TWIST – Tourism Wide Infrastructure supported by Satellite Technology

Satellitengestützte touristische Infrastruktur

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Zusammenfassung:
Informations- und Kommunikationstechniken haben für viele menschliche Aktivitäten an Bedeutung gewonnen, so auch im Tourismus mit Millionen von täglich durch die Welt reisenden Menschen. EGNOS und in näherer Zukunft auch GALILEO bieten die Grundlagentechnologien für die Implementierung innovativer Dienste und Anwendungen in das Konzept der „Personal Info-Mobility", bei dem den Touristen Daten und Informationen standort- und objektbezogen effizient und auf Anforderung zur Verfügung gestellt werden. Dabei werden aktuelle Position und Bedürfnisse der Touristen berücksichtigt. Das TWIST-Projekt wird durch die europäische GNSS-Aufsichtsbehörde mit Mitteln des 6. Rahmenprogramms der EU gefördert. Unter Einbeziehung von Mobile-Computing, GNSS, Web-Sevices und anderen neu entstehenden Technologien sollen Grundbedürfnisse der Touristen mittels Bereitstellungs- und Abfrage-Diensten befriedigt werden: auf passende Informationen zugreifen, Zeit sparen, die eigene Sicherheit erhöhen.

Abstract:
Information Communication Technologies have become of great importance for many human activities: one of these is represented by tourism, involving millions people moving around the world every day. EGNOS, and in the near future GALILEO, represent enabling technologies for the implementation of innovative services and applications related to the concept of "Personal Info-Mobility" where information and data, regarding the territory and its resources, can be efficiently provided on-demand to the tourists, taking into account their current position on the territory and their needs. TWIST Project is managed by the European GNSS Supervisory Authority through EU 6FP funds, and aims, by mean of the integration of Mobile Computing, GNSS, Web Services and other emerging technologies, at satisfying the main needs of a tourist providing it with pull and push services able to make it: access the Right Information, save Time and enhance its personal Safety.

What is TWIST ?

The fruition of the Cultural Heritage show evidence of a growing importance in the European society, particularly rich of Cultural Assets, demanding a rising attention to the theme.

The European Commission gives high importance to the subject, promoting actions for improving the understanding and dissemination of the culture and history of the European citizen, making Cultural Heritage increasingly available and accessible.

The innovative idea behind this project is to help the tourist while doing a cultural visit to easily get the right information at the right time and in the right place, by providing him/her with a set of innovative applications and services based on EGNOS signal and integrated with other emerging technologies like: Mobile Computing, Web Services, Intelligent Agents, RFId (Radio Frequency Identification) and Digital Watermarking (for DRM issues).

The service provision relies on a software infrastructure, specifically designed for secure info-mobility applications, in which a Service Control Centre and a Web Portal, integrated with external

Content Providers via Web Services, provides on-demand and located contents to mobile Users Terminals for Tourists.

Objectives

The TWIST Project aims at satisfying needs related to Cultural Heritage fruition in different contexts (indoor and outdoor), both by the point of view of cultural tourists and of owners of Cultural Assets.

Overall goal was to realize and demonstrate live a proof of concept to validate the exploitation of EGNOS and the other emerging technologies in personal info-mobility applications for cultural tourists, facilitating their transfer into the market.

In particular, with regard to information extraction and provision, the most important objectives were:

- To provide the user with information contextual to his/her location in the most reliable way, by mean of a proximity function taking efficiently advantage of the valuable characteristics of the EGNOS signal;

- To provide the user with information that could be stored locally on the mobile terminal, but that could also be stored remotely on a Content Provider and provided via the Internet through a Web Service, thus realizing a decoupling between tasks related to data management and data provision, and increasing the amount of information that can be provided on mobile devices (such as PDA or smartphone) connected to the Internet.

As a long term objective, TWIST intends to facilitate the visit of tourists by providing information both on cultural assets and on logistic issues (public transports, events, accommodations), thus facilitating the user in the deployment of a complete visit to: a City, a Museum or an Archaeological Area.

The System

The project objectives have been accomplished and demonstrated through the development, the integration and the demonstration of a system composed of:

- a Service Control Centre: providing messaging functionalities between linked mobile terminals, and providing emergency services for the users;

- a Client: realizing the real multimedia guide for the user, a sort of electronic "Cicerone";

- a Web Portal: by mean of which the user can register to the service and specify his/her specific preferences,

- a Web Service: for the provision of information on points of interest via the Internet, and

- a specific software solution: providing, via the Internet, images optimized for the visualization on mobile terminals and representing details of cultural assets high definition images.

The system was able to operate transparently both in outdoor and in indoor environment, providing the user with a smooth transition between the two, and, in both contexts, providing the user with multimedia information (audio, text, images) related to cultural assets close to the user location, or directly chosen by the user.

Moreover, information on cultural assets and other type of points of interest could be provided via Internet by a Web Service, in a transparent way with respect to the user.

In particular, applicative benefits brought by TWIST System are:

- Integration of geo-referenced, multimedia, interactive, personalized and heterogeneous information, that will reach the tourists along their "Regional" or "City" journey, taking into account their actual location.

- Harmonization of domain contents over multiple distinct Content Providers, by the use of a Domain Ontology.

- ⑩ Distribution of Domain information in push mode (unsolicited by the User but coherent with its profile location and visiting context) and pull (upon User request) mode.
- ⑩ Personalization of information brought to the tourists, with respect to their needs and their specific "profiles" (language, habits, preferences, interests etc.).
- ⑩ Authentication of multimedia contents by Digital Watermarking technologies.

Technical Information

Both in the outdoor and in the indoor environment, information on points of interest could be retrieved locally on the terminal, or remotely via the Web Service: in the second case, specifically in the outdoor environment, the info retrieving application had to manage spatial researches based on the geographic information sent by the user terminal.

While a common ADSL connection was used to forward requests to the Web Service and to get back the results, GPRS was the communication channel used to connect the client application to the service control centre and to allow all the transfers of information between the client and the server.

While GPS with EGNOS correction was used to locate the user in the outdoor environment, and, thus, to provide him/her with location contextual information, RFId technology was used in the indoor environment to

identify the different cultural assets and the rooms in which they were hosted (simulating the real operas), and get from the service control centre the multimedia information (floor plan, audio or textual description of the operas) related to the object the RFId tag was attached to.

Schedule

- Starting date: September 2005
- Duration: 12 months
- Project Phases: Preliminary Activities, Implementation, Transfer of Technology
- Demonstration in Florence (Italy)

Consortium

The TWIST Project Consortium is composed of four SMEs that represent a significant portion of the Value Chain, with a strong experience in National and International Research projects, with specific technological expertise in: system development, complex software infrastructures, mobile user terminal computing and communication, data and information service provision and images elaboration and DRM.
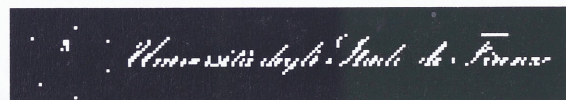
TWIST Screenshots

The following figures show, from left to right: Vector Map Panel visualizing a pre-defined tour; Main Menu; Uffizi Museum POI logistic information; Uffizi Museum POI description; Tour Type Selection Menu; Indoor POI description.