QUT pwc CHAIR IN DIGITAL ECONOMY

RETAIL 5.0: CHECK-OUT THE FUTURE

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The Evolution of Retail

1.0

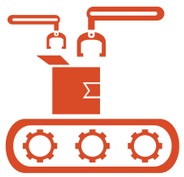
Production

Department stores appear, acting as brokers between producers and consumers.

2.0

Industrialisation

Emergence of retail chains and centralised distribution centres.



3.0

Automation

Streamlining of processes within distribution centres and at point of sale.

4.0

Digitalisation

Technology advancements help tailor the retail experience. Emergence of self-service, crowd-sourcing, and peer-to-peer networks.

5.0

Individualisation

Customer is king! Extreme personalisation where the customer is at the centre of activities.

Retail 5.0

Customer centricity is absolute in Retail 5.0. Roles will be reversed and customers will manage the retailers they choose to interact with. Retailers will need to identify the best way to address a customer's particular need, this is unlikely to be through the permanent purchase of goods.

In this world, customers are equipped with systems allowing them to manage their own data, provide organisations with access to this data and experience corporations in personalised ways. Processes are triggered by life events that are shared with trusted providers. Retail will become a seamless, invisible, tool used to achieve a customer's goal.

Major trends

The rise of customer managed relationships

Proactive retail

Device as a Customer (DaaC)

Frictionless retail experience

Make-your-own-products

Extreme personalisation:Customising retail at the cellular level

Re-imagining loss prevention

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This report was prepared by the PwC Chair in Digital Economy based at QUT. The Chair investigates, stimulates, and educates to help organisations and individuals thrive in the digital economy.

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Introduction

The retail sector is one of the essential B2C industries. Thus, it is no surprise that the move from the economy of corporations to the economy of people has had massive implications for retailers and their surrounding ecosystems. The digital economy has shaped this sector over the past decade in the form of, for example, significant improvements to in-store technology, and in advanced omni-channel infrastructure, new point-of-sale systems, and personalised recommender systems. However, we have also witnessed hybrid (online–physical) retailers becoming regarded as the most promising path forward, as ultimately physical goods have to reach the consumer. As a consequence, pure online retailers have started to establish physical outlets to combine the best of both worlds. This has led to comprehensive experiments with new delivery concepts, and partnerships between retailers and network owners (e.g., postal outlets and petrol stations).

These changes are set to escalate, with retail projected to have one of the highest degrees of digital disruption of all industries by 2020 (Rigby & Tager, 2014). The immediate future sees the introduction of, among other things:

- digitally enhanced customer service and loyalty programs,
- greater use of Internet of Things applications such as tracking of items along the entire supply chain (provenance tracking),
- mobile training tools,
- hybrid products,
- C2C experiences,
- enhanced data analytics and data trading, and
- augmented reality experiences in-store.

In this report, we explore and predict the evolution of retail, one of the oldest sectors, from Retail 1.0 to Retail 5.0. We identify major trends shaping customer experiences and the supply chains of the future. We also offer a number of recommendations to address the opportunities and challenges that come with Retail 5.0.

Retail in 2017

Traditionally, retail has been defined as “the sale of goods to the public in relatively small quantities for use or consumption rather than for resale” (*Oxford English Dictionary*, 2017).

However, the digital economy has challenged key aspects of this definition:

“**sale**”
Sale is traditionally understood as the transfer of possession and ownership. However, the digital economy has facilitated the emergence of a rental model in addition to an ownership model – while possession is often transferred for a practically unlimited time, ownership is not. The products commonly susceptible to this trend are digital goods, such as e-books, yet other goods like phones, farming equipment, and transport (i.e., bike-sharing) are increasing in their propensity for rental over ownership models.

“**goods**”
Digital technologies have facilitated the enriching of physical products with services (so-called hybrid products). The right to consume a service can be more readily purchased at checkout points, and complementary markets and the sharing economy have seen the rise of scalable-access service providers. For example, it can easily be imagined that a future homewares store might ask at the checkout point whether a customer buying paint wants to purchase a painting service. Such a service would be linked to the painting products as a cross-selling item and could be resourced by other customers (who want painting). In this model, a retailer would act as a broker (facilitator) between customers. This shows how models of an established retail economy can be combined with ideas from the sharing economy.

