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AI Cloud Spatial Management Platform

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3D LiDAR Spatial Management Platform

3D LiDAR-based
Real-time Monitoring Control
provides smart space management
solution by accurate and rapid
object detection and the alarm.

Even provides effective insights of
business operation through the
Data Statistics Dashboard by using
the data set with the
object detection/segmentation.

3D LIDAR SPATIAL MANAGEMENT PLATFORM

Service information

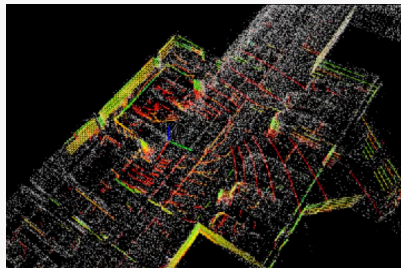
Service introduction

- Interlocking with various IoT sensors such as smartphone sensors and BLE/UWB
- Accurate location and spatial awareness through AI algorithm
- Enhancing Safety & Improve Corporate operational efficiency via analyzing statistical data on the dashboard

Applied industry sector

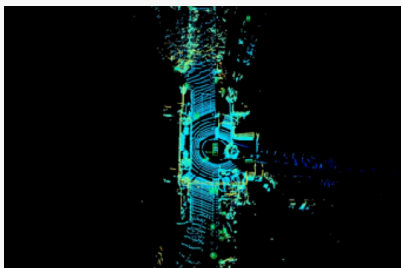
- All industries who purpose safety and efficient space management: offices/ factories/ shopping/ banks/ hotels/ hospitals etc.

Core Technologies



Creation of 3D LiDAR spaces.

- 3D lidar scanning to build and monitor 3D space.
- Update real-time spatial information in a dynamic environment where environmental changes frequently occur.



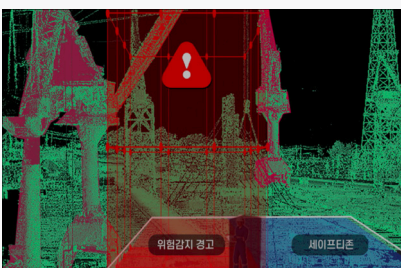
3D object recognition & tracking

- Detects and tracks movements of three-dimensional objects such as persons, carts, bicycles, and cars.
- Creates and assigns unique IDs through the extraction of feature points of the recognized object.



Semantic segmentation

- Classification and subdivision of objects such as roads, lanes/parking lines, road marks, street lights, shelves, pedestrians, etc.



3D Geofencing

- 3D Spatial Geofencing enables sophisticated observation area setup
- Accurately recognizes access to objects within the set spatial geofencing area and provides real-time notifications.

Suggested Customer

✓ Suggested Customer 1

Company with the need to control monitoring the workplace due to security and safety issues;

✓ Suggested Customer 2

Companies concerned about accuracy of established control monitoring solutions

✓ Suggested Customer 3

Customers who want to prevent repeated incidents and improve operational efficiency with data-driven future forecasts

✓ Suggested Customer 4

Customers looking to use control monitoring and data platforms at a reasonable cost

Platform features/ functions



Object Recognition

Recognition and identification of people and assets within the observation area (unique ID/height/speed)



Real-Time Monitoring

Real-time positioning and movement path tracking of people and assets



3D Geofencing

3D geofencing by space according to industrial groups, such as accident risk zones, security enhancement zones, and high density zones



Object detection and alert

Detects an approaching object within the Geo-fencing area and alerts the approach warning to the danger zone and security-enhanced zone



