Smart Tourist Safety Monitoring & Incident Response System

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***Abstract*—This project has an aim to provide safety and security for tourists in cities as well as in remote and high-risk areas such as hills, forests, trekking zones, border check-posts, crowded tourist places, and restricted regions etc. Many tourists travel to new locations where they may face problems like entering unsafe zones unknowingly, getting lost, lack of quick emergency support, or delay in police response. So the authorities are not able to monitor every tourist manually at all times. This project provides a smart way to monitor tourist safety and help in emergency situations without disturbing the normal travel experience.**

In this project, a Digital Tourist ID is generated for every tourist using a secure system which contains basic details, trip information, and emergency contacts. The tourist mobile application continuously tracks location (with permission) and gives geo-fencing alerts when a tourist enters a high-risk or restricted area. The system also provides a panic button which shares live location instantly to nearest police unit and emergency contacts for faster response. AI based monitoring helps to detect abnormal activity like sudden location drop, long inactivity, or deviation from planned route and sends alerts for quick action.

***Index Terms*—Tourist Safety, Geo-Fencing, Digital Tourist ID, AI Monitoring, Panic Button, Live Location, Police Dashboard, Incident Response.**

I. INTRODUCTION

At present tourist safety issues are mostly occurs due to lack of awareness about unfamiliar places, entry into restricted zones, and delay in getting emergency support. Many tourists do not bother about safety guidelines while travelling, especially in remote and high-risk areas. The number of tourist visits is increasing year by year and because of this it becomes difficult for the police and tourism departments to monitor all tourists manually. The government has taken many steps to improve security, but traditional methods like manual verification and patrolling are not enough in today's fast moving world. Some systems are available for tracking and emergency support, but their cost is high and they are not reliable in every situation. So we tried to develop a system to control and handle these problems in a simple and effective manner.

Nowadays many tourists travel in areas such as forests, caves, hill stations, trekking routes, border zones and crowded city locations. In such places tourists may get lost, become inactive for a long time, face health emergencies, or get trapped in unsafe zones. Many times tourists are not familiar with local rules and restricted areas, and because of this they unknowingly enter dangerous or prohibited locations. Also in some cases tourists get separated from their group, face theft issues, or do not get proper guidance during emergency situations. The only way to ensure safety is to provide a technical solution that can monitor the tourist location, detect risky behaviour, and provide quick incident response automatically.

There is always a considerable effort required to provide fast help during emergencies and reduce the time taken for police response. Tourist safety may depend on many factors like location sensitivity, time, crowd, and travel pattern. In emergency situations, delay of even a few minutes can create serious risk for the tourist. Therefore, it is necessary to design a smart system which can generate a secure Tourist ID, detect unusual movements, send geo-fencing alerts, and provide a panic button facility with live location sharing. This system will help authorities to respond faster and improve tourist security without disturbing the travel experience.

In this project, a digital ecosystem is developed which includes a tourist mobile application and an authority dashboard. The system generates a Digital Tourist ID

with basic details and emergency contacts for secure verification. Geo-fencing technology helps to alert tourists when they enter unsafe areas, and AI based monitoring detects sudden location drop, inactivity, or route deviation. The panic button feature supports instant emergency reporting with live location sharing. This will reduce manual workload on police and tourism departments and provide a safer travel experience for every tourist.

The system is enhanced by introducing a dedicated Police Dashboard for criminal detection and law enforcement operations, an SOS system for hospitals, and a dual-mode Tourist ID creation facility for Indian and Foreign tourists. These additions strengthen public safety, emergency response, and identity verification.

