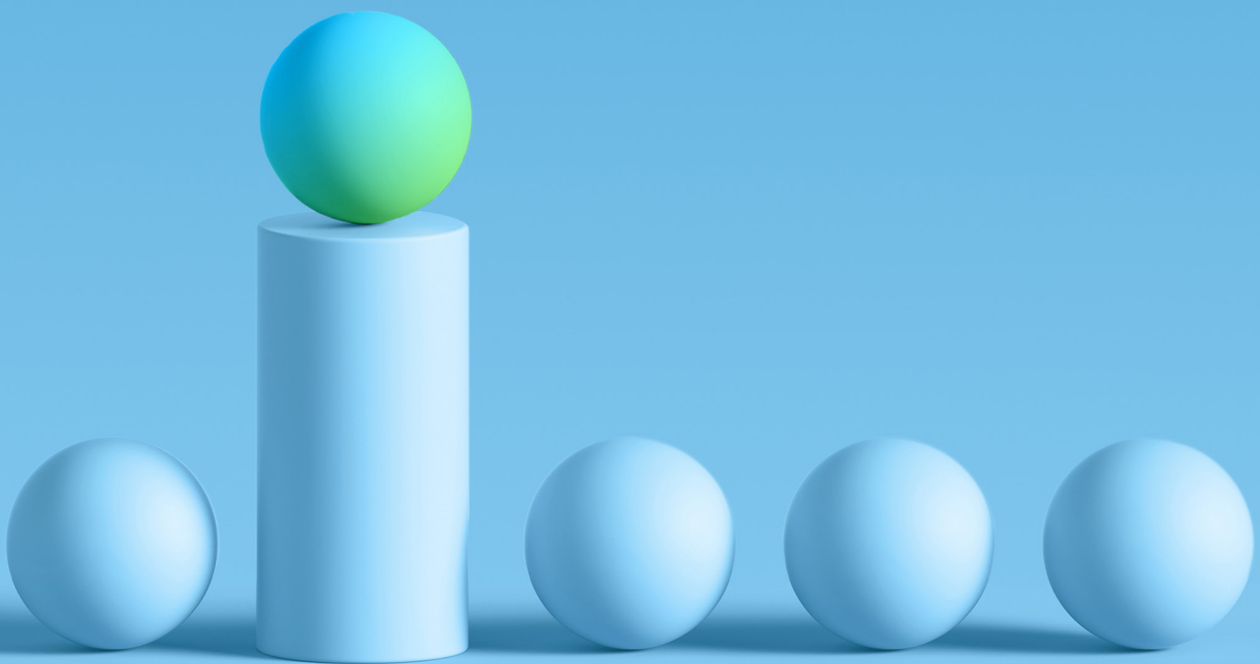


New technologies and trends in digital payments in 2022



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Introduction

The use of alternative payments is becoming more common in the UK and worldwide, and although cash is still among the favourite payment methods of a significant number of consumers, as seen in depth in the whitepaper "[Use of cash: are we close to a cashless society?](#)", **digital payment solutions** in the last two years have been the protagonists of a **cashless acceleration never recorded** before.

The global pandemic, which is still ongoing throughout the globe, is also having significant implications on [consumer buying behaviour](#) and, as a direct consequence, on payment habits. **Click & Collect, delivery** from the nearby retail trade

and **Ecommerce** are just some of the purchasing methods that are encountering more and more success with the public, and are becoming a focus of companies' and merchants' investments, with priorities shifting from silos to multichannel.

The technological response from the world of payments to the **new forms of purchasing experiences** with an **omnichannel** and **fluid** approach, are the platforms capable of satisfying increasingly complex and personalised needs, both from the point of view of the merchant and from that of the customers.

Growth in digital payments worldwide

The increase in the adoption of digital payment tools has been underway for some time, as shown in Figure 1, but it was 2021 that showed the strongest year-on-year acceleration. At the end of 2020 digital payments via global **Ecommerce** was equal to almost **\$3.4 billion**, and by 2021 this number rose to about **\$4.2 billion**, recording a YoY increase of over **23%**.

Significant growth was also expected for digital payments via **POS**: **+26% compared to 2020**. In fact, in 2020 these payment methods generated volumes of almost **\$2 billion**, which reached almost **\$2.5 billion** in 2021.

In addition to the total volumes per channel, the **average transaction value (ATV)** per user also grew, as shown in Figure 2. **Digital commerce** in the period of 2020-2021 demonstrated a change in the overall growth trend, which is a two-year decline that has brought the ATV from \$1,148 to \$975.

However, ATV is forecast to grow up to **\$1,197** by the **end of 2025** with a decelerating dynamic that would become static in the period of 2024-2025. In turn, a linear increase is confirmed for digital payments via **POS**: from \$1,300 in 2019 to **\$2,474** within the next four years.

