



Cognitive Heterogeneous Reconfigurable Optical Network



Project number: **258644**

Call identifier: **FP7-ICT-2009-5**

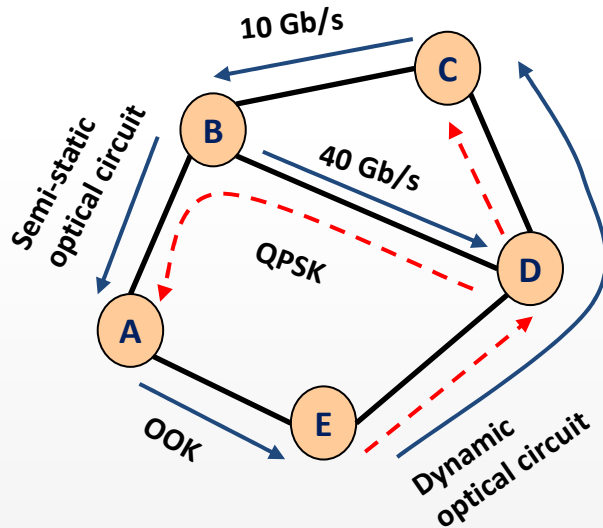
Funding scheme: **Collaborative project**

Future Networks 6th FP7 Concertation meeting, October 2010



Cognitive Heterogeneous
Reconfigurable Optical Network

Rationale for launching the project



❖ Current **optical transport networks** are facing increased levels of **heterogeneity**

- Different *transmission technologies* (coding/modulation formats, data rates)
- Different *switching paradigms* (e.g., semi-static and dynamic wavelength switching)
- Different *services* with different QoS requirements

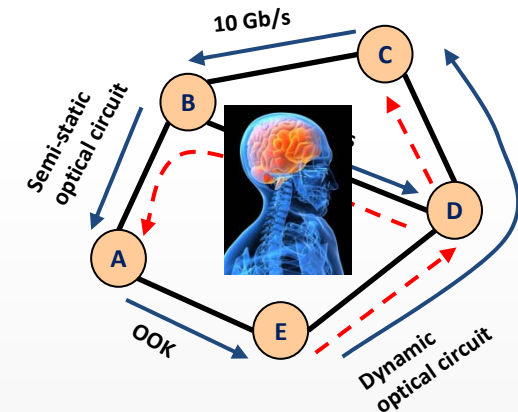
❖ **Existing monitoring and control systems are not sustainable**

How to efficiently control and manage those heterogeneous resources?

Strategy: Use of cognitive techniques

✿ What is a **cognitive** network?

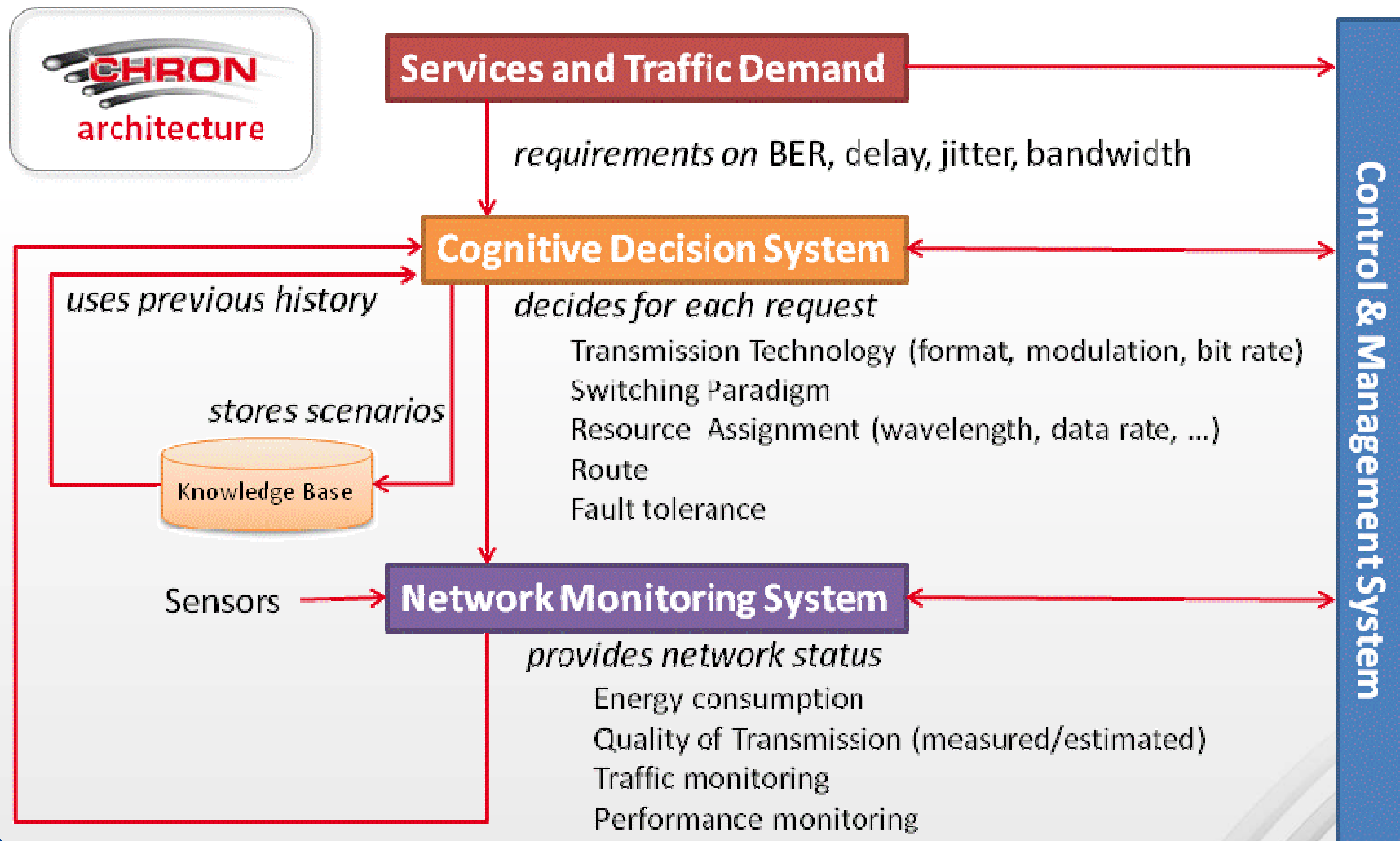
- A network which **perceives current conditions**, then **plan, decide**, and **act** on those conditions.
- A network which **learns from those adaptations** and uses them to make future decisions, taking into account end-to-end goals.



