

# Opportunistic networks and Cognitive Management Systems for Efficient Application Provision in the Future Internet

**OneFIT is aiming at developing and validating the vision of opportunistic networks that are managed, and coordinated with the infrastructure, by advanced cognitive systems. OneFIT leads to better services for the user and creates market opportunities for manufacturers, operators and service providers. Partners from Greece, Germany, Spain, France, UK, Finland, Poland and Serbia have come together to achieve these goals.**

## At A Glance: OneFIT

**Opportunistic Networks and Cognitive Management Systems for Efficient Application Provision in the Future Internet**



### Project Coordinator

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**Duration:** July 2010 - December 2012

**Funding scheme:** STREP

**Total Cost:** € 6,6 m

**EC Contribution:** € 3,9 m

**Contract Number:** INFISO-ICT-257385

## Main Objectives

The main objective of the project is to design, develop and validate the concept of applying opportunistic networks and respective cognitive management systems for efficient application/service/content provisioning in the Future Internet.

The main requirements defining the Future Internet, and intrinsically influencing the socio-techno-economic future of Europe, provide the motivation for the work in OneFIT:

- Demand for new applications/ services and expanded use of wireless,
- Support for diversified applications/ services,
- Need for increased efficiency in resource provisioning and utilization.

The OneFIT project also aims to:

- Elaborate on business and application provision scenarios, derive requirements and technical challenges, and provide validation criteria that will drive the adoption of opportunistic networks and respective cognitive management systems in the Future Internet era,
- Design the functional and system architecture that will address the requirements and the technical challenges.
- Develop the appropriate "Control Channels for the Cooperation of the Cognitive. Management Systems" (C<sup>4</sup>MS),
- Develop the appropriate algorithms for enabling the opportunistic networks. ("Cognitive systems for Managing the Opportunistic Network"-CMON and "Cognitive management Systems for Coordinating the Infrastructure"-CSCI functionality).

**Operator governed opportunistic networks, cognitive management systems and control channels for efficient application provision in the Future Internet**

## Technical Approach

The following technical approach is used in order to meet OneFIT's objectives:

- Scenarios on
  - Expanding the coverage of the infrastructure,
  - Resolving cases of congested access to the infrastructure,
  - Operator-governed cost-efficient localized application, service, content provision,
  - Traffic aggregation and bridging of opportunistic network with outside world,
  - Congestion handling in backhaul.
- Business aspects, requirements, evolution of functional and system architecture,
- Control channels for the cooperation of the cognitive management systems,
- Algorithms for enabling opportunistic networks:
  - suitability determination (candidate nodes and spectrum determination), creation (node and spectrum selection, routing), modification (QoS control, reconfiguration prediction) and release (applications' preservation),
- Integration, experiments and validation.

## Key Issues

The key issues that the OneFIT project will accomplish are:

- Cost efficient handling of various situations including unexpected or not-frequently occurring events,
- Lower transmission power levels, energy consumption, traffic load,
- Increased utilization of resources,
- Value creation through the support of more scenarios.

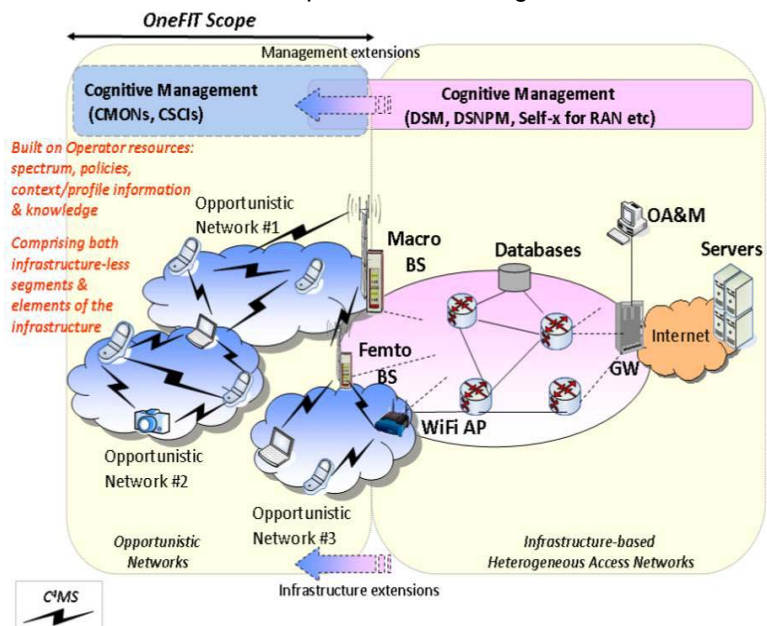
## Expected Impact

Based on the expected impact from the Objective ICT-2007.1.1 "The Network of the Future" (EC Work Programme), the OneFIT project is targeting specific contributions to:

- Strengthened positioning of European industry in the field of Future Internet technologies and reinforced European leadership in mobile and wireless broadband systems optical networks cognitive network management technologies.
  - OneFIT outcomes will shorten the time to deploy and market new services/ applications thus providing significant

benefits for mobile operators and service providers. Furthermore, OneFIT will contribute to keeping the European Research into Cognitive networks at the forefront of the global research efforts.

- Increased economic efficiency of access/ transport infrastructures (cost/bit).
  - OneFIT results are expected to have a significant impact on economic efficiency of access/ transport infrastructures (CAPEX and OPEX reduction, cost of management for customer relations).
- Global standards, interoperability and European IPRs reflecting federated and coherent roadmaps.
  - Providing extensions to the infrastructure, the techniques expected to result from OneFIT will support interoperability, the opportunistic networks will allow bridging between infrastructure and devices that would not have been able to access the infrastructure directly.
- Wider market opportunities from new classes of applications taking advantage of convergence.
  - Through the solutions of OneFIT, network operators and service providers are equipped to provide applications/ services in wide range of situations. Accelerated uptake of the next generation of network



and service infrastructures.

- Through the OneFIT technologies operators will be given the opportunity to provide and deploy a variety of new types of services in a shorter time frame.