RADICAL ENLIGHTEN

# Smart Tourism Solution

Elevating Tourism Management with DeepTrack

"Tourism is a vital source of income for both the nation and local communities."

These day, both Thai and international travelers expect their journeys to be worthwhile — choosing destinations and activities that match their interests, lifestyle, and convenience.

Accurate, real-time tourism data is essential to designing activities that distribute visitor flow, manage time spent across multiple areas, and create fresh, meaningful, and sustainable experiences.

Radical Enlighten Co., Ltd. has developed DeepTrack, a real-time movement analytics system that detects Bluetooth and Wi-Fi signals from mobile devices. This technology allows local agencies to analyze visitor behavior patterns and redesign tourism activities to balance crowd density, encourage travel to various points of interest, and enhance the overall tourism experience in a sustainable way.

The insights generated by DeepTrack support data-driven decision making, improve management efficiency, and help stimulate the local and provincial economy — driving tourism growth together with community development.

## System Capabilities

- Real-time detection and analysis of tourist density
- Analysis of movement patterns, entry–exit behavior, and popular routes
- Identification of peak periods to support campaigns and promotions
- Differentiation of actual tourists based on device behavior and activity
- Repeat-visitor tracking using statistical data analytics

## Supporting Policy Decisions & Tourism Management

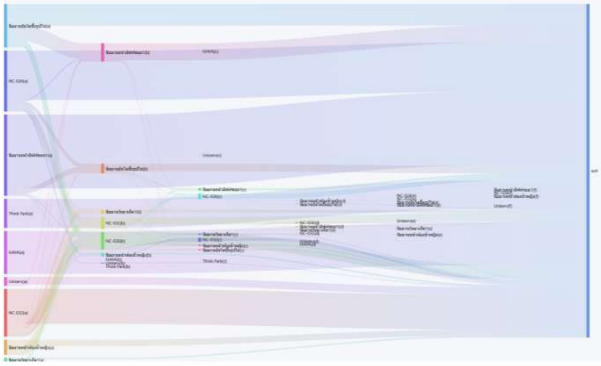
- Helps distribute activities and services to secondary areas, reducing congestion
- Enables experience and product design aligned with traveler behavior and target segments
- Uses actionable data to increase community and provincial revenue while enhancing visitor experiences

# PLATFORM INTERFACE

## Function Overview
DeepTrack Platform

### 4.1 Node Profile Management
(Sensor Device Management)
จัดการ Node ID และตำแหน่ง GPS ของเซนเซอร์
- Manage sensor Node IDs and GPS locations
- Configure Active/Inactive, Indoor/Outdoor, RSSI threshold, and effective radius
- Supports map-based location picking
- Automatic calculation of Tourism Carrying Capacity (TCC) for each area

### 4.2 Daily Heat Map Report
Daily heatmap showing tourist density distribution
- Hourly heatmap (00:00–24:00) with Comfort / Busy / Alert status
- Playback timeline: view historical data or auto-play
- Uses distinct device filtering to eliminate duplicates and increase accuracy



### 4.3 Weekly Detection Report
Weekly detection statistics
- Bar and pie charts showing actual detected visitors
- Compare density across locations (Top 10 areas)
- Interactive map displaying nodes and total detections

### 4.4 Device Flow Report
Shows tourist movement paths
- Analyzes transitions from Node → Node
- Uses Sankey diagrams with 3-hour time windows
- Ideal for planning activities and tourism route management

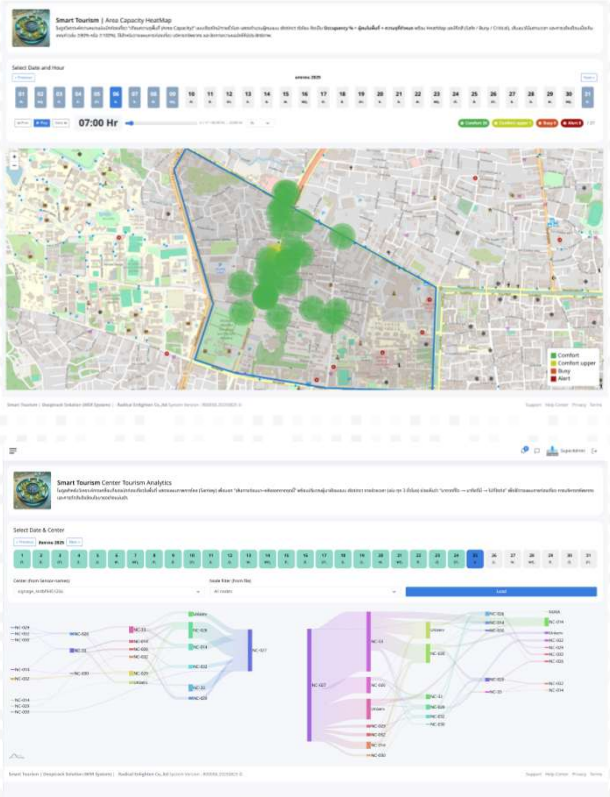
### 4.5 Center Flow Passthrought Analyzer
Movement network analysis using a central reference point
- Displays node relationships in Star / Circle topology
- Identifies hub areas and secondary (leaf) zones
- Supports drill-down to view movement volume per route