II. LITERATURE SURVEY

Currently tourist safety has become a major concern in many Indian regions, especially in remote and high tourism areas like hills, forests, trekking routes and border locations. Due to increasing tourism, the number of incidents such as missing tourists, accidental entry into restricted areas, theft, and delayed emergency response are increasing year by year. Many tourists are not familiar with local rules, routes, and risk zones, and traditional safety methods like manual verification and local police patrolling are not sufficient. In many cases, tourists do not have proper local support and language barrier also creates difficulty during emergencies. Although some tracking and emergency helpline systems exist, they are not properly integrated, and real-time monitoring is still a challenge. The need for a smart system that can provide secure tourist identification, continuous monitoring, and quick incident response is increasing rapidly.

In existing systems, tourist details are mostly stored manually at hotels or check-posts and there is no proper verification method. Also, police departments get information only after a complaint is registered, which increases the delay in rescue operations. Some mobile apps provide location sharing, but they depend completely on user action and network availability. Therefore, an automatic alert and monitoring system is required which can work smoothly and provide accurate results. Technologies like AI, blockchain, and geo-fencing can play an important role in building such a system for smart tourism safety.

Author- S. Allyn Paper- Smart Tourist Safety System Using Geo-Fencing. In this research paper the author explains how geo-fencing can be used to detect when a tourist enters a restricted or unsafe zone and instantly send alerts. The study highlights that geo-fencing helps tourists to avoid dangerous areas by providing warning notifications and also supports quick action by authorities. It suggests that location-based monitoring reduces the chances of tourists getting lost and improves safety in unknown destinations.

Author- R. Sharma Paper- Digital Identity and Verification using Blockchain. In this research paper the author focuses on blockchain-based digital identity systems. The study explains that blockchain provides secure and tamper-proof storage of user details and verification records. It helps in preventing fake identity issues and provides safe access to tourist information only when required. The paper concludes that blockchain-based digital IDs can improve trust, data security, and transparency in identity verification systems.

Author- P. Das Paper- AI Based Anomaly Detection for Human Safety Monitoring. In this research paper the author discusses AI based monitoring methods to detect abnormal behaviour patterns. The system can identify sudden location drop, prolonged inactivity, route deviation, or unusual travel behaviour and generate alerts for investigation. The paper shows that AI plays an important role in predicting risk situations and helps authorities to respond quickly in emergency cases.

This section describes the previous work and research done with related topics. Emergency Alert and Panic Button Systems for Public Safety. In this study, the author explains how panic button features can be used in mobile applications to send SOS alerts with live location. This feature helps in contacting emergency services and family members quickly. The research concludes that panic button systems reduce response time and improve emergency handling in critical situations, especially when the user is in danger or unable to call for help.

Author- A. Kumar Paper- Real-Time Safety Dashboard for Authorities. In this research paper the author explains the importance of dashboards for police and government departments. The dashboard provides real-time monitoring, heat maps, tourist cluster locations, and alert history for faster decision making. The system also helps in managing incident

records, generating reports, and improves coordination between tourism departments and law enforcement agencies.

From the above studies, it is observed that combining these technologies can create a stronger tourist safety system. Geo-fencing provides zone monitoring, blockchain ensures secure identity management, and AI supports automatic detection of risk situations. The integration of emergency alert features with authority dashboards can help in reducing the rescue time and improve safety for tourists. Therefore, our project focuses on implementing these concepts in a single system to provide a smart, secure, and reliable solution for tourist monitoring and incident response.

III. PROBLEM STATEMENT

The ever-increasing cases of tourist safety incidents such as missing tourists, accidental entry into restricted zones, delay in emergency response, and lack of proper identity verification presents the direst need for a sustainable and an economically viable solution. In many remote and unfamiliar tourist locations, tourists may face threats like getting lost, accidents, theft, or medical emergencies. The safety of tourists is a major concern because traditional monitoring methods are slow and mostly depend on manual reporting, which increases risk and response time. The affordability and the efficiency of the solution system have to be optimized so that it can be implemented on a large scale without disturbing the normal travel experience.

