

MyHealthID — Universal Emergency & Health Access via National Digital ID

PROPOSAL

BY

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Abstract

Malaysia's healthcare sector faces some critical challenges regarding medical records fragmentation, late identification in emergency services, and a lack of control for patients over their medical records. MyHealthID offers a reliable and identity-based solution, which utilizes the National Digital ID infrastructure, including MyKad NFC and MyDigital ID, to link access to vital medical records among government and private medical centers. MyHealthID will make it easier and more efficient, with quicker verification and immediate access to vital medical data, while giving control back to patients regarding who accesses these records. MyHealthID will improve the efficiency and precision of emergency services while promoting better data privacy. It will also have an impact on diagnostic testing, reducing unnecessary time and financial waste.

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1.0 Project Objectives

Malaysia's healthcare ecosystem remains challenged in fragmented medical records, delayed emergency response, and limited patient control over personal health data even in today's advanced technology. Hence, there is an urgent need for a secure, identity-based solution that can unify access to essential medical information across different healthcare institutions. To address these challenges, the MyHealthID project is designed with **three key objectives**.

1. To Unify

Firstly, the project aims **to unify healthcare access** by using national identity card as a reliable, secure and trusted identity anchor. This common identity platform eliminates gaps in data and enables data exchange between public healthcare institutions under KKM, as well as private healthcare institutions, helping to solve the issues of fragmented medical record systems.

2. To Accelerate

Secondly, the project seeks **to accelerate emergency response** by significantly shortening the timeframe to identify a patient and extract pertinent data. With the verification provided by MyKad NFC and Digital ID, the system helps emergency responders quickly access important information such as blood type, allergies, and chronic conditions in almost 10 seconds, compared to the current average of approximately 15 minutes. This improvement directly enhances clinical decision-making capabilities during the "golden hour" as every second matters.

3. To Empower

Lastly, the project aims **to empower citizen control** through granting total control of who may view their medical files to the citizens. MyHealthID allow patients or their guardians explicitly grant or deny for healthcare providers to access to detailed medical

records. This privacy-focused approach enhances user autonomy and improves data protection.

2.0 Project Scope

- The system will provide a secure platform for patient identification using a Digital Health ID that supports both QR-based consent access and NFC-based emergency access.
- Access to medical data will require valid doctor or hospital credentials, ensuring that only authorized healthcare providers can view or manage patient information.
- The system will support two access modes: standard Dynamic Consent for normal visits and Break-Glass Emergency Override for unconscious or critical patients.
- Patient information available through the system will be limited to essential medical details such as blood type, allergy warnings, and verified medical records uploaded through the Clinical Admin Portal.
- Hospital interoperability will be supported through a centralized database, enabling the system to merge medical records from both government and private hospitals into a unified timeline.
- Medical record creation and management will be restricted to the Clinical Admin Portal, with automatic tagging of hospital identity and doctor credentials to maintain data accuracy and accountability.
- Real-time patient verification via IC number will be included to prevent duplicate profiles and ensure data consistency across institutions.
- Doctors will only be permitted to edit or delete medical records they personally created, and all entries older than 24 hours will be locked from modification to preserve data integrity.
- Emergency access will trigger mandatory logging and simulated SMS alerts to the patient's next-of-kin, ensuring accountability and transparency in high-risk situations.

- The system will exclude integrations with external telecom services, hardware NFC devices, insurance processes, billing systems, or appointment scheduling modules, focusing solely on identity verification and medical record accessibility.

3.0 Problem Statement

1. Data Trapped In Silos

The healthcare industry in Malaysia continues to face daunting challenges due to a fragmented patient data management system between public and private healthcare institutions. Different **patient data are trapped in isolated silos**, which means that, for example, a doctor in Sunway Medical Centre cannot access data from a patient from either Hospital Kuala Lumpur or other government hospitals.

2. The “Golden Hour” Risk

These problems are even more severe in emergency situations. In circumstances involving accidents, stroke, or when a patient is brought in unconscious, healthcare professionals face a **"Golden Hour" risk**, where decisions have to be taken immediately without access to essential information like blood group, allergies, and previous medical conditions. This lost time in searching for this information can lead to inaccuracies, which in some situations, even threaten a patient's life.

3. Redundant Costs

Further, a lack of integration of patient data from different healthcare institutions leads to substantial **redundant healthcare costs**. This means that, in most cases, patients are subjected to tests such as X-ray, blood, and imaging studies due to the lack of access to their past test results.

4.0 Proposed Solution

4.1 Core Concept and Architecture

Identity as the Unifying Key

MyHealthID employs a decentralized identifier (DID) architecture and is connected to Malaysia's National Digital ID infrastructure. Each citizen's MyKad/MyDigitalID serves as a cryptographic root of trust, enabling secure, verifiable credentials without creating a centralized health database.

Three-Layer Technical Architecture:

- 1. User Interface Layer (How People Access It)**
 - Web portal accessible from any browser
 - NFC card readers for MyKad tapping
 - QR code scanning for mobile access
- 2. Intelligence Layer (The Brains of the System)**
 - Smart consent management system
 - Rules engine that determines what data to show
 - FHIR (Healthcare Interoperability Resources) API gateway that translates between systems
 - Complete audit trail of every access
- 3. Data Source Layer (Where Information Lives)**
 - Connects to existing hospital systems
 - Links both public (KKM) and private healthcare providers

4.2 How It Works in Practice

Emergency Scenario (Patient Unconscious):

When a patient arrives at the emergency room unconscious, medical staff simply:

1. Tap the patient's MyKad on an NFC reader
2. Instantly see critical information:
 - Blood Type
 - Severe allergies
 - Current medications

- Emergency contact
- 3. Make immediate treatment decisions with confidence

Regular Clinic Visit (Patient Conscious):

For routine medical care, the process respects patient privacy:

1. Doctor requests access to medical records
2. Patient receives notification on their phone
3. Patient approves with a PIN or QR scan
4. Doctor sees authorized information
5. System logs everything for transparency

4.3 Key Technological Features

Smart Access Control System:

- Emergency Mode: Automatic access to life-saving data only
- Consent Mode: Patient controls what information to share
- Time-Limited Access: Doctors get temporary access, not permanent
- Guardian Mode: Family members can manage access for children or elderly

Data Standards and Compatibility:

- Uses FHIR (Fast Healthcare Interoperability Resources), the global healthcare data standard
- Works with existing hospital systems through adapters
- Supports gradual upgrade from paper-based clinics

Privacy and Security Protections:

- End-to-end encryption for all data transfers
- Patients see who accessed their records and when
- No central database vulnerable to mass attacks
- Compliance with Malaysia's PDPA regulations

