Smart India Hackathon 2025: Comprehensive Analysis of Selected Problem Statements

Based on the research conducted on the Smart India Hackathon 2025 problem statements, here's a detailed analysis of the 13 problem statements you've shared with their technical requirements, potential solutions, and suggested contributors:

Problem Statement Details

SIH25026 - Ministry of Ayush

Title: Develop API code to integrate NAMASTE and/or the International Classification of Diseases (ICD-11) via the Traditional Medicine Module 2 (TM2) into existing EMR systems
Category: Software
Theme: MedTech / BioTech / HealthTech
Suggested by: SUMIT BHAGAT

What to Build: A comprehensive API integration system that connects NAMASTE (National Ayush Morbidity and Standardised terminologies Electronic) portal with ICD-11 Traditional Medicine Module 2 and existing Electronic Medical Record systems[1] [2].

Tech Stack:

- **Backend:** Python/Node.js with FastAPI/Express
- **Database:** PostgreSQL/MongoDB for EMR data storage
- **API Standards:** FHIR (Fast Healthcare Interoperability Resources)
- **Authentication:** OAuth 2.0/JWT tokens
- **Integration:** RESTful APIs, HL7 standards
- **Cloud:** AWS/Azure for healthcare compliance

Dataset Requirements:

- NAMASTE portal terminology database
- ICD-11 TM2 code mappings for Ayurveda, Siddha, Unani
- Sample EMR datasets compliant with EHR Standards for India
- Disease classification and treatment terminology datasets

SIH25029 - Government of Jharkhand

Title: Authenticity Validator for Academia
Category: Software
Theme: Smart Education
Suggested by: SUMIT BHAGAT

What to Build: A comprehensive system to verify and validate academic documents, certificates, and credentials to prevent fraud and ensure authenticity in educational institutions.

Tech Stack:

- **Frontend:** React.js/Vue.js for user interface
- **Backend:** Python Django/Flask or Node.js
- **Blockchain:** Ethereum/Hyperledger for immutable records
- **Database:** PostgreSQL with document verification logs
- **Image Processing:** OpenCV/TensorFlow for document analysis
- **APIs:** Document verification services, OCR engines

Dataset Requirements:

- Sample academic certificates from various institutions
- Fraud detection patterns and markers
- Institution verification databases
- Digital signature and watermark patterns
- Historical academic document formats

SIH25031 - Government of Jharkhand

Title: Crowdsourced Civic Issue Reporting and Resolution System
Category: Software
Theme: Clean & Green Technology
Suggested by: SUMIT BHAGAT

What to Build: A citizen-centric platform enabling residents to report civic issues like waste management, infrastructure problems, and environmental concerns with tracking and resolution mechanisms.

Tech Stack:

- **Mobile App:** React Native/Flutter for cross-platform
- **Backend:** Node.js/Python with microservices architecture
- **Database:** PostgreSQL with geospatial extensions
- **Maps:** Google Maps/OpenStreetMap APIs
- **Real-time:** WebSocket for live updates

- **Image Storage:** AWS S3/Cloudinary
- **Analytics:** Power BI/Tableau for dashboard

Dataset Requirements:

- Geographic data of Jharkhand municipalities
- Historical civic issue categories and resolution times
- Government department contact information
- Sample citizen complaint data
- Environmental and infrastructure standards

SIH25002 - Ministry of Development of North Eastern Region

Title: Smart Tourist Safety Monitoring & Incident Response System using AI, Geo-Fencing, and Blockchain-based Digital ID
Category: Software
Theme: Travel & Tourism
Suggested by: SOWDARJYA KOLEY ECE3 AOT

What to Build: An integrated safety system for tourists in Northeast India using AI-powered monitoring, geofencing for restricted areas, and blockchain-based digital identification[3].

Tech Stack:

- **Mobile App:** Flutter/React Native with offline capabilities
- **Backend:** Python/Node.js with microservices
- **AI/ML:** TensorFlow/PyTorch for threat detection
- **Blockchain:** Hyperledger Fabric for digital IDs
- **Geolocation:** GPS with offline mapping
- **Emergency Services:** Integration with local authorities
- **IoT:** Wearable device integration

Dataset Requirements:

- Tourist movement patterns in NER
- Historical incident and emergency data
- Geofencing coordinates for safe/restricted zones
- Local emergency services contact database
- Weather and terrain data for risk assessment

SIH25030 - Government of Jharkhand

Title: AI-Based Crop Recommendation for Farmers
Category: Software
Theme: Agriculture, FoodTech & Rural Development
Suggested by: SOWDARJYA KOLEY ECE3 AOT

What to Build: An intelligent system that analyzes soil conditions, weather patterns, and market prices to recommend optimal crops for farmers in Jharkhand [4] [5] [6].

