

Strategies for Wi-Fi Business



NTTBP

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NTT Broadband Platform, Inc.

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1. Wi-Fi Business Activities and Initiatives

2. Value Added Services for Monetization

Transition from "old telco" to "new telco"

3. Mutual Wi-Fi Business Partnerships for Inbound Travelers

Single Sign-on Authentication

Packages for travelers - Prior/During/After the trip -

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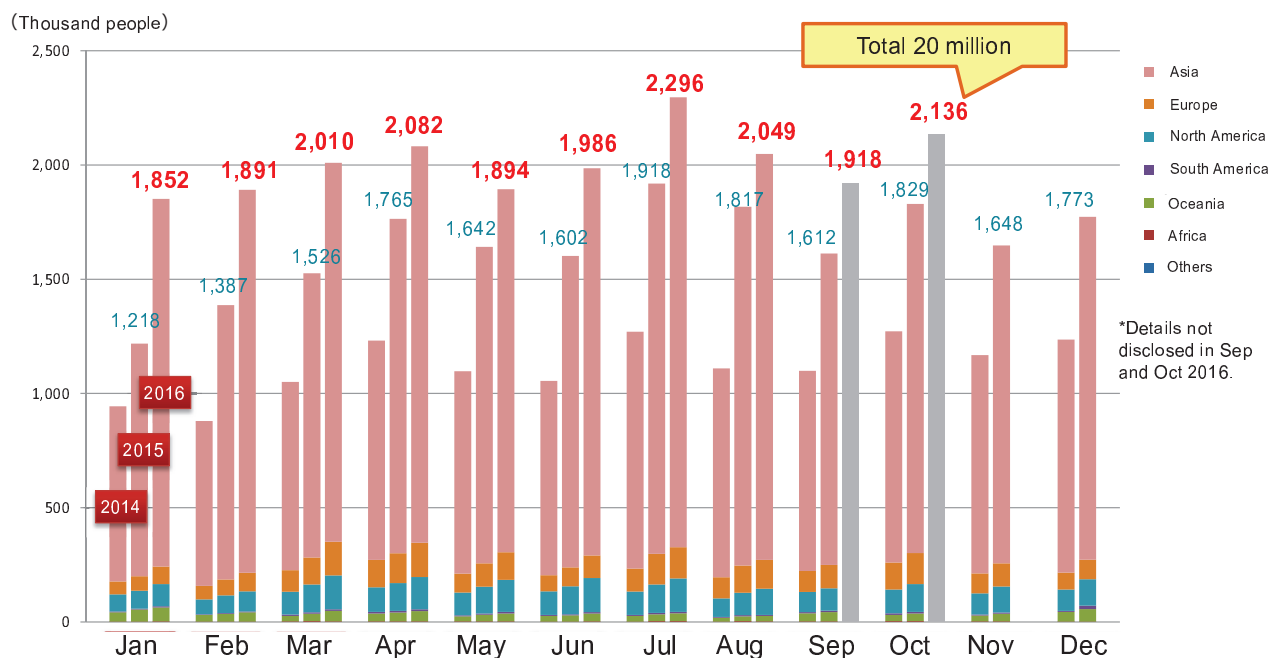
Single Sign-on Authentication

Packages for travelers - Prior/During/After the trip -

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Inbound visitors from overseas to Japan

Accumulating total over **20 million** in Oct 2016!



Source: Japan National Tourism Organization

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Wi-Fi environment evaluated by inbound tourists

Issue that tourists felt inconvenient the most:

Public Free Wi-Fi environment

Rank	Issues that tourists felt inconvenient during travel in Japan	Percentage
1	Public Free Wi-Fi environment	46.6%
2	Not able to communicate with staff in some venues	35.7%
3	Multi-language guidance (Tourist info board, etc.)	20.2%
4	Limited places where tourists can get multi-language maps and brochures	18.8%

N=7,939 50%

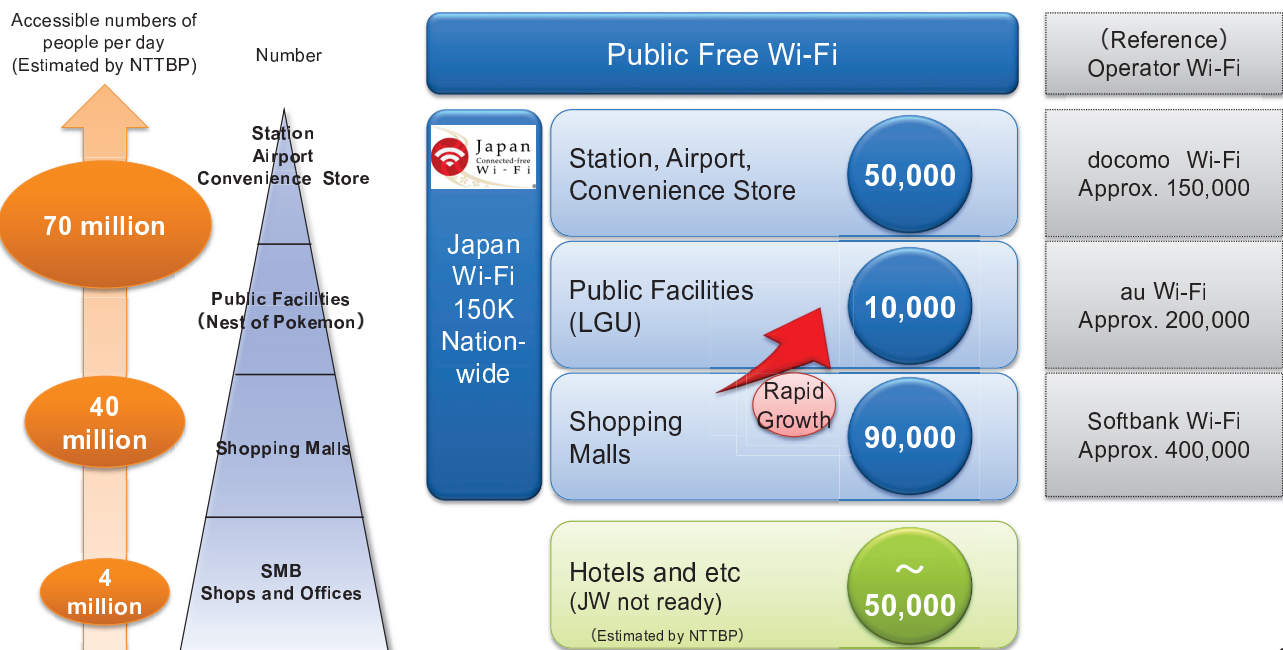
Source: NTTBP summarized based on the following source;
<http://www.mlit.go.jp/common/001115689.pdf>

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Wi-Fi in Japan Today -Number of Access Points-

-NTTBP: Subsidiary of NTT Group, focusing on Wi-Fi business (Established July 2002)

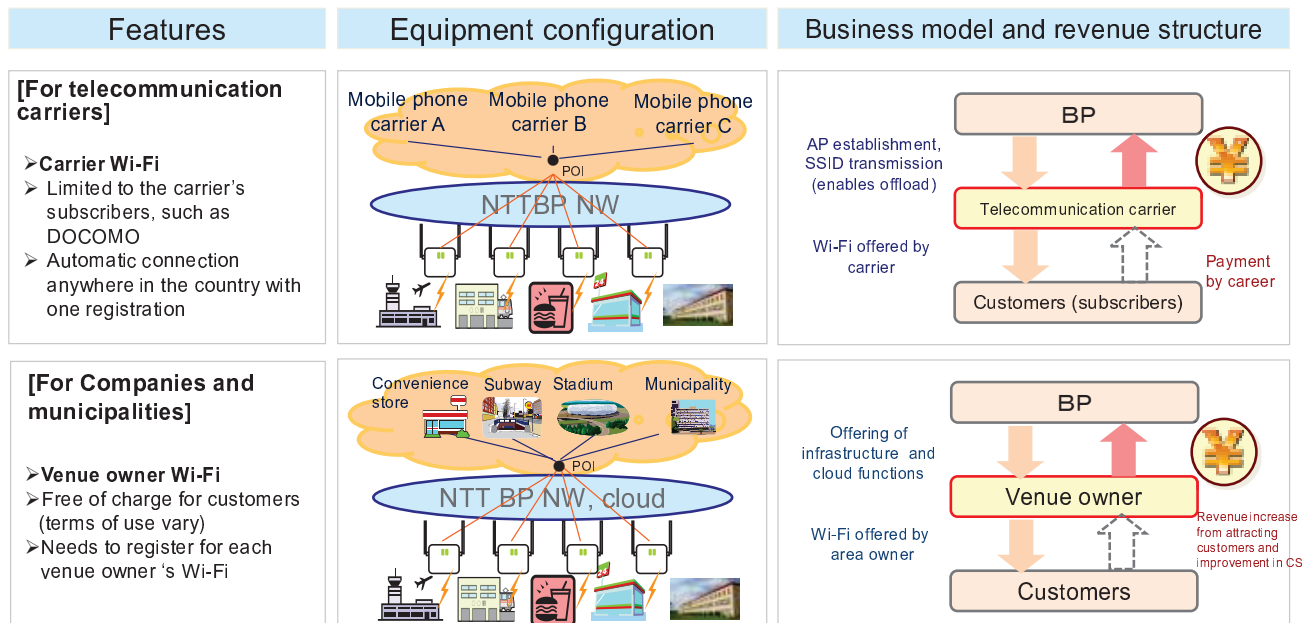
-Operating AP (Access Points) deployed mainly in **public and densely-populated area** where people come and go



6

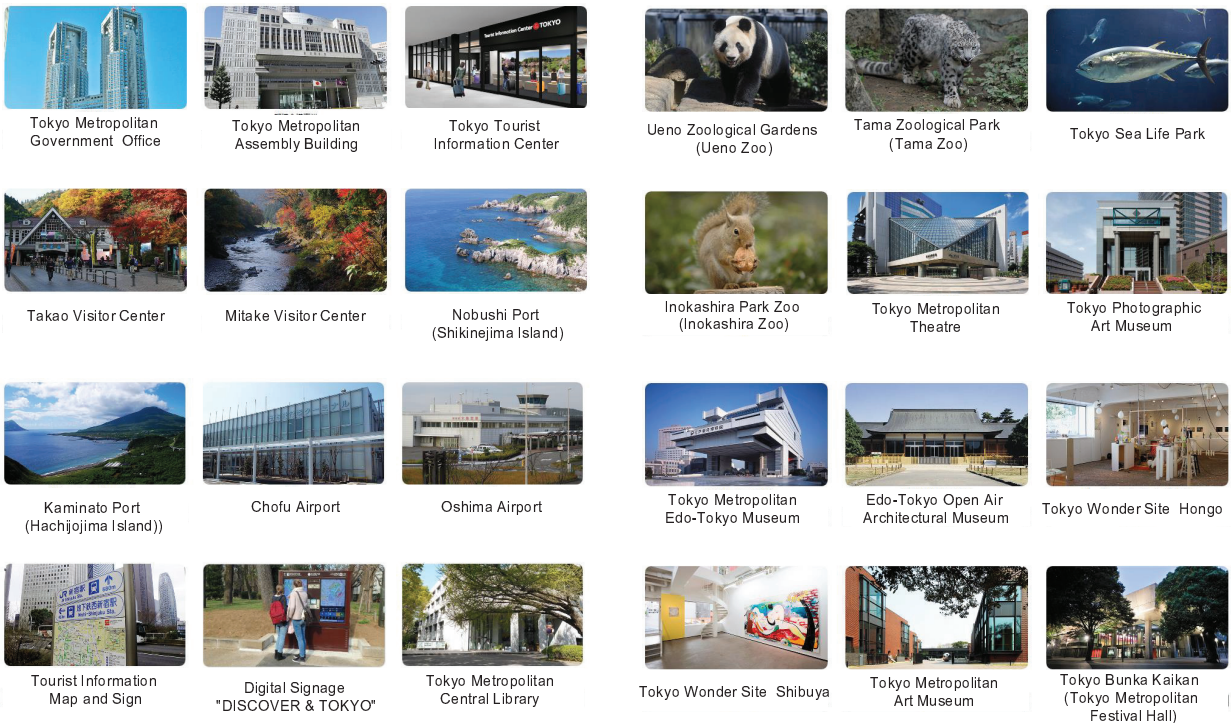
Business Model and Revenue Structure

- Telecommunication carriers: offer offload AP and NW (e.g. DOCOMO: established docomoWi-Fi)
- Companies, municipalities: provide service from the Internet connection to portal screen
⇒ NTT BP's business: based on revenues from telecommunication carriers and venue owners



