Application for e-Tourism: Intelligent Mobile Tourist Guide

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Motivation: Smartphones can Help the Tourist.

- There are more than 700 million smartphones with active iOS and Android OS*.
- Global Mobile data traffic is growing rapidly last years*.
- Tourism has manifested as one of the most well suited sectors to mobile technology and mobile applications
- German Apple Store accounted around 780,000 apps and 36,000 travel apps (category Travel) representing a market share of 4.62% of all available apps*.

Introduction: Major Touristic Problems

- Main Problems
  - Information about public transport
  - Ridesharing possibilities
  - Information and recommendation of interesting places
  - Provide the tourist text and graphic descriptions

- Tourist Support
  - Pre-travel phase, that provides range of services to facilitate travel-related information search;
  - Travel phase, that provides the tourist real-time information about the destination (interesting places, transportation possibilities);
  - Post-travel phase, try to get feedback from the tourist for improvement the system recommendations in the future.
Introduction:

Summary

• Development of mobile applications that can recommend and provide information about interesting for the tourist attractions nearby and recommend of transportation means to reach them taking into account current situation in the location region and the tourist preferences is an actual task with good business potential.
# Introduction: Classification of Mobile Travel Applications

<table>
<thead>
<tr>
<th>Online Bookings</th>
<th>Information Resources</th>
<th>Location Based Services</th>
<th>Trip Journals</th>
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<tbody>
<tr>
<td>Car Rental</td>
<td>Airport Information</td>
<td>Map &amp; Navigation</td>
<td>Travel Management</td>
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<tr>
<td>Train, Cruises</td>
<td>Flight Tracking</td>
<td>Travel Security</td>
<td>Travel Expense</td>
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<td>Airlines</td>
<td>Destination Country/Region</td>
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<td>Taxi</td>
<td>Public Transport</td>
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<td>Online Travel Agency</td>
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<td>Last-Minute Hotel Booking</td>
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<td>Travel Guides</td>
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<td></td>
<td>Hotel &amp; Hotel Chains</td>
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<tr>
<td></td>
<td>Tour Operators</td>
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Intelligent Mobile Tourist Guide: General Description


Based on Smart-M3 information sharing platform

1000+ downloads in Google Play
Intelligent Mobile Tourist Guide: System Architecture

Smart Space-Based Interaction

Tourist Mobile Device

- Client Application
- Tourist Context

Other Devices in Smart Space

- Attraction Information Service
- Recommendation Service
- Region Context Service
- Public Transport Service
- Ridesharing Service
Intelligent Mobile Tourist Guide: Smart-M3 Platform

- Smart-M3 includes:
  - SIB: Devices and software entities (applications) can publish their embedded information for other devices and software entities through simple, shared Semantic Information Brokers.
  - The interface for managing information in the SIB is provided by Knowledge Processors (KP)
  - The understandability of information is based on the usage of the common RDF ontology models and common data formats.

- Smart-M3 allows user KP to:
  - add,
  - remove,
  - change, and
  - subscribe, on information in SIB.

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**Diagram:**

- Application
- Smart Space
- Knowledge Base (RDF Store)
- RDF Ontology
- Ontology Matching
- KP

...
Intelligent Mobile Tourist Guide: Ontology for Services Interaction
Intelligent Mobile Tourist Guide: A System Scenario

Acquiring the tourist location

Generate list of attractions around location and recommends the tourist the best one

The tourist can see description and photos of an attraction and confirm the visit

Provides the tourist information in the attraction

Navigate the tourist to the attraction with the chosen transport

Propose the tourist transportation means
Live Scenario

**Tourist**

**Pick up point**

**Drop off point**

**The Hermitage Museum**

**Transportation Service**

*Pick up tourist and go to the museum with driver.*
Implementation & Evaluation: Intelligent Mobile Tourist Guide - TAIS

Okayama Castle is a Japanese castle in the city of Okayama in Okayama Prefecture in Japan. The main tower was completed in 1597, destroyed in 1945 and replicated in concrete in 1966. Two of the watch towers survived the bombing of 1945 and are now listed by the national Agency for Cultural Affairs as Important Cultural Properties.

In stark contrast to the white "Egret Castle" of neighboring Himeji, Okayama Castle has a black exterior, earning it the nickname. (The black castle of Matsumoto in Nagano is also known as "Crow Castle", but it is karasu-jÅ in Japanese.)
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In stark contrast to the white "Egret Castle" of neighboring Himeji, Okayama Castle has a black exterior, earning it the nickname "Crow Castle" (烏城, karasujō). (The black castle of Matsumoto in Nagano is also known as "Crow Castle", but it is karasu-jō in Japanese.)
What Happens if We Have More Online Tourists

<table>
<thead>
<tr>
<th>Characteristic name</th>
<th>Characteristic value</th>
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<tbody>
<tr>
<td>Host operation system</td>
<td>Windows Server 2008</td>
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<tr>
<td>Hypervisor</td>
<td>Hyper-V</td>
</tr>
<tr>
<td>Virtual operation system</td>
<td>Debian 7.6 64 bit</td>
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<tr>
<td>RAM</td>
<td>1.4 Gb</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel Xeon CPU E5620 @ 2.4 GHz</td>
</tr>
<tr>
<td>Allocated CPU cores</td>
<td>1</td>
</tr>
<tr>
<td>Network Type</td>
<td>Ethernet</td>
</tr>
<tr>
<td>Network Speed</td>
<td>1000 Mbit/s</td>
</tr>
</tbody>
</table>

![Graph showing the relationship between tourists count and time, with a blue line indicating the actual data and a red line showing the trend.](chart.png)
Conclusion

- Intelligent Mobile Tourist Guide – TAIS has been successfully developed in the scope of ENPI cross-border collaboration project between Europe and Russia.
- The application has been a recommended walking guide for the last two Open Innovations Association Conferences FRUCT (www.fruct.org).
- The application is based on smart space technology that allows to simply integrate and use new services.
- The main differences of the presented application from existing is extraction of information about attractions from accessible internet sources taking into account current situation and the tourist preferences. That allows the tourist to get up-to-date information and does not require to download attraction database before the trip.
Thank you for Attention. Questions are Welcome

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