✿ Cognitive techniques are **promising for heterogeneous** environments (e.g., significant work on radio communications)

CHRON proposes the utilization of **Cognitive** techniques in **Heterogeneous Reconfigurable Optical Networks**

CHRON Architecture



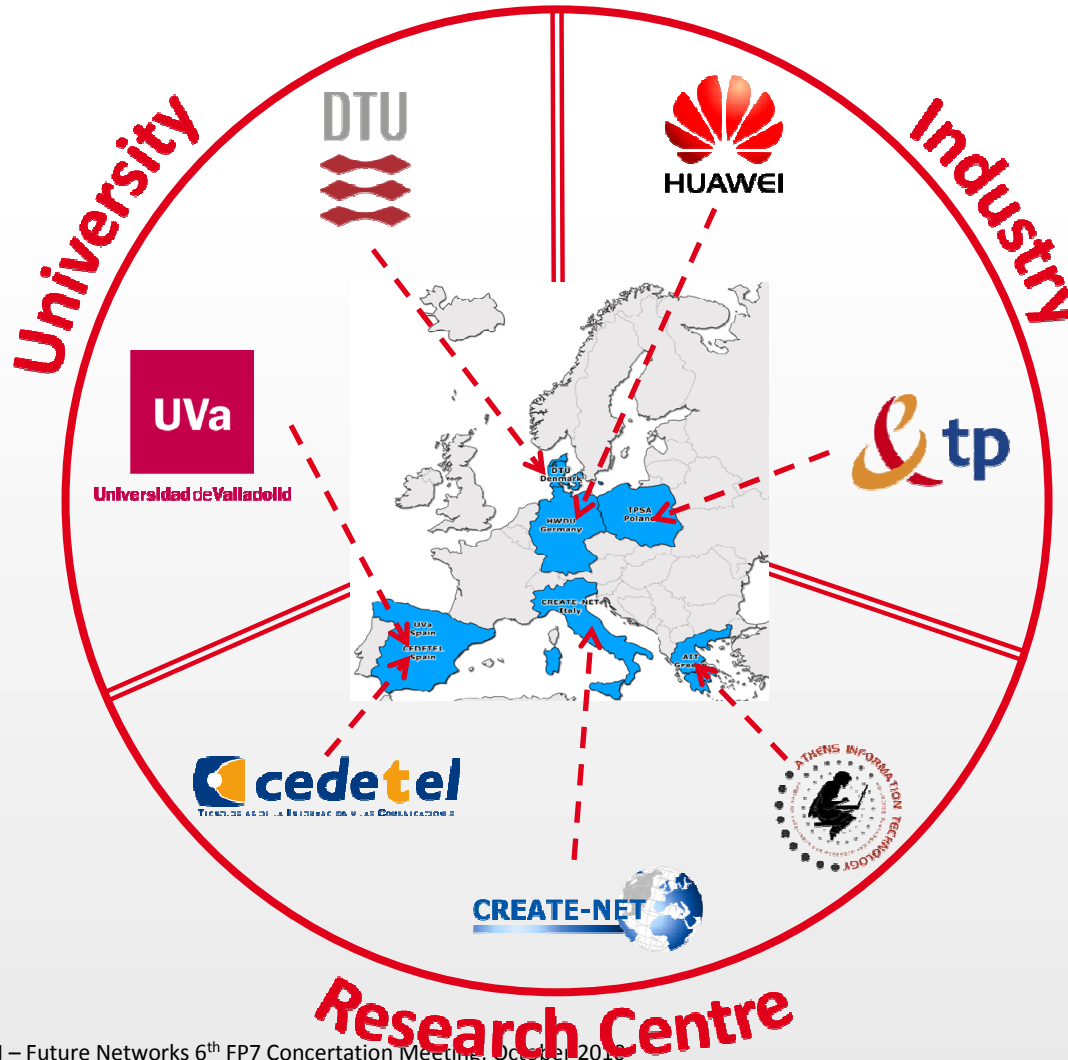
Project aims (1/2)

- ✿ To **define** an overall **optical transport network architecture with cognitive control**
- ✿ To **identify services and application scenarios** that can exploit the advantages of the architecture
- ✿ To **develop techniques** for traffic, impairment and performance **monitoring**
- ✿ To **define and implement a cognitive decision system**

