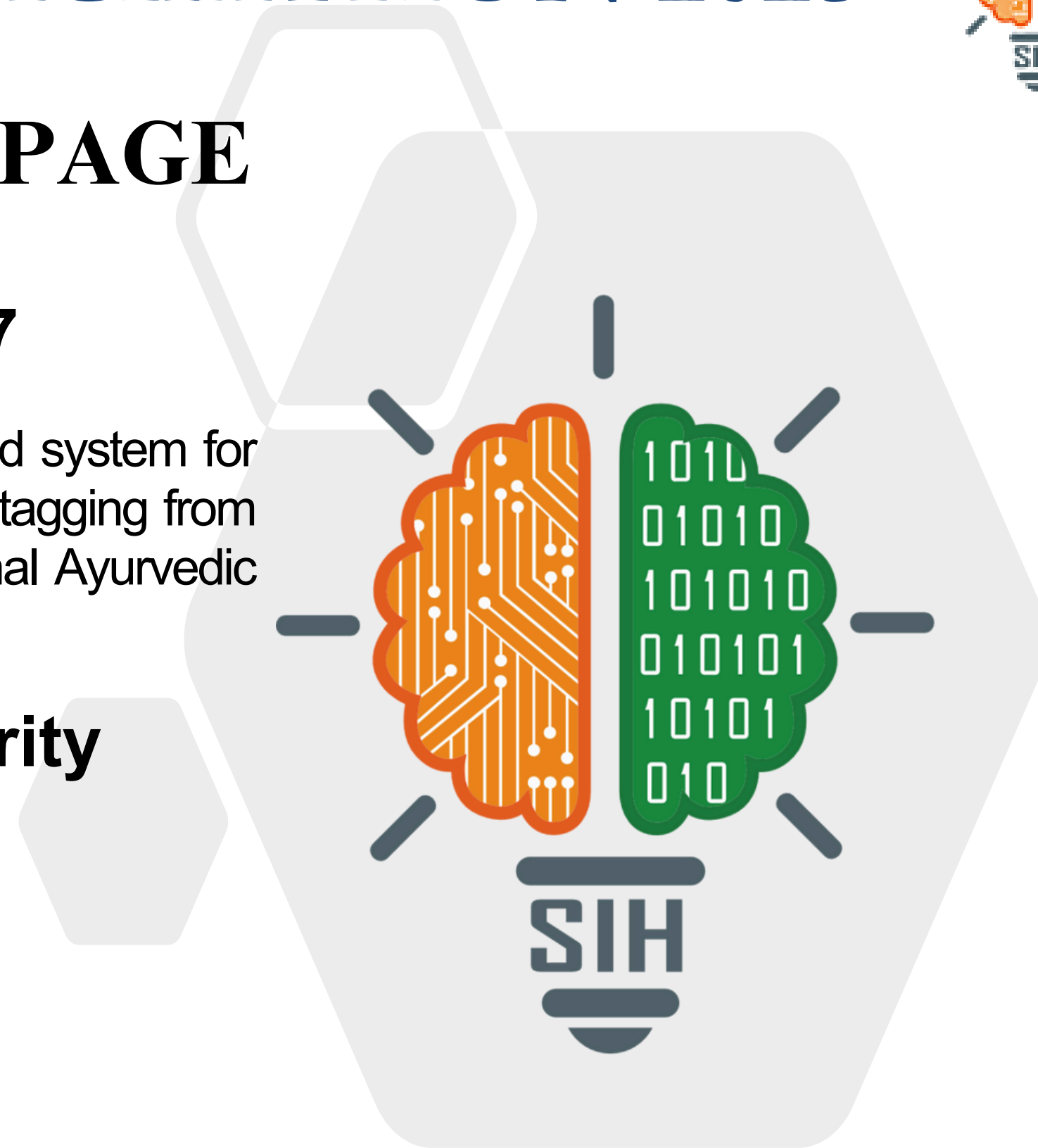


TITLE PAGE

- **Problem Statement ID –SIH25027**
- **Problem Statement Title-** Develop a blockchain-based system for botanical traceability of Ayurvedic herbs, including geo-tagging from the point of collection (farmers/wild collectors) to the final Ayurvedic formulation label.
- **Theme-Blockchain & Cybersecurity**
- **PS Category- Software**
- **Team ID- 70874**
- **Team Name -TECH EXPLORER'S**

<https://github.com/Supravat2021/Tech-Explorer-s.git>



Detailed Explanation of the Proposed Solution

Blockchain records every step: harvest → processing → lab test → packaging.

Geo-tagging + timestamps verify location and season of collection.

Smart contracts auto-check compliance (geo-fencing, quality, seasonal limits).

QR codes link finished products to full provenance data.

App supports farmers (offline/SMS), processors, labs, regulators, and consumers.

🌟 Innovation & Uniqueness of the Solution

Consumer-facing QR transparency (not just internal traceability).

Offline + SMS integration for rural farmers.

Smart contracts auto-enforce sustainability & quality rules.