Transaction value by segment

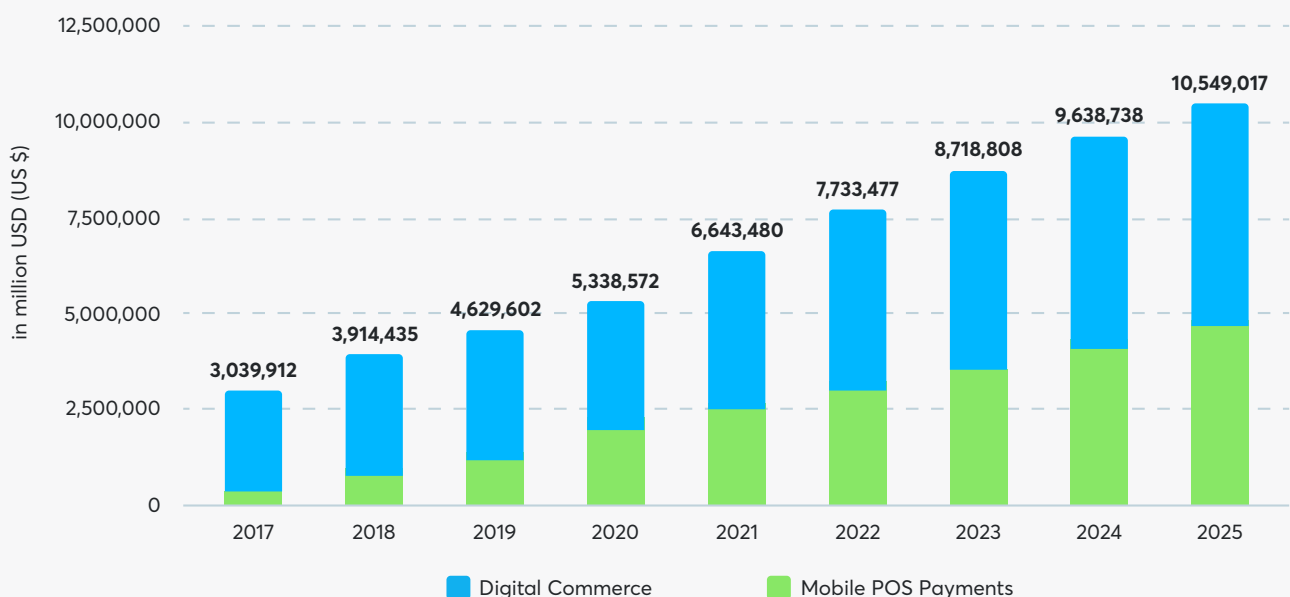
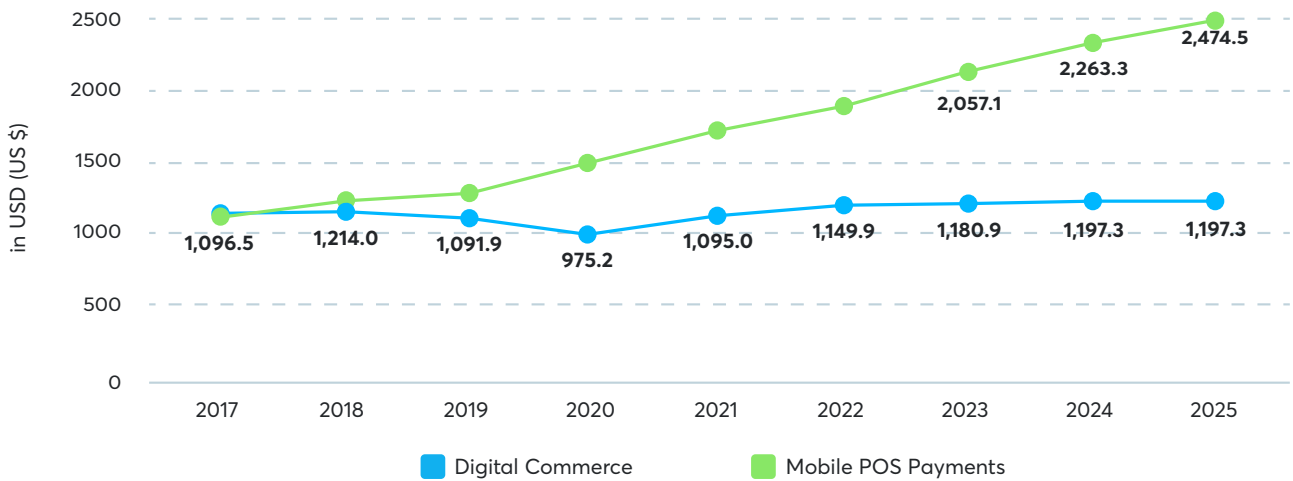


Figure 1 - Source: Statista, October 2021

Average transaction value per user

Figure 2 – Source: Statista, October 2021



The increase in **users per channel**, on the other hand, will result in the opposite situation: **digital commerce users number will continue to grow** at a constant rate, while those of digital payments in **points of sale** has already experienced a **deceleration** in 2021 that will continue at least until 2025.

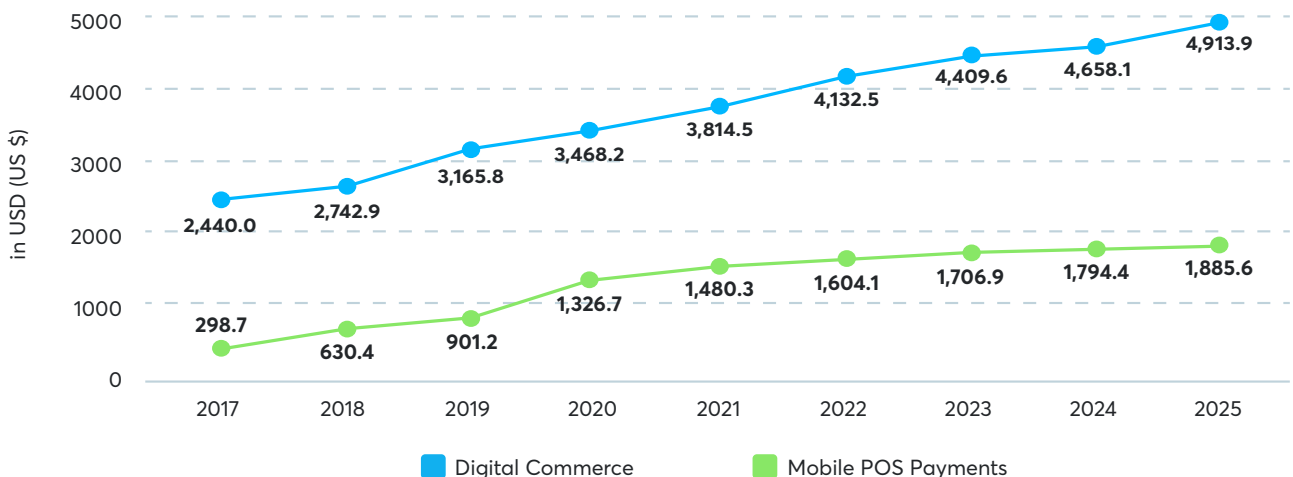
Globally, **volumes generated** via digital payment instruments are not homogeneous, but fragmented by country. In the short term, by the end of 2022, **China** will continue to lead the ranking of the top-5 countries that demonstrate the highest numbers, more specifically, with over **\$3 billion of generated**

value, followed by the **United States** with less than half of China's volumes (**\$1.5 billion**).