Tech Stack:

- **Frontend:** React.js with mobile-responsive design
- **Backend:** Python with FastAPI/Django
- **ML Framework:** Scikit-learn, TensorFlow for crop prediction
- **Database:** PostgreSQL for farmer and crop data
- **Weather API:** OpenWeatherMap integration
- **Deployment:** Docker containers on AWS/GCP

Dataset Requirements:

- Jharkhand soil composition and pH data
- Historical weather patterns and rainfall data
- Crop yield data for different seasons
- Market price trends for various crops
- Fertilizer and seed availability information

SIH25094 - Government of Jammu and Kashmir

Title: One-Stop Personalized Career & Education Advisor
Category: Software
Theme: Smart Education
Suggested by: SUMIT BHAGAT

What to Build: A comprehensive AI-driven platform providing personalized career guidance, education pathways, and skill development recommendations for students.

Tech Stack:

- **Frontend:** React.js/Next.js with responsive design
- **Backend:** Node.js/Python with recommendation engines
- **AI/ML:** Natural Language Processing, recommendation algorithms
- **Database:** Neo4j for relationship mapping, PostgreSQL
- **APIs:** Educational institution databases, job market APIs
- **Chatbot:** DialogFlow/Rasa for interactive guidance

Dataset Requirements:

- Career trajectory data across industries
- Educational institution programs and requirements
- Job market trends and skill demands
- Student aptitude and interest assessment data
- Success stories and career path mappings

SIH25093 - Government of Jammu and Kashmir

Title: Centralised Digital Platform for Comprehensive Student Activity Record in HEIs
Category: Software
Theme: Smart Education
Suggested by: Subhabrata Mondal Ece3 Aot

What to Build: A unified platform to track and manage student activities, achievements, and progress across Higher Education Institutions in J&K.

Tech Stack:

- **Frontend:** Angular/React with dashboard components
- **Backend:** Spring Boot/Django REST framework
- **Database:** PostgreSQL with activity logging
- **Authentication:** Single Sign-On (SSO) integration
- **Analytics:** Python pandas, matplotlib for reporting
- **Export:** PDF generation for transcripts

Dataset Requirements:

- Student enrollment and academic records
- Co-curricular and extracurricular activity categories
- Institution-wise activity tracking formats
- Assessment and grading rubrics
- Portfolio and achievement templates

SIH25033 - Ministry of Corporate Affairs

Title: AI-Based Smart Allocation Engine for PM Internship Scheme
Category: Software
Theme: Smart Automation
Suggested by: SOWDARJYA KOLEY ECE3 AOT

What to Build: An intelligent matching system that optimally allocates interns to companies under the PM Internship Scheme based on skills, preferences, and organizational requirements.

Tech Stack:

- **Backend:** Python with machine learning libraries
- **ML Algorithms:** Collaborative filtering, matching algorithms
- **Database:** PostgreSQL for intern and company profiles
- **API:** RESTful services for integration
- **Dashboard:** React.js for admin panels
- **Optimization:** Linear programming libraries (PuLP/OR-Tools)

Dataset Requirements:

- Intern profiles with skills and preferences
- Company requirements and intern capacity
- Historical internship success and feedback data
- Skill-job matching datasets
- Geographic and industry preference data

SIH25081 - Government of Kerala

Title: AI-Driven Train Induction Planning & Scheduling for Kochi Metro Rail Limited (KMRL)
Category: Software
Theme: Smart Automation
Suggested by: Subhabrata Mondal Ece3 Aot

What to Build: An intelligent system for optimizing train scheduling, maintenance planning, and operational efficiency for Kochi Metro.

Tech Stack:

- **Backend:** Python with optimization libraries
- **ML Framework:** TensorFlow/PyTorch for predictive modeling
- **Database:** PostgreSQL for operational data
- **Visualization:** D3.js/Chart.js for schedule displays
- **Real-time:** WebSocket for live updates
- **APIs:** Integration with existing metro systems

Dataset Requirements:

- Historical ridership patterns and peak hour data
- Train maintenance schedules and downtime records
- Route efficiency and delay analysis data
- Passenger flow and station usage statistics
- Weather impact on metro operations

SIH25065 - Ministry of Jal Shakti

Title: Designing and development of an application for on-spot assessment of Roof Top Rain water harvesting and artificial recharge potential
Category: Software
Theme: Smart Automation
Suggested by: Subhabrata Mondal Ece3 Aot

What to Build: A mobile application that uses geospatial analysis and calculations to assess rainwater harvesting potential for buildings and recommend optimal system sizing.

