

In-Store Payments Re-Imagined

Delivering seamless multi-channel
retail experiences



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Executive Summary

Many people love to shop. What's more, they love to go out, to leave their home, and to purchase goods in physical stores.

The Covid-19 pandemic has led to a huge shift away from physical to online shopping. It has also reminded us that realworld shopping experiences offer unique value: the chance to see, touch, feel and try out products before buying them, as well as to benefit from knowledgeable, in-person assistance.

The challenge for retailers is to offer an enticing experience for customers by making use of both digital and physical channels. Those shops which can offer the best customer experience will be the most successful, with research showing they could make triple the returns of their peers, and that investment in customer experience yields a gain of almost 10,000%.

To deliver this world-class customer experience, retailers need to provide a seamless experience across multiple channels. Click-and-collect is already well established. However customers also now expect to click-in-store (for delivery at home) or click-and-return (to exchange or return goods). They want to complete their shopping journey via any channel and switch seamlessly between channels at any time. This increases drastically the operational complexity of providing the service, although at the same time it also serves to build trust and loyalty with customers, leading to more repeat custom.

The payment experience is a crucial part of the overall customer experience. Payment is the moment when the value exchange is completed: when a browser becomes a buyer. A jarring, awkward payment experience can lead to long queues and purchases being abandoned. A smooth experience will be quick and easy, resulting in more sales being completed and customers who are more likely to return.

To achieve this smooth experience, many novel approaches to payment are emerging. Some are blurring the line between instore and remote payments. For example, Pay by Link enables a customer who is physically present in the store to make an online payment to the retailer using their mobile phone. This is just one example from a whole spectrum of payment experience innovation. Some are already well established and widely used, such as contactless and mobile payments. At the other end of the spectrum, there are those innovations that are at a nascent stage today, such as biometric payments and crypto-wallets.

We believe that retail will undergo significant transformation in the coming years. To be successful, retailers will have to combine the best aspects of in-store and online to provide an attractive, seamless experience. This will require a payment experience that is fully integrated, providing innovative and frictionless methods to complete each sale. In this White Paper, we explore the way ahead to the payment experience of the future.



Introduction

Digital technologies have been adopted over recent years by both brick-and-mortar and online retailers. In this paper we examine how digitalisation is transforming the customer-facing side of the retail industry and how Covid-19 has accelerated this trend, while also introducing new needs to be addressed. Retail is one of the sectors where, in just one year, Covid-19 has advanced digital transformation to a level which would otherwise have taken many years to achieve. Yet the greatest impact for most retailers has not been the change in consumer habits, but rather the need to adapt their business models and shopping experiences to the new reality.

2020 will be remembered as the year when the onset of the Covid-19 pandemic changed the way we live. We have had to face a vast array of new challenges, and one of the most important was having to give up our old consumption habits in order to adapt to a new world where safety became a major new factor in our daily decisions. This new reality severely impacted our perception of shopping, which had previously been seen as a fun and experiential activity.

During the last year, consumers have adapted to buying online much more and using services such as click-and-collect as a way of minimising the risk of infection. According to Bazaarvoice, more than 49% of consumers globally shop online more now than they did before the pandemic¹. And in the US market, according to eMarketer, click-and-collect leapt from a 5.8% share of all retail e-commerce to 9.1%². While shoppers initially embraced click-and-collect due to safety considerations, judging by the 2021 figures it seems they will continue this practice due to the convenience it offers.

Entering the new era of experiential payments

We are all aware that, during this pandemic, technology has played an important role. The initiatives that have arisen as a result of this new context have modified the strategic plans of many retailers, who have had to abruptly change course to find ways to offer what customers demanded in order to continue their lives.

Within these initiatives we have seen how physical stores have had to adapt faster: controlling store capacity, offering contactless experiences, making their delivery models more flexible, digitising their sales and customer service processes, and managing customer visits. All with the aim of maintaining business continuity and providing a safe environment for customers and employees.

It is also in this context where we have perhaps seen the most important advance. The act of paying, which until recently for many people had itself been almost a formality, has become an additional lever of change in the customer experience. A new generation of stores has been born around this concept, with autonomous stores (where it is the customer who becomes the means of payment) offering a new, previously unknown value proposition. From classic contactless payments, through the new self-checkout terminals, to the totally autonomous stores, what we are witnessing is a complete revolution that affects how consumers interact with products and services at the physical point of sale, making it safer and seamless. Thanks to these advances, in-store shopping is getting much closer to the convenience that online or app-based e-commerce offers (e.g. no queues, one-click payments, facilities to compare products, etc) while, in addition, providing an in-person, physical experience. One of the main consequences is that cash is often no longer the preferred option for payment. This opens up many new opportunities to continue accelerating the adoption of new digital payment solutions.

The act of paying has become an additional lever of change in the customer experience

This revolution in the field of payments is also impacting how customers interact with brands, with stores, with fulfilment companies and with each other. Payment innovation is transforming what was until now a simple experience into something new and challenging: it is now part of the “new normal” for everyone.

About this white paper

Based on the experience and knowledge of Worldline experts in this field, in this paper we address the key questions being faced by retailers.

We start by examining the significant benefits of delivering a great customer experience and how this, in turn, depends on providing great shopping and payment experiences.

After that we deep-dive into the challenges being faced by retailers, before outlining how new payment solutions can help to address them.

We conclude by looking at the current level of adoption of these innovative approaches to payment acceptance, as well as outlining the main drivers for their future adoption.

¹ <https://www.bazaarvoice.com/blog/how-the-consumer-electronics-industry-can-maintain-the-unexpected-momentum-of-2020/>
² <https://www.emarketer.com/content/us-click-collect-2020-2021>

The payment user experience

In a globalised world, companies strive to retain their customers by offering a set of interactions which create a positive, safe relationship and which develop loyalty to their brand.

These interactions are covered by the term Customer Experience (CX). However, the focus of any business is the sale of goods or services, in which the payment process is a key part. For this reason, User Experience (UX) in the payment process is critical for a positive relationship with clients and for business success.

It is useful to differentiate between CX and UX. As illustrated in Figure 1, whereas CX analyses the whole experience that a consumer has of a brand across all channels and interactions, UX specifically focusses on the user experience of a specific product or a process.

User Experience in payments involves different profiles of users: merchants and financial institutions (Business to Business - B2B) as well as customers (Business to Customer - B2C). Optimal acceptance of the process of payment by both groups is crucial.

UX is therefore part of CX and it must be consistent with the complete experience offered to customers. When a company invests in UX, it enhances customer satisfaction: satisfied customers are loyal and they trust the company's products. Investing in UX increases customer retention, reduces the cost of customer acquisition and helps business-to-business satisfaction. The first requirement for an exemplary UX is to meet the exact needs of the customer in a simple and pleasant way, without problems or discomfort.

The impact of UX in the digital payments era

The impact of UX in the era of digital payments depends on intrinsic and external factors:

Intrinsic factors are related to a customer, such as age, economic situation, cultural bias, environment of use, and local compliance rules.

External factors include items such as connectivity and infrastructure or the political and economic position of the user's country.

Based on these intrinsic and external factors, merchants can tailor technology solutions to best suit their customers.

For instance, in China, mobile payment has become widespread as the main method for making purchases (e.g. AliPay and WeChat Pay). In countries such as Mexico and Brazil, for online purchases it is common for users to pay in person at a convenience store (e.g. Oxxo or Boletto Bancario). In Chile, payment with debit cards requires a physical device for two-factor authentication. And in Western Europe and North America, contactless transactions have become a common method of payment (via card or smartphone).

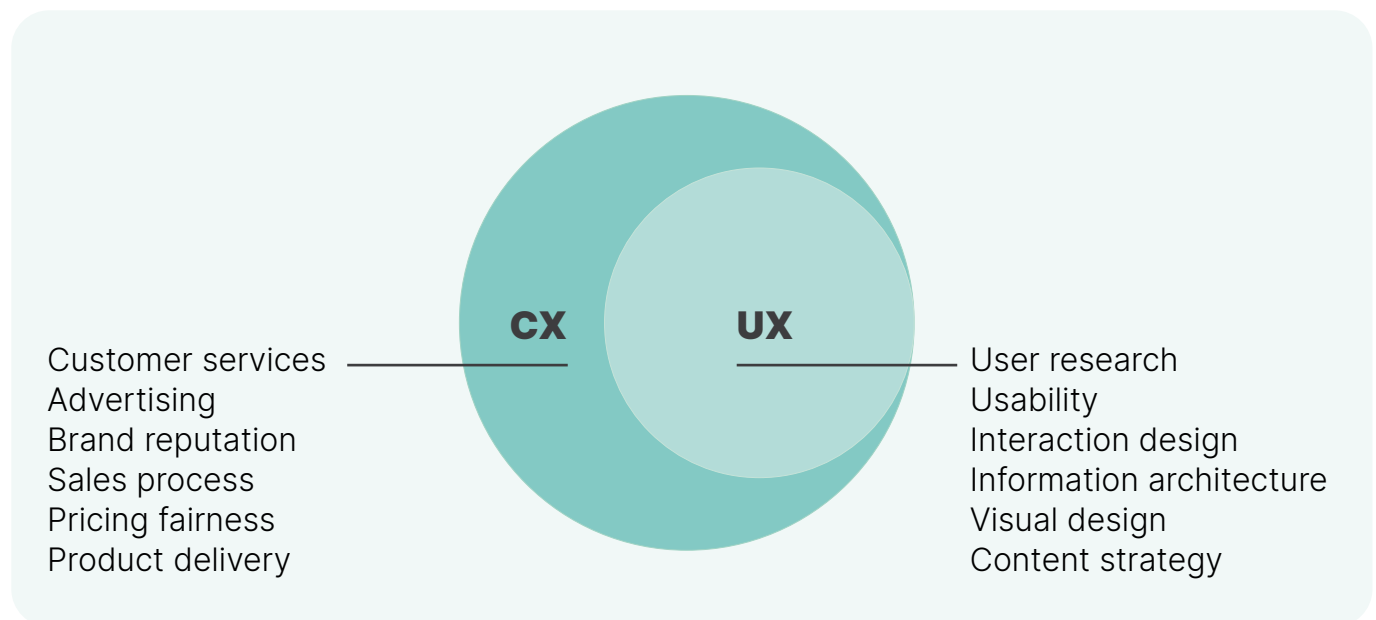


Figure 1: The difference between CX and UX

Another example of differences in adoption is biometric facial recognition. In China this is used not only to recognise people accessing public places (airports, banks, hotels, etc.), but also as a method of payment in physical stores. In western countries, public opinion demands stricter regulations to comply with privacy and data protection rights. It is also difficult to implement facial recognition in countries where a large part of the population traditionally covers their faces in public places.

