

IoT Applications and Services: From Smart Environments to Business Opportunities

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This paper is taken from IDC's ongoing research on IoT and from "Definition of a Research and Innovation Policy Leveraging Cloud Computing and IoT Combination" FINAL REPORT, a study prepared for the European Commission DG Communications Networks, Content & Technology; IDC and TXT, December 2014".

Focus Area

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IDC analysts have recently combined their market research and market modelling capabilities with field research to uncover and qualify new business opportunities related to the use of IoT and Cloud-based applications and services in several industries in Europe. The field research completed the already rich assets of IDC knowledge and databases about cloud computing demand and is focused on the identification and assessment of the main additional opportunities of business development and creation of new services and products enabled by the combination of IoT and cloud computing, taking into account global as well as European perspectives of development and business strategies.

Who benefits and how?

The IoT use cases highlighted in IDC research tap into advanced and uninterrupted networking capabilities (supported/extended by other technologies such as cloud and big data) to spawn viable business opportunities. They generate a value that extends the economic nature to apprehend a wider societal and cultural dimension. The benefits associated to the use cases address the needs of a multitude of stakeholders, including consumers, customers, citizens and the society as a whole, and not exclusively to business actors. As an example:

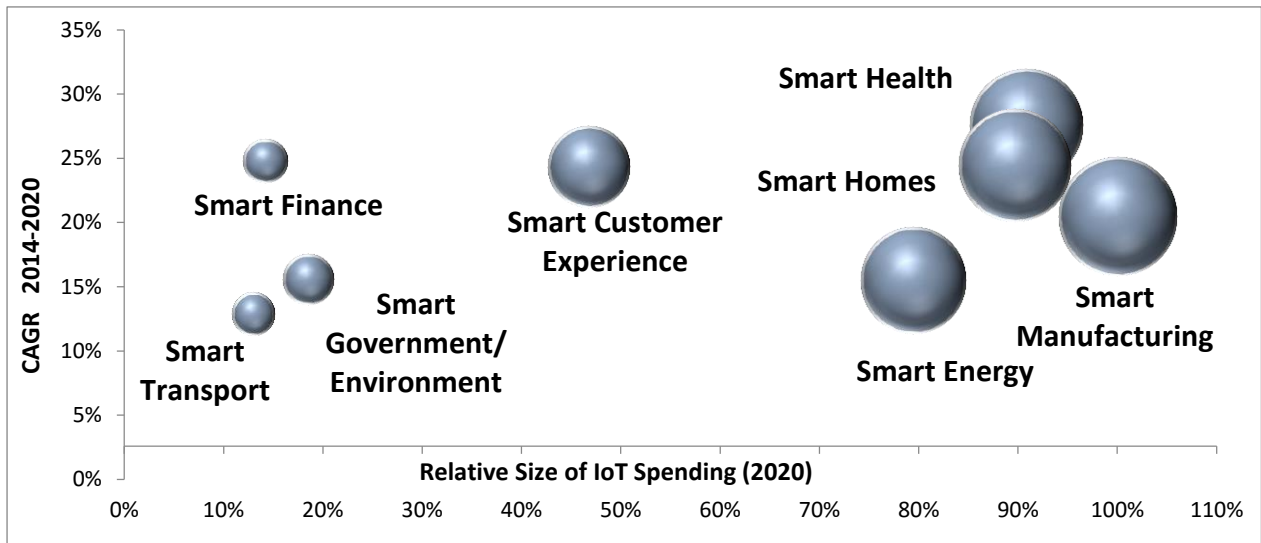
Stakeholders	Potential benefits
Large Companies, SMEs and other business organizations	Increased return on R&D investments, additional innovative services, shorter time to market
	Supply-Chain management & logistics, improvements, increased business processes efficiency
	Productivity improvements and enhanced asset utilization
Customers, Individuals	Better customer experience
	Increased transparency and reduced information asymmetry
	Time savings and reduced transaction costs
Society, Citizens	More timely and effective services to specific communities (elderly, rural communities, impaired citizens or other vulnerable groups)
	Better use of public resources and reduced waste of taxpayer's money
	Enhanced levels of environmental protection, public safety and security

This paper is concerned with positioning, market readiness, and business models with regard to the IoT and the emergence of the most significant smart environments

IDC has carried out a cross-industry analysis of all main IoT-related case studies in Europe and identified **eight most significant smart environments** according to two fundamental variables:

- the estimated size of each Smart Environment in terms of IoT spending in 2020;
- the estimated growth of each Smart Environment in terms of IoT spending over the period 2014-2020.