Based on these challenges to the traditional definition of retail, we propose that retail in the digital economy is defined as “the temporary or permanent transfer of the possession of goods, and/or access to services, to the public in quantities targeted at the individual, for use or consumption”.

The five stages of industry evolution

Here we propose a five-stage model for the evolution of any industry from its emergence (1.0) to a possible future state (5.0). We use retail examples to highlight the differences between each of these stages.

1.0: Production

The first version (i.e., 1.0) of any industry is its emergence. The first farmers used manual processes and primitive tools when exploring and incrementally improving activities such as cultivating, seeding, or harvesting. Similarly, trades such as retail and banking emerged during medieval times. This first phase of any industry is much more driven by desired outcomes than by improvement of its underlying processes. The mechanisation of activities and the notion of efficiency are only in their infancy. At 1.0 stage, industries are explorative and very much trial-and-error in nature. They predominantly rely on humans and their physical and intellectual capabilities as their main assets. At 1.0 stage, organisations are business models and initial-value chains in the making.

One could argue that the innovation industry is very much at this stage. We are still trying to reach consensus about possible innovation value chains, and are continuing to work out how to best ideate or incubate without access to a common and proven reference model. In a similar way, the business model and the operating model of start-up hubs show them to be a 1.0 industry, as the focus is still very much on identifying the services of relevance.

Retail 1.0 was characterised by the first department stores (see, for e.g., Bennett's in Derby in 1734), which started to aggregate supply and demand and acted as brokers between producers and consumers. Stage 1.0 creates new value chains and new value propositions. It is a testing and learning stage and leads to the birth of new industries. Thus, many entrepreneurial attempts leading to Minimum Viable Products are in this stage of maturity.

2.0: Industrialisation

Once the core activities of an industry sector are understood and the initial challenges of executing the core activities in the value chain of an establishing industry are mastered, the appetite for economies of scale and the related desire for reliability increases. Industries in this stage of evolution start to focus on streamlining their operations and seek to improve the cost-to-serve ratio. Henry Ford and Frederick Taylor were the masterminds of 2.0 industries. In industries at this stage, we see the emergence of asset-intensive processes, mass production concepts such as assembly lines, and how these assembly lines support, or even start to replace, physical human labour. In addition to asset-intensive industrialisation, we also witness a scientific industrialisation grounded in deep reflection on how we conduct work at this stage and how re-organisation could facilitate improved workflows. (Think: Taylorism, Industrial Engineering, Lean Management.)

Retail 2.0 saw the emergence of retail chains replicating patterns of sourcing–storing–selling in multiple stores with centralised distribution centres. It is the stage when reference models for better/best practices emerge. Most of the industrialisation activities happen behind the line of visibility, that is, they are not noticed directly by the customer. In Retail 2.0, this included models to optimise the purchasing lot size or efficiency gains in the distribution centre.

3.0: Automation

The age of automation provides organisations with an opportunity to optimise the flow of data and information. Automation means that manually maintained paper flows no longer bottleneck. This stage facilitates the replacement of repetitive intellectual manual labour with machines. Automation accelerates communication, further eliminates human error, and helps organisations to scale up and process large amounts of data quickly, leading to improved production and decision-making processes. As such, automation helps to improve all corporate planning processes. The backbone of significant automation has often been enterprise systems such as SAP or Oracle.

Ideally, the automation stage follows an industrialisation stage, so that the foundation of automation is an already-optimised process. In reality, however, most organisations conduct industrialisation and automation at the same time, leading to high levels of project complexity.

Retail 3.0 was characterised by advanced intra- and inter-organisational supply chains, and included data and integration-intensive concepts, such as:

- vendor-managed inventory
- continuous replenishment
- efficient consumer-response systems
- sophisticated distribution centres
- streamlined checkout points in supermarkets
- collaborative, demand-planning, forecasting and replenishment (CPFR) processes.

As such, 3.0 (automation) industries have a clear focus on the B2B part of retail value chains.