There are many examples of how solutions can be adapted to local culture. In Europe, one such case is the Lidl mobile application for paying in stores. While in Spain and Poland it uses credit card payment, in the German version it relies on account-based payment³, because in Germany this method is already a common way to pay in shops as well as to pay utility bills such as electricity.

Forecasts of the increase of digital payments for 2020 were exceeded due to the restrictions caused by the global pandemic that accelerated buyers' adoption of new methods of payment⁴ and changed their purchasing habits in all segments of the market.

This development highlights a useful theoretical perspective for the evolution of digital payments. To ensure successful adoption, services must be designed for everyone, including senior users and people with disabilities⁵.

Merchants must progress from mere omnichannel towards fully integrated commerce

In short, to provide a good experience in digital payments, beyond the cultural characteristics of the buyers and the financial particularities of the countries, payment methods that make sense for each customer niche must be offered.

At the same time, merchants must progress from mere omnichannel towards fully integrated commerce (across all channels, processes, payment systems, etc.) to optimise costs and deliver a completely unified customer experience.

Investing in UX/CX has a strong ROI

Return on Investment (ROI) is a powerful metric which shows that UX is not just good for users, it is also very positive for businesses. We believe that good UX is a critical component of good CX, and good CX has a positive impact on business goals, including market impact, brand perception and customer retention.

Tackling the calculation of ROI in a payment process is complex and depends on many factors: the usability of terminals (hardware and software), the connectivity technology, the context of use, and the maturity and competitiveness of the market, as well as the level of social penetration of a process, how disruptive it is and its level of demand.

Back in 2015, a study conducted by Forrester⁶ found that, compared to their peers, the top 10 companies leading in CX outperformed the S&P index with close to triple the returns. The same research also showed that, on average, every dollar invested in UX brought 100 dollars in return (an ROI of 9,900%).

Today, calculations have become more precise and supporting tools have emerged. The "CX Transformation ROI Calculator"⁷ helps to calculate the benefits, cost and ROI of an enterprise-wide CX transformation and use the resulting model to derive a business case.



3 <https://thepappers.com/mobile-payments/lidl-launches-lidl-pay-in-germany--1248102>
4 <https://worldline.com/en/home/knowledgehub/blog/2020/may/preparing-for-the-new-normal-in-payments.html>
5 [...] By focusing on the extreme users, inclusive design will enable them to be able to use it, while many users having (temporary) similar needs will also be covered. https://en.wikipedia.org/wiki/Inclusive_design
6 http://uxdesign.uw.edu/why_oo_ux.html
7 Capturing the ROI of CX, a guide to demonstrating CX performance, 2020 Forrester Research, Inc. and ROI Model For CX Transformation.xlsx

New retail experiences

In the previous section we have seen how customer experience is critical for business success. We also saw that delivering a great customer experience depends on providing a great payment experience. In this section we will now examine the broader retail experience which is also being transformed by technology.

Digitalisation of physical stores

Retailers have been digitalising their physical stores to improve the experience of their customers, providing personalised services (e.g. promotions and loyalty services), facilitating interaction with products (e.g. search & scan products, digital walls and virtual reality), and enhancing the check-out process (for example with new ways of paying and seamless checkouts).

In our White Paper, “The World After Covid-19: Adapting your business now for the new normal in payments”, we detailed how merchants faced an asymmetric challenge⁸. On the one hand, many merchants were forced to close their stores for several weeks, with only those stores that provided essential services being allowed to remain open. This impact was even greater for small merchants, who did not provide any online options to their clients. On the other hand, there has been a significant growth in online services, forcing many retailers to reorganise their operations and to open new channels (such as phone and social media) for accepting orders for collection.

This transformation has impacted the retail experience as illustrated in Figure 2.

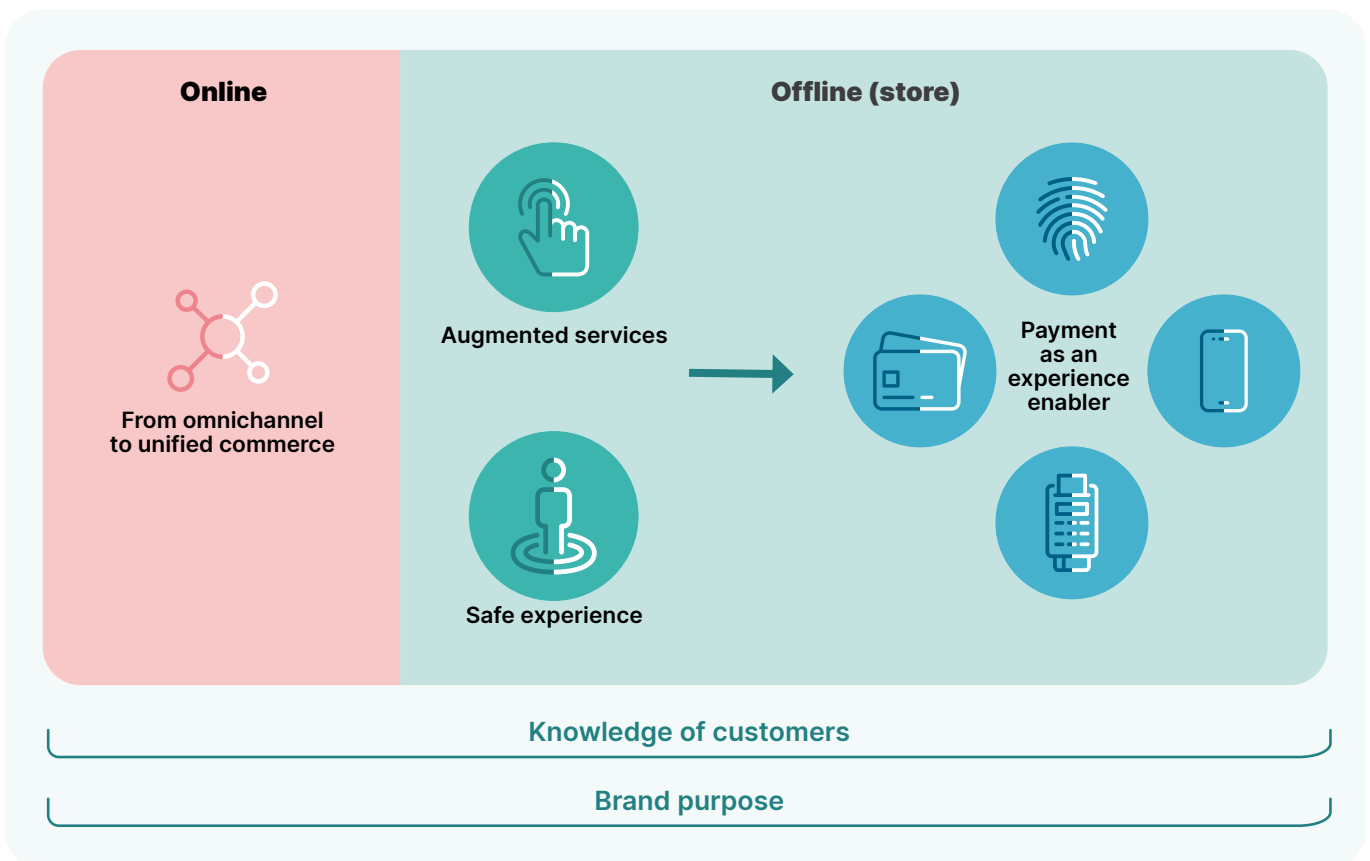


Figure 2: New Retail Experiences

8 Worldline whitepaper “The World After Covid-19 – Adapting your business for the new normal in payments” (May 2020) - <https://worldline.com/content/dam/worldline/documents/publications/whitepapers/the-world-after-covid19-white-paper.pdf>

From omnichannel to unified commerce

Unified commerce is the next step beyond an omnichannel retail strategy. It is achieved when all sales channels can exchange product inventory, order and customer data in real time. A unified commerce strategy drives the customer experience across every channel, delivering relevant, seamless and personalised experiences.

This new approach offers an opportunity for retailers to create new, hybrid shopping experiences that place the customer at the centre, regardless of the point of contact through which they interact. Here we provide some examples of hybrid selling models that illustrate the possibilities that retailers can offer to their customers when a unified commerce strategy is adopted:



Click and collect

A customer orders and pays for products online, picking them up in the physical store, covering various scenarios:

- In-store pick-up - Stores are used as the pick-up point for orders that might be started online.
- Pick-up stores - Dedicated stores in which the user can only collect orders placed online.
- Drive-in stores and kerbside pick-up - The consumer comes to the store in their car and the goods are placed in their vehicle for them.
- Robotic pick-up - Dedicated areas in the store with robot fulfilling a customer's order once they have been identified at a kiosk.



Reserve and collect

A customer reserves products online to be collected and paid for in the store.



Click and return

A customer orders and pays for products online which are then delivered to their home. Once the customer tries them, they can visit a physical store to exchange or return them. They might be credited with the refund amount without having to present the card used for the initial payment.



Click and go or click in store

A customer selects the products they want to buy in the physical store through a light kiosk or an interactive screen provided by the retailer or directly using their own mobile phone, enabling them to order products which are not available in the store and which will be delivered directly to their home.



Live-stream shopping

Combining physical shops (with real products and personalised in-person service) with the world of e-commerce by allowing customers to interact online in a live experience.

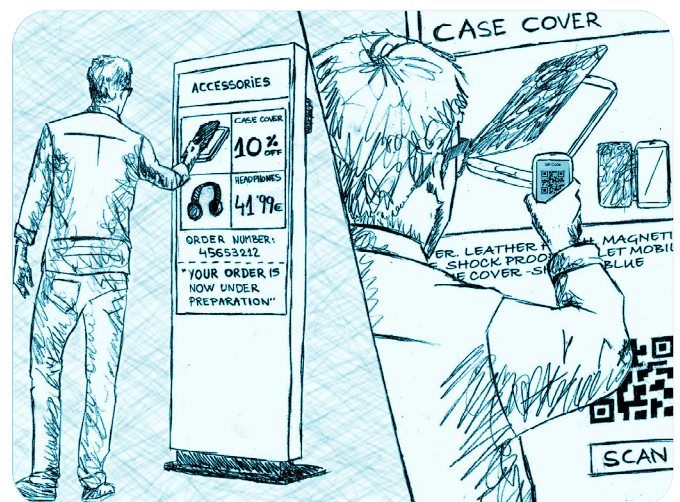
Augmented services

The migration towards new digital retail can also be executed using less radical or advanced technologies. The transformation of retail does not only consist of creating new types of shops. It also includes transforming existing physical, ordinary shops into digital ones. This approach consists of augmenting stores with a set of equipment and services that allow customers to enjoy novel, seamless shopping journeys within their regular shops. In this way, customers can easily evolve towards different shopping practices without being obliged to go to new shops, and physical shops can attract new profiles of customers who prefer digital and seamless shopping services.

