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IOT Using Cloud Technology

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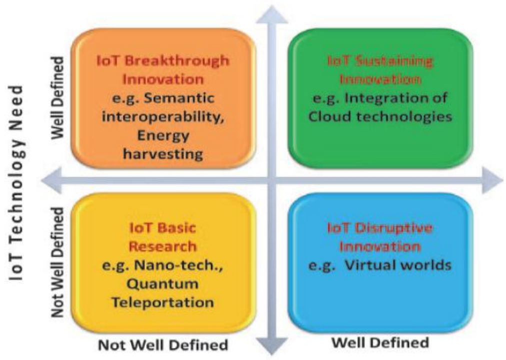
Abstract:- **The Internet of Things continues to develop, further potential is estimated by a combination with related technology approaches and concepts such as Cloud computing, Future Internet, Big Data, robotics and Semantic Technologies The idea is of course not new as such but becomes now evident as those related concepts have started to reveal synergies by combining them.**

***Keywords*— Smartcites, Iot ,Cloud Technologies.**

I. INTRODUCTION

Integrated environments that have been at the origin of the successful take up of smartphone platforms and capable of running a multiplicity of user-driven applications and connecting various sensors and objects are missing today. Such super-stack like environments, bringing together a number of distinct constituencies, represent an opportunity for Europe to develop Internet of Things ecosystems. As an example this would include the definition of open APIs and hence offer a variety of channels for the delivery of new applications and services. Such open APIs are of particular importance at module range on any abstraction level for application-specific data analysis and processing, thus allowing application developers to leverage the underlying communication infrastructure and use and combine information generated by various devices to produce added value across multiple environments. As a quintessence the next big leap in the Internet of Things evolution will be the coherence of efforts on all levels towards innovation (Figure 1.2). In case of the IoT community this would mean that out of many possible "coherence



Innovation Matrix of IERC — Internet of Things European Research Cluster

horizons" the following will likely provide the foundation for a step forward to the Internet of Things:

• Coherence of object capabilities and behaviour: the objects in the Internet of Things will showa huge variety in sensing and actuation capabilities, in information processing functionality and their time of existence. In either case it will be necessary to generally apprehend object as entities with a growing "intelligence" and patterns of autonomous behaviour.
• Coherence of application interactivity: the applications will increase in complexity and modularisation, and boundaries between applications and services will be blurred to a high degree. Fixed programmed suites will evolve into dynamic and learning application packages. Besides technical, semantic interoperability will become the key for context aware information exchange and processing.

The Internet of Things continues to affirm its important position in the context of Information and Communication Technologies and the development of society. Whereas concepts and basic foundations have been elaborated and reached maturity, further efforts are necessary for unleashing the full potential and federating systems and actors.

Internet of Things Vision
Internet of Things (IoT) is a concept and a paradigm that considers pervasive presence in the environment of a variety of things/objects that through wireless and wired

connections and nique addressing schemes are able to interact with each other and cooperate with other things/objects to create new applications/services and reach common goals. In this context the research and development challenges to create a smart world are enormous. A world where the real, digital and the virtual are converging to create smart environments that make energy, transport, cities and many other areas more intelligent. The goal of the Internet of Things is to enable things to be connected anytime, anyplace, with anything and anyone ideally using any path/network and any service.

New types of applications can involve the electric vehicle and the smart house, in which appliances and services that provide notifications, security, energy-saving, automation, telecommunication, computers and entertainment are integrated into a single ecosystem with a shared user interface. Obviously, not everything will be in place straight away. Developing the technology in Europe right now—demonstrating, testing and deploying products—it will be much nearer to implementing smart environments by 2020. In the future computation, storage and communication services will be highly pervasive and distributed: people, smart objects, machines, platforms and the surrounding space (e.g., with wireless/wired sensors, M2M devices, RFID tags, etc.) will create a highly decentralized common pool of resources (up to the very edge of the "network") interconnected by a dynamic network of networks. The "communication language" will be based on interoperable protocols, operating in heterogeneous environments and platforms. IoT in this context is a generic term and all objects can play an active role thanks to their connection to the Internet by creating smart environments, where the role of the Internet has changed. This powerful communication tool is providing access to information, media and services, through wired and wireless broadband connections.

Participatory Sensing

People live in communities and rely on each other in everyday activities. Recommendations for a good restaurant, car mechanic, movie, phone plan etc. were and still are some of the things where community knowledge helps us in determining our actions.

Situation Awareness and Cognition

Integration of sensory, computing and communication devices (e.g. smart phones, GPS) into the Internet is becoming common. This is increasing the ability to extract "content" from the data generated and understand it from the viewpoint of the wider application domain (i.e. meta-data). This ability to extract content becomes ever more crucial and complex, especially when we consider the amount of data that is generated. Complexity can be reduced through the integration of self-management and automatic learning features (i.e. exploiting cognitive principles). The application of cognitive principles in the extraction of "content" from data can also serve as a foundation towards creating overall awareness of a current situation. This then gives a system the ability to respond to changes within its situational environment, with little or no direct instruction from users and therefore facilitate customised, dependable and reliable service creation.

Properties of Autonomic IoT Systems

The following properties are particularly important for IoT systems and need further research:

Self-adaptation

In the very dynamic context of the IoT, from the physical to the application layer, self-adaptation is an essential property that allows the communicating nodes, as well as services using them, to react in a timely manner to the continuously changing context in accordance with, for instance, business policies or performance objectives that are defined by humans. IoT systems should be able to reason autonomously and give self-adapting decisions. Cognitive radios at physical and link layers, self-organising network protocols, automatic service discovery and (re-)bindings at the application layer are important enablers for the self-adapting IoT.

Self-optimisation

Optimal usage of the constrained resources (such as memory, bandwidth, processor, and most importantly, power) of IoT devices is necessary for sustainable and long-living IoT deployments. Given some high-level optimization goals in terms of performance, energy consumption or quality of service, the system itself should perform necessary actions to attain its objectives.

Self-protection

Due to its wireless and ubiquitous nature, IoT will be vulnerable to numerous malicious attacks. As IoT is closely related to the physical world, the attacks will for instance aim at controlling the physical environments or obtaining private data. The IoT should autonomously tune itself to different levels of security and privacy, while not affecting the quality of service and quality of experience.

Enabling Multi Systems Integration

Developing research on multi systems integration is key to enable future European SMEs to integrate larger systems and solutions, and requires research on different models of

IoT and IoT systems integration, taking into account IP and legacy sensors platforms.

Standardisation

Life-cycle approach towards standardisation

Standardisation should be viewed as only one activity in a life-cycle process that also includes preparatory regulatory and legislative activities, as well as post-standardisation activities towards certification and validation. Special care should be taken for understanding pre-standardisation impacts coming from the various applied sectors. Open system for integration of Internet of Things data It is necessary to ensure the efficient integration of Internet of Things data from devices in an open environment. This will require standardisation of Internet of Things data formats and semantics. Furthermore, tools and technologies are required to achieve sharing of Internet of Things data across applied domains, and standardisation should be considered as a means to ensure the open and secure availability of Internet of Things data and information

Societal, Economic and Legal Issues

Accessibility

The complexity of user requirements resulting from personal characteristics and preferences, together with the variety of devices they might use, poses a problem of systems being non-inclusive for individual users that have nonmainstream needs. Accessibility of future IoT technologies will be a challenge that needs to be addressed.

II. CONCLUSION

The Internet of Things continues to affirm its important position in the context of Information and Communication Technologies and the development of society. Whereas concepts and basic foundations have been elaborated and reached maturity, further efforts are necessary for unleashing the full potential and federating systems and actors.

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