SMART INDIA HACKATHON 2024

TITLE PAGE

- Problem Statement ID : **SIH1707**
- Problem Statement Title : **Development of a Geolocation-Based Attendance Tracking Mobile Application.**
- Theme :**Miscellaneous**
- PS Category : **Software**
- Team Name : **ADS Labs**

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IDEA TITLE

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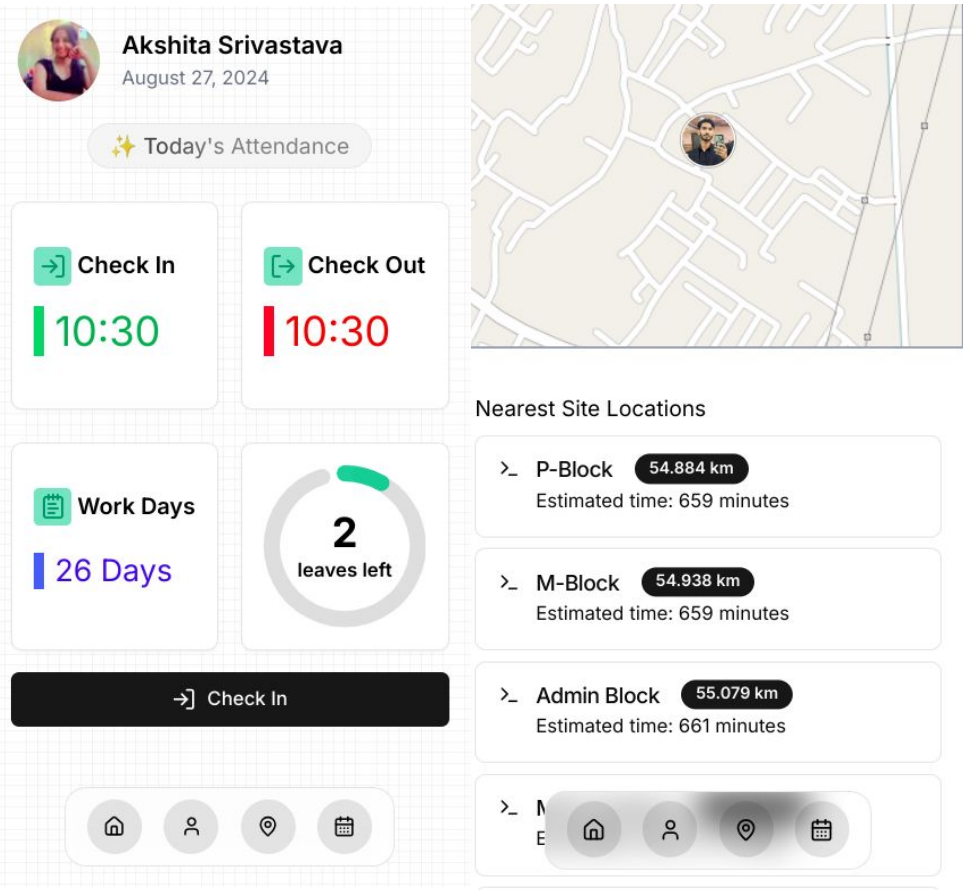
Proposed Solution

Implementation of a tamper proof advanced **Geolocation-Based Attendance Tracking Mobile App**

- **Real time location** based **Check-in** and **Check-out**
- Provide a user friendly view of **Nearest Site Locations**
- Calculate accurate **Working Hours** from the check in times.
- Provide a **Manual check in feature** for off-site locations using Admin approval and Geo-location
- Have a **accuracy of ~5 meters** and provide a **true data accuracy and integrity using cloud databases.**



Unique Value Propositions (UVP)

- **Location Storage Feature** using cache when user is offline.
- Implementation of **AI Based Facial Recognition** to prevent **Buddy Punching** (Model can detect ID and Photos)
- Cross platform access (Android, iOS, WEB) using PWAs and TWAs.

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TECHNICAL APPROACH

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Framework and Utilities:

Next.js, React.js & Tailwind CSS with MagicUI and ShadCN used to develop a responsive WebApp.

Mobile Application Development:

Used Progressive Web Apps (iOS) and
Trusted Web Activity (Android) for ensuring cross-platform compatibility