Below we describe some examples of the augmented services that are being incorporated by retailers into their stores, including some services which integrate payment to provide customers with a full and seamless experience:

Promotional and interactive displays - Many stores have installed big screens to promote products and brands using images and videos to boost in-store sales and transactions. To achieve true engagement with customers, simply displaying information on a big screen is not enough; you need to transfer control to the consumer and move beyond pure digital signage to interactive, smart signage, allowing connected consumers to interact with their mobile devices as well. With these solutions, consumers will be able to receive a personalised promotion that they can redeem later in the store.

An example of this type of solution is the Promowall solution developed a few years ago by Worldline.



An evolution of these smart interactive displays is based on a touchless experience. Shop windows are digitised, providing contactless promotions to attract customers without the need to touch the screen, since full interactivity is enabled using a mobile phone thanks to a QR code or Augmented Reality.

Finding stores - Stores need to be found by their customers, whether they are on a street corner or in a large mall. If the user is outdoors, the main technology that can be used is GPS embedded on the customer's mobile. When the geolocation is required indoors, GPS might not be effective and other technologies like beacons and WiFi are used for a precise indoor location.

In some stores, mainly those with a large number of products (hypermarkets, malls, stores at airports and stations), retailers want to help their customers find products and specific locations within the store. Some of the functionality enabled by these solutions includes product location, path-to-product with shopping lists automatically sorted, and map navigation.

Interacting with products - Customers expect at least as much information to be available about a product in-store as they could find online. In addition, they want to be able to see, touch, feel and try out the product in-store (all things they can't do online). This is where physical stores can have an edge, providing customers with relevant information about products and services in-store while engaging users with promotions to prevent pure showrooming⁹.

Customers expect at least as much information to be available about a product in-store as they could find online

Several technologies allow users to interact with the products via their mobiles:

- Barcodes
- QR codes
- Near Field Communications (NFC)
- Radio Frequency Identification (RFID)
- Image Recognition

Via these means, users can get extended information about a product, check reviews on social networks, access personalised discounts and promotions, or even add a product directly to their shopping basket.

Some solutions combining most of these features are already available in stores:

- **Tap & Go** - As shown in Figure 3, Digital labels, already present in many stores to show dynamic pricing and product information, also facilitate interaction with client devices and cards through NFC. Users tap the digital label of the product they want (with their mobile or with their contactless card) to add it to their basket. Once they are ready to check out, they only need to tap again on the payment terminal, which will display all items previously tapped and allow a quick completion of the purchase.
- **Scan & Pay** - A web application opened in less than four seconds from a smartphone that allows customers to scan products in-store, pay from their mobile and avoid waiting at the checkout¹⁰.
- **Buy & Pay** - Restaurants and bars are moving from paper signage to digital signage, including screens for ordering and paying directly at the table, with useful new services like splitting the bill.

Proximity marketing - Once customers are in the store, retailers need to communicate promotions and targeted content to customers to boost sales in-store and avoid showrooming. Some of the functionality enabled by these solutions include greeting messages, personalised advertisements, geofenced promotions, digital coupons, after sales messages, and loyalty engagement. This functionality can be enabled by combining some of the technologies already described above.

Shop assistants - In-store sales volumes are directly linked to the knowledge of the product range by staff and their capacity to provide a personalised and detailed explanation to customers. As illustrated in Figure 4, retailers need to provide their staff with digital tools to enable them to offer this personalised support at the store or remotely through a screen where specialists will be available. They can also transform their devices into a mobile point of sale, enabling payment acceptance if required.



Figure 3: Tap & Go enabled through digital labels

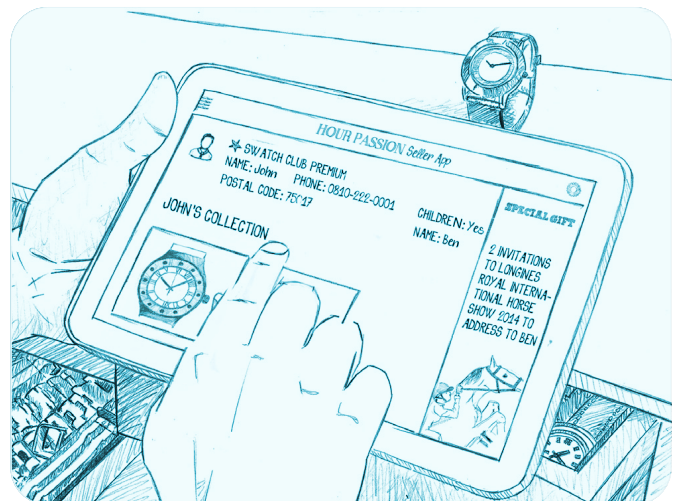


Figure 4: Digital tools for in-store staff

9 The act of visiting brick-and-mortar retail stores to research merchandise before purchasing it online for a lower price
 10 <https://worldline.com/en/home/solutions/pos-and-terminals/scan-and-pay.html>

Digital receipts and warranties - Paper receipts and paper warranties are being replaced by digital receipts and digital warranties in many stores, while always following legal compliance and tax requirements in different parts of the world. These innovations provide greater convenience for customers, who do not need to keep and store paper receipts and warranties for many days in case they are needed for a return or warranty repair. This digitalisation also allows additional information to be stored, providing added value whilst simultaneously contributing to sustainability goals.

Safe experiences

As mentioned earlier, the digital transformation of stores has been impacted by a new need that did not exist before the Covid-19 pandemic: retailers now have to show customers that their shop is clean and safe, and that they follow all health and safety recommendations to reduce the risk of the virus spreading.

Retailers need to re-organise their stores to facilitate quick purchases and optimised routes, minimising waiting times and optimising traffic inside to create a safe distance among customers. New services are being provided to facilitate this safe access to stores and to monitor occupancy:

Appointments

In some cases, consumers need to book an appointment in advance of their visit to a store.

Virtual queuing

When retailers want to manage access to the store when it is full, consumers are requested to join a queue from their mobile, normally scanning a QR code at the entrance to the shop. Consumers are notified on their mobile when they can enter the shop (by methods such as SMS, mobile web, app, WhatsApp message, etc.).

Store occupancy

This normally complements appointments and virtual queuing and it provides real-time information about the occupancy of the store. It can allow predictions about when new customers will be able to enter, using a combination of sensors, video and artificial intelligence.

Temperature screening

As part of new measures to ensure a safe environment for customers and employees, some stores (in countries where this is not forbidden due to privacy concerns) are introducing a temperature check at the entrance.

Smart distancing system

Once inside the store, there are also some retailers introducing solutions to ensure safety distances are respected within the store.

Safety signalling

Retailers also need to communicate all these new procedures and rules to their employees, including in some cases certifications provided by third parties about the safety of the store (disinfections per day, continuous cleaning of trolleys and baskets, shop capacity limit, distance among customers controlled, provisioning of cleaning gel, controls for employees, etc.).

Contactless payment & 1-metre mobile payment

Allowing a safer payment experience by minimising physical interaction.

Payment as an experience enabler

The evolution of payment is tending towards requiring less action at the same time as creating a more impactful experience. Shoppers will minimise their interaction with cashiers, will use cash less often, and will have less contact with Point of Sale (PoS) terminals and paper receipts. Mobile and contactless payment methods like NFC or QR codes will gain further momentum, not only due to hygiene concerns but also because of the potential value-added services they can provide.

The evolution of payment will require less action from users while at the same time creating a more impactful experience

Consequently, retailers are transforming their stores and digitising the way customers interact with products and employees, while automating or eliminating the traditional in-store check-out process.

Thanks to a broad range of emerging technologies, the new normal will usher in a contactless, seamless and fully integrated experience at that critical point: the payment. Payment will be simplified as much as possible, while the feeling of control will be maintained, helping retailers to provide a trusted and positive experience.



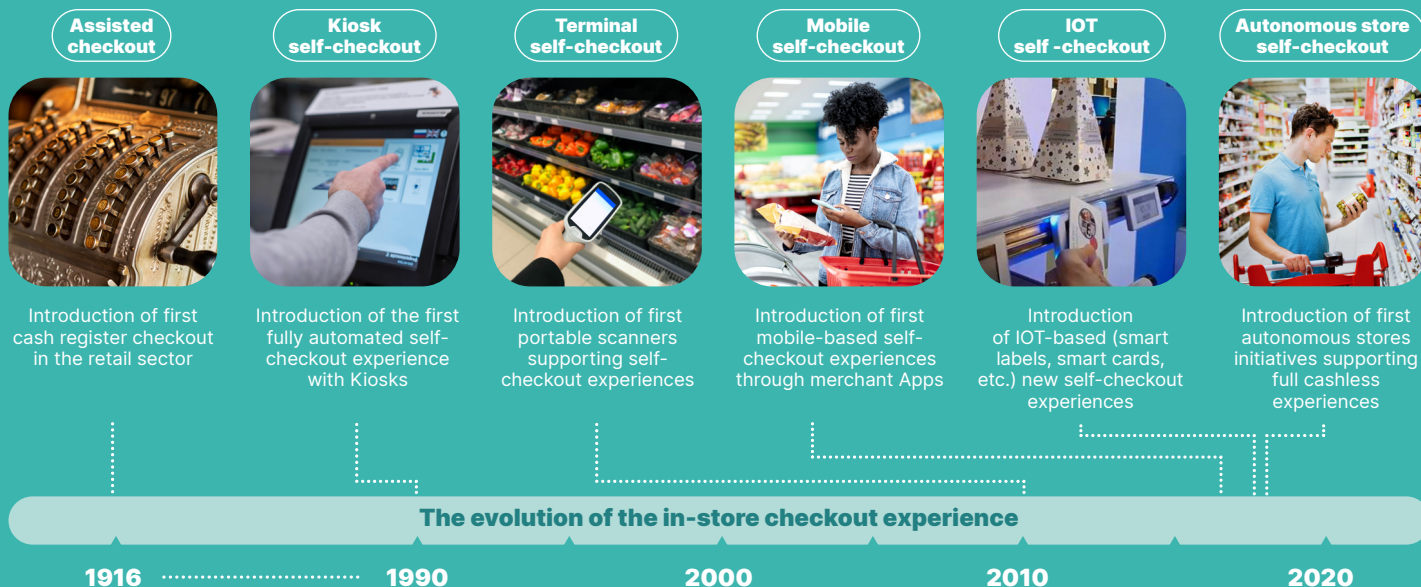


Figure 5: The evolution of the in-store checkout experience

Moving towards checkout-free

There are many initiatives in the market nowadays that aim to improve the customer experience by eliminating friction at the time of payment (as already seen in online channels).