Farmer identity & premium pricing linked to products.

All-in-one system bridging farmers, manufacturers, regulators, and consumers.

🎯 How It Addresses the Problem

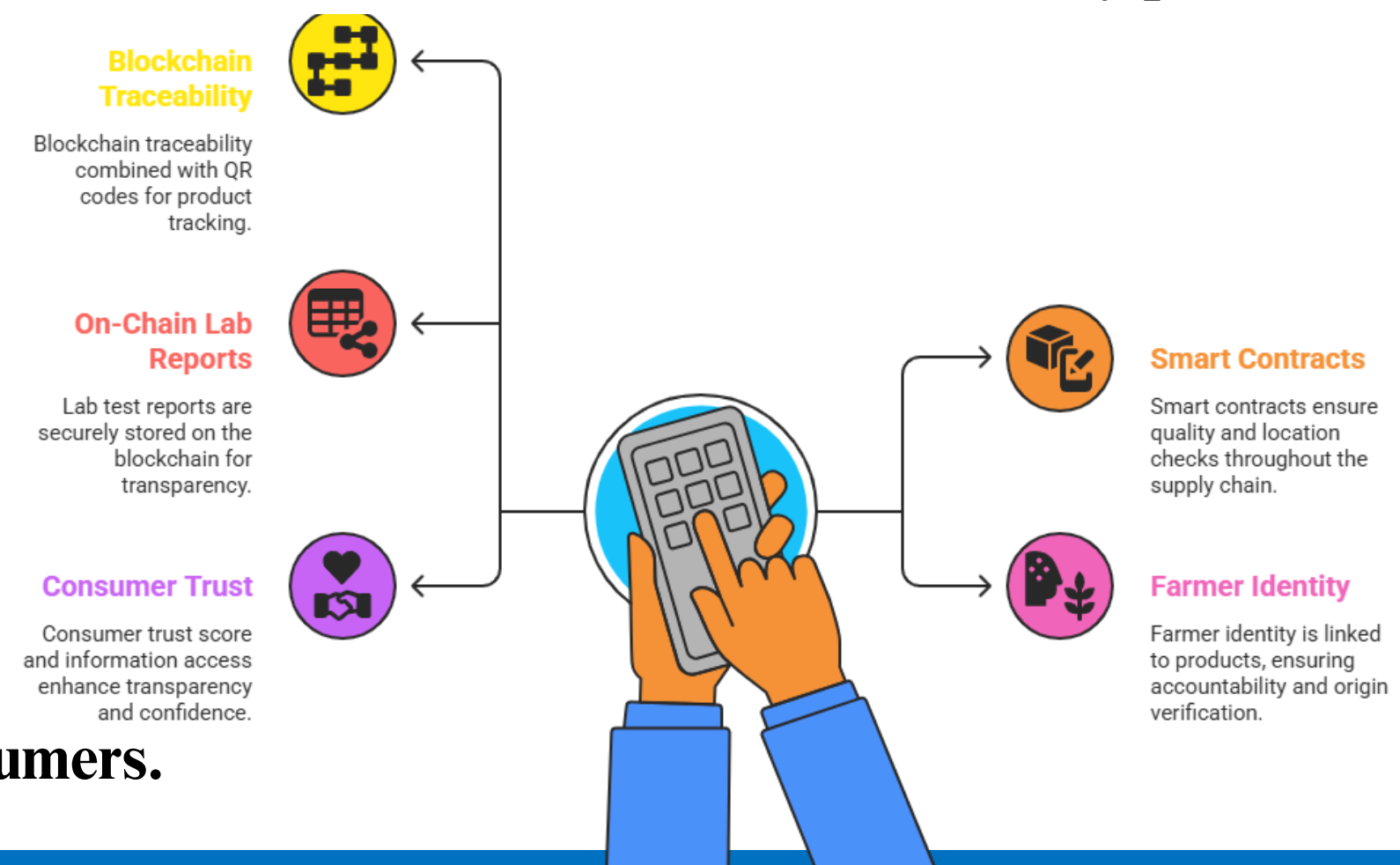
Solves adulteration & fake products → immutable blockchain records.

Fixes farmer exploitation → fair pricing & recognition via product linkage.

Handles rural connectivity issues → offline-first + SMS support.

Builds consumer trust → QR scan shows full herb journey & lab reports.

Aids regulators → dashboards for audits & biodiversity protection.





