August 8, 2017

Tokyo International Air Terminal Corporation

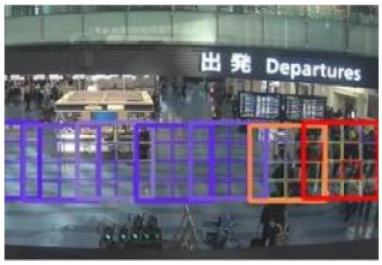
Japan Airport Terminal Co., Ltd.

Nippon Telegraph and Telephone Corporation

Panasonic Corporation

Public Testing of Information Universal Design begins at Haneda Airport

- World-leading Hospitality Enters Trial Phase at ‘Gateway to Japan’ -




Tokyo International Air Terminal Corporation (TIAT; Head Office: Ota-ku, Tokyo; President & CEO: Katsuji Doi), Japan Airport Terminal Co., Ltd. (JAT; Head Office: Ota-ku, Tokyo; President & COO: Nobuaki Yokota), Nippon Telegraph and Telephone Corporation (NTT; Head Office: Chiyoda-ku, Tokyo; President & CEO: Hiroo Unoura) and Panasonic Corporation (Panasonic; Head Office: Kadoma, Osaka; President: Kazuhiro Tsuga) will begin public testing of information universal design initiatives.

With the international terminal at its core, Haneda Airport has implemented universal design concepts to promote the development of airports that cater to all individuals. Looking ahead to 2020 and beyond, we can expect further increase in not only foreign visitors but also the number of customers requiring mobility support as the population continues to age. As such, we believe integrating the latest information technology (ICT) is essential to advancing universal design, and have been striving to do so through various initiatives since December 2015. With such efforts showing steady results, we have now established an environment for real-world application through public testing by Haneda Airport customers.

- Current Needs of Haneda Airport Terminals -

As the gateway to Japan, Haneda Airport receives many customers, with the number expected to rise as foreign visitors continue to increase. Initially, public testing will give these customers a chance to experience Japan’s cutting-edge technology; we hope to utilize their diverse comments and feedback to create valuable tools for greater use both in and outside the airport.

As part of progressive efforts in universal design, Haneda Airport is striving to ensure user-friendliness for all of its increasingly diverse customers. We consider the integration of universal design and various information technologies an urgent task, and these public trials provide an important opportunity to ascertain the effectiveness of each technology.

Having so far conducted tests involving only airport staff, we hope that real-world use by numerous customers will serve as the final phase in creating reliable technologies.

■ Public Testing of Improvements in Information Universal Design - Outline

Test period: Tuesday August 8, 2017 - Saturday March 31, 2018

Test location: Haneda Airport International and Domestic Terminals

Test content: <NTT> ・Kazashite Guidance™ functions on TIAT official website (Multilingual/multicultural support for restaurant menus, facility navigation from information signs)

・ Measurement/forecasting of congestion at international departure screening gates and mobile signs to manage passenger flows