The objective of this system is to present a viable alternative to these problems which also leads to a safe and smart tourism ecosystem. This research work aims to provide a solution in the form of a digital platform in which tourist identification and verification is done using a blockchain-based Digital Tourist ID system with proper security and valid duration of visit. The system also includes the provision of incident prevention and fast response using geo-fencing alerts and a panic button facility. Mostly during travelling in high-risk areas like forests, hills, caves, trekking routes and border zones, tourists may unknowingly enter danger zones or remain inactive for a long time which can lead to serious incidents.

This problem can be solved efficiently by our system as geo-fencing technology will monitor tourist location and alert the tourist when entering restricted zones. The system also provides AI based anomaly detection to identify sudden location drop, long inactivity, or route deviation and generate alerts for police and authorities. In emergency situations, the panic button shares live location to nearest police unit and emergency contacts for quick rescue operations. Hence, the Smart Tourist Safety Monitoring & Incident Response System provides a secure, reliable, and affordable solution to improve tourist safety and reduce incident response time.

IV. EXISTING SYSTEM

When in the existing system, when a tourist travels in normal and safe areas, no monitoring or alert is provided and the tourist continues the journey normally. There is no automatic safety support unless the tourist personally calls for help or informs someone. When the tourist enters into risky or restricted areas, the system does not automatically identify the danger zone and no warning message is delivered to the tourist. Most of the time, tourist information is collected manually at hotels or check-posts and it is stored in registers or simple databases, which is not secure and also difficult to access quickly during emergencies.

Whenever any incident happens, the police and tourism department usually get information only after receiving a complaint. The authorities then start searching based on limited details like last phone call, hotel records, or manual enquiry. Due to this, the response becomes slow and the chances of finding the tourist quickly are reduced. In many cases, tourists become inactive for a long time or deviate from their planned route, but the existing system cannot detect this automatically. Also, families and authorities do not get real-time location updates unless the tourist shares it manually.

In emergency situations, the tourist mostly depends on helpline numbers, local people, or manual reporting. This process takes more time and sometimes tourists are unable to contact anyone due to network issues or panic condition. Therefore, the existing system is not efficient for real-time monitoring, quick identification, and fast incident response in tourist safety management.