An interesting fact that the **United Kingdom** and **Germany** also make the list, two European countries that certainly represent peculiar cases from a payment point of view. The UK has always been ahead of all Europe in regard to the penetration of digital payment tools, and is known for its resilience and adaptiveness when dealing with novelties that are particularly impactful in the digital payments arena. As discussed in the whitepaper "[Strong Customer Authentication in 2021](#)", the high authentication rates in the

Users by segment

Figure 3 – Source: Statista, January 2021



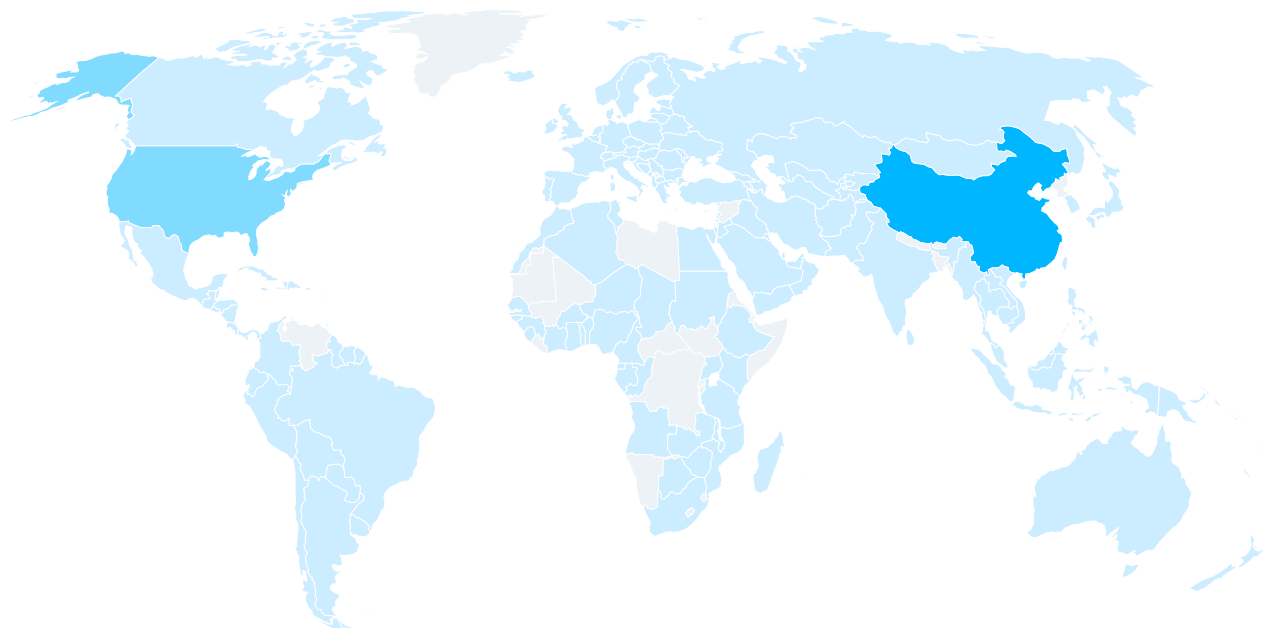
United Kingdom demonstrate its ability to adapt, especially when compared with the data of the rest of the European countries.

As for Germany that is also among the top-5 countries in the world with the highest transaction value in digital payments, it is different from the UK, since this country is at the same time among the [European countries with a high use of cash](#), which remains one of the preferred forms of payment among Germans, despite the consequences of COVID-19. In any case, Germany encourages the population to use alternative instruments as well¹. According to Statista's analysis, the most developed economies for several decades have been

implementing a **cashless payments infrastructure**, based mainly on credit cards. But in recent years the more "traditional" structures have suddenly become a burden on the ecosystem. And for this reason, among others, the western markets are now much slower in adopting new payment solutions than emerging economies such as China, India or Eastern Europe.

Large swaths of population in the developing economies of Asia, Africa and Latin America have also been underestimated until the raise of mobile payments and the innovations introduced by digital wallets that rely on easily accessible technologies.

Transaction value comparison, 2022



1. China	3,272,729	3. United Kingdom	355,315	5. Germany	238,278
2. United States	1,511,684	4. Japan	280,343		

Figure 4 – Source: Statista, January 2021

1 - Infas quo-Studie: girocard-Zahlung in Zeiten von Corona | Initiative Deutsche Zahlungssysteme e.V.

Digital payments in the UK

The forecast for the **UK market for the next 4 years** shows an increase in the total transaction value via all channels (**Ecommerce** and **Mobile POS**).