New shopping experiences have a common catalyst: the checkout process. As illustrated in Figure 5, if we compare how we used to pay with how we pay now, we realise that technology has evolved to fully automate the experience. This idea has been in the market for many years. But it is only now that technology has allowed us to go one step further and offer a full experience without contact or human intervention.

The following describes each of these evolutions for improving the checkout process, paying particular attention to the most recent innovations of IoT self-checkout and autonomous store self-checkout.

Kiosk self-checkout – Products are self-scanned by users at the kiosk, using barcodes or touchless options like placing the goods directly in a receptacle (through RFID or image recognition). This service can also be complemented with biometrics such as face recognition for client identification and voice-bots to enhance these interactions.

Terminal self-checkout – In a terminal-based self-scanning checkout, customers are typically required to scan product barcodes using a dedicated device available at the entrance of the

store. They place all scanned items into a dedicated self-checkout PoS and transfer the product list directly to the PoS. The weight measured is verified against the list of scanned items.

Mobile self-checkout – Customers scan products themselves using their mobile at the store, pay online for them and display the proof of payment (digital receipt) at the cash desk or in a self-service kiosk for bagging. This is an example of the Scan & Pay solution explained previously.

IoT self-checkout – IoT devices can facilitate the checkout, including:

Digital label self-checkout where the customer only needs to tap their NFC card/mobile on digital labels to add the collected products to a virtual cart. Later they simply go to a kiosk and transfer the list of tapped products by tapping it on an NFC kiosk and completing the payment. This is an example of the Tap & Go solution described previously.

Connected carts or trolleys are one of the main innovations that can be used to digitalise a physical shop. Connected Trolleys are mainly used in supermarkets. For instance, the American start-up Caper¹¹ has created connected trolleys that are fitted with a screen, barcode reader and payment terminal. These trolleys can also function as scales for items sold by weight. According to Caper, the trolleys can even learn: each item is photographed so that ultimately the items are recognised without the customer even scanning them. The

trolleys can also guide the user along the shop aisles and tell them when they are close to current promotions.

Autonomous store self-checkout

– Retailers are also transforming their stores to provide a seamless and frictionless experience to their customers. These stores provide a new and improved shopping experience, enabling cashier-less checkout and invisible payments to consumers.

The first initiative was launched by Amazon with Amazon Go in 2018, and many other retailers are also proposing autonomous and unmanned stores including Bingo Box, Tmall, JD, Auchan Minute, Watasale, PickGoPay, Casino, Monoprix, Boxy and LIFVS.

In most of the cases, this is possible thanks to artificial intelligence (AI) and the technological progress that has been made in image and video processing, and in sensor data aggregation. It has drastically improved the accuracy of product recognition, person tracking and gesture recognition. The Amazon Go experience may represent the ultimate version of shopping basket creation: the customer has nothing to do except to select the items and leave the shop. But there are other solutions that may be cheaper or easier to install in an existing shop. For example, in its flagship store in New York City, Nike has pioneered “scan the look”, where a customer can scan the QR code associated with a mannequin to purchase the whole look (or alternatively scan just one of the items), then pay via the mobile app and just walk out¹².

11 <https://www.caper.ai/>
12 <https://www.digitalcommerce360.com/2018/07/19/mobile-takes-the-starring-role-at-nike/>

Other companies, such as fashion and sports equipment retailers, have taken advantage of the RFID tags that they already use for traceability and inventory to experiment with seamless checkout. For example, at Decathlon DX¹³, customers can choose a product and use their merchant wallet Decathlon Pay.

Some retailers go even further, offering disruptive customer journeys such as the NanoStores[®] provided by AiFi. These are fully automated, container-sized, checkout-free stores, ready for global deployment at a moment's notice. Customers in the NanoStore can simply swipe a credit card or tap an app, select their items and then walk out, without the need for the retailer to have any onsite personnel to complete transactions. Receipts are generated in almost real-time, so shoppers can review their itemised receipt as they walk out. The entire shopping journey can be completed in seconds.

The cheapest option is to set up a store in a container. The store is so small that it can accommodate only one customer at a time (20 square meters). Yet this constraint also comes with great benefits: It makes the work for AI much easier, meaning that the computation can be performed locally on cheap hardware. On this basis, with a very limited investment, you can deploy a new store in a matter of days. The only infrastructure needed is a power supply and 4G connectivity. In Sweden, the start-up Lifvs opened 19 stores, choosing remote places that have lost their local shops. Thanks to very reduced operational costs, they can serve rural places. It takes only one employee to operate six to eight nano stores. And if, for some reason, the revenue of a specific store is too low, then it can be moved to another spot in a matter of hours at nearly no cost.

Understanding customers

A detailed knowledge of their customers is fundamental for brick-and-mortar retailers who now have to compete with pure online retailers. The digital solutions we have already described will lead to high volumes of new data being generated in physical stores. This can be used by retailers to build a more in-depth understanding of how their customers shop, interact and pay.

Predictive models will be defined to provide increased understanding of the customer (adaptation to changes, savings trends, priority products, level of mobility, proximity shopping, reduced shopping frequency, conversion rate, increase of picking up at stores from orders online, new models to estimate demand, etc.). This increased understanding will have two main objectives: firstly, it will allow retailers to provide customers with better experiences that are seamless from screen to store, resulting in an increase of customer spend and loyalty; secondly, it will also allow retailers to better understand all in-store operations and optimise their costs.

Detailed knowledge of their customers is fundamental for brick-and-mortar retailers

As a reminder: retailers do not need to worry if customers switch to online, provided that customers still buy from them. This better knowledge of their customers will enable retailers to keep customers loyal to them, even when switching channels.

Brand purpose

According to some surveys¹⁴, the number of consumers who would pay more for eco-friendly products has risen during recent years. This is especially the case for younger people whose spending power increases year by year.

In response to these trends, many new brands are defining their purpose around Corporate Social Responsibility (CSR) and positioning themselves so they can contribute towards a better society and a better environment.

This strategy might lead to higher revenues and a higher brand loyalty for those who embrace the same values. It also means that technology and payments need to be aligned with this brand purpose as part of the whole in-store shopping experience. Let's now explore some existing initiatives related to this:



Social initiatives around in-store payment

Charity rounding - In each payment transaction, customers are asked if they wish to round up the total to make a micro donation and collaborate with a charity project in a simple and transparent way.

Social cryptocurrencies - Use of specific currencies to boost local commerce. They are like a loyalty card but for a certain community.



Environmental / sustainable initiatives around in-store payment

Sustainable payment terminals - Merchants will prioritise payment providers with a clear commitment to provide eco-friendly payment terminals.

Payments without physical cards - Mobile payments and autonomous payments will also be prioritised by customers since they do not require plastic cards, therefore reducing the carbon footprint needed to manufacture and distribute them.

Digital receipt and warranty - Moving receipts and warranties from paper to digital (when possible from a compliance and tax perspective), will help reduce the carbon footprint of a payment transaction.

Green shopping: carbon footprint calculators - Some retailers provide their clients with information about the carbon footprint generated by the purchase they are making. This will help customers track the environmental impact of their purchases and make more sustainable choices.

ReCommerce - Some retailers, mainly within fashion, have also entered the ReCommerce market for buying and selling pre-owned goods, to address the willingness of consumers to reduce their own consumption, and to help combat the negative impact on the environment.

13 <https://www.retaildetail.eu/en/news/general/d%C3%A9cathlon-opens-exclusive-thematic-shop-its-members>

14 <https://newsroom.accenture.com/news/more-than-half-of-consumers-would-pay-more-for-sustainable-products-designed-to-be-reused-or-recycled-accenture-survey-finds.html>
<https://www.bbc.com/news/business-55630144>