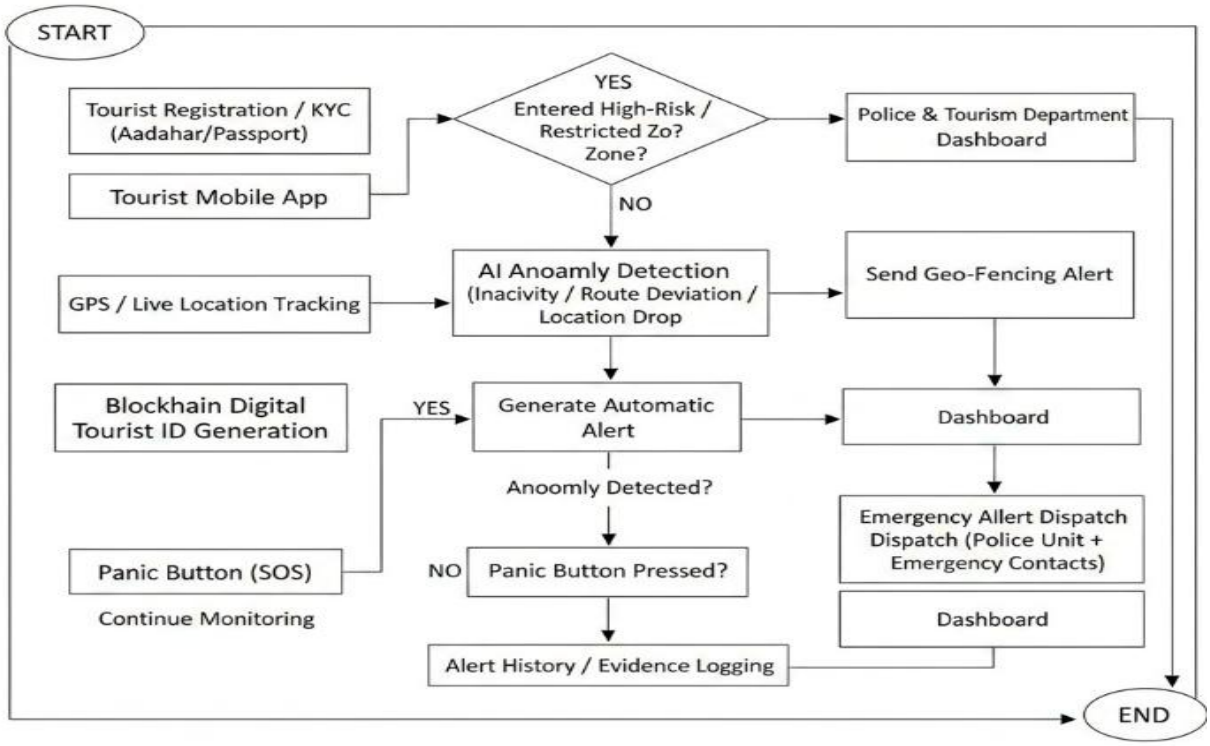
V. PROPOSED SYSTEM

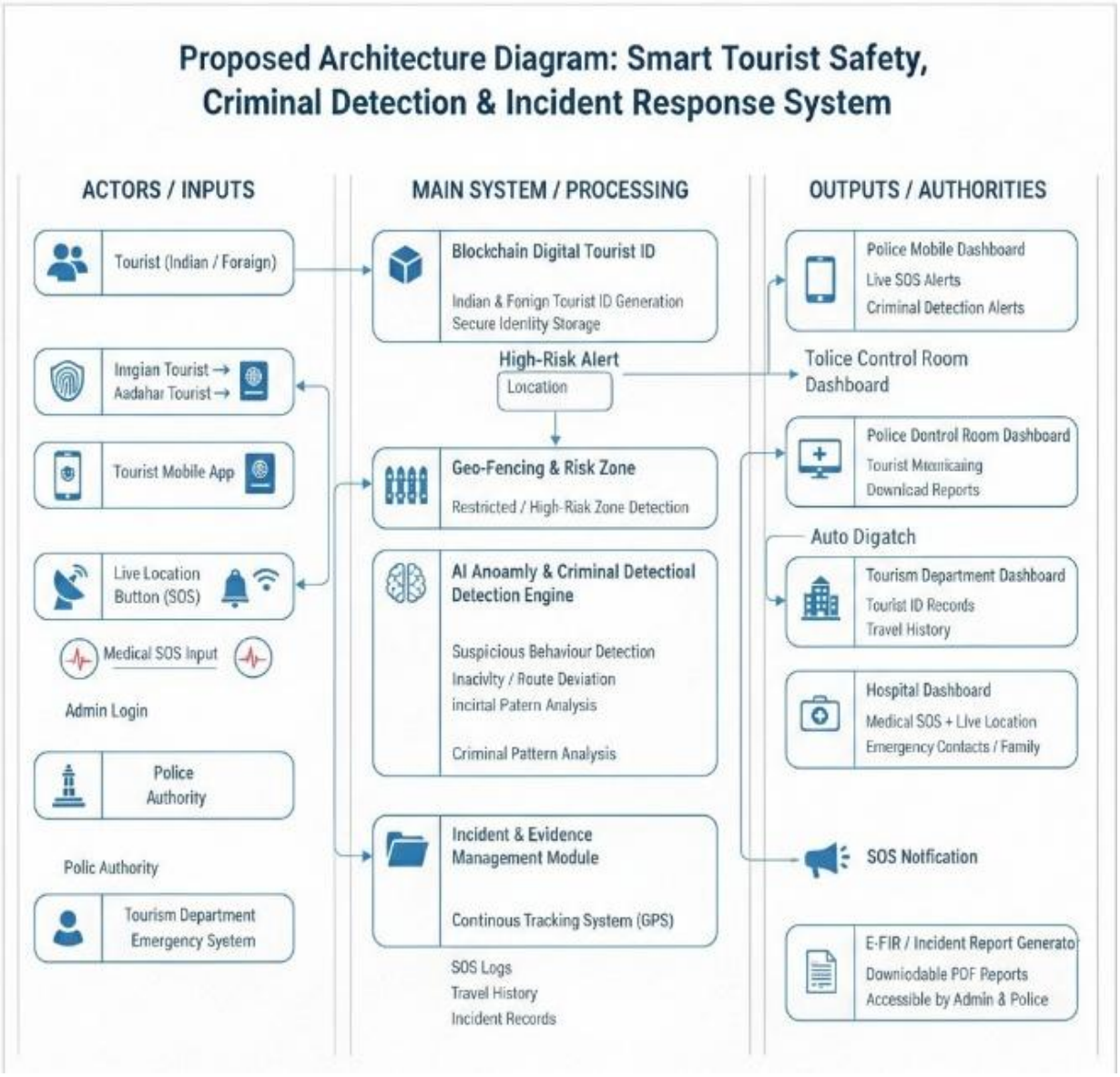
The changes that we have made to the proposed system is that tourist safety monitoring will be done automatically using a smart digital platform. In this system, every tourist will get a Digital Tourist ID which contains basic KYC details, trip information, and emergency contacts and it will be valid only for the visiting period. By this way, secure identification and verification of tourists can be done easily and safely whenever required. Our project ensures that tourist details are tamper-proof and accessible only to authorized authorities, which helps in reducing fake identity issues and improves trust in tourist verification.

