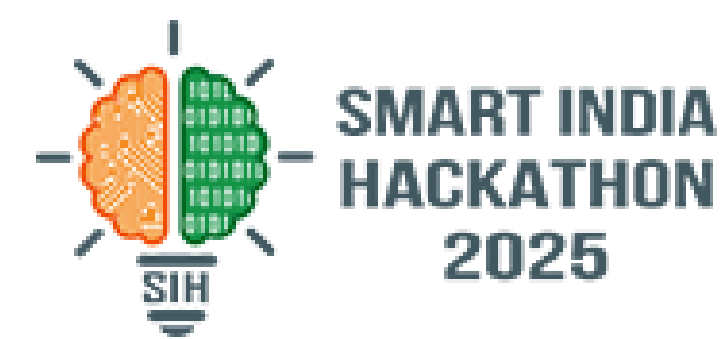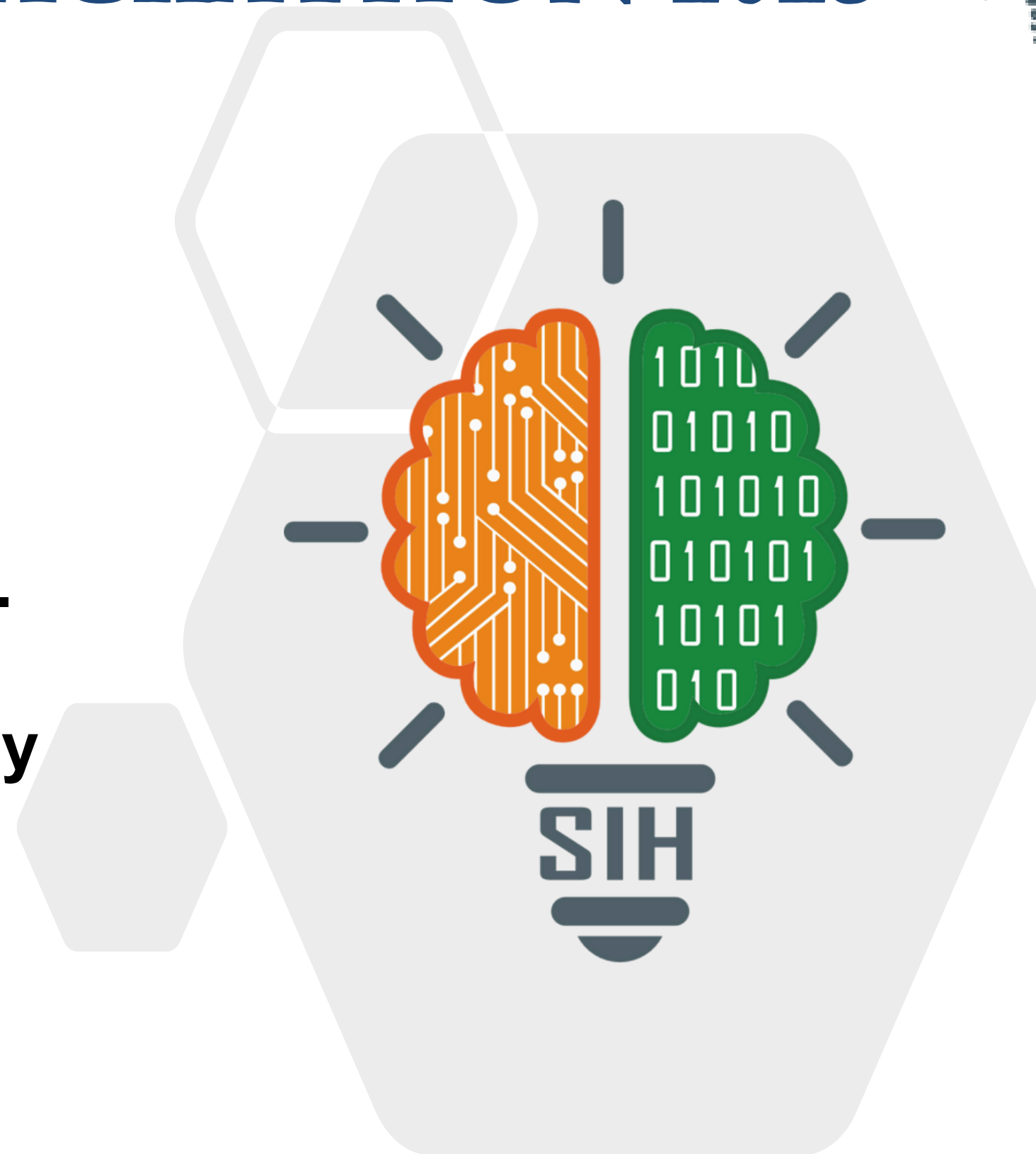# SMART INDIA HACKATHON 2025

