SMART INDIA HACKATHON 2024

Basic Details and Problem Statement

- **Team Name:** Bitwise Innovators

Problem Statement ID : 1656

- **Problem Statement Title :**

Development of a mobile application to provide recreational suitability information of beach locations across India.

- **Theme :** Travel & Tourism

- **PS Category :** Software

- **Team ID :**

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Ideation Process

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Proposed Solution (Describe your Idea/Solution/Prototype)

- We've created **SafeCoast, an app based solution**, providing real-time beach suitability assessments. The app empowers users to make informed visit decisions by leveraging environmental data, helping them avoid hazards and enjoy secure experiences with comprehensive beach information.
- Visualize and Compare data effortlessly with graphical representation using line graphs.
- Stay informed and protected with our Beach environment monitoring system.
- Our app also contains a friendly itinerary planning chatbot that provides users the ability to seamlessly plan their visits consisting of local activities, attractions and accommodations tailored to their needs .
- For safety, our app sends an SOS alert if any hazardous situation occurs.
- Our multi-layered data strategy, leverages historical data, providing comprehensive safety analytics.

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TECHNICAL APPROACH

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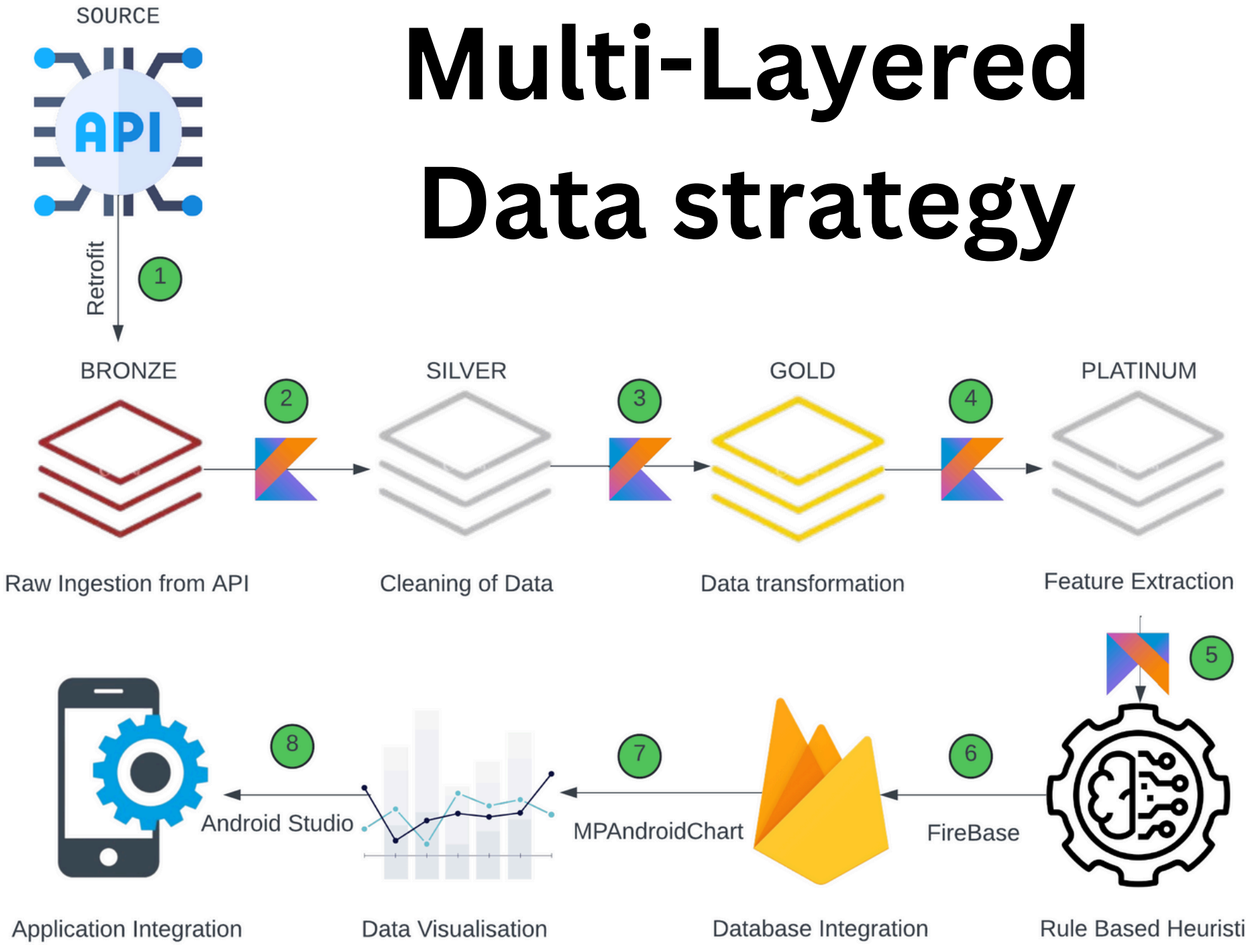
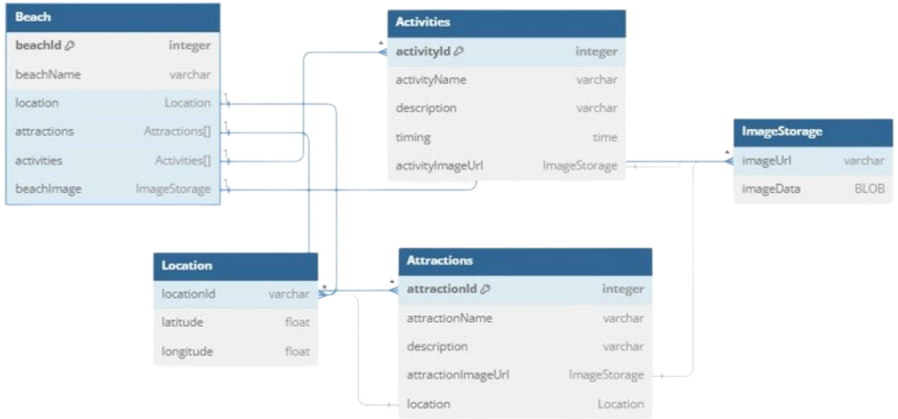
Multi-Layered Data strategy



