

# Making the connection

**How the internet of things engages consumers and benefits business**



# Introduction:

## this is just the beginning

Our industry faces a challenge; connecting with consumers is becoming increasingly difficult. You have to do it where they are spending more of their time: on social media, smartphones, tablets, and apps. There, you have to hold their attention long enough to engage them in the relevant conversations that translate to ecommerce sales, or convince them to go to a store. We are transforming marketing, sales, operations, and supply chains as a result. It's a challenge but it's not the end goal. It's just the beginning.



Every product, every process, every person, and every place leaves a data trail, and that data trail can be captured, tracked, shared, combined, mined, and analysed. The result is ways of better understanding, not only your own operations, but also what consumers want, what they need, how to offer it to them, and what they are willing to pay for this. Data aggregated from multiple sources and devices can be turned into unique, actionable insights which can inspire new products, and new services, which enhance consumers' lives and the way they experience the world, whether they are part of the West's aging demographic, or the burgeoning middle class in an emerging economy.

To turn this inspiration into reality, consumer focused industries can build value networks – loosely-coupled collaborations within the supply chain, across industries and with consumers themselves. These networks can wrap products and services around consumers and their demands. Gradually, such networks will replace the value chains that have been the backbone of consumer industries for years (for more information on value networks, please see “Rethinking the Value Chain: New Realities in Collaborative Business” by The Consumer Goods Forum and Capgemini!).

It's a huge opportunity. Companies can either grasp it, or wait for other players to do so. Every market is ripe for disruptions and the Uber effect knows few limits. Startups can spring from anywhere in the world and quickly reach a global market. Competitors can migrate from other industries too. Apple disrupted the music industry; Amazon, the market for hosted software.

There is a concept that can help. It can provide the foundation for the necessary transformation, but it comes with previous baggage. The internet of things (IoT) arrived with a bundle of technology buzzwords which gave it a bad name. But don't shoot the messenger. Think instead about the business benefits it can bring.

# What is this thing called the IoT?

The growth of the IoT will be staggering. According to Gartner, there will be nearly 26 billion devices on the internet of things by 2020<sup>2</sup>.

The strength of the internet of things lies in its simplicity. It uses the founding protocols of the internet to allow any electronic machine, device, object or sensor to send data to anywhere else on the network. This could be to another machine, database, application or device (e.g., smartphone). Really any connected, “smart” object. Although the idea of machines exchanging data is nothing new, the increasing bandwidth of wireless and mobile networks means they can be connected wherever they are, making the IoT incredibly powerful at gathering, sharing, and enriching data. It can also send data to devices – switching off lights or turning down thermostats.

Meanwhile, data acquisition and analysis tools are now capable of collecting, and drawing inferences from this vast array of sources at a volume and velocity never before possible. The combination of data from sources such as the IoT, social media, and smartphone locations, can offer businesses insight into their operations, their supply chains, consumer behaviour, and the life of products after they have left the store – in real time. The insight can feed new product and service development. The IoT gives consumer products companies and retailers an entirely new way of collaborating with suppliers, other industries and consumers themselves.

The growth of the IoT will be staggering. According to Gartner, there will be nearly 26 billion devices on the internet of things by 2020<sup>2</sup>. By which time, IDC says 10 percent of all data in the world will come from machines talking to one another<sup>3</sup>. Network technology firm Cisco and engineering giant GE estimate the IoT could add \$10 trillion to \$15 trillion to global GDP by 2034<sup>4</sup>.

## Other industries lead in IoT, for now...

The IoT is already here, but it is mainly being applied to specific, narrow problems outside the consumer products and retail industries. Utilities companies, for example, use sensors connected to their infrastructure to measure performance and send data via the internet to pinpoint problems and to forecast outages. Buildings can control lighting and temperature in real time for maximum comfort and efficiency, using internet-connected sensors and control systems. In the automotive sector, transmitting data from sensors inside vehicles can provide information to the driver but also to the maintenance garages and car manufacturers. Research firm BI Intelligence says revenue from connected services in the automotive industry could reach \$152 billion by 2020. There are many such examples in healthcare, logistics, and other sectors, which can be studied and applied to create business and consumer value.