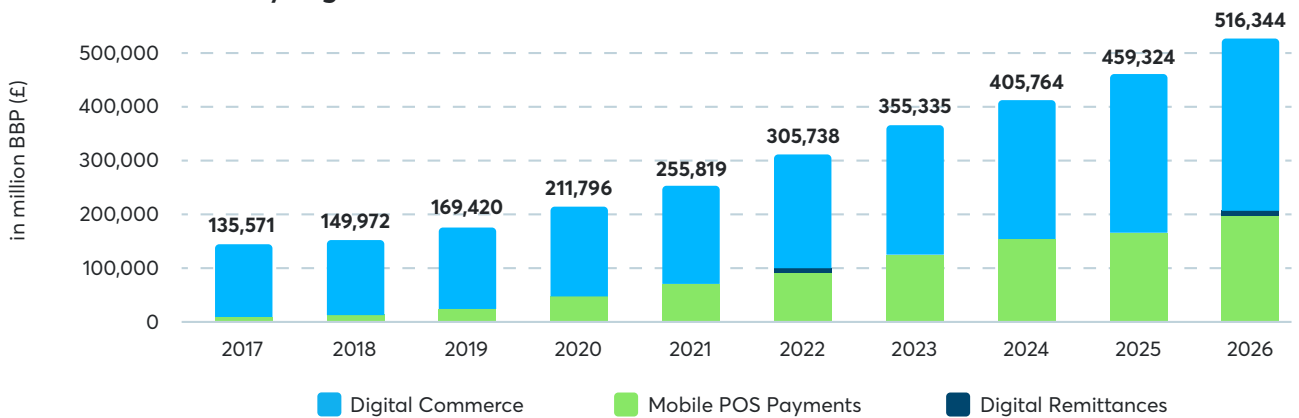
As can be seen in Figure 5, both will **grow steadily** over the following years, especially **mobile POS payments** segment, with Ecommerce still holding the reins of the leadership.

Digital commerce transaction value will increase by 15% from 2021 to 2022, reaching £204,064 million, and by **78% by 2026**. Mobile POS transaction value will see a YoY increase of 30% by 2022, reaching £99,082 million, and a whopping **160% growth by 2026**, getting closer in value to Ecommerce transactions.

If we look at the graph in Figure 6 that shows the trend of users growth in digital payments in the period of 2021 - 2026 in the UK, some similarities emerge. In both segments (Ecommerce and POS) the trend is growing almost evenly (**+ around 1 million yearly**), even though the data relating to in-store users demonstrates a particular YoY boost in users in 2020 (**+4.5 million users**). Starting this year, however, in 2022 the growth is around **1 million per year in store**. In the **digital commerce** segment, we observe a similar trend, a particular increase in 2020 (**+2 million users**), followed by a slowdown from 2021 to 2023, and then going up again with **over 1 million YOY growth per year**.

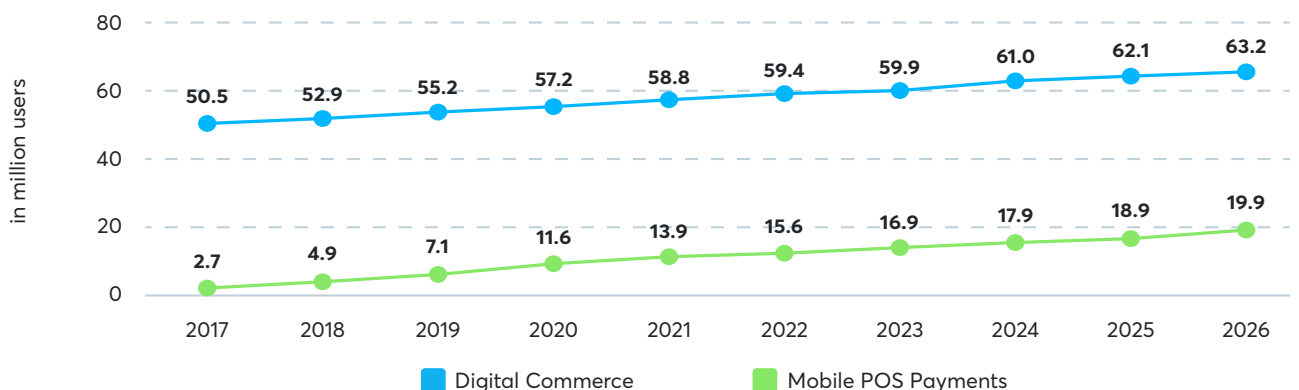
Transaction value by segment

Figure 5 – Source: Statista, Digital Market Outlook (release March 2022)



Users by segment

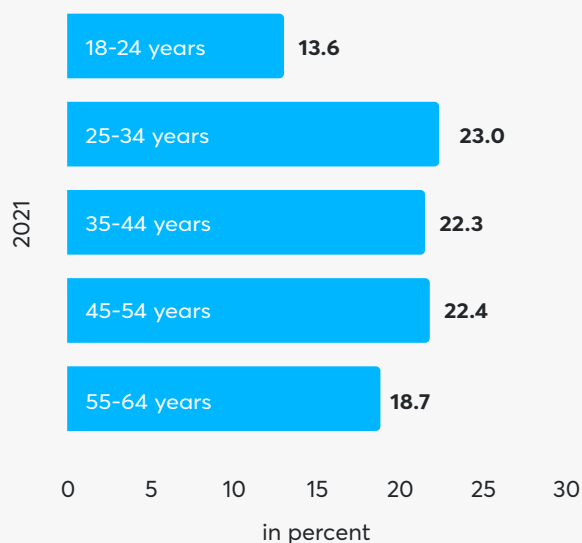
Figure 6 – Source: Statista, Digital Market Outlook (release March 2022)



What is the demographic profile of the users of these payment methods in the UK? Again, according to Statista (Figure 7) almost **45% of users** are aged between **35 and 54 years**, and the most well-represented group, **23%** are younger Millennials (**25-34 years**). Gen Z, under 25 years old is the least represented generation in this statistic with only **13.6%**. Significant drop in users compared to Millennials and Gen X are younger Boomers (**55-64 years**) with **18.7%**, which is still very significant and much higher than Gen Z. There are no relevant gender distinctions, with women being slightly more represented (**50.6%**) a sign that the gap in the use of digital platforms, which still exists in some countries around the world², has gradually narrowed in the UK, at least in digital payments.