- **Problem Statement ID –25060**

- **Problem Statement Title-Real life solutions for Waste Management.**

- **Theme-Clean & Green Technology**

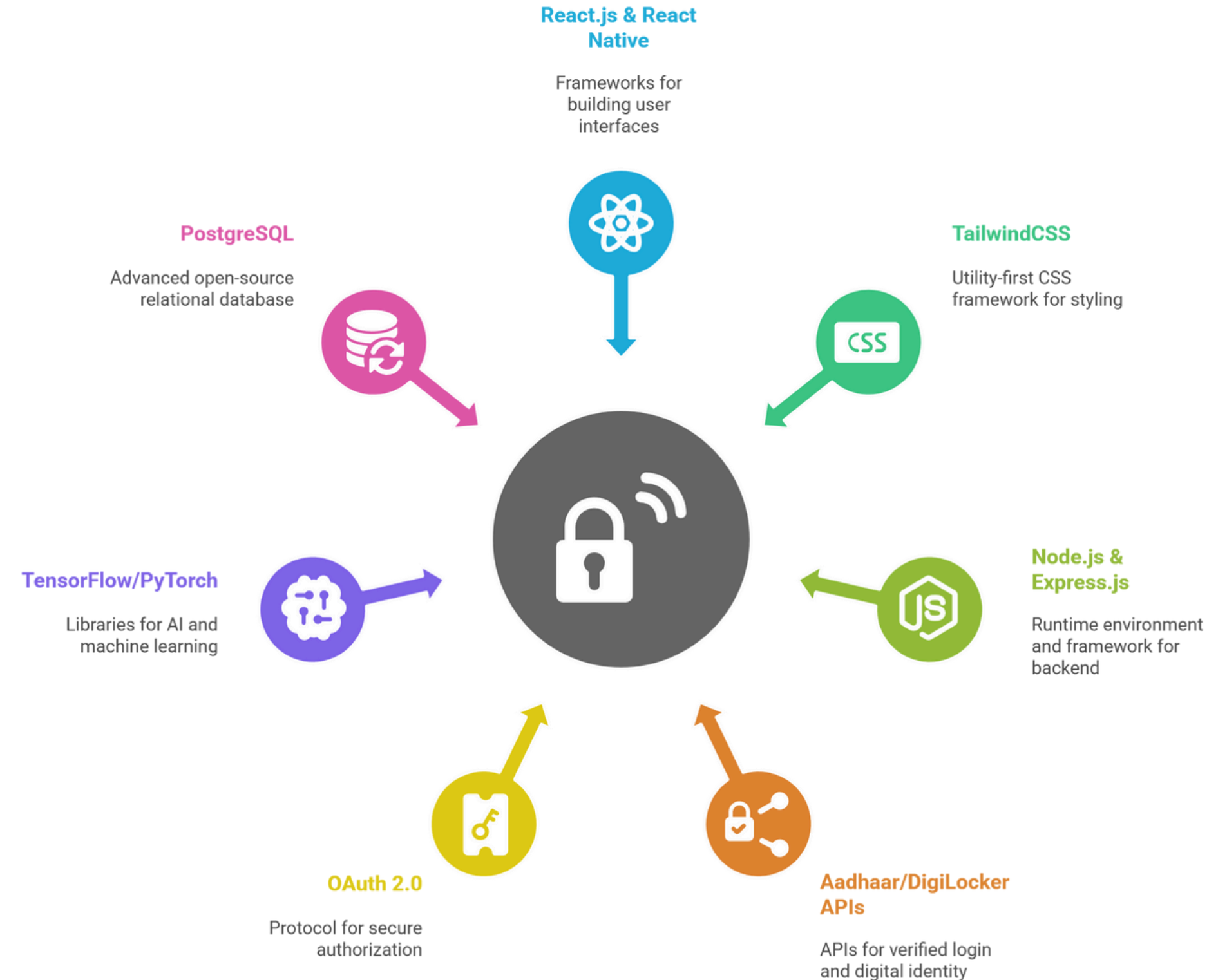- **PS Category- Software**

- **Team Name-Codeblooded**

WASTE TO WEALTH

❖Proposed Solution

- Spread awareness among citizens via games and simple tasks.
- AI-driven assistance for dumping or recycling appropriately
- AI-Driven Geo-Tagged Waste Monitoring and Incentive System for Cities(via QR)
- Award credits to most active citizens on web, it can be credited in the form of concessions in public transport or government schemes.
- City/Town Ranking in cleanness via heatmap (Dataset:Government website)
- Reselling the used materials (people to people/ people to industry)

TECHNICAL APPROACH

- Frontend :
  - React.js & React Native
  - TailwindCSS
- Backend :
  - Node.js (express.js)
  - Aadhaar/DigiLocker APIs for verified login
  - OAuth 2.0
- AI/ML & DBMS :
  - TensorFlow/PyTorch
  - PostgreSQL

React.js & React Native
Frameworks for building user interfaces

TailwindCSS
Utility-first CSS framework for styling

PostgreSQL
Advanced open-source relational database

Node.js & Express.js
Runtime environment and framework for backend

TensorFlow/PyTorch
Libraries for AI and machine learning

OAuth 2.0
Protocol for secure authorization

Aadhaar/DigiLocker APIs
APIs for verified login and digital identity

FEASIBILITY AND VIABILITY

- Feasibility
  - Tech: QR + GPS + AI + APIs are proven.
  - Social: Swachh Bharat fit, gamified rewards.
  - Ops: ULB/NGO/recycler support possible.
- Risks
  - Fake data, API failure, low engagement, privacy, logistics.
- Mitigation
  - GPS/AI validation, retry buffers, gamified rewards, verified login, partnerships, encryption.

Feasibility