Although it has many technical applications, it is a mistake to think of the IoT as a technology, per se. The greatest benefits will not come from applying new technologies to existing processes or structures because the IoT offers so many new possibilities. It can connect companies directly with consumers; it can support rapid and seamless collaboration across all parties in the supply chain; and it can create collaborative partners out of all the industries that touch consumers, to make their lives easier while building brand value. The IoT can underpin the transformation necessary for our industry to prosper in the face of the radical changes in consumer behaviour happening as a result of the digital revolution, globalisation and demographic shifts. Here's how.



# Keeping step with consumers



First of all, the IoT can give retailers and consumer goods firms much richer insight into shopper behaviour in stores. Video cameras and motion sensors in-store and the resulting “unstructured” data provides intelligence about how consumers use the store location, capturing information on traffic patterns, products of interest and dwell times. Bluetooth and Wi-Fi beacons can track a shopper’s smartphone through the building within a metre, and, with the right permissions, that data can be integrated with the customer’s profile information and previous purchase history for more personalised recommendations. Sensors inside and out can share information about temperature, light and humidity, which can influence shopping behaviour, the in-store experience and store operations.

Analysis of these multiple data feeds combined with input from social media and external sources such as weather forecasts can, at the very least, act as a leading indicator of future demand, offering the opportunity to optimise both supply chains and pricing.

But there are further, deeper benefits. Monitoring movements and interactions within stores enriches the retailer’s understanding of how consumers use the environment and what they purchase. This can feed into customer intelligence systems, which can tailor marketing messages, coupons, special offers, and useful content, targeted at segmented groups of consumers or even individuals. Messaging can be designed for wherever the consumer is most receptive to it: at home, at work or while browsing a particular area of the store. Brands can create more top-of-mind awareness by engaging with shoppers in this contextually relevant manner.

Of course, this needs to happen in a way that fully respects consumers’ privacy and is relevant to each individual consumer’s interactions. The “Consumer Engagement Principles”, developed by The Consumer Goods Forum together with Capgemini, can help companies ensure a trusted engagement, with mutual benefits<sup>5</sup>.

Insights into how stores are used based on vast reserves of historical buying behaviour can also help spot emerging trends, improving product positioning as well as store assortments, layout, and design. The knowledge can also feed into the development of media vehicles such as billboards and other forms of market specific advertising.

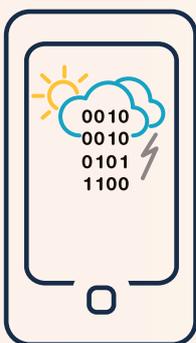
Some simple examples are already with us.

## How to Haircast wins consumers’ attention

In 2013, Pantene, a P&G haircare brand, launched a “Haircast” campaign teaming up with Weather Channel<sup>6</sup>, one of the most well-used weather apps. Customers checking weather updates in the app also received recommendations for Pantene solutions suitable for the particular day’s forecast. The geo-targeted messages also offered coupons redeemable at nearby Walgreen stores.

Other retailers are trying out the IoT for consumer engagement. US retailer Kroger has been testing smart shelves to display outsized price images and nutritional information<sup>7</sup>. It is planning to add further capabilities to smart shelves to allow them to interact with consumers’ phones, synchronising with their digital shopping lists, and highlighting the shelf location where consumers can find the products they are looking for.

The IoT can help engage consumers, but it can also address another challenge facing the industry, that of trust.



# IoT helps nurture trust

Consumer products and retail companies need not look far to find data demonstrating the decline in consumers' trust in their industries. Concerns range from the provenance of food, to working practices in the supply chain, to environmental impacts of manufacturing and distribution.

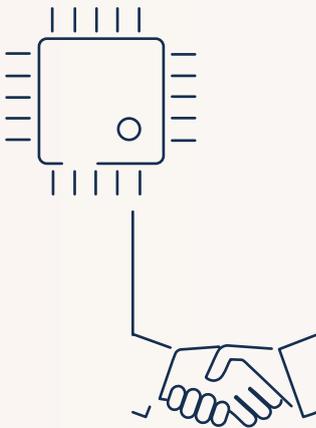


The internet of things is among the group of technologies which can help with the governance of supply chains and provide consumers with the timely information they need to put more trust in consumer industries.

For example, Italian food firm Barilla is working in partnership with network company Cisco<sup>9</sup> to create greater traceability in its supply chain. By scanning a digital QR code, consumers can view all the stages of the production process, from farm to fork via a linked website. Details are provided about the origin of the durum wheat varieties together with background on the harvest, milling, and movement through the supply chain to Barilla's plant in Parma, Italy, through to the point of sale.