Software

- **Frontend:** React Native (mobile app), React.js (web & dashboard) → both free & open-source
- **Backend:** Node.js / Express.js → free, lightweight
- **Database:** MongoDB Community Edition (free & scalable)



Blockchain

- **Hyperledger Fabric** (open-source) for traceability
- **Smart Contracts:** Node.js (no license cost)



App Features

- **Free GPS APIs** (built-in mobile GPS)
- **Free QR Code libraries** (npm packages for generation & scanning)
- **Multilingual** using i18n open-source libraries



Analytics

- **Grafana** (free, open-source dashboards)
- **Python (Scikit-learn)** for simple fraud detection models



Security

- **JWT** (free authentication standard)
- **HTTPS** with Let's Encrypt SSL (free)

✓ Feasibility

- Technically doable with open-source tools
- High market demand for authentic herbs
- Low-cost MVP possible (zero budget)

⚠ Challenges

- Low farmer digital literacy
- Fake data entry risk
- Connectivity issues in rural areas
- Consumer adoption (QR scans)

🔧 Strategies

- Simple multilingual app + SMS option
- Geo-tagging & blockchain for data proof
- Offline-first app design
- Trust score & authenticity badge for consumers

<https://github.com/Supravat2021/Tech-Explorer-s.git>

Potential Impact

- Farmers: Recognition & fair pricing
- Consumers: Authentic & safe products
- Manufacturers: Easy compliance & better brand trust
- Regulators: Simple audits & biodiversity protection

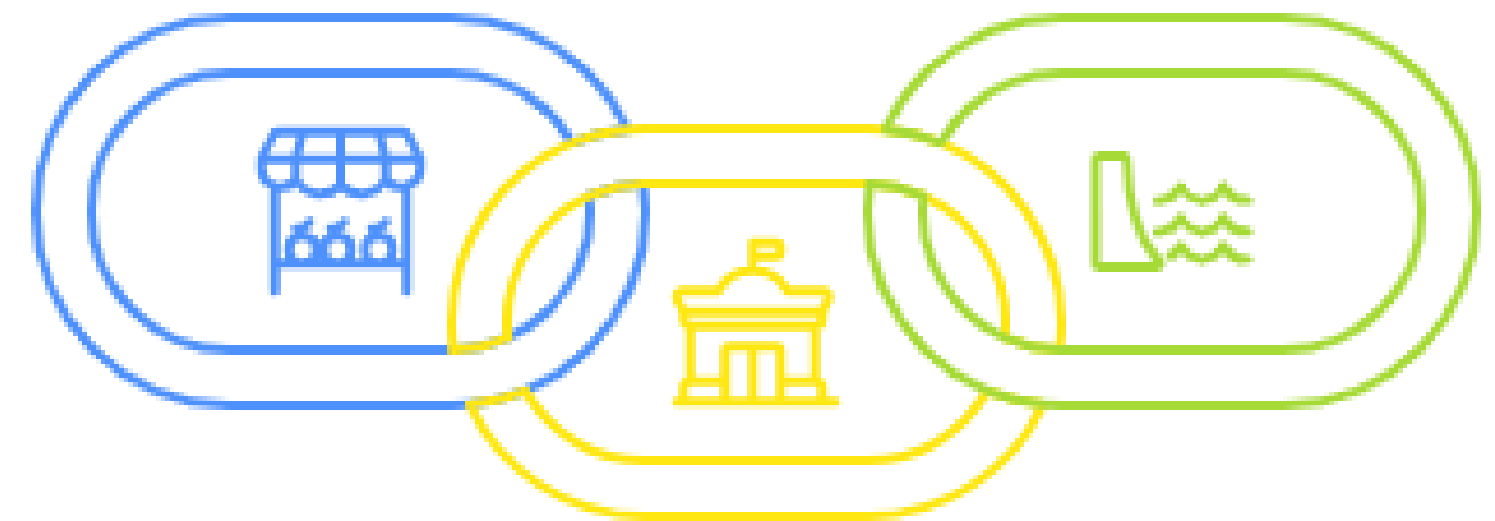
<https://github.com/Supravat2021/Tech-Explorer-s.git>

Social Impact

Focuses on building trust, empowering farmers, and promoting ethical consumerism.

Environmental Stewardship

Highlights preventing over-harvesting and promoting sustainable practices.



Economic Growth

Emphasizes premium pricing, reducing losses, and enhancing export potential.

Farmer / Collector

GACP certificate

Organic certificate (if applicable)

Farmer ID / Cooperative proof

Processor / Manufacturer

GMP certificate

Batch processing records

Storage & handling compliance

Laboratory

Moisture test

Pesticide & heavy metals test

DNA/species authentication

Microbial test

Finished Product

AYUSH approval

Fair-trade / sustainability certificate

QR code traceability record

Company / Feature	Farm-to-Fork Traceability	Consumer QR Transparency	Smart Contracts / Auto Compliance	Offline / SMS Support	Farmer Recognition / Premium	Sustainability Proofs
Arjuna Natural Extracts Ltd.	✓ Yes	✗ No	✗ No	✗ No	✗ No	✓ Yes
Botanic Healthcare	✓ Yes	✗ No	✗ No	✗ No	✗ No	✓ Yes
Vidya Herbs	✓ Yes	✗ No	✗ No	✗ No	✓ Partial	✓ Yes
Star Hi Herbs	✓ Yes	✗ No	✗ No	✗ No	✗ No	✓ Yes
Baidyanath Group	✓ Yes	✗ No	✗ No	✗ No	✗ No	✓ Partial
Our Platform	✓ Yes	✓ Yes	✓ Yes	✓ Yes	✓ Yes	✓ Yes

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