



## Service Information

May 1, 2018

### **NTT DATA Begins Distribution of High-Precision Indoor Location Information Service based on Hybrid Geomagnetic Technology**

**~The highly precise determination of location even in indoor areas beyond the reach of GPS, and the ability to conduct facility navigation, grasp and analyze traffic lines, and more~**

NTT DATA Corporation

**NTT DATA Corporation (hereinafter, "NTT DATA") will begin distribution of a high-precision indoor location information service based on hybrid geomagnetic technology <sup>(Note 1)</sup> on June, 2018.**

**By making use not only of signals from the various signal-emitting devices (Wi-Fi, Bluetooth low energy beacons, etc.) installed in facilities, but also of geomagnetic fingerprints (which vary in accordance with a building's shape) combined with the user's dynamics (detected by a state of the art pedestrian dead reckoning), this service will accurately calculate location, even in indoor areas beyond the reach of GPS.**

**Simply by using a smartphone application, users will be able to grasp high-precision location information. Companies will be able to utilize this service for a wide variety of purposes, such as navigation in large commercial facilities, the grasping and analysis of traffic lines, the visualization of congestion, and evacuation and rescue operations in indoor disasters.**

**With regard to the indoor positioning functionality, NTT DATA will realize high-precision location positioning functionality through the utilization of a hybrid indoor positioning technology that combines radiofrequency, user's dynamics and geomagnetism to deliver a high accuracy service with a very low cost on infrastructure. This technology comes from GiPStech <sup>(Note 2)</sup>, which is in a partnership with NTT DATA Italy.**

**NTT DATA will distribute this service to companies with indoor facilities that are predicted to experience increased demand for the utilization of location information. Utilization examples include detailed user guidance within facilities, employee management, and more. In addition, in the future, NTT DATA will aim to expand the number of users through efforts such as linking this service with services in lateral areas.**

#### [Background]

In recent times, the precision when using GPS to grasp outdoor locations has improved to a margin of error in the tens of centimeters. Meanwhile, in indoor spaces beyond the reach of GPS signals, the introduction of an indoor positioning mechanism and the construction of an application to use this are necessary in order to accurately grasp locations and utilize this information.

To this point, NTT DATA has introduced and conducted verification tests on map solutions in large-scale indoor facilities centered in the Tokyo area. In the process, it has cultivated knowledge in such areas as the creation and development of high-precision maps and the development of indoor positioning environments. On this occasion, NTT DATA has decided to develop a high-precision indoor location information service and begin distribution on June so that the maximum number of companies with indoor facilities can utilize indoor location information.

#### [Service Outline and Characteristics]

This is a cloud service that includes, as a set, indoor positioning functionality (the basic functionality for realizing location information services in indoor spaces) and a mechanism to send maps to smartphones and other devices. By using this service, it will become possible for companies to efficiently provide various applications in a short period of time.

Examples of such applications range from improved guidance services for facility visitors to the streamlining of tasks through the grasping of employee traffic lines and so forth.

#### ■ The Realization of High-Precision Location Positioning Indoors

As a mechanism for grasping indoor location information, this service will make it possible to grasp locations with high precision by making use not only of signals from the various signal-emitting devices (Wi-Fi, Bluetooth low energy beacons, etc.) installed in facilities, but also of indoor positioning technology that uses geomagnetism combined with a state of the art pedestrian dead reckoning engine.

This will make utilization for a wide variety of purposes possible, including navigation in large commercial facilities,

the grasping and analysis of traffic lines, the visualization of congestion, and evacuation and rescue operations in indoor disasters.

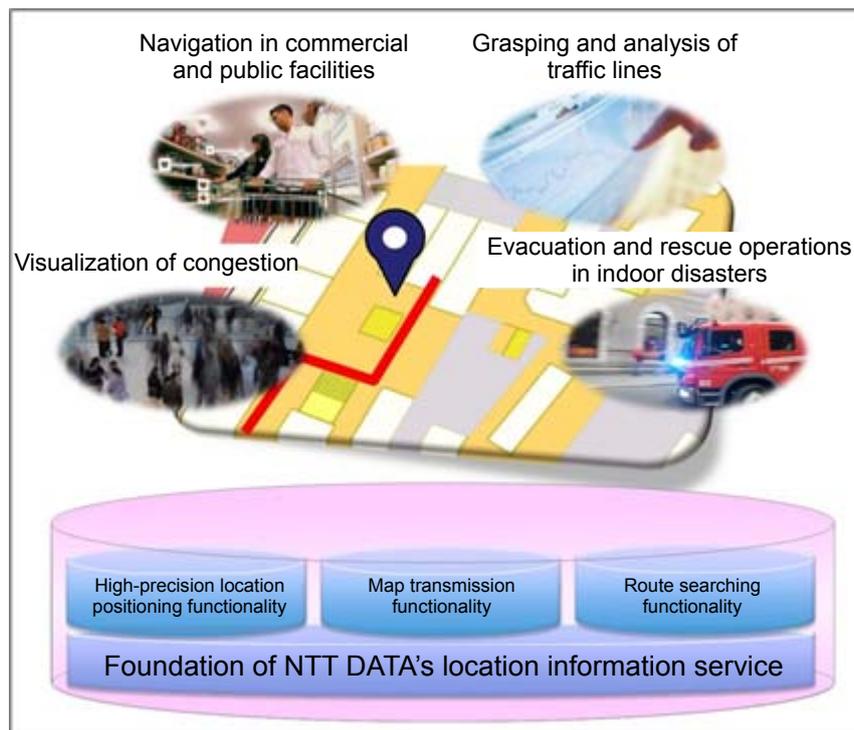


Diagram 1: Outline of Location Information Service Foundation

With regard to the realization of indoor geomagnetic positioning, this service employs a technique in which it accurately calculates location by creating a magnetic map using signals and magnetic data from an on-site survey (collected in a walk-through survey), and then matches that magnetic map with information acquired by users' smartphones combined with radiofrequency signals (coming from WIFI networks or Bluetooth beacons) and the user's dynamics estimated by a pedestrian dead reckoning engine. Through this, users will be able to grasp high-precision location information simply by using a smartphone application.

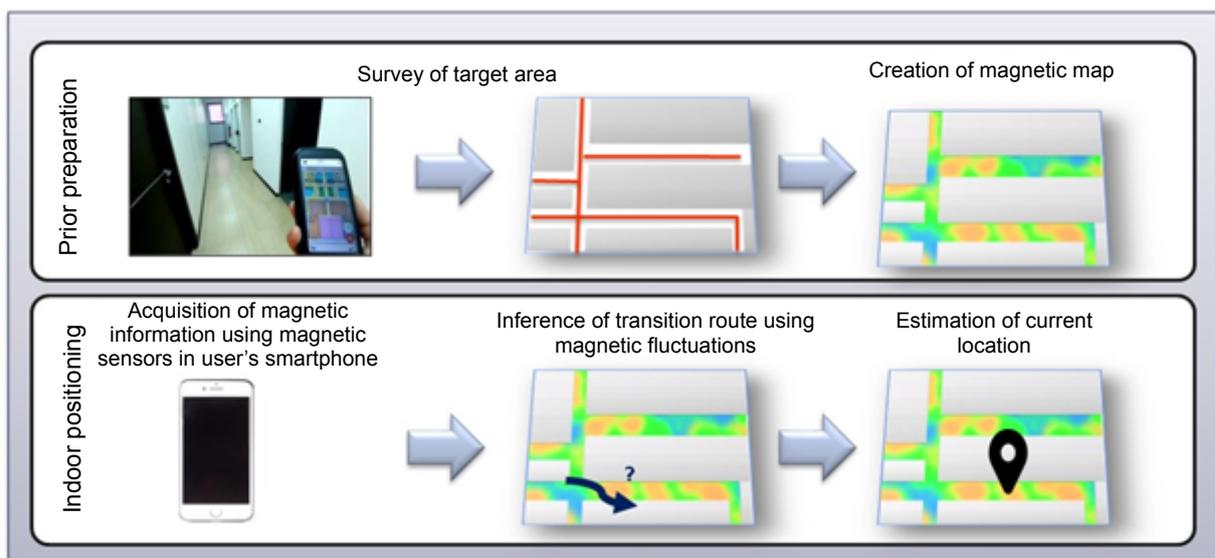


Diagram 2: Indoor Positioning Mechanism Using Geomagnetism

[Toward the Future]

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(Note 1) Geomagnetism refers to the magnetic fields generated on the earth. This technology creates and uses maps that utilize, as magnetic fingerprints, distortions in magnetic fields that actually vary due to elements such as the surrounding structures.

(Note 2) About GiPStech:an Italian startup spin-off of the Università della Calabria, has developed a proprietary technology for indoor localization, navigation and tracking. Based on sensor fusion and covered by numerous patent filings, the technology integrates geomagnetic fingerprinting, inertial analysis and radio-frequency mapping, all in all providing a very precise yet inexpensive and resilient localization platform. GiPStech technology was independently tested by third party and at GeoIOT 2017 received an evaluation of having the highest performing “infrastructure-free” localization technology. Their solutions entered the market during past years and have been adopted by an increasing number of customers in Italy and Worldwide. (URL: [www.gipstech.com](http://www.gipstech.com) [external link])

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