

TOWARDS THE DEVELOPMENT OF FUTURE INTERNET ENTERPRISE SYSTEMS

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Abstract: Current R&D activities, sustained by the European Commission and by FP7 financial support are focusing on the development and standardization of new technologies to sustain the “Future Internet”. In this context the development of new Internet related concepts and technologies oriented towards providing positive benefits for individuals, society, economy, culture and environment has been included in a broad concept of Future Internet Systems. One of the paradigms proposed in this area is the “Internet of Things”. The future of the manufacturing oriented knowledge management that use the concept of Internet of Things will be characterized by emerging intelligence that could be obtained by a future enterprise from the information detained by its components, contextualized for reflecting a given situation.

Keywords: Future Internet Enterprise Systems

The development of new concepts in the area of enterprise collaboration like: Collaborative Networks and Digital Business Ecosystem, the large scale utilization of the Service Oriented Architecture using the new infrastructure provided by Cloud Computing technologies and the ongoing demand for communication and collaboration is stressing to the limits the current internet technologies and infrastructure.

In this context the development of new Internet related concepts and technologies oriented towards providing positive benefits for individuals, society, economy, culture and environment has been included in a broad concept of Future Internet Systems. The development of Future Internet Enterprise Systems (FInES) has been oriented towards enabling enterprises and SMEs access to the full potential of Future Internet technologies through ICT.

As one of Internet’s expanding directions is towards becoming a universal business environment, the business values associated may refer to (FInES, 2009):

- Revenue and profit
- Reputation and level of trust
- Resource planning towards efficient use
- Green manufacturing
- Enterprise social networking
- Business partners collaboration
- Customer relationships
- Tacit and implicit Enterprise Knowledge Management
- Business transparency and corporate governance.

In order to achieve these principles the characteristics that have to be taken into consideration when discussing future enterprise systems should include and not limit to: flexibility, adaptively, collaboration, innovation, knowledge manageability, openness a.s.o.

The quality issues regarding the enterprise are another aspect of organization and management that has been greatly emphasized, in the last few years. New concerns and constraints like: social and environmental impact, cultural diversity and ethical issues, have to be taken into consideration and extend the Total Quality Management standards. As a consequence a new concept has been introduced: Quality of Being, (FInES, 2009). QoB will have to incorporate along with the quality issues associated with the enterprise operation: products, strategies, staff and client relationships, new concepts like green manufacturing, social responsibility, community vs. global impact.

In order to achieve such characteristics a new concept has been introduced: Internet Enterprise Resource (FInER) as describing a digitalization of enterprise entities. These entities will allow for identification, computational power, storage and communication. This concept will support the evolution of FInES as a network of different FInERs.

Another important step in the evolution towards FInES is the ongoing research in the area of the Internet of Knowledge. The current knowledge management tools and knowledge repositories will have to be replaced by a flow of knowledge from distributed FInER collections accessible via internet infrastructure and with a meta-knowledge infrastructure represented with the help of ontologies and linked at semantic level.

The research objectives as stated by the FInES EU Cluster (FInES, 2009) in relationship with Future Internet technologies and QoB can be identified as:

- Inventive Enterprise
- Cloud Enterprise
- Cognizant Enterprise
- Community-oriented Enterprise
- Green Enterprise
- Glocal Enterprise

A few technological paradigms that can sustain the future researches on FInES are presented below:

- Applications with proactive behavior
- IaaS or PaaS (Infrastructure/Platform as a Service)
- Interoperability Service Utility (ISU)
- Knowledge Representation and Semantic Modeling
- Federated, Open and Trusted Platforms (FOT)
- Software as a Service (SaaS)
- Automated Service Discovery and Configuration

An important aspect of FInES is the integration of the new approaches to the Future Internet: Internet of Service, Internet of Things, 3D and Media Internet, Internet of Knowledge, Internet of People. Two main benefits have been emphasized within the Internet of Things research area, with regard to enterprise systems: "things on the move", "ubiquitous intelligent devices". (Santucci, 2009)

The "things on the move" concept will allow: better identification and transport efficiency of food products along the Supply Chain from the producer to the distributor, the shop floor, cashier and check-out leading to the intelligent logistic management. This will also prevent counterfeiting and assure consumers of controlled origin of the food product.

The "ubiquitous intelligent devices" concept will allow the possibility of information exchange between any intelligent object. Another capability is the implementation of reactive behaviors according to a predetermined set of actions.

Integrating devices and everyday objects to a smart environment is the first step towards the Internet of Things.

CONCLUSIONS

The concepts, proposed within the Internet of Things, paradigm are becoming a reality due to the research efforts leading towards the development of new devices and services.

The integration of objects within the "Internet of Things" offers great perspectives, but it is not easy to implement at this point, taking into consideration the following aspects:

- different or no interoperability standards
- different service descriptions and capability declaration
- different radio interfaces and media access
- different resources management
- different encryption
- different publication and subscription of devices

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