Data Dashboard

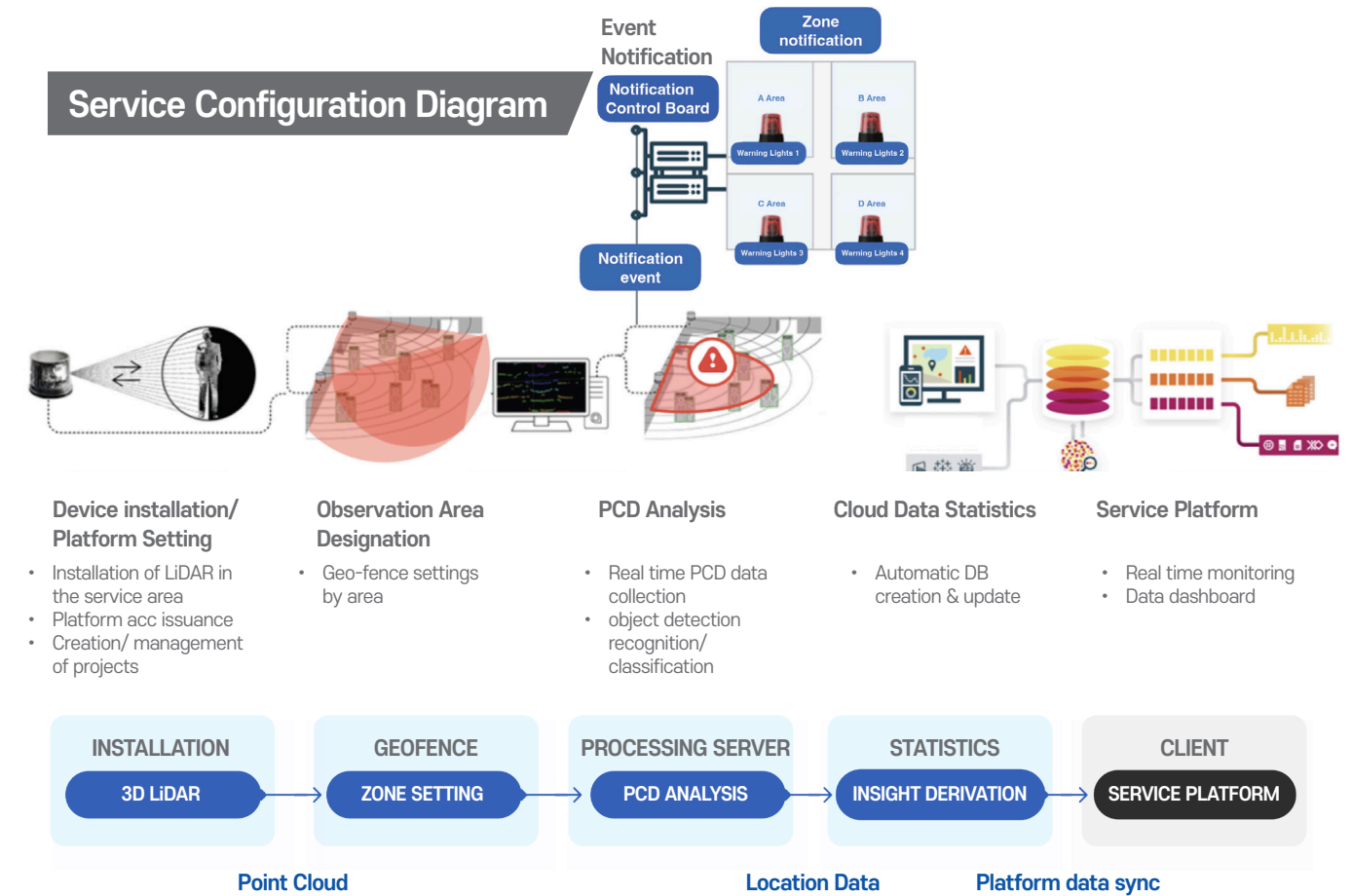
Provision of statistical dashboard for object detection and segmentation data sets. Provides effective insights of business operation through the statistics by time and space, object type and weight, density/congestion, movement pattern, etc.