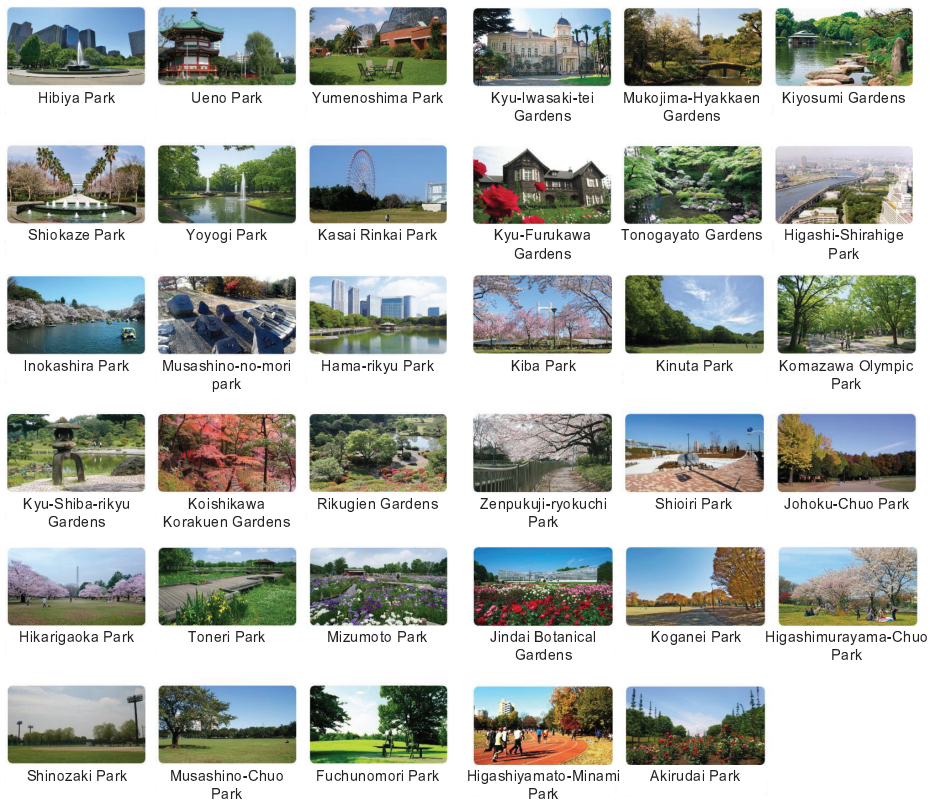
7

Wi-Fi Deployment Case in Tokyo Metropolitan Area Gallery / Museums / Halls / Zoos / Others



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Wi-Fi Deployment Case in Tokyo Metropolitan Area Parks /Gardens



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Wi-Fi Service in Transportations

Railways



TOBU Spacia



Toei Asakusa Line



NANKAI Rapit



Bullet train

✓ High Speed
✓ Sightseeing Spot
✓ Video, Magazines

Cruise Ships



Pacific Venus



KUMAMOTO Ferry



AKAN KANKOSEN



Queen AZAMI

Bus



TOEI Bus



JR Bus



FUKUSHIMA KOTSU



SANDEN KOTSU



NISHITESU Bus



JUMBO Tours



ITOCHAN Bus

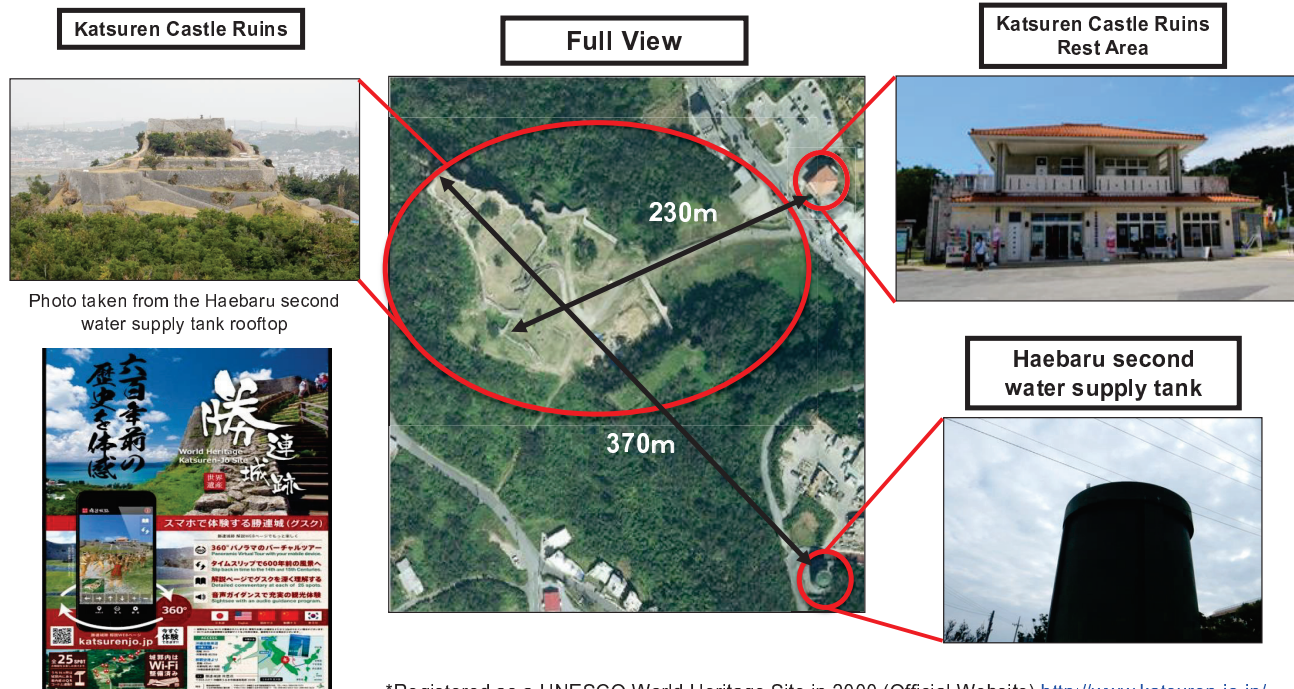


ENOSHIMA DENTETSU

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Wi-Fi Deployment Case in World Heritage

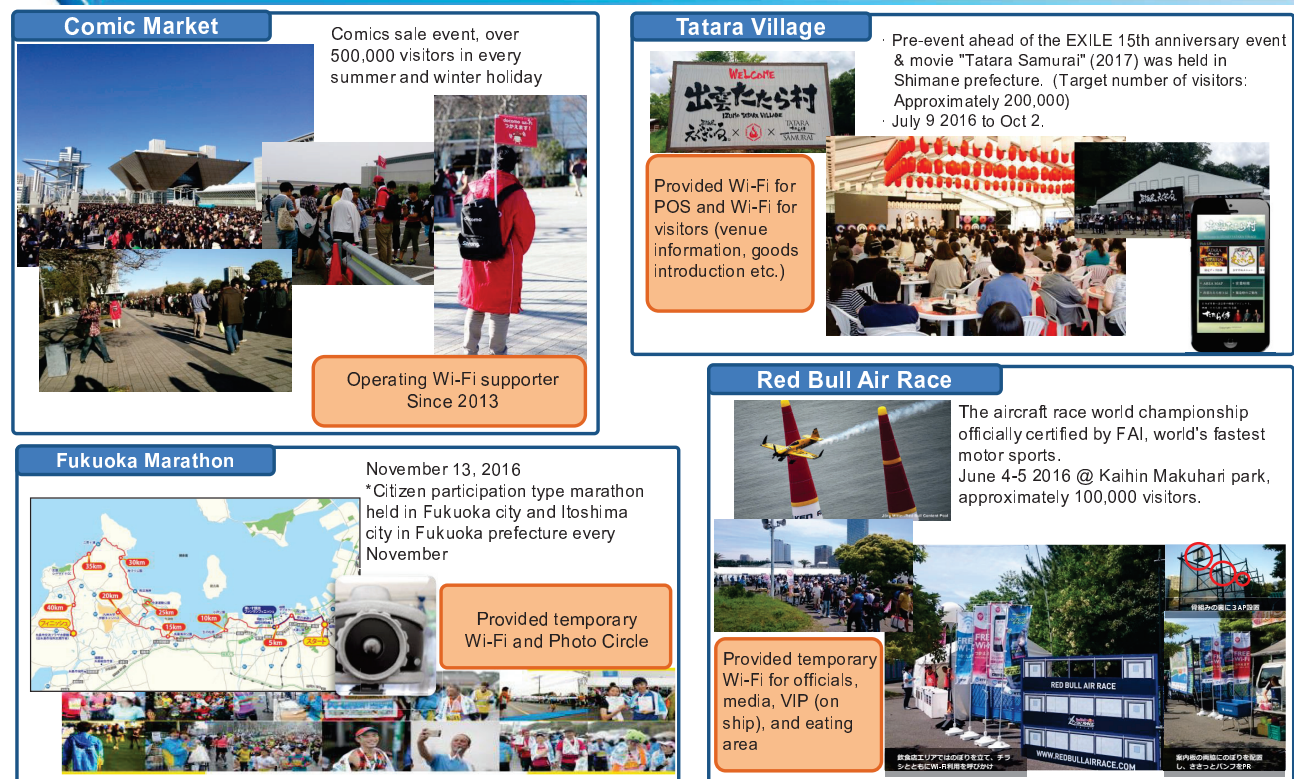
Provide Wi-Fi service even in world heritage where power supply facilities not equipped!



*Registered as a UNESCO World Heritage Site in 2000 (Official Website) <http://www.katsuren-jo.jp/>

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Wi-Fi Utilization Case in Events



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Portable Wi-Fi

For tourist spots, events and even in case of disasters...

Easy and convenient "Carry Bag Wi-Fi"



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Samples of Portable Wi-Fi Service



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Interior and Exterior Appearance of the Seibu Dome

- Domed baseball stadium in Tokorozawa, Saitama Prefecture, Japan
- Home of the professional baseball team, the Saitama Seibu Lions
- Seibu Railways owns the stadium, but it's operated by the Seibu Lions Inc.



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NACK5 Stadium

- Dedicated stadium for soccer, located in Omiya Park at Saitama prefecture.
- Japan's first football stadium, the oldest existing stadium in the country.
- Home stadium of J-League Omiya Ardija.



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Sapporo Dome

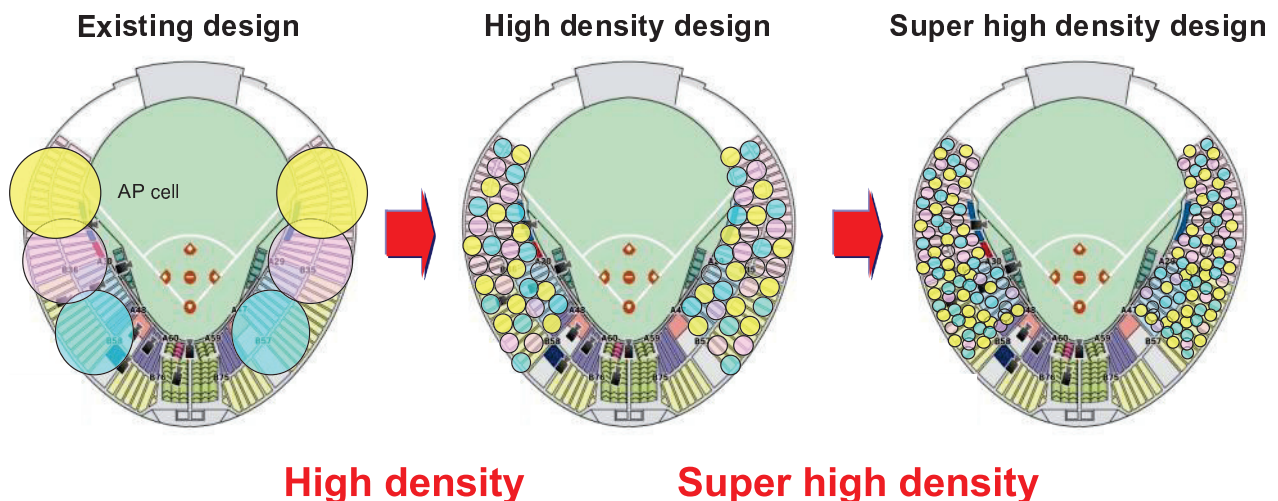
- Dome stadium in Sapporo city, Hokkaido. Able to use natural turf ground for soccer and artificial turf ground for baseball.
- Home stadium of J-League Hokkaido Consadole Sapporo and Japan professional baseball Hokkaido Nipponham Fighters.



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High Density Wi-Fi for Stadium and Arenas

- We have deployed several **high density Wi-Fi for stadiums, convention centers**, etc.
- **Install each AP into small cells and increase the network capacity** to ensure growing data consuming demand of audience with smartphones and tablet and/or connected devices.