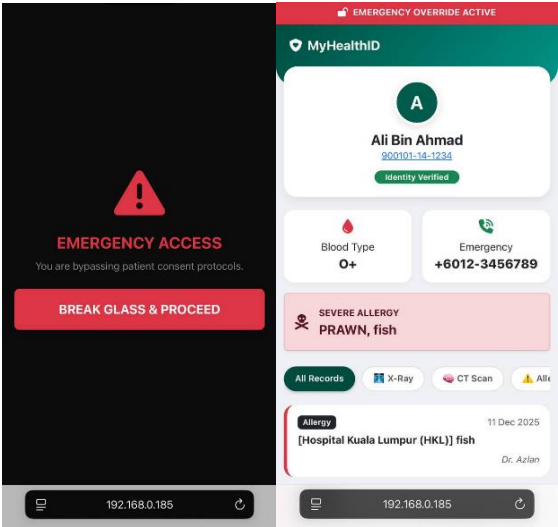
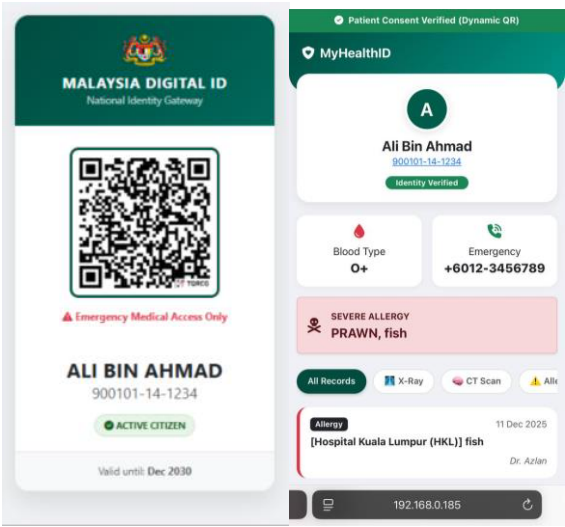
5.0 Key Features

5.1 Dual-Mode Access Protocol

- Dynamic Consent (QR Mode): Patient-approved access during normal visits; generates real-time consent signature.
- Break-Glass Emergency Mode (NFC): Enables secure access when patient is unconscious. Screen shows Red Security Overlay, requires manual confirmation, and logs EMERGENCY_OVERRIDE with automatic SMS alert to next-of-kin.
- Solves Privacy vs. Emergency Care conflict without compromising safety.

5.1.1 System Key Features in Action

Table 5.1.1.1 Compare Interface between Emergency mode (NFC) and Normal Mode (QR)

EMERGENCY MODE (NFC)	NORMAL MODE (QR)
 <p>Figure 5.1.1.1: Interface when access in emergency mode</p>	 <p>Figure 5.1.1.2: Interface when access in emergency mode</p>

5.2 Provider Mobile Interface

- Instant Vitals Display: Fast access to blood type, conditions, and critical allergies.
- Emergency Contact Dial-Out: One-tap phone link for rapid coordination.
- Unified Medical Timeline: Combines government and private hospital data into one chronological feed.
- Interactive Medical Imaging: View X-Rays/CT scans with full-screen zoom modal.
- Instant Category Filters: Zero-latency filtering (All, Allergies, X-Ray, etc.) without reloading page.

5.2.1 System Key Features in Action

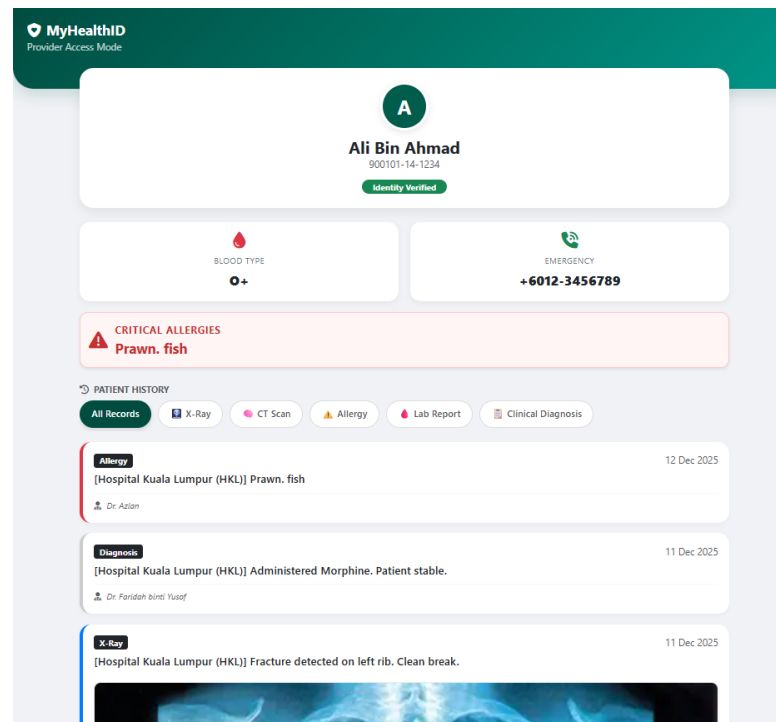


Figure 5.2.1.1: Doctor's Mobile Interface with All Records View

Once access to the system, direct to this main interface which displays the important personal details and important patient's medical records, allowing healthcare providers to quickly scan through all categories without switching pages.

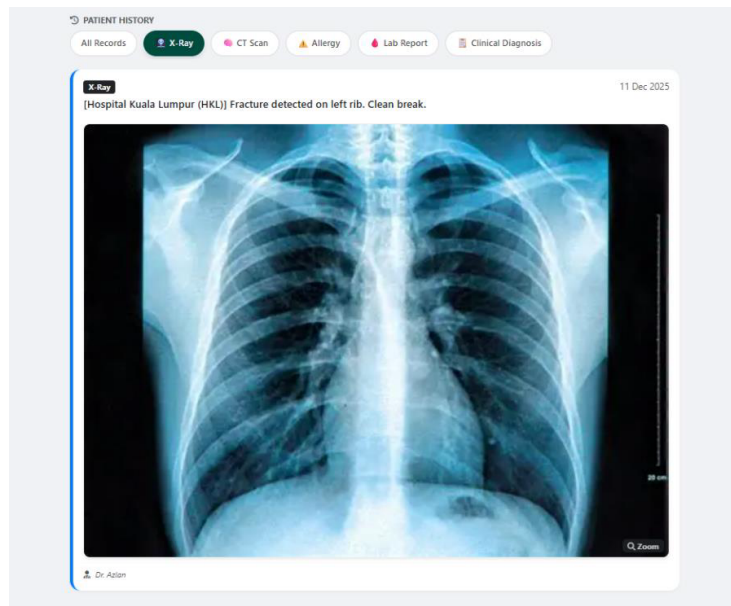


Figure 5.2.1.2: Doctor's Mobile Interface with X-Ray Record

When press the "X-ray" button, navigate to this page which shows visualize X-ray results of the patient, providing doctors with instant access to radiology images and related metadata for clinical assessment.

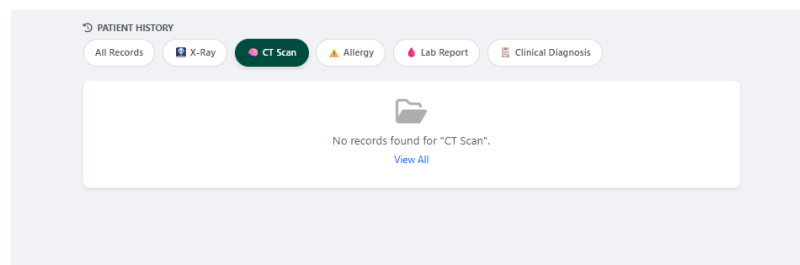


Figure 5.2.1.3: Doctor's Mobile Interface with CT-Scan Record

Once press "CT Scan", can view presents the patient's CT-scan records in full detail, enabling healthcare providers to review critical imaging findings efficiently.