### 4.6 Tourist Visited Hour
Hourly visitor analytics
- Hourly unique device counts, separated by date and location
- Sankey diagrams showing hourly entry–exit flow
- Supports seasonal trend prediction and event planning

### 4.7 DeepFlow Analytics
Continuous deep-level movement analysis
- Tracks full movement behavior: Before → During → After visit
- Multi-layer Sankey diagrams showing multi-step flow
- Ideal for evaluating carrying capacity and long-term tourist behavior

### 4.8 Dashboard & Tourism IOC
Tourism command center dashboard
- Overview dashboard: number of sensors, unique devices, detection summary
- Interactive map: node location, detection zones, occupancy percentage
- Movement charts: circular flow graphs showing movement between points
- Executive view: enables provincial leaders to visualize all data and plan events, logistics, and resources effectively

# PLATFORM INTERFACE



## Dashboard & Tourism IOC

**Tourism Monitoring & Command Center**

**Dashboard Overview**

- Displays total active sensors
- Shows total unique detected devices

**Detection Summary by Time Period**

- Morning (06:00–09:00)
- Late Morning (09:00–12:00)
- Noon (12:00–15:00)
- Afternoon (15:00–18:00)
- Evening (18:00–21:00)
- Night (21:00–24:00)

**Interactive Map**

- Shows sensor node locations
- Displays detection zones
- Shows occupancy percentage and crowd density levels

**Movement Chart / Circle Graph**

- Visualizes tourist flow between nodes
- Clearly shows movement routes and connections between key attractions

## Examples of Real-World Use Cases

### Government Agencies / Municipal Administrations

***Example*** Saturday Walking Street, Chiang Mai shows tourist density exceeding the Comfort Zone

→ Authorities can define controlled entry times or open multiple access points to reduce congestion.

***Example*** Data shows most tourists entering from Tha Phae Gate walk through Walking Street and exit at Ratchadamnoen Road

→ Agencies can place additional activities, street performances, or vendor zones along this route to increase dwell time and local spending.

### Provincial / National Tourism Marketing Teams

***Example*** Foreign tourists primarily visit during 18:00–21:00

→ The Tourism Authority can organize a Night Light Festival, entertainment zone, or night market promotions that match peak arrival time.

### Private Sector (Hotels, Restaurants, Retail Businesses)

**Example** Hotels and restaurants in Patong Beach, Phuket observe a strong increase in tourists during the High Season (Dec–Feb)

→ They can launch promotions such as “Stay 3 Nights, Get 1 Night Free” perfectly aligned with peak months.

**Example** Flow data shows tourists travel from Wat Phra That Doi Suthep to Phu Ping Palace

→ Coffee shops or souvenir stores can position themselves along this route to capture increased spending.