4.0: Digitisation

Automation is largely concentrated on the computerisation of existing business processes, whereas digitisation is focused on designing and facilitating new customer-focused processes and experiences. Thus, the shift from automation to digitisation means also a shift from concentrating on B2B optimisation to B2C experiences. In other words, automation is largely happening "behind the plastic door", while digitisation means change that is immediately visible to the customer.

Digitisation relies on citizens with high levels of digital literacy empowered by increasingly affordable and powerful smart devices used in the context of a densely connected society. Digitisation 4.0 is the current stage of many consumer-facing (B2C) industries, and it is characterised by, among other things:

- new digital engagement channels (e.g., apps, social media, voice-controlled devices)
- self-service
- crowd-sourcing
- peer-to-peer networks.

Retail 4.0 has seen the explosion of omni-channel retailing, that is, a plethora of digital channels that now

provide consumers with choice in terms of how they want to interact with the retailer. Synchronising these channels and providing a consistency of experience as well as seamlessly handing over interactions from one channel to the other remain significant challenges. Retail 4.0, however, also provides retailers with much deeper consumer insights, as the use of devices and apps closer to the customer leaves digital footprints that can be used to further personalise the experience (e.g., when shopping online). This opens a new design space for retailers, as personalisation in the world of physical retail was not previously possible due to strong demands for equality (i.e., “I want access to what they have”).

The retailer, however, might no longer control some of these channels. The emergence of voice-controlled smart assistants such as Google Home and Amazon Echo means that the first interaction no longer happens between consumer and retailer, but includes a broker. This makes retailers a second-tier provider. In this world, the digital assistant has a powerful role as the first-demand identifier who channels customer needs to specific retailers.