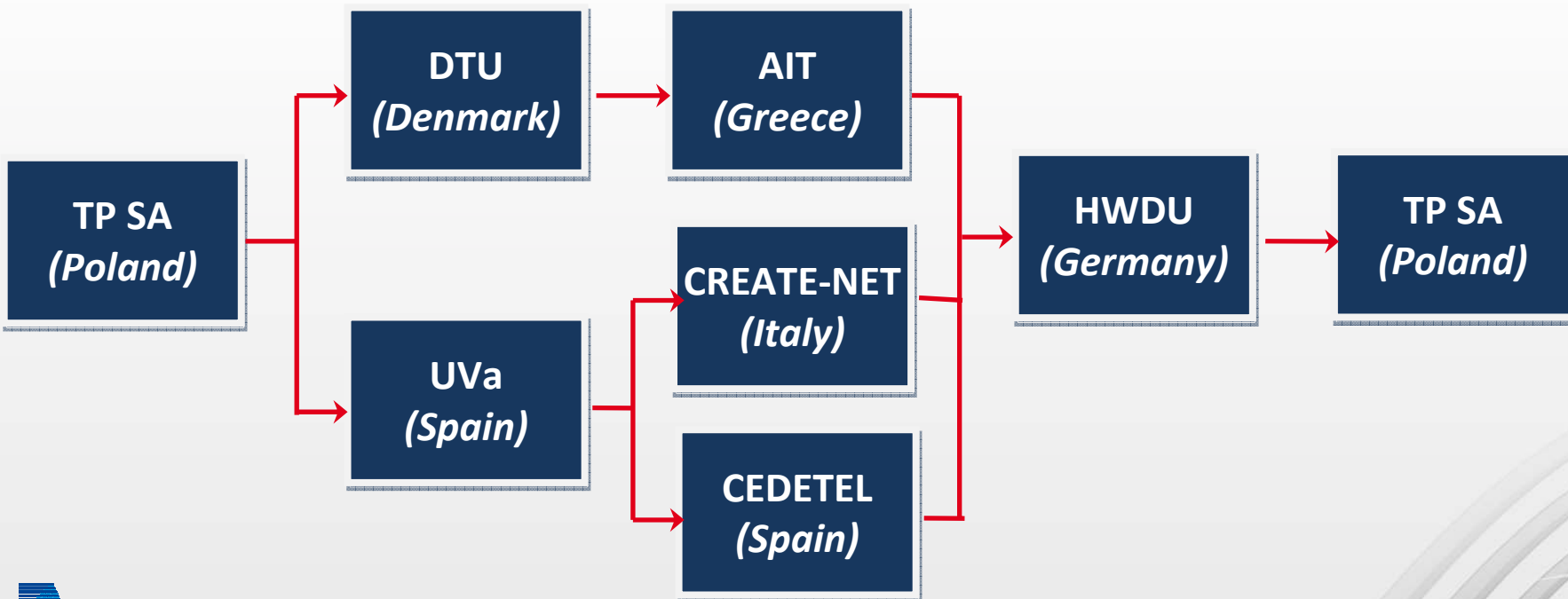
Project aims (2/2)

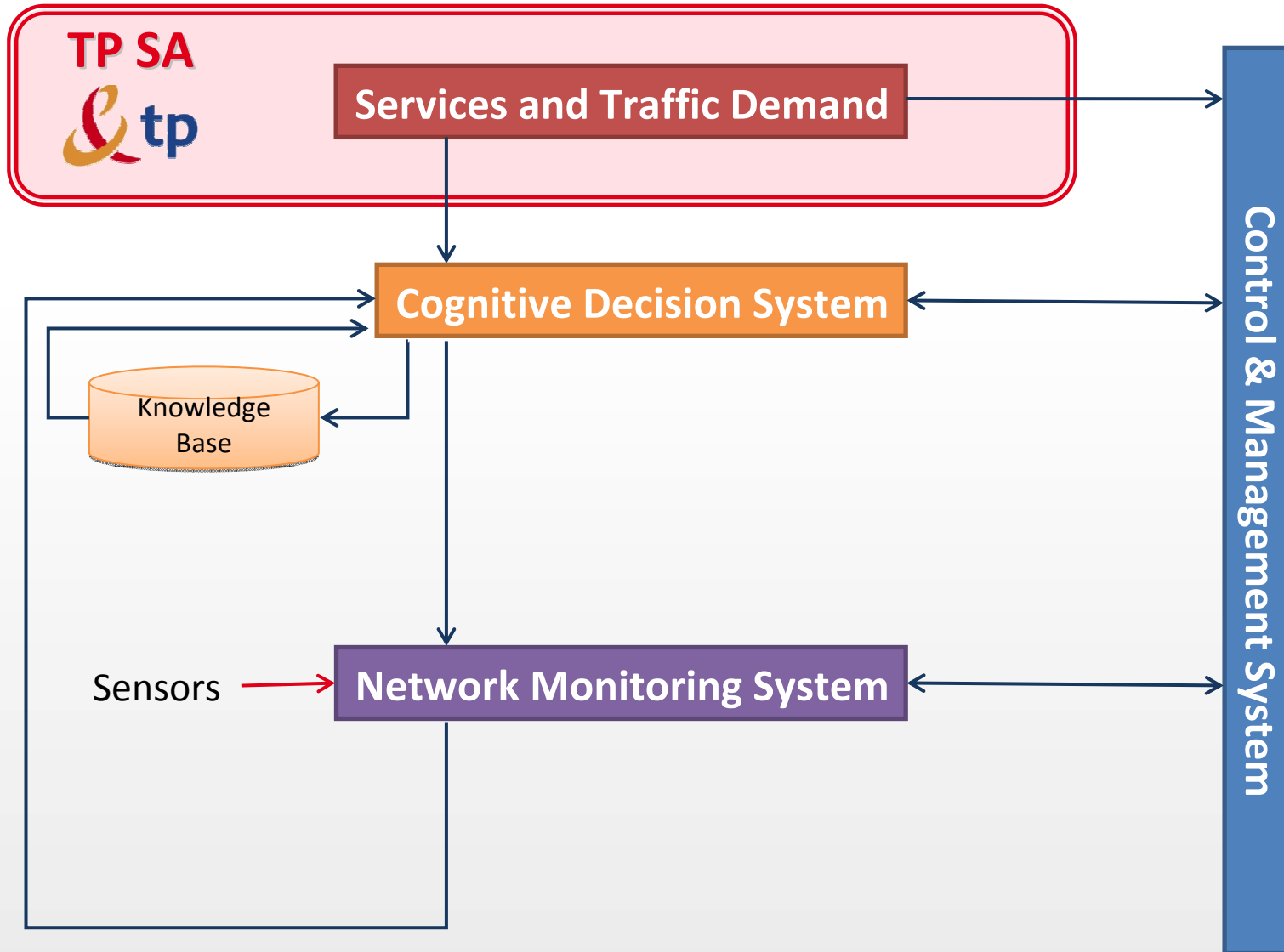
- ✿ To **develop new control/management plane protocols and mechanisms.**
- ✿ To **increase energy efficiency** of the network
- ✿ To **develop performance/complexity and techno-economical studies**
- ✿ To **propose migration strategies** in operators towards the new architecture
- ✿ To **disseminate the project results and contribute** to relevant **standardization** fora

