A virtual assistant for e-Tourism

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Motivations and Goals

- The tourism industry is **rapidly evolving**
- Increasingly people prefer to plan **personally** their own tours
  - Visit **several** websites to make all necessary reservations
  - Typing personal data and **waiting** for confirmation
  - **Multiple payments**
- **Virtual assistents** as solution to offer personalized services to users through a **single system**
- **Integration** with e-tourism services provided by Smart Cities

Planning a Trip

Flight Ticket

Car Rental

Hotel

Guided Tour

Museum

Restaurants

Events

Recommender Systems

- Useful for delivering correct and accurate information
- Support for **choosing** products, services, events and places to visit, according to **user interests**
- Suggestions offered on the basis of **user profiles** and resources' features
- User profiles built by observing and analyzing their **previous choices**
- **Data Mining** techniques

Recommender Systems

- **Quality** of the suggestions closely related to the **precision** with which resources and user preferences are described

- It is necessary to include **meta-data** and **semantic** information inside web pages

- **Goal**: Describe the **relationships** between the concepts

- **Solutions**: Semantic web & ontologies

Technological Issues for Tourism Industry

- Dichotomy between tourism portals and the rest of the Internet
  - Tourism portals offer **static** offers
  - **Fragmented** information from the rest of the Internet
- Main Issue: **lack of standards**
- **Goal**: interoperable systems
- **Solution**:

Semantic Web

"The Semantic Web is not a separate Web but an extension of the current one, in which information is given well-defined meaning, better enabling computers and people to work in cooperation."
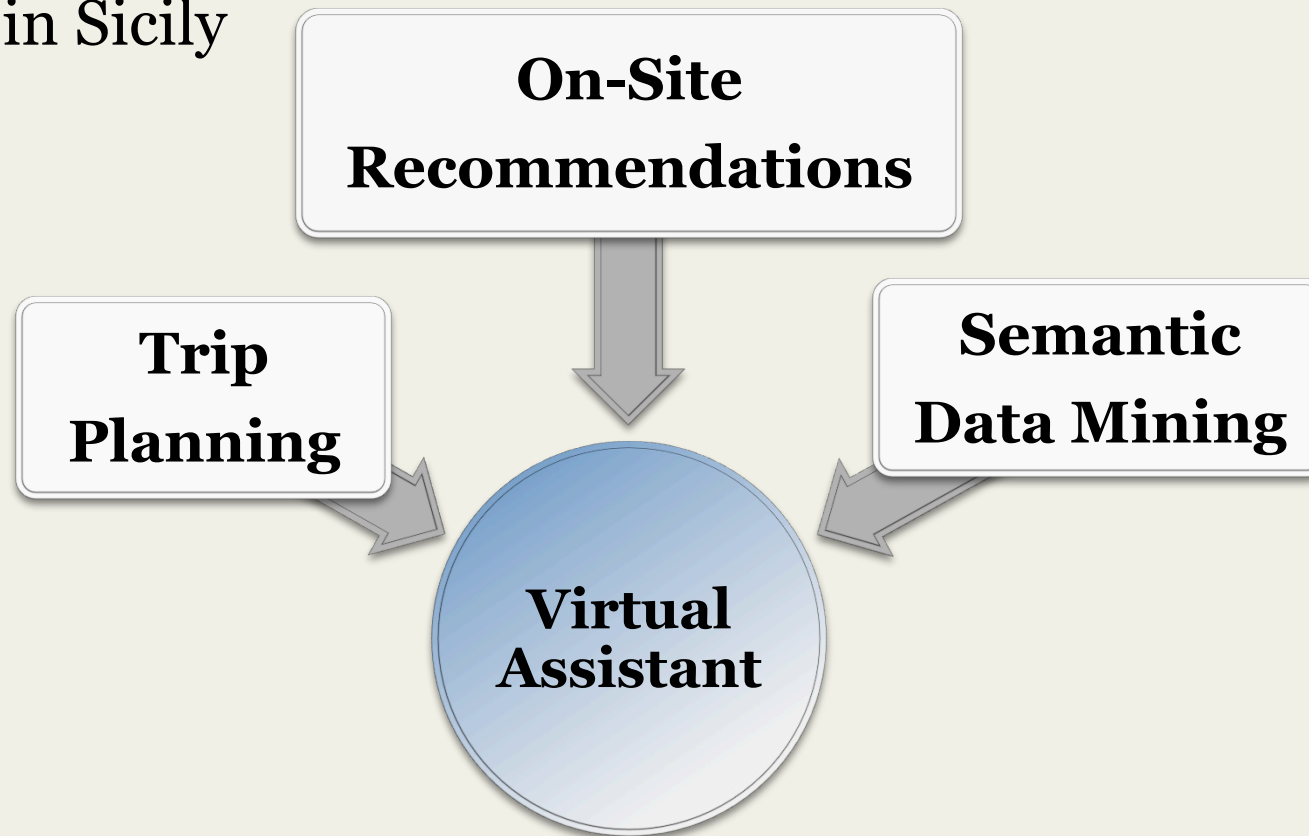
Tim Berners-Lee, James Hendler e Ora Lassila

- Documents enriched with metadata

- Intelligent software agents

- Automatic information processing

Past Experience

- POR FESR SICILIA 2007-2013, "**On-Sicily**" for the realization of a virtual assistant for improving the tourism industry in Sicily

On-Site Recommendations

Trip Planning

Semantic Data Mining

Virtual Assistant

Virtual Assistant

- Effective if semantic web technologies are adopted by several actors
- Continuous interaction with the user via smartphone and mobile devices for on-line modifications of trip plans
- Aritificial intelligence for adapting to needs of different users

Semantic Data Mining

- **Recognize** the users' profile on the basis of their use of the application
- **Merge** information about the users, collected when they **interact** with websites

| Data Gathering and pre-processing | → | Pattern Recognition | → | Pattern Analysis |

Technological issues

- Issues dependent on the tourism sector
  - Lack of standards
    - Adopted systems are not interoperable
    - Different terms for same concepts
    - Lack of structured information (only natural language)
  - Possible solutions: Ontologies
    - Bridge between different models
    - Unified terminology
    - Wrapper for obtaining structured knowledge from non-structured web pages

Technological issues

- Integration with museum and cultural web services
- Continuity of user experience
- Interaction with pervasive systems deployed in sites of interest

Technological issues

- Integration with museum and cultural web services
- Continuity of user experience
- Interaction with pervasive systems deployed in sites of interest
  - **Bluetooth Beacons**
    - Low energy devices
    - Broadcast their ID
    - Enable mobile app to provide the user with location-aware services

Technological issues

- Integration with museum and cultural web services
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- Interaction with pervasive systems deployed in sites of interest
  - Bluetooth Beacon
  - **NFC** (Near Field Communication)
    - Proximity Bi-directional communication
    - Philips, LG, Sony, Samsung, Nokia

Technological issues

- Integration with museum and cultural web services
- Continuity of user experience
- Interaction with pervasive systems deployed in sites of interest
  - Bluetooth Beacon
  - NFC
  - **QRCode**
    - Optical label
    - Store information such as URL
    - Scanned by smartphone camera

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