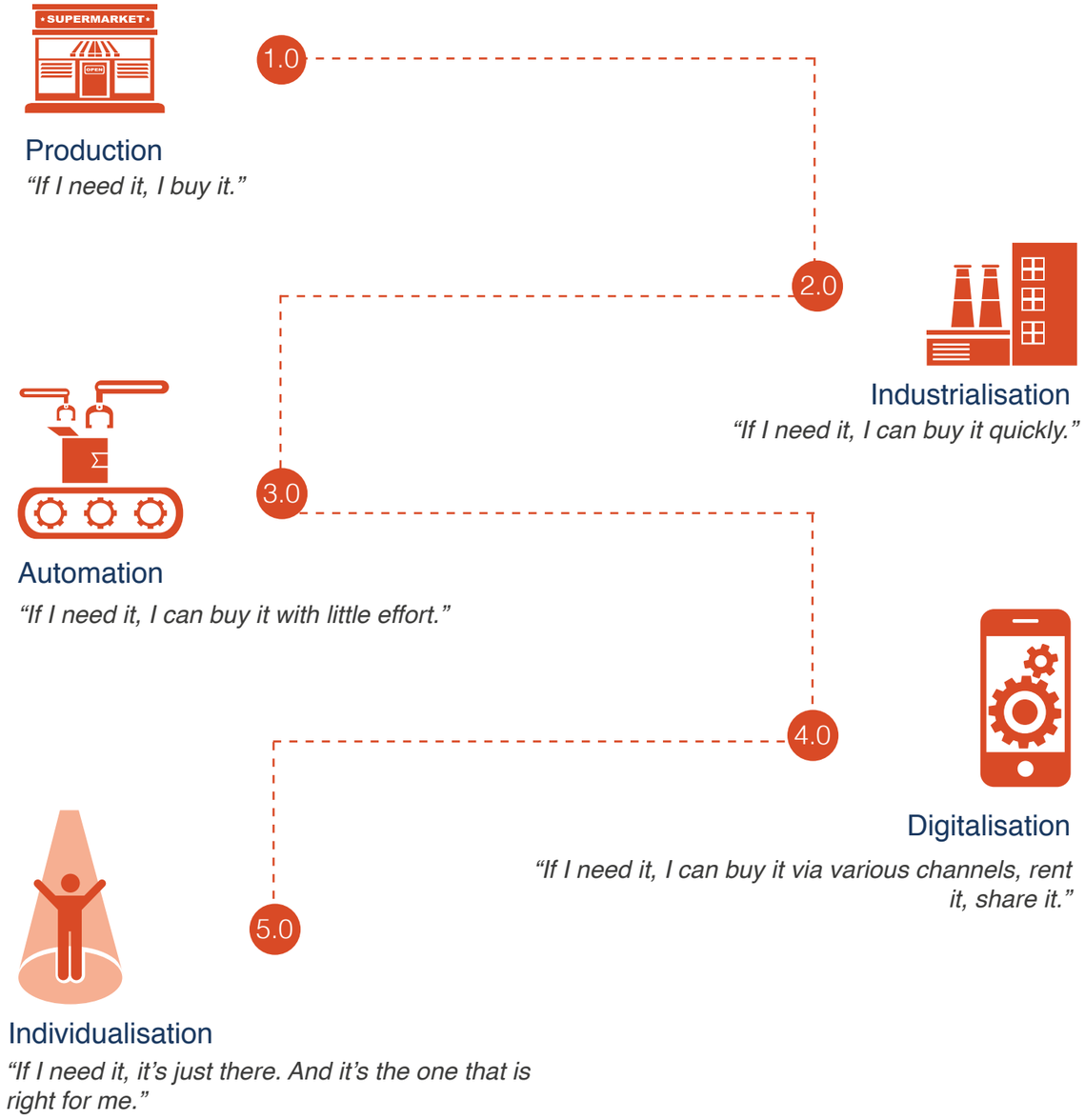
5.0: Individualisation

Stages 1.0, 2.0, and 3.0 are very much grounded in an economy of corporations. In such an economy, the corporation is the main unit of analysis. The objectives of the corporations drive (re)design activities and its boundaries define the scope of engagements. Stage 4.0 then expands this view and triggers a transition from business processes and enterprises to value networks, marketplaces, and platforms. The boundaries between internal and external stakeholders start to blur. However, stage 4.0 still largely mimics principles of the economy of corporations while further extending established value chains that lead to a stronger involvement of the consumer (e.g., crowd-sourcing).

The 5.0 stage, then, takes the transition from an economy of corporations to an economy of people to the extreme. Following a people-centred view of the economy means consumers are at the centre of all activities. In this world, consumers are equipped with systems allowing them to manage their own data, to provide trusted organisations with access to this data, and to experience corporations in personalised ways guided by recommender systems. In a 5.0 environment, private processes produce life events that are shared with trusted relevant providers and trigger their business processes. It is no longer just about the streamlining of these business processes, but about understanding and improving demand-triggering private processes and embedded events. The focus on process efficiency is enriched with a focus on process latency, that is, how long does it take from demand origin to process initiation? Hardly any industry has reached this stage at present.

Retail 5.0 means the retailer comes to you. An example is Pillo, a personal home health robot releasing medication based on voice and facial recognition algorithms. It could also mean that a consumer makes a virtual (or even a physical) space available to (competing) retailers who populate this space according to the individual requirements, for example, a “retail room” in your home. A consumer would select preferred vendors, who compete for attention and private shelf space. Augmented reality technology could provide customers with a tailored supermarket experience without the noise of a traditional, non-personalised retail environment. For example, this could include removing the products the customer is not interested in from their view of the store shelves. Advanced physical solutions could include personalised vendor-managed inventory concepts (e.g., the customer is only charged when an item is consumed, as in some hotel minibars). Ultimately, 5.0 means that the shift from a push-based to a pull-based value chain that we have witnessed in the retailer–manufacturer relationship since the 1980s now also hits the retailer–consumer relationship.

The following diagram briefly summarises the five stages of retail evolution in the eyes of the customer experience.



Retail 5.0

“The consumer really is king.”

A growth in consumer power, that is, consumers enabled to achieve their goals without any friction, has underpinned changes in retail so far. A study found that 70 per cent of consumers were more likely to recommend a brand if their experience with that brand was simple and there were unified communications across all channels (Schneider, 2015). For example, corner stores helped customers purchase any required goods in one place, removing a need to travel long distances. Shopping malls offered choice and efficiency, minimising the time wasted on comparing what other merchants offered. The introduction of e-commerce allowed one to make purchases virtually from anywhere and at any time, removing a need for customers to travel to make purchases and helping them save time. One aspect stayed constant, however: the assumption that the sole act of purchasing a product or a service was integral to the process.

