



Google Developer Group
On Campus

TechSprint



Leveraging the power of AI



Team Details

- Team name: **Semicolon**
- Team leader name: **Manvi Sharma**
- Problem Statement: **In developing regions, a patient's recovery is often a gamble. Because there is no reliable way to verify medication at the point of care, counterfeit drugs are infiltrating the supply chain, turning life-saving treatments into life-threatening risks.**

Problems

Opaque Supply Chains

- Life-saving drugs (GLP-1s, anti-malarial) move through untraceable, black box supply chains in developing regions.

Deadly Counterfeits

- Patients cannot distinguish genuine medicines from fake or toxic alternatives.

Critical Gap

- No reliable, patient-level mechanism to verify medicine authenticity at the point of care.

Solutions

Instant Medicine Verification

- Patients scan a QR code using a smartphone to verify drug authenticity in seconds.

Cryptographically Secure

- Uses public-key cryptography and digitally signed QR codes that cannot be forged or duplicated.

Truth at the Point of Care

- Authentication happens where the medicine is consumed, empowering patients directly.

Decentralized Architecture

- Verification handled by distributed, independent servers

Opportunities

- a. How different is it from any of the other existing ideas?
- b. How will it be able to solve the problem?

a. Most existing solutions:

- Use SMS-based codes which can be easily copied
- Rely on centralized databases that can be hacked or shut down
- Need internet access; not reliable in rural areas
- Are designed for companies, not patients

Our solution is different because

- No blockchain, no central dependency
- Works offline
- Uses cryptography instead of trust
- Patients verify directly using smartphones
- Detects QR code reuse

b. How Will It Be Able to Solve the Problem?

Step-by-step impact:

1. Fake medicines cannot pass cryptographic verification
2. Patients immediately know if a medicine is real or fake
3. Duplicate scans expose counterfeit distribution
4. Authorities get alerts before large harm occurs
5. Fear of detection reduces counterfeit circulation

Our solution prevents counterfeit medicines by making authenticity instantly verifiable by patients, not databases or middlemen.



List of features offered by the solution

Feature	What It Does
QR Code Scanning	User scans QR code printed on medicine
Offline Verification	Works even without internet
Instant Result / Alert System	Shows Genuine or Fake in seconds
Patient-Friendly UI	Simple design for non-technical users
Privacy Safe	No personal data collected
Duplicate Scan Check	Warns if same medicine is scanned many times
Scalable System	Can support many users
Cloud-Based Analysis	Finds areas with fake medicine supply

Google Technologies used in the solution

Frontend (User App)

- Flutter (Google) – cross-platform app
- ML Kit (Google) – QR code scanning
- Material UI – clean, familiar UI

Backend & Cloud

Google Cloud Platform (GCP)

- Cloud Run – backend APIs
- Firebase Authentication– anonymous authorization
- Cloud Functions – scan verification logic
- Firestore – distributed scan logs
- Cloud Storage – manufacturer keys & metadata

Security

- Google Tink – cryptographic signatures
- Public Key Infrastructure (PKI)