## ThinFilm packaging combats fraud

Technology firm ThinFilm can print electronic circuits onto a thin plastic material which manufacturers can stick to packaging<sup>9</sup>. The circuits can communicate over a short distance with other electronic devices and can combat counterfeiting, ensure unique factory-encoded identification, and cannot be cloned, the makers say. Drinks giant Diageo is already deploying the technology.



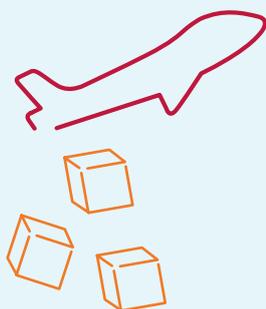
Consumer companies will need to work with technology providers to mitigate security threats. Anything that can be connected to the internet can potentially be compromised by hackers. However, security concerns should not become a deterrent. They were initially raised over ecommerce too, but have not held back companies such as Amazon.

By tagging components, constituents or ingredients of products as they pass through the supply chain, companies can aggregate the data needed to reassure and inform consumers. Employing the IoT in this way can reduce the need for expensive surveys or research on a case-by-case basis. Data can be uploaded and migrated to central tracking systems automatically. Offering consumers the resulting rich and relevant information at the right time can help keep their trust and build competitive advantage.



# Agile supply chains, better delivery

While the IoT will help build bridges with consumers, the behind-the-scenes transformation of supply chains will be where consumer products and retail industries can see the most immediate benefit. For a start, IoT technologies offer a great opportunity; they improve the efficiency and productivity of many processes in logistics, replenishment, supply chain, merchandising, store operations and manufacturing.



Having products, components, vehicles, distribution centres, and manufacturing plants linked to the internet offers oversight of an end-to-end process. Operations can be mapped and modelled. Analytics tools can seek out inefficiencies and predict bottlenecks in the system. Suppliers, manufacturers, and retailers can synchronise inventory to much greater accuracy, helping all players reduce costs.

When analysis of shopper behaviour, social media, marketplace trends or the weather predicts a sudden surge or collapse in sales, supply chains can become more responsive and less likely to fail to meet demand, or overshoot it. This helps avoid the bullwhip effect, which can cause massive stock write-offs.

Clothing firm Levi Strauss & Co has been working with technology firm Intel to offer near real-time inventory visibility<sup>10</sup> of every item in its flagship store in San Francisco. The project identifies all items in the store with an RFID tag and uses readers to disseminate item-level data to its analytics systems. The store team gets visibility about on-shelf availability and what is running low, making inventory replenishment more accurate.

Combining smarter supply chain and logistics operations with mountains of data available to the industry means organisations can be more flexible in responding to demand, without losing margins. If analysis of social media conversations and Google searches forecasts a flu outbreak, products and promotions can be directed to the right stores at the right time.

Better supply chain management can also change what companies offer consumers. The efficiencies gained make it economical to manufacture products in smaller quantities to meet the needs of niche markets. The IoT can help change mass customisation from a promising idea into a viable reality.

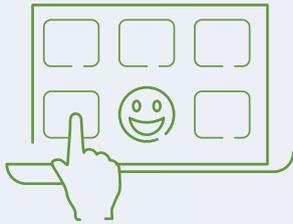
## Improving the omni-channel promise and performance

Besides improving supply chain and store performance, the IoT promises a leap forward in omni-channel retail. Upstream supply chains and downstream logistics can be synchronised using live data from IoT devices embedded in products, factories, stores, warehouses and vehicles to help companies make and keep in-demand products stocked when consumer interest is high. Retailers can offer consumers shorter delivery times, narrower delivery windows, and multiple choices for delivery options such as click-and-collect and delivery to home, office or other convenient location. And they can let them know if anything is going to be late or when it is due to arrive.

But IoT can go further. Products themselves can become smart, internet-connected things, changing the foundation of the relationship between the industry and consumers.



# Products talk back after purchase



The IoT can connect products so they supply data on their usage and conditions to back-end systems long after they have left the retailer. As already mentioned, ThinFilm can print electronic circuits on packaging. Using a smartphone or other device, owners can directly receive information about how to use or maintain a product without going online to search for this.

More complex products, from vacuum cleaners to hair dryers, can host sensors which send data about usage and wear and tear back to the manufacturer. The resulting information can predict when replacements might be needed and help design product improvements and enhancements, better suited to evolving consumer needs. Smart, connected products can also receive information, such as new setting updates or instructions tailored to their usage.

