



GS1 “Consumer IoT” Innovation Initiative

Consumers are changing the ways in which they interact with retailers, brands and products—both in the physical world and online. They increasingly demand that their shopping experiences be relevant, timely, personal, secure and seamless. More and more, these interactions occur with, and between, smart-connected devices.

Behind this change is the Internet of Things (IoT). As a key market disruptor, the IoT will have a profound impact on GS1 stakeholders across industries and around the world. It is important that GS1 continues to serve its stakeholders in a way that preserves global standards and benefits people and companies today—and prepares them for tomorrow. At the same time, GS1 intends to lead this space by developing an inclusive architecture that aims to be **the global language of business, people—and things.**

The emergence of Consumer IoT

We are moving into the age of the Consumer Internet of Things (C-IoT). One can easily imagine a future in which a consumer’s pantry alerts Amazon Alexa to order more baby formula, using a small camera, RFID tag or a WiFi-enabled scale. Once the item is ordered, the parent would be able to track the shipment and confirm the product’s authenticity—directly with the manufacturer—upon delivery. If a problem arises, they could request a replacement by simply asking Alexa. The new product would be fulfilled through an Uber delivery service or a robot/drone.

Though the IoT has traditionally been leveraged within the B2B space, it is already prevalent across retail channels and we expect healthcare and other industries to follow suit. Today, the IoT is driven by the needs of—and interactions with—everyday people. In retail, for example, the pen-and-paper shopping list is no longer necessary because we can “talk” to objects that order products for us and arrange for their delivery. In healthcare, IoT devices can tell us to see a doctor before we even know we need to.

“As the Internet of Things grows we need an agreement on system architecture and open standards. If leaders don’t think this through, and don’t create a framework for it to succeed, there’s a real chance that the full potential of the Internet of Things could be compromised”.

Sanjay Sarma
Chairman, GS1 Innovation Network
Professor, VP for Open Learning, MIT

Life in the future of Consumer IoT



Consumer IoT represents a move beyond the traditional boundaries of today's supply chain and focuses on the "life" of a product post-purchase. This extension of the supply chain is referred to as the "consumption chain". These activities and interactions include set up, installation, use, customisation, storage, subscription, replenishment, maintenance, repair, reorder, resale, share and disposal. Focusing on this new landscape of product use enables GS1 and its stakeholders to extend their conversation with consumers far beyond the point-of-sale.

Leaders in the IoT field include companies such as Uber, Amazon and Tesla—all of which are taking advantage of these market disruptions and moving the focus of commercial activity closer to the consumer. Some of these innovations, such as conversational interfaces (Amazon Alexa, Google Home), smart stores (Amazon Go) and even delivery robots (Starship), could be highly disruptive. More and more, companies are winning the loyalty of the end user by delivering significant value, rather than just the product or service itself.



The term the "Internet of Things" was coined at the Auto-ID Center at the Massachusetts Institute of Technology (MIT) during the early days of RFID development work. In 1999, the vision was to connect "things" to object-specific data on the internet, which could then be accessed using a unique tag attached to the object. **A set of standards was built around the three core concepts of identification, data capture and information sharing.** That work spurred the creation of EPCglobal®, a GS1 subsidiary, and continues to be foundational to the GS1 system of standards.

Consumer benefit, enabled by unique identification, was the original intent of this work; the rise of the IoT has created a real opportunity and need to address topics of system interoperability, data management, data discovery and data governance.

A new GS1 Consumer IoT framework is needed

It is no longer a lack of technology, but rather a lack of vision and imagination that limits new opportunities. Fragmented standards, protocols and services—all of which impede competition and hurt consumers—will be the most significant bottlenecks for the advancement of future C-IoT success stories, such as the baby formula example outlined earlier. It is necessary to build on existing global standards and technologies to ensure that consumer needs and business processes run seamlessly.

A framework for GS1 Consumer IoT standards would significantly enhance GS1's relevance and critically benefit manufacturers, brands, vendors—and society.

This framework will be inclusive in its approach, data-carrier agnostic, secure and open. It will be a modular approach that promotes competition and drives data exchange and commerce for decades. Of course, embracing consumer privacy through the responsible use of technology and systems will continue to be key as we move forward.

GS1's expertise in the realms of unique product identification and zero-power devices uniquely positions the organisation to advance standards-based, seamless interoperability.

As a neutral, not-for-profit global organisation with the most widely-adopted numbering system for trade items in the world, GS1 is uniquely positioned to define the foundational standards for Consumer IoT.

The work begins: GS1 and MIT

GS1 can play a pivotal role in accelerating the pace at which "things" can be efficiently identified, interconnected and made interactive. A new team will explore this potential and evaluate the use cases that underscore gaps in existing standards and system architecture. We will work across GS1's key industries and will, in partnership with the Massachusetts Institute of Technology (MIT), publish initial findings and a proposed plan of action in 2017.

In today's hyper-connected world, this work is foundational to the relevance of GS1 and we look forward to sharing our initial findings. We believe that a unique opportunity exists for industry to leverage decades of investments in standards and extend the GS1 system of standards to become industry's **global language of business, people—and things.**

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