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Sports × ICT

Tokyo2020 Gold Partner

2015.1.26



J League – DAZN – NTT Group

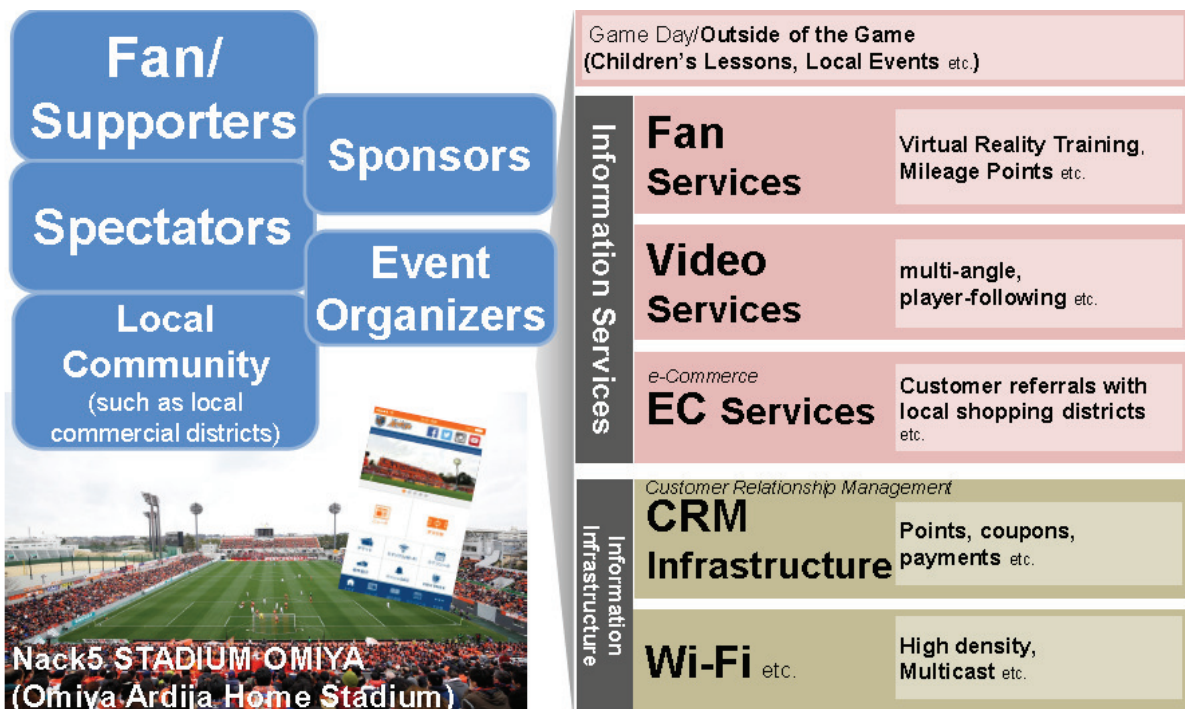
2016.7.20



Source: NTT IR DAY [September 29, 2016]

20

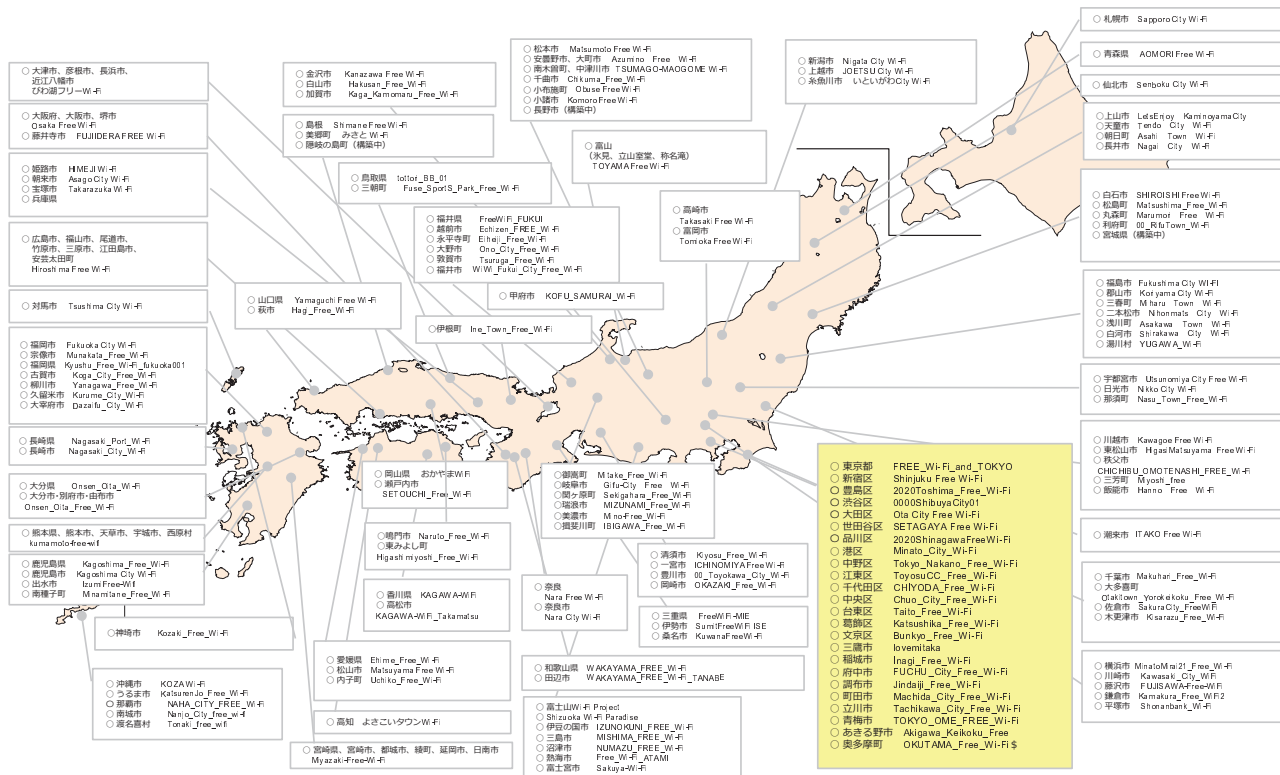
Smart Stadium powered by Digital Marketing



Source: NTT IR DAY [September 29, 2016]

21

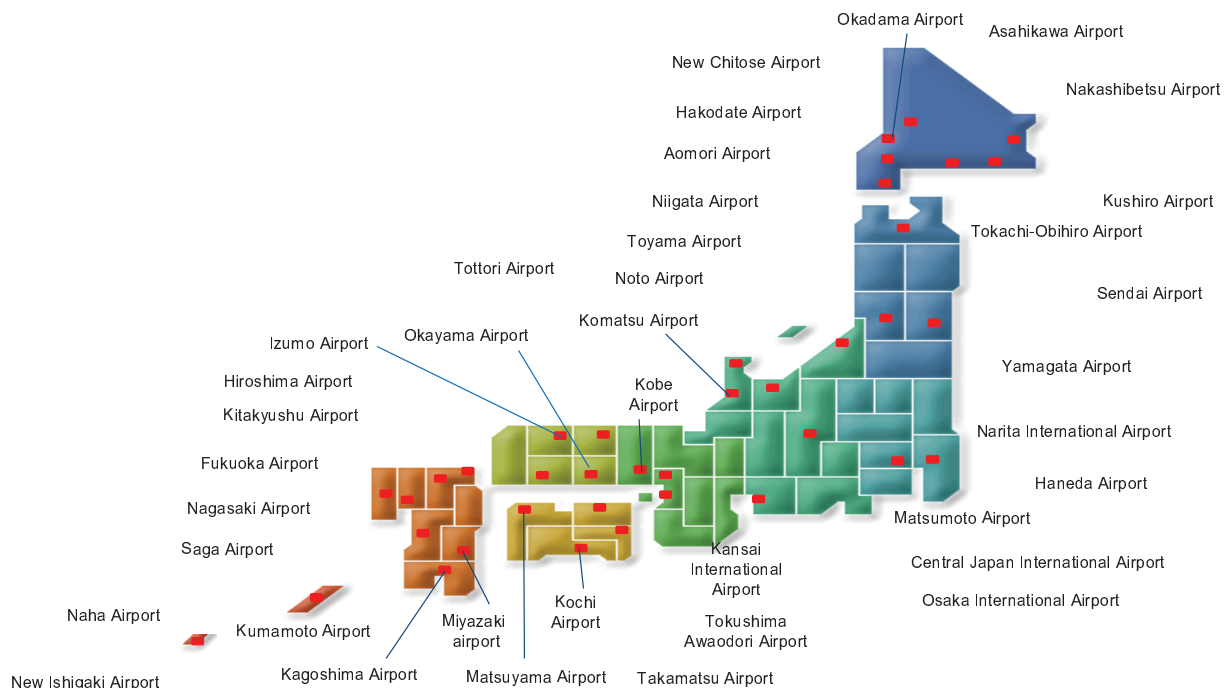
Wi-Fi Services at Local Governments



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Wi-Fi Services at the Airports

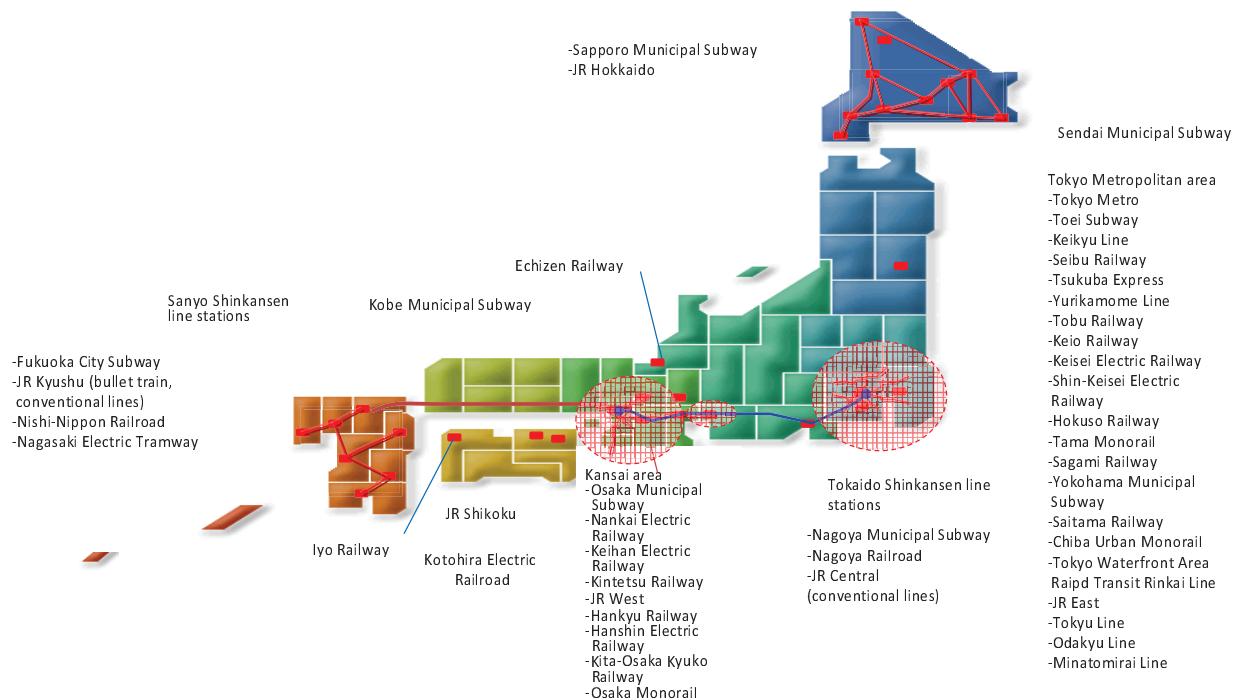
– We have deployed **866 APs at 38 airports** all over the country.



23

Wi-Fi Services on the Railway/Subway Stations

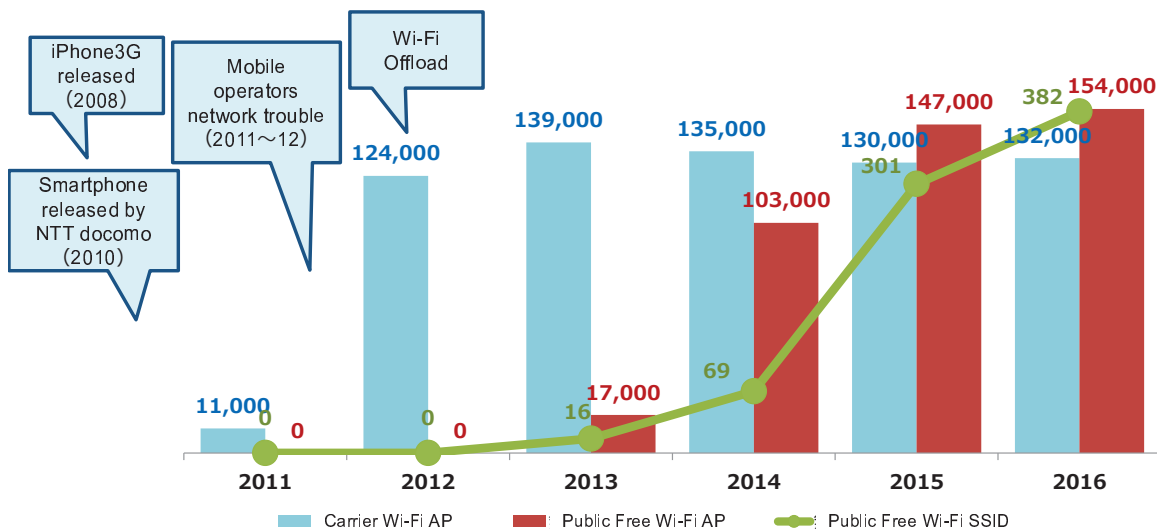
- We have deployed **14,601 APs at 2,170 railway stations** all over the country.



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Growth of Public Free Wi-Fi

- Service started at airport, train station, and convenience store. (From 2013)
- After then, local governments such as Fukuoka city, Hiroshima city, and Osaka city started providing Wi-Fi service.
- Rapid expansion since last year, especially in further local governments, shopping malls and commercial districts.

