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CODE-A-THON 2.0

PROBLEM STATEMENTS





PROBLEM STATEMENT 1

1. SpaceScope – Explore, Learn & Stay Connected with the Universe

Overview

Information about space events, missions, and real-time cosmic conditions is scattered across multiple platforms, making it difficult for students, enthusiasts, and the public to access in a simplified manner. People frequently miss sky events like meteor showers, ISS passes, aurora visibility, or rare planetary alignments due to the lack of centralized notifications. Additionally, the impact of satellite data on Earth applications — such as agriculture monitoring, climate analysis, pollution tracking, and disaster prediction — is not effectively communicated to the general audience.

Expected Solution

Develop an interactive platform that centralizes real-time space information and educational content in a user-friendly visual format. The system should provide visibility maps for sky events, visual mission timelines, cosmic weather insights, and a learning space to understand how space technology contributes to solving real Earth problems.

Deliverables

- Interactive dashboard showing upcoming celestial events with visibility maps and timing.
- Real-time cosmic weather data (solar storms, aurora forecast, radiation alerts).
- Visual timeline of past, current, and future space missions.
- Learning zone with quizzes, infographics, and student-friendly content.
- Visual demonstration of how satellite data contributes to real-world problem solving.



PROBLEM STATEMENT 2

2. COSMIC Data Fusion – Unified Astronomical Data Processing Platform

Overview

Astronomical data generated by space agencies and global observatories is fragmented across incompatible file formats, coordinate systems, units, and metadata structures. Researchers struggle to combine, compare, or analyze datasets without extensive manual preprocessing. This fragmentation delays research outcomes and limits collaborative AI-driven discoveries.

Expected Solution

Design a cloud-enabled data fusion platform capable of ingesting, standardizing, and harmonizing astronomical datasets from different sources. The system should resolve inconsistencies in format and units, store processed datasets in a unified repository, and provide visualization and analytical tools for researchers.

Deliverables

- Multi-source data ingestion and standardization engine.
- Metadata harmonization and coordinate/unit conversion pipeline.
- Centralized dataset repository supporting query, filtering, and export.
- Visualization layer for charts, maps, and comparative data analysis.
- Optional AI-assisted discovery insights such as anomaly detection or pattern prediction.



PROBLEM STATEMENT 3

3. Social Media Analysis Dashboard — Data-Driven Content Strategy Optimizer

Overview

Creators and businesses rely on social media for visibility, but analyzing performance across multiple platforms is difficult. Users must manually track likes, comments, shares, reach, and follower behavior, leading to decisions based on assumptions instead of data.

Common challenges include:

- Identifying which content type performs best (Reels, Carousels, Static posts)
- Understanding why some posts go viral while others don't
- Finding the best posting time
- Tracking long-term engagement patterns across platforms

Existing tools offer limited analytics and lack a unified, intelligent dashboard.

Expected Solution

Develop a web-based platform that consolidates social media analytics into one interface, visualizes performance metrics, detects patterns, and provides AI-powered insights. A natural-language query system should allow users to ask questions and get direct answers without technical skills.

Deliverables

- Unified performance dashboard (likes, comments, shares, reach, engagement rate)
- Cross-format comparison system (Reels vs Carousels vs Static posts)
- AI natural-language query interface (e.g., "Which post had the highest engagement last month?")
- Automated insight summaries + strategic recommendations
- Exportable analysis reports for planning and decision-making



PROBLEM STATEMENT 4

4. Integrated Community Resource & Crisis Response Platform

Overview

During emergencies or public crises, resource availability, on-ground information and agency coordination are often disconnected, causing delays and inefficient response. Communities lack a single platform where they can report incidents track resource distribution and monitor real-time emergency status.

Expected Solution

Develop a centralized web platform that enables users to report incidents, track resources, and support coordinated response between community members, volunteers, and agencies. The system should maintain real-time visibility of resources and incidents with geographic representation.

Deliverables

- Real-time resource dashboard with status visualization.
- Incident reporting system with severity, category, and location mapping.
- Role-based system for agencies, coordinators, and community users.
- Alerts and notifications for urgent cases.
- Analytics for response times, crisis patterns, and resource utilization.