Tourism Service Portfolio

Hidekazu Kasahara,
Masaaki Iiyama, Michihiko Minoh
Kyoto University
Summary of Proposal

• For developing the smart tourism in destination, how to collect the data is key. (Characteristics of AI technology)

• **Smart service providers and data owners are not always the same. (Exception is data giant)**

• Most of data is owned by various data owners (data ownership).

• The data owners do not know the need for their data (Recognition gap).

• So, by making the list of required data, we will facilitate the data exchange among data owners and service providers.

• The list is called as “tourism service portfolio.”
Summary of Proposal

Regional Data Owners

Private Sector

Dynamic Data
- GPS Traj.
- Biological
- Transaction
- SNS
- Camera
- Post

Closed Access RD

Provided via API

Usage is Limited to Members in Closed Market

Public Sector

Static/Statistic Data
- Weather
- Population
- Road Map
- Disaster

Open Access RD

Usage is Not Limited

Tourist Service Portfolio (TSP)

TSP shows the needs of data to data owners

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Contents

• Summary
• Background
• Research Objectives
• Methodology
• Previous Researches
• Definition of Smart Tourism
• Tourism Service Portfolio
• Conclusions
• Tokyo Olympic in 2020
• Governmental Policy (MIC/ METI/ JTA)
  – Tourism services using IoT/ Bigdata/ Artificial intelligence technology
  – This can be called “smart tourism services.”
• However, no standard concept for developing smart tourism services in the destination.
  – What’s smart tourism services
  – How and who provides.
  – What kind of data are needed.
Research Objectives

• Propose new standard concept for developing smart tourism services in the destination from the viewpoint of informatics.

  – What’s smart tourism
  – What’s the most important problem
  – How to solve the problem
Methodology

• Closed discussions with tourism community
  – Japanese government (MIC, METI)
  – Kyoto city local government
  – Venture companies in Kyoto
  – Privacy/security experts

• Open discussion in symposium
  – IT companies
    • Yahoo!, NAVITIME, NEC
  – Researchers
    • University, Think Tank

• Refer previous researches
## What’s smart tourism?

<table>
<thead>
<tr>
<th>Traditional Tourism</th>
<th>Mainframe</th>
<th>Flight Booking</th>
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</thead>
<tbody>
<tr>
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</table>

### e Tourism

<table>
<thead>
<tr>
<th>Internet Web-based technology</th>
<th>Room Reservation Web Guide and Map</th>
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<tbody>
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</table>

### Smart Tourism

<table>
<thead>
<tr>
<th>Intelligent information processing (AI)</th>
<th>Real-time Recommendation</th>
<th>Evacuation Support</th>
<th>Traffic Congestion Avoidance</th>
<th>Resource Optimization</th>
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</thead>
<tbody>
<tr>
<td>Internet of Things</td>
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<tr>
<td>Big Data processing</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Smart phone, Sensors</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Personalize Real time</th>
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• “Tourism supported by integrated efforts at a destination to collect and aggregate/harness data derived from physical infrastructure, social connections, government/organizational sources and human bodies/minds in combination with the use of advanced technologies to transform that data into on-site experiences and business value-propositions with a clear focus on efficiency, sustainability and experience enrichment.” (Gretzel et al. 2015)

From the viewpoint of informatics ….
Difficulty of Data Collection

- Intelligent information processing requires **vast amount of data**.
- **Various data owners** collect data independently. (Data ownership)
- **Smart service providers and data owners are not always the same**.
- Data monopoly by Data Giant (Google, Apple, Facebook, Amazon)
- It is difficult for new service providers to collect the data and develop smart tourism services, especially in a region.

How to collect data?

Technical and social problem.
The dynamic data show real-time and individual condition of an object that changes in short time, and are available accordingly in short time, less than 2-3 hours in general.

The static data show individual status of an object that does not change in long time, and the object is mainly environmental object. The average temporal range is generally long.

The statistical data are integrations of dynamic data like a number of tourists who visit a destination.
Regional Data Owners

Private Sector

Dynamic Data
- GPS Traj.
- Biological
- Transaction
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Open Access RD

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Service providers

How to collect dynamic data owned by private sector?

To share the service provider’s data needs.
TSP shows the needs of data to data owners

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Slide Number 13
Tourism Service Portfolio (TSP)

- TSP is defined as the list of smart tourism service (STS) required in the destination and correspondent RD to each required STS.

- By using TSP, data holders can recognize the needs for their data and can start trading among service providers.

- STS listed in TSP are given priorities in order to indicate the importance of STS based on the degree that the STS improves the satisfactions of tourists and inhabitants.