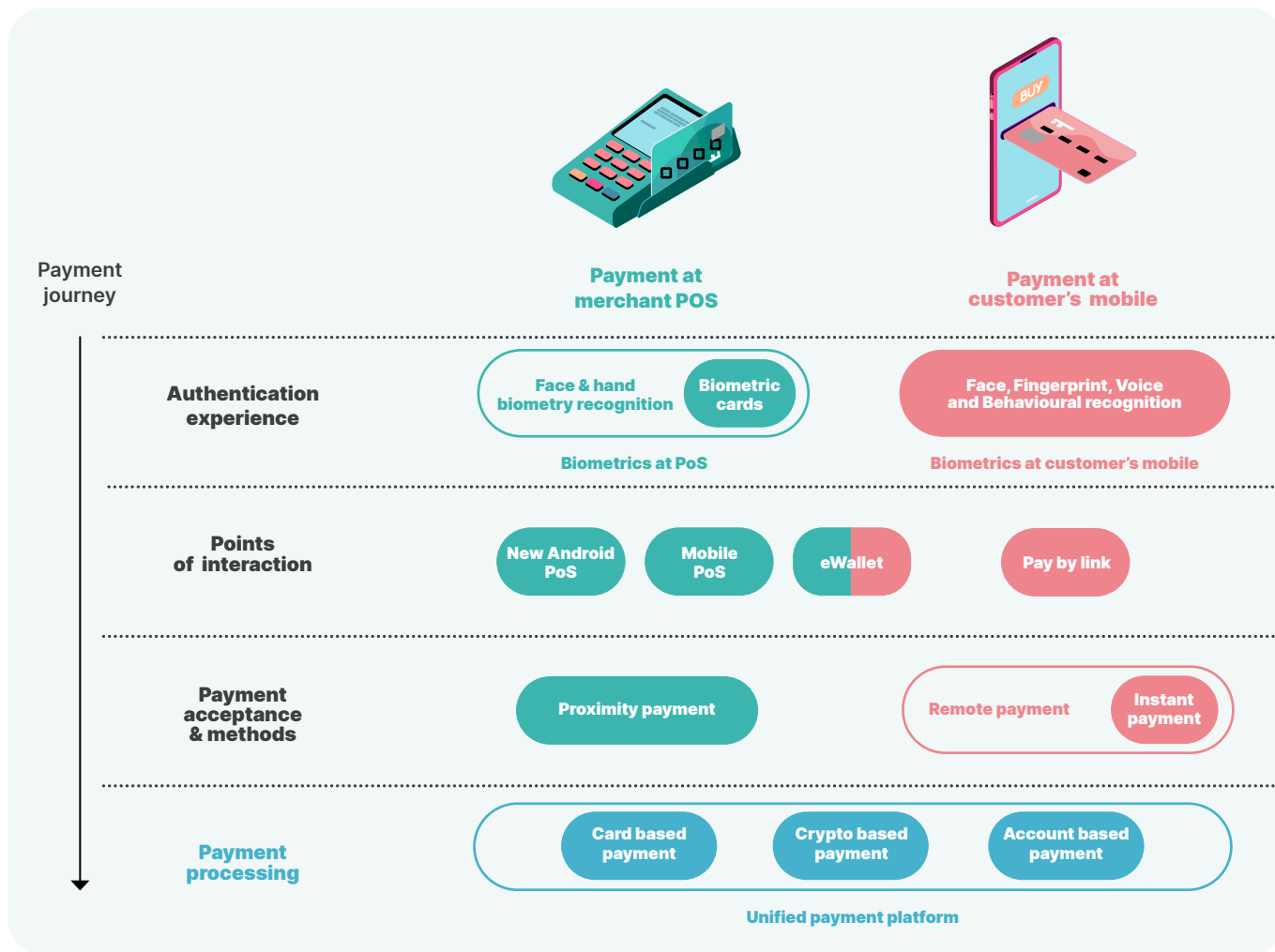


Figure 6: New in-store payment journeys

Technologies enabling new in-store payment journeys

In the previous section we have seen how the retail experience is undergoing a transformation. Supporting this shift, in-store customers are being offered a large variety of payment options. This is leading to a diversity of payment journeys adapted to the needs of merchants and customers for different types and sizes of shops in different geographies.

In this section, we provide a summary of new in-store payment journeys as illustrated in Figure 6. We differentiate those technologies relying on a payment terminal provided by the merchant from those in which the payment is fully managed through a device owned by the customer. In both cases, we observe how biometric technologies are facilitating the authentication experience of the customer with biometric cards, or even with the customer themselves being the payment means using their face or hand for authentication in the store. This is leading to diverse points of interaction that are evolving to facilitate a better customer experience. At one level, new payment devices have been developed with improved usability. On another level, we also observe new ways to pay which require no interaction with any payment device in the shop, which is instead replaced by a link for

remote payment. In both cases, the user experience can also be improved through e-wallets, which allow customers to have all their payment means easily available on their mobile. Behind the scenes, the range of payment mechanisms at play is broad: proximity payment, remote payment, card-based payment, account-based payment and even crypto-based payment.

Authentication experience

Payment authentication is the process of confirming a customer's identity. For in-store payment, the main factors that are used for this authentication are ownership (something the user has, like a credit card), knowledge (something that only the user knows, like the PIN for a card) and inherence (something that is intrinsic to the user, like their biometrics). These factors can be combined to reinforce the authentication process, in most cases using two authentication factors. Biometric authentication offers more secure payments and it also improves the overall customer buying experience. We will now describe different ways in which biometric technologies are used for authentication.

Biometric cards

Fingerprint biometrics has been brought to cards by the inclusion of a fingerprint sensor on the card and the storage of the fingerprint data inside its secure chip. This simplifies the user experience since the user does not need to type any PIN for identification on the payment terminal when presenting their card. In addition, security is improved (because the CVV¹⁵ code is only displayed when you put your finger on the card and the NFC antenna is active only if your finger is recognised).

These biometric cards are not subject to current limits on contactless payment transactions. The key issue for biometric cards is the enrolment process and how the biometric data of the cardholder is protected. In this new identification method, the biometric data cannot be shared (as can happen sometimes with a PIN).

Consumers as the means of payment

Facial recognition can provide the most seamless means of biometric identification as it does not require any contact or physical interaction by the end-user. It is one of the most explored biometric options (together with fingerprint recognition), and it can be useful for diverse use cases such as frictionless payments and loyalty experiences. However, facial recognition also comes with its fair share of controversy because of its potential for bias and ethically questionable uses.

When looking at new customer journeys in-store using facial recognition, China is leading the way¹⁶. For the last three or four years, facial recognition has been used to facilitate check-in at airports and hotels, or to order and pay in restaurants, fashion stores, banks, and hospitals. KFC and Alipay have showcased this type of journey¹⁷. In Western countries, however, much news coverage dedicated to these types of system has been less positive, detailing the potential for them to intrude on people's privacy in public spaces when used for video protection services. These concerns have led to numerous calls for stricter regulation of the use of facial recognition by authorities in the USA¹⁸, in Australia¹⁹, and Europe with GDPR. Even in China, where the technology is already in use, there is still some controversy around the use of facial recognition.

Facial recognition can provide the most seamless means of biometric identification

The Covid-19 pandemic indirectly raised a new challenge for the use of face recognition, as many countries have mandated a requirement to wear a mask in certain situations, obscuring part of the face. Of course, people may also choose to continue to wear masks, even if there is no longer a legal requirement to do so.

Meanwhile, the launch of specific customer journeys based on facial recognition has demonstrated that the technology is now ready to create genuine added value. In Pasadena in the US, PopID has been rolling out a network for facial recognition-based payments for businesses such as restaurants, allowing users to pay using facial recognition²⁰. As these business journeys succeed and grow, there will be more practical opportunities to convince potential users that facial recognition-based services could meet their current expectations.

Current studies show a huge difference of perception between users and retailers²¹. On average, 60% of users questioned in a recent survey said that they would avoid a store with facial recognition-based services, while only 23% of retailers expect this kind of reaction. The reasons behind this perception gap are related to the conflation with unsolicited surveillance, as well as the global opposition of citizens to the use of biometrics by a third party that would collect, store and process their data, especially when this data is considered to be sensitive²².

Nevertheless, today's concerns regarding the acceptability of facial recognition may change over time. Let's consider an alternative perspective: instead of asking customers if they would avoid a store that is using facial recognition systems, many of today's market studies show that customers are waiting for a better payment experience, with no queues and no check-out issues. For example, according to the Capgemini Research Institute²³:

- Two-thirds of customers believe that automation in general, including facial recognition, could improve their shopping on a daily basis.
- Half would shift from an online experience to a physical one using automation, with more fun and engagement.
- Those retailers that have already set up automation systems have seen 11% more visits per customer, 11% more sales, and 10% more time spent in their stores.

Therefore, it is no surprise that, by 2024, the global facial recognition market is expected to generate \$7 billion of revenue annually, with a growth rate of 16% per year over the period 2019-2024²⁴.

Other biometric techniques such as palm biometry (based on line detection and vein patterns) could be perceived as less intrusive²⁵, but they are also less seamless as they require an additional action from the user. For example, Amazon recently unveiled Amazon One²⁶ that enables customers to be identified at a store using their hand.

15 <https://www.cvvnumber.com/>
16 <https://www.marketsandmarkets.com/Market-Reports/next-generation-biometric-technologies-market-697.html>
17 <https://money.cnn.com/2017/09/01/technology/china-alipay-kfc-facial-recognition/index.html> will also be covered. https://en.wikipedia.org/wiki/Inclusive_design
18 <https://www.biometricupdate.com/202006/u-s-congress-member-welcomes-aws-facial-recognition-moratorium-demands-further-explanations>
19 <https://www.brisbanetimes.com.au/technology/harm-against-humans-rights-chief-warns-of-facial-recognition-threat-20200611-p55106.html>
20 <https://www.foxia.com/news/new-facial-recognition-technology-created-rolled-out-in-pasadena>
21 <https://www.capgemini.com/wp-content/uploads/2020/01/Report-%E2%80%93-Smart-Stores-1.pdf>
22 <https://www.nextgov.com/emerging-tech/2016/02/more-third-citizens-would-undergo-iris-scans-better-government-services/125674/>
23 <https://www.capgemini.com/wp-content/uploads/2020/01/Report-%E2%80%93-Smart-Stores-1.pdf>
24 Facial Recognition Market worth \$8.5 billion by 2025 (marketsandmarkets.com)
25 https://uploads-ssl.webflow.com/5a0ad2cbd65a2f0001be3903/5ba1f1164b592a76fc7821a0_Can-Biometrics-Beat-the-Developing-Worlds-Challenges.pdf
26 <https://www.theverge.com/2020/10/1/21496673/amazon-one-palm-reading-vein-recognition-payments-identity-verification>

Point of interaction

Having discussed the authentication experience, let's focus next on how, in most stores, the payment process is an important point of interaction between the merchant and the customer. Point of Sale (PoS) payment terminals have been a mainstay for merchants, seeing only minor evolutions over decades. This is changing, and different stakeholders are trying to bring more value to the PoS in order to transform it into an informed point of interaction for the merchant. We will now explain how this new generation of payment terminals is providing additional value-added services, while enhancing the overall usability for the merchant and the customer. We will also see how smartphones are being transformed into payment terminals, able to meet all associated security requirements. Finally, we will look at how these interactions are enabled with new options that do not require a physical payment device, using instead a device owned by the customer.

A new generation of payment terminals is providing additional value-added services

Next generation Point of Sale

From the point of view of a customer in a store, the payment process is embodied by the payment terminal (PoS). A new generation of PoS based on Android is providing a range of new services and customer experiences, in particular for people who want to pay with their mobile phones. In previous generations of PoS, only payment applications were available and they were typically quite static. Moreover, with simple PIN keyboards and arrows, possible interactions were limited. The new generation of Android-based PoS offer all the benefits of a smartphone-like experience combined with an extremely secure payment solution. They allow the development of VAS (Value-Added Services) based on cloud services offering an attractive user interface as well as the flexibility and the richness of online services such as Click & Go or Click & Return that we described earlier. The possibilities for VAS are endless and they can be tailored to a merchant's needs.