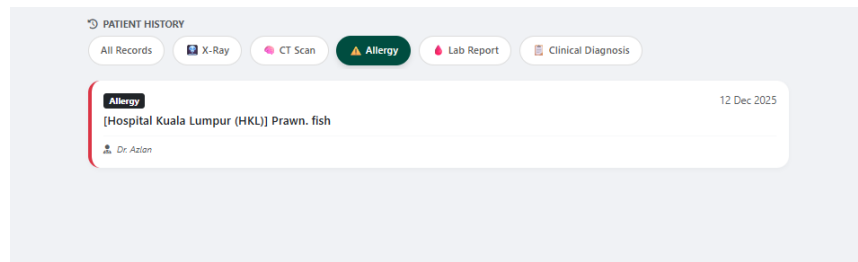


Figure 5.2.1.4: Doctor’s Mobile Interface with Allergy Record

“Allergy” button direct to this interface highlights the patient’s allergy information, ensuring doctors can identify high-risk allergens immediately during diagnosis or treatment.

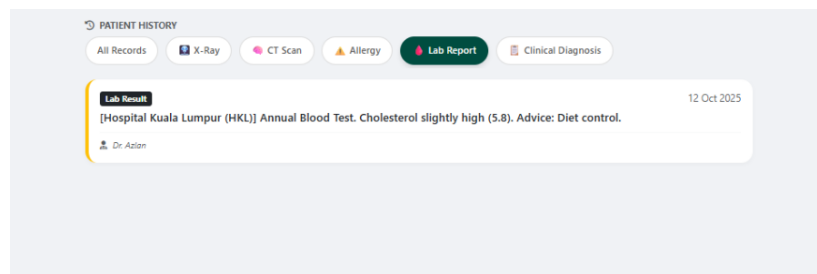


Figure 5.2.1.5: Doctor’s Mobile Interface with Lab Report Record

Once press “Lab Report” button, navigate to screen displays laboratory results, including blood tests and biochemical panels, allowing providers to quickly reference essential diagnostic data.

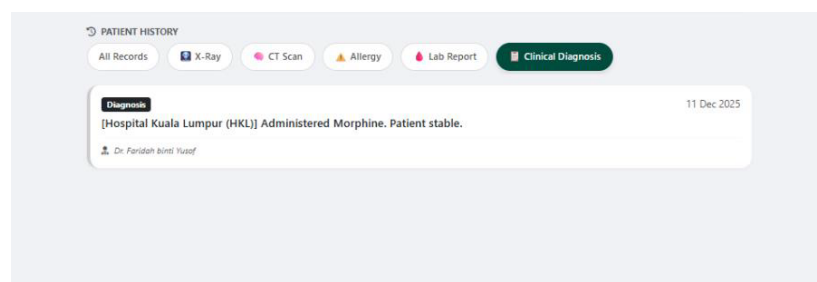


Figure 5.2.1.6: Doctor’s Mobile Interface with Clinical Diagnosis Record

“Clinical Diagnosis” will present showcases clinical notes and previous diagnoses, helping doctors understand the patient’s medical history and ongoing conditions during consultations.

5.3 Clinical Admin Portal

- **Context-Aware Login:** Hospital selection auto-filters relevant doctors and tags all data with correct Hospital & Doctor ID.
- **Live Patient Verification (AJAX):** Real-time IC lookup prevents duplicate records or wrong-patient errors.
- **Smart Data Entry:**
 - Auto-Hospital tagging in descriptions
 - Automatic Allergy Sync updates patient profile warnings
- **Local vs National View:** Local logs for hospital operations + nationwide record search for interoperability.

5.3.1 System Key Features in Action

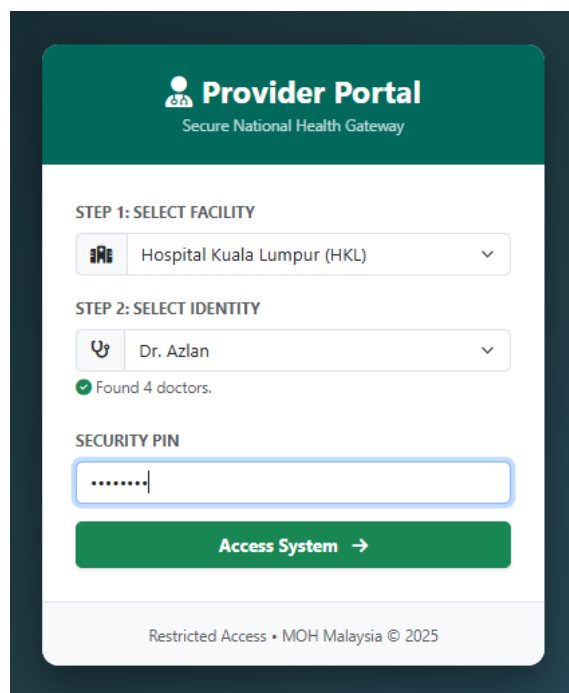



Figure 5.3.1.1: Admin Portal – Hospital and Doctor Verification Page

The initial login screen where hospital staff need to select their hospital and identity, enter the security pin before accessing patient records.


 MyHealthID

Government Sector

Dr. Azlan

Hospital Kuala Lumpur (HKL)

Logout

 Add Clinical Record

Patient IC Number

Verify Identity

Record Type

X-Ray

Attachment

Choose File

No file chosen

Findings / Description

Submit Record

Hospital Kuala Lumpur (HKL) (Local Logs)

Diagnosis

Dr. Dr. Faridah binti Yusof • 11 Dec 14:13

Administered Morphine. Patient stable.

X-Ray

My Entry • 11 Dec 13:13

Fracture detected on left rib. Clean break.

Locked

Lab Result

My Entry • 12 Oct 15:21

Annual Blood Test. Cholesterol slightly high (5.8).
Advice: Diet control.

Locked

Prescription

Dr. Dr. Faridah binti Yusof • 11 Dec 15:21

Insulin Glargine 10 units daily. Monitor sugar levels.

Figure 5.3.1.2: Clinical Record Management Interface

The main interface where doctors can add new clinical records and view the local hospital's activity logs. They are only accessible for their own patients' records. Other doctors' records remain locked to ensure privacy and comply with role-based access control.

Add Clinical Record

Patient IC Number
900101-14-1234 Verify Identity

✓ Ali Bin Ahmad

Blood: O+

Active

History (Last 3)

Diagnosis
[Hospital Kuala Lumpur (HKL)] Administered Morphine. Patient stable. 11 Dec 2025

X-Ray
[Hospital Kuala Lumpur (HKL)] Fracture detected on left rib. Clean break. 11 Dec 2025

Lab Result
[Hospital Kuala Lumpur (HKL)] Annual Blood Test. Cholesterol slightly high (5.8). Advice: Diet control. 12 Oct 2025

Record Type
X-Ray

Attachment
Choose File No file chosen

Findings / Description
For Allergy: Type ONLY the allergen name (e.g. Peanuts)

Submit Record

Hospital Kuala Lumpur (HKL) (Local Logs)

Diagnosis
Dr. Dr. Faridah binti Yusof • 11 Dec 14:13
Administered Morphine. Patient stable.