As we have examined, the generational gap between younger and older generations has decreased compared to past years. It is plausible that the flattening is due to the aging of the population and to an increasingly widespread digital market penetration in many areas, especially that of services (e.g. banking and financial services, payments, citizen services, etc.).

Users by age



Users by gender

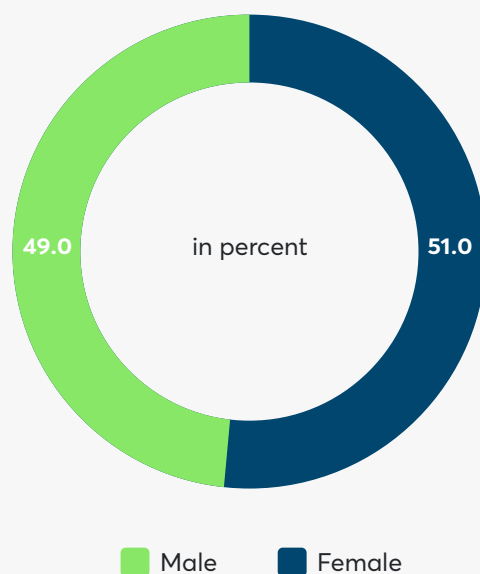


Figure 7 – Source: Statista, Digital Market Outlook (release October 2021)

² - Digital gender gap: men 50% more likely to be online in some countries – report | The Guardian

New technologies and trends in digital payments

In the purchase process, **payment** is probably the most delicate phase because it determines the transition from the purchase intention to the actual sale. At the same time, for obvious reasons it can be considered the least pleasant phase for the buyer, so it is essential that the operation is as **frictionless** as possible, **immediate**, almost **imperceptible**, while still **transparent**, **clear** and **above all safe**.

Precisely with a goal of combining a complex series of features and also thanks to the rise of digital, all players involved in the payment processing have been investing for some time in innovation of processes, legislations and platforms. Regulation, alternative payments, fraud prevention, value-added services are just some of the fields on which companies and institutions are working to improve the shopping experience for consumers, as well as in the B2B sector, and that of collection for merchants.

What is the main focus of the global players and what are the **trends to follow** in order to meet and, if possible, anticipate the needs of buyers?

Blockchain and cryptocurrency

We have already touched upon the concepts of [blockchain](#) and [cryptocurrencies](#), with the goal of providing some tools to approach the subject in relation to the world of payments, without examining all of its aspects, both due to the complexity and the vastness of the topic.

Although in some respects **cryptocurrencies** are still considered a **grey area** of the financial world

in general, and it is undeniable that this form of digital currency is also used by criminal actors. However, it is important to consider that it is not the only payment instrument used for illicit purposes, for example, cash and prepaid cards are protagonists of many illicit actions around the globe. Even though cryptos are **not very eco-friendly**, due to the increasing energy consumption to generate it, it is certain that the **underlying technology**, specifically the blockchain, represents an **innovation with enormous potential**, especially in terms of [transaction security](#).

Over the last few years, several companies have introduced **Bitcoin**, the predecessor of all cryptocurrencies, among the accepted payment systems, or rather currencies. For the sake of completeness of information, it is good to remember that some companies, for example Microsoft³ and Tesla⁴, have revised their position on the issue over time, some even several times, without, however, denying its technological advantages.

Although today there are still few companies that accept Bitcoin, cryptocurrencies and their capacities of a payment tool are a relevant topic and to be taken into consideration, especially if we observe some developments in the field of payments.

Last October at the Money20/20 event, **Mastercard** announced⁵ that it would offer an opportunity to its business customers to allow consumers to buy, sell and hold cryptocurrencies, simplifying the issuance of credit and debit cards for these purposes, and has further **highlighted the attention on this**

3 - 10 Major Companies That Accept Bitcoin | Yahoo Finance

4 - Tesla will no longer accept Bitcoin over climate concerns, says Musk | BBC

5 - Mastercard and Bakkt partner to offer innovative crypto and loyalty solutions | Mastercard

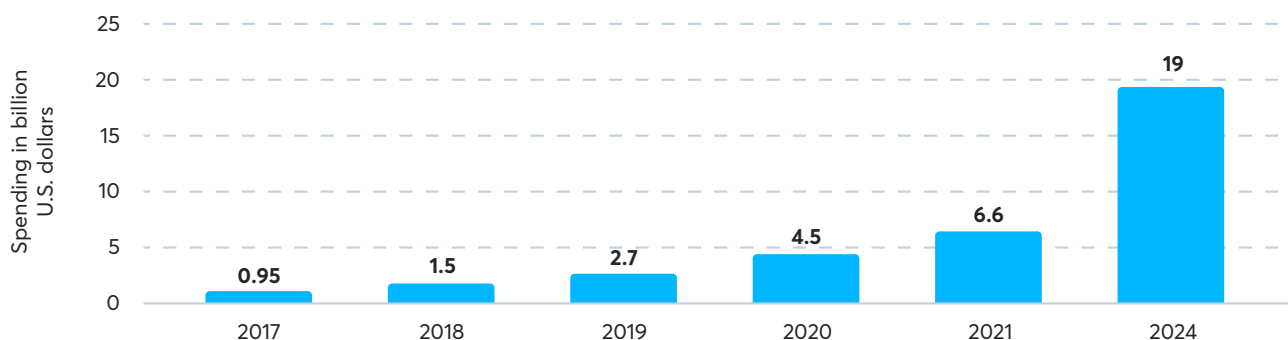


Figure 8 – Source: Worldwide Semiannual Blockchain Spending Guide | IDC

technology, including from the **major international financial players**.