## Pushing consumers' buttons

Some examples of IoT in the home are already in play. For regularly used household products, Amazon has created Dash buttons, small devices which link to household Wi-Fi and place orders to replenish common items when they run out. For example, a Dash button stuck by the washing machine can reorder detergent via an Amazon account<sup>11</sup>. More than 60 versions are available, each specific to a particular product. As part of this launch, Amazon partnered with a range of brands including razor firm Gillette, beauty products company Olay, and coffee system Tassimo to brand the buttons.



In a similar move, the French electronics retailer Darty is offering consumers a button in their home that promises to connect a helpdesk call within 60 seconds using a smartphone app. "Le Bouton Darty"<sup>12</sup> provides a 24/7 service to help consumers tackle issues such as operating microwave ovens, fixing an internet connection, or checking the status of an online order.

FMCG companies are also investing in IoT embedded in products. P&G has created a Connected Oral B toothbrush<sup>13</sup> that comes with a Bluetooth radio and programming to send and receive information. The toothbrush can be connected to a smartphone app to improve brushing and oral hygiene.

## Inspiring innovation

While some of these proposals seem far-fetched, the benefits to consumer convenience and product innovation are clear. The IoT gives businesses the opportunity to understand how products are being used, which combined with social, ecommerce, and in-store information, can help build better products, and even new classes of product. Consumer companies, their suppliers, and retailers can work with firms from other sectors in the spirit of open innovation in product development, much as the software platform firms work with application developers. This will not only create better products, but also an ecosystem of services that wrap around them, generating additional revenue streams as well as long-term brand loyalty.



# Consumer goods...as a service

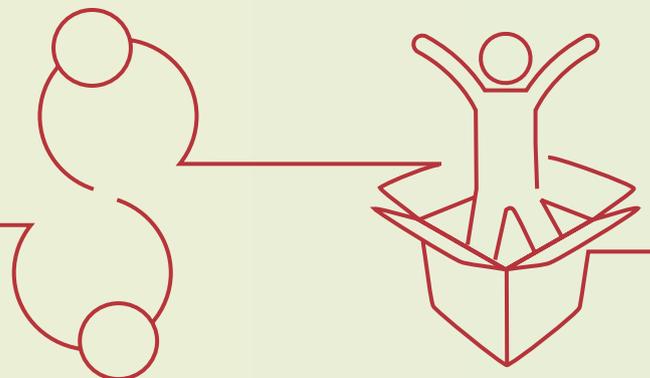
Consumers are looking for solutions to the challenges they face in increasingly busy lives.

A consumer buys washing powder because he needs washing powder. That's the assumption the industry is built on. The challenge is persuading him to buy the right brand. But maybe the assumption is wrong. Maybe he needs a crisp, ironed white shirt for tomorrow's important job interview and would rather not be spending time shopping for washing powder when he could be preparing for the big day.

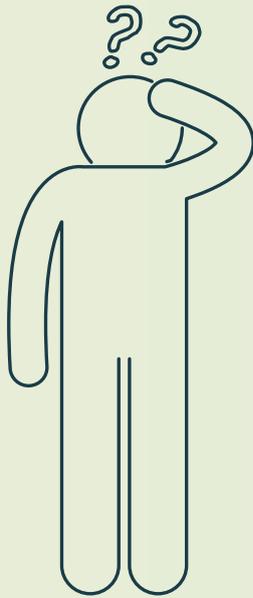
Consumers are looking for solutions to the challenges they face in increasingly busy lives. In just a few years, we will see massive adoption of new consumer technologies embedded in new business models, built in co-operation with other sectors, all aimed at improving the way people live their lives. A trip to the doctor might result in a prescription, dietary advice, a complementary health product, an app, an online service, and a digital shopping assistant. Consumer goods, healthcare, financial services and social care providers will hope to align paths to purchase and after-purchase care, blurring the line between goods and services and placing a premium on information, quality, connectivity, and convenience.

Services built around products have already been introduced in the automotive and industrial sectors. General Motors pioneered the use of telematics to create new revenue streams. With its OnStar telematics system, the company generates nearly \$1.5 billion in revenues annually<sup>14</sup>, through several paid safety, security, and navigation services. Similarly, industrial giant GE launched its "Predictivity" line of IoT services in 2012<sup>15</sup>, to help industrial customers manage the data from their connected equipment. Within a year of launch, Predictivity generated \$290 million in revenues for the company.

