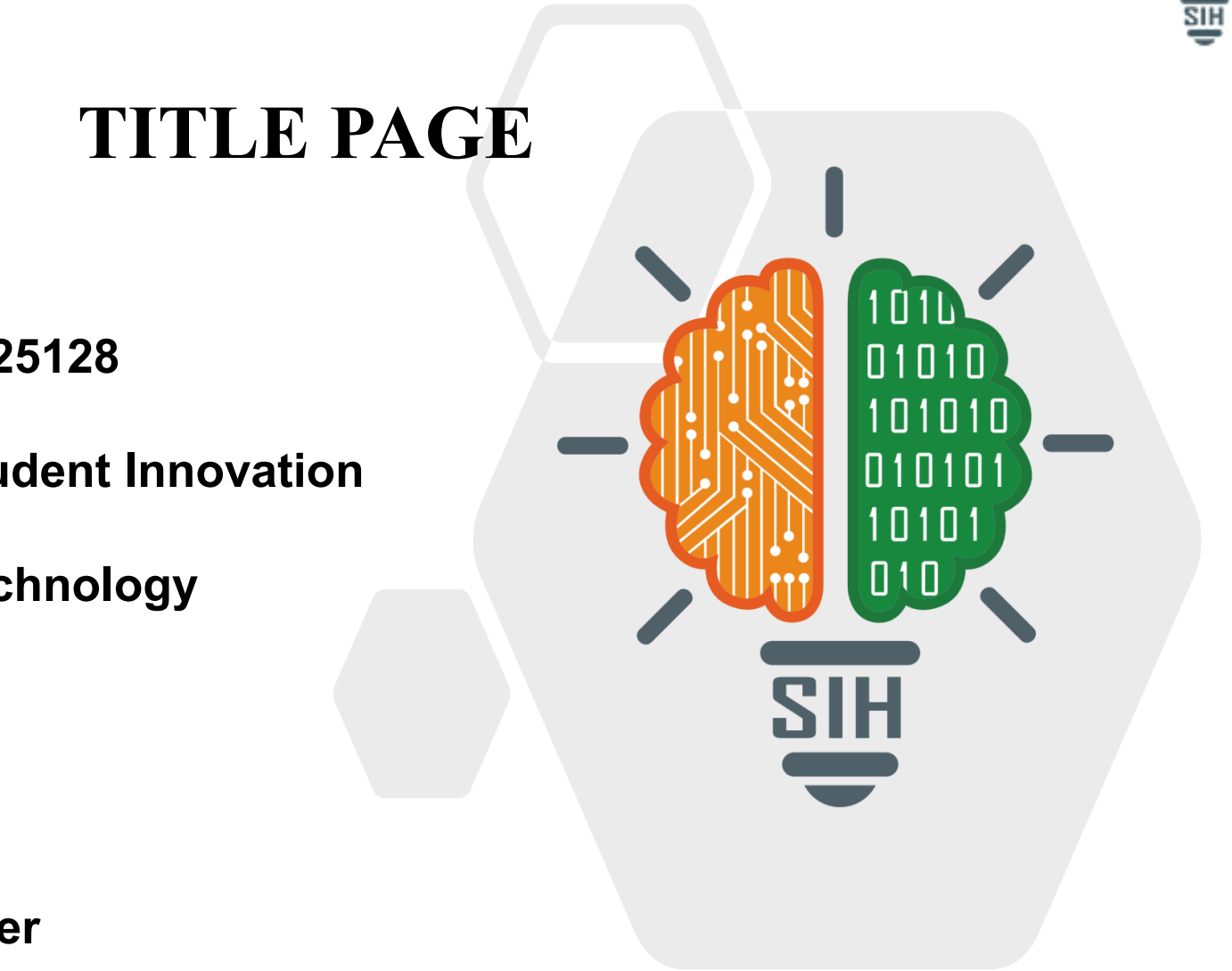
SMART INDIA HACKATHON 2025

TITLE PAGE



- **Problem Statement ID – SIH25128**
- **Problem Statement Title- Student Innovation**
- **Theme- Clean and Green Technology**
- **PS Category- Software**
- **Team ID-**
- **Team Name – The CodeFather**