Mobile devices as a payment terminal

For SMBs (Small & Medium Businesses) which would like to accept contactless card payment without having to install a payment terminal, the solution may be to use their own mobile device as a payment terminal. Solutions based on mobile applications can offer them the possibility of turning their mobile phone into a mobile payment terminal. Alternatively a tablet, acting as both a cashier and a payment terminal, could provide a seamless PoS. It could also be an attractive solution for casual merchants (e.g. Bring Your Own Device for the self-employed) or for fleets of professionals using open OS devices. This approach may also allow merchants to shift costs from capital expenditure to operational expenditure (pay-as-you-go).

Several companies are currently developing Tap-on-Phone software solutions aimed at enabling a simple smartphone to process secure card payments, using the NFC capabilities of the device to read the chip of the contactless card or customer mobile (or even their smart watch). Depending on the technology, the user can enter their PIN on the merchant's mobile or on their own smartphone.

Technically, there are several software-based solutions based on Android such as Quest Airpay TAP, Worldline Mobile Pay or Ingenico Moby-Tap.

Some innovations, such as Worldline Mobile Pay, incorporate solutions based on both software and the Secure Element embedded into a mobile phone that provides hardware security. These provide a standalone solution, but one that is not available on all the smartphones on the market. Others, such as Ingenico Moby-Tap, rely on the white boxing cryptography (WBC) on the mobile phone and in the cloud. These technologies point to a future of payment in which the PoS will rely more on software and less on hardware. These kinds of solutions offer an evolving, programmable and cloud-based approach and they will help to implement new use-cases in-store such as web-in-store or digital receipts.

Proximity mobile payment via e-wallets

The Covid-19 crisis has rapidly accelerated the use of contactless payment²⁷. We believe that this, in turn, has motivated more people to use their mobile e-wallet to pay (such as Apple Pay, Google Pay, Samsung Pay, Lidlpay, Tesco pay, Paylib Paypal, etc.).

An e-wallet is a mobile application provided either by a bank, merchant, Original Equipment Manufacturer (OEM) or other parties. It is protected by a highly secure mechanism to strongly authenticate the users and their devices, such as two-factor authentication based on smartphone biometrics, PIN entry or other software mechanisms that guarantee both the identity of the user and integrity of the software and hardware. It also contains payment functionality, such as payment card emulation with tokenisation, remote payment, account-based payment, or crypto-currency payment.

With e-wallets, banks and merchants have full control of the user experience and can create new services and customer journeys. Users can also find added value in services other than payment, such as a history of their transactions or loyalty points. Nevertheless, e-wallet payments are not yet as widely accepted as payment cards.

27 <https://www.finextra.com/blogposting/20271/contactless-payments-set-to-boost-business-as-covid-restrictions-ease>

In terms of the customer experience, e-wallet users do not use their credit card physically, but rather their mobile phone, which may often be easier to reach. Thanks to biometrics on mobiles, users also avoid typing their PIN and any touch interaction with the PoS. Most of the time, e-wallets integrate payment receipt functionality, so paper receipts become obsolete.

Despite these many advantages, one potential downside is that a proliferation e-wallets would require the end-user to install multiple apps on their device and select the correct one depending on where and who they are paying. This could create a new type of friction as the end-user will not only have to select the right app for each purchase, but also maintain their payment credentials inside each e-wallet solution. We believe that this will create a need for payment service providers to offer solutions that can be integrated into multiple e-wallets to provide the payment functionality with payment credentials automatically being synchronised between them.

In-store remote payments via Pay by Link

Perhaps spurred on by the accelerated use of non-cash payments, we are seeing the adoption of new means of payment where the physical PoS is no longer the point of interaction. One example of this, which is gaining popularity especially in emerging markets, is the use of Pay by Link.

As shown in Figure 6, the operation is very simple: through a mobile application, merchants now have the ability to generate their own payment links on the fly to accept payments remotely or in person at the point of sale. They can be shared through social channels, messaging (such as WhatsApp, SMS or email), or transformed into a QR code that a customer can scan from their own mobile device. Once the customer clicks on the link, they are redirected to a payment page where they enter the amount to be paid and select their favourite payment means: a bank card, PayPal, Apple Pay or any other means that are supported by the payment provider. When the payment transaction has been made, the merchant is informed of the transaction and can send the digital invoice directly through the channel from which the payment was started.

This technology can also complement payment processes carried out via chatbots, especially in WhatsApp, which has not yet integrated a payment solution (although it has run pilots in India²⁸ and Brazil). The ability to send and receive money right from where you chat caters for many interesting use cases, such as bookings, peer-to-peer payments, or product and service purchases.

Payment and acceptance methods

Having discussed the authentication experience and point of interaction, let's now cover the available methods of payment and acceptance.

Payment acceptance is the process by which merchants are paid by customers, normally through an acquirer who can settle payments from diverse payment types. We will now describe different payment and acceptance methods used in stores, including proximity payments enabled through a device provided by the merchant, and remote and account-to-account payments that do not require any payment device provided by the merchant.

Proximity payments

Proximity payments are payments in which the customer (the payer) and the merchant (the payee) are located in the same place (the store) and the communication between their devices is based on a proximity technology such as Near Field Communication (NFC), Bluetooth or Quick Response (QR) codes. In these cases, the customer uses a contactless card or their mobile to interact with the PoS provided by the merchant.

For e-wallets based on card emulation, such as Apple Pay, Android Pay, or Samsung Pay, the user experience is very close to the NFC contactless payment, using the contactless EMV (Europay MasterCard Visa) application of the payment terminal.

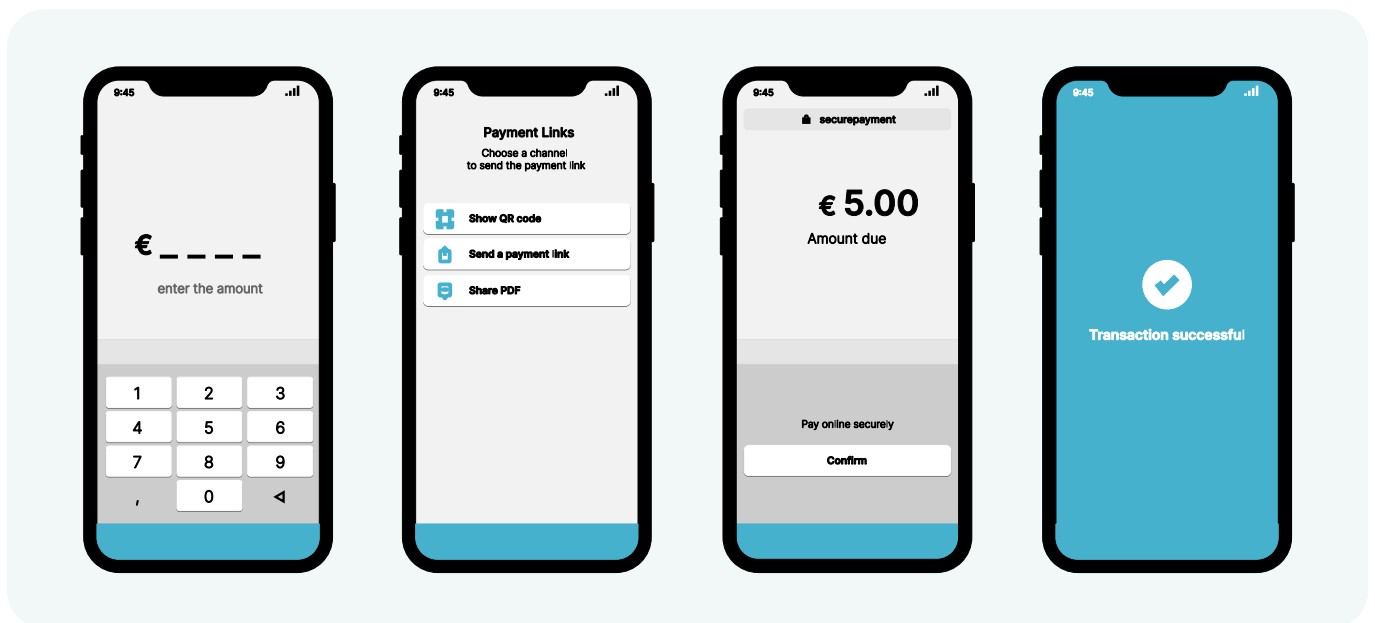


Figure 7: Getting paid with payment links

28 <https://www.whatsapp.com/payments/in>

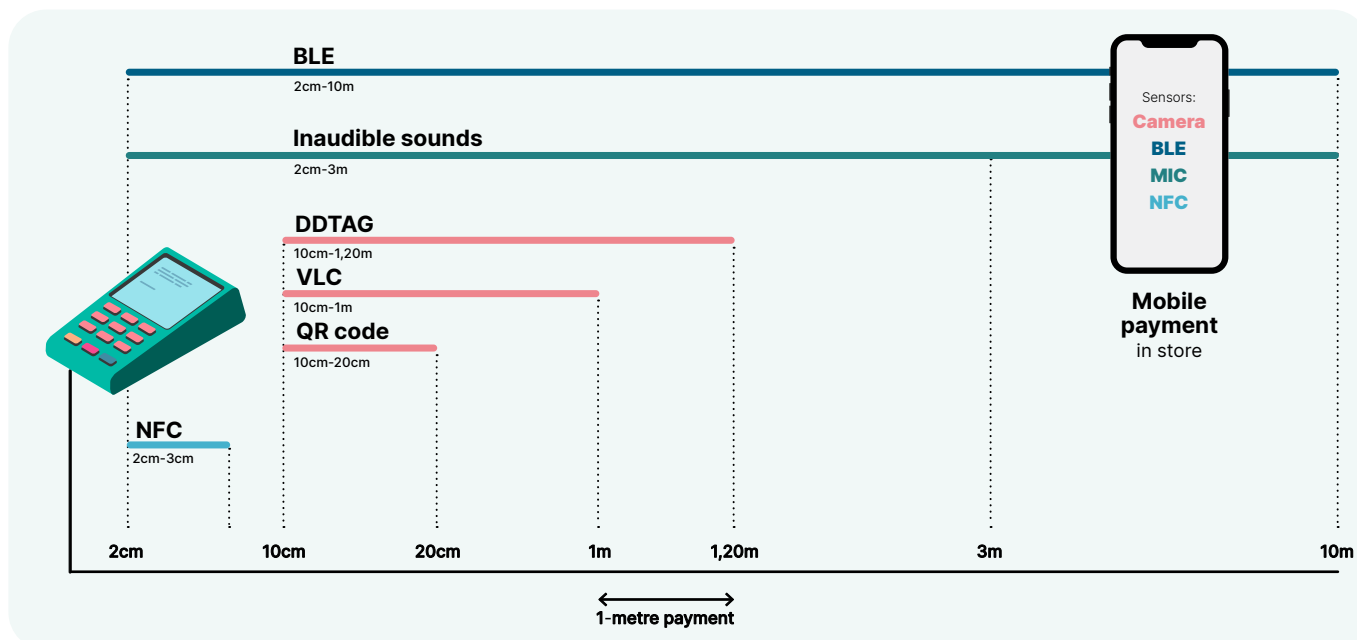


Figure 8: 1-Metre Mobile Payment Technologies

However for card non-present wallets (i.e. non-EMV payment), transferring the transaction from the PoS to the mobile application takes time and customer effort. The most common way today is to use a QR code printed on the cash register or displayed on the PoS screen and scanned by the user²⁹. Proximity payments can be efficient, but not seamless. It is also possible to use NFC as a short-range communication protocol, although this is limited to Android phones because iPhones directly switch to the Apple Pay application when they detect an EMV contactless interaction.