“Purchasing is optional.”

Recently, increasing numbers of retailers have realised that often consumers’ goals can be achieved in ways other than through purchasing a product or service that addresses a need. Making purchasing optional has enabled new opportunities for innovation in the retail industry. Customers do not buy because they want to buy. Behind every transaction, there is always a particular need that has to be addressed. Often customers buy because that is the only, or currently most preferred, way of addressing their need. Cases where the act of purchasing is an important part of customer experience form just a subset of retail transactions.

Major trends in Retail 5.0

We outline below a few selected trends that will shape Retail 5.0.

The rise of customer-managed relationships

Description

Retailers, so far, have been managing their customers. In truly customer-centric retail, however, customers will manage the retailers. We see a rise in popularity of such approaches where customers open up their retail decision processes to product and service providers and invite trusted providers to compete in fulfilling their needs. This approach is often referred to as customer-managed relationship (CMR; Law, Lau, & Wong, 2003), as opposed to customer relationship management (CRM).

Existing CRM tools do not allow for real-time data collection, making retailers largely reactionary in responding to customer needs (Jones, 2015). More importantly, these tools only collect information directly related to the customer–retailer interaction; any other information that cannot be derived from observable shopping behaviour (e.g., allergies) needs to be consciously shared by the customer.

Example

MyWave (mywave.me), a technology startup based in New Zealand, developed Frank, an intelligent assistant that selectively shares customer information with businesses, depending on buying intentions and preferences (Baldassarre, 2015). In return, the businesses can offer services and products that are relevant to customers. This is an example of the advanced use of digital identities, that is, customer records that also store dynamic data such as life events (Mertens & Rosemann, 2015).

What to do about it

Retailers need to be aware that the centre of customer data management might move from the CRM systems and customer databases to a new category of systems that will allow customers to manage their own private data. Building trust and the required digital technologies to access and respond to relevant customer data will be essential to succeed in such a world.

Proactive retailers

Description

Proactive organisations are those able to offer products and services the moment the need for them arises, often even before the individual realises that there is a need. In other words, a proactive retailer is faster than its customers. This trend is critical for retail, as the underlying premise of Retail 5.0 is that if a consumer needs or wants a product it is there for them instantly, before they even know they need it.

Computers with previously unimaginable power are now within reach (Juskalian, 2017), allowing retailers to leverage real-time data analytics to proactively recommend products to consumers, help with purchasing decisions, or automatically purchase the product on behalf of the customer.

Example

Analysis of digital signals shared by customers with retailers allows them to anticipate customer needs and deliver products or services accordingly. Retailers are able to use their data analytics systems to predict purchasing trends in cities and stock products ahead of time, effectively proactively ensuring availability of their products.

The technology already exists for cameras to capture 360-degree images (Woyke, 2017), which could be leveraged by retailers when consumers place these cameras in their pantry and retailers live-track consumption to enable proactive delivery of products. Another application could be the hotel minibar where the 360-degree camera live-monitors what you have in there and the retailer restocks it – and is also able to monitor theft and charge accordingly. In many cases, technologies such as Radio-frequency identification (RFID) tags, can play a similar role.

What to do about it

Identify ways in which customer data or third-party data could be leveraged to proactively recommend, assist, or automatically purchase products relevant to customers' needs.

Device as a Customer (DaaC)

Description

Device as a Customer (DaaC) has perhaps the potential to become the most significant disruption in Retail 5.0. Retailers soon will no longer sell just to "human-customers". For the first time in history, devices have the capability to make purchasing decisions on behalf of their owners. For example, washing machines can order detergents, beer glasses can order a refill, or fridges can restock themselves. This creates a completely new set of challenges for retailers (Ghosh, 2017). We expect devices will take into account preferences prescribed by their owners when shopping, such as their price sensitivity, preferences for premium or locally produced goods, or level of urgency. But this begs the question, How do retailers market to robots? How do you convince a car that your battery is better than a competitor's battery? How will retailers compete and make their product seem favourable to a device driven by business rules and without being influenced by any

form of emotions? The rapidly rising discipline of behavioural economics will no longer be relevant in a world where robots and their algorithms go shopping. DaaC models will give rise to an entirely new model called Business-to-Thing (B2T) management (Oberlaender, et al., in press).