3D LIDAR SPATIAL SAFETY MANAGEMENT

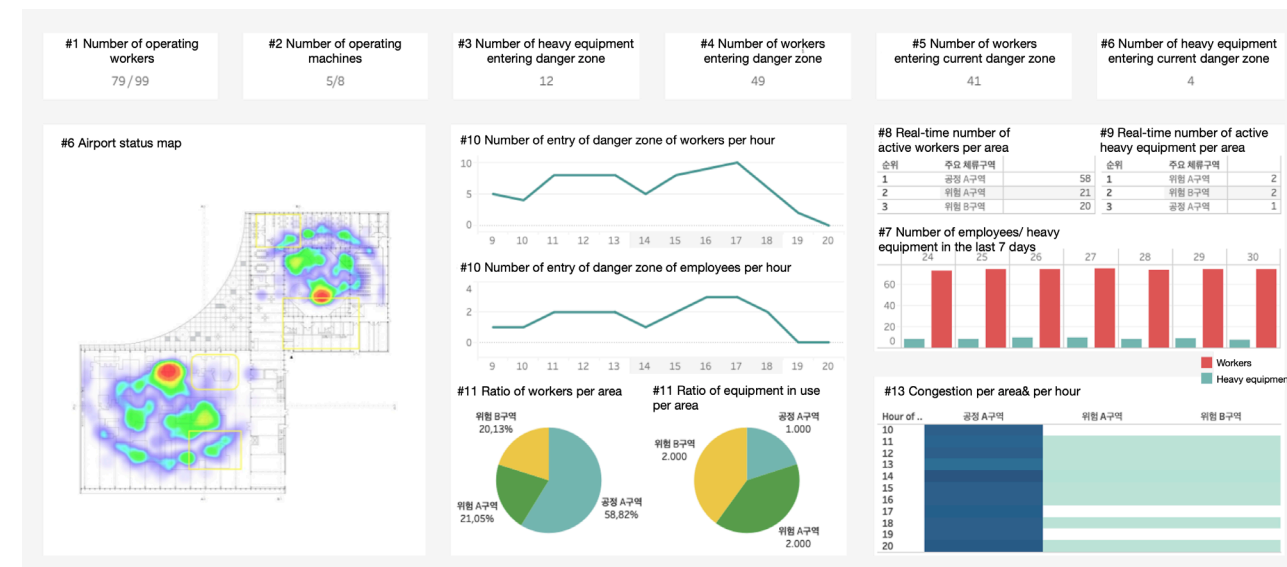
Solution use examples



Service Configuration Diagram



Data provision



Pricing

3D LiDAR

Category	Configuration	Fee	Duration (Months)
Platform Subscription Fee	AWS (Data+Infra) Costs 3D Lidar object detection solution 3D Lidar Safety Management Platform (Spatial Awareness Monitoring/Data Statistics)	Monthly subscription (Contact for inquiries)	36
			24

* 3D LiDAR & GPU analysis server & installation cost is not included

AI Cloud Spatial Awareness Platform

Efficient enterprise operations through accurate location identification of people and assets

Increased customer experience with hyper- proximity/ hyper-personalized service through non-contact services and location information.

Informed decision making and future forecasting of the enterprise through data statistics and analysis.

AI CLOUD SPATIAL AWARENESS PLATFORM

Service information

Service introduction

- Interlocking with various IoT sensors such as smartphone sensors and BLE/UWB
- Accurate location and spatial awareness through AI algorithm
- Provides accurate location control monitoring and data statistics

Applicable industry

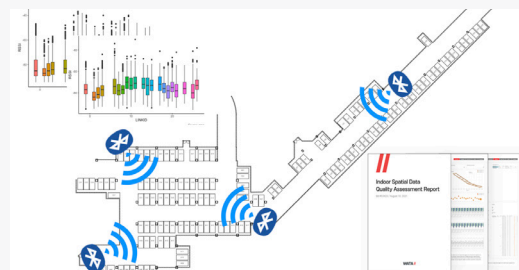
- Companies/institutions operating large indoor buildings and multi-store branches
- Shopping/Office/Building/Hospital/Hotel/Airport/Art & Sports Industry

Core Technologies



1. Collection of spatial data and map creation based on smartphone sensors

- Collect hybrid spatial data such as Wi-Fi, BLE, atmospheric pressure, magnetic field, and LET/5G base station pattern using a smartphone sensor
- Automatic path generation and editing using unmapped PDR.
- Collecting width/height/POI information of path using the AR mode on the camera and generating real-time 3D map on the phone



2. Calibration of data quality and creation of database (quality evaluation report)

- Spatial data quality evaluation through location infrastructure scanning
- Additional infrastructure installation and positioning simulation based on evaluation results
- Construction of DB after accuracy improvement

* Provision of quality assessment report



3. AI Positioning Algorithm

- Accurate location and spatial recognition through the combination of complex data with the highest probability, selecting only excellent spatial data from all the hybrid spatial data collected using a smartphone

Suggested Customer

✓ Suggested Customer 1

Companies seeking to provide non-face-to-face/non-contact services.