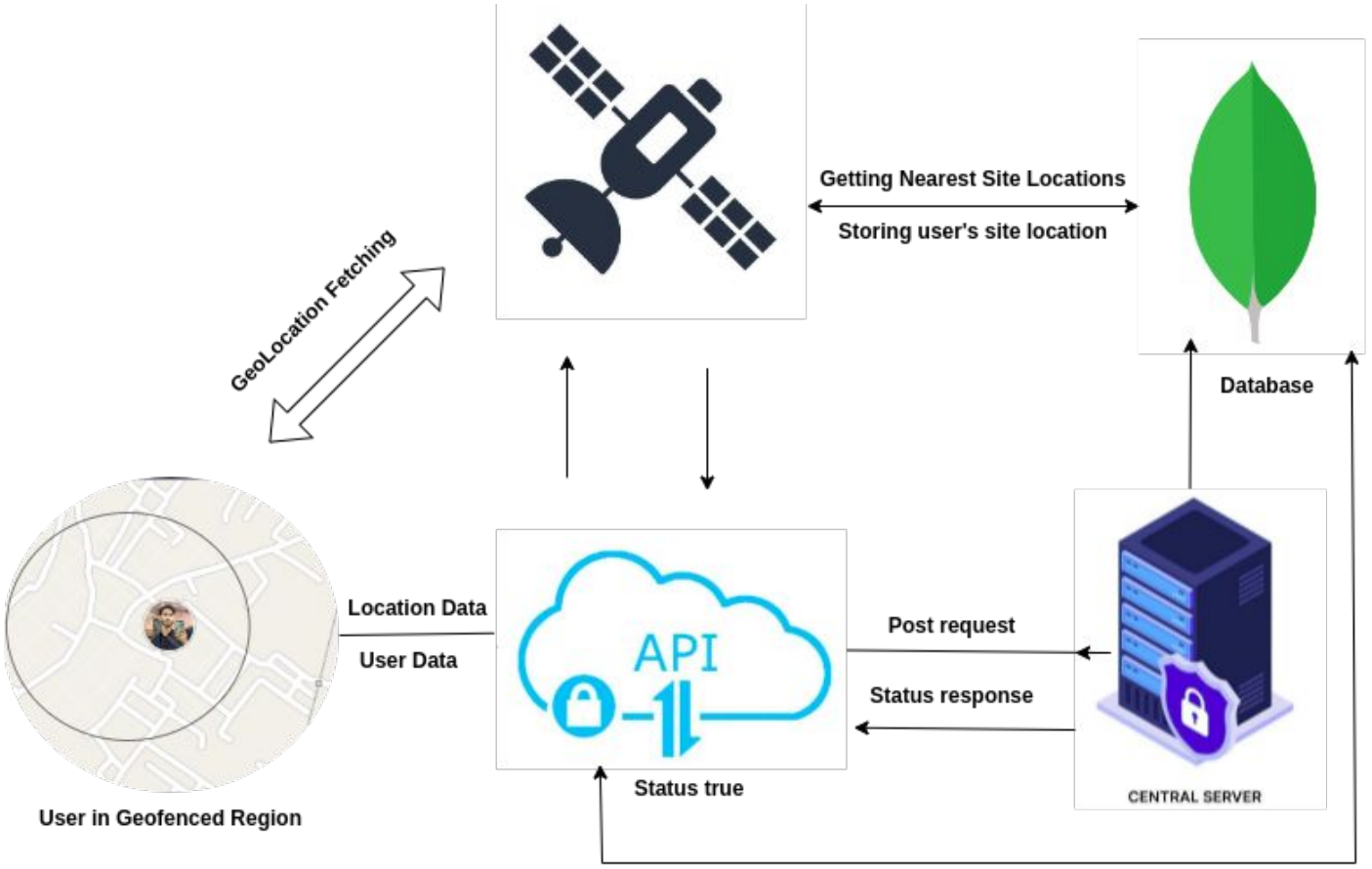
PWA

Cloud Services and Database :

MongoDB is used to maintain the data accuracy and integrity and Vercel & Github is used to set up cloud CI/CD pipeline for deployment.

Vercel

GitHub



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FEASIBILITY AND VIABILITY

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Analysis of the feasibility idea

- **Technical Feasibility: The app is achievable using current technology and open-source tools, integrating GPS and secure data storage.**

Potential challenges and risks

- **Privacy Concerns:** ***Employees may worry about location tracking.***
- **GPS Inaccuracy:** ***Location errors may occur in some areas.***
- **Battery Drain:** ***Continuous GPS use could affect device battery life.***

Strategies for overcoming these challenges

- **Privacy:** ***Visually representing the map location which keeps the record only when the person check -in or check- out the geo-fenced site.***
- **GPS Accuracy:** ***Combine multiple signals to improve location accuracy.***
- **Battery Optimization:** ***Implement smart algorithms to reduce GPS usage.***

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IMPACT AND BENEFITS

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Potential impact on the target audience

- **Employees :** Easier attendance management, transparency in records, and increased trust in attendance policies.
- **Managers:** Better oversight of team attendance, reduced administrative tasks, and more time for strategic planning.
- **HR Personnel:** Improved accuracy in attendance tracking, streamlined payroll processing, and valuable data for workforce planning.

Benefits of the solution

- **Social:** Improves employee well-being and reduces attendance disputes.
- **Economic:** Cuts admin costs, prevents payroll errors, and boosts productivity.
- **Environmental:** Saves paper and lowers carbon footprint with remote work support.

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RESEARCH AND REFERENCES

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Details and links of the research work

- **Haversine formula helps in determining the distance between two geo-locations precisely**
  [https://en.m.wikipedia.org/wiki/Haversine_formula**]**

- **Face Recognition we have enhanced this model using this article for the employee's verification in order to prevent buddy punching.**
  [https://medium.com/@khwabkalra1/face-recognition-e45aff329fba**]**

- **Global positioning system helps in understanding about geo-location and implementing accurate geo-fencing and all other dynamics in our app.**
  [https://en.m.wikipedia.org/wiki/Global_Positioning_System **]**