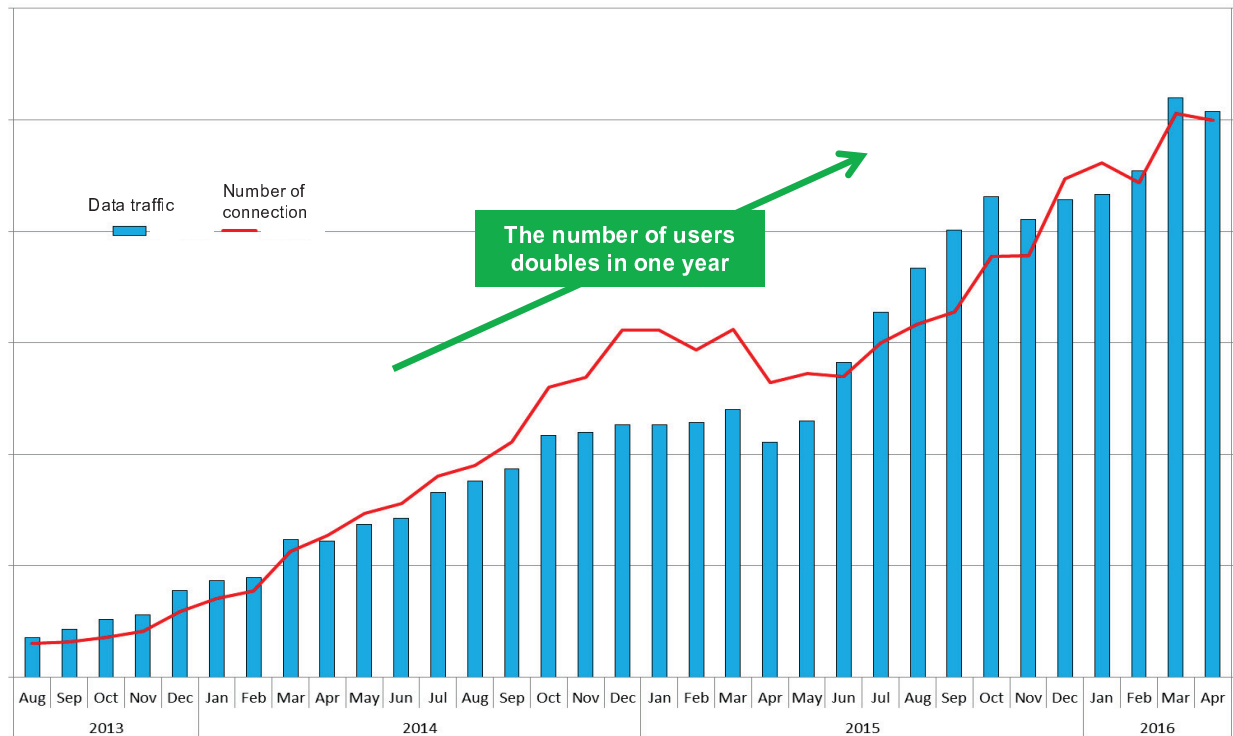


※Public Free Wi-Fi AP number and SSID number are based on Japan Wi-Fi registration.
Number of Carrier Wi-Fi AP is based on the number of NTTBP assets.

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Growth of Wi-Fi, growth of data traffic

For one year (April 2015 to March), the amount of **data traffic** is about 2.5 times



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Additional Request from Venue Owners



Additional request from venue owners

- Inconvenient to register user profile at each venue for Wi-Fi access
⇒ **Single Sign-on**
- Make the landing page multilingual ⇒ not only English but also other languages
- Support translation software ⇒ trouble-free communication with foreigners
- Show maps of popular area ⇒ enable users to see maps even if it is offline

Where can I use Wi-Fi near here?



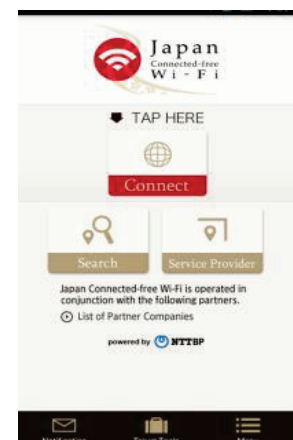
Not only English but also other languages

I could make single sign-on happen

I could see maps even if I am offline

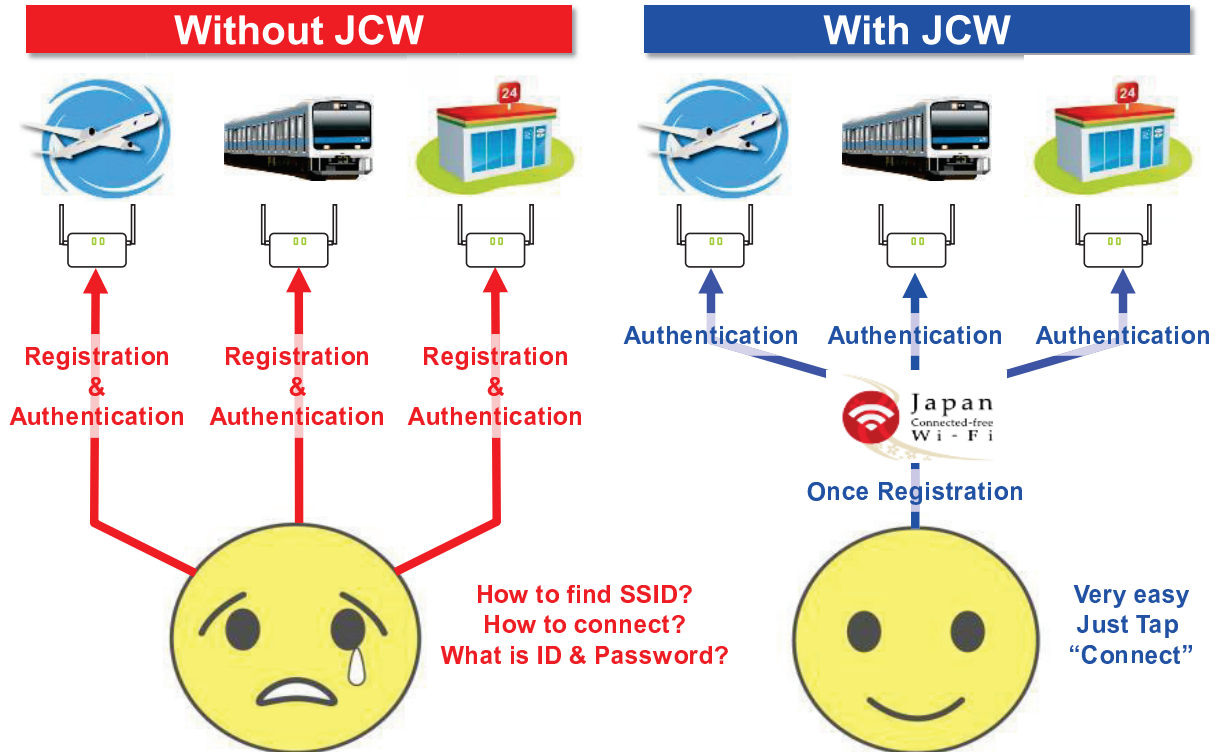
Japan Connected-free Wi-Fi application

- Available at more than 150K APs throughout Japan
- Single Sign-on, multilingual supporting 13 languages, translation software and offline maps are installed



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Single Sign-on Application, JCW



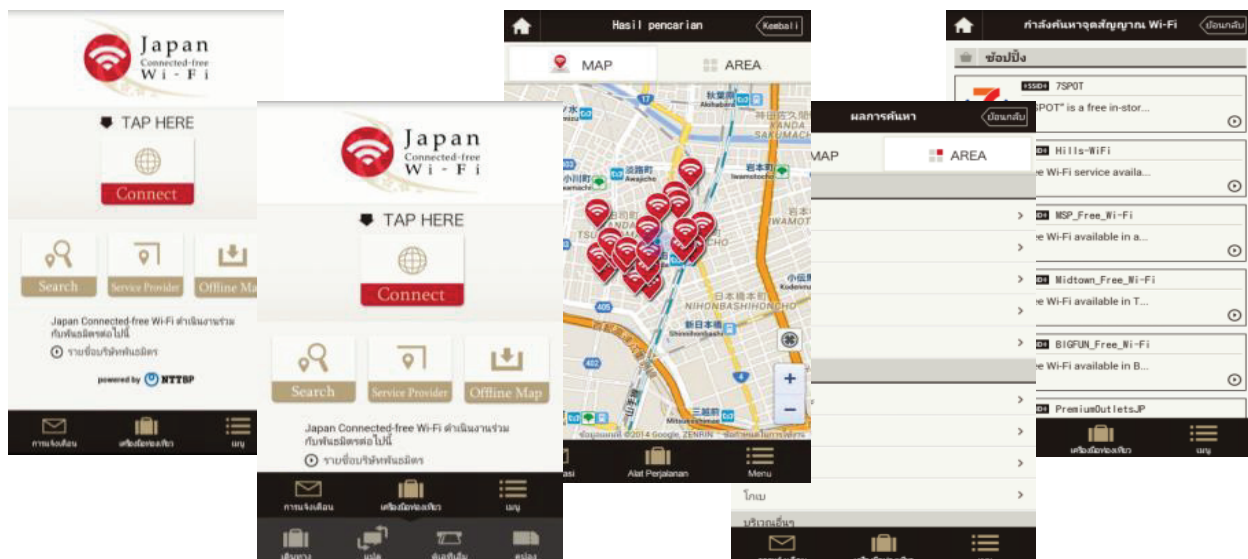
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Japan Connected-free Wi-Fi with Multi Language



- The app sets the language of the contents automatically by OS setting of user's device.
- It currently supports **13 languages**, e.g. **English**, 2 types of **Chinese**, **Korean**, **Thai**, **Malay**, **Indonesian**, **French**, **Spanish**, **German** and **Japanese** as well.

In case of Thai

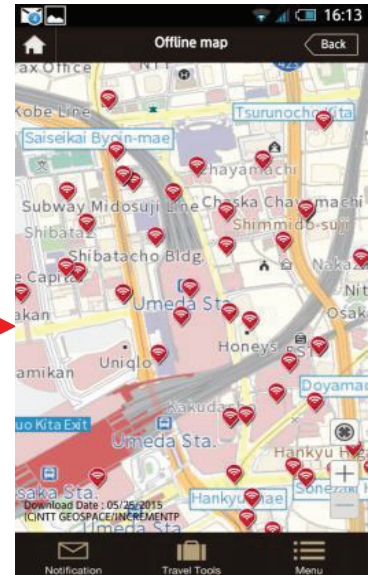
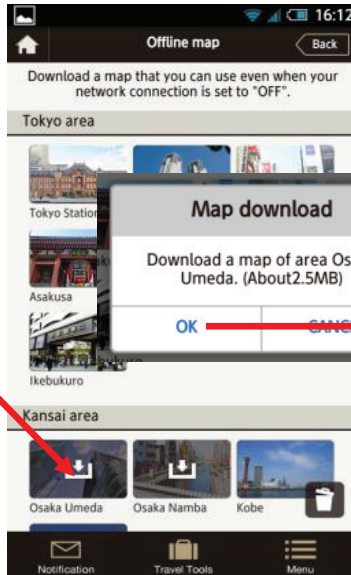


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Japan Connected-free Wi-Fi Offline Map

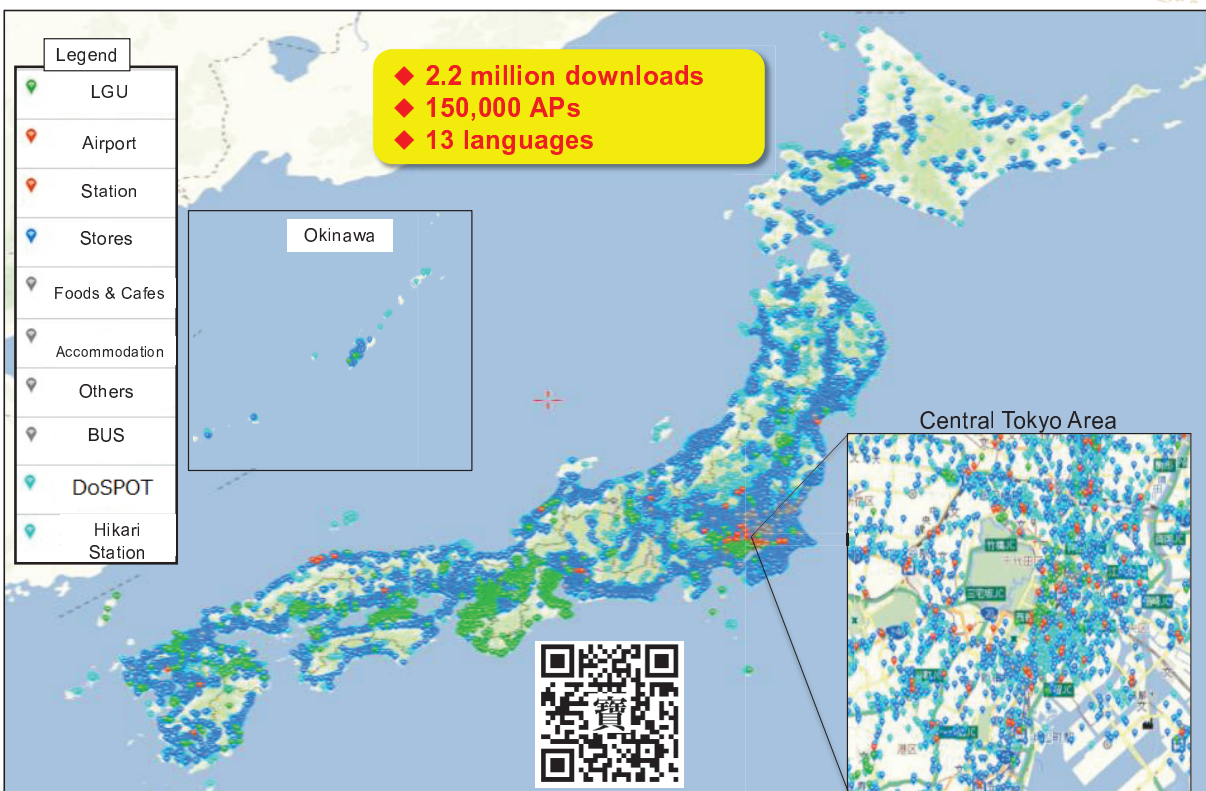


- **Offline maps of 30 areas are available currently**, which include Tokyo , Osaka , Sapporo, Sendai, Yokohama, Nagoya, Hiroshima, Fukuoka, Kagoshima ,Okinawa and so on.
- You can **see those maps, even if you are NOT online**, once you download the maps.
- Currently, **5 languages, including English, 2 types of Chinese, Korean and Japanese, on the maps are available.**



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Nationwide Coverage of Japan Wi-Fi



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Packages for travelers - Prior/During/After the trip -

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2.1 Analytics of Wi-Fi Access Data