In our proposed system, when a tourist enters normal safe areas, no action is required and the tourist can travel normally. But when the tourist enters into a high-risk or restricted zone, the mobile application will generate geo-fencing alerts and notify the tourist instantly. This helps the tourist to avoid unsafe areas and stay within safe travel routes. Our system also includes a panic button feature which sends live location directly to nearest police unit and emergency contacts for faster help during emergency situations.

Our proposed system also uses AI based anomaly detection, where sudden location drop, long inactivity, or route deviation is detected automatically and alerts are generated for authorities. A dedicated dashboard is provided for tourism department and police where they can monitor tourist status, view alert history, and take quick action. In this way, our Smart Tourist Safety Monitoring & Incident Response System will reduce emergency response time and provide a safer travel environment for tourists.

Proposed Block Diagram / Flowchart: Smart Tourist Safety Monitoring & Incident Response System AI, Geo-Fencing, and Blockhain-based Digital ID





VI. MODULES

A. Admin:

Admin can generate and manage the Digital Tourist ID system. Admin can view, verify, update and delete tourist records. Admin can also manage geo-fencing zones (safe zone / high-risk zone) and monitor tourist alert history. Admin is able to access all details and data available in the system dashboard for controlling and managing tourist safety monitoring.

B. Tourism Department / Police Authority:

In our system the Tourism Department or Police Authority can add and manage the high-risk or restricted zones such as forests, hills, caves, trekking routes, border zones and unsafe locations with their longitude, latitude, zone name, zone type, and description. They can also monitor tourist movement, view real-time alerts, tourist safety status, and take quick actions during emergency situations.

C. System:

In this web and mobile application, when any tourist travels in any zone, the GPS tracking system monitors the current live location of the tourist. This location is matched with the geo-fencing zones which are declared and saved by the Tourism Department / Police Authority. If the tourist enters a high-risk zone,

the system sends a geo-fencing alert to the tourist and updates the dashboard. The AI module checks tourist behaviour such as prolonged inactivity, sudden location drop, or route deviation. If any anomaly is detected, an automatic alert is generated for authorities. The system also provides a panic button feature, where the tourist can instantly share live location with nearest police unit and emergency contacts for fast incident response.