Alternative solutions are based on Bluetooth, such as Unwire BLE (Bluetooth Low Energy) Tap and Pay³⁰ which creates a user experience very similar to an NFC tap except that it requires the addition of a BLE device to the PoS. Invisible light communication³¹ or inaudible sounds (Copsonic³², Lisnr³³, Stimshop³⁴) could also provide an easy link between a smartphone and the PoS. These innovations allow for early check-in or check-out which may be part of an identification process before and after shopping. On the customer side, these solutions are compatible with a very wide range of smartphones. On the merchant side, they are available on PoS devices such as tablets, but they are not yet implemented in all payment terminals. With the popularisation of mobile wallets, there is still room for improvement when it comes to user experience at the PoS.

In-store remote payments

Many merchants are also accepting remote payments in the store, blurring the line between the online and offline worlds.

Whether scanning QR markers or NFC tags, interacting with Digital Signage, using their e-wallet, sending a Person to Business transfer, or receiving payment links directly on their mobile, customers are experiencing the use of remote payments at the point of sale in many ways. Remote in-store payments allow customers to use their preferred means of payment, the details of which they have already stored on their mobile devices. By linking the two worlds, it is possible

to buy a physical product by clicking on an Apple Pay or Google Pay button, using your preferred payment card or bank account details (or even your crypto-wallet) to initiate the payment transaction. And all this without the need to interact with any physical PoS.

The deployment of this type of technology is, in many cases, related to self-service or single-product sales models. The aim is to give the customer autonomy to make the purchase of their products independently, without having to go through the checkout. Nowadays, physical merchants have tools where they can collect remote payments and can monitor transactions, so that they can validate sales in real time.

The SEPA payment standard Request to Pay (R2P)³⁵ introduced at the end of 2020 will provide merchants with a new way to request a payment initiation in the store.

Account-to-account payments

Account-to-account payments, triggered via QR codes or e-wallets, provide an efficient solution for reducing the fees for accepting payments, and give merchants the opportunity to provide additional loyalty advantages or discount vouchers for their customers. Additionally, many customers will consider this type of payment more convenient since they prefer to pay directly from their account in order to better manage their budget.

Buy now pay later

Buy Now Pay Later (BNPL) is a way to spread out your payments when you buy a product or service. It is similar to a traditional instalment plan. When a customer pays using BNPL, the provider has an account to pay on their behalf, and later the customer repays the BNPL provider over an agreed length of time, in instalments. Buy Now Pay Later is also attractive for brick-and-mortar stores, since it allows all their products and services to be accessible to all consumers at the point of sale.

29 <https://www.pavconiq.be/en/private/pay-in-store>

30 <https://www.unwire.com/ble-tap-and-pay/>

31 https://en.wikipedia.org/wiki/Visible_light_communication

32 <https://www.copsonic.com/>

33 <https://lisnr.com/>

34 <http://www.stimshop.com/>

35 <https://www.europeanpaymentscouncil.eu/what-we-do/other-schemes/sepa-request-pay-scheme>

Payment processing

Customers now have many more options for paying at stores. We have seen how cash and cheques are being replaced by other means like debit and credit cards. We can also observe the rise of account-based payments and the emergence of payment through cryptocurrencies. All of these will require payment processing behind the scenes to authenticate and approve these transactions and process the transfer of funds from customer to merchant, covering all entities participating in the transaction.

Unified payment platforms

Behind the scenes, API-based convergence platforms bring all transactions together. This means that it is possible on the same platform to process transactions from online or in-store (at PoS), and even remote transactions made in store such as transactions launched on a mobile wallet. These platforms also enable different kinds of payments such as credit, debit, prepaid and closed loop cards³⁶. This ensures that merchant and acquirer data are consolidated via a unified system, regardless of the payment method or channel. Worldline One Link or PayOne offer these kinds of services. Merchants benefit from real agility to use the best channel for the different use-cases (autonomous store, pop-up stores, Click & Collect, Try & Buy). For customers, unified payment platforms provide a seamless omni-channel solution.

Furthermore, thanks to card tokenisation, these platforms can even identify a customer whenever they interact with the system without having to manage their identity. This enables the implementation of use cases that improve the customer journey, such as Click & Collect, where the customer buys online with their payment card and then comes in-store to collect the goods. Customers are recognised simply by presenting their card.

Tokenisation is a solution for taking the credit card information that is entered into any payment acceptance system or environment and replacing it with a surrogate value or token. This token is used as if it were the real card to support customer requests and facilitates reporting without interrupting day-to-day operations. However, the randomly generated token has no meaning or value to hackers in the event of a breach. This credit card tokenisation technology keeps unsecured cardholder data and other personal data from entering enterprise systems including ERP, CRM, legacy applications and e-commerce sites. The encrypted card number is stored off-site in a secure, PCI-compliant data vault. By capturing and tokenising cardholder information before the raw card data touches the source system, merchants no longer handle or store unsecured cardholder data on-site, but instead store tokens. This solution is a secure step towards digitalisation of the payment process and CX improvement.

Account-based payment

New account-based payment solutions are appearing, such as BlueCode³⁷ where the user provides their account data rather than their payment card data. For the merchant, this kind of transaction relies on the same insurance mechanisms to guarantee being paid as for payment cards. There is no need for previous payment authorisation. There are also specific recovery mechanisms and insurance for merchants. As such, account-based payment may help merchants avoid some card-based transaction fees, reduce the complexity of implementation and result in higher conversion rates. Even if the customer is not happy with the delivered product or service, the merchant will get the opportunity to speak directly with the customer rather than resolving the dispute via schemes. This is another opportunity to deepen the interaction with the customer and strengthen brand loyalty.

Account-based payment delivers many possibilities to design new user experiences. For example, with BlueCode, when the customer arrives at the till, their mobile wallet displays a QR code containing an ID that is managed by a QR code reader attached to the till. When the payment arrives, the customer does not have to do anything and the transaction is completed automatically. And by “completed” we really mean crediting the payment account of the retail store or customer within seconds. Even though the PSD2 standard for account-based payments in Europe is well advanced and there are existing solutions based on it, it is still in its early stage and we anticipate more new services in the coming years. The UK and Scandinavian countries seem to be spearheading developments at this point³⁸.

Crypto-based payment

Increasingly stores of different sizes are accepting cryptocurrencies like Bitcoin as a form of payment in the same way they might also accept other currencies³⁹, to attract new customers and to showcase their innovativeness. Moreover, on high-value purchases, depending on the payment card fees of the region, the use of cryptocurrencies may also significantly reduce the bill for customers. PoS which accept cryptocurrencies, gift cards bought with crypto money and mobile apps are the most popular ways of allowing these innovative crypto payments in stores.

A concrete usage of cryptocurrencies to pay in stores is local money⁴⁰. These community currencies circulate mostly locally and at a community level, are accepted by local traders, and give local residents an incentive to shop locally. Bristol pounds and its digital successor Bristol Pay in the UK are among the more well-known examples. They are also referred to as social money because the city council can pay a proportion of social benefits to underprivileged people with this electronic money, which can then only be used in the stores within the city. Worldline's stablecoin innovation playbook⁴¹ offers more in-depth information on how local currencies can be used for large-scale events in sports and music, as well as at a regional level.

36 Typically a card which can only be used to make purchases certain merchants (often just one company).

37 <https://bluecode.com/en/>

38 <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op229~4c5ec8f02a.en.pdf>

39 <https://99bitcoins.com/bitcoin/who-accepts/>

40 <https://www.bbc.com/worklife/article/20200427-how-community-currencies-help-keep-businesses-afloat>

41 Stablecoin: towards a trusted digital currency (January 2021) <https://worldline.com/en/home/knowledgehub/stablecoin.html>

Adoption of new in-store payment technologies

In the previous sections we have seen the huge potential and range of innovative retail and payment experiences that can now be offered. We have also described how these experiences can be enabled from a technological perspective. However, not all companies are able to adopt these new approaches at the same pace. In this section, we examine some of the main drivers and challenges for the adoption of new in-store payment technologies.

Survival instinct is accelerating change

The ability to move fast and adopt emerging technologies has been a lever of change for most large companies in the world, although historically retail has not followed this approach⁴². Only in recent times have we seen that survival instinct push the retail sector to evolve more rapidly.

Today's reality is that retailers are adopting new digital solutions at an astonishing rate. Thanks to automation and self-learning technology, they are creating new experiences for customers that, just five years ago, would have been difficult to imagine. As consumers, we are living in one of the most exciting times in history, discovering every day how technology is steadily changing our habits and improving the customer experience.

Now, when time is more valuable than ever, we have shown as a society how much we appreciate the many innovations that make life easier for us. We adopt these innovations almost intuitively. Less time in a queue provides more opportunities and better services. No generation has experienced so many changes in such a short time. Looking back on this period in years to come, we will see that we have not made just a step forward, but a leap into the future.

This digital transformation is not only revolutionising the way people shop, but also the way retailers discover what their customers are doing in physical stores and online. Several emerging technologies appear poised to advance this process even further. These technologies allow retailers to create new customer journeys based on deeper, data-driven insights into customer behaviour. In this way, retailers are overcoming what until now had been an insurmountable barrier: the differentiation between online and offline channels.

One world, many adoption realities

While the technological revolution has a global effect, there are many nuances that mean the level of adoption and the type of solution differ from one place to another around the world. Different factors affect the way retailers and consumers are embracing new technologies, leading retailers to develop localised rather than universal strategies.