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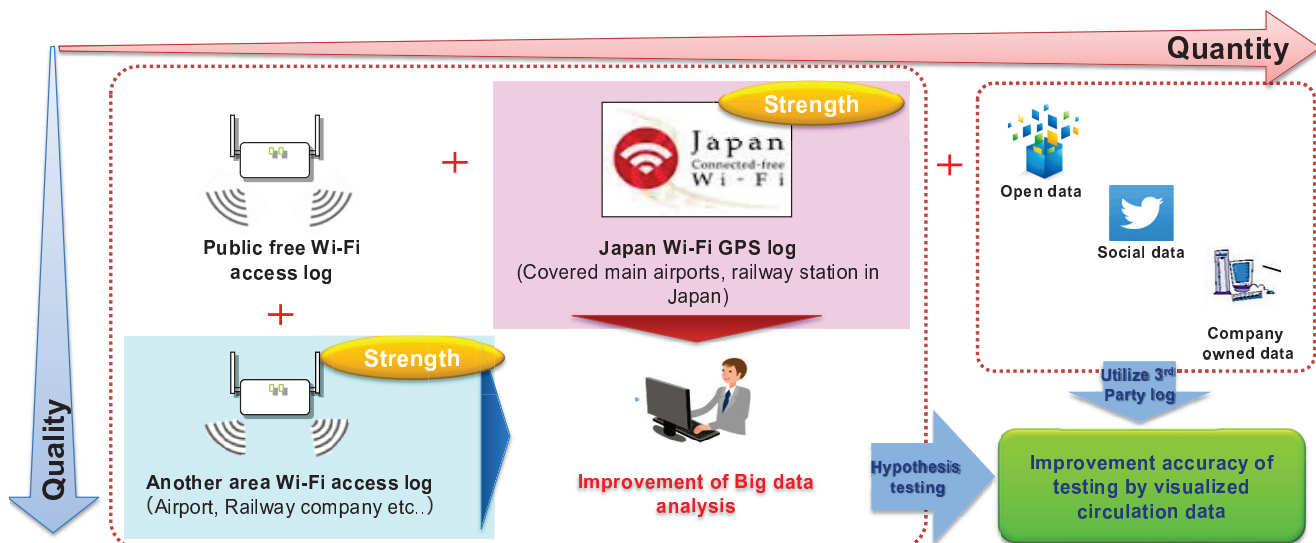
What are expected for Wi-Fi today:

- Wi-Fi is required for the inbound tourists.
- Visualization of where the inbound tourists come from, where they are going around, how long they are staying, and where they are going to return.
- Although succeeding to attract LCC, where do the inbound tourists spread after they land to airport?
- Distribution of tourist spot information by Wi-Fi, “Before traveling”.
- Analysis of what is reputable in SNS, and what is bad in it.
- Utilization for people flow analysis in order to consider about security at the event.
- Since Wi-Fi technology evolves so quickly, isn't there a concern of end of service due to product obsolescence even if deployed?

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Wi-Fi Log Data Analysis

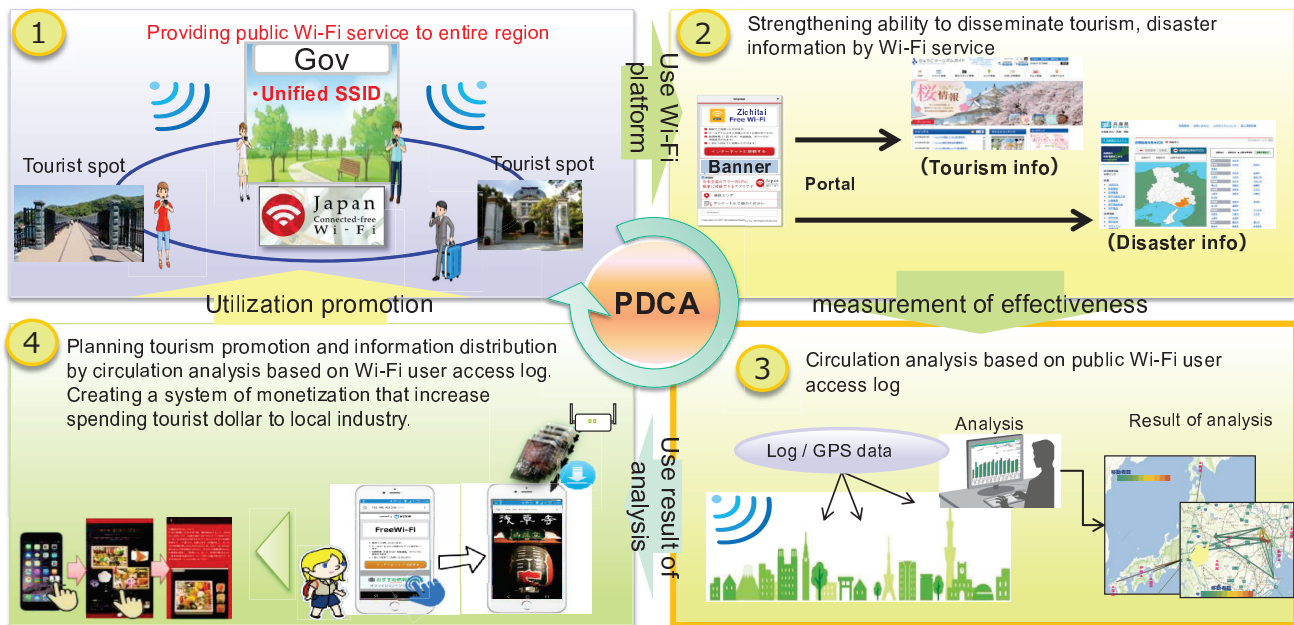
- NTTBP is able to provide analyzed and visualized report that would help customers effective circulation planning.
- Also we can provide tourist flow investigation based on Wi-Fi utilization at the airport, railway station and “Japan Connected-free Wi-Fi” application log, as well.



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Wi-Fi Log Data Analysis

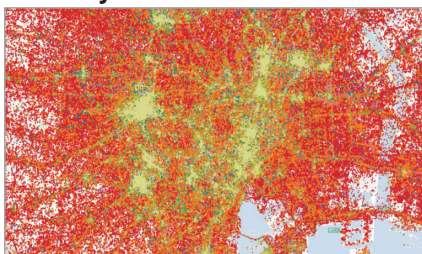
- NTTBP's data analysis **improves attractiveness of area by Wi-Fi service with PDCA cycle.**
 - Providing public Wi-Fi, information distributing and data analysis platform
 - Planning tourism promotion and information distribution by circulation analysis based on Wi-Fi user access log



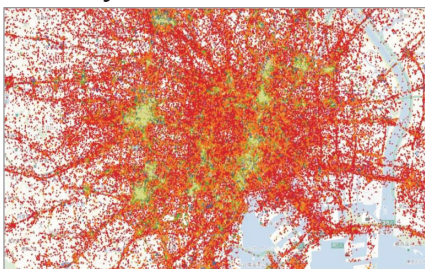
36

(2015.8-2016.11) Analysis of Wi-Fi Service Utilization

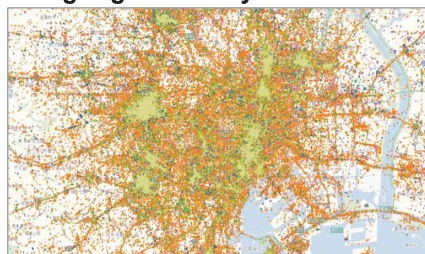
24hours & 13languages
in Tokyo



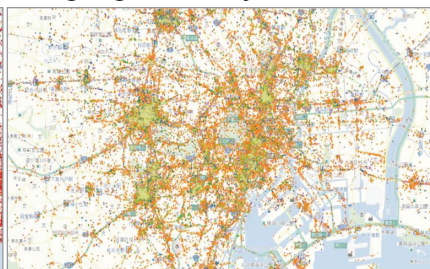
18:00 – 20:00 & 13 languages
in Tokyo



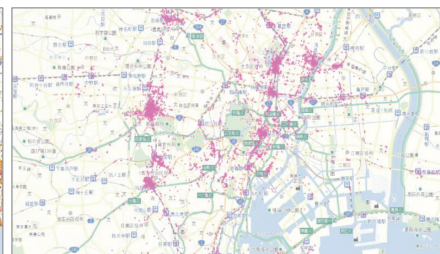
24hours & foreign
languages in Tokyo



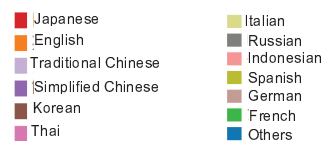
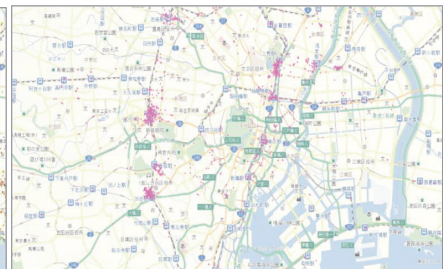
18:00 – 20:00 & foreign
languages in Tokyo



24hours & Thai in Tokyo



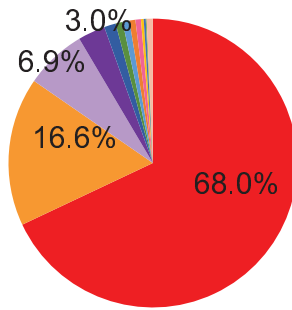
18:00 – 20:00 & Thai in Tokyo



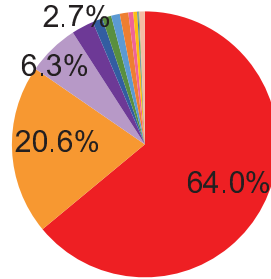
37

Percentage of language used

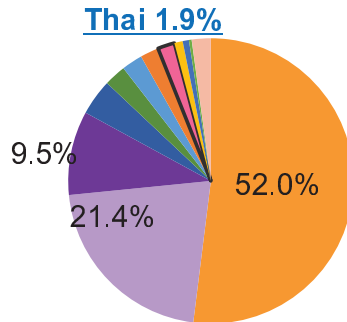
Nationwide All Languages



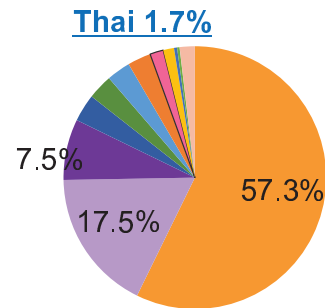
Tokyo All Languages



Nationwide Foreign Languages

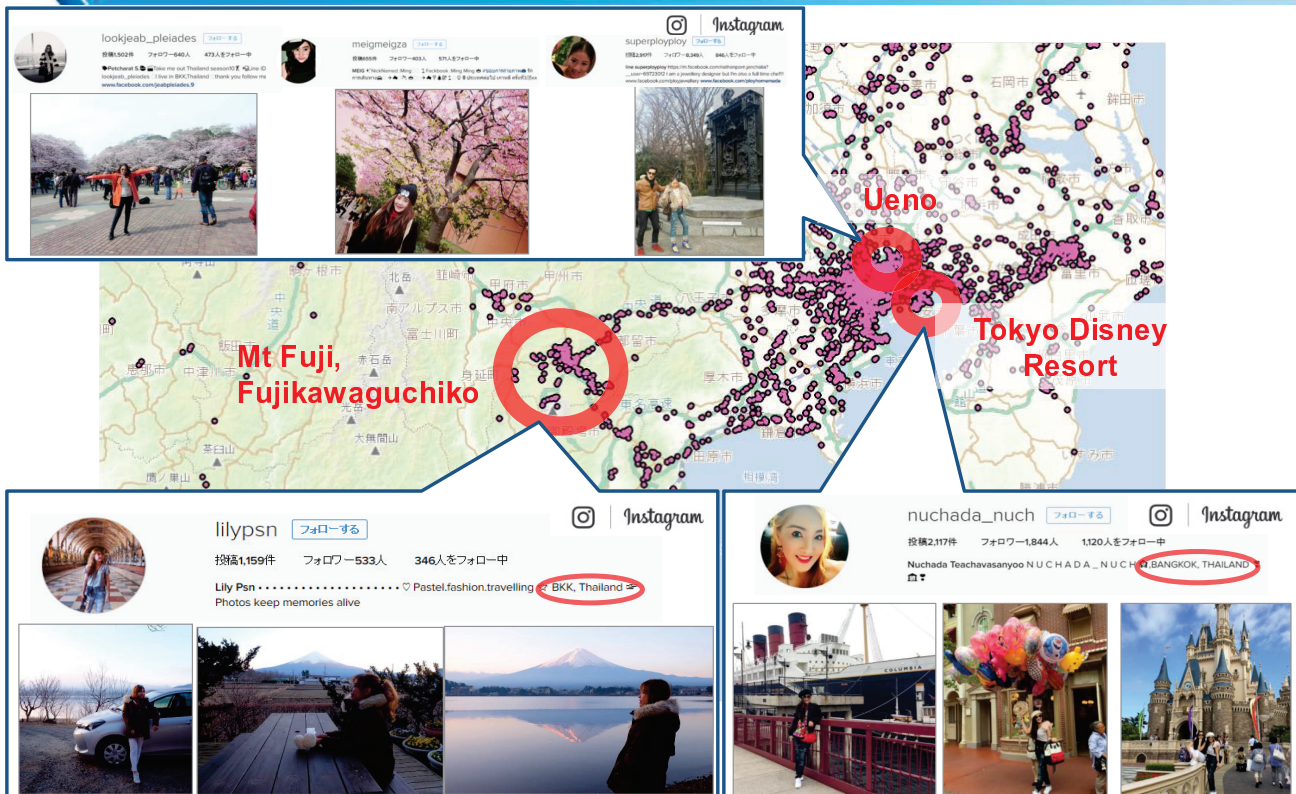


Tokyo Foreign Languages



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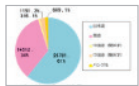



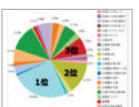

Major Destinations of Thai People visiting Japan



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NTT Group's Big Data Analysis

Visualizing the staying status and flow line of travelers including inbound tourists visiting Japan, Big Data Analysis is **effective for planning promotion** to extend staying time and to **attract people to shopping areas**.