In consumer industries, the services firms build around products will almost certainly require more than one organisation to support them. Companies and industries can work together to build collaborative networks that not only support consumers, but continually engage them.



# Where to start



Adoption of the IoT is far from mature. Research from Capgemini shows solutions vary significantly in their levels of sophistication<sup>16</sup>. The basic starting point is connected products that generate alerts and notifications based on sensor readings. More advanced solutions allow remote operation using sensors. The most mature solutions allow organisations to use sensor data to provide customers with high-value performance improvement based on actionable insights. The research, which drew on responses from more than 100 leading organisations in North America and Europe, shows less than 30 percent support remote operability and fewer than 40 percent use sensor data to offer insights that can be used to improve performance.

## Delving into the data offers the biggest benefits

We advise companies to begin IoT discussions with the business strategy front and centre – the value the organisation needs to create, and the innovative business capabilities that will deliver that value. The value of IoT is created not through the “things” themselves, but from the use of data which includes data businesses already have and data that can be newly acquired or newly mined. How organisations process, analyse, and act on the increasing amounts of data will set the winners apart from the rest of the field.

Consumer industries now have five sources of data around which they can design their processes, supply chains, store activities and marketing:

1. Traditional, store-based structured data on transactions, customers, store operations, and products (pricing, attributes, inventories)
2. E-commerce structured data on traffic (path to conversion, dwell time, abandons), transactions, customers, and products
3. Contextual, unstructured data, primarily derived from weather, location data, and social media
4. New, product-based, thing-based data – which is primarily about product, place, use, and condition
5. New store-based unstructured behavioural data from video, motion capture and beacons which identifies traffic patterns (path to purchase, dwell time, abandons) and product location and condition

Leveraging these multiple data sources will offer new business insights, which can be used to accelerate, automate, or slim down a business process or identify new ways of delivering value to the consumer through product or service innovation.

Businesses can start by defining a strategy to win the new digital shopper. It might mean offering personalised recommendations, reminders, and services that ease the process of making a decision and create loyalty to the retailer or consumer goods brand. Equally, it could mean tightening supply chains using IoT intelligence to create faster ecommerce deliveries to get products to consumers wherever they are, whenever they need them.

Ultimately, leading organisations are developing products uniquely engineered and designed for the needs of specific consumer groups, using feedback from embedded IoT devices. These companies can also figure out how to help consumers solve problems, have fun, or achieve their goals by connecting innovative products with a broader network of services, which together enhance the brands involved.

# Cheat sheet on IoT for consumer industries

Technology experts are buzzing about the potential of the IoT, but where should leaders in consumer industries start to look for business benefits?



## 1. Start with data

The value of IoT will be in the data. Businesses will be able to build new systems to store and analyse the data arriving from smart objects, be that in the supply chain, in the store or in consumers'

homes. But companies are already surrounded by data whether in internal ERP, sales or finance systems, or external sources such as weather data, social media and web searches. Businesses benefiting from the IoT will see it as a continuation of the data-driven decision making they have already embraced.



## 2. Start dumb

The technology industry may sometimes give the impression that IoT will involve smart technologies embedded in everything. In fact, the most immediate value, at the lowest expense, will be from relatively dumb things which simply transmit data about the quality of the physical environment, such as light,

humidity, temperature and movement. In the supply chain and in-store, these can provide valuable data which, if analysed and acted on, can reduce energy costs and improve the management of supply chains and stores, particularly when dealing with fresh, perishable products.



## 3. Flexing the supply chain

With dumb sensors connected to data capture throughout the supply chain, consumer businesses can pinpoint and predict the location and condition of perishable products from farm to fork. Spoilage of items such as bananas can

be slashed by knowing the conditions they are grown in, how they are stored and when they will be at their best.



## 4. Simplicity in the home

Darty and Amazon Dash buttons are the poster boys for the IoT in the home. But it will probably be other applications that will become popular. Mid-value items, such as propane gas canisters, which power barbeques can benefit from sensors that detect how much gas remains. Using an online service to remind consumers to order

replenishments can help them avoid running out of gas as party guests arrive. Simple and automated replenishment applications can be extended to a wide range of domestic products.



## 5. Smart containers move data up the supply chain

As containers in homes and stores gradually become hosts of connected sensors, detecting volume and temperature changes, for example, consumer goods firms and retailers

can start to build the information into their supply chain calculations. It will help supply chains become more flexible and responsive, allowing shorter runs of products at lower costs.