X-Ray Locked
My Entry • 11 Dec 13:13
Fracture detected on left rib. Clean break.

Lab Result Locked
My Entry • 12 Oct 15:21
Annual Blood Test. Cholesterol slightly high (5.8). Advice: Diet control.

Prescription
Dr. Dr. Faridah binti Yusof • 11 Dec 15:21
Insulin Glargine 10 units daily. Monitor sugar levels.

Figure 5.3.1.3: Patient Clinical Record Page After NRIC Verification

This shows the patient's complete clinical record page after verifying their identity through NRIC entry. Medical history is organized into categorized local logs (e.g., "Allergies", "Prescriptions", "Lab Results"), with each entry displaying the doctor's name, record type, timestamp, and a description.

 MyHealthID

Government Sector

Dr. Azlan
Hospital Kuala Lumpur (HKL)

Logout

Success! Allergy added to history AND Patient's Main Profile updated.

 Add Clinical Record

Patient IC Number

e.g. 900101-14-1234

Verify Identity

Record Type

X-Ray

Attachment

Choose File

No file chosen

Findings / Description

For Allergy: Type ONLY the allergen name (e.g. Peanuts)

Submit Record

Hospital Kuala Lumpur (HKL) (Local Logs)

Allergy

My Entry • 12 Dec 10:05

Prawn, fish

Edit Del

Diagnosis

Dr. Dr. Faridah binti Yusof • 11 Dec 14:13

Administered Morphine. Patient stable.

X-Ray

My Entry • 11 Dec 13:13

Fracture detected on left rib. Clean break.

Locked

Lab Result

My Entry • 12 Oct 15:21

Annual Blood Test. Cholesterol slightly high (5.8).
Advice: Diet control.

Locked

Prescription

Dr. Dr. Faridah binti Yusof • 11 Dec 15:21

Insulin Glargine 10 units daily. Monitor sugar levels.

Figure 5.3.1.4: Clinical Record Addition Success Confirmation

The interface shows the confirmation screen after successfully adding a new clinical record (e.g., allergy, prescription, lab result). The system automatically updates relevant patient profiles and triggers any necessary alerts across connected healthcare systems.

MyHealthID Government Sector

Dr. Azlan
Hospital Kuala Lumpur (HKL) Logout

Edit Clinical Record (ID: 9)

Editing active record. Cancel

Patient IC Number
900101-14-1234 Verify Identity

Ali Bin Ahmad
Blood: O+ Active

History (Last 3)

Allergy
[Hospital Kuala Lumpur (HKL)] Prawn, fish 12 Dec 2025

Diagnosis
[Hospital Kuala Lumpur (HKL)] Administered Morphine. Patient stable. 11 Dec 2025

X-Ray
[Hospital Kuala Lumpur (HKL)] Fracture detected on left rib. Clean break. 11 Dec 2025

Record Type
Allergy

Attachment
Choose File No file chosen

Findings / Description
Prawn, fish

Update Record

Hospital Kuala Lumpur (HKL) (Local Logs)

Allergy Edit Del
My Entry • 12 Dec 10:05
Prawn, fish

Diagnosis
Dr. Dr. Faridah binti Yusof • 11 Dec 14:13
Administered Morphine. Patient stable.

X-Ray Locked
My Entry • 11 Dec 13:13
Fracture detected on left rib. Clean break.

Lab Result Locked
My Entry • 12 Oct 15:21
Annual Blood Test. Cholesterol slightly high (5.8).
Advice: Diet control.

Prescription
Dr. Dr. Faridah binti Yusof • 11 Dec 15:21
Insulin Glargine 10 units daily. Monitor sugar levels.

Figure 5.3.1.5: Clinical Record Editing Interface

The edit interface for existing clinical records, with audit trail shows previous versions and edit history.

5.4 Enterprise-Grade Security & Compliance

- **Role-Based Access Control (RBAC):** Doctors can only edit/delete records they created.
- **24-Hour Write-Once Lock (WORM Compliance):** Records older than 24 hours become permanently locked.
- **Server-Side Enforcement:** Blocks unauthorized attempts even if URLs are manipulated.
- **Normalized 3NF Database:** Strong data integrity, scalability, and consistent foreign-key relations.

5.4.1 System Key Features in Action

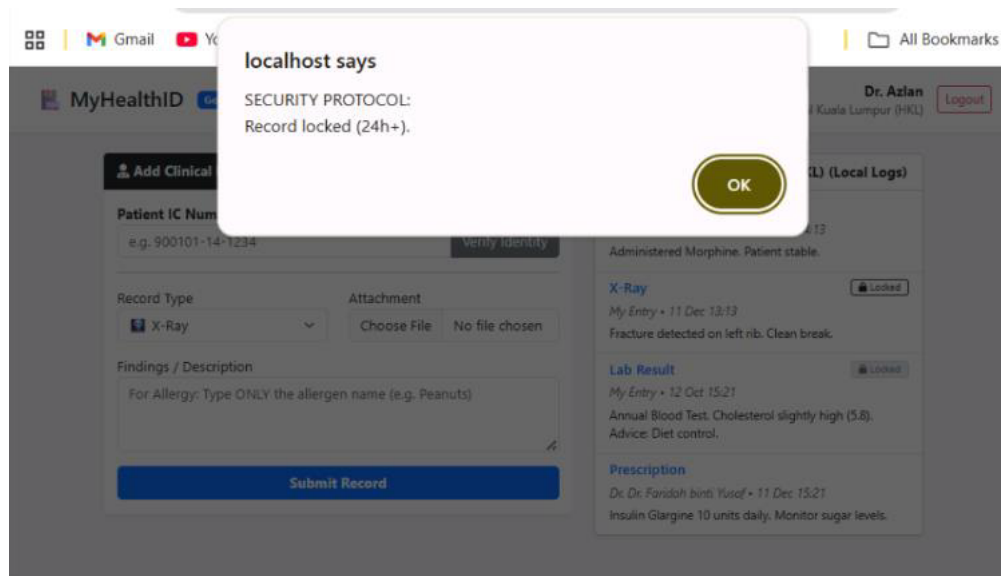


Figure 5.4.1.1: Security Audit Log Notification

This shows the complete security audit log with timestamped access records, user details, actions performed, and system responses. Includes a localhost security notification alerting users when records are locked within 24 hours.

5.5 Smart Patient Digital ID

- Government-Grade UI: Official MOH-style identity card with QR + NFC functionality.
- Dynamic Consent QR: Includes timestamped consent signature for legal clarity.
- Tap-to-Identify (NFC): Instantly retrieves vital data—blood type, allergies, chronic conditions.
- No App Required: Works across all devices via secure browser interface.
- Emergency Mode Disclaimer: Clear alert for medical-only usage and emergency behaviour.