Overview	Image
1. Staying status in the tourist spots (Heat map "Point") ・Visualize the place where visitors including inbound tourists stay, by language and by time slot, and furthermore visualize trends of staying people per time slot. -Analysis by language, specifying time slot, and scale change (Scaling) of map	
2. Ratio / number of user language of Local Governments Wi-Fi spots and tourist spots ・Visualize user language of visitors at the major Wi-Fi spots and tourist spots specified by JW.	
3. Analysis of staying status in Local Governments area (Accommodation rate / staying days) ・Accommodation rate : Analyzed in each language, based on the usage of continuous use within specified range. ・Staying days :Analyzed in each language, based on the number of days from the first use date to the last use date within specified range.	Accommo- dation Rate  Staying Days 
4. Time slot based people flow analysis of Local Governments Wi-Fi spots and tourist spots (Time slot based people flow analysis for major spots) ・Visualize flow by language, when and where people come from, when and where they move.	
5. Ratio / number of travel between tourist spots (IN / OUT analysis of two sites) ・Visualize the next place of visit and last place of visit, based on the starting specified spots. - Analysis by language	
6. Map to show people flow in between tourist spots ・Visualize the people flow in between hub spots and high flow spots, at the major Wi-Fi spots and specified tourist spots.	

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SNS Analysis of Japanese / foreign travelers

- From the comments posted to SNS in regard with events and sightseeing spots where public free Wi-Fi is provided, we are able to collect live true voices of tourists and these could be useful for understanding market and considering improvements.
 - "Attack of Titan" "Dragon ball Z super" and "Love Live!" are most popular contents for SNS pictures.
 - Some SNS users take "action selfie", the same posing of Anime Snow statue.
- "Selfie Stage" helps SNS users to take "action selfie" for their SNS. Action selfies on SNS bring more visitors: NEW opportunity

Macao tourism video on Ice Carving



-Posted by an Indonesian
- 4,043 followers



Reflected fireworks on snow

- Posted by a Thai
- 905 followers

Attack on Titan



- Attack on Titan. One of the coolest ice sculptures – at night the eyes light up as well!

- Posted by an Australian
- 3,240 followers

Look at the details !!!

- Posted by a Mexican
- 78 followers



**Mr. Irfan Haarys Bachdim,
Professional Soccer player in Japan,
also an Indonesian**



ibachdim 240-98
Irfan Haarys Bachdim
登録368件 フォロワー583人

AMAZING! One of my favorite anime!!
- 58K followers

Dragon ball super



In Japan, I think, Manga and Anime are not just for kids but also for all generations, I would say it seems to be a part of daily life. It is culture. This year, in the 67th Sapporo Snow Festival, 30th anniversary for Manga snow statue series brings Dragon ball Z's symbolic hero, Goku, to the center stage. OTAKU!

- Posted by an English speaker
- 1.4K followers



드래곤볼 눈사람 될거같오 눈보라

... I think Son-goku becomes a snow man after snow storm!

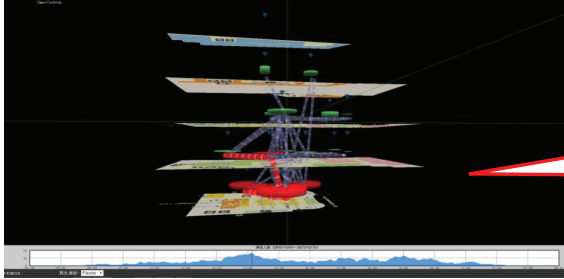
- Posted by a Korean
- 213 followers

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Visualization of People Flow

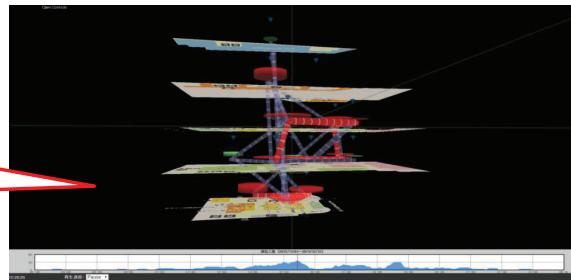
- 3D Mapping of AP location.
- **Visualize number of people and staying time** in each location, plus **flow from one place to another** by 360 degrees view.

Case: Chinese People Moving



Able to see Chinese people only stay in lower floors and do not move to upper floors.

Case: Korean People Moving



Able to see Korean people more people stay in upper floors.

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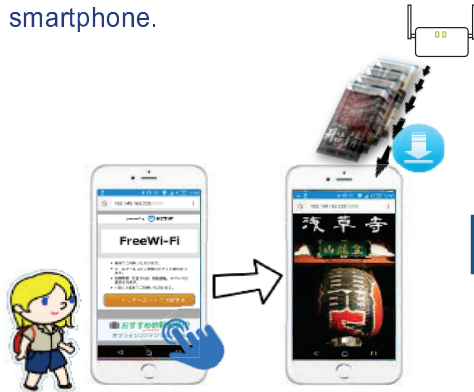
2.2 Value Added Services

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Quick Information Download

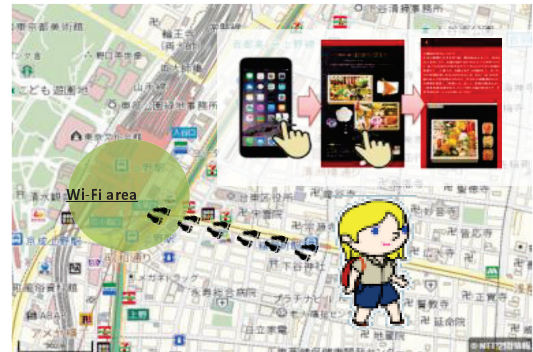
1

When you connect to a Wi-Fi access point, you can download content easily to smartphone.



2

Downloaded content can be viewed even outside of Wi-Fi area



No Apps

No need to download any apps
Just use web browser

Multilingual

The signage distributing to clients by automatically recognizes client smartphone language settings

Viewable while offline

Downloaded content can be viewed even outside of Wi-Fi area

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Quick Information Download

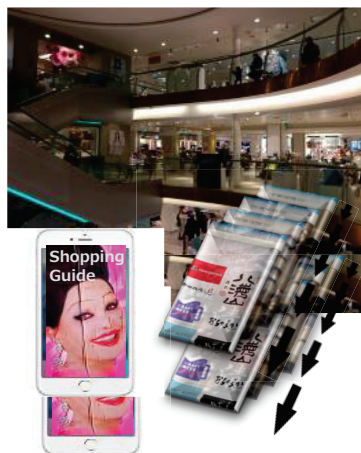


Travel guide



Providing multilingual travel spot and guide with maps. Good for cost savings compared to paper guide.

Floor guide



Guests can bring digital map and brochure with their smartphones

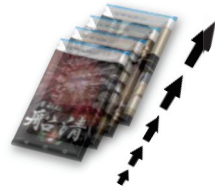
Digital Signage



Sponsors can deliver their advertisements directly to customer's devices and evaluate their effect.

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Mitsukoshi Ginza Ads for Chinese Customers



Coupons



Promos

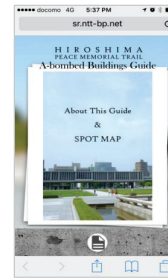


Other Examples

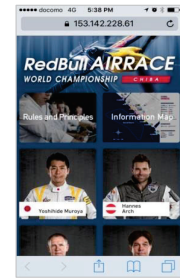
Okinawa (LGU)



Hiroshima (LGU)



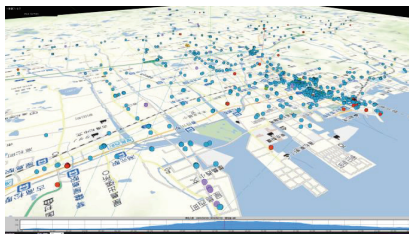
Red Bull Air RACE



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Signage Service for Tourists

- Here we introduce various **signage services** such as **3D map display** of popular spots based on **Wi-Fi user information**, transmission of tourist information on signs to your smartphone and more.



You can instantly see **which spots are popular based on Wi-Fi access data** on a 3D map!

This service could be packed with local information such as tourist spots, bars, restaurants and more!
You can easily **get those information into your smart phone via Wi-Fi as you like** and carry it around with you.



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Photo Circle 1 - Memorial Photo -

- Take a **photo superimposed you and image of players or favorite scene!**
- Photos can be **downloaded to your smartphone**, and you can also **print out at the spot**.
- **No apps are necessary** to enjoy this service.

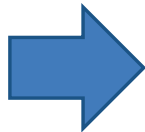
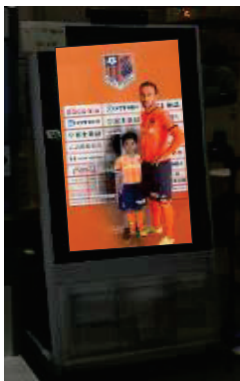


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Photo Circle 2 - Virtual Image -

- Choose **the favorite costume that clients have interests**.
- The Photo is **downloaded to the client's smartphone via Wi-Fi**.
- Gift as a **souvenir with printed photos**.

Stand in front of the display



Choose the background



Shooting



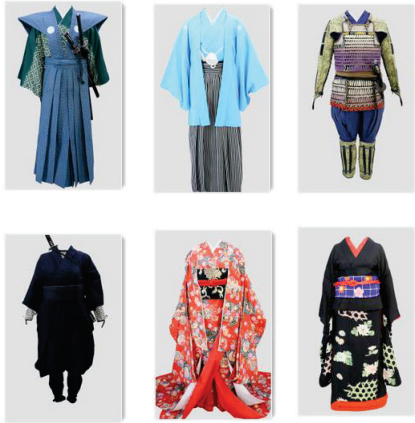
AD Ads on the photo

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Virtual Costume Photo Service

- This service lets you **take photos in costumes that you rarely get the chance to wear.**
- Use Wi-Fi to **easily get the photos you took on your smartphone.**

We have lots of costumes for you to try.
How will you look?



Photos are printed and downloaded.
Get it home as a souvenir.

Just stand in front of the screen.
You will get change into your costume of choice!

50

Photo Circle 3 - AR Image -

3D models appear in your smartphone!



Ads together

You can use...

Shooting with a 3D model in hand



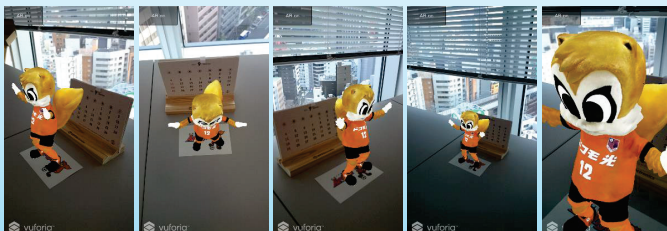
Representing the formation in VR



Commemorative photo with mascot



Displayed according to the direction and distance to the target



51

360 degrees image / Kirari! For Mobile (3D)

➤ Stereoscopic viewing experience as if it exists on the spot

<360 degrees image>



Able to choose your favorite direction with intuitive operation, and you can experience more powerful images.

<Kirari! For Mobile>

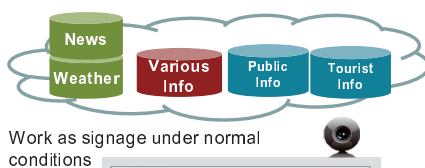


A stereoscopic viewing experience as if it exists on the spot. Just wearing a smartphone on a paper craft makes it possible to see players / mascots in 3D as though they existed on the spot.

52

Human sensor signage

- Service that can display various data in signage by simple operation.
- In addition to information distribution from venue owner, information distribution such as news and advertisement are possible.



Work as signage under normal conditions

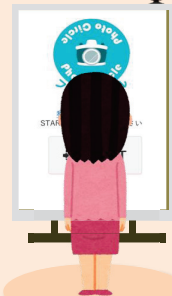


Multi-touch Signage

Detect human

Photo Circle (Wi-Fi Selfie Service)

Human sensor camera



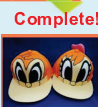
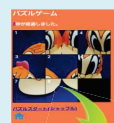
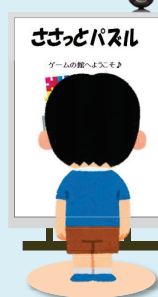
When people detected with human sensor, the signage changes to Photo Circle quickly.



Choose frame and take photo by own smartphone. Photo can be downloaded to own smartphone.