## 6. Building broader data models

The value in the IoT will come in connecting and understanding broad classes of data. By analysing data from sources such as social media, weather information, traffic feeds, smartphone locations, sales, and supply chains, businesses can start to see

patterns and predict sales opportunities. By feeding forecasts back through the supply chain, companies can dramatically improve efficiency and boost opportunity. Organisations can divert products to where they will be most needed. Stores and websites can promote the right products at the right time, in the right location. But identifying the right patterns that forecast behaviour will require continual testing of models and validation of the data.



### 7. Wearables for health, not just fitness

Wearable technologies have hit the headlines as fitness enthusiasts adopt wristbands which can monitor heart rate, speed and performance. But the real benefit of wearables will be in offering long-term healthcare services to a much bigger market.

Around 380 million people globally suffer from Type 2 diabetes<sup>17</sup>. Wearable technologies that can monitor blood sugar are not far off<sup>18</sup>. They could send early warnings to the patient, allowing them to better manage their condition, and share long term data to help physicians provide better care. Companies can wrap additional services and products around these conditions to guide consumers with tailored recipes and menus.



### 8. Security is paramount

A survey of more than 1,000 enterprise leaders conducted by 451 Research shows a third have plans to gather sensitive information with IoT technologies, but they say the rush to deploy new types of architectures makes security a concern<sup>19</sup>.

Successful businesses are looking at a layered approach, which not only keeps hackers out, but detects those who try to break in, and isolates the potential damage. The IoT can be secured in a way which is proportional to the risk, but it will take a concerted effort in the face of threats which have become better organised and more pervasive.



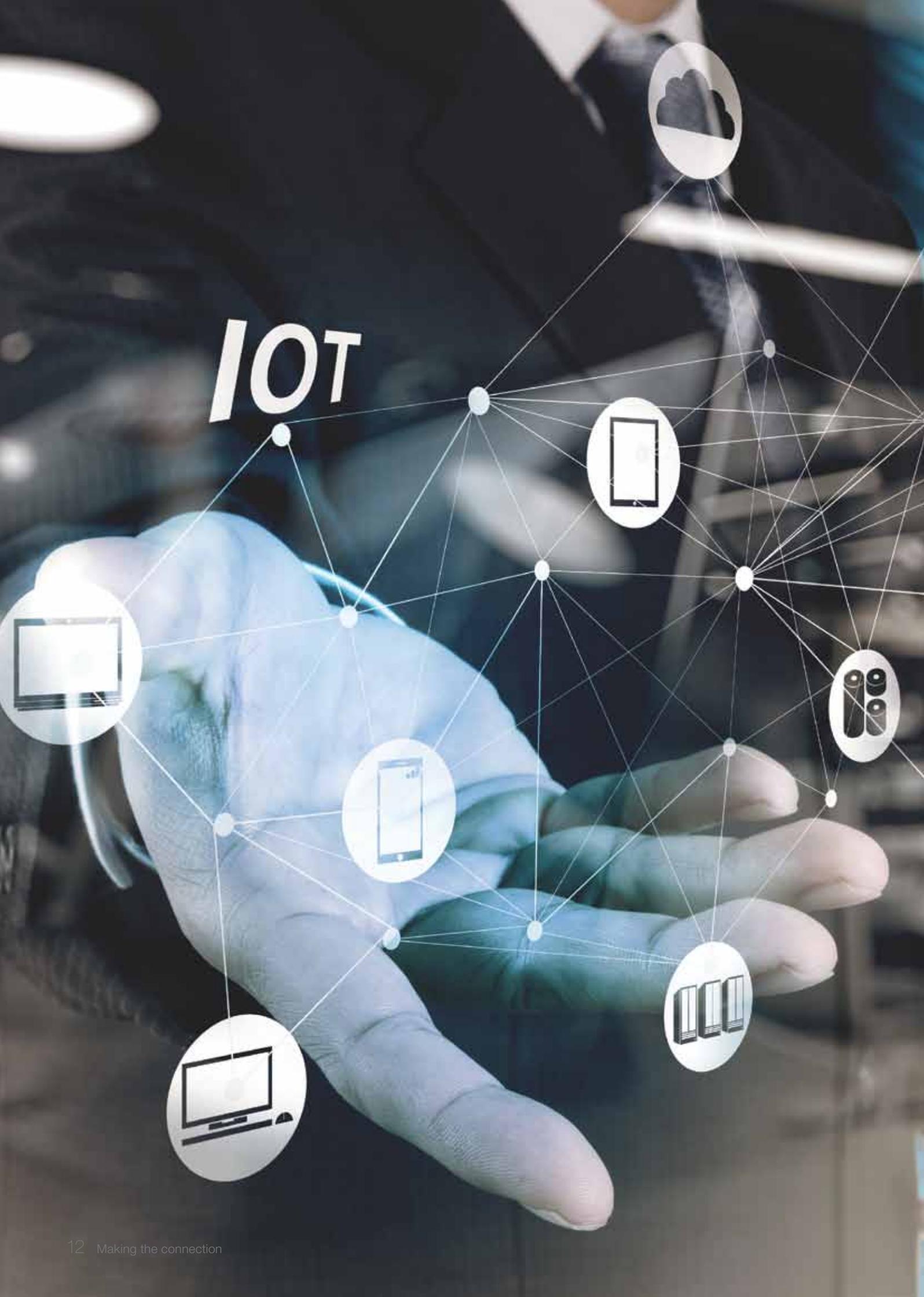
### 9. Marketing and messaging in context

