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The "Internet of Things" Needs to be about more than RFID, European Research Group Says

Interim CASAGRAS Report Says More Vision Must Encompass other AIDC Technologies, Broader Computing Framework

SCDigest Editorial Staff

What is an "Internet of Things," and what technology frameworks and standards need to be put in place to get there?

Those are among the questions being addressed by the Coordination and Support for Action for Global RFID-Related Activities and Standardization (CASAGRAS) organization, another quasi-standards body funded by the European Union.

In an interim report on its work released two weeks ago, CASAGRAS had some interesting things to say about the "Internet of Things" vision, which generally refers to the ability of item level objects to have their own (RFID-based) identity, and be connected to the Internet for use by various applications. The full report is available here: **CASAGRAS Interim Internet of Things Report**.

The report notes that the original vision for an Internet of Things initially started in the work of the Auto ID Lab at MIT, whose work was largely transferred to and then expanded by the EPC Global organization in 2003.

Since then, however, "The concept subsequently embraced the need for other object-connectable [non-RFID] data carriers with differing degrees of functionality. It has moved from the confines of the Auto-ID Center development and is now being influenced strongly by wider developments in computing and network ubiquity and developments in the next generation Internet," the report says. "The original MIT offering provided a unique Internet address for objects while the EPC offering restricted that offering to subscribers."

In the current business-to-business driven RFID world, companies must join EPC Global and apply for a base EPC number, the way companies have done for decades with the Uniform Code Council (UCC) and UPC bar code numbers. But that model would not work with a vast deployment of Internet connect things.

In other words, in the current business-to-business driven RFID world, companies must join EPC Global and apply for a base EPC number, the way companies have done for decades with the Uniform Code Council (UCC) and UPC bar code numbers. But that model would not work with a vast deployment of Internet connect things –maybe even the food in our refrigerators – which would need some more basic Internet ID, such as the IP addresses that connected computers receive.

Other AIDC Technologies Must Be Included

The report says that as the Internet of Things vision was explored, it became clear that the framework and standards also needed to support more than just RFID-based automatic identification (AIDC), but also bar codes, vision systems, biometrics, intelligent sensors, and other approaches. "To ignore them is to compromise the potential for interfacing with the physical world," the report

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says. It notes, however, that RFID will play a critical and probably leading role.

CASAGRAS also said not nearly enough work has been done on the overall framework of this vision, including what it really looks like in the end, and the computer-applications-internet side of the equation.

"In the weakest version of the Internet of Things, these objects can be identified but do not 'do' anything actively; in the strongest version, objects communicate with each other so that the Internet of Things and Ubiquitous Computing complement each other," the report notes.

But to get to a more comprehensive overall system architecture, a number of issues must be addressed – and it's more complicated than some might have guessed. CASAGRAS lays out the following as the list of key topics that must be resolved to get to a workable Internet of Things framework:

Objects and real world awareness - recognizing the nature and life-cycle features of objects as the basis for considering the way in which they might be included and managed within networking structures and data connectivity strategies.

Ontology of identification for objects - expressing the generic nature of identification and the need to accommodate both primary, natural feature identification and secondary, data carrier-based identification within an Internet of Things.

Coding for Identification - identifying the key components for achieving a global unique and type identification system, that can be used with a variety of data carrier technologies and accommodate significant legacy systems of identification coding.

Technologies for identification - both natural feature and data carrier technologies for realizing object-connected or associated identification.

Other object-connected 'edge' technologies - for supporting real world awareness and management of network-connected or simply system-connected objects that embrace the needs for spatial awareness and sensor capability as well as identification.

Communications technologies and networking structures - wired, optical and wireless that can feature within an inclusive structure for an Internet of Things, embracing structures from body area networks to global area networks and accommodating differing network types including ad hoc networks.

The Internet and next generation Internet - distinguishing the issues to be addressed in accommodating the Internet of Things within, or associated with the Internet.

Coding for an inclusive networked infrastructure - considering the issues for coding and messaging within an inclusive structure and how it relates to object identification coding.

Services and the Service Oriented Architecture (SOA) - considering services, federated service needs, evolutionary and scalable developments in services.

Quality of Service (QoS) - considering the important issues of performance and quality of service support requirements.

Security - considering the important issues of security across the inclusive model, and as appropriate with issues of data protection and privacy.

