The Internet world as we know it today has undergone far reaching changes since its early days while becoming a critical communications infrastructure underpinning our economic performance and social welfare. As the Internet extends its reach and serves an ever growing population of users and intelligent devices, new innovate services are introduced, demanding an environment which supports innovation, creativity and economic growth. It is anticipated that the current Internet may in the long term not be fully capable of supporting the ever larger set of usages, constrains and requirements that it will have to face as it further penetrates out immediate surroundings and environment.

However, today's Internet was designed in the 1970s to support communications between computing systems for communities of technically expert users. As the Internet extends its reach and servers an ever growing population of users and intelligent devices, new innovate services are introduced, demanding an environment which supports innovation, creativity and economic growth. The paradigm shift in society and the opportunities enabled by new technological advances in devices, place completely new requirements on the evolution of today's Internet. Future Internet will enable a multitude of new application sectors leading to the development of new markets.

Considerable effort has already devoted to defining options and concepts which could form the basis of Future Internet to support a sustainable society. According to the current European vision (www.future-internet.eu), the dimensions of the Internet by and for the People, the Internet of Contents, the Internet of Services and the Internet of Things (IoT), connected to the Real Word Internet, that focuses on the vision to integrate the real world into Internet, where a huge number of heterogeneous networked embedded devices (NEDs) with disparate communication and computation capabilities can be integrated into the fabric of Internet.

The ubiquity of mobile devices and proliferation of wireless networks will allow everyone permanent access to the Internet at all times and all places. The increased computational power of these devices has the potential to empower people to generate their own applications for innovative social and cognitive activities in any situation and anywhere. This wireless connection is not limited to user devices, almost any artifact from clothing to buildings can be connected and collaborate as a NED. Furthermore new sensor technologies and wireless sensor networks provide environmental intelligence and the capability to sense, reason and actuate. This leads to the exciting vision of the interconnection of artifacts embedded in our realm environment, forming a society of "intelligent things" and "smart spaces".

Trillions of heterogeneous NEDs such as sensors and actuators located in open space or attached to existing objects, RFID enabled items, robots and Programmable Logic Controllers (PLC), generally many heterogeneous devices with communication and computational capabilities are integrated into the fabric of the Internet, providing an accurate reflection of the real world, delivering fine-grained information and enabling almost real time interaction between the virtual world and real world. Information about location, status and situation of objects and persons, information about places as well as influencing and changing the places (through actuation), objects and persons based on the gathered information and defined rules and policies can now flow e.g. into enterprise systems and decisions can be made in real-time.

NEDs such as sensor and actuator networks, RFID readers have become more powerful with respect to computing power, memory, and communication; therefore they are starting to be built with the goal to offer their functionality as one or more services for consumption by other devices and services. Due to these advances we are slowly witnessing a paradigm shift where devices can offer more advanced access to their functionality and even host and execute business intelligence, therefore effectively providing the building blocks of a service-oriented architecture. As such, event based information can be acquired, processed on-device and in-network. This capability provides new ground for approaches that can be more dynamic and highly sophisticated, and that can take advantage of the available context. Cross-layer collaboration is expected to be a key issue in such a highly dynamic and heterogeneous infrastructure such as the Real World Internet.

Many research challenges arise from this vision in various domains, e.g. networking, architecture, interoperability, management, security & trust, etc. in order to achieve a robust, heterogeneous and resilient solution. This work proposes to study and convince models to address the problematic identity management associated to the IoT, in the sense that there will be multiple identifiers for people, machines, objects and it is necessary to specify how identities will be assigned and discovered in a distributed, dynamic, mobile environment.

The goal of the research work is develop an approach to identity management that work in a distributed non-centralized environments and that are able to scale and adapt to changing conditions and requirements. A proof-of-concept implementation of the approach is expected as means for test & assessment of the research hypothesis. Scientific publications are also expected as an output of this research work to contribute to the advance of the knowledge frontier.

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