Tech Stack:

- **Mobile App:** Flutter/React Native with camera integration
- **Backend:** Python with geospatial libraries (GeoPandas)
- **ML:** Computer vision for roof area calculation
- **Maps:** Google Maps API for location services
- **Database:** PostgreSQL with PostGIS extension
- **Cloud:** AWS for image processing and storage

Dataset Requirements:

- Rainfall data across different regions
- Building types and roof area calculations
- Water consumption patterns
- Groundwater recharge coefficients
- Local regulations and guidelines for RTRWH

SIH25038 - Ministry of Earth Sciences (MoES)

Title: Blockchain-Based Blue Carbon Registry and MRV System
Category: Software
Theme: Clean & Green Technology
Suggested by: Subhabrata Mondal Ece3 Aot

What to Build: A blockchain-powered system for monitoring, reporting, and verifying blue carbon credits from coastal ecosystems like mangroves, seagrasses, and salt marshes.

Tech Stack:

- **Blockchain:** Hyperledger Fabric/Ethereum for carbon credit tracking
- **Backend:** Node.js with blockchain integration
- **Database:** IPFS for decentralized storage
- **Frontend:** React.js for registry interface
- **IoT Integration:** Sensor data collection from marine ecosystems

- **APIs:** Satellite data integration for monitoring

Dataset Requirements:

- Marine ecosystem carbon sequestration data
- Satellite imagery of coastal areas
- Historical blue carbon project data
- Carbon credit pricing and trading information
- Environmental monitoring sensor data

SIH25022 - Ministry of Railways

Title: Maximizing Section Throughput Using AI-Powered Precise Train Traffic Control
Category: Software
Theme: Transportation & Logistics
Suggested by: Subhabrata Mondal Ece3 Aot

What to Build: An AI-driven system that optimizes train traffic flow, reduces delays, and maximizes railway section capacity through intelligent scheduling and real-time adjustments[7].

Tech Stack:

- **AI/ML:** Deep learning models for traffic optimization
- **Backend:** Python with real-time processing capabilities
- **Database:** Time-series database (InfluxDB) for operational data
- **Simulation:** AnyLogic/SUMO for traffic modeling
- **Dashboard:** React.js with real-time monitoring
- **Integration:** APIs with existing railway management systems

Dataset Requirements:

- Historical train movement and delay data
- Railway network topology and capacity limits
- Signal and track availability information
- Passenger demand patterns across routes
- Weather impact on railway operations

SIH12507 - AICTE

Title: Develop computer programs to identify design principles behind Kolam designs and recreate kolams
Category: Software
Theme: Heritage & Culture
Suggested by: SUMIT BHAGAT

What to Build: A computer vision and machine learning system that analyzes traditional Kolam patterns, extracts design principles, and generates new Kolam designs following traditional rules.

Tech Stack:

- **Computer Vision:** OpenCV, PIL for image processing
- **ML Framework:** TensorFlow/PyTorch for pattern recognition
- **Backend:** Python with image analysis libraries
- **Frontend:** Canvas-based drawing interface (HTML5/JavaScript)
- **Database:** MongoDB for pattern storage
- **Graphics:** SVG generation for scalable designs

Dataset Requirements:

- Large collection of traditional Kolam images
- Annotated datasets with design principles
- Geometric pattern classification data
- Cultural significance and regional variations
- Mathematical foundations of Kolam construction

Implementation Recommendations

For Software Projects: Focus on scalable microservices architecture with proper API documentation and user-friendly interfaces. Ensure mobile responsiveness and offline capabilities where applicable.

For Hardware-Software Integration: Consider IoT sensors, real-time data collection, and edge computing solutions for better performance.

For AI/ML Projects: Implement robust data preprocessing, model validation, and continuous learning mechanisms. Use transfer learning where possible to reduce training time.

Team Composition Suggestions:

- Full-stack developers (2-3 members)
- AI/ML specialist (1 member)
- UI/UX designer (1 member)
- Domain expert/project manager (1 member, mandatory female member as per SIH rules)

Each problem statement offers significant potential for creating impactful solutions that address real-world challenges across various sectors in India[8] [9] [10].

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