

Future Internet PPP Position Paper

ISA is an innovative SME specialized in telemetry and Machine-to-Machine (M2M) communication.

ISA has traditionally been especially involved in the Energy Market, where it is the world leader in LPG tank telemetry, and other markets concerned with telemetry for the energy industry.

Recently, ISA has been dedicating its attention to three large new areas, which are Energy Efficiency, Home Healthcare and Ambient Assisted Living, and Smart Cities.

ISA is an active participant in several European-funded Projects, under the FP7, CIP, and FP7 Research for SME's Programmes.

- (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 ([please refer to the documents referred to on the above websites for inspiration](#))?

That would most definitely be the extension of the Smart Grid to the inside of the home, making appliances aware of the prevailing conditions on the energy network, thus adapting their behaviour accordingly.

Presently, in the electricity market, the demand side and the supply side work against each other, creating many large inefficiencies. Utilities have very little elasticity in their supply curves, which is only getting worse with the introduction of renewable sources of energy renowned for their unpredictability (wind mills, solar). Consumers, on the other hand, have very unsteady rates of electricity consumption throughout the day, throughout the week, and throughout the year. Since current technology does not allow utilities to charge different rates at different times, and since electricity cannot be easily stored, great market distortions emerge.

If homes would be made aware, through the Internet, of the prevailing energy market conditions, and thus were able to influence the operation of the individual appliances in response to those conditions, the energy grid would become a lot more efficient, less generation capacity would be needed, both consumers and utilities would save billions, and the environment would benefit tremendously.'

ISA, however, does not see the Smart Home/Smart Appliances area as a closed environment, since it intersects with other important use scenarios such as Smart Cities, and Ambient Assisted Living, in which it is also very committed.

- (2) What innovative Internet functionality and technologies would you consider important for your suggested use case and scenario (e.g. context awareness, sensor networks, advanced real time processing capabilities handling huge volume of data, ad hoc service composition and mash-up, managed broadband connectivity and services, embedded media support for interfaces easing the interpretation of processed contextual data, etc.)?

First and foremost, the sensor networks, working in tandem with actuator and meter networks. They are what's most needed in order to get the home to act smartly. The electrical grid has been, for the past 100 years, a dumb brute force network, of devices that share a common medium but do not communicate. Just as the Internet unleashed the untapped potential of the Personal Computer revolution (which was basically treading water since the 80's), the Internet of Things will unleash the full potential of the Embedded Computers that start to be ubiquitous in electrical devices. Being able to know the status, the electrical consumption, and the modes of operation of appliances, as well as being able to control them, will enable the Smart Home to perform wonderful services for its users, making technology "just work", and optimizing the use of resources while improving the quality of life. Another very important functionality is Device Discovery, the capability of each device knowing what is available in the vicinity, and thus acting in the appropriate manner to make its services available, and taking advantage of the services offered by others.

- (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?

We feel that it would be most important to develop a low-power/low bandwidth mode of operation that would be especially suited for battery-operated long-time-in-the-field devices that need to be alive for several years on one charge of batteries, but which only need to communicate a very small amount of data. This mode of operation would be especially suited for M2M communication, since machines tend to be a lot terser in their communication, but also have energy conservation issues. Such a mode would enable, for example, gas and water meters to be remotely read through an Internet of Things paradigm.

- (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? A corporation with a large customer base (a utility, a phone company) would make the platform available to its customers as an added-value service, with the double-whammy, in the case of an electric

utility, of being able to shape the consumption profile of its customers in a way that would take better advantage of the utility's energy availability. Once the basic structure was setup, the platform could bring along other usage scenarios such as Ambient Assisted Living, eHealth, Smart Home for the Smart City, among others.

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

ISA would be especially suited to play a mediator role in the Utility and Environment usage scenario, since it maintains a great working relationship with some of the leading utilities in Europe; it has 20 years of experience in developing wireless networks of embedded systems; it has parallel competencies in other usage scenarios, such as eHealth and Smart Cities, and it has an extended European Network of partners with which it has worked on a large number of European projects around the fields of ICT, Energy, and the environment.