i-Tour
intelligent mobility in an urban context
i-Tour project overview

**Project acronym:** i-Tour

**Project full title:** *intelligent Transport system for Optimized URban trips*

**Grant agreement n°:** 234239

**Grant Agreement for:** Collaborative Project – Small of medium-scale focused research project

**Funding scheme:** Seventh Framework Programme (FP7) – Activity code “SST.2000.3.1.2 Intelligent mobility systems and multi-modal interfaces for transport of passengers”

**Duration:** 36 months

**Website:** www.itourproject.com
## Partners’ competencies

<table>
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<tr>
<th>Organisation</th>
<th>Competencies</th>
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<tbody>
<tr>
<td>Fondazione Graphitech</td>
<td>• Computer graphics, human-computer interaction, geo-visualisation, visual analytics</td>
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<tr>
<td>Eindhoven University of Technology</td>
<td>• Multimodal transport modelling, travel optimisation through user preference, dynamic re-scheduling</td>
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<tr>
<td>University College London</td>
<td>• Trust, virtual communities, recommender systems</td>
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<tr>
<td>PTV AG – Traffic Mobility Logistics</td>
<td>• Traffic, mobility, logistics</td>
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<td>MAGMA / ULA</td>
<td>• Natural Language Interface for geographical systems</td>
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<td>Formit Servizi SpA</td>
<td>• Consultancy in the field of ICT and public administrations, project management</td>
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<td>Cadzow Communications Consulting Ltd.</td>
<td>• Security, privacy, TVRA (Threat, Vulnerability, and Risk Analysis)</td>
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<td>ELASIS / FGA</td>
<td>• Mobility systems and road safety</td>
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<td>FORMIT Foundation</td>
<td>• Business planning, exploitation, patenting and licencing, definition of business incubators</td>
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Project Stakeholders Board

Circumvesuviana

Provincia Autonoma di Trento

Provincia di Bologna

Transport for London

Talisaur

Thales

TTS Italia

Provincia di Napoli

OCiGESt

algorab

Sincro Consulting

i-Tour project overview
Main goals of i-Tour

• **Objective 1**: Reliable and secure data collection and access

• **Objective 2**: Modular infrastructure based on standard open technologies

• **Objective 3**: Personalised multi-modal transport information system

• **Objective 4**: User friendly personalised travel information systems

• **Objective 5**: Identification of new business models based on real-time personalised LBS
How to achieve these goals?
Thorough the development of Location Based Services (LBS)
What are Location Based Services?

• A location-based service (LBS) is an information and entertainment service, accessible with mobile devices through the mobile network and utilizing the ability to make use of the geographical position of the mobile device.

• LBS services include services to identify a location of a person or object, such as discovering the nearest banking cash machine or the whereabouts of a friend or employee.
Location Based Services Social Networks

The importance of local Knowledge

- Updated
- Maintained
- Reliable if trust management is ensured

i-Tour project overview
Web 2.0 and geospatial technology convergence

i-Tour project overview
i-Tour features

- Open Source
- For Mobile Use
- Private and Public Transit Option
- Interfacing Databases of Transport Service Providers
- Integrated Multimodal Option
- Navigator / Routing Features
- GPS Locator / Location Based Service
- Real-time Updates
- Recommender System on Routing Choices
- Routing Options Comparison (price, traffic, weather, etc.)
- POI Information
- User Feedback
- Serious-game interface
- Natural Language Interface
- Environmental Consciousness
- Rewarding of Eco-Friendly Behaviour
## Scenario analysis

<table>
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<tr>
<th>Open Source</th>
<th>Integrate Databases of Transport Service</th>
<th>Intelligent Multimodal Option Providers</th>
<th>Navigator / Leather Based Service</th>
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Objective 1: Reliable and secure data collection and access

- From transport operators
- From users
- From other channels
Naples test site

- Provincia di Napoli
- Alilauro
- Autostrade Meridionali
- Circumvesuviana
Goal: ensuring harmonised access
Advanced data collection techniques

• Transport load prediction systems using cameras, to be installed at designated train platforms from Circumvesuviana, to automatically detect crowding levels.
Advanced data collection techniques
From consumers to prosumers of information

Community’s knowledge

Shared repository

Local knowledge

Trust management system

Trustworthy Local knowledge

i-Tour project overview
Security and privacy

• Approach similar to other social networks e.g. Wikipedia

• Huge problems of security and **privacy**:
  – Time
  – Position of the user
  – Personal preferences

**Privacy Threat Vulnerability and Risk Analysis**
Novelty

• The i-Tour data model is a first example of definition of a unique process to treat different types of transport and traffic data in a harmonised manner.