✓ Suggested Customer 3

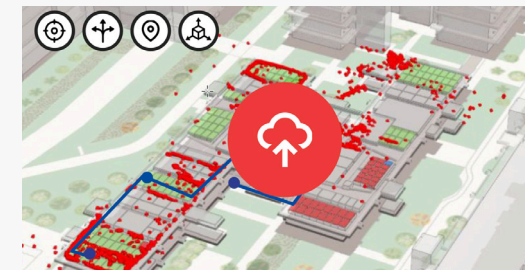
Companies with the need to improve satisfaction and generate corporate profits by maximizing customer experience.

✓ Suggested Customer 2

Organizations with the aim to improve operational efficiency by the identification of people and assets

✓ Suggested Customer 4

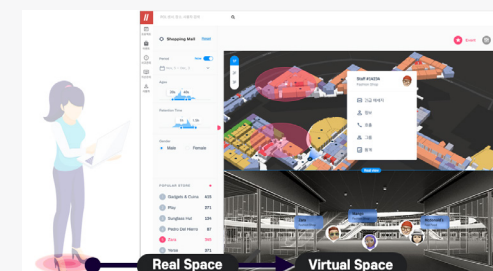
Customers seeking for monitoring control and data platforms at a reasonable cost.



4. Automatic update on DB space

- Maintaining the latest DB by automatically updating data when a change in location information between the DB and the scan data is detected through user cloud sourcing

* Rotation angle according to wireless infrastructure scan data/magnetic field change/air pressure change/step and motion estimation/direction change



5. Real& Virtual Monitoring

- 3D digital twin control monitoring combining physical space and virtual space information



6. Data Statistics

- Classification and analysis of user movement and usage pattern data through cloud space data platform to derive customer insights.

Platform features/ functions



Real-time location control

Real-time location control & monitoring of people and assets



Navigation/Path Identification

Identify movement paths of individuals, crowds or assets.



Geo-fencing Promotion

Promotion, coupon, message, and other information when approaching geofencing area



Incident Management

Identification and management of location of accident in the event of a disaster, fire, or human accident;



Real-time Messaging

Send normal or urgent messages when monitoring business orders & critical alerts



Asset Registration & Management

Fixed/portable assets, etc. Register and track assets.