A visualisation of this analysis is presented in figure 22 below, where Smart Environments' relative size of IT spending in 2020 is plotted on the x-axis and expected growth rates for the period 2014-2015 are plotted on the y-axis.



In essence, each of the eight identified smart environments is already producing (or will produce by 2020) a considerable number of use cases successfully exploiting IoT technologies. More specifically:

- In Smart Manufacturing, operations and asset management already represent fertile ground for IoT solutions and applications; by 2020, they will be joined by other opportunity-rich use cases such as connected vehicles, driverless cars and e-call.
- Smart Homes will offer business opportunities in relation to home security, energy applications (thermostats & HVAC) and household appliances.
- Personal wellness applications and the varied world of wearable devices for both generic and health-specific purposes constitute the number-one opportunity area in Smart Health. They will be accompanied by remote health monitoring and staff identifications by 2020.
- Smart Customer Experience is and will be driven mainly by retail-oriented opportunities such as omni-channel operations, digital signage, in-store digital offers and Near Field Communication (NFC) payment solutions.

IoT has the potential to be a growth engine, also for SMBs in EMEA. The technology is not just about the enterprise — it is about developing smart homes, connected cars, smart meters/grids, smart environments, telehealth, smart cities, smart services from local authorities, telecare, and so forth. In this picture, SMBs can either innovate their own products and services but can also find niche roles in conjunction with major corporates in the complex IoT ecosystem.

Smart environments and the ensuing business opportunities are also shaped by a number of powerful **innovation accelerators**. These accelerators are in an earlier maturity and deployment stage than the main technology pillars of IDC's 3d platforms (mobile, cloud, social business technologies and big data) or the IoT. In summary they are:

- Virtual/augmented reality: Technology that allows immersive visual experience that removes or complements external visual input and follows the user's head movement.
- Wearables: Wearable devices with a microprocessor, that is capable of digitally processing data.

- Cognitive systems: Systems that observe, learn, analyse, offer suggestions, and even create new ideas — dramatically reshaping every services industry. This includes artificial intelligence (AI), machine learning, cognitive computing, and robotic process automation.
- Robotics is the branch of technology that deals with the design, construction, operation, and application of robots, as well as computer systems for their control, sensory feedback, and information processing.

This movement of IT, way beyond traditional boundaries of data centres and IT departments, will be the most dramatic aspect of the 3rd Platform's innovation stage. The end goal is nothing less than the reinvention — and continuous transformation — of every industry on the planet. In fact, at IDC, we believe the 3rd Platform is not just a technology innovation platform; it is fast becoming a business innovation platform.

IDC calls these trends innovation accelerators because of their combined potential to drive innovation. As shown in the figure below, these trends have strong technology intersections creating new business opportunities. The IoT is the main technology platform underlying these technologies, providing them with the universal connectivity and data communication capabilities needed for their operation. Then there is a cluster connecting Robotics with 3D printing and Cognitive computing: 3D printing combined with robotics enables automated manufacturing; Cognitive computing through the development of software for tasks automation provides the "brains" for the new robots: both require new types of sensors to function through IoT. This cluster is particularly relevant for industrial manufacturing, but also for evolving business processes in main services sectors such as healthcare and government.

A second cluster underlines the intersection between Wearable devices (which can function because of the IoT, naturally) and Virtual/ augmented reality systems (providing the context and software for wearables such as portable augmented reality glasses, e.g. Google glasses). Both Virtual/Augmented reality and Wearables have addressed so far mainly the consumer market, but the next years are likely to see greater diffusion in the business worlds as new applications are being developed.

The deep intersection between these technologies means that they face common development challenges, particularly concerning the need for a seamless interconnected environment with sufficient capacity and bandwidth to allow for real-time interaction and the exchange of data flows.