AI criminal behavior analysis
Multi-authority alert routing (Police + Hospital)
PDF auto-generation for Admin & Police
Manage Police and Hospital SOS access
Admin is responsible for managing the system, creating Digital Tourist IDs for Indian and foreign tourists, managing geo-fencing zones, and downloading complete tourist data including SOS reports, E-FIR documents, and travel records.

Police Dashboard
Functions
View live SOS alerts with location
Criminal detection and suspect monitoring
Access tourist Digital ID records
Download tourist details, SOS reports, and E-FIR PDFs
Track high-risk tourists and incident history

D. Hospital Module:
This module allows hospitals to receive SOS alerts during medical emergencies. Live location sharing helps in dispatching ambulances quickly, reducing response time and improving tourist safety.

VII.REQUIREMENT

A. HARDWARE RESOURCES REQUIRED

- System: - Windows 7 and Upgrade version Linux
- RAM: - 4 GB
- Hard Disk: - 500 GB
- CPU Speed: - 2 GHz
- Smartphone (Android)
- Internet Connection
- GPS (Mobile Location Service)

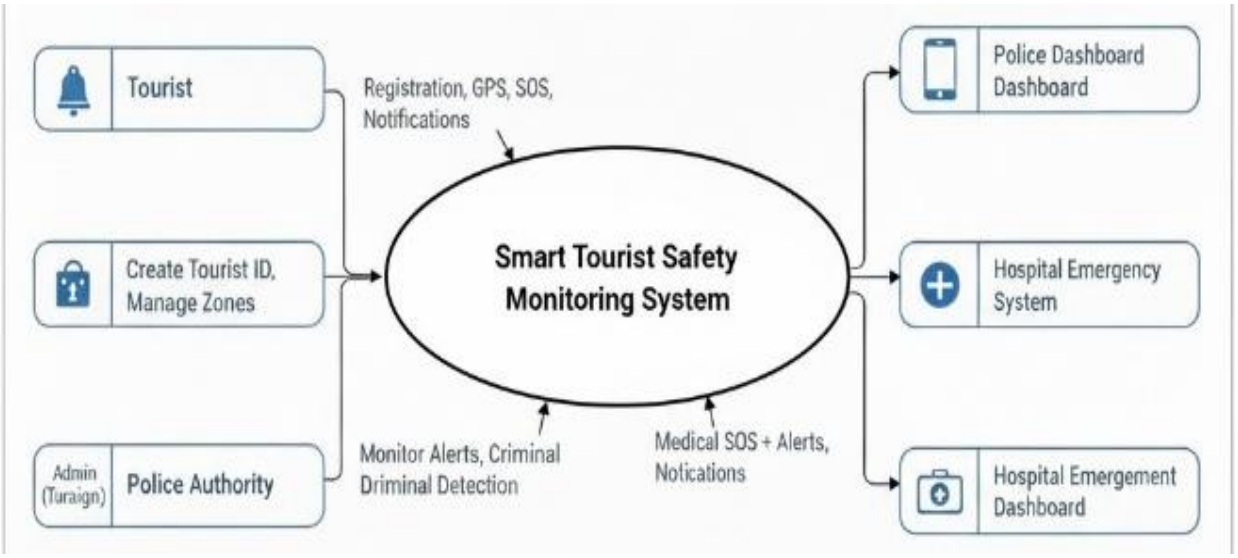
B. SOFTWARE RESOURCES REQUIREMENT

- Operating System: Windows / Linux
- Programming Language: - Python
- Framework: - Flask
- Database: - SQLite (Flask-SQLAlchemy)
- Libraries/Tools: - Flask-Login, ReportLab, Pillow
- Development Tool: - VS Code / PyCharm

