

Towards a Future Internet Public Private Partnership – Second Usage Area Workshop – University of Piraeus Position Paper

P. Demestichas, V. Stavroulaki, K. Tsagkaris, Y. Kritikou
University of Piraeus
Department of Digital Systems
Telecommunication Networks and integrated Services
Email: pdemest@unipi.gr

1. INTRODUCTION

This document is a position paper coming from the University of Piraeus (University of Piraeus Research Center – UPRC). It is intended for the “Second Usage Area Workshop” [1], in the context of the overall theme “Towards a Future Internet Public Private Partnership (FI PPP)”, which will take place on June 21-22, 2010, in Brussels Belgium. The document addresses the five issues and open questions, which will be addressed during the Workshop.

2. CONTRIBUTION DESCRIPTION

2.1 Point no. 1

What use case and scenario in your area would you consider the most appropriate and representative one for large-scale experimentation with the Future Internet platform to be built starting from 2013?

The decision should be based on the following aspects:

- The benefits in terms of criteria related to the economy and the society. Regarding the societal criteria, use cases and scenarios should lead to growth that is sustainable (“green”) and inclusive (fairly sharable by all).
- The timescale in which these benefits can be obtained.
- The maturity of the related areas (involved stakeholders and overall eco-system) in accepting the progress that will be entailed by the use cases and scenarios.

In the light of the aspects above mature areas of immediate value are the following

- Smart energy.
- Transportation and logistics.

Regarding smart energy, stakeholders demand the inclusion of vital features such as the sharing and exploitation of renewable sources, the handling of outages, the reduction of emissions and energy consumption. These will lead to financial savings for all and also improve our environment. Pertinent initiatives [2,3] (complementary or competing), as well as technologies (initial samples in [4,5]), exist, so action is required for evolving, integrating validating and deploying.

Regarding transportation, traffic jams cost at the order of some hundreds of billions of Euros per year. Likewise, logistics constitute an important factor contributing to prices, and therefore, competitiveness. Therefore, stakeholders call for technology that will manage the transportation infrastructure, for instance, in order to dynamically resolve congestion situations. Likewise, in the area of logistics, automation can be imposed, in order to reduce the times of delivery and increase the utilization of the transportation means. Pertinent

initiatives [6], as well as technologies (initial samples in [7,8]), exist, so actions can be taken for further developing integrating, validating and deploying.

The list is open to be refined and complemented with more areas.

2.2 Point no. 2

What innovative Internet functionality and technologies would you consider important for your suggested use case and scenario?

Cognitive/autonomic systems [9,10,11,12,13] are seen as a viable direction for basing the management of services and infrastructures of the FI era. In general, the diverse applications/services and use cases that can be supported demand Quality of Experience (QoE) and Quality of Service (QoS) guarantees, lead to changing (often unpredictably) situations, call for resource efficiency, and finally, require the satisfaction of requirements deriving from the evolution of business models. Cognitive/autonomic systems are suitable for basing the management due to their self-management and learning features. Self-management is essential for fast adaptations to changing situations, and also for finding efficient ways for satisfying requirements, with respect to mere over-provisioning of bandwidth. Learning can increase the reliability of decisions through knowledge, for instance, on situations encountered, on how they were handled, and on the efficiency of the handling.

Cognitive/autonomic systems call for platforms (implementing frameworks) for the federation of different architectures/domains, the evolution and validation of intelligence. Intelligence evolution can occur in the area of context acquisition and reasoning, the derivation and evaluation of policies, distributed optimization techniques, and learning for acquiring and sharing knowledge and experience

2.3 Point no. 3

Which of the identified functionalities would you expect the Future Internet core technology platform to deliver to support your and other usage area scenarios?

It could be expected that the core platform will offer all the functionalities mentioned above. The reason is that these functionalities can yield the core platform highly available, attractive (by enabling seamless use), dependable, and trustworthy.

2.4 Point no. 4

What kind of experimentation environment would you consider necessary for broad large scale testing of the platform to be developed in your use area? What would be needed to experiment new services and applications cutting across use areas (services and application mash-up) and building a new services and application ecosystem around the prototype implementations of the platform?

The experimentation environment should consist of the following essential parts. The first will include the testbeds. The second will include the software systems, which will realize the applications/services, middleware and management functionality. The third can comprise simulators and emulators for generating diverse requirements and conditions, and therefore, putting functionality under test and complementing the validation.

The testbeds should provide capabilities for experimentation with small electricity networks and also with elements of a transportation infrastructure. In the area of electricity networks the testbed should provide the means for energy generation, transportation, distribution and consumption. Regarding transportation the testbed should yield intelligent infrastructures and vehicles, and therefore, enable the experimentation with some essential services, like the management of the traffic flows (distributed arterial management through traffic lights), incidents, emergencies, road due to weather, transit, etc.

2.5 Point no. 5

How do you see the potential role of your organization in the FI-PPP, in the context of Usage areas taking a prominent role in the Initiative, to ensure an appropriate application driven approach?

UPRC works on the design, development and validation of autonomic/cognitive functionality for the management of applications/services and infrastructures in the Future Internet. These are main enablers for scaling application/service provision to the wide market. UPRC can contribute to the FI PPP, through

- Background knowledge and software prototypes;
- Research and experimentation infrastructures, already in possession;
- The design, development, integration, and validation of functionality.

An aspect that should be noted is the extensive experience with validation activities, which, in general, rely on prototyping and experiments (e.g., work samples are [14,15]), as well as on pilots and contribution to trials (in more commercial activities).

UPRC, apart from an extensive network of collaborations at the European level, has several and intensive collaborations at the national level. The collaborations are in the area of combining Information and Communication Technologies for optimizing transportation systems, energy and content provision, as well as for managing our eco-system.

- Network operators;
- Application and service providers;
- ICT manufacturers;
- Application and service developers;
- Independent authorities;
- Research organizations and academic institutions;
- Ministries.

Details on the initiatives undertaken can be found in [16].

3. SUMMARY

This document is a position paper coming from the University of Piraeus. The document is intended for the "Second Usage Area Workshop", which will be conducted in the context of the shaping of the Future Internet Public Private Partnership.

4. REFERENCES

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