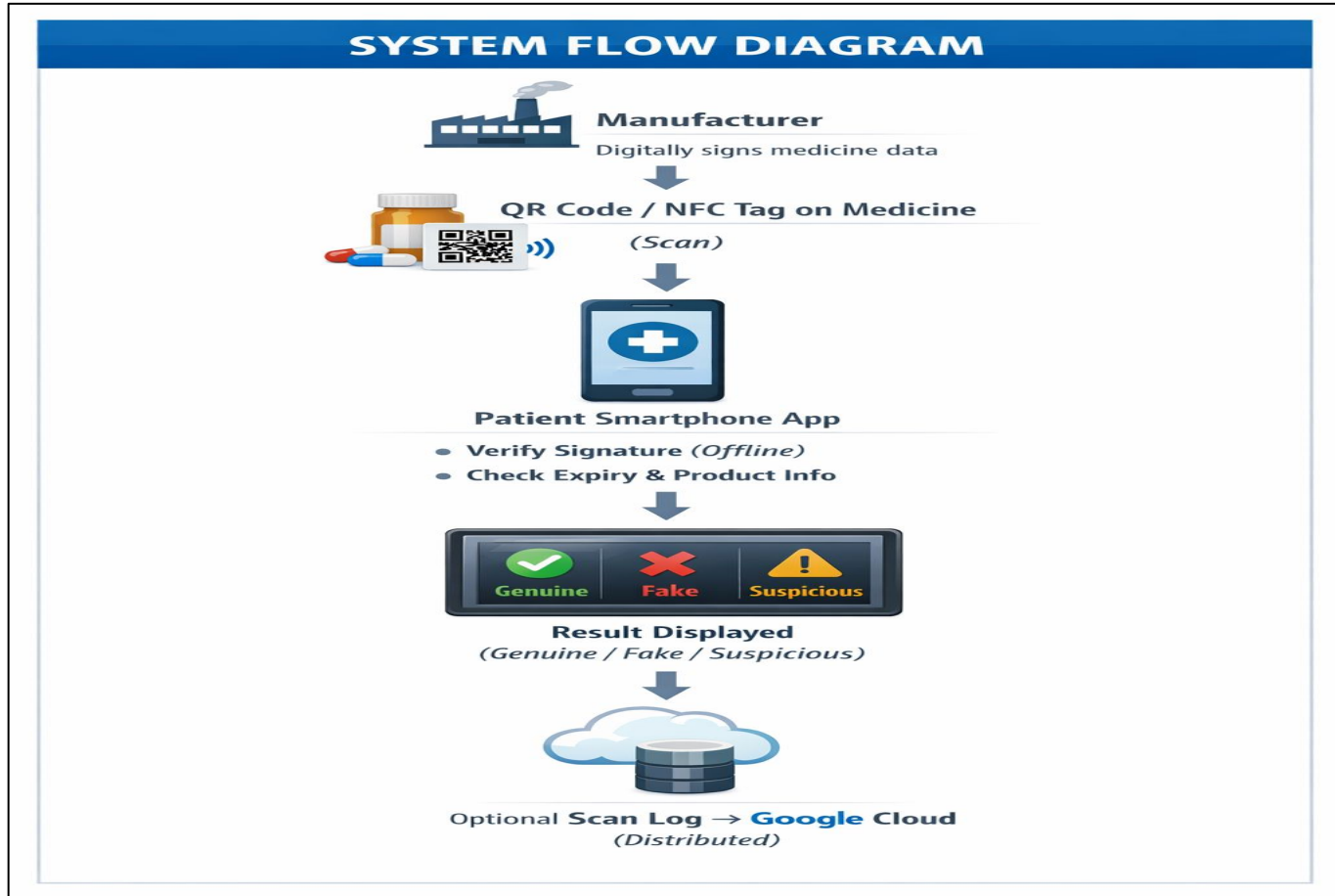
Analytics & AI

- BigQuery – counterfeit pattern analysis

Communication

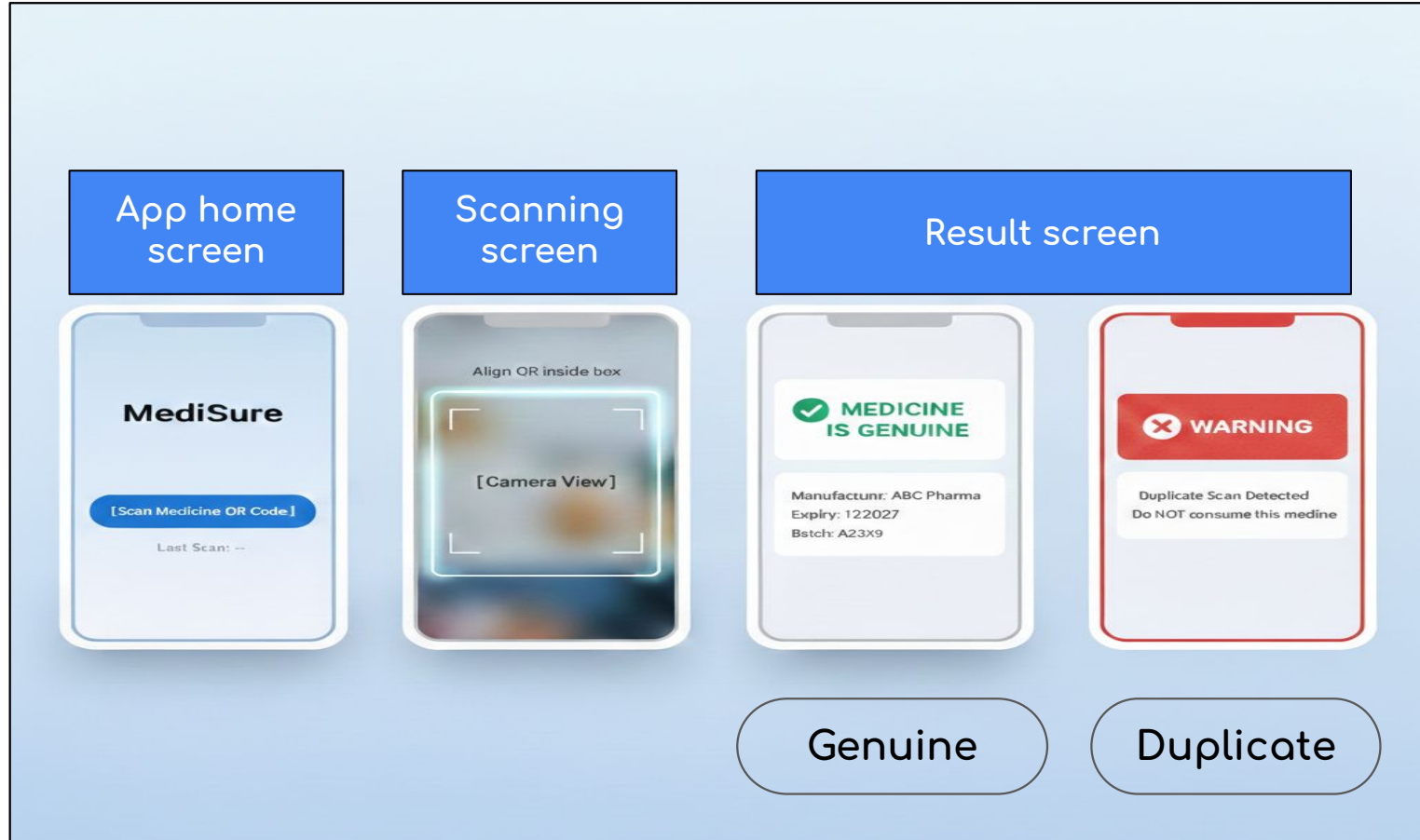
- Firebase Cloud Messaging – alerts

Process flow diagram or Use-case diagram



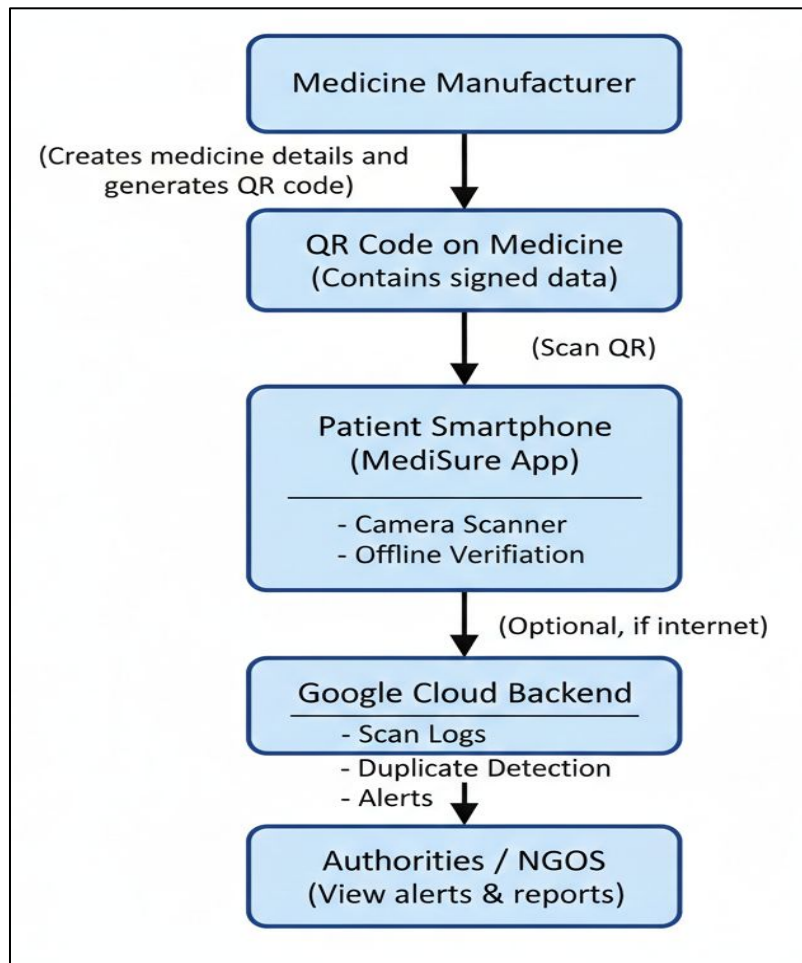