While current approaches involve a closed ecosystem (e.g., Alexa only buys Amazon-sold products or products listed by Amazon), we should expect that at some point regulators will step in to ensure equitable access for other providers. We have seen this with existing product categories like coffee machine brands opening up to competition in the coffee pod market. In Retail 5.0, regulators could prevent BMW cars automatically buying only BMW batteries. With the assistance of the Internet of Things, a washing machine could be in charge of ordering its own washing powder when it knows it is running out, which completely disengages the consumer from the process. This will create a new, effectively parallel market in which retailers will operate.

Examples

Amazon sells self-replenishing devices, as part of their Amazon Dash Replenishment Services (DRS) products. They include printers, washing machines, and even a blood glucose monitor. DRS is available for manufacturers to integrate with. Effectively anyone can build a product that self-replenishes using the service.

IBM recently partnered with VISA to create Amazon DRS's first competitor using their IBM Watson artificial intelligence software (Wheelwright, 2017). As devices become more connected with the rise of the Internet of Things, the point of sale is essentially everywhere, on any device. For instance, a fitness watch tracks a customer's running distance and then, after a certain distance, prompts the customer to purchase new shoes with a personalised recommendation that reflects the data collected by the fitness watch, such as the customer's style of running, and their distances and speeds. This initiative will operate in an open ecosystem, not restricting purchases to a specific store.

What to do about it

If an organisation retails products that may be purchased by devices, there is value in reaching out to leaders in the DaaC industry and exploring partnership options.

If you build or sell devices that require replenishment, now is a good time to develop a new service. Consider integrating your devices with an existing replenishment system (such as Amazon DRS), but remember to leave other options available. There will likely be other, competing, providers of replenishment services.

Frictionless retail experience

Description

The best retail is invisible retail – a retail experience that is frictionless whether it is online, in-store, or occurs via omni-channel. The retail industry has already seen the introduction of processes that streamline the customer journey, such as mobile payment, which are beneficial to the overall shopping experience. Friction can be found in the form of:

- expensive or untimely shipping options
- failure to connect customers in-store with the online store when products are unavailable
- inefficient payment systems
- poor parking options
- untrained employees failing to uphold service expectations.

Example

What if you didn't have to carry your in-store purchases? Budgee from Five Elements is a new robot built especially to carry items for consumers, with the goal of making it easier for customers to purchase and transport the products they need in an efficient way.

DigitalBridge recently addressed a friction point in retail known as the imagination gap, which sees customers reluctant to purchase homewares as they struggle to picture how they would look and fit in their house. DigitalBridge seeks to resolve this using augmented reality technology that created 3D models of customers' rooms so they can virtually test what different wallpapers, paint colours, carpets, and furniture will look like before they buy them (Rigby, 2016).

What to do about it

Retailers should explore their customer journeys and remove points of friction identified within and across retail channels. This could mean identifying all the processes that could be automated, and finding new ways for employees to add value to the customer experience.

Make-your-own-product

Description

As a consequence of the increasing accessibility of 3D printers and printing templates, consumers have the ability to print and consume their own products. Originally used in manufacturing to prototype models of products to assess functionality, fit, and look, 3D printing is being used more frequently in a number of contexts, from everyday consumables to bio-tech. The contexts will continue to expand as the materials compatible with 3D printing continue to expand, from plastics, ceramics, steel, aluminum, food, and bio-tissues (Olson, 2013). The next step from 3D printing is 4D printing, which involves printing materials with the capability to transform over time or in response to a stimulus such as water or temperature (Tibbits, 2014).