Schema



Link to Github:

SafeCoast

Tech Stack:

Python, Kotlin, XML, FireBase, LangChain, HuggingFace

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FEASIBILITY AND VIABILITY

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Feasibility

- **Technology:** Reliable data sources (INCOIS, MOSDAC) readily available
- **Market Demand**: Growing interest in travel apps with real-time environmental monitoring
- **Scalability**: Potential to expand to other coastal areas and include more parameters
- **User Accessibility**: Kotlin, as a language for Android development, ensures high performance, smooth user experience, and broad accessibility

Challenges

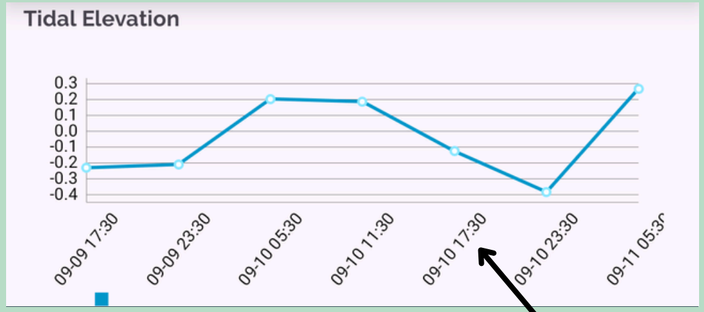
- **Data Reliability**: Potential disruptions in real-time data streams
- **Model Limitations**: Rule-based models may oversimplify complex weather patterns
- **User Experience**: Balancing detailed data with user-friendly interface
- **API Dependencies**: Possible rate limits affecting real-time data retrieval
- **Connectivity**: App performance vulnerable to network disruptions

Solutions

- **Backup Data Sources:** Multiple data sources and local caching ensures reliable data access during outages.
- **Advanced Prediction Models**: Transition from rule-based to machine learning models to handle complex patterns and improve accuracy.
- **API Optimization**: Implement smart caching and call optimization to handle rate-limits and enhance response times.
- **Offline Functionality**: Provide access to cached data with update alerts during connectivity issues.

IMPACT AND BENEFITS

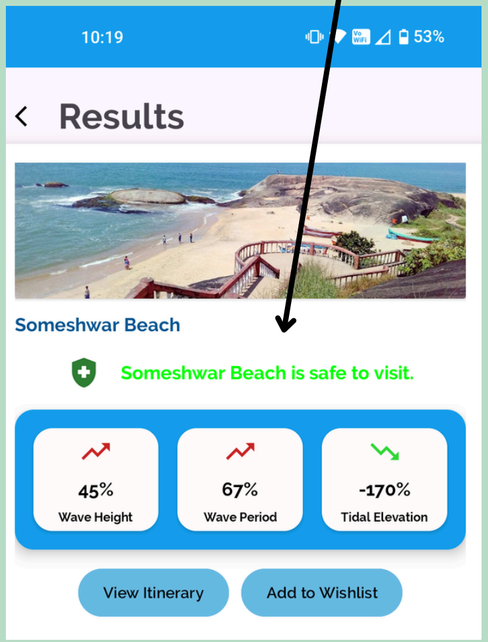
- **Attractions**: Comprehensive information about the diverse attractions and activities at each beach, allowing users to plan their visits and explore local offerings, from water sports to dining.
- **SOS**: An emergency feature that enables users to quickly alert authorities in case of incidents, providing an invaluable safety net and peace of mind.
- **Safety**: Real-time data on environmental factors empowers users to make informed decisions about beach suitability, helping them avoid hazards and ensuring a secure experience.
- **Mapping and Exploration**: Interactive map visualization facilitates easy comparison and identification of the most suitable beach destination.