Not only cryptocurrencies, but above all, the blockchain has spiked the interest of many companies around the world. According to the research "Worldwide Semiannual Blockchain Spending Guide" conducted by IDC, investments in blockchain-based technologies in the world will grow almost exponentially (Figure 8). **By 2021**, spending in this sector was around \$6.6 billion, but by the end of **2024**, volumes are expected to grow almost thrice and to equal **\$19 billion**.

Buy Now Pay Later and instalment payments

[Buy now pay later](#) is a payment formula that is becoming very popular in online sales. According to data recently published by FIS Global⁶, today **instalment payments** are used for **2% of total Ecommerce transactions** globally, and by **2024 it will reach 4%** of the market. Deferred online payments are particularly popular in **Europe**: today they account for **7.4% of the total Ecommerce payments**, equal to more than double of the cash on delivery, and in **the UK** in 2021 this form of payment represented **6% of all collections**, which is 8th in Europe.

Amazon's initiative to include instalment payments in its marketplace in February 2020, the \$48 million loan raised by the Italian fintech start-up Scalapay

in January 2021⁷, and the \$45.6 billion valuation of Klarna⁸ do nothing but confirm the growing interest in these forms of payment by consumers as well as by investors.

There are two forms of BNPL that can be integrated into Ecommerce platforms: the first is that of financing and the most used type by individuals – **consumer credit**, the second allows a customer to **pay in tranches**, that are requested directly from a **credit card**, thanks to platforms such as Klarna, ClearPay, Laybuy and recently PayPal.

Solutions, such as Klarna and Laybuy, allow deferred payments to be directly associated with the credit card, and are ideal for smaller loans, and in addition, offer a better **user experience**, thanks to the fact that there are no long buyer evaluation processes. The platforms have no costs for the buyer but apply commissions to the merchant, which is the case for other online payment systems. Then there are hybrid offers that combine typical characteristics of loans with those of platforms that charge directly the credit cards, combining the advantages of both solutions.

In-store payments: Pin on Glass, Tap on phone and SoftPOS

The adoption of [contactless payment solutions](#) continues to **grow globally**. The recent increase in contactless spend limit up to £100 without PIN in October 2021 in the UK, as well as all around

6 - The Global Payments Report 2021 | FIS Global

7 - Scalapay raises \$48M to scale its buy now, pay later service in Europe | TechCrunch

8 - Fintech giant Klarna raises \$639M at a \$45.6B valuation amid 'massive momentum' in the US | TechCrunch

Europe, the replacement of cards without [RFID](#) by banks, and the inception of digital wallets, such as Apple Pay and Google Pay, just to name a couple, are contributing to the increase in the use of the mobile POS payments.

The global pandemic has contributed to further acceleration of the use of these tools in the last two years, favouring solutions that reduce contact between people and objects, especially if used by multiple people, such as POS screens or buttons. And the growth of digital payments market size, discussed in the previous chapters, is further confirmed in the Figure 9 that shows **growth** forecast of almost **250%** in **NFC payments** via card or smartphone in Europe from 2021 to 2024.

To improve and expand contactless payments further, technological innovations' contribution to the collection solutions are now aimed to dematerialise and [virtualise the POS terminals](#). There has been talk for a while about solutions doing just that, and today the timing seems to be perfect, in fact, some payment platforms that are going in this direction are already available on the market:

Pin on Glass

In the case of PIN on Glass solutions, the merchant must install a dedicated software on their device:

smartphone or tablet, to which a certified card reader is connected. The innovation is in the possibility of typing the PIN on the display of the merchant's device and not on external dongles, but there is still the need to have a dedicated card reader device.

Tap on Phone

Thanks to Tap on Phone technology, it is possible to manage transactions exclusively via certified software installed on the merchant's smartphone or tablet, without any third-party hardware accessories. This technology does not require external intervention or installation of additional devices but still has some limitations, such as availability only for the Android operating system; the contactless payment (CVM) limit for transactions, due to the inability to enter the card PIN, processable transactions are only those below the thresholds, above which the code entry is required; as well as the need to have a device with an NFC antenna.

SoftPOS

This is probably the ultimate solution. However, for the moment, there is a need for an Android device with NFC technology, but this technology, even if still in prototyping form, due to the lack of some system requirements specification, is promised to manage any type of transaction, regardless of the

Market size of contactless payments in various regions worldwide in 2020 with forecasts Research, Digital Market Outlook (release January 2021)

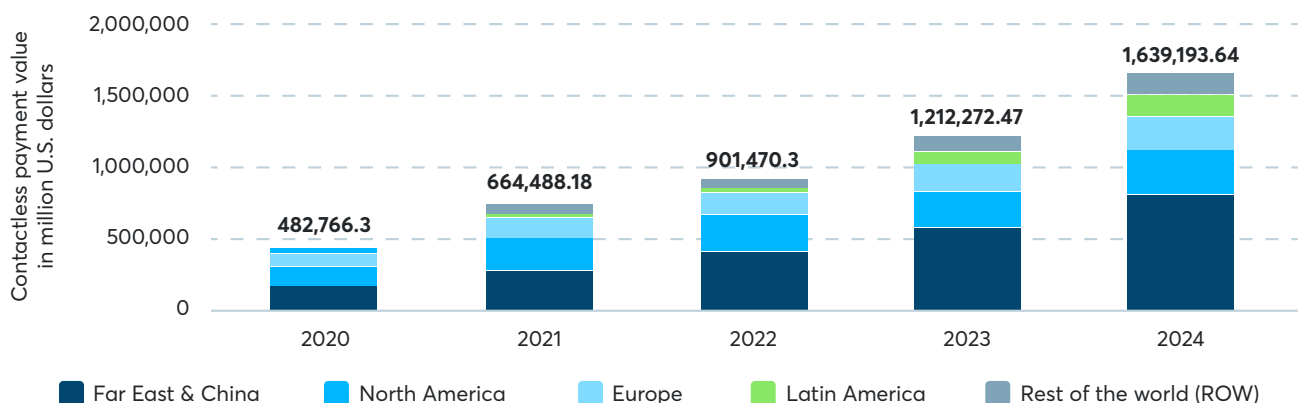


Figure 9 – Source: Juniper Research, March 2021

amount paid and the used payment instrument, considering that it will be able to accept both payment cards and digital wallets.