With the consumer trend for wanting products available to them as instantaneously as possible, 3D printing offers a competitive advantage to waiting for items to ship, or physically going to the store to buy a product. While the benefits of mass-scale production may endure over time in some category-specific retailers, the technology allows consumers to customise products on-demand, catering specifically to their needs, which again offers a competitive advantage over products available in-store or at online retailers. As domestic-scale 3D printers become available, access, adoption, and use of this technology could see retailers becoming obsolete.

Example

At QUT's Institute for Future Environments, a team of researchers have developed a program to design and 3D-print fruit, which can be customised to an individual's personal nutritional requirements, and their texture and taste preferences.

What to do about it

This is where an in-store, online, or omni-channel experience that goes beyond a specific product is critical in Retail 5.0. Consumers need a reason to continue their relationship with the retailer. Therefore, retailers should consider new opportunities enabled by make-your-own-product approaches. On the one hand, customers will be seeking (and purchasing) ingredients used in the process; on the other hand, we see an opportunity for a new retail channel emerging – a retailer-branded 3D printer in every home. Finally, we expect that, similarly to computer software, designs or recipes for home-created products will become a product that customers

will pay for. Retailers planning strategically should explore opportunities to become the first entrants in this new market.[1]

Extreme personalisation: Customising retail at the cellular level

Description

As consumers learn more about themselves, their biology and genealogy, and share that data with trusted retailers, it raises an opportunity to customise the retail experience to each individual at the cellular level. The goal for addressing this major trend is to use the consumer data as a tool to inform the consumer's decision-making, and not a tool to force choice, which is a common criticism of behavioural economics "nudging" strategies (Delany, 2016) that seek to guide optimal decision-making.

Example

InsideTracker is an evidence-based tool used predominantly by elite athletes to guide optimal diet plans (Vienneau, 2017). Athletes upload blood test results, which are reviewed by a team of doctors, and personalised nutritional and lifestyle recommendations are provided to optimise the individual's athletic performance. Recommendations are supported by links to scientific articles, enhancing the legitimacy of the information provided. InsideTracker offers a competitive advantage over traditional models, as the data and recommendations are personalised directly to the individual and not to the cohort level.

What to do about it

Tapping into third-party data sources, or improving data-collection points, could result in more targeted, customised product recommendations for customers.

Re-imagining loss prevention

Description

Consumer deviance (theft, fraud, lying, abuse) is an ongoing problem in retail and Retail 5.0 offers unique opportunities and challenges in this space. Traditional forms of deviant behaviour, such as shoplifting, will likely be replaced with a digital version, such as digital fraud (Agilence Inc., 2015). This means that current loss-prevention techniques, such as warning signs and security personnel, could become redundant in this new era of retail and open up opportunities for alternative loss-prevention tools that protect digital rather than physical assets.

There are two ways in which loss prevention needs to be addressed in Retail 5.0:

- using technology to design out opportunities for deviance
- improving cyber-security of customer information.

Example

Amazon's first brick-and-mortar venture, Amazon Go, introduced the idea of a store with no checkout lines, because there is no cashier or self-checkout system. By removing the customer from the scan-and-pay process that we see in-store today, Amazon has reduced opportunities for in-store theft. When an item is removed from the shelf and placed in the customer's pocket, bag, or basket, the purchase is registered as they walk out the door. Traditional loss prevention mechanisms are made redundant in this retail model.

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1 Services such as Thingiverse (http://thingiverse.com) already allow users to send money to creators of 3D-printable designs.

What to do about it

When embracing technology for loss prevention (e.g., robots), consider humanising the technology so it triggers an empathetic response from the customer to reduce the likelihood of the customers vandalising or stealing from the store via the technology. Also, finding novel ways to identify the customer as they enter the store (in-store or online) will remove anonymity, which then decreases the propensity for deviant consumer behaviour.

To address the threats to digital assets, retailers need to make cyber security a key priority and plan under the assumption that data breaches will occur (Samsung, 2017).

Conclusion

There are many exciting opportunities ahead for retailers to meet the changing demands of customers in a new era of retail. It is critical that retailers large and small rise to meet these innovation challenges to ensure they capitalise on the major trends rather than getting left behind. The future is now. Retail 5.0: Check it out.

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