For example, there are some countries that are still adopting certain technologies, whereas in other countries the payment and market infrastructure is already highly developed. This situation conditions the type of solutions that are deployed and allows countries to skip some steps along the way. For example, China and Africa have gone directly from cash payment to mobile payment without going through the adoption of EMV cards.

Demographics and cultural aspects are other factors that influence the choice of approach. Whether due to generational gaps or purely behavioural aspects of society, many solutions are localised and adapted to a specific country's reality, or even at the regional level of states, cities or communities.

Likewise, another determining factor for the adoption of technology is formed by the different legal regulations for issues as important as privacy, the use of data, or the roles of companies in the service chain. While in certain countries we can see that the use of biometrics is already a reality, in many others regulations and users' concerns about sharing their personal data are slowing adoption.

Retail stores are adopting at different rates

To understand the impact of digital transformation on the payment experience and how it has affected consumers, we only have to look at those payment services that we already use in our daily life. In this document we have summarised the status of many different payment solutions and we have seen how some of them have already achieved a degree of adoption that is close to maturity while others are still at an early stage.



42 <https://www.tnp.sg/news/views/one-four-retailers-slow-adopt-new-technologies>

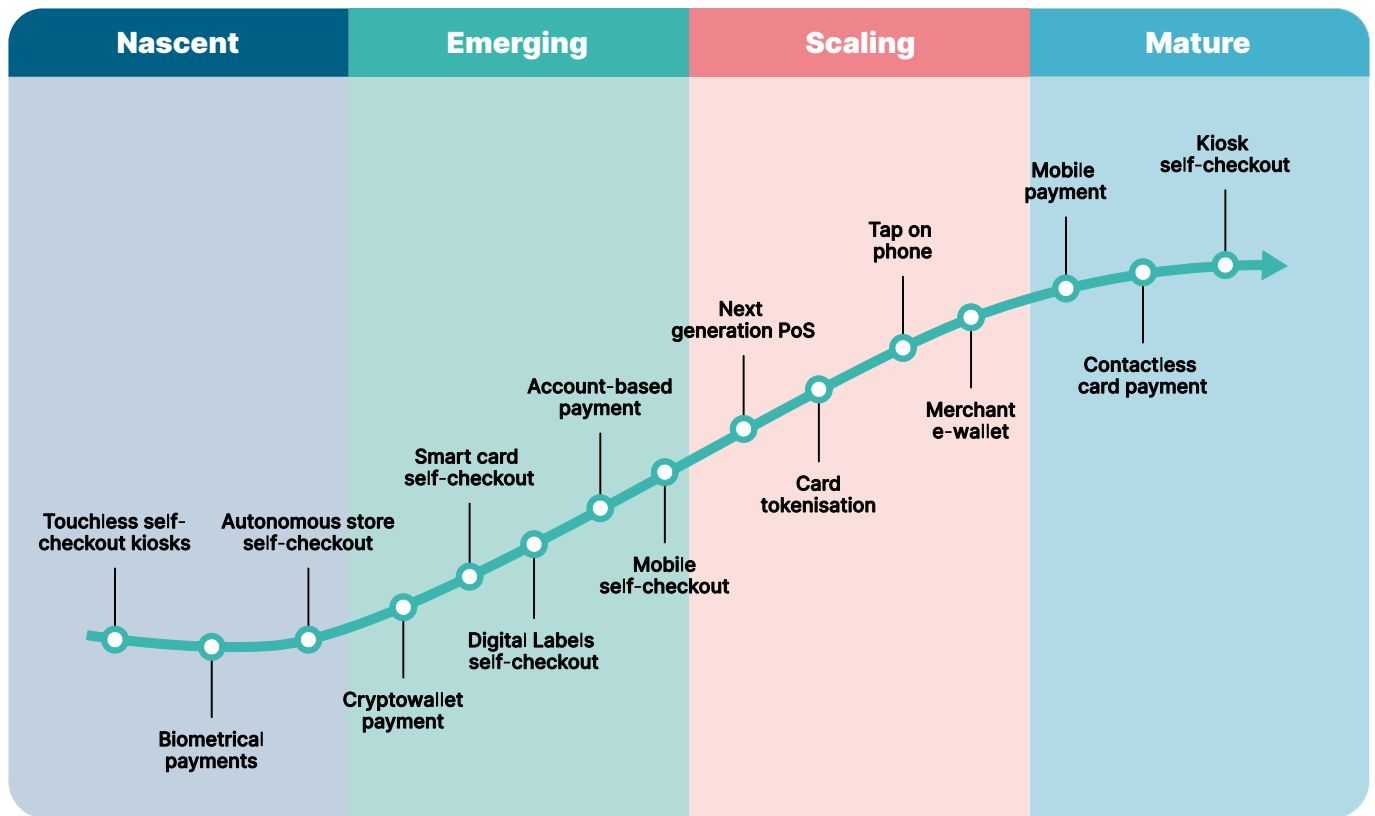


Figure 9: Our assessment of technology adoption by retailers

As shown in Figure 9, we can break down these technologies according to their degree of adoption within stores.

We are currently at a stage where retailers are embracing seamless payments without first implementing proofs of concept. That means that today's technological innovation is going directly into physical stores. Technologies that are already mature, such as mobile payment or self-checkout kiosks, coexist with totally disruptive initiatives that surprise and capture the interest of customers. Regulators echo this trend and have become facilitators of disruption. For example, they offer innovation hubs and sandboxes that allow new entrants to devise and test new solutions while not yet having the complete licensing or governance framework in place⁴³.

And this is just the beginning. In the coming years we will see new disruptive proposals land in the market that will forever change our perception of the shopping experience. Automation and robotisation will be the main protagonists. It may be that in the not-too-distant future we will forget that there was ever a time when human beings served you in a store.

We will see new disruptive proposals land in the market that will forever change our perception of the shopping experience

A revolution that is not for everyone

Technology adoption by consumers is never homogeneous. Different population segments have different predispositions and show different levels of resistance to change. Before this technological deployment, many people in the senior

segment already refused to use self-checkout kiosks, stating that they preferred to deal with a human. Many others refused even to use cards to pay and mobile payment was not among their priorities.

But it is precisely in the baby boomers and Generation X where retailers have found their audience. The former because they have lived through the entire digitisation process that the sector has gone through and are able to appreciate each of the improvements that arise. The latter simply because they have already been born in a digital context and embrace any change that goes in that direction. They are less concerned than others with the use of their data or with privacy.

Today it is difficult to find someone visiting a store who does not have their mobile phone with them, who has never compared prices, who has not made an online purchase, or who has not used some type of self-checkout system. This could be considered as an indicator that retailers are successfully introducing new payment technologies and experiences to their customers. In the end, it will be the new generations who will decide if this strategy is the correct approach. After all, they are our future, and retailers are aware of it.

43 [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652752/IPOL_STU\(2020\)652752_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652752/IPOL_STU(2020)652752_EN.pdf)

Conclusion

As we have seen, brick-and-mortar stores are experiencing a significant transformation. They are enabling multiple journeys that are changing the way in which customers interact and pay at the stores. This is already leading to new payment experiences that are enabled by different underlying technologies, with the final goal of providing a better user experience to the customer and higher revenues to retailers.

At Worldline, we continue to research new in-store payment experiences together with our clients and our partners, exploring and testing innovative solutions and use cases. We hope this paper has helped you to understand the potential of these new payment experiences, as well as helping you to formulate the actions to take in order to achieve the maximum benefit from these current and emerging options.

10 Takeaways

#1

New payment experiences accelerate transformation of stores

The pandemic has accelerated the shift of the retail sector towards the adoption of new digital payment experiences for physical stores.

For consumers, the payment experience can be a differentiating factor in their purchase decisions. Retailers who adopt innovative solutions can achieve a competitive advantage allowing them to differentiate themselves.

#2

Improved Customer Experience with a ROI

New payment technologies with a high ROI are revolutionising the customer experience at the point of sale, offering merchants a great return on investment based on smart transactional data and business analytics.

#3

From omnichannel to unified commerce

Thinking about the short- and mid-term, retailers will need to move from omnichannel to unified commerce to increase customer loyalty and retention by providing a seamless in-store experience. The distinction between Point of Sale (PoS) and e-commerce (also known as Card Not Present) has become obsolete.

#4

New in-store journeys

The adoption of new technologies at the point of sale offers retailers the possibility of designing new journeys for customers that increase security, improve interaction with their services and products, and eliminate friction during checkout payments, thereby limiting the risk of drop-off and increasing conversion rates.

#5

Biometrics as enabler for frictionless payments

With proper regulation and if used appropriately, biometric technology is a serious candidate to become one of the most important new pillars of transformation for payment services in the coming years.

#6

From Point of Sale to Point of Interaction

Point of Sale payment terminals are evolving to a Point of Interaction, with new devices providing value-added services in addition to payment acceptance.

#7

From self checkout to autonomous checkout

The checkout process has been the catalyst for new shopping experiences. Autonomous checkout will gain momentum in the coming years once supporting technologies become affordable for all types and sizes of store.

#8

Consolidation of e-wallets

E-wallets will play a leading role for those retailers who want to develop loyalty strategies that include payment experiences based on smart customer data, allowing them to control the entire value chain.

#9

Emergence of account-based payment at store

It is expected that there will be increasing adoption of account-based payment models due to the savings in commissions for retailers, especially those who work with very tight profit margins.

#10

Fragmented adoption

Due to major cultural, social, infrastructure and regulatory differences, technological adoption will take place at different speeds in different countries. This requires localised rather than globalised strategies for multinational merchants. Regional diversification is a must. It is important to engage and listen to consumers when adopting all new payment mechanisms.

About Worldline

Worldline [Euronext: WLN] is a global leader in the payments industry and the technology partner of choice for merchants, banks and acquirers. Powered by 20,000 employees in more than 50 countries, Worldline provides its clients with sustainable, trusted and innovative solutions fostering their growth. Services offered by Worldline include instore and online commercial acquiring, highly secure payment transaction processing and numerous digital services. In 2021 Worldline generated a proforma revenue close to 4 billion euros. [worldline.com](https://www.worldline.com)

Worldline's corporate purpose ("raison d'être") is to design and operate leading digital payment and transactional solutions that enable sustainable economic growth and reinforce trust and security in our societies. Worldline makes them environmentally friendly, widely accessible, and supports social transformation.

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