5.5.1 System Key Features in Action

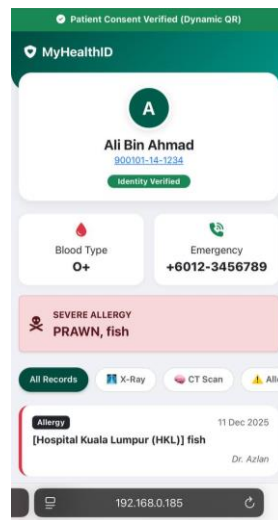


Figure 5.5.1.1: Smart Patient Digital ID Card

This interface shows the patient's digital health card accessed via phone, displaying verified identity information and view-only medical data (e.g., blood type, severe allergies). Patients cannot edit this data here.

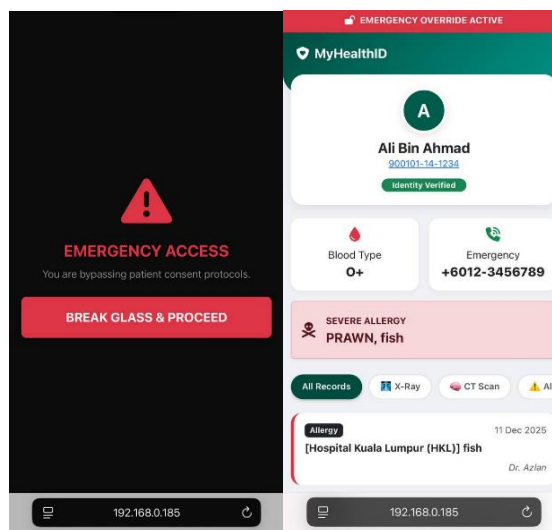


Figure 5.5.1.2: Emergency Access Alert on Patient's Phone

This interface shows the real-time notification on a patient's phone triggered by Emergency Mode (NFC) access at a medical facility, alerting them that their data was accessed due to an emergency situation.

6.0 Minimum Viable Product (MVP)

The Minimum Viable Product (MVP) for this project focuses on delivering a fully functional demonstration of the core features required to validate the system's purpose: secure patient identification, controlled access to medical records, and seamless interoperability between healthcare providers. The MVP will include a working Patient Digital ID capable of generating a dynamic QR code for consent-based access and simulating NFC tap functionality for emergency scenarios. Through this ID, doctors will be able to retrieve essential patient information such as blood type, allergy warnings, and key medical history.

The Provider Access Interface will be operational in the MVP, allowing doctors to scan the QR code or activate the NFC emergency workflow. The interface will load the patient's vitals, medical timeline, and uploaded medical images, while also demonstrating the Break-Glass Protocol through a red security overlay and manual confirmation step. The system will record emergency override events and simulate an alert being sent to the next-of-kin.

The Clinical Admin Portal will support hospital staff in entering and managing patient records. It will include hospital-based login selection, doctor identity tagging, real-time IC verification, and automated syncing of allergy information to the patient's profile. The portal will allow users to perform basic data entry, view local hospital logs, and conduct national-level searches to show cross-institution data accessibility.

Technically, the MVP will showcase the full backend workflow using PHP and MySQL, complete with role-based access, server-side validation, and 24-hour record lock enforcement. While SMS and NFC operations will be simulated rather than integrated with external hardware or telecom services, the MVP will provide a realistic, end-to-end experience of how the system functions in both normal and emergency healthcare scenarios.

Overall, the MVP will demonstrate a complete and coherent system that proves the feasibility of a national digital health identity solution, highlighting improvements in consent management, emergency care, and cross-hospital data sharing.

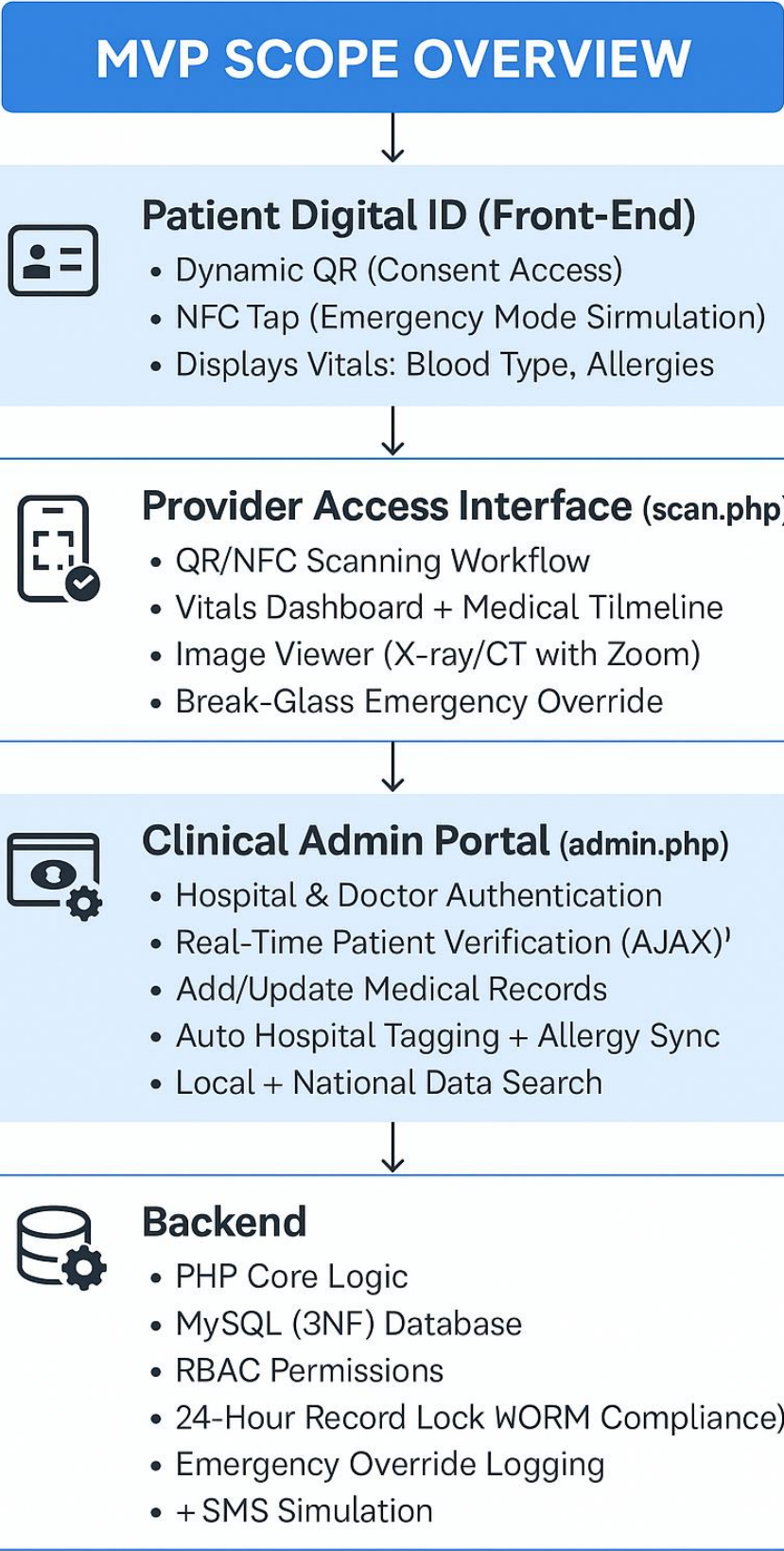


Figure 6.0.1 Visual MVP scope diagram

7.0 Target Users

7.1 Primary Users

- **Emergency Doctors**

When a patient is unconscious in some situation, doctors can immediately view the live-saving information such as blood type, allergies and patient history by scanning the MyKad NFC to the patient's phone. This allows the doctors to administer the correct treatment immediately during the "Golden Hour", which can prevent medical errors and negligence due to lack of patient information.