The virtualisation of POS terminals and the simplification of the payment processes, for both merchants and their customers, are particularly promising innovations, especially for small and micro-enterprises realities. In fact, according to a survey carried out by Visa⁹, **63% of micro and small businesses** would likely **integrate Tap to Phone** into their businesses, and over **50% of buyers** said they **would use it** if it were available in store.

Moreover, according to a Visa research¹⁰ that involved 2,000 small businesses and 4,500 consumers in 8 strategic markets during the pandemic period, almost **50% of shoppers** stated that they **would not shop** in stores that offer only **payment methods that require direct contact** with cashiers or shared POS terminals.

Recurring payments and Negative Option Billing by MasterCard

Recurring payments concern many goods sectors, and especially the service sector. What we are going to explore in this chapter does not fall within the context of innovations or trends, but the **MasterCard Rules**, which regulate recurring payments online on this circuit.

MasterCard has requested **changes to the payment pages, receipts and emails of merchants** that offer recurring payments and/or whose services include the offer of a trial period followed by the implicit opt-out subscription, which means an automatic acceptance unless explicitly refused, i.e. the so-called Negative Option Billing Model.

The deadlines established by MasterCard for the implementation of modifications are:

- **March 22, 2022:** all changes relating to the subscription and payments notifications;

- **September 22, 2022:** all changes to the payment pages;

Subscription and payments notifications changes

By **December 8, 2021** merchants that use recurring payments and/or offer services with the **Negative Option Billing Model** must:

- send a confirmation notification via e-mail or another digital channel immediately after subscription that contains:
 - plan's payment terms and deadlines, including the frequency and amount of the recurring payment;
 - the duration, terms and conditions of the free trial period, as well as the value of the first payment, if there is one. All must be listed if a Negative Option Billing Model is chosen or if there is a free trial period;
 - instructions on how to unsubscribe;
- send a payment receipt by e-mail or via another digital channel after each transaction is made, the notification must contain the cancellation policies. If the transaction wasn't successful, the email must contain the reason for the decline. If multiple tries are performed in a 24-hour period, only a single receipt can be sent containing all information on payment attempts;
- send a notification via e-mail or another digital channel that is clearly distinguishable from a marketing communication, in case of the subscription with a payment frequency of no less than 6 months and not earlier than 7 days before payment, and the notifications must contain:
 - Plan terms;
 - Cancellation policies;
 - Clear specification in the subject that it is related to the upcoming recurring payment;
- send a notification via e-mail or another digital channel, in the case of Negative Option Billing Model, with the subject that mentions digital services and products, not less than 3 days and not more than 7 days before the expiry of the free trial or the conditions change, and the

⁹ - Understanding the Future of International Tap to Phone Acceptance Study | Visa

¹⁰ - The Visa Back to Business Study | Visa

notification must contain:

- Notice of the upcoming free trial expiration;
- Payment terms and deadlines of the plan;
- Instructions on how to unsubscribe;
- request to show the client the date when the subscription period for the Negative Option Billing Model with the subject of physical products, will start, in addition to the explicit consent of the cardholder regarding the plan information after the end of the trial period;
- send a confirmation notification by e-mail, another electronic channel or on paper, at least 7 days in advance of the plan modification, if the terms of the subscription changed;
- send a confirmation notification by e-mail, another electronic channel or on paper, within 7 days of cancellation, if a request for cancellation was made by the customer.

Change of payment pages

The payment pages are all the pages where the order report is present or where the buyer enters the card credentials.

Merchants who fall into the categories described in the introduction must:

- include subscription payment terms and deadlines together with the request for card credentials, including the frequency and amount of the recurring payment;
- for the Negative Option Billing Model, include the free trial terms and conditions, such as the initial payment, the length of the trial period, the price and payment frequency of the subscription;
- include a check that explicitly requires approval of the terms set out in the offer;
- include cancellation policies online or via other electronic channels, for example by inserting a direct link to cancel the subscription on the same website where the cardholder accepted the conditions.

If a dedicated page is used, the requirements are not met, if there is a need to scroll down the or expand a

text box to view the conditions.

New plan features for Negative Option Billing Models

As regards the subscription plans, the only change specified by MasterCard concerns the start date of the plan: the start date of the free trial must correspond with the date, when the cardholder receives the physical or digital product.

Payment orchestration and smart routing

The concept of **payment orchestration** comes from the analogy with music, where the maestro orchestrates different instruments in order to obtain the perfect symphony. The same idea applies to payment processing: each integration works together within the system to enable the most efficient path to a fast and secure transaction. This **simplifies the process**, allowing companies to **save on additional integrations**, while providing a **frictionless checkout** experience for shoppers.

The adoption of a payment orchestration platform offers a number of advantages:

- Increase in conversion rate
- Greater effectiveness on international markets
- Faster scalability
- Reduction of fraud
- Automatic reconciliation
- Automatic backup system

We have published an insight to investigate what exactly [payment orchestration is and why it is fundamental for Ecommerce](#) and in this chapter we will examine the opportunities offered by *smart routing*, one of the crucial features of payment orchestration.

In the context of online sales and other sectors, a number of transactions can fail for various reasons, attributable to all the players involved in the payment process. Among these are failed payments

due to technical problems in the management of the payment flow.

A study by Accuity¹¹, a LexisNexis® Risk Solutions company, estimated that **failed payments** have **cost** the global economy **\$118.5 billion** in fees, labor and lost business in **2020**. Not only, on average the impact of failed payments amounted to just over **\$200,000 for corporate firms**.

