Cognitive Service Provision

Makis Stamatelatos
makiss@di.uoa.gr
University of Athens

eMobility – WG4: Mediation Bus for Ubiquitous Services
The Future internet service provision landscape

• **Outline**
  
  — Types of Services
  
  — Future Internet Evolution
    - Key characteristics of the Future Internet
  
  — Future Internet Service Provision
    - Service Provision essentials within the Future Internet ecosystem
  
  — Example: ontology based Service representation and selection
Types of Services

• **Network Service Provision**
  — network connectivity (to a given type of RAT)

• **Application Service Provision**
  — includes multimedia services, games, etc.
Future Internet Evolution

• Integration of heterogeneous and mobile networks – Mobile Internet.

• Power/bandwidth efficiency.

• Variety of service delivery modes (uni-, multi- and broadcast).

• No more one person-one device but more likely one person-many devices and device-to-device communications.

• Cross layer (spectrum, network) operation.

• Autonomic concepts: self-organisation, network self-management and QoS management.
Future Internet Evolution

• Services networking; multi-modal services; flexible billings.

• New architecture with self-management capabilities supporting multi-domain and be wireless-friendly (i.e. to be energy and spectral efficient and be capable of supporting a variety of wireless networks, from very low power sensor networks to wide area mobile networks).

• Introduction of cognitive capabilities in Future Internet elements.
Future Internet service provision

• The Future Internet environment should support services differently than today:
  — the service provisioning itself is expected to be transformed
  — service delivery will be knowledge based
  — services will be proactive, open and ubiquitous
  — service-networks will be formed.

• Complexity will grow
  — Service plurality will lead to new requirements on control and management of services provisioning.
  — Conflicts are likely to emerge between new ways of service provisioning and the existing limitations of the current IP networking environment.

• Vision: overcome limitations and allow for management of new levels of complexity.
Future Internet service provision

- Adoption of a general service framework, allowing the increase of the freedom degree in service offerings as well as the efficient management of complexity.

- Future service provisioning solutions will be based on personal aware communications and user behaviour patterns.

- New discovery mechanisms, personalization, guidelines on “how to use” and a recognizable party that is responsible for overall customer care.

- Optimized service-layer solution to the ubiquitous, mobile service-enabled communications.

- Embed cognition in service provision and enable knowledge based service delivery.
Example: Ontology-based Service Representation and Selection

- **Definition of profiles**
  - Service
  - User
  - Terminal
  - Network

- **Example (Service):**
  - MMS
  - Text
  - Picture
  - Audio
  - Video
Example: Ontology-based Service Representation and Selection

- Example (cont.):
- GPRS Services
  - Text
  - Picture
  - Audio
  - Video
Example: Ontology-based Service Representation and Selection

- Example (cont.)
- Reasoning:
  - GPRS Services include MMS → When connected to GPRS, user can use MMS
  - GPRS Services include GSM Services → GSM Services are a subset of GPRS Services
Thank you