DATA FLOW DIAGRAM

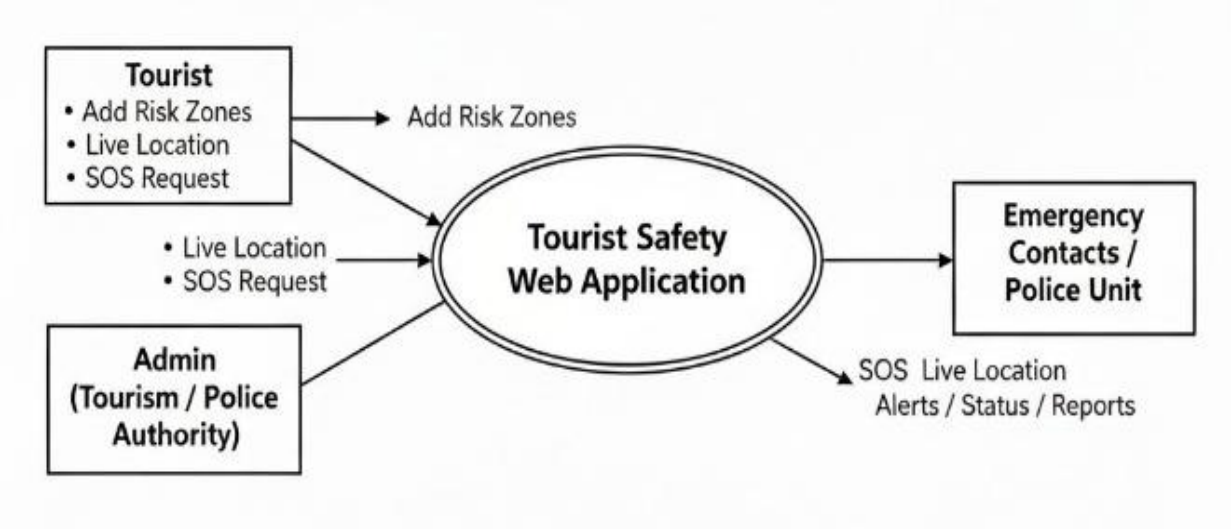
A. DFD Level-0

Level 0 DFD shows the general flow of data between all its elements which performs different function. DFD Level-0 of Smart Tourist Safety Monitoring & Incident Response System.



B. DFD Level-1

Level 1 DFD show the detail flow of data which is not briefly explained in level 0 DFD. DFD Level- 1 of proposed System.



C. DFD Level-2

FD Level 2 shows the detail flow of system and their interaction. DFD Level-2 of Proposed System.

VIII. ADVANTAGES

- Tourist safety incidents like missing cases and entry into restricted zones can be reduced.
- Tourists will be intimated immediately about high-risk or restricted zones through geo-fencing alerts.
- Emergency situations can be handled quickly using Panic Button (SOS) with live location sharing.
- GPS tracks the tourist live location and the system continuously monitors tourist movement for safety.
- AI anomaly detection helps to identify inactivity, sudden location drop, or route deviation and alerts authorities.
- Enhanced safety and security is provided through Digital Tourist ID verification and real-time police/tourism monitoring dashboard.

IX.CONCLUSION

The tourist safety issues that occur due to lack of proper monitoring, delayed emergency response, and entry into restricted zones can be minimized by this system. In this project we developed a smart solution to improve tourist security by using Digital Tourist ID generation, Geo-Fencing alerts, AI based anomaly detection, and Panic Button (SOS) support. In normal travel mode, the tourist can move freely without any interruption, but when the tourist enters a high-risk or restricted area, the system immediately detects it using GPS and sends alert notifications.

Tourist safety may look like a simple issue, but when seen through a larger perspective it is a major concern, especially in remote and unknown locations. With quick alerts and fast response system, the chances of missing cases and incidents are reduced. The panic button feature provides immediate help by sharing live location to police and emergency contacts. AI monitoring helps in early detection of abnormal behaviour such as inactivity or sudden route deviation. Therefore, with this initiative overall safety is improved, emergency response time is reduced, and a safer travelling experience will be ensured for tourists.

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