Bluetooth and Wi-Fi beacons will give retailers and consumer goods firms the chance to make offers to consumers via their smartphones, depending on their location in the store. Though this scenario

is possible, it could be intrusive if introduced in the wrong way. It is just as likely that data gathered from beacons and other location-aware sensors will be used to connect with consumers after they have left the store. By understanding what consumers have browsed in-store and what they are looking at online, together with the broader social and physical context, businesses can tailor marketing, offers, useful content and services to specific needs and lifestyles. The Consumer Engagement Principles, as developed by The Consumer Goods Forum working with Capgemini, can help companies maintain a relationship built on trust with their consumers while driving deeper engagement<sup>20</sup>.



# IOT



# Conclusion

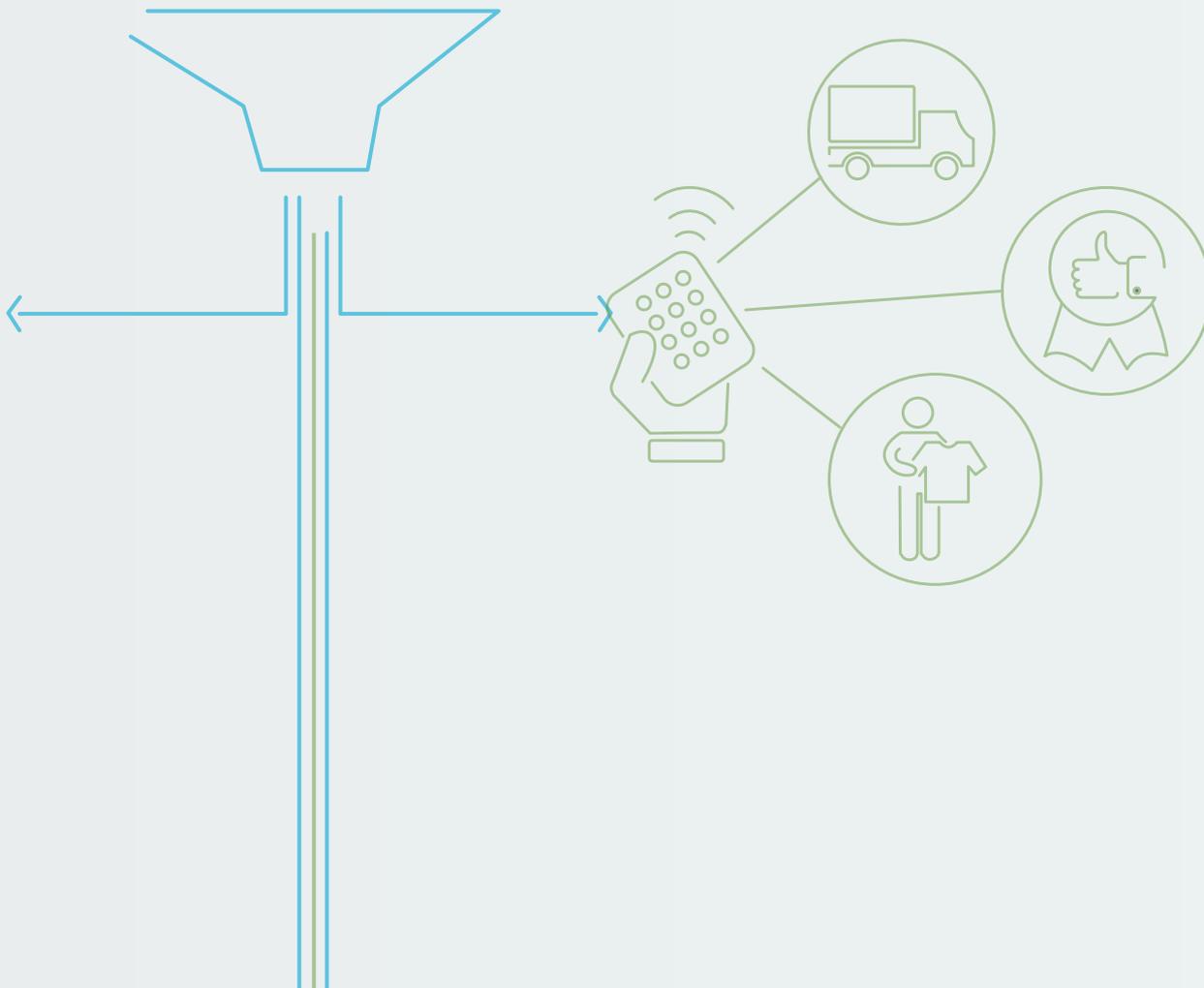
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The IoT is easily misunderstood. Business leaders turn off when the technology industry begins to spout technical jargon. But the IoT is not about technology.