• The application provides an innovative solution based on the use of video analysis systems.
Objective 2: Modular infrastructure based on standard open technologies
Main issue

• Lack of interoperability in terms of:
  – Information (data structure)
  – Infrastructure (services)
  – Data Formats (protocols)
The multi-level architecture SDI of i-Tour
Each component of the infrastructure becomes a service
Novelty

• Full delegation through SOA

• Intrinsic **scalability** through support of OGC standards

• Extended OpenLS interface (to cater for Multimodal Trips & recommendations)
Objective 3: Personalised multi-modal transport information system
Multi-modal routing services

- Capable to **adapt to the user preferences**
  - Travelling style
  - Agenda & booking
  - Weather

- **Respond** adequately to **real-time events** through proper re-scheduling
  - unforeseen travel
  - a meeting went on longer than expected
  - bumping into a friend

- Capable to adapt to **real time external conditions**:
  - Public infrastructure load
  - Traffic condition
  - Transport network status

i-Tour project overview
Novelty

• Routing system
  • **Multimodal** – private vehicle and public transport
  • **Multi-criteria**
  • **Personalized** advice
  • **Self-learning** of user preferences

• Activity scheduler
  • Integration of alert and recommendation function with routing system

• System consequences
  • More **sophisticated emission modelling**
  • Monitor of actual behaviour and feedback to the learning system
Objective 4: User friendly personalised travel information systems
User-friendly mobility clients

- user-friendly mobility clients
  - public i-Tour portal
  - Smartphones or PDAs

- 3D client as Java WebStart

- Mobile client based on Android
LBS and natural language interaction

POSITION + “show me the nearest Indian restaurants where I can pay with credit card”

“FuLL” (Fuzzy Logic and Language)

Spatial data

SQL query

Geospatial repository

human language parsing technologies

results

i-Tour project overview
Promote rewarding mechanisms

• defining **rewarding mechanisms** for citizens opting for travel choices with positive impact on climate change

• by promoting forms of **incentives** that can raise the level of public awareness

• **informed of the Kg of CO²** or the amount of PM emission saved

• create reward schemas
Novelty

• Dialogue-based communication through natural language
• Interface adaptability through ambient intelligence
• Promotion of sustainable travel patterns through serious games as LBS
• Integration of ITS with serious game engine to motivate users towards sustainable travel patterns
• Recommender System
  – diversity of recommendations (surprise users with new results each time)
  – bootstrapping (how to cater for new users for whom we know no preferences)
  – application of recsys technique outside classic LBS (for example, recommending what travel-card to purchase)
• Access control (people as sensors) use of crowd-sourcing
• Virtual community analysis
Objective 5: Identification of new business models based on real-time personalised LBS
Target market

**Targets** could, therefore, be identified among the following categories:

- *Information technology and web companies*, (e.g. Google, Nokia, Microsoft);
- *Application distribution platform* (e.g. Google Play, Appstore);
- *Telco operators* (e.g. Vodafone);
- *Local administrations and transportation management bodies*;
- *Central procurement bodies* (e.g. Consip in Italy);
- *IT outsourcing companies* (e.g. IBM);
- *Services providers via web* (e.g. transport info, road network, weather) (e.g. Viamichelin)
Business plan discussion

**Marketing plan – three options**

<table>
<thead>
<tr>
<th>Institutional configurations</th>
<th>Business strategies</th>
<th>Institutional configurations</th>
<th>Business strategies</th>
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<tbody>
<tr>
<td>a) A new company representing the present consortium so as to go to market maintaining capacity and opportunity to manage the innovation process</td>
<td>1) Market the entire system (server + data exchange interfaces, and sell assistance for system use)</td>
<td>a) A strong partner (or more than one, per each European country or group of EU countries) for industrialisation, placement and assistance</td>
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<td>2) Market server access and interfaces configuration (exclusive and non-exclusive licence, on a territory base, and sell assistance for system use)</td>
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<td>3) Market the system as an app (through application stores)</td>
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Project Stakeholders Board membership

We are interested in your opinion and we consider with the utmost attention new memberships.
Acknowledgments

The research leading to these results has received funding from the European Community’s Seventh Framework Programme (FP7/2007-2013) under the Grant Agreement n.234239.

The authors are solely responsible for it and that it does not represent the opinion of the Community and that the Community is not responsible for any use that might be made of information contained therein.
Thank you for your attention!

i-Tour website
www.itourproject.com

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