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Clean and Green Technology – Smart Waste Management System

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Proposed Solution:

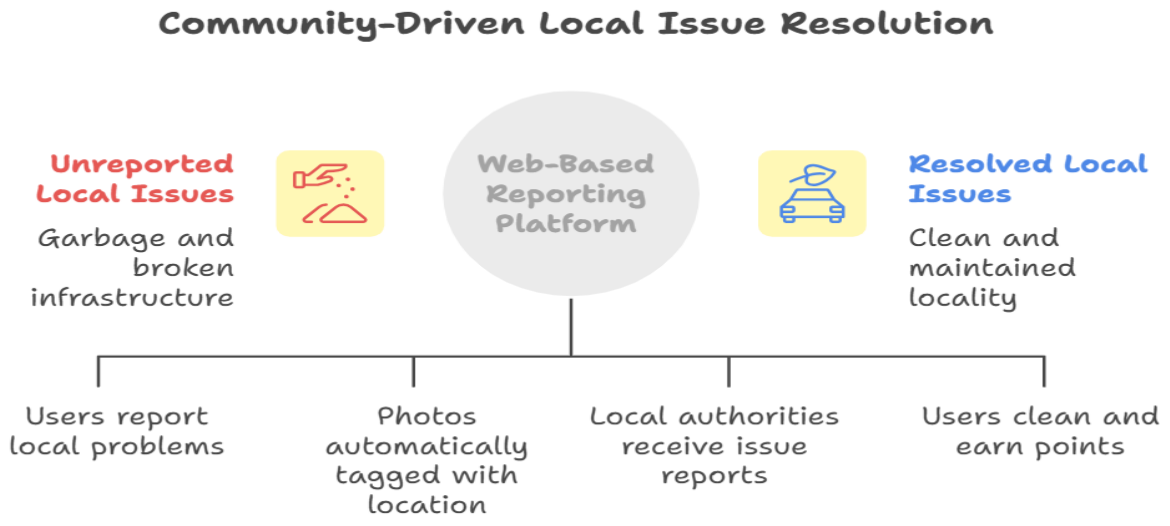
- Smart Waste Reporting & Segregation System
- Photo-Based Verification & Accountability
- Geotagged Waste Reporting System
- Reports sent to authorities (MCD)
- Awareness & Educational Content
- Gamified rewards for participation

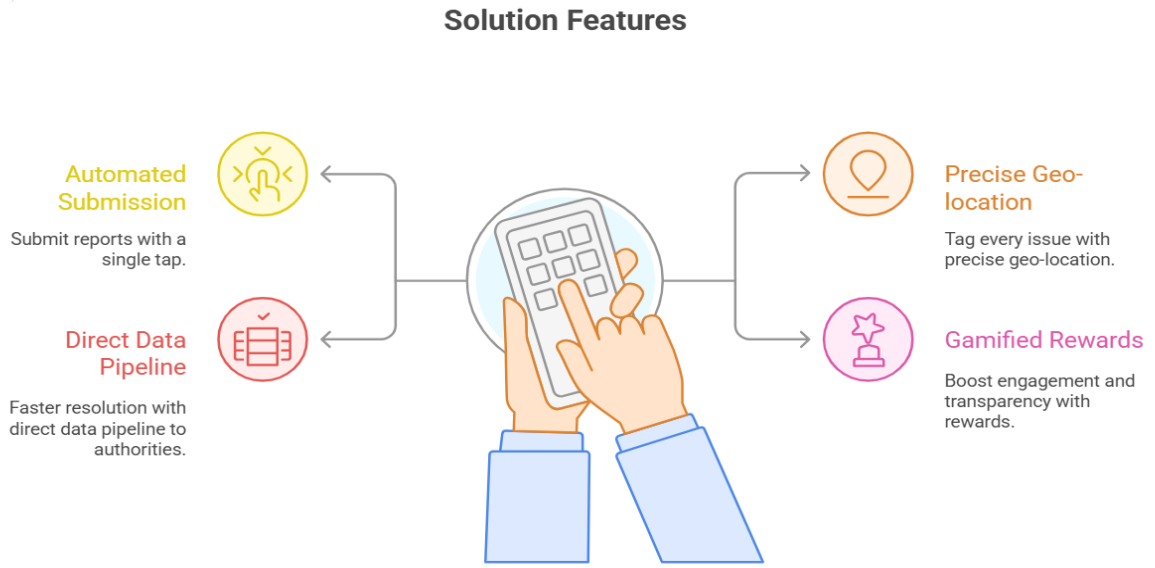
How It Addresses the Problem:

- Ensures Faster Waste Resolution
- Promotes Waste Segregation & Awareness
- Direct data pipeline to authorities and other users
- Gamified rewards system to boost engagement and transparency

Innovation and Uniqueness of the Solution:

- Instant geotagged, timestamped issue reporting
- Before-and-after photo verification
- Points-based gamification for cleanup
- NGO-driven volunteer event postings





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TECHNICAL APPROACH

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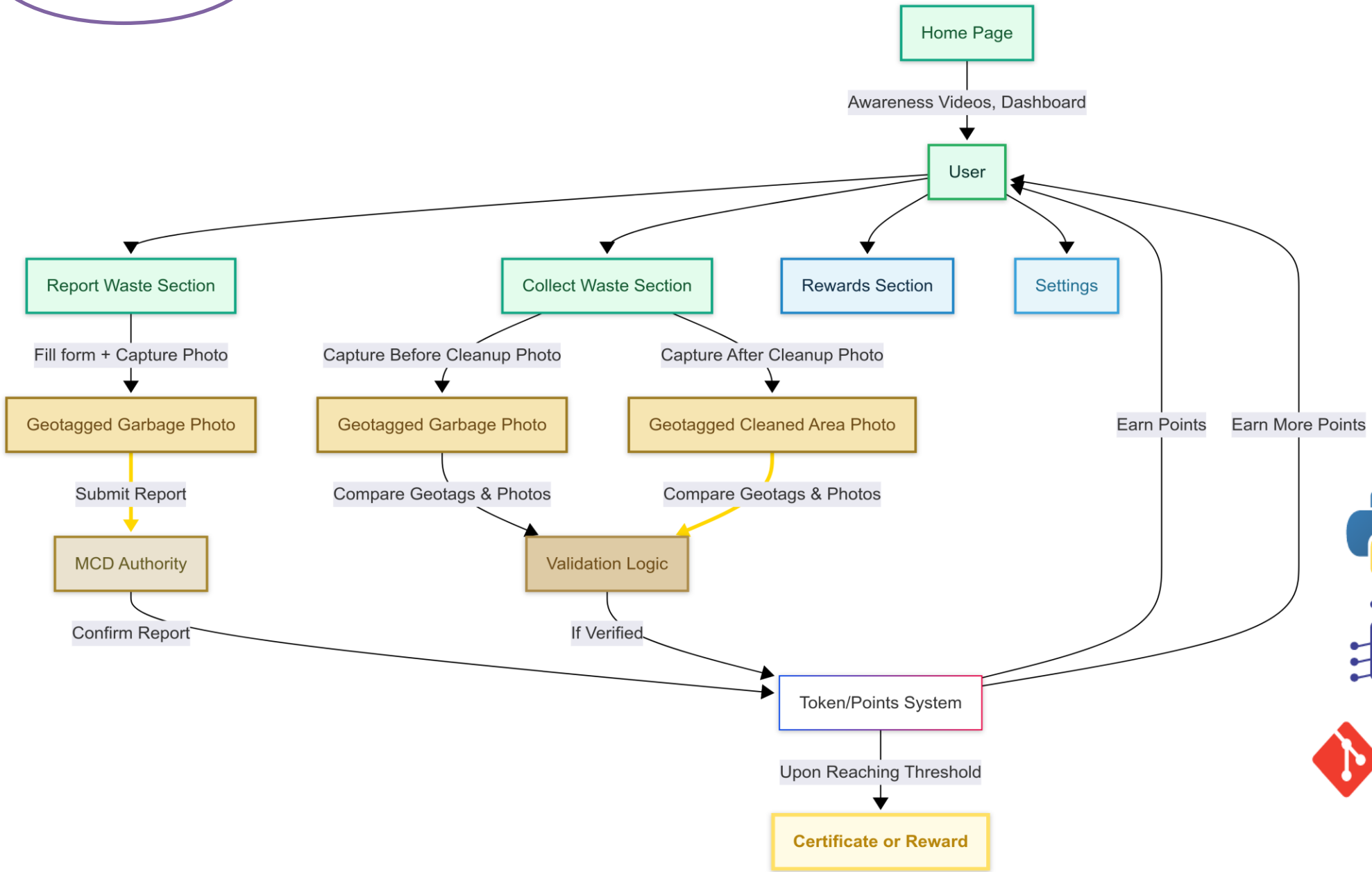