Puzzle Game

Easy to use Fun puzzles



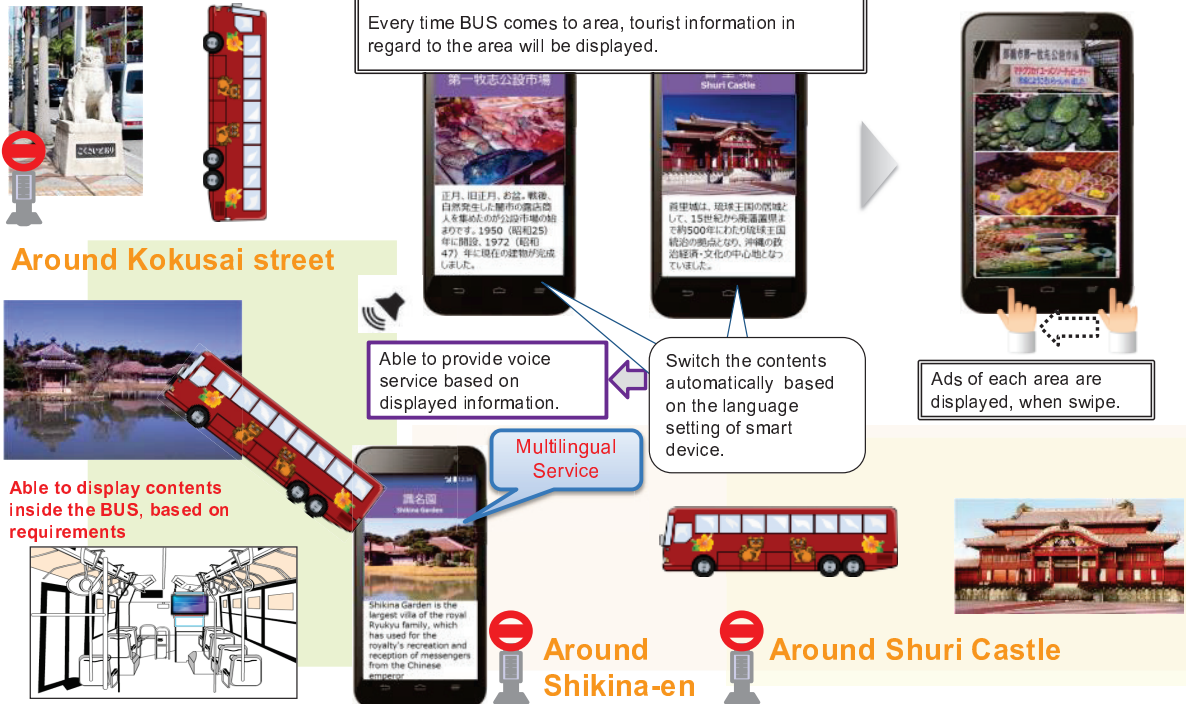
Touch screen

Puzzle game appears by touching screen

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Multilingual Voice Guidance

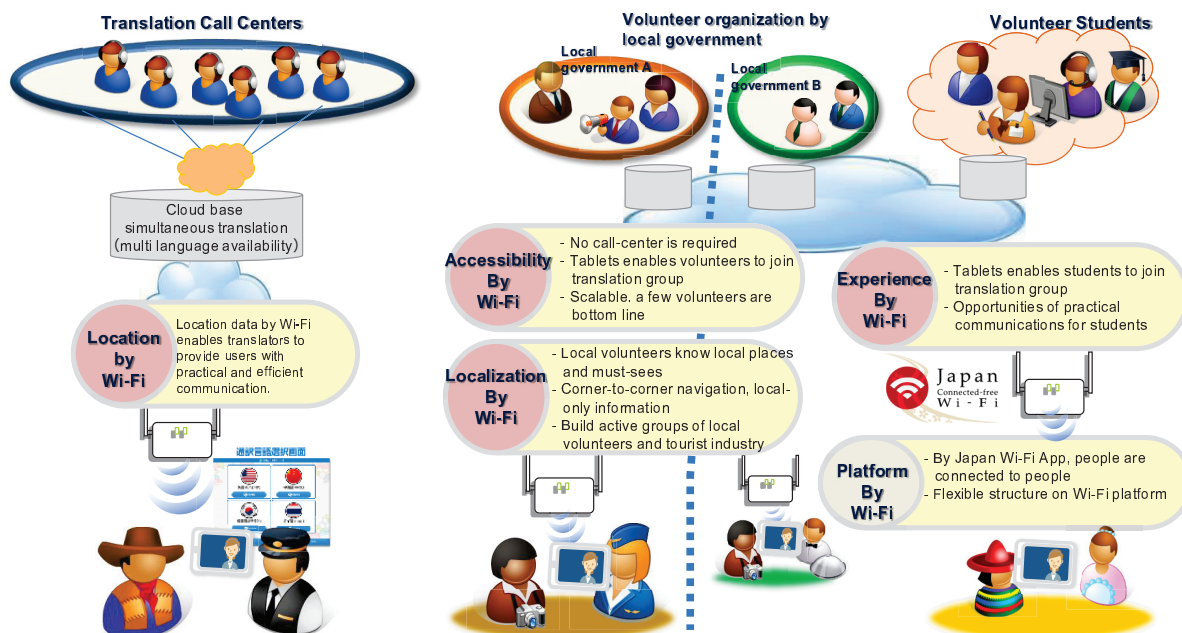
- Service that can **automatically switch the contents according to the location**.
- Able to distribute tourist information and advertisements for passengers in BUS.



54

Voice Translation by volunteers via Wi-Fi conference service

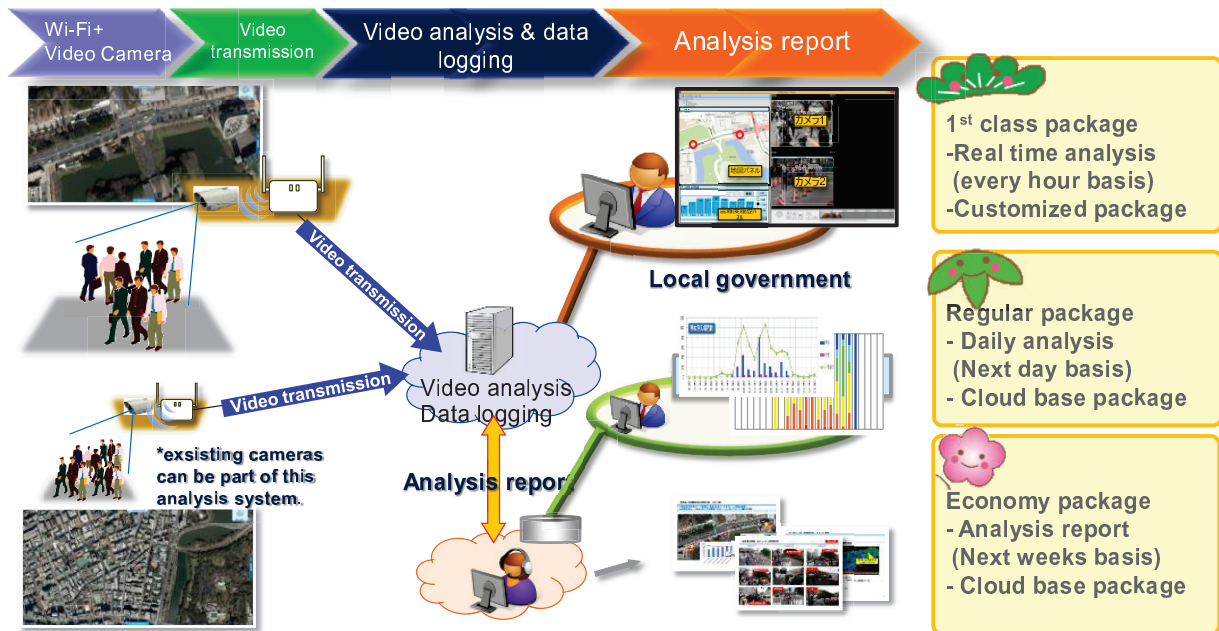
- Voice Translation on Wi-Fi tablets is flexible and high quality F2F conference service
- It meets translation demands with flexible deployment of type of type of translators
- It creates opportunities for new service models, improved services, and revitalization.
- It is an integral part of Japan Wi-Fi's concept, connecting people to people



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People flow analysis by Wi-Fi camera

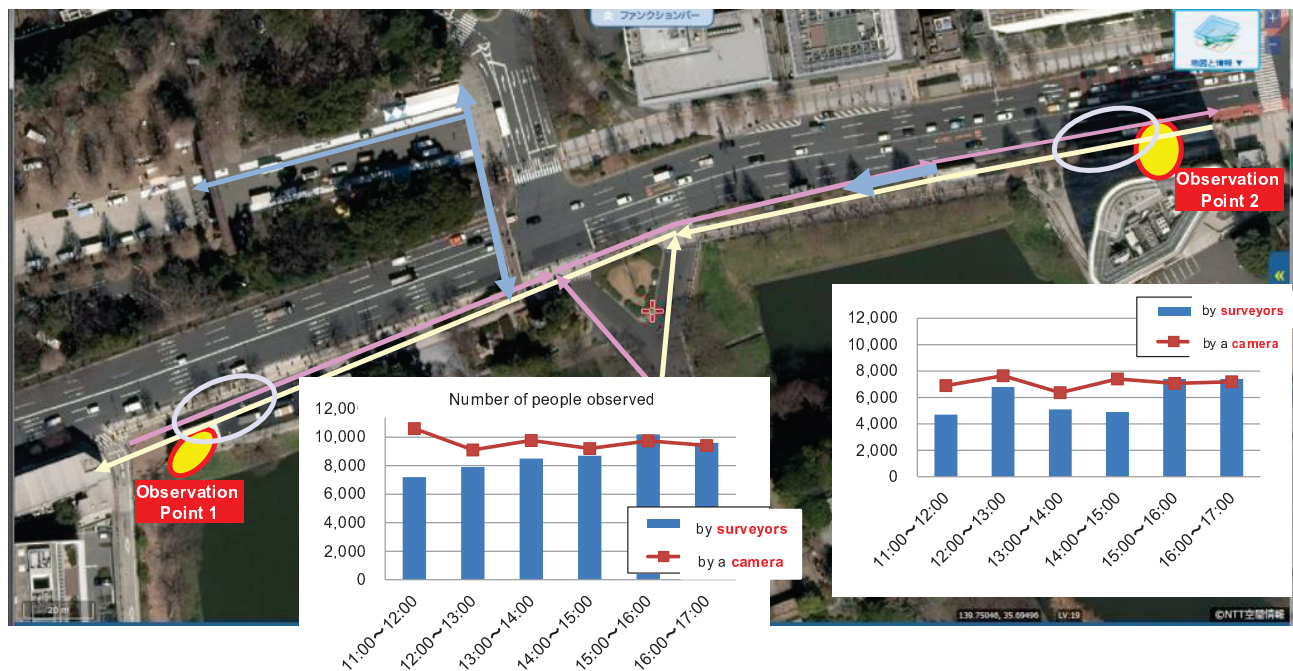
- By combining Wi-Fi, video cameras and video analysis application, an analysis report shows people flow, **time-basis**, **quantity-basis** and **direction-basis**, in a place.
- Wi-Fi log analysis, people flow analysis gives more insight people's behavior in a place.



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People flow analysis by Wi-Fi camera at Sakura Festival

- People flow analytics has consistent people flow logs with logs by surveyor's counting and calculation.
- It observes about 10,000 people flow per hour at observation point 1.
- It observes about 7,000 people flow per hour at observation point 2.

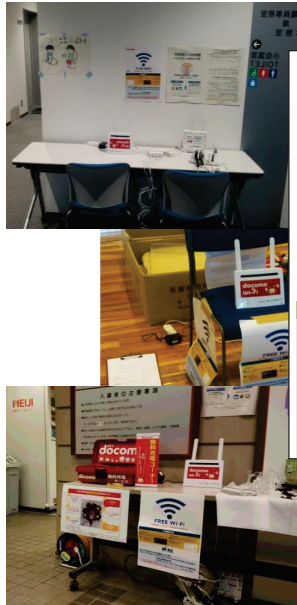


57

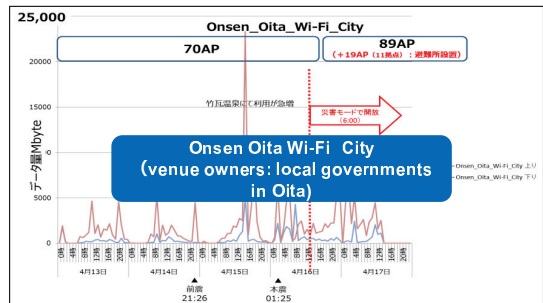
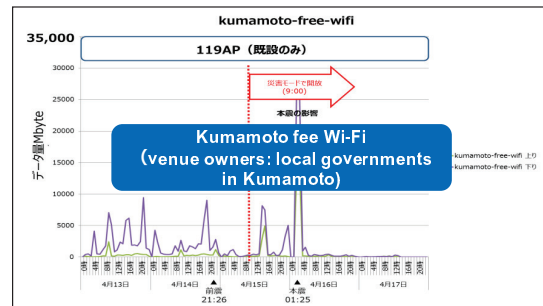
Contributions for people after multiple earthquakes hit Kumamoto and Oita pref.

- Deployed 500 APs of Temporary Wi-Fi at safe shelters after multiple earthquakes in Kumamoto and Oita in April, 2016
- SSIDs of local governments and NTT groups are available for people as free Wi-Fi after disaster

Temporary WiFi at safe shelters: 500APs



Data usage logs for local governments

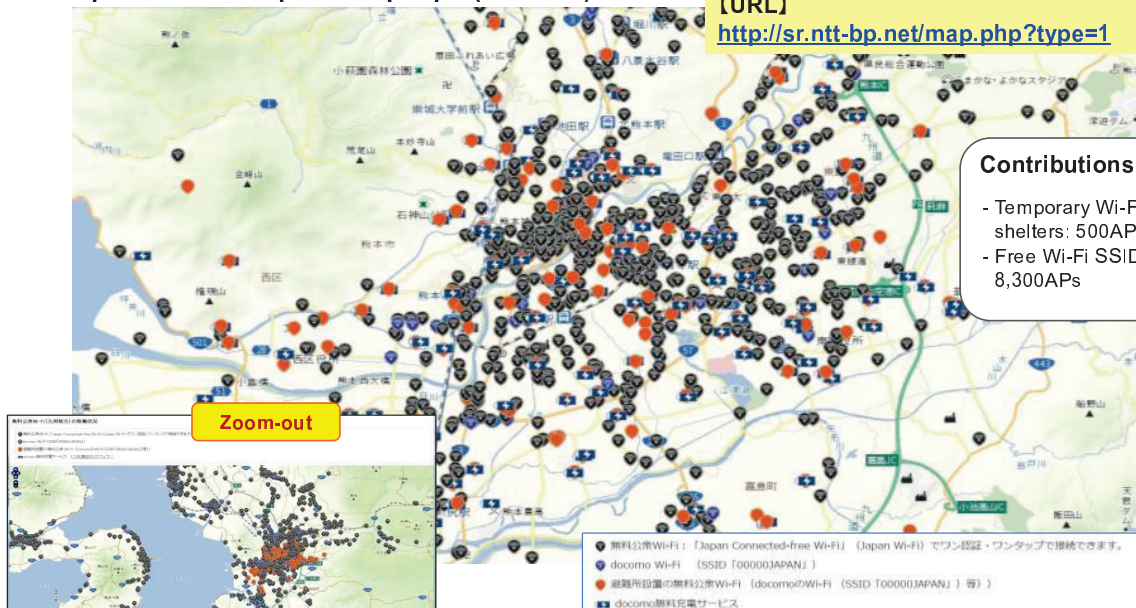


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Contributions for people after multiple earthquakes hit Kumamoto and Oita pref.

