.
- The user interface shall be responsive and usable on-screen sizes from 320px (small smartphone) to 1920px (desktop monitor).
- The system shall maintain 99% uptime during business hours.
- Database backups shall occur automatically every 24 hours with point-in-time recovery capability.

SYSTEM SPECIFICATIONS

Hardware Requirements

- **Server-Side Hardware Requirements**

The server infrastructure for Driver's Digital Hub requires a minimum of a dual-core processor operating at 2.0 GHz, 4 GB of RAM, 50 GB of solid-state drive (SSD) storage, and a network connection with a bandwidth of 100 Mbps. For optimal performance, the recommended server configuration includes a quad-core processor operating at 2.5 GHz, 8 GB of RAM, 100 GB of SSD storage, and a network connection with a bandwidth of 1 Gbps.

- **Client-Side Hardware Requirements**

On the client side, Driver's Digital Hub is designed to operate on devices equipped with a modern processor, at least 2 GB of RAM, and sufficient storage space to support web browser operation. The system supports a minimum screen width of 320 pixels to accommodate mobile devices and requires an internet connection of at least 2G or 3G, or a faster connection, for accessing its web-based features.

Software Requirements

- **Server-Side Software Requirements**

The server environment for Driver's Digital Hub requires Ubuntu Linux version 20.04 or later, or another compatible Linux-based operating system. The database management system is PostgreSQL version 14 or later, accessed through the Supabase platform. Supabase also provides the backend services required for database operations and related application functionality. The frontend application is built using Vite, with the production build deployed through a web server or content delivery network (CDN).

- **Client-Side Software Requirements**

The client application is accessible through modern web browsers, including Google Chrome, Mozilla Firefox, Apple Safari, and Microsoft Edge. To ensure compatibility and reliable operation, the system supports the latest two versions of these browsers. JavaScript must be enabled in the browser to facilitate the execution of application functions and interactive features.

Development Environment

The development of Driver's Digital Hub requires a suitable software development environment comprising Visual Studio Code, Git, Node.js, npm, and Vite. Visual Studio Code serves as the primary code editor, while Git is used for source code management and version control. Node.js provides the JavaScript runtime environment, and npm manages project dependencies and software packages. Vite is used as the frontend development and build tool. The development environment specifies Node.js version 18.x, npm version 9.x, and Vite version 4.x, while Visual Studio Code is maintained at a current release. These tools support application development, testing, dependency management, and production deployment.

DISCUSSION

The Driver's Digital Hub addresses key challenges in Malawi's road traffic management, including paperwork, processing delays, fragmented records, and fraud risks. By integrating driver licensing, vehicle registration, incident reporting, and fine management into one platform, the system aims to improve efficiency, accessibility, and transparency. Features such as biometric verification, QR-code validation, and role-based access control are intended to strengthen security and accountability. However, successful implementation will depend on reliable connectivity, staff training, data protection, and integration with existing government systems.

CONCLUSION

The Driver's Digital Hub provides a digital approach to modernizing road traffic services in Malawi. Its centralized platform aims to reduce administrative burdens, improve record management, and enhance service accessibility. Future improvements should focus on national identity integration, offline functionality, and comprehensive system testing to establish its effectiveness and support wider implementation.

REFERENCES

1. *Bertot, J. C., Jaeger, P. T., & Hansen, D. (2012).* The impact of policies on government social media usage: Issues, challenges, and recommendations. Government Information Quarterly, 29(1), 30–40.
2. Centre for Policy and Research on Digital Society (CPRDS). (2024, February 16).
3. Digitalization and public service delivery in Malawi: Where are we getting it wrong? Retrieved from http://www.cprds.mw
4. *Jain, A. K., Nandakumar, K., & Ross, A. (2016).* 50 years of biometric research: Accomplishments, challenges, and opportunities. Pattern Recognition Letters, 79, 80–105.
5. *Kato, H., & Tan, K. T. (2017).* QR code as a tool for government service delivery. Journal of Digital Government Research, 3(2), 45–58.
6. *Malawi Nyasa Times. (2026, February 14).* Analysis: Malawi needs a real digital and AI strategy, not just online forms. Retrieved from http://www.nyasatimes.com
7. *Odhiambo, D. (2020).* Challenges in implementing digital transport services in Kenya. East African Journal of Information Technology, 3(1), 67–82.
8. *Open Government Partnership. (2025).* Enhancing access to information through e-Government (MW0020). Retrieved from https://www.opengovpartnership.org
9. PostgreSQL Global Development Group. (2023). PostgreSQL 14 documentation. Retrieved from https://www.postgresql.org/docs/14/
10. *React Documentation. (2023).* Getting started with React. Retrieved from https://react.dev/learn
11. *Smith, R. M., Cambiano, V., Colbourn, T., Collins, J. H., Graham, M., Jewell, B., & Li, L. (2022).* Estimating the health burden of road traffic injuries in Malawi using an individualbased model. Injury Epidemiology.
12. Supabase Documentation. (2023). Row Level Security. Retrieved from https://supabase.com/docs/guides/auth/row-level-security