TECH STACK

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FEASIBILITY AND VIABILITY

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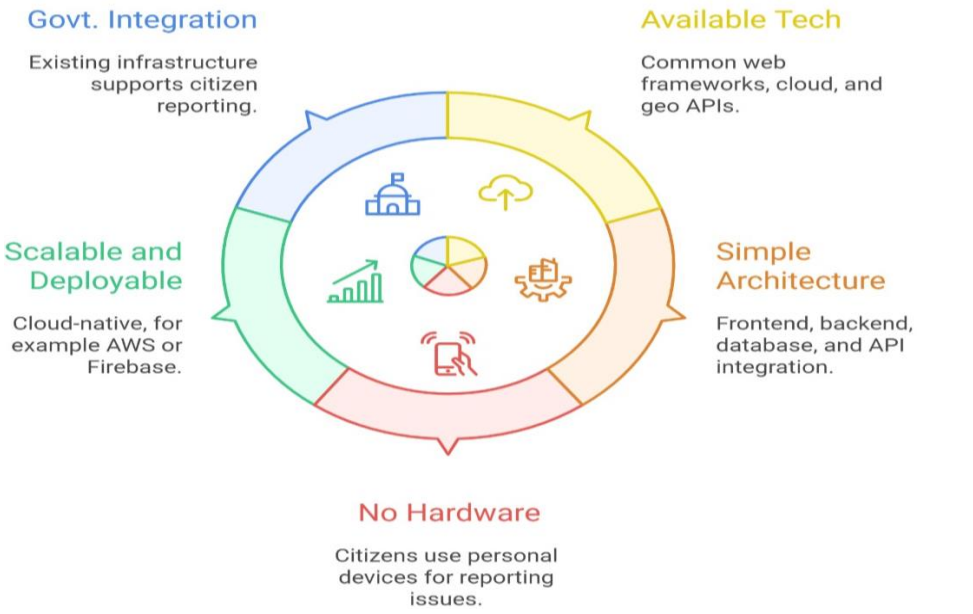
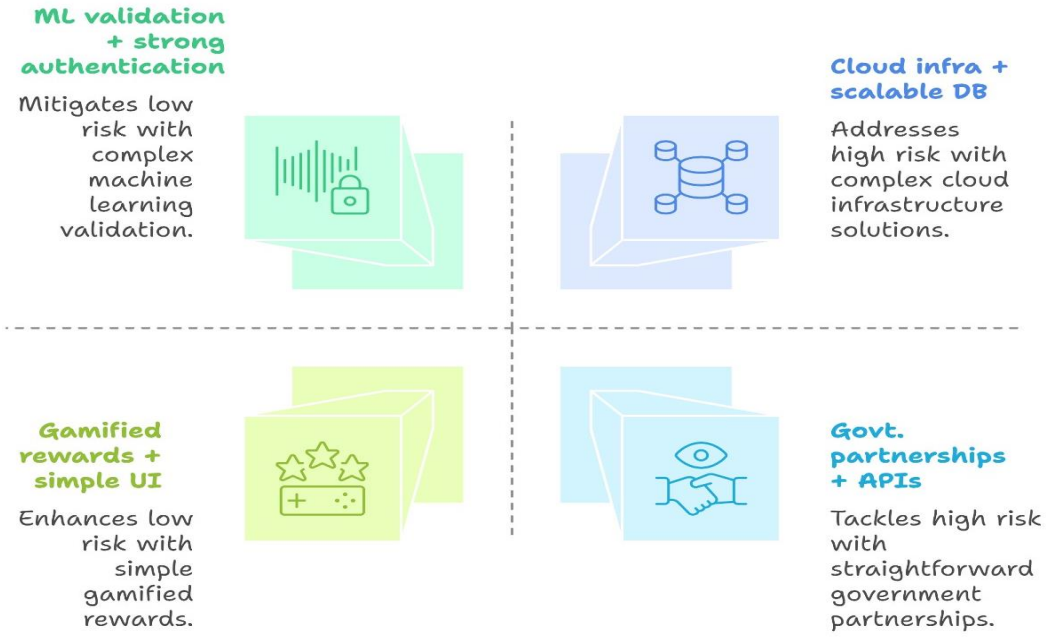
Feasibility:

- **Widely available tech** → Web frameworks, **cloud** services, **geo** APIs.
- **Simple architecture** → Frontend + backend + DB + API integration.
- **No extra hardware** → Citizens use personal devices for reporting.
- **Scalable & deployable** → Cloud-native (AWS, Firebase, etc.).
- **Govt. integration ready** → Existing **MCD** infra supports reporting.
- **AI based image validation** → Uses **AI-ML** to validate before and after photos.

Risk vs Solution:

- **Low Adoption** → Gamified rewards + minimal UI to drive participation**.**
- **Govt. Coordination** → Partnerships with civic bodies for direct integration.
- **Infra/Storage Bottlenecks** → Cloud storage + CDN for fast image access**.**
- **Data Security Concerns** → HTTPS + secure transmission + JWT auth.
- **Fake/Spam Reports** → ML-powered **image validation** + strong user authentication





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IMPACT AND BENEFITS

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Impact on users :

- **Empowers Citizens :** Provides an easy platform for people to report and act on waste problems, giving them a sense of responsibility.
- **Raises Awareness :** Spreads knowledge about proper waste segregation and disposal methods, encouraging eco-friendly habits.
- **Encourages Active Participation :** Rewards and recognition motivate individuals to contribute regularly to cleanliness efforts.
- **Strengthens Community Collaboration :** Connects citizens, NGOs, and volunteers, creating a united community movement for a cleaner environment.
- **Builds Trust & Accountability :** Transparent reporting and proof-based cleaning builds trust between citizens and authorities.

Benefits:

- **Social Benefit:** Empowers citizens and communities to take active responsibility for cleanliness.
- **Environmental Benefit:** Promotes sustainable waste management for a cleaner and greener ecosystem.
- **Educational Benefit:** Spreads awareness and knowledge about sanitation, recycling, and eco-friendly practices.

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RESEARCH AND REFERENCES

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- **The New Indian Express report :** The Dark side of city: Chronic neglect fuels garbage woes in India's capital. (link)
- **Article by Down to Earth** : Why it matters: Rethinking litter & responsibility in Indian cities. (link)
- **Existing platforms studied :** Swachhata App (Govt. of India), Clean India App (NGO-based), MCD-311 (Delhi Government) , Literrati.
- **Research Papers :**
  - Digitalization and Digital Applications in Waste Recycling: An Integrative Review. https://doi.org/10.3390/su16177379
  - Digital Transformation in Waste Management: Disruptive Innovation and Digital Governance for Zero-Waste Cities in the Global South as Keys to Future Sustainable Development. **https://doi.org/10.3390/su17041608**