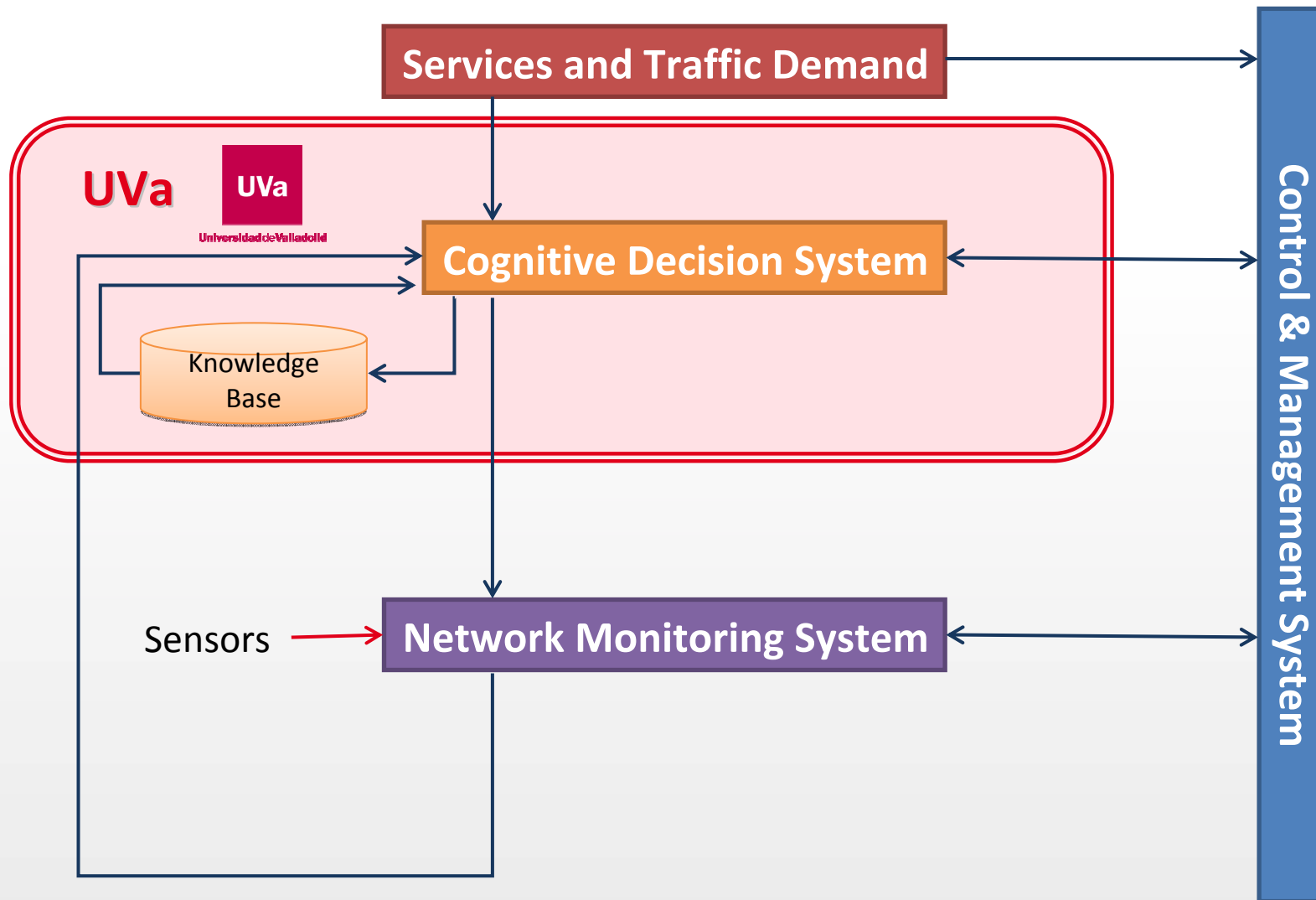
Consortium

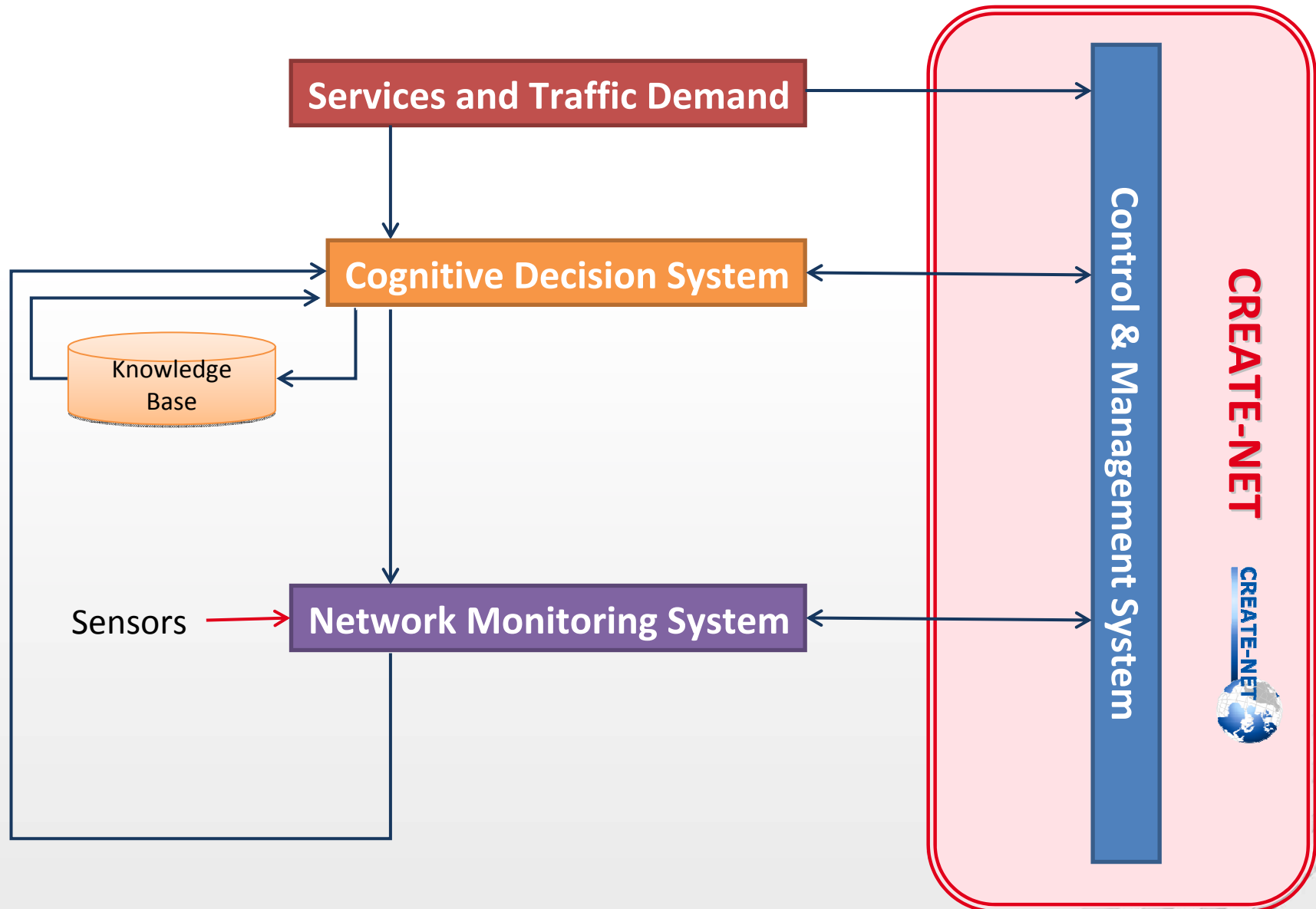


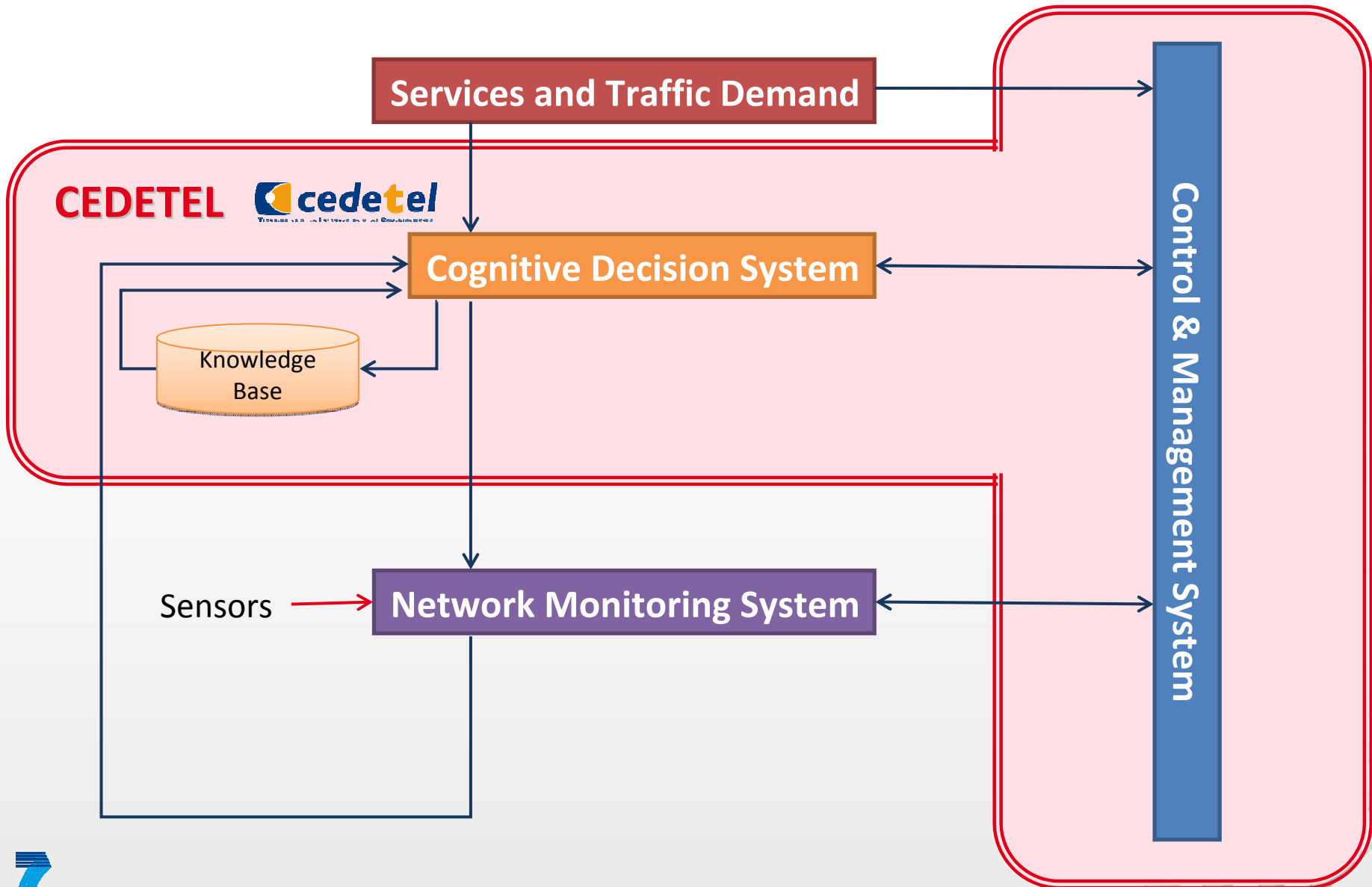
Role of each partner

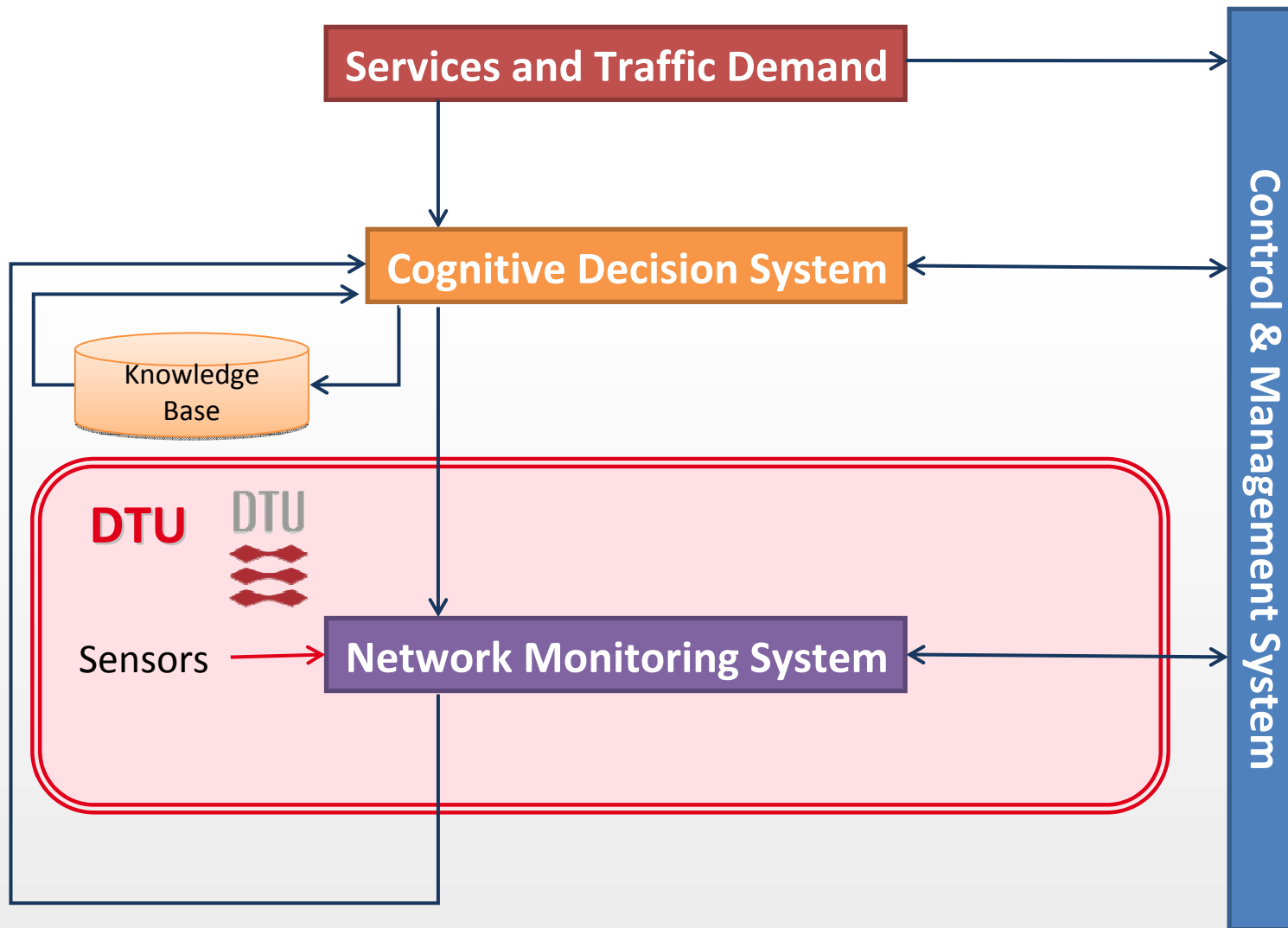


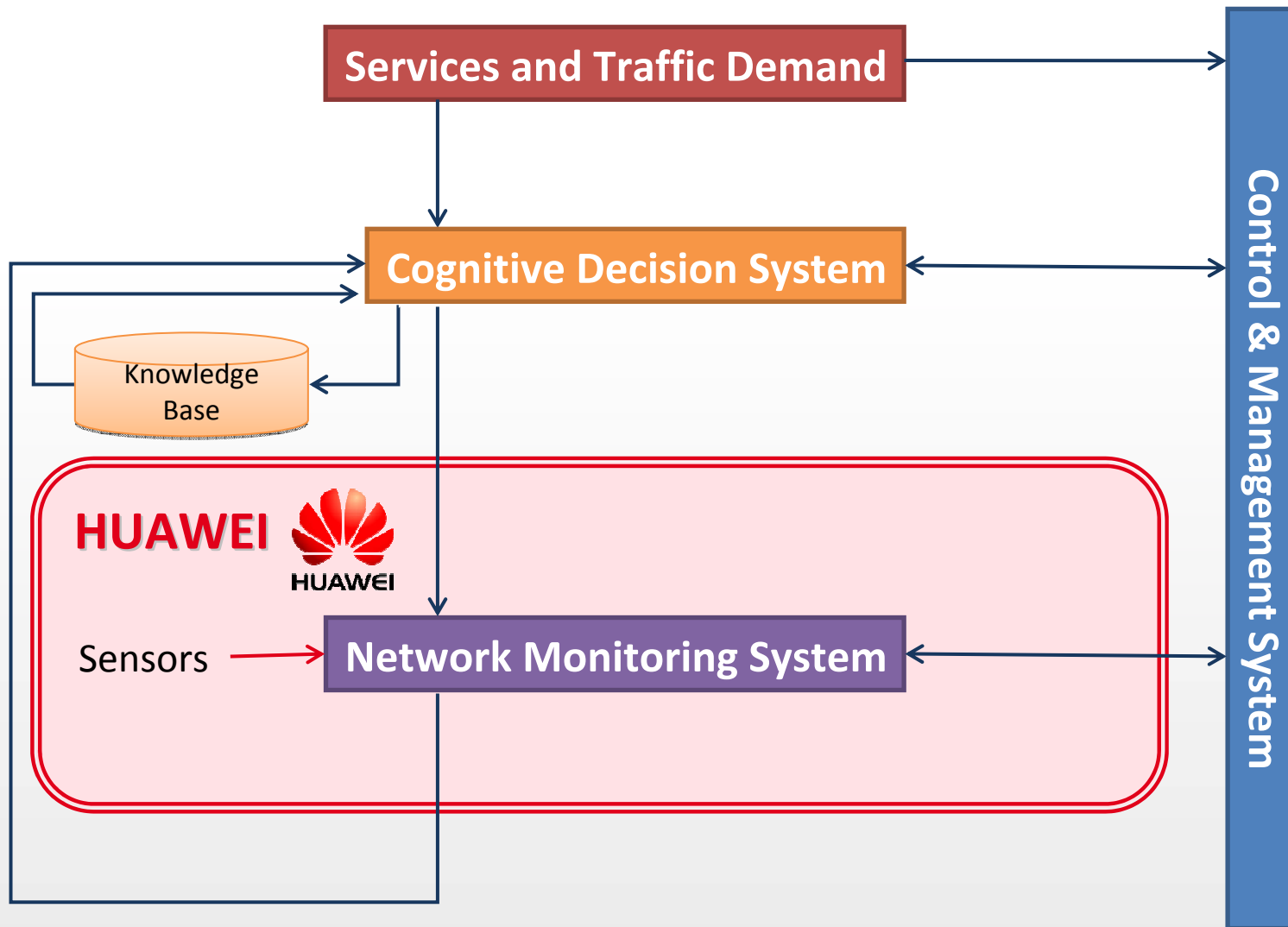


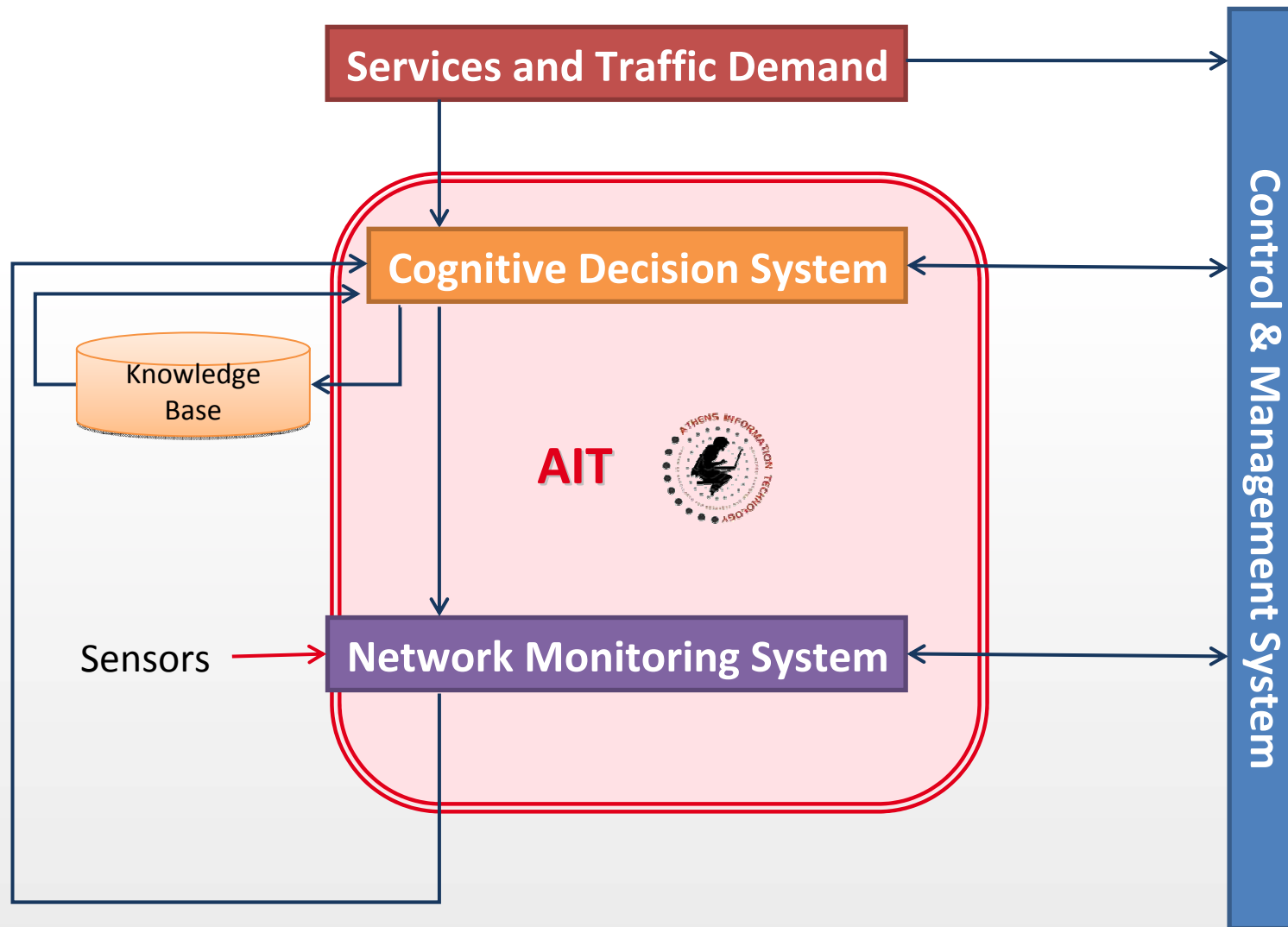