・ Implementation of audio signage equipment with noise-reducing technology

<Panasonic> ・Autonomous mobility via Robotic Electric Wheelchair WHILL NEXT

・Transport information for foreign visitors, utilizing LinkRay™ technology

■ NTT Testing Overview

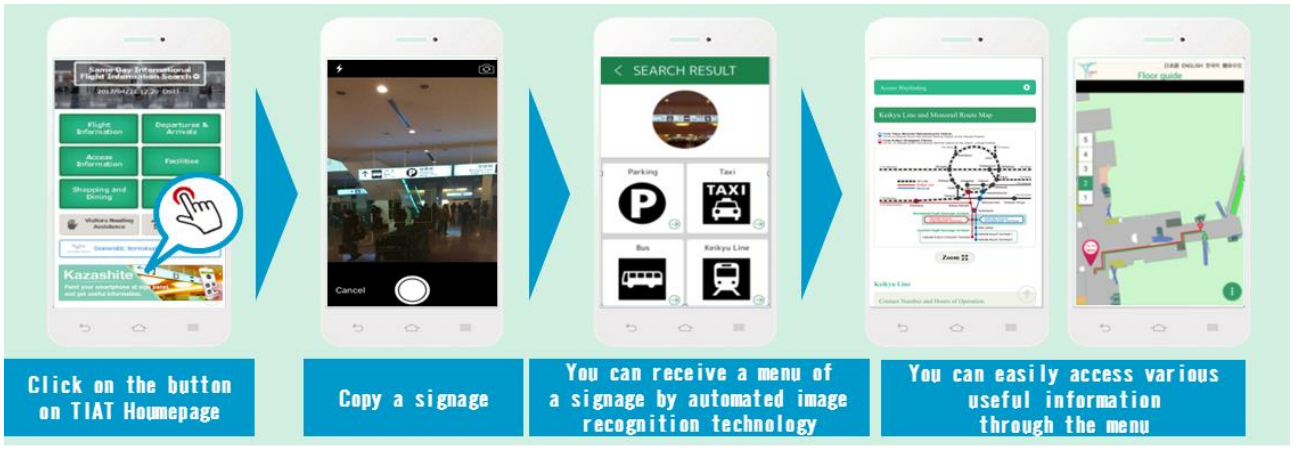
Employing corevo®[*1] AI technology, NTT will conduct trials to improve information universal design using ICT.

(1) Eliminate language/cultural barriers with Kazashite Guidance™

Valuable information can be obtained in one's native language by simply pointing a smartphone camera at signage and other objects. This not only allows multilingual browsing of transport and other information, but also includes multidimensional maps[*2] to promptly identify the user's current location within the terminal; route guidance with consideration for universal design; and introductions to unfamiliar aspects such as Japanese food.

By using the Kazashite Guidance™ function via the official TIAT website, we have now simplified the process for passengers by not requiring the installation of apps. Available content in the initial phase includes guidance and information signage, as well as menus at select restaurants; we plan to expand the service to include all restaurant menus and tourism posters by the end of FY2017.

Based on usage rates and passenger feedback in the public trials, we will make the interface and content more user-friendly ahead of launching the service.



○ Technology Features

・ Angle-free Object Search Technology:

Regardless of the photographed angle, this technology uses high-accuracy object recognition/searching to display relevant information. While traditionally the process required an existing database of around 100 images, this technology reduces the requirement to 10 or less.

・Universal Object Recognition Technology:

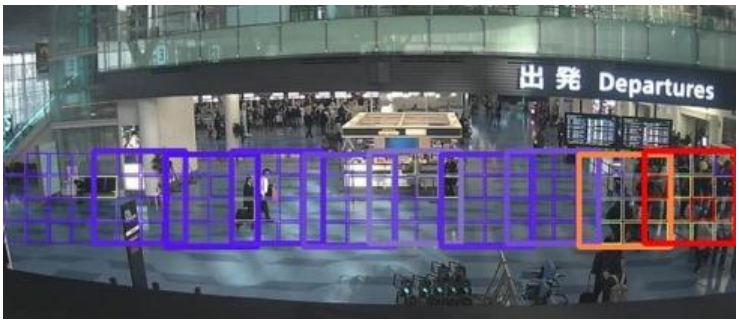
Technology that integrates various methods of recognition. Combining multiple methods enables the recognition of diverse items without requiring conscious selection by the user. Shared API also enables use from various client apps (including browsers).

2) Reducing Airport Congestion with Sophisticated Management of Passenger Flows

Employing image recognition technology for automated measurement of passenger flows from camera footage, this system will also use projectors and digital signage to automatically change display content according to real and forecast congestion. This enables information to be designed for easy communication to many people, including adjustment of display language based on conditions in specific areas and varying display location according to the extent of external light.

These public trials will be used to evaluate the accuracy of congestion measuring/forecasting at international departure screening gates and to confirm the effects of leveling congestion, with the aim of preparing the service for launch.