Moreover, research suggests that failed transactions have a strong impact on customer experience. In fact, **37%** of organizations reported that there was a **severe impact on customer service** and nearly **50%** indicated that customer service was in some way affected.

In order to minimize the number of failed transactions due to technical problems, smart routing (also called dynamic routing) and artificial intelligence work in synergy in order to guarantee that in case of technical issues with one of the payment providers, transactions can be managed by an alternative provider.

Dynamic routing can be viewed as the next step in the evolution of static routing, aka redirecting to different PSPs through manual configuration, according to rules defined according to the needs of the merchant.

For example, merchants may need to carry out transactions on different acquirers or PSPs, depending on the market, amount or other variable, for reasons that may be related to costs, efficiency or rate of authorization.

Manual routing therefore responds to specific needs but is unable to react in real time to technical problems of the acquirer or to other factors that require changes in real time. This is where smart routing comes into play, by automatically routing transactions to the best performing service provider at the time of purchase.

This flexibility helps **minimize failed transactions** due to technical errors by automatically switching to a different vendor to get transaction approval. This allows for better performance both in terms

of costs and time and availability of payment methods. In addition, dynamic routing engines, powered by intelligent learning algorithms, cause **routing performance** to become more and **more accurate** as more transactions are performed. Dynamic routing allows, for example, to sell internationally with maximum efficiency by providing local payment methods and to obtain transaction approval faster, on the acquirer with the highest approval rates and with specific parameters for each geographic region. In summary, in addition to reducing failed transactions, dynamic routing is ideal for:

- decreasing commissions and costs
- speeding up payments
- managing multiple geographic regions in the world

According to the Global Market Estimates¹² report, the payment orchestration market has been growing at a global level at a very fast pace: **it is predicted to grow at a CAGR of 20.2% from 2021 to 2026**. Also for these reasons, payment orchestration solutions are among the trends that will characterize the innovation of the next few years in the field of payment management.

Artificial intelligence at the service of Ecommerce fraud prevention

Especially in recent years, fraud prevention platforms have evolved over time as have the increasingly sophisticated techniques put in place by cyber-criminals, as already detailed in the whitepaper "[Cyber-crime and online fraud: a challenge for the entire Ecommerce ecosystem](#)".

Integrating effective and innovative prevention solutions means being able to estimate additional costs while, in the meantime, allowing to reduce both the direct costs related to the management of frauds and the indirect ones, attributable for example to the reputation of the brand and the churn rate.

¹¹ - True Cost of Failed Payments | Accuity

¹² - Global payment orchestration market - Forecasts to 2026 | Global Market Estimates

These solutions go beyond the limits of outdated measures, such as the setting of static rules, IP and email blacklisting or limitations on the amount and frequency of payments by individual users, just to cite a few examples.

Accurately quantifying these costs globally is a daunting task and the reasons are many. First of all, there is no shared database. Moreover, the offer of payment systems available in the world is highly fragmented and keeping track of all illegal events recorded by individual instruments and by all PSPs is not a viable option today.

However, we can look at some research carried out in the field of online payments in order to draw a general framework and work on conscious business choices in terms of safety and prevention.

FIS Global, an international player in the field of payment systems, has recently published the results of a survey¹³ commissioned to Forrester on a pool of nearly 700 managers of large Ecommerce companies from 11 countries around the world. The research found that almost **90% of the companies** involved suffered losses due to **online payment fraud** and about **50% spent on prevention**, in 2020 alone, **from 1% to 5% of profits**. In 38% of cases, according to the FIS Global survey, the losses correspond to at least 6% of the revenues to which must be added the costs for the implementation of solutions related to prevention and regulatory adjustments (the [PSD2](#) regulation for example).

The research of FIS Global is flanked by other studies, available in the [Axerve whitepaper dedicated to Ecommerce fraud prevention](#), which show an increasingly complex but also profitable landscape for those who carry out this type of scam. As written at the beginning of this chapter, the solutions and measures to reduce the effectiveness of these illicit acts are increasingly effective, however it remains essential to identify platforms and partners able to keep up with the continuous evolutions of cyber-crime.

So what are the innovations to be evaluated in this area to reduce the impact of online fraud?

The application of artificial intelligence in this sector is actually not one of the most recent innovations but it is its growing effectiveness that is extremely topical, thanks to increasingly sophisticated algorithms. In fact, due to ever-increasing data acquisition, constant growth in volumes and in the number of online shoppers globally, and the advent of regulatory updates such as PSD2, there is a rise in opportunities for evaluating transactions and the ability of algorithms to distinguish potential fraud from so-called false positives, i.e. transactions incorrectly identified as scams.

Moreover, **prevention platforms** will extend their perimeter, integrating value-added services able to better manage the entire payment process. An example are the functions capable of performing timely risk analyzes and making the most of the opportunities offered by the exemptions provided for by the PSD2, also **100% guaranteeing the transaction** for the merchant, with the full reimbursement of any unidentified fraud.

PSD2 and SCA: challenge and opportunity for online sales

The European PSD2 regulation to make payments safer dates back to 2018 but its implementation took place in January 2021. Among the innovations introduced precisely to increase the security of online transactions is [Strong Customer Authentication \(SCA\)](#), i.e. two-factor authentication request to buyers to finalize a purchase, managed through the 3DS2 protocols of various circuits. Since its introduction, however, the two-factor authentication has represented a challenge for the entire Ecommerce ecosystem, considering that it represents a further step in the purchase flow and for this reason it has reduced the conversion rate of many online stores, as detailed in the whitepaper "[Strong Customer Authentication and conversion rate in Europe in 2021](#)".

It has therefore become strategic to be able to better manage strong customer authentication,

¹³ - Global Payment Risk Mitigation | FIS Global e