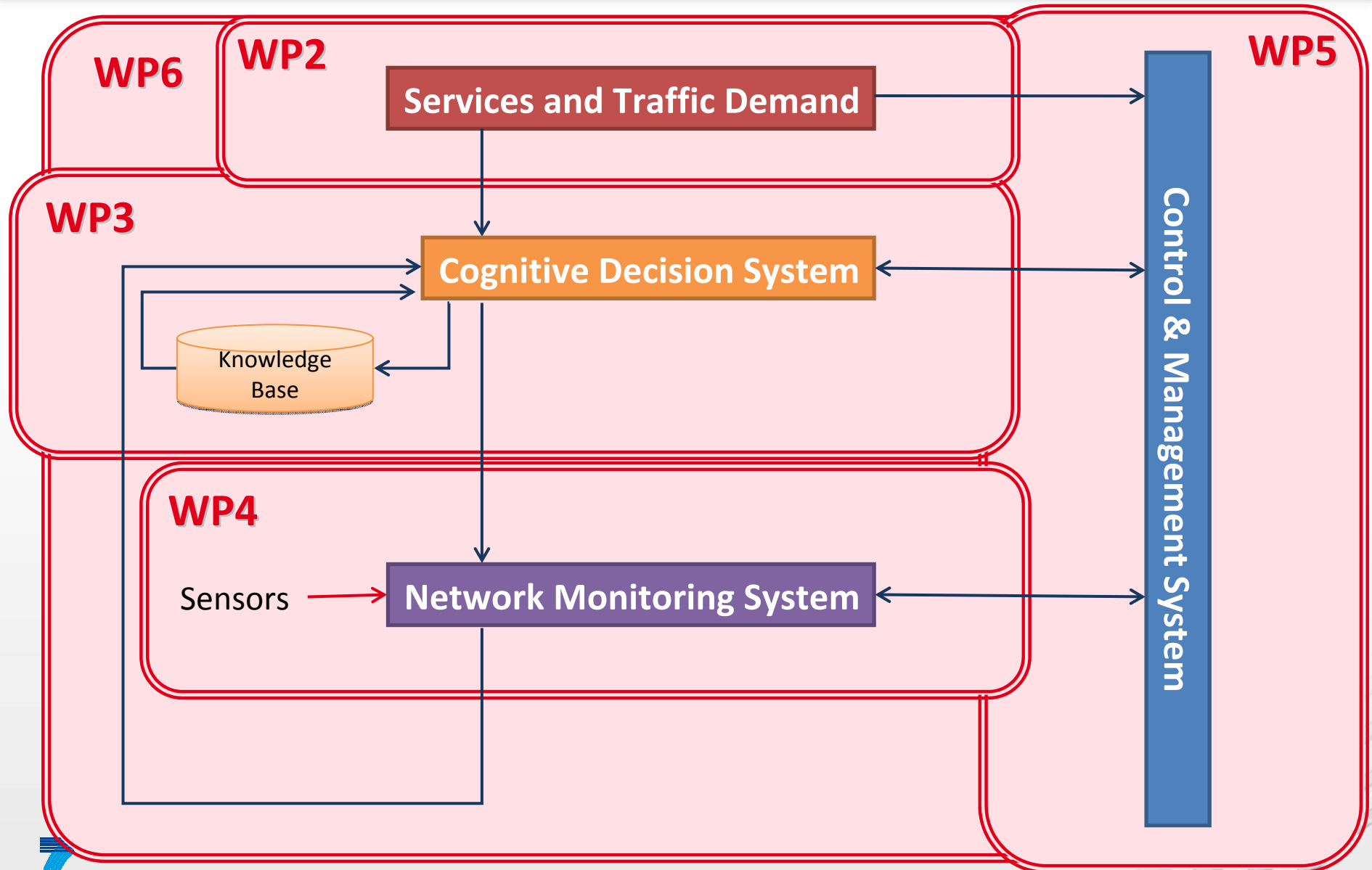






Overall Planning

WP	WP Title	Type of activity	Lead participant
WP1	Project Management	MGT	CEDETEL
WP2	Network and Service Definition	RTD	TP SA
WP3	Cognitive Decision System	RTD	UVa
WP4	Network Monitoring System and QoT Evaluation Techniques	RTD	HWDU
WP5	Control and Management System	RTD	CREATE-NET
WP6	Integration and Experimental Validation	RTD	AIT
WP7	Dissemination, Exploitation and Standardization	MGT	CEDETEL



Expected impact of the project

- ✿ The successful execution of the CHRON project will:
 - Strength the **positioning of European industry** in the field of Future Internet technologies and will reinforce the **European leadership** in **optical networks** and **cognitive network management**
 - Increase the **economic efficiency** of transport infrastructures (cost/bit)
 - Contribute to **global standards**
 - Lead to **wider market opportunities** from new classes of applications
 - Facilitate the accelerated uptake of the **next generation of network and service infrastructures**



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