The project is feasible due to proven technologies, social alignment, and operational support.

Risks

Potential risks include fake data, API failure, low engagement, privacy concerns, and logistical challenges.

Mitigation

Mitigation strategies involve GPS/AI validation, retry buffers, gamified rewards, verified login, partnerships, and encryption.

IMPACT AND BENEFITS

- Impact
  - Empowers citizens with simple reporting + rewards.
  - Engages youth via gamified credits & DIY challenges.
  - Gives govt/ULBs better data & faster complaint resolution.
  - Connects recyclers/startups to waste streams.
- Benefits
  - Social: Stronger civic participation, cleaner communities.
  - Economic: Waste → value (credits, marketplace), lower cleanup costs.
  - Environmental: Reduced litter, more recycling, data-driven waste management.

1

Gamified youth engagement

Gamified youth engagement offers high benefits with low impact.

2

Data-driven waste management

Data-driven waste management maximizes both impact and benefits.

3

Simple citizen reporting

Simple citizen reporting provides minimal impact and benefits.

4

Connecting recyclers to waste streams

Connecting recyclers to waste streams has high impact but low benefits.

RESEARCH AND REFERENCES

- Swachhata API – MoHUA – https://swachh.city/api
- Open Government Data (India) – https://data.gov.in
- Smart Cities Mission – Solid Waste APIs – https://smartcities.data.gov.in
- DigiLocker Developer Docs – https://developers.digilocker.gov.in
- Plastic Waste Management Rules (MoEFCC, 2022) – https://moef.gov.in
- Annual Report on Solid Waste (MoHUA, 2023-24) – https://mohua.gov.in
- India State of Environment Report (CSE, 2023) – https://www.cseindia.org
- YOLOv8 – Litter Detection (Ultralytics) – https://docs.ultralytics.com
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