ENTREASE

Geolocation Based Attendance Tracking

Problem Statement ID	1707
Problem Statement Title	Development of a Geolocation-Based Attendance Tracking Mobile Application
Theme	Miscellaneous
PS Category	Software
Team ID	35895
Team Name	Kairos

Geolocation-Based Attendance Tracking Mobile Application

SMART INDIA HACKATHON 2024

Team Name - Kairos

PROBLEMS ?

- High Possibility of **data tampering** in manual attendance records
- ID-Card based check-in allows for **counterfeit records by third person**
- **Time theft** (No exact tracking of person's location in case of overtime)
- Need of **additional electronic devices**
- No check on break timings
- Employees **forgetting to check-in** causing unnecessary trouble
- Requirement of **replacement cost of devices**
- **No flexibility** in attendance records in offsite places
- Manual checking of attendance required

SOLUTION

- **Automated workflow** reduces data tampering possibilities
- **Eliminates possibility of false entries** by a third person
- Increases **data ambiguity** due to exact status of employee location and presence in the working space
- Eliminates the need for additional **devices reducing the risk of hardware faults and physical resources**
- **Precise tracking status** to even ensure employees stick to the break time period
- No chance of uncertainty incase employees forgot to check-in
- Allows for smooth attendance tracking **even outside the office premises, for ex – offsite work.**
- **Attendance record visible** on app

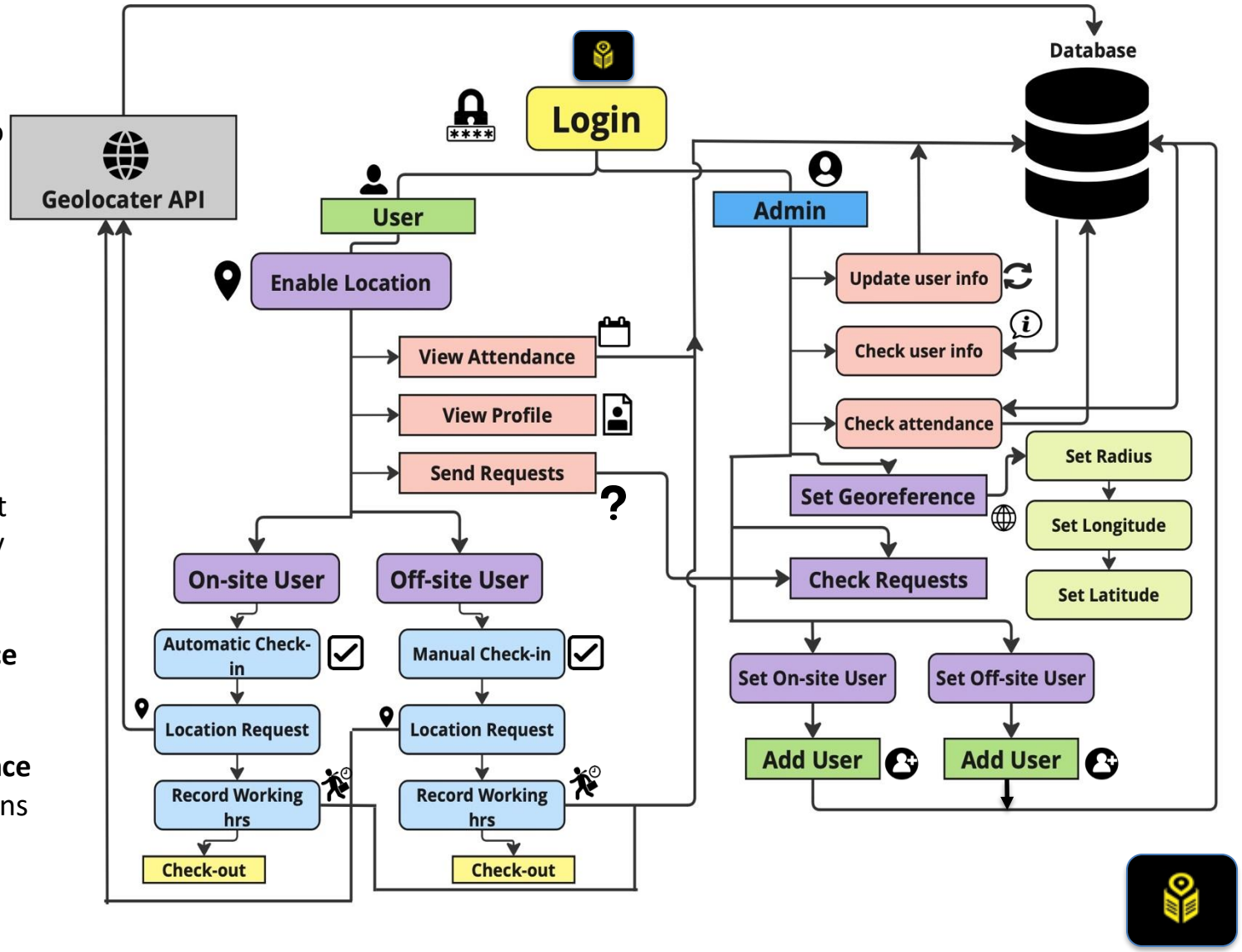
GPS Based Tracking	**Data Security**	**Automated**	**Flexible Attendance**	**Real time Data Sync**