- **Paramedics Responders**

As paramedics responders are responsible for any patient that involved in an accident, they use the system to identify and stabilize the patient when they have any injury. By scanning the patient's MyKad NFC, they can access the patient data which provides the accurate information to the receiving hospital before arrival. This makes the overall treatment process smoother.

7.2 Secondary Users

- **Elderly users**

Basically, many of the elderly users are struggling to remember complex medical histories and it is hard for them to use smartphone apps. This system can benefit them by allowing them access the data via scanning their own physical MyKad NFC to the smartphone without requiring them to learn a new mobile application. This will ensure their critical health data can always be accessed even if they do not know how to use it.

- **Chronic Disease Patients**

Patients with a long-lasting health condition such as heart disease, diabetes and cancer require consistent monitoring and management. By using the system, they can maintain a centralized record of their long-term medications and treatments across different specialists. They ensure every new doctor is immediately aware of their existing conditions.

7.3 B2B Clients

- **Private Clinics**

Currently, most of the private clinics are operated in isolation and cannot access the government clinics records. By using MyHealthID, the administrators and doctors of private clinics can view the patient's medical history from government hospitals to ensure there are safer prescriptions and avoid redundant tests.

- **Insurance Provider**

By integrating with the system, insurance provider can identify and verify the authenticity of the patient's medical records submitted for claims, which help them to automate the approval process and detect the fraud. This can avoid the needs of manual document verification, ensuring only legitimate, unaltered hospital records are used only.

8.0 Market & ROI

Malaysia offers a significant market for a comprehensive, identity-based healthcare access platform. The country has a population of around **33 million citizens**, and this represents the total available market, as all Malaysians use government and/or private healthcare. Furthermore, there are over **8,000 private healthcare clinics** in Malaysia, offering a huge potential for software as a service (SaaS) adoption, especially for those that seek to accelerate patient enrollment.

The revenue stream of MyHealthID revolves around two functional and scalable aspects. Firstly, private healthcare facilities can **subscribe to a SaaS model** at RM50 per month, which includes benefits of one-tap patient registration and identity verification functionality. Secondly, insurance companies can utilize a RM1 per-claim **insurance verification fee** to authenticate the authenticity of healthcare information for efficient processing of claims.

On a macro-level, the benefit of this solution to a country like Malaysia, in terms of economy, can't be underestimated. This model has the potential to reduce redundant diagnostic test such as X-rays and blood tests, among others, that are often done multiple times due to a lack of interoperability. A 10% cut in unnecessary tests has the potential to save over RM10 million annually to a country like Malaysia.

- **Market Size:** 33M Malaysians, 8,000(total addressable market) + Private Clinics (SaaS Target).
- **Revenue Model:**
 1. **SaaS Subscription:** Clinics pay RM50/month for "One-Tap Registration" (Saves admin time).
 2. **Insurance Verification Fee:** Insurers pay RM1 per claim to verify genuine medical records (Prevents fraud).
- **Cost Saving (ROI):** Eliminating 10% of redundant tests = RM 10 Million+ savings for the national healthcare system annually.

9.0 Expected Impact

9.1 Social Impact

MyHealthID is designed to directly improve patient safety and outcomes, particularly in time-sensitive situations.

9.1.1 Enhancing Emergency Care

- **Challenge:**

In emergencies, especially when a patient is unable to communicate, medical staff often lack immediate access to critical information. This can lead to delays in treatment and potentially dangerous situations, such as administering medication to a patient with a known allergy.

- **Solution with MyHealthID:**

By providing instant access to a verified medical profile via the National Digital ID, first responders and emergency room personnel can quickly identify life-saving information.

- **Expected Outcome:**

- **Faster, Safer Interventions:** Access to accurate data on severe allergies, blood type, and current medications allows for immediate and appropriate medical decisions, reducing the risk of adverse reactions.
- **Informed Emergency Response:** Paramedics and doctors can provide better initial care with knowledge of pre-existing conditions (e.g., diabetes, heart disease).
- **Rapid Family Notification:** Instantly available emergency contact details facilitate quicker communication with loved ones.

9.1.2 Protecting Vulnerable Groups

- **Challenge:**

Elderly individuals, young children, and patients with chronic conditions are particularly at risk when their medical history is not readily available across different healthcare providers.

- **Solution with MyHealthID:**

The system is designed for universal access, using simple NFC taps or QR codes, ensuring it works for non-tech-savvy users.

- **Expected Outcome:**
 - **Continuity of Care:** A patient's key health information is accessible at any clinic or hospital, leading to more consistent and coordinated care.
 - **Guardian-Managed Profiles:** Caregivers can manage and provide consent for access to the records of children or dependent adults.
 - **Reduced Medical Errors:** A clear, centralized view of a patient's profile helps prevent mistakes in diagnosis and treatment.

9.2 Economic Impact

MyHealthID aims to reduce significant wastage in the healthcare system, creating savings for patients, providers, and the nation.

9.2.1 Reducing Healthcare Waste

- **Challenge:**

The lack of shared medical records leads to inefficiencies, including repeated diagnostic tests, lost physical records (like the Buku Merah), and administrative delays.
- **Solution with MyHealthID:**

Creates a digital, interoperable layer that makes existing patient data portable and accessible with consent.
- **Expected Outcome:**
 - **Fewer Duplicate Procedures:** Patients transferring between public and private facilities can avoid repeating X-rays, blood tests, and scans because previous results are accessible. This saves costs and reduces patient exposure.
 - **Elimination of Physical Record Loss:** Digital access prevents the permanent loss of health histories associated with misplaced physical booklets or files.
 - **Streamlined Insurance Claims:** Insurers can verify treatment claims against authentic digital records more efficiently, potentially reducing fraudulent claims and processing costs.

9.2.2 Improving Systemic Efficiency

- **Challenge:**

Healthcare resources are often consumed by administrative tasks and inefficient processes rather than direct patient care.

- **Solution with MyHealthID:**

Automates and accelerates the processes of patient identification and record retrieval.

- **Expected Outcome:**

- **Optimized Resource Use:** Savings from reduced redundant testing can be reallocated to other critical healthcare needs.
- **Faster Clinical Workflows:** Doctors spend less time searching for information and more time on patient consultation and treatment.

9.3 Efficiency Impact

The primary operational benefit of MyHealthID is a dramatic reduction in time spent on administrative processes.

9.3.1 Transforming Patient Registration

- **Challenge:**

Registering a new patient or retrieving a known patient's file can be a manual, time-consuming process involving forms, questions, and system searches.