Wireframes/Mock diagrams of the proposed solution



WHY DECENTRALIZATION MATTERS:

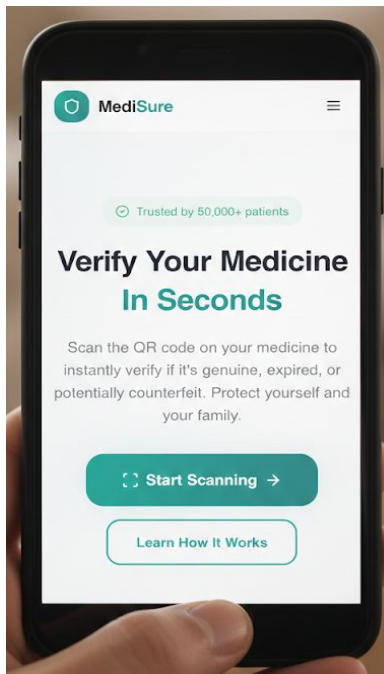
- Trust without gatekeepers
- No single authority can manipulate records
- Immutable audit trails
- Works across borders and trails
- Resistant to corruption and data loss



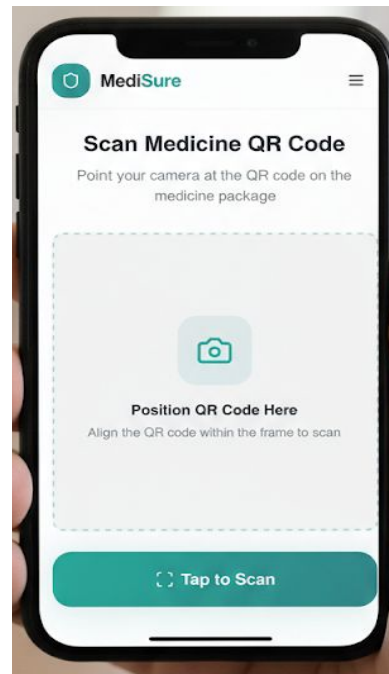
Snapshots of the MVP



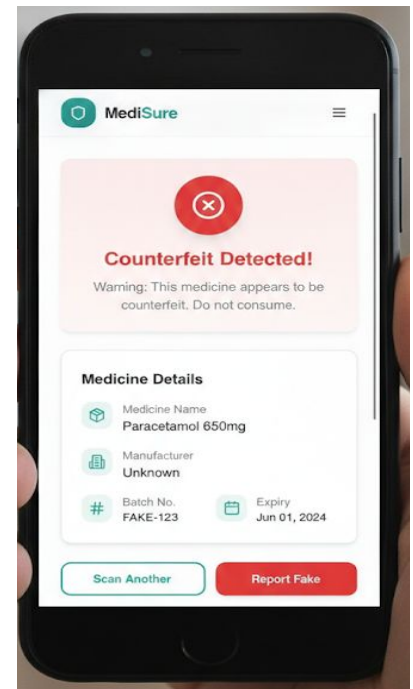
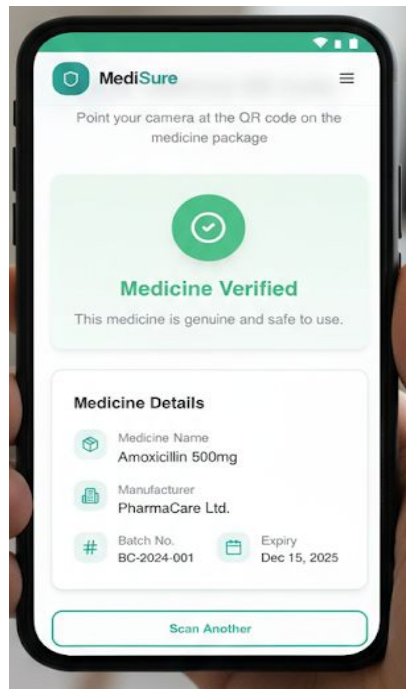
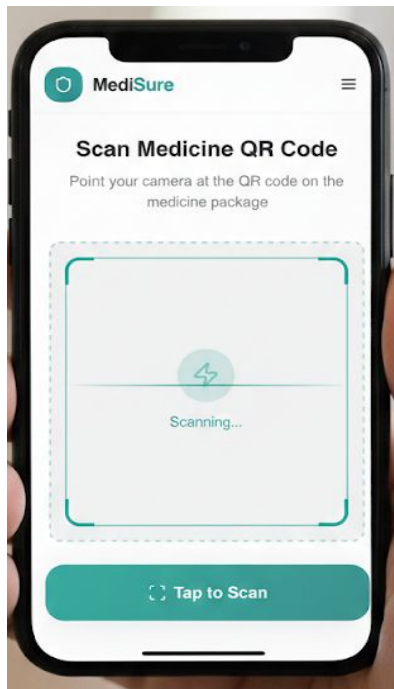
- App Launch Screen
- Displays the MediSure logo