As a part of NTT's protocol to larger scale disasters, NTT group companies, as a team, contribute to people. They quickly dispatch dedicated teams so that people have 500 APs of temporary Wi-Fi at safe shelters, 8,300 APs with Free Wi-Fi SSID and internet map of APs available for people.

Map of Wi-Fi hotspots for people (zoom-in)



Contributions for people

- Temporary Wi-Fi at safe shelters: 500APs
- Free Wi-Fi SSID deployed at 8,300APs

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1. Wi-Fi Business Activities and Initiatives

2. Value Added Services for Monetization

Transition from "old telco" to "new telco"

3. Mutual Wi-Fi Business Partnerships for Inbound Travelers

Single Sign-on Authentication

Packages for travelers - Prior/During/After the trip -

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Single Sign-on Authentication

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Wi-Fi Single Sign-on Between Countries

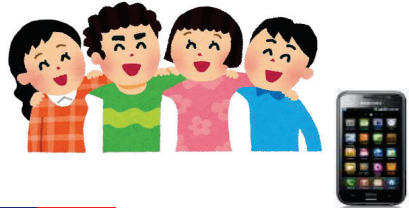
- The number of foreigners visiting Japan has **already exceeded 20 millions in 2016**.
- From customer's perspective, **Wi-Fi with single sign-on feature could bring a huge benefit**.
- In addition of that, we could provide **useful and beneficial information tailored to the location of visitors with Wi-Fi hotspot feature**.

Taiwanese People in Japan



- Customers can use their account, ID & password, registered in their own country.
- They could have Single-sign on feature with the app of Japan Wi-Fi.

Japanese People in Taiwan



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Packages for travelers Prior/During/After the Trip

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Mutual Business for Inbound Travelers

- For the travelers purchasing the airline ticket, we and our partner provide **a set of mobile SIM and Wi-Fi**, also provide the useful **travel information such as transportation, accommodation, gourmet, entertainment, and temporary events**, etc.
- On the basis of the **big data analysis from Wi-Fi usage**, local governments and travel agencies could **improve the tourism initiatives and/or promotions**.

① Download Japan Wi-Fi

→ Starting to get GPS location information log

② Download travel Information

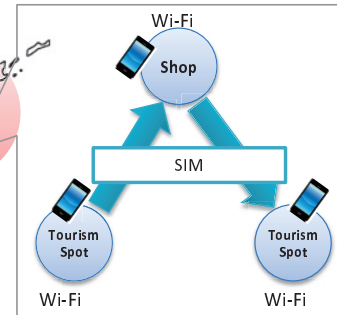


Multilingual contents



③ Watching travel Information prior to travel

④ During the trip



Position information



⑤ Flow analysis of the visit to Japan tourists from upon arrival

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Mutual Business for Inbound Travelers

Provide **contents of tourist spots in Japan**, powered by **Digital Advertisement service**.



※ Campaign web page Access by QR code.



Tourist Guide Off-line Contents

Experience of Japanese Life



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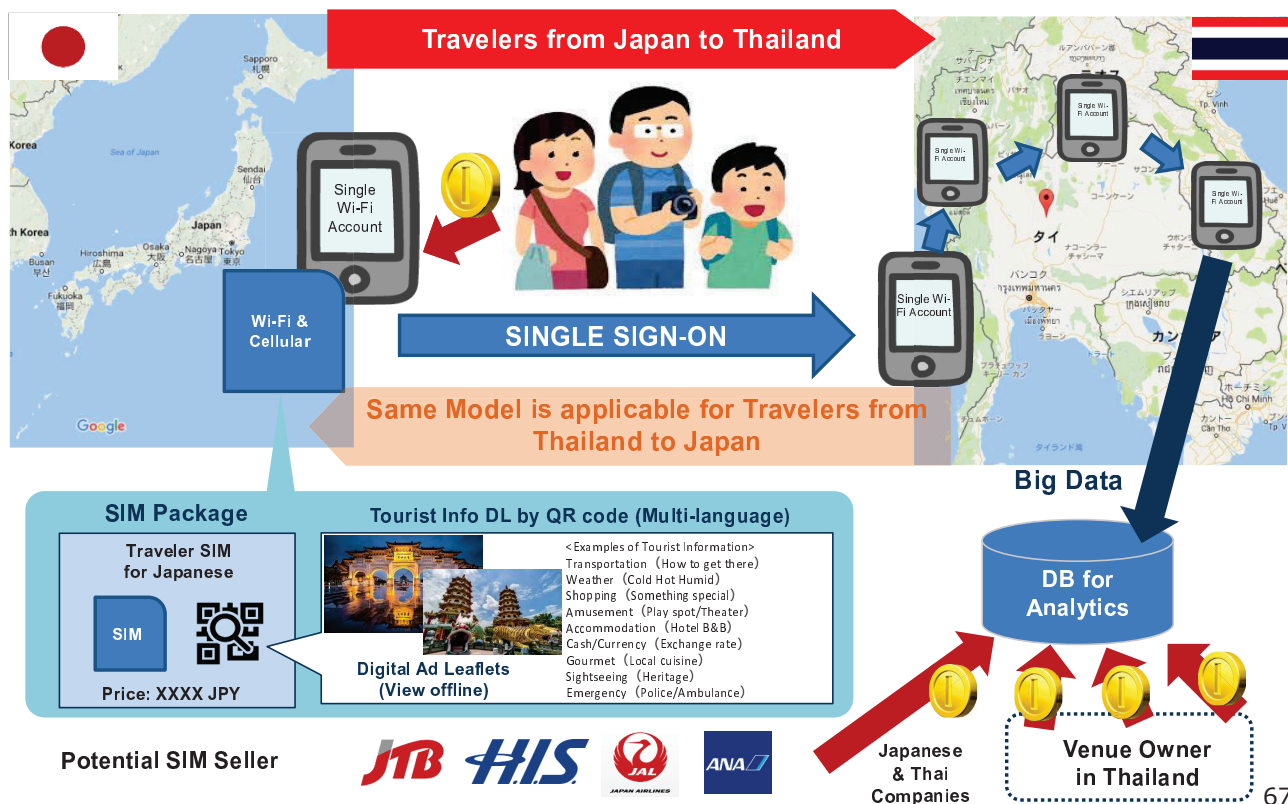
Mutual Business for Inbound Travelers

- SIM sold in Taiwan in November, encapsulating the Japan Wi-Fi user manual and stickers.



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Mutual Business for Inbound Travelers



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ขอบคุณ สำหรับ วันนี้ ครับ

Khobkhun Samrab Wannii Krab

Thank you very much for today.

***I would like to have Wi-Fi business
with you.***

***Companies in Thailand & NTTBP will make
difference in Wi-Fi business.***

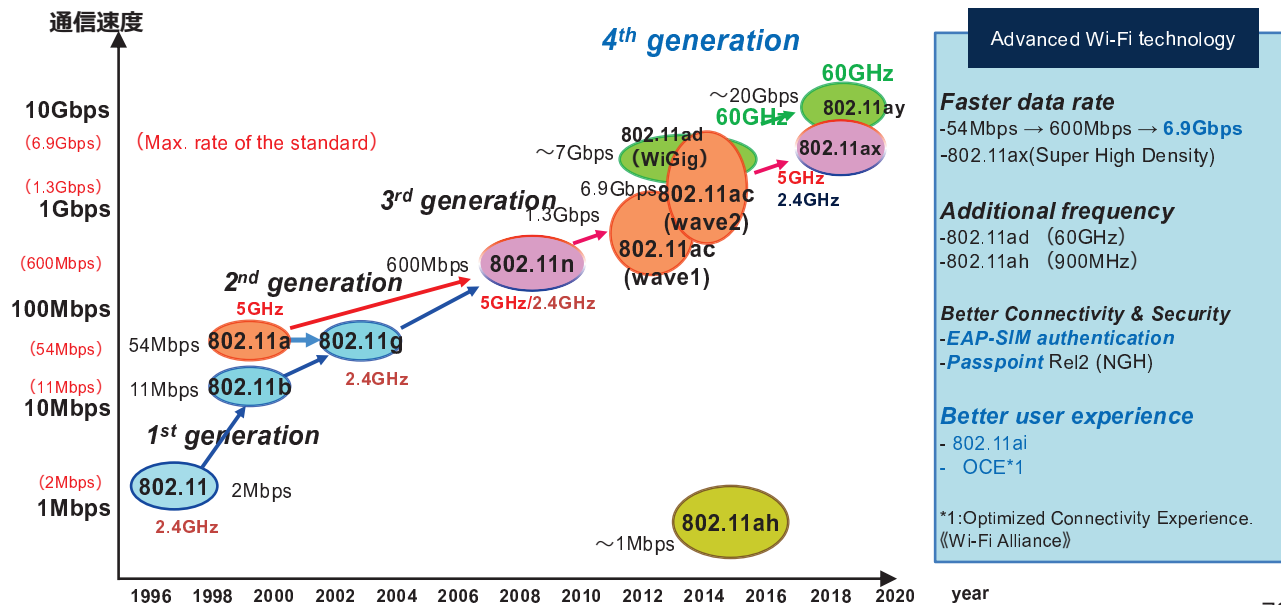


Appendix

Wi-Fi Technology Trend and Features

- Unlicensed Wi-Fi: More frequency, faster data rate, better user experience
- Licensed LTE/5G(next generation): To be deployed by 2020

Wi-Fi technology trend



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Characteristics/advantages of wireless LAN (Wi-Fi)

Characteristics (advantages)

● High speed/low delay

Achieve high speed of
433Mbps (Smartphone)
to 1.3Gbps (PC)

● Broadband

550MHz bandwidth in total
(100 MHz on 2GHz /450 MHz on 5GHz)

● Global standard

<=Wi-Fi as a de facto standard>

Ability to be used anywhere in the world/
Upward compatibility
(11ac is compatible with a/b/g/n)

● Unlicensed

Smartphones, game consoles, cameras, and
many other devices are Wi-Fi capable:
offering diversified devices & services

● Inexpensive

Commoditization due to the
wide spread use

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Widely Applicable Characteristics of Wi-Fi

1. Global common standard specification

- Devices with Wi-Fi can **access the Internet anywhere throughout the world**.
- Foreigners coming to Japan can **access the Internet by their own devices**.

2. Backward compatible technology

- **Once the latest specification deployed**, the existing specification, even if it is lower one, **enables users to access the same Wi-Fi access point as heretofore**.
- On the other hand, **in the cellular service, the specification between base station and devices have strong relations**. e.g. transition of 3G to LTE

3. Small coverage but fast access

- **Flexible area design of Wi-Fi access points** enable users to build a certain quality of connection **even in the densely populated area such as stadium and arena**, etc.
- By **installing APs in high density**, we could **ensure more than 100K user connections**.

4. Unlicensed one enables owners to arrange services

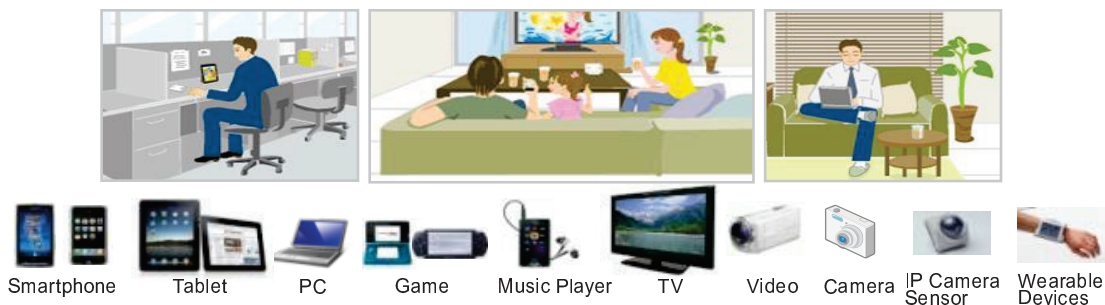
- A various kind of **enterprises and municipalities are venue owners** of Wi-Fi services.
- Based on their business strategy, **they would arrange the area of Wi-Fi spots and the service specifications by themselves**.

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Device Free / Carrier Free

Wi-Fi has Device-Free and Carrier-Free nature.

All Devices come to have Wi-Fi connectivity



Device Free

Carrier Free

High Speed
Low Delay

Broadband

Global Standard

Unlicensed

Inexpensive

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Wi-Fi Service Operations

- We have been **monitoring approx. 200,000 APs** deployed all over Japan for **24 hours a day** and keeping quite a good service level.