Battery & Sensor Status Management

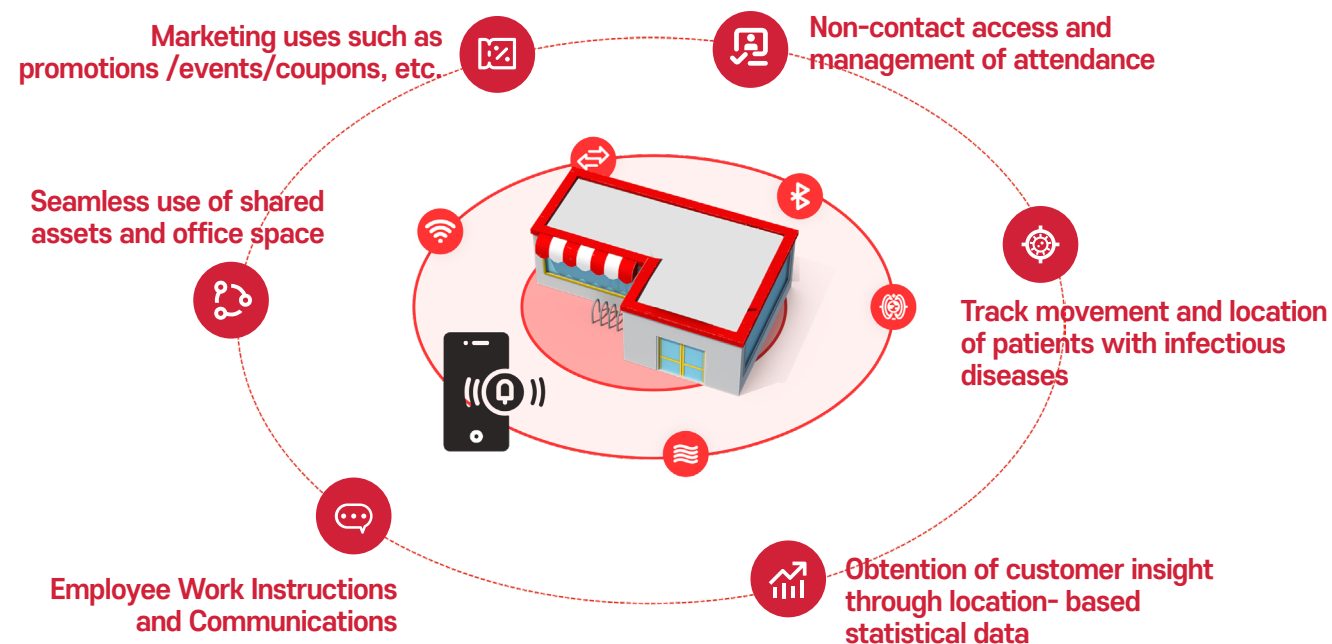
Position infrastructure and sensors in the environment. Battery and sensor state management (Easy to Maintain)