At its core, the IoT is about data and insight. It gives consumer companies the power to understand their supply chains in detail and to work with partners to innovate and respond rapidly to unexpected events or emerging trends. It offers companies the ability to see how people are using their stores, online services, and even their products, in the context of their daily lives.

By combining these insights, companies can win consumers' attention and continual engagement. They can build services and products which synchronise with consumers' lives making their presence vital and their brand valuable. That is the opportunity being offered— for those willing to take it.

**This paper has been developed as part of The Consumer Goods Forum's Educational Series.**



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## About The Consumer Goods Forum

The Consumer Goods Forum (the CGF) is a global, parity-based industry network that is driven by its members to encourage the global adoption of practices and standards that serves the consumer goods industry worldwide. It brings together the CEOs and senior management of some 400 retailers, manufacturers, service providers, and other stakeholders across 70 countries, and it reflects the diversity of the industry in geography, size, product category and format. Its member companies have combined sales of EUR 2.5 trillion and directly employ nearly 10 million people, with a further 90 million related jobs estimated along the value chain. It is governed by its Board of Directors, which comprises 50 manufacturer and retailer CEOs.

For more information, please visit:  
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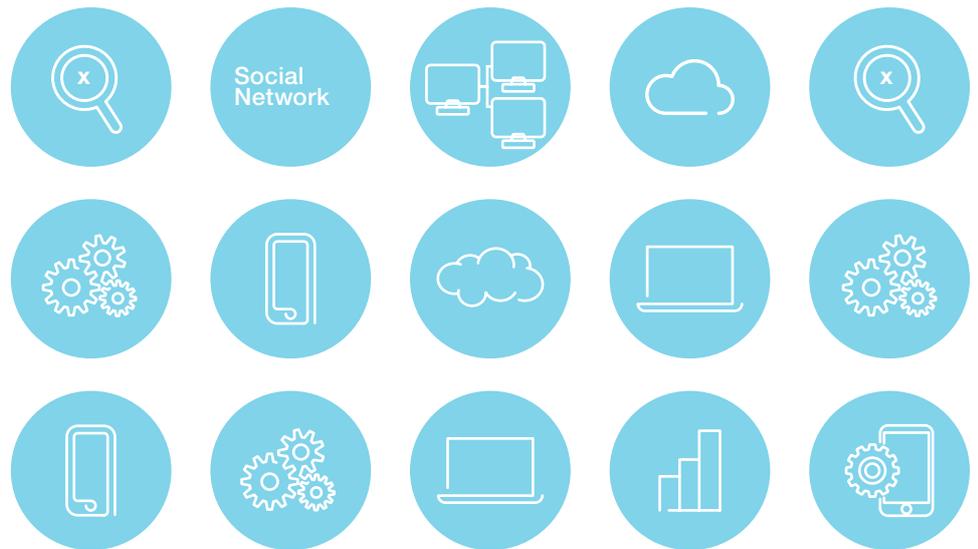
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