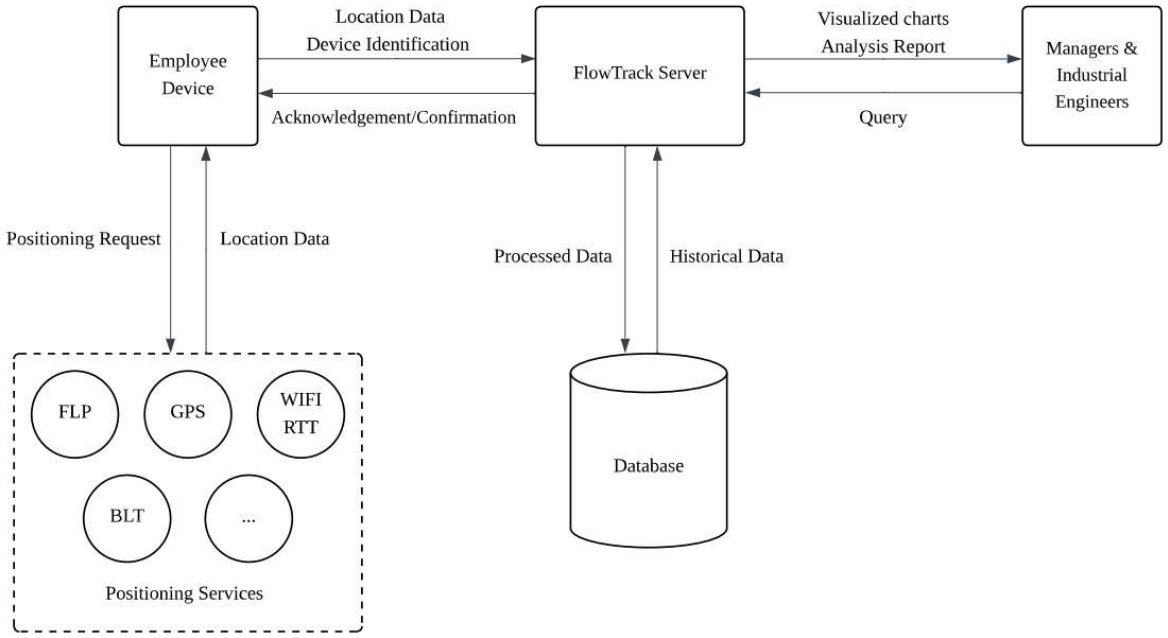
FlowTrack: Employee Traffic Monitoring System
Project Abstrct

This Project Abstract consolidates all business requirements into a unified summary of scope that is aligned with the sponsor's mission of improving production efficiency. It also identifies items that are explicitly out of scope, making clear to stakeholders what will and will not be delivered. For clarity, the abstract includes both a context diagram and an equivalent stakeholder relationship table, allowing readers to compare system boundaries and stakeholder interactions side by side.

Project Mission	
Enterprises lack continuous, objective visibility of how people and work move through space. The FlowTrack system turns raw location signals into clear, privacy-safe maps and visual timelines, giving teams a shared, factual picture of reality and improving production efficiency. ● Single source of truth: Standardized, timestamped location records and visual layers everyone can trust. ● See the floor, not a spreadsheet: Heat maps, occupancy trails, and room timelines that make bottlenecks and idle zones obvious. ● Measure without judgment: Neutral, audit-ready views that support productivity, safety, and facilities decisions.	
System responsibility	
Objective 1	***Data Collection***: Support real-time location data collection from employees' smartphones, with data uploaded to a central database at fixed intervals. The system must ensure data accuracy and integrity.
Objective 2	***Visualization and Reporting***: The system processes the collected data through objective aggregation, formatting, and statistical analysis, and then automatically generates visual results and structured reports. These outputs clearly present the distribution of employees across different areas and highlight movement trends within the workplace. By reviewing the visualizations and reports, managers can better understand the current situation—for example, identifying inefficient workspace layouts or potential causes of reduced productivity—and make informed decisions accordingly.
Objective 3	***Security and Privacy***: Provide robust data transmission and identity authentication mechanisms to protect employee privacy and safeguard enterprise-sensitive information. Data should only be used for statistical and optimization purposes, ensuring compliance and ethical standards.
Objective 4	***Performance Requirements***: The system should be capable of handling large volumes of concurrent data uploads and query requests while maintaining stable performance, even under peak load conditions. It is expected to provide continuous long-term operation with high availability, low latency, and strong scalability to ensure reliable user experience and data processing efficiency.

Objective 5	***Reliability and Fault Tolerance***: Incorporate backup mechanisms and error handling to prevent data loss and minimize downtime in case of network or server failures.
Objective 6	***System Usability***: The system should provide a clear and user-friendly interface for managers and engineers, ensuring that reports and visualizations can be easily interpreted without requiring technical expertise.
Objective 7	***Deployment and Maintainability***: The system should be designed for straightforward deployment, updates, and maintenance, ensuring long-term sustainability in industrial environments.
Not Included	• Predictive or prescriptive AI/ML decision-making. • Indoor positioning accuracy beyond mobile device capabilities. • Collection of biometric, audio, or video surveillance data. • Employee tracking outside production-related areas • Employee tracking during non-working hours. • Integration with payroll, HR, or disciplinary systems.



Flowtrack Context Diagram

Actor	Workflow	Data In	Data Out
Employee Device	During the work period, continuously upload the employees' location information and bind the device identifiers.	Location data and bonded device id	Acknowledgement/ Confirmation

Positioning Services	Providing positioning signals through external services and hardware	Positioning request	Location data
Managers & Industrial Engineers	Submit the query to view the visualized results (heat maps, from-to diagrams, etc.) location information and efficiency analysis.	Command query	Heat maps flow charts, and statistic reports
Database	Storage and provision of historical data	Processed and cleaned data	Historical data, location data and device ID stored before