- **Solution with MyHealthID:**

A simple tap or scan of a Digital ID instantly confirms identity and pulls up a core medical profile.

- **Expected Outcome:**

- **Drastic Time Reduction:** The goal is to cut patient registration time from an average of 15 minutes to under a minute. This speeds up the intake process in clinics and is critical in emergency triage.

- **Improved Data Accuracy:** Automated retrieval eliminates transcription errors from manual data entry.
- **Enhanced Patient Experience:** Significantly shorter wait times and less repetitive form-filling lead to higher patient satisfaction.

9.3.2 Streamlining Clinical and Administrative Workflows

- **Challenge:**

Healthcare staff spend considerable effort on coordination, communication, and documentation between departments and facilities.

- **Solution with MyHealthID:**

Provides a secure, standardized method for sharing essential patient information.

- **Expected Outcome:**

- **Faster Referrals and Handovers:** Specialists receive necessary patient history immediately.
- **Simplified Audit and Compliance:** A digital log of all record accesses provides clear trails for accountability and regulatory compliance.
- **Empowered Healthcare Workers:** Reduces administrative burden, allowing medical professionals to focus more on clinical care.

10.0 Feasibility and Implementation Plan

10.1 Technical Feasibility

MyHealthID system is designed to be fully based on a lightweight architecture whereby it is entirely web-based and can be worked by using any web browser without having to install the application. This is to ensure that everyone can easily access the system, particularly to the elderly who might not be at ease when using smartphones. In the case of the Hackathon aim, the system is not legally accessible to the actual government servers. Rather, it simply uses PHP and MySQL environments to simulate the responses of FHIR-standard APIs, allowing access to other hospital systems. To ensure that data integrity is assured and medical compliance is simulated in the real world, strict business logic has been introduced whereby doctors can edit or delete records they created within a time frame of 24 hours. To prevent historical manipulation by other people, all records after this time are legally locked and cannot be changed.

10.2 Operational Feasibility

Operational feasibility is brought through the utilization of the current infrastructure instead of creating a new huge database. The MyKad NFC is used as a secure Key in the system to unlock the existing secured system stored data, which saves a lot of money and avoids the requirement of a new hardware ecosystem. The system is fully compliant with the Personal Data Protection Act (PDPA), where doctors are technically not allowed to access a detailed history of a patient unless they scan through the dynamic QR code of a patient to obtain the approval.

10.3 Implementation Plan

Phase 1: Hackathon MVP (Current Status)

This phase aims to attain operational MyKad NFC Scan and PHP/MySQL Web Portal. The current deliverables consist of a functional doctor portal with secure logic of the entry, a patient module with MyKad NFC/QR code scans displaying the data of the patient such as allergies and blood type, and a record management module is capable of adding the patient record with the 24-hours edit or delete window.

Phase 2: Pilot Deployment (Q1 2026)

This pilot phase program incorporated 5 General Practitioner (GP) Clinics and Integrations with Mock FHIR API. This is done through the production of a pilot program to simulate real life processes and realistic exchange of data between the various clinic systems to make sure that it is working well. This stage also involves verifying the approved record-sharing mechanism and role-based access controls to monitor a high level of compliance with data privacy measures.

Phase 3: Ecosystem Expansion (Q3 2026)

The goal of this phase is to be commercialized with the strategic intention of Insurance Panel Integration to facilitate automated claims. The main action points are enabling fraud detection and automated processing among insurers. In addition, an API Gateway will be released to enable other authorized health apps to read MyHealthID data with user permission, thus creating the entire ecosystem.