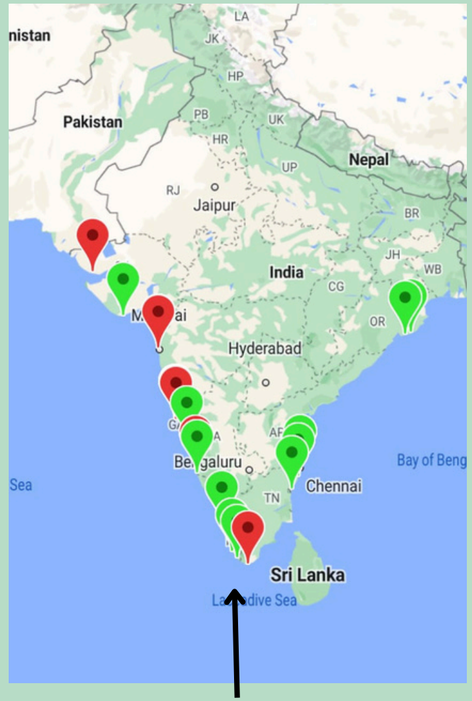


Data Visualisation

USP

Safety Prompts





Map visualisation

Business Models

- **Local Business Partnerships**: Partner with local businesses, such as rental shops, restaurants, or tour operators, to provide deals or promotions within the app. You could earn a commission for each user that makes a purchase through the app.
- **B2B Licensing:** License the app to organizations such as coastal management agencies, tourism boards, or large resorts that could use the app for their visitors or staff.
- **Event and Activity Integration**: Collaborate with local event organizers to offer users information on beach events or activities, potentially earning a fee for event promotion.

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RESEARCH AND REFERENCES

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Data Source: Indian National Centre for Ocean Information Services

Key Parameters:

- Wave height, direction, and period - Important for evaluating beach conditions.
- Sea surface temperature - Helps determine the suitability of water activities.
- Atmospheric pressure - Influences overall beach environment.
- Surface currents - Crucial for understanding water safety.

Data Collection Methods:

- Drifting Buoy Program - Collects data on surface currents, pressure, and temperature.
- Wave Rider Buoy - Measures key wave characteristics at coastal locations.

Relevance: Critical for assessing beach suitability and conditions

- The INCOIS data is vital for predicting and evaluating beach safety and suitability.

Website: INCOIS.gov.in

Data Source: MOSDAC (Meteorological and Oceanographic Satellite Data Archival Centre)

Key Parameters:

1. Atmospheric conditions
2. Water vapor
3. Rainfall data
4. Ocean conditions

Data Collection: Satellite-based
Relevance: Essential for predictions of beach safety and suitability

Website: MOSDAC.gov.in

Data Analysis & Prediction

Sources:

1. INCOIS
2. MOSDAC

Process:

- Data extraction via APIs
- Thorough analysis
- Rule-based heuristic modeling

Outcome: Predictions on beach visit suitability
Focus: Determining optimal beach visit time

TEAM DETAILS

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Team Leader Name: Nitin Goyal	**Btech - IT**	**3rd year**
Branch(BTech/Mtech/PhD): BTech	Stream(CSE/ECE etc)	Year (I/II/III/IV)
Team Member 1 Name: Rashid Siddiqui	**Btech - IT**	**3rd year**
Branch(BTech/Mtech/PhD): BTech	Stream(CSE/ECE etc)	Year (I/II/III/IV)
Team Member 2 Name: Vaishant Sharma	**Btech - IT**	**3rd year**
Branch(BTech/Mtech/PhD): BTech	Stream(CSE/ECE etc)	Year (I/II/III/IV)
Team Member 3 Name: Ishan Mangotra	**Btech - IT**	**3rd year**
Branch(BTech/Mtech/PhD): BTech	Stream(CSE/ECE etc)	Year (I/II/III/IV)
Team Member 4 Name: Shreya Goel	**Btech - IT**	**3rd year**
Branch(BTech/Mtech/PhD): BTech	Stream(CSE/ECE etc)	Year (I/II/III/IV)
Team Member 5 Name: Vasu Goel	**Btech - IT**	**3rd year**
Branch(BTech/Mtech/PhD): BTech	Stream(CSE/ECE etc)	Year (I/II/III/IV)