Governance - addressing the important issues of control, maintenance and overall governance of the Internet of Things, including issues of identification coding control.

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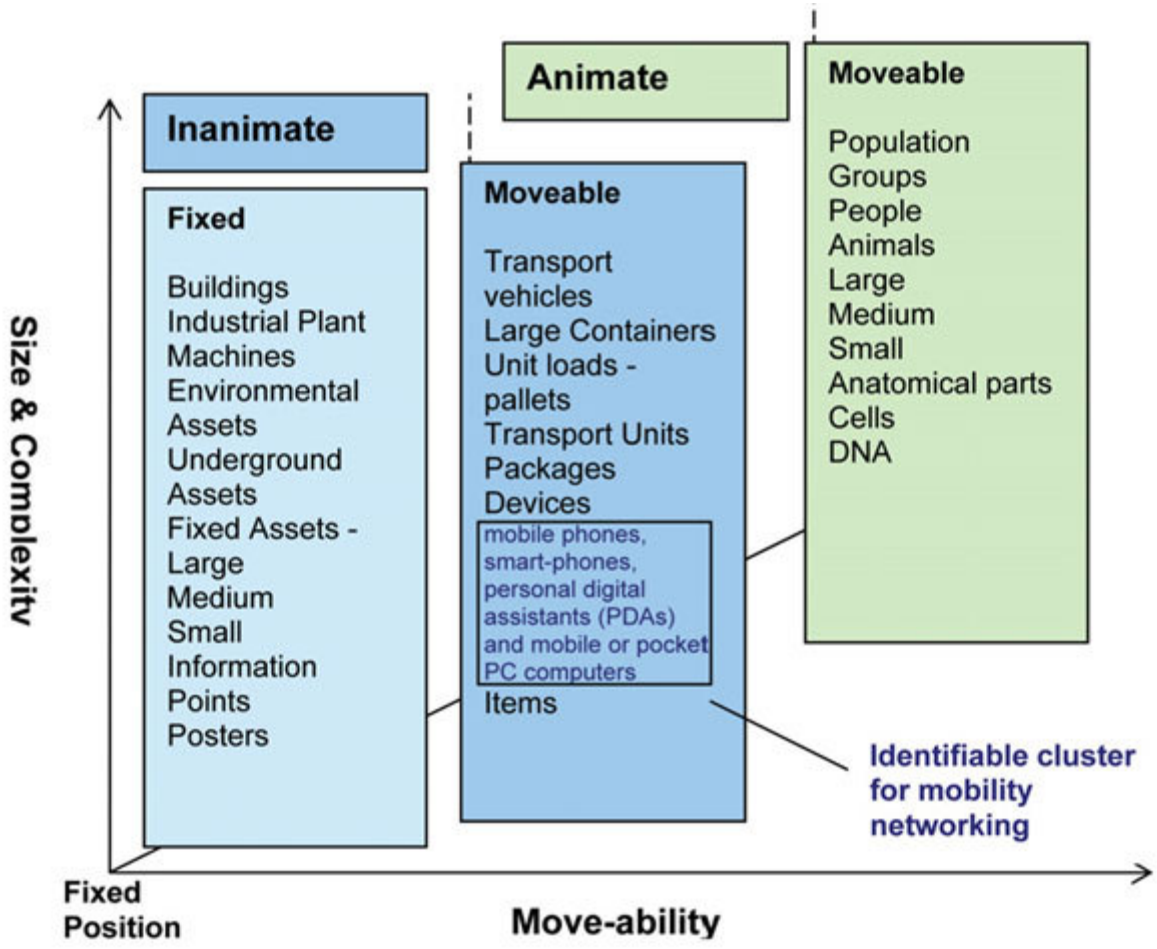

Standards and regulations - identifying the appropriate international standards and regulations, existing and required, for supporting an inclusive Internet of Things.

Principles and application methodology for object identification and data management - including sensor and location data and distinguished as object-connected (or item-attendant) ICT and positioned as an evolving sector within mainstream ICT.

As just one example, the report notes the challenges of a physical hierarchy of objects (e.g., a desk inside a building) and the different types of objects based on characteristics, as shown in the illustration above.

CASAGRAS has created a number of working groups with participation of experts from across the globe to explore a series of these issues and develop recommendations for standards and frameworks. We'll keep you posted as progress is made.