Published on *Digital Agenda for Europe* (http://ec.europa.eu/digital-agenda)

Internet of Things (IoT) is a technology and a market development based on the inter-connection of everyday objects among themselves and applications. IoT will enable an ecosystem of smart applications and services, which will improve and simplify EU citizens' lives.
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Whereas in the first run Internet of Things referred to the advent of barcodes and Radio-frequency identification (FID), helping to automate inventory, tracking and basic identification, the second current wave of IoT sees a strong verve for connecting sensors, objects, devices, data and applications. The next wave could be called a “cognitive IoT”, facilitating object and data reuse across application domains, leveraging on hyper-connectivity, interoperability solutions and semantic enriched information distribution, incorporating intelligence at different levels, in the objects, devices, network(s), systems and in the applications for evidence-based decision making and priority setting.

Economically , it could generate billions of Euros that easily translate into growth and employment, provided it ensures trust and security for the European citizens and businesses. At the same time, the IoT will bring hyper-connectivity to a global society, using augmented and rich interfaces. This global society will also be characterised by higher semi-autonomous system behaviour than today.

Applications for Society

Smart cities are an obvious application of IoT as a horizontal enabler, covering sustainable smart grids [1], smart mobility [2] and smart health [3].

Advances in integration and miniaturisation of ultra-low power components and micro systems [4] and increased autonomy and flexibility of service robots [5] is accelerating the diffusion of embedded ICT in all types of physical objects and artefacts ranging from clothes and even bodies to homes, cars and transport systems, as well as all public spaces and cities.

IoT Research and Innovation

The IERC-Internet of Things European Research Cluster [6] groups together the IoT projects [7] funded by the European research framework programs , as well as national IoT initiatives. The requirements of IoT will also be fed into the research on empowering network technologies [8], like 5G Mobiles [9]. The Future Internet PPP [10] will develop building blocks useful for IoT applications, while Cloud Computing [11] will provide objects with service and storage resources. On the application side, initiatives like Sensing Enterprise and Factory of the Future [12] help companies use the technology to innovate, while experimental facilities like FIRE [13] are available for large-scale testing.

In order to manage content and the related large amount of information, the Open Data [14] strategy

will be instrumental. A European Data Forum [15] was established in 2012 to contribute to it.

Policy Environment

Creating a climate for trust and responsible innovation is essential, as the development of IoT touches upon questions of security, privacy and trust. Furthermore, as the IoT will become widespread in citizens' lives at home, in the office, in public or on the move, discussion needs to identify any policy or regulatory requirements, where an impact could be foreseen, as well as in terms of education.

In order to fully deploy IoT, pervasive and easy access to wireless and mobile communication and identification/numbering resources to connect billions of objects is necessary. Iin particular, mobile access should be provided in a competitive, low-cost and cross-border manner to allow Machine-t--Machine and IoT applications to flourish. IoT will benefit from the work of BEREC [16] and ETSI [17] on fostering M2M development, the work of CEPT [18] and ITU [19] on future numbering, naming and addressing, and the Implementation of the roaming [20] Regulation. To ensure wireless connections for a huge number of objects, spectrum [21] availability will have to be managed with care.

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Last updated on 27/02/2015

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