11.0 Technical Diagram

11.1 Context Diagram & Data Flow Diagram

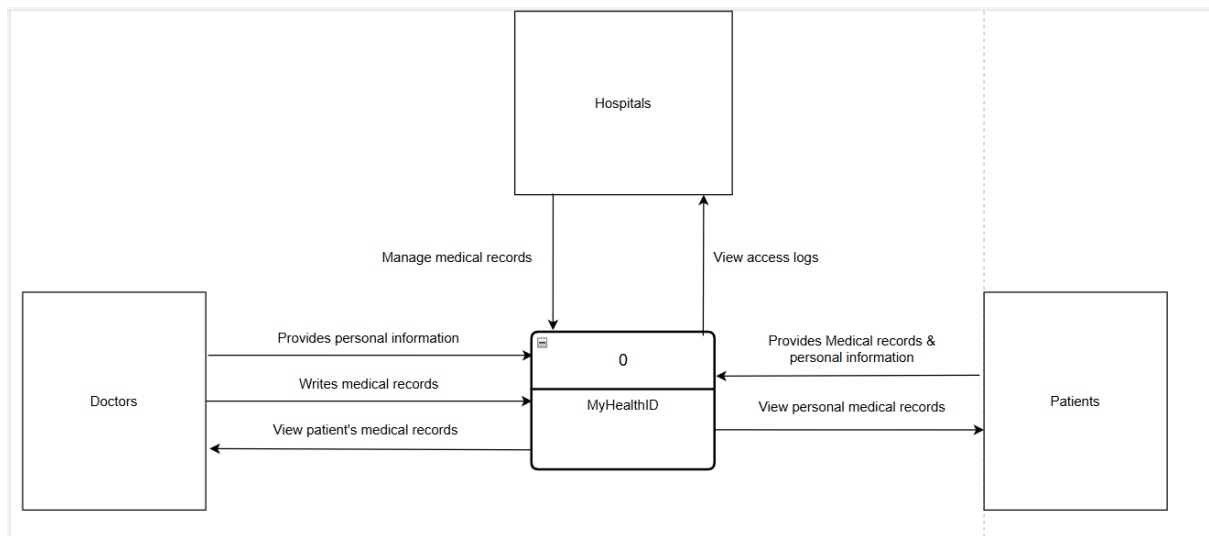


Figure 11.1.1: Context Diagram of MyHealthID

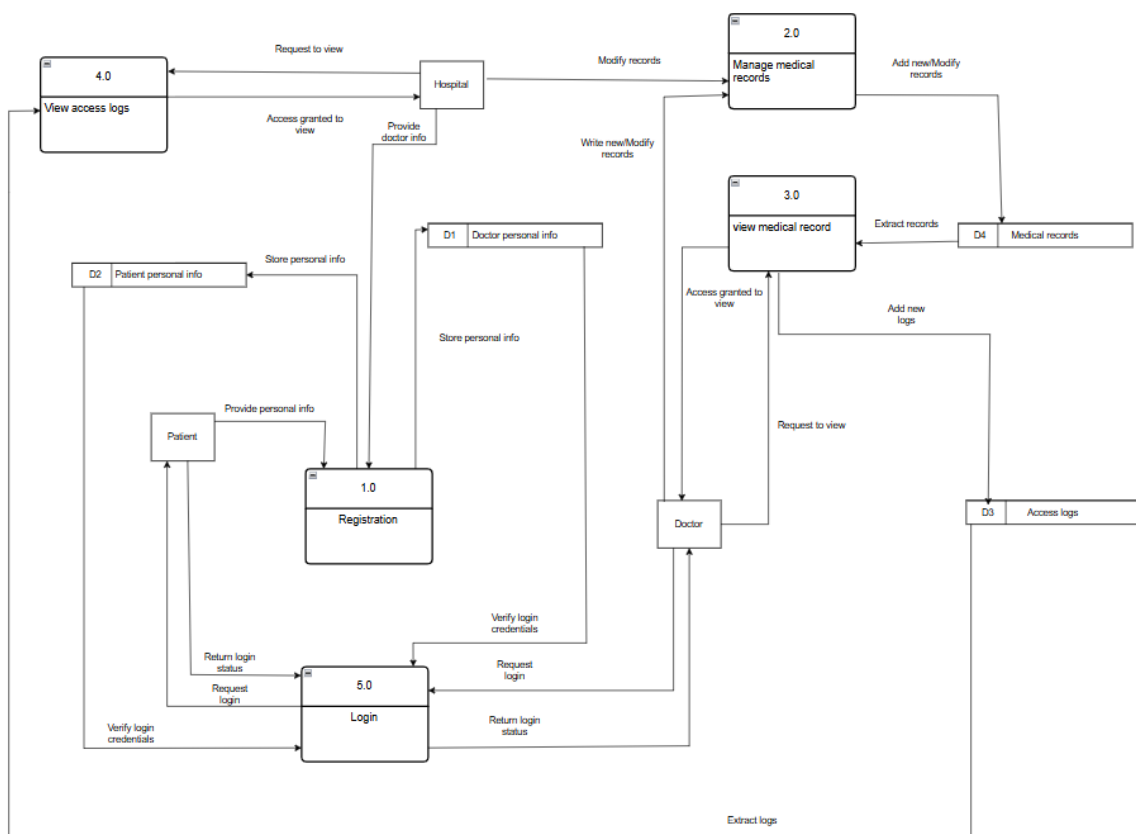


Figure 11.1.2: Data Flow Diagram of MyHealthID

11.2 Entity Relationship Diagram

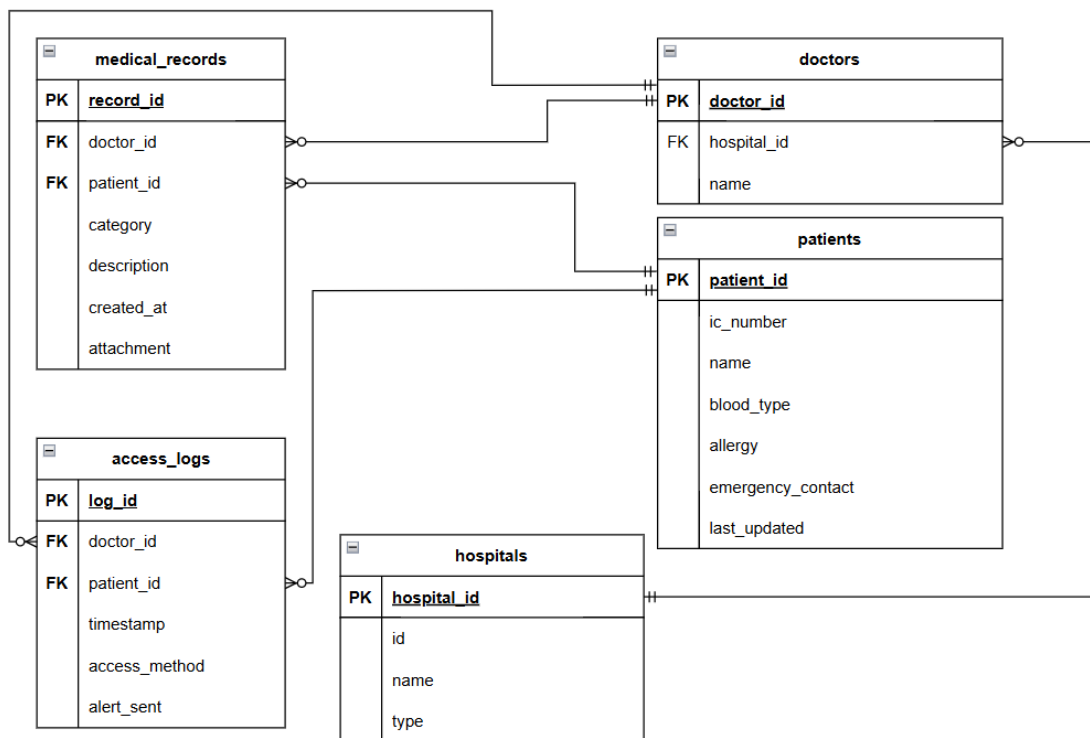


Figure 11.2.1: ERD of MyHealthID

11.3 Data Dictionary

Table 11.3.1: Data Dictionary of MyHealthID

TableName	Attribute	Contents	Type	Format	Required	PK or FK	Example
access_logs	access_method	App access method	varchar(20)	Text	Yes		QR
access_logs	alert_sent	Flag for alert sent	tinyint(4)	Number	Yes		0
access_logs	doctor_id	Doctor unique identifier	int(11)	Number	Yes	FK	NULL
access_logs	log_id	Log unique identifier	int(11)	Number	Yes	PK	1
access_logs	patient_id	Patient unique identifier	int(11)	Number	Yes	FK	1
access_logs	timestamp	Log timestamp	timestamp	Datetime	Yes		2025-12-11 04:54:19
doctors	doctor_id	Doctor unique identifier	int(11)	Number	Yes	PK	1
doctors	hospital_id	Hospital unique identifier	int(11)	Number	Yes	FK	1
doctors	name	Doctor name	varchar(100)	Text	Yes		Dr. Azlan
hospitals	hospital_id	Hospital unique identifier	int(11)	Number	Yes	PK	1

hospitals	name	Hospital name	varchar(100)	Text	Yes		Hospital Kuala Lumpur (HKL)
hospitals	type	Hospital type	varchar(50)	Text	Yes		Government')
medical_records	attachment	Record attachment	varchar(255)	Text	No		Xray.png
medical_records	category	Record category	varchar(50)	Text	Yes		X-Ray
medical_records	created_at	Record timestamp	timestamp	Datetime	Yes		2025-12-11 05:13:45
medical_records	description	Record description	text	Text	No		[Hospital Kuala Lumpur (HKL)] Fracture detected on left rib. Clean break.
medical_records	doctor_id	Doctor unique identifier	int(11)	Number	Yes	FK	1
medical_records	patient_id	Patient unique identifier	int(11)	Number	Yes	FK	1
medical_records	record_id	Record unique identifier	int(11)	Number	Yes	PK	1
patients	allergy	Patient allergy	varchar(255)	Text	Yes		PRAWN, fish

patients	blood_type	Patient blood type	varchar(5)	Text	Yes		O+
patients	emergency_contact	Patient emergency contact	varchar(20)	Text	Yes		+6012-3456789
patients	ic_number	Patient IC no	varchar(20)	Text	Yes		900101-14-1234
patients	last_updated	Update timestamp	timestamp	Datetime	Yes		2025-12-11 04:09:22
patients	name	Patient name	varchar(100)	Text	Yes		Ali Bin Ahmad
patients	patient_id	Patient unique identifier	int(11)	Number	Yes	PK	1