App UI Demonstration Video

Click on the icon to play app demonstration video ->

Workflow Architecture and Process

1. **Geolocation tracking** in the system is **fully automated**, eliminating the need for employees to manually manage attendance.
2. For instance, in an office with working hours from 9:00 AM to 5:00 PM, the tracking activates automatically at 9:00 AM and deactivates at 5:00 PM, making the process **seamless and hassle-free**.
3. To respect **employee privacy**, managers and admins only receive information on whether an employee is within the designated work area, without revealing their exact location. This approach prevents unnecessary surveillance, especially during break times.
4. During scheduled breaks, such as lunch and tea, the location tracking feature is **automatically turned off** to further protect employee privacy. Additionally, employees have the flexibility to request extra breaks, providing a reason for their request.
5. While **exact location data is not visible** by default, it can be accessed through specific protocols if necessary. The **geofence boundaries** are carefully set to ensure accurate tracking, preventing any discrepancies in data.
6. Both admins and employees can **conveniently view attendance records** and manage requests directly through the app. Admins also have the ability to **add new users, manage employee information, and handle new hires** as needed, ensuring the system **adapts smoothly** to organizational changes.



Team Name - Kairos

Technologies and Feasibility

SMART INDIA HACKATHON 2024

Feasibility

❖ **Technical Feasibility:**
It is capable of handling the rising workforce demands in the future

❖ **Financial Feasibility:**
Initial development costs and maintenance costs might be a bit pricey, but still gives a great ROI

❖ **Legal Feasibility:**
App complies with all Data Protection Laws

❖ **Ethical Feasibility:**
All privacy concerns put to rest by offering multi-mode facilities

Challenges & Risks

- **Geolocation inaccuracy** in areas with GPS reception
- Network dependency
- **Battery consumption**
- Handling multiple locations
- Data and **privacy concerns**
- Security vulnerabilities
- User consent and transparency
- Intrusiveness
- **Handling exceptions**

Strategies

- Implementation of **GPS based geolocation tracking** to solve accuracy issues
- **Hybrid Tracking System** – GPS based + Wi-fi based geolocation to cater to places with poor GPS reception
- **Multifactor Authentication** for enhanced security
- **Cloud based data storage & synchronization** to ensure up to date location
- **Efficient GPS Usage**: Optimize the app's GPS usage to minimize battery drain, such as by reducing the frequency of location updates when the device is stationary or using low-power location services like Wi-Fi or Bluetooth

Technologies

miro Dart Cloud Firestore

Frameworks

Flutter Geolocator Plugin

Flutter Firebase

Team Name - Kairos

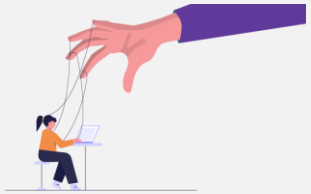
IMPACT AND BENEFITS

SMART INDIA HACKATHON 2024

BENEFITS

SOCIAL	ECONOMIC	ENVIRONMENTAL
Reduces attendance hassle	Less **physical resources**	**Plastic usage eliminated** (used in NFC Tags)
Encourages healthy work practices	**Eliminates the need of technical assistance** needed for the physical devices	**Reduced paper usage** (documentation)
Enhances **employee wellbeing**	Cost-efficient	Reduced **transportation emissions**
Improves **employee engagement**	**Scalable** for growing businesses	Minimized **electronic waste**

POTENTIAL IMPACT ON AUDIENCE

Convenience	Flexibility	Time Management	Secure	Might feel micromanaged	Fair and Transparent
					

Team Name - Kairos

RESEARCH AND REFERENCES

SMART INDIA HACKATHON 2024

https://pub.dev/packages/geofence_service

https://github.com/yaeunjess/Flutter-GoogleMap

https://github.com/mptwaktusolat/test_gps_geocoding_geolocation

Geo-fence based facial image recognition system
https://ijrpr.com/uploads/V4ISSUE3/IJRPR10861.pdf

https://console.cloud.google.com/apis/library?supportedpurview=project

https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6003963

App UI Demonstration Video

Click on the icon to play app demonstration video ->