- The priorities are expected to be decided by the consensus of all stakeholders including data owners, STS providers, inhabitants and local governments.
<table>
<thead>
<tr>
<th>Service</th>
<th>User</th>
<th>Technology</th>
<th>Static Data</th>
<th>Dynamic Data</th>
<th>Current Service</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offline Map</td>
<td>Tourist</td>
<td></td>
<td>Map (Toilet, Police box, ATM, Cycle, Parking, Tourist Spot, AED)</td>
<td>Event</td>
<td>Only Private</td>
<td>A</td>
</tr>
<tr>
<td>Transfer Guide</td>
<td>Tourist</td>
<td></td>
<td>Time table, Map</td>
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<td>Yes</td>
<td>-</td>
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<tr>
<td>SNS post Analysis</td>
<td>DMO</td>
<td>Statistical Analysis</td>
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<td>SNS post</td>
<td>No</td>
<td>A</td>
</tr>
<tr>
<td>Travel Guide</td>
<td>Tourist</td>
<td></td>
<td>Tourist Spot Data, Tourist Spot, Tourist Route</td>
<td></td>
<td>Yes</td>
<td>A</td>
</tr>
<tr>
<td>Disaster Alert</td>
<td>Tourist/Inhabitant</td>
<td></td>
<td></td>
<td>Disaster Data</td>
<td>Yes</td>
<td>A</td>
</tr>
<tr>
<td>Route Recommendation</td>
<td>Tourist</td>
<td>Recommendation</td>
<td>Tourist Spot, Tourist Route</td>
<td>Tourist Trajectory, Climate Data</td>
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<td>B</td>
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<tr>
<td>Spot Recommendation</td>
<td>Tourist</td>
<td>Recommendation</td>
<td>Tourist Spot, Tourist Route</td>
<td>SNS post, Tourist Trajectory, Climate Data</td>
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<tr>
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<td>Tourist/Inhabitant/DMO</td>
<td>Positon Data Analysis</td>
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<td>Tourist Trajectory, Transportation Trajectory</td>
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<tr>
<td>Bus Arrival Forecast</td>
<td>Tourist/Inhabitant</td>
<td>Positon Data Analysis</td>
<td>Map</td>
<td>Tourist Trajectory, Bus Trajectory</td>
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<td>C</td>
</tr>
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</table>
Regional Data Platform

RDP collects RD from various data owners, and transforms the collected RD, to the symbol data by using intelligent information processing, distributes the symbol data.
Smart Tourism Definition

- Tourism supported by **real-time and personalized** tourism services based on **a list of required services** in a destination with **use of intelligent information processing**, and **regional data** (RD) collected in the destination for **promoting on-site experiences of tourists** and **coexistence with inhabitants and tourists**.
Conclusions

• This paper propose new standard concept for developing smart tourism services in the destination from the viewpoint of informatics.

• List the issues for collecting data required for smart tourism.
• Newly define the smart tourism from the viewpoint of informatics.

• Propose the concept of smart tourism portfolio.
Future Work

• Make tourism service portfolio.
  – Tourist Services Benchmarking among destinations internationally.

• Privacy issues.
• TAP maker issue.
• Data ownership.
• Business model.
• Etc…
• Appendix
Smart Service Requires Regional Data

Regional Data (RD)

Dynamic Data
- ex. GPS

Statistical Data
- Statistically Integrated

Static Data

- The dynamic data show real-time and individual condition of an object that changes in short time, and are available accordingly in short time, less than 2-3 hours in general.

- The static data show individual status of an object that does not change in long time, and the object is mainly environmental object. The average temporal range is generally long.

- The statistical data are integrations of dynamic data like a number of tourists who visit a destination.
## Regional Data

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<thead>
<tr>
<th>Type</th>
<th>Data</th>
<th>Global Attribute</th>
</tr>
</thead>
</table>
| **Dynamic Data** | ● Tourist location  
                ● Sales transaction  
                ● Surveillance camera  
                ● Transportation status  
                ● SNS post  
                ● Climate  
                ● Transportation (Taxi, Bus, Train, etc)  
                ● Disaster alert | ● No  
                         ● No  
                         ● No  
                         ● No  
                         ● No  
                         ● No  
                         ● No  
                         ● No |
| **Static Data**  | ● Event  
                ● Public facility (Toilet, AED, Police, etc)  
                ● Tourist spot data  
                ● Time schedule  
                ● Road network  
                ● Geographical map | ● No  
                         ● No  
                         ● No / Yes  
                         ● No / Yes  
                         ● Yes  
                         ● Yes |
| **Statistical Data** | ● Tourist statistics  
                         ● Population statistics  
                         ● Weather statistics  
                         ● Sales statistics | ● Yes  
                                                   ● Yes  
                                                   ● Yes  
                                                   ● Yes |

Recently Publicized as Open Data

Traditionally Publicized as Open Data
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<tr>
<td></td>
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</table>

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**Traditionally Publicized as Open Data**

**Difficult to collect**
Issues of Data Collecting

• Ownership
  – Data has measured and collected by various owners.
  – Data holder has motivation to keep the data inside.
    • Probe car data ➔ Car navigation, auto maker
    • Location data ➔ mobile carrier
    • Surveillance camera ➔ Retail, rail

• Data Giant (Google, Apple, Facebook, Amazon)
  – They collect dynamic data via services.
  – They play leading role in developing smart services.

• New smart service providers try collecting RD independently, but can collect too small number of RD to machine learning.

• Easy access to RD promotes smart services.