

Future Internet Platform – Use Cases

Position Paper

Vladimir Soroka, Sr. Manager, Collaboration Technologies, IBM Haifa Research Lab, Israel

(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)?

IBM is the largest IT company in the world, and includes a Research Division with about 3000 employees in 8 labs world-wide. The Haifa Research Lab (HRL) is the largest of the five labs outside the United States, with 547 employees. Since it first opened as the IBM Scientific Center in 1972, HRL has conducted decades of research that have been vital to IBM's success. HRL staff members are actively involved in the academic community, publishing papers in leading conferences and journals, participating in program committees, and organizing conferences and workshops.

The Information & Interaction Technologies department of HRL focuses on the analysis, exchange, and management of the explicit information expressed in unstructured/semi-structured content and implicit information.

IBM's Smarter Planet campaign and research direction is very relevant to the Future Internet Platform. In particular, our department is looking at the concept of **Human Augmented Systems** – where people are considered first class citizens in the building of next generation systems. Let us define a scenario that depicts the concept. Today in the modern city there are many unconnected systems which need to be unified. But to really achieve a *Smarter* City – unifying its subsystems is not enough. We need to put a lot of sensors around and perform a lot of complex analytics. The first problem is that it is very costly to equip the entire city with sensors. The second problem is that the state of the art analytics is not ready yet for serving all this vast amount of data. Our vision is building a Smarter City which cooperates with its citizens who can server as information creators, sensors and information processors to assist existing infrastructure.

Consider the following scenario. John is walking on the street. He sees a broken pipe. He calls a known number and simply says: "Broken Pipe". The smart infrastructure understands where this was reported from, sends the message to the right department and also attaches a relevant surveillance camera to it. Maybe John can also take a picture of the area. As a result not only many things in the city get reported, but also a large repository of pictures, voices, videos and observations about the city are created constantly. Analytic solutions constantly process the data. Some of it gets automatically processed. Some other (like suspicious video images from cameras) are passed to citizens through games and voluntary projects for further analysis. Machines and citizens run the city together and achieve a Smarter City now and not in the future when expensive sensors are fully in place and analytics is ready.

(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.)?)

The good thing about the above scenario is that it really leverages all the aspects of the Future Internet Platform. It needs Context capabilities to be able to analyze where the data is being collected, how and by whom. It will need to analyze large volumes of data by combining machine and human capabilities; hence it needs sensor networks and real time data processing. It will have to support multimodal interactions between humans and machines and thus will require media streaming and processing. We feel that this scenario is the perfect testbed for the Future Internet Platform vision.

(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?

If we would need to briefly describe the requirements - we would like to get a large scale storage, streaming and interaction platform with add on services, including context inference, bandwidth management, media processing and more. But to leverage our scenario, not everything should be in place immediately. We argue that by using human computational capabilities we can start with rudimentary elements, where people will replace missing functionality. The functionality can be added as we go forward.

(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?

Since people are the core of our proposal, we envision large cities as living labs for our technology. We believe that many cities in Europe, large and small, will be able to see immediate benefit of serving as testbed for this technology. It will enable the cities to jumpstart their "smarter" activities and also provide requirements and improvements for the Future Internet Platform.

(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?

IBM is trying to play a leading role in the FI-PPP including participation in the core platform proposal and definitely use cases. IBM is willing to lead a Use Case proposal, since we believe that it will promote our Smarter Planet agenda. We will also be willing to help shaping the FI-PPP directions so it can benefit from the power of IBM engineering and research teams.