



INDUSTRY VERTICALS IMPACTED BY THE INTERNET OF THINGS
How the IoT Will Change our Bodies, Homes, Cars, Workplaces and More

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The DCIA is an international trade organization focused on the commercial advancement of cloud computing and related technologies.

Background

The Internet of Things (IoT) refers to a level of connectivity of devices that goes far beyond the norm of what we already expect to provide Internet access – such as PCs and smartphones. IoT in fact covers a whole new class of smart objects and applications that are now being developed and deployed, ushering in novel forms of automation for nearly all fields of human endeavor.

“Things” in this context refers to a wide assortment of physical and virtual objects being equipped with sensors, drivers, software, motors, processors, and modems; and connected to networks of similar and related devices, with varying degrees of human intervention.

Besides an enormous expansion of Internet-connected automation, IoT is also expected to generate large amounts of high-velocity data from diverse locations that will need to be stored, indexed, and processed. Among other uses, this data is expected to be able to help drive the development of more and more personalized and therefore valuable IoT services.

Industry analysts project a steep growth trajectory beyond the more than 12 million connected IoT devices at the end of 2014, with a range of numbers that underscores the newness of this phenomenon. Gartner forecasts 26 billion IoT devices by 2020; ABI Research projects more than 40 billion by then; and IDC and others have estimated the figure to exceed 50 billion – with the highest estimates at 200 million or more.

The stakes grow exponentially larger with these advancements, beyond data security now also to include physical safety. But so do the opportunities to enhance people’s lives in

unimagined ways. As Gilad Meiri, CEO of tech start-up Neura, said, "The IoT holds potential for disruptive change, and its evolution will likely be faster than the Internet."

Let's examine five industry verticals now being significantly impacted by this phenomenon.

Smart Objects for Fitness & Healthcare

Objects are smart when they can interact with the virtual as well as physical world. Fitness and healthcare actually cover a spectrum of personal wellness concerns ranging from self-managed abilities to perform sports-related activities to professionally-managed diagnosis and treatment of illnesses and injuries.

On one end of the scale, an increasing number of people are using connected personal objects – often so-called “wearables” -- to collect information about themselves and positively impact their lives. Most such wristband monitors and mobile apps currently track performance metrics separately. The next generation will be far more integrated, connecting directly with exercise machines at fitness centers and spas, and revealing patterns of behaviors and trends that previously have gone undetected.

On the other end of the scale are an array of implanted medical devices that create new opportunities to serve patients with unprecedented precision and efficiency. These can dispense medications, provide electronic and motor stimuli, and monitor critical biometrics.

All of these areas generate huge amounts of data that need to be managed, analyzed, and protected.

Programmable Homes & Energy Management

Machines are considered programmable when they can be given instructions and perform tasks automatically. Homes include permanent and temporary dwelling places for individuals, families, or larger groups of people. Energy management encompasses planning and adjusting power consumption.

IoT is making inroads in this sector with solutions ranging from smart thermostats and security systems to many different types of appliances and energy management products being controlled from remote locations and connected to related services.

Combined surveillance cameras and garage-door openers, which integrate parking-assistance features, are an early and increasingly popular entrant.

The connection of major consumer appliances, including water heaters, with utility companies is already benefiting society by improving the economics and performance during peak usage periods when electricity is most expensive. Wide-scale brown-outs face obsolescence with IoT solutions now facilitating micro-adjustments of power delivery.

Media Entertainment & Social Networking

Psychologists say the function of media entertainment is solely to promote the attainment of gratification. Social networking is accomplished by means of platforms that build relationships among groups of people who share interests, activities, or backgrounds in real life.

The IoT is breaking down the barriers between professional and user-generated content as never before with higher-and-higher quality connected data-capture and display capabilities. Media entertainment and social networking are becoming a seamless continuum thanks to such connected devices.

Combinations of entertainment and communications products are also facilitating new types of intelligent commerce by accessing users' behavioral data at opportune times.

Fans now access apps to enhance their real-time sharing and participating in live events from sports and games to music and other live events.

As another example – it's now possible to view a time-shifted TV food network cooking show of interest, connected to a smart refrigerator integrated with a supermarket that delivers, to enable timely access to all needed ingredients, and then activate a smart oven and social network of fellow food-preparers to provide feedback during the actual recipe preparation. It may not take a village to make a meal, but the dynamics of cooking are changing thanks to IoT.

Geolocation Services & Vehicular Automation

Geolocation services involve the identification of real-world geographic locations combining radar-like sources with mobile-phone and Internet-connected computer-terminal services. Vehicular automation involves the use of mechatronics, artificial intelligence, and multi-agent systems to assist or even replace in-vehicle operators.

The IoT is ushering in an era of smart mobility.

Connected cars now feature enhanced entertainment and communications, diagnostics, and driver-assistance features that are already changing automobile purchasing and post-sale servicing. Experimental semi-autonomous vehicles that perform such tasks as parking themselves in parking garages have been successfully demonstrated and fully self-driving commercial passenger vehicles are imminent within a few years.

Meanwhile, airborne drones with an enormous array of payloads to serve categories from agriculture to mining to package shipments and restaurant deliveries, are now becoming a reality, with regulatory concerns lagging behind avionic technological capabilities.

Retail, Public Space & Manufacturing Environments

Retail, public space, and manufacturing environments are self-explanatory; and all three are benefiting from IoT beacons and low-power short-range communications.

Retail has a huge opportunity to create smarter stores with highly personalized shopping experiences, and do a much better job with inventory management thanks to the IoT.

Networking embedded devices with limited CPU memory and power resources means that the IoT has public space applications as well, such as toll-booth management, drawbridge operations, and park vegetation control.

The IoT in manufacturing environments is supporting connected machines in factories that are or more efficient, productive, and smarter with such features as self-diagnosing for maintenance and machine-to-machine communications and learning.

A new generation of networking and analytical platforms capable of processing vast streams of industrial data will break-down walls between operational domains to spur collaboration and creativity in the emerging intelligent network landscape.

Conclusion

We've emphasized the promise of IoT in these examples, but this area is not without its challenges. Three current priorities are to: 1) better the power-consumption characteristics of connected devices, 2) improve cybersecurity and privacy protection, and 3) ensure interoperability across brands and product lines.

Micro-chip designers are developing new ways to reduce power consumption. Cyberattacks are being thwarted by hardening systems, increasing the frequency of encrypted software updates, and using secure protocols for communication. Consumer security and privacy are now paramount concerns among industry participants. IoT standards-setting bodies are assisting with interoperability among multiple brands of consumer electronics (CE) products using a variety of operating systems.

In short, the IoT is opening-up unprecedented opportunities for entrepreneurs and large established enterprises alike. Whether you prefer to think of it as the "Internet of Everything" or the "Internet of New Services for Me," your life will be changed in ways not yet imaginable by the IoT.

Marty Lafferty is the Chief Executive Officer (CEO) of the Distributed Computing Industry Association (DCIA). His background includes senior management roles at leading global brands and progressive start-ups in high-value digital content delivery. His assignments have ranged from CEO of NBC's Olympic joint venture to Corporate & Services Marketing VP at Microsoft TV. As VP of TDBS, he led Turner Broadcasting's pioneering work in satellite-signal security technology. He also served as CEO of Zoom Culture, CMO of StreamSearch, and President of FutureVision.