### Local Communities

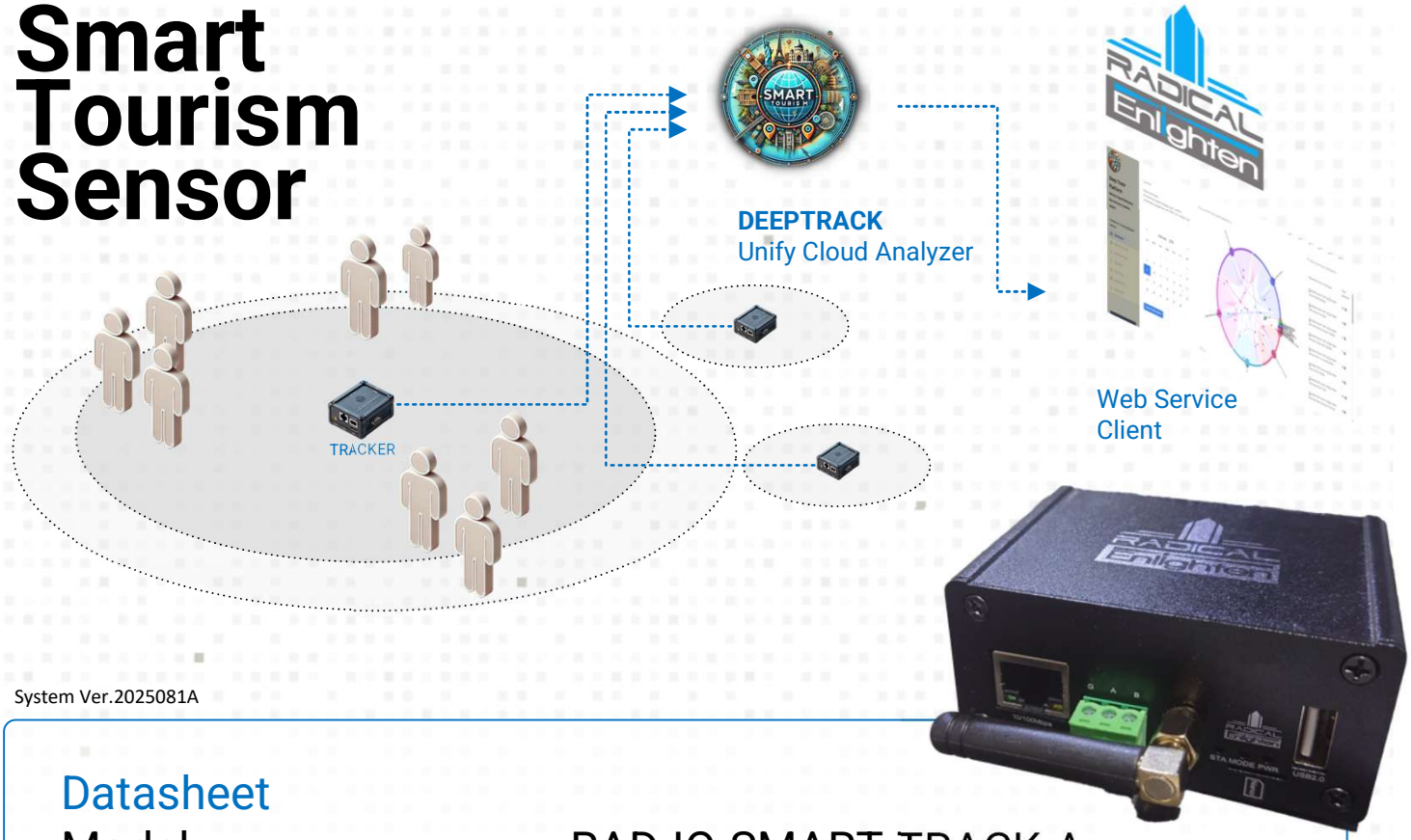
**Example** Tourists from the Walking Street often continue to Warorot Market

→ The community can organize a Local Food Fair at the market to draw visitors into secondary areas and generate local income.

**Example** Data shows tourists spend only about 30 minutes in a specific attraction

→ Local vendors can offer Grab & Go items or quick Set Menus that match real visitor behavior.

# Smart Tourism Sensor




System Ver.2025081A

## Datasheet

Model RAD-IO-SMART-TRACK-A

Zone of Application Global

### Controller Specification

| | |
|---|---|
| CPU | Broadcom BCM2710A1, 64-bit Quad-core Cortex-A53 @ 1GHz |
| RAM | 512MB LPDDR2 |
| Storage | MicroSD Card (Supports up to 256GB) |
| Wireless Communication | Wi-Fi 802.11 b/g/n/ac (2.4GHz & 5GHz), Bluetooth 5.2 (BLE) |
| Network Interface | Wi-Fi, Bluetooth (Classic + BLE) |
| USB Interface | USB 2.0 OTG (via micro-USB) |
| GPIO | 40-pin header (with various digital/analog interfaces) |
| Sensor Interfaces | I2C, SPI, UART, ADC (via expansion board) |
| Power Supply | 5V DC via USB-C or GPIO (Typical: 500mA - 1A) |
| Power Consumption | Idle: ~100mA, Active: ~250-500mA (depending on peripherals) |

### Operation Range

| | |
|---|---|
| Operating Temperature | -20°C to 70°C |
| Protocol Stack | TCP/IP, MQTT, HTTP, HTTPS, NTP, FTP, SSH, WebSocket |
| Supported Sensors | Temperature, Humidity, Barometric Pressure, CO2, TDS, EC, pH, ORP (via expansion board) |
| Enclosure | Optional Custom Case (Weatherproofing available for outdoor use) |
| Mounting Options | Wall-mount, DIN rail, Pole mount |

โปรดติดต่อ
Radical Enlighten Co.,ltd.
www.radical-enlighten.com
HOTLINE : 098-284-3354
Info@radical-enlighten.com

Specifications are subject to minor changes due to component updates or manufacturing adjustments without prior notice, ensuring continuous product improvement and availability