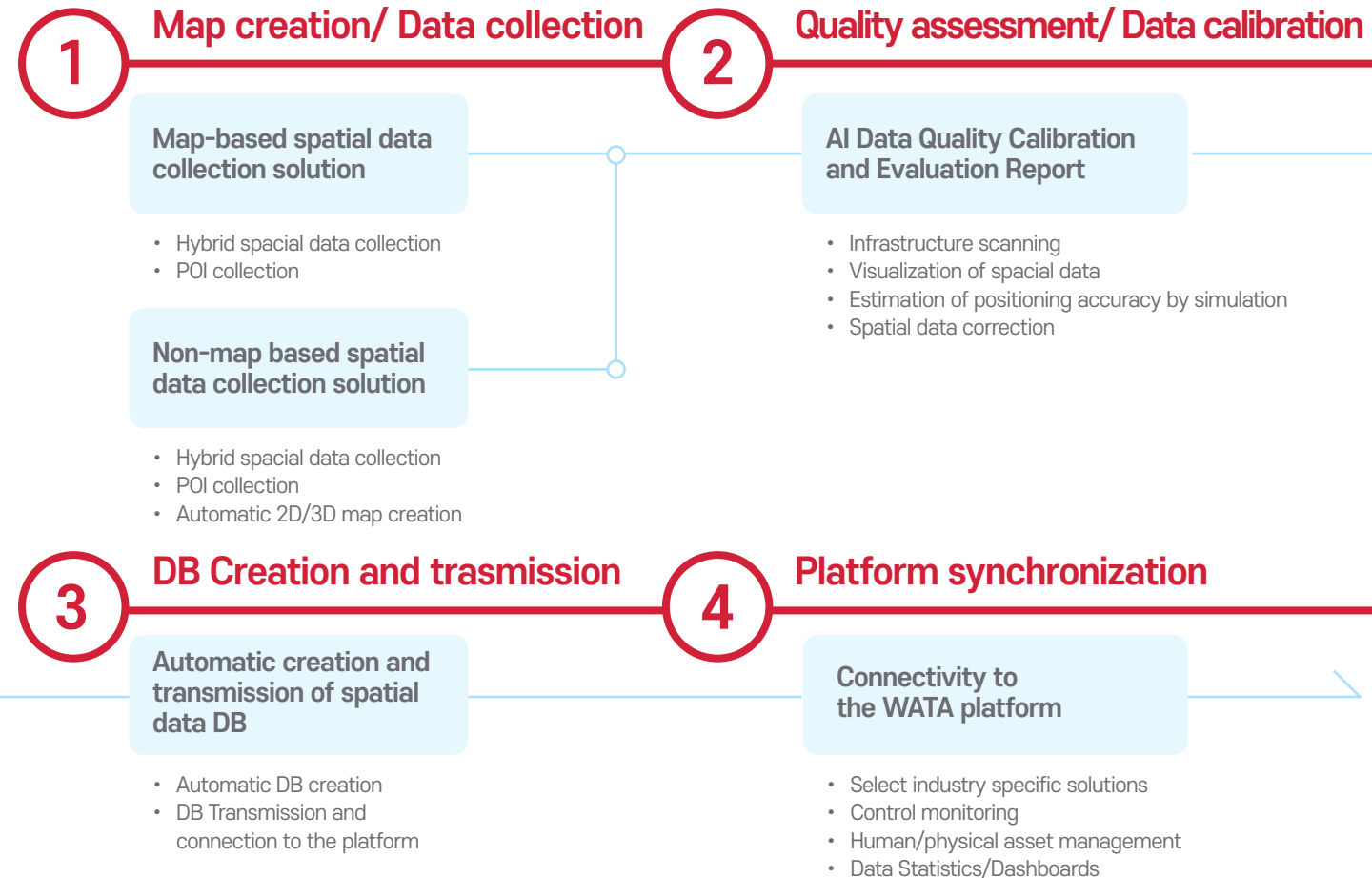
Data Dashboard

Statistics/analysis of data based on visitor location, such as number of visitors, time of stay, movement path, and density

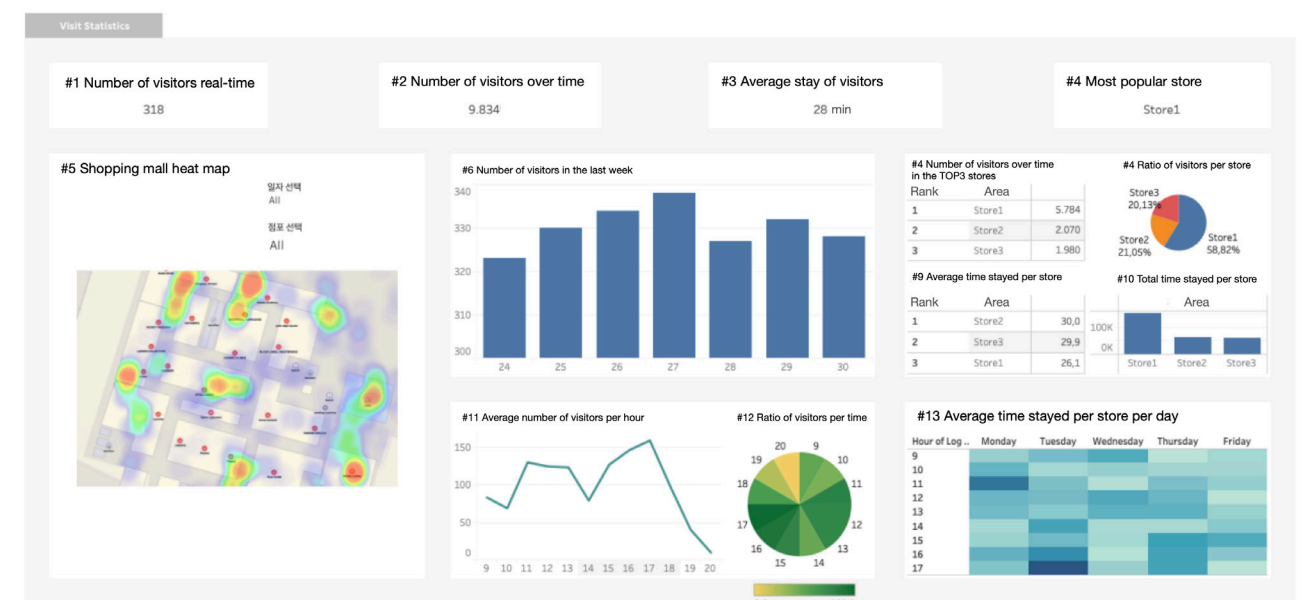
Solution use cases



Service Configuration Diagram



Data provision



AI CLOUD SPATIAL AWARENESS PLATFORM

Pricing

Smartphone/ IoT sensor (BLE, UWB etc.)

