Enhancing the intelligence of IoT applications using Semantic Web technologies

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This presentation is for

☐ Workshop 4 internet of Things
Description of the Organization

- François-Rabelais Tours University
  - Multidisciplinary University of about 22000 students

- Computer Science Laboratory
  - 39 Associate- and Full- Professors
  - 3 research teams.
    - Databases and Distributed Systems team
    - Pattern Recognition and Image Analysis
    - Optimisation and transport
  - Experience in regional, national and EU projects.

- Center Loire Valley – Touristic Region
  - Castles, gardens, museums, etc.
  - The region supports projects related to tourism: e.g., SmartLoire
Description of the your research interest

• Research interests
  – Internet of Things (IoT)
  – Automatic reasoning techniques and the semantic Web
  – Data and applications integration using Web services technologies

• Experience
  – SmartLoire : IoT and Semantic Web for Smart Tourism
  – Regional founded project

• Collaboration
  – With European and Turkish researchers and SME in the context of Horizon 2020 related calls
IoT-03-2017: R&I on IoT integration and platforms (1/2)

• Project: Enhancing the intelligence of IoT applications using Semantic Web technologies

• Motivation: current IoT applications
  • are mainly focused on sensors
  • lack of semantics and automation in a dynamic open Web of Things where “things events” can appear or change at every moment

• Objectives: bring
  • a semantic layer to IoT applications
  • dynamicity and automation by taking profit from the semantic Web and the semantic Web services experiences
IoT-03-2017: R&I on IoT integration and platforms (2/2)

• Expected results:
  • propose knowledge representation formalisms to semantically describe “things events”
  • propose reasoning techniques to dynamically manage (discover, use, aggregate, replace, etc.) “things events”
  • take into account interoperability (syntactic and semantic) and scalability concerns to easily reuse and integrate IoT applications
  • take into consideration non-functional aspects: privacy, security and QoS

• Project validation: a Mobile application that helps a tourist to
  • dynamically access, reuse and aggregate semantic touristic information from sensors and services (airports, hotels, touristic area, etc.)
  • find the best itinerary (program) based on different information (schedule of public transportation, description of touristic area, meteorological information, geocoding operations, etc.)
  • find solutions to unexpected events
  • satisfy her/his preferences and constraints
  • enhance her/his user-experience by gathering and analyzing IoT devices data
## Consortium - profile of known partners

<table>
<thead>
<tr>
<th>No</th>
<th>Partner Name</th>
<th>Type</th>
<th>Country</th>
<th>Role in the Project</th>
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<tbody>
<tr>
<td>01</td>
<td>University of Manchester</td>
<td>RTD</td>
<td>UK</td>
<td>Privacy/Security: Tackle security, confidentiality and ethics problems</td>
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<td>Mobile Application Development: Take into account design and development aspects of</td>
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<td>the mobile application (presentation layer) and non-functional considerations</td>
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<td>(ergonomics, esthetics, referencing problems, etc.).</td>
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<td>02</td>
<td>Korgün</td>
<td>SME</td>
<td>Turkey</td>
<td>Querying interface: Video questions&amp;answers and recommandation</td>
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<tr>
<td>03</td>
<td>Netaş</td>
<td>SME</td>
<td>Turkey</td>
<td>Propose adequate smart knowledge/representation &amp; reasoning techniques (Semantic Web</td>
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<td>on an open Web of things) to dynamically and automatically find, reuse and aggregate</td>
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<td>adequate touristic “things events” to tourists requests.</td>
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<tr>
<td></td>
<td>François-Rabelais Tours University</td>
<td>RTD</td>
<td>France</td>
<td>Propose solutions to semantic interoperability using use cases and conflict resolution</td>
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<td>Tackle scalability problems</td>
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## Consortium - required partners

<table>
<thead>
<tr>
<th>No</th>
<th>Expertise</th>
<th>Type</th>
<th>Country</th>
<th>Role in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Smart sensors</td>
<td>IND</td>
<td>EU Member or associated country</td>
<td>Propose smart solutions to produce and communicate data using different smart sensors (cameras, lights indicating touristic area, sensors indicating number of parking place, etc).</td>
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<tr>
<td>02</td>
<td>Web services, SOA, cloud computing</td>
<td>SME</td>
<td>EU Member or associated country</td>
<td>Implementation of Web/Cloud services publishing different types of reusable data in a service oriented computing paradigm.</td>
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<tr>
<td>03</td>
<td>Web/Mobile Marketing</td>
<td>IND</td>
<td>EU Member or associated country</td>
<td>Promote the developed mobile application, establish a business model, etc.</td>
</tr>
</tbody>
</table>
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