- Large scan button
- Last scan status
- Offline/Online indicator



- Powered by Google ML
- Accurate scanning
- Works in low light



- Local cryptographic verification
- No internet dependency

- Manufacturer name
- Batch number
- Expiry date
- Product name

- Invalid digital signature
- Duplicate scan detected
- Expired medicine



Additional Details/Future Development

Multi-Language Support

- Regional languages for rural areas
- Voice-based instructions

Pharmacist Mode

- Bulk verification of medicine stock
- Dashboard view for clinics

AI-Powered Counterfeit Detection

- Identify counterfeit hotspots using scan patterns
- Early warning system for authorities

Government & NGO Integration

- Public health dashboards
- Automated alerts for mass counterfeit outbreaks

IoT & Smart Packaging

- NFC-enabled blister packs
- Cold-chain monitoring for vaccines

Regulatory Compliance Integration

- Align with:
 - WHO guidelines
 - FDA DSCSA
 - National drug authorities

Provide links to your:

1. GitHub Public Repository
2. Demo Video Link (3 Minutes)
https://drive.google.com/file/d/18FPc776vKoCF5ZnTxKWpLGUQ7qcYw_QA/view?usp=sharing
3. MVP Link <https://medi-sure-safe.lovable.app>

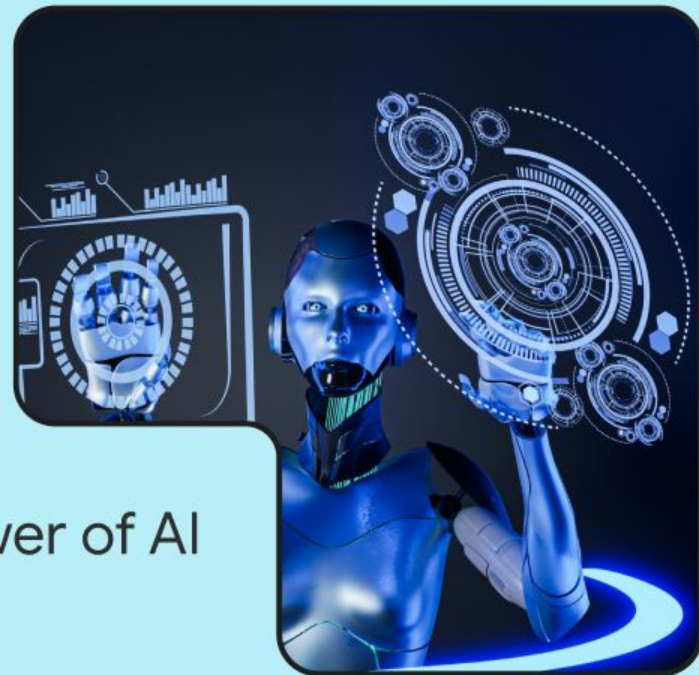


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Thank you!



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