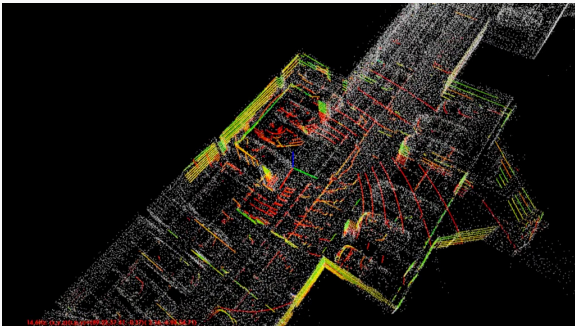
Category	Configuration	Fee	Duration (Months)
Platform Subscription Fee	Initial setup fee: Cartography, spatial data collection, data correction, DB creation = (Charges * per 3.3m ²)	Monthly subscription (Contact for inquiries)	36
			24
			12

DIGITAL INDOOR MAP GENERATING

Service information

- Create 2D/3D indoor maps quickly and easily in any environment.
- Collect and convert data from the service area into digital maps using the 3D LiDAR
- Simpler process than the existing map construction process.

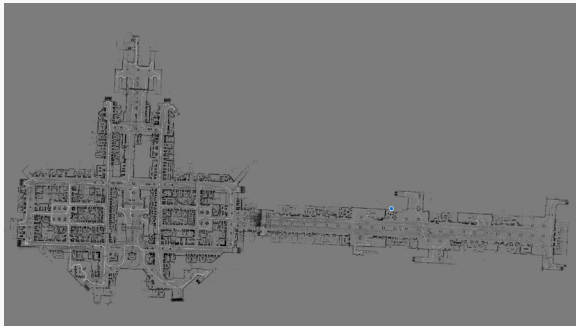
1. 3D LiDAR Scanning



3D LiDAR Scanning

- Service area 3D lidar scanning
- Point cloud data collection

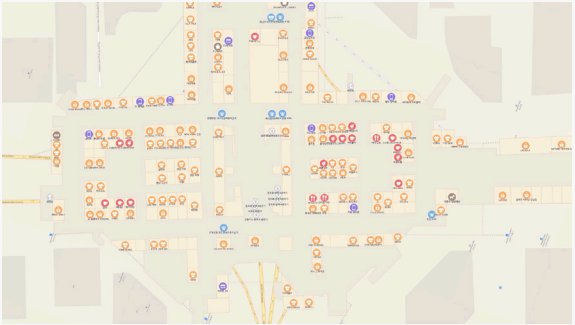
2. Rasterized Pointcloud Image



Point cloud processing

- Separation of fixed spatial data and moving object
- Convert image files

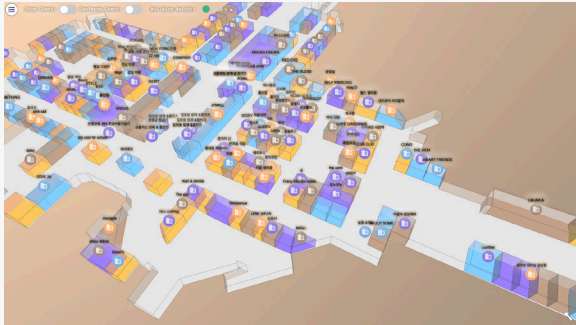
3. 2D Indoor Map Creation



2D Map creation

- Creation of drawing after 2D vectorization
- Creation of 2D maps through matching (post-processing) process

4. 3D Virtual Indoor Map Creation



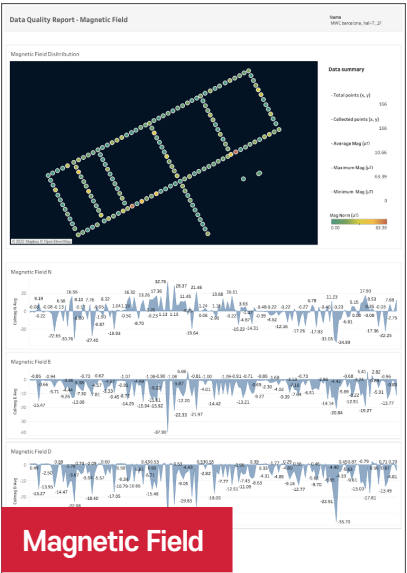
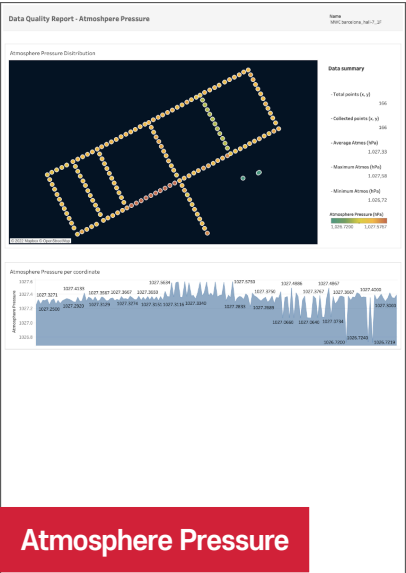
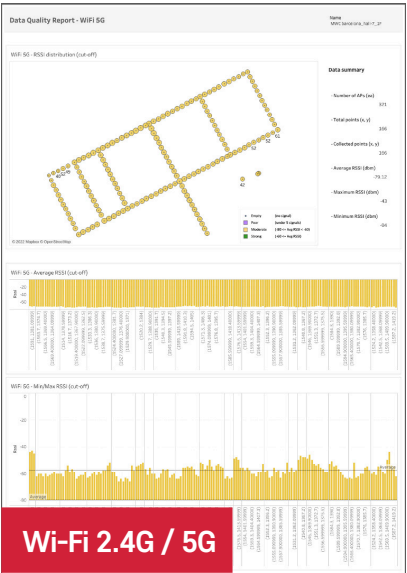
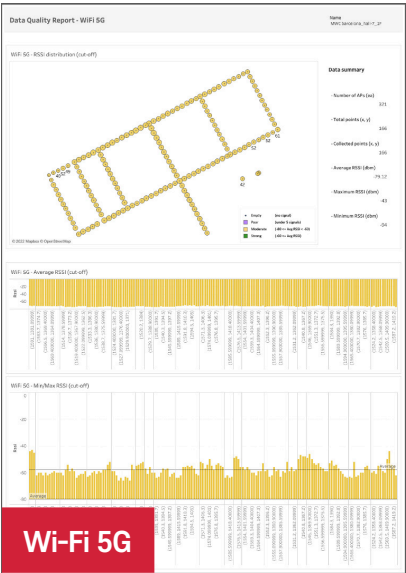
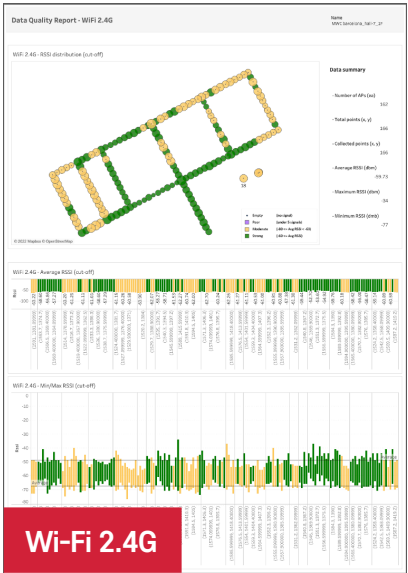
3D Map creation

- Assigning Height Values to Generated 2D Vector Maps
- Automatic 3D map generation

SPATIAL DATA QUALITY ASSESSMENT

Service information

- Collect location data that exists within the coverage area and evaluate the quality of infrastructure environment.
- Visualize the collected data and provide data correction proposal report that evaluates expected accuracy through simulation.
- Improvement of success rate, response rate, and accuracy of location information services through data correction.





AI Cloud Spatial Maanagement Platform

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