Guidance sign (near TIAT 3F international departure screening gate)



Camera crowd analysis (TIAT 3F Departure lobby)

○ Technology Features

・Camera Crowd Analysis Technology:

Measures line length through a screening algorithm based on texture complexity and the characteristic movements of queues. Features include the ability to compensate for shadows caused by external light, highly-accurate measurements even in the case of numerous passengers mingling together, and no requirement for individual identification such as facial recognition.

・Passenger Flow Forecasting Technology:

Forecasts passenger flows by modeling trends in queue length at departure screening gates and accounting for factors which contribute to congestion, such as flight schedules.

(3) Clearer Voice Guidance with Intelligent Audio Signage

Achieves clear voice guidance without increasing volume, even in noisy surroundings. Testing will be used to confirm the effectiveness of offering noise-reducing audio for those with impaired vision, using the airport's existing voice guidance equipment and pre-recorded ambient sounds.

○ Technology Features

・Noise-reducing Technology:

Changes tone according to the characteristics of background noise while retaining spoken content, enabling voice guidance to be heard clearly even in noisy environments.

(*1) Corevo® is the registered trademark of Nippon Telegraph and Telephone Corporation.
http://www.ntt.co.jp/corevo/

(*2) We have created new base indoor maps for each floor of the terminals by utilizing results from the Ministry of Land, Infrastructure, Transport and Tourism's Indoor high-precise positioning project.In addition to multidimensional display of the terminal interior (NTT's 2.5D Map Representation Technology), these can also be used as base maps for indoor positioning, barrier-free navigation, and mobility robot control.
Indoor high-precise positioning project:
http://www.mlit.go.jp/common/001111217.pdf
2.5D Map Representation Technology: http://www.ntt.co.jp/news2016/1611/161125a.html

■ Panasonic Testing Overview

(1) Autonomous Mobility via Robotic Electric Wheelchair WHILL NEXT

Developed through a collaboration between Panasonic and WHILL Inc., the WHILL NEXT is a mobility robot that enables safe, comfortable transport for Passengers with Reduced Mobility (PRM), whose use of airports is expected to increase.

This year, we will conduct technical trials of the ① Automatic Stop, ②Autonomous Mobility and ③Tandem Movement functions within the airport. With the cooperation of airlines, we will also test ways to reduce the burden on staff and improve customer convenience.

*In the development of this technology, we have also received a grant from the New Energy and Industrial Technology Development Organization (NEDO).


○ Technology Features

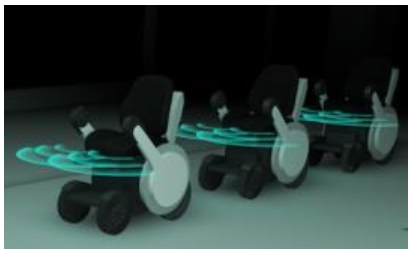
① Automatic Stop Function

Equipped with sensors to detect nearby obstacles, the wheelchair will stop automatically if it identifies a potential collision, such

② Autonomous Mobility Function

Using autonomous mobility technology developed for the autonomous delivery robot HOSPI®, the wheelchair can

③ Tandem Movement Function



Utilizing autonomous mobility technology, a family or group using multiple wheelchairs can move together in a column. After use,

as in the event of incorrect operation or a sudden lurch. This assists users who are unfamiliar with the controls.

identify its own position, select routes and automatically move to destinations input via smartphone. It can travel efficiently to specific shops or boarding gates.

the wheelchairs automatically return together, reducing the work load for airport staff.

(2) Transport information for foreign visitors, utilizing LinkRay™ technology

Public transport information at airports is a source of difficulty for two-thirds of foreign visitors*; focusing on this, a joint project with route-information provider Jorudan has led to the design of transport information signage linked to smartphones via LinkRay technology. The trial will test the effectiveness of one-stop, multilingual transport information that allows foreign travelers arriving at the airport to easily select their ideal mode of transport.

With the cooperation of Keikyu Corporation, LinkRay Spotlight will also be available at the Haneda Airport International Terminal Station, allowing users to search and obtain multilingual route information for their destination by simply pointing a smartphone at the network map above the ticket machines.

*Japan Tourism Agency “Results of Surveys Targeting Foreign Travelers”

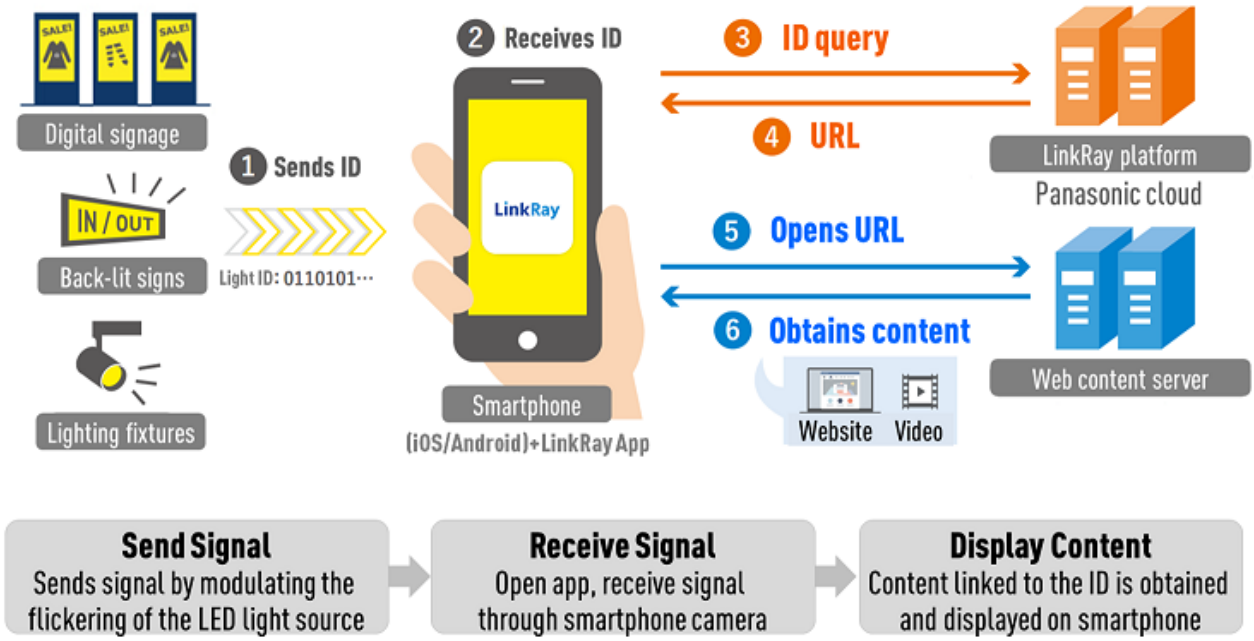
Transport Information Signage (TIAT 2F Arrival lobby)

LinkRay Spot at the Railway Network Map (Haneda Airport International Terminal Station)

○ Technology Features

・LinkRay™ :

By using visible light communication technology, LinkRay allows smartphones to read ID signals emitted by LED lighting and digital signage. By simply pointing their smartphone at such signs, users can instantly obtain relevant information in their own language.



Videos about Panasonic Testing

<Japanese>

Robotic Electric Wheelchair WHILL NEXT & LinkRay Signage - Hospitality Solutions at Haneda Airport

https://channel.panasonic.com/jp/contents/20902/

<English>

Robotic Electric Wheelchair WHILL NEXT & LinkRay Signage - Hospitality Solutions at Haneda Airport

https://channel.panasonic.com/contents/21150/

■ Future Development

The results of this public testing will be used to implement/adopt ICT in preparation for 2020 and beyond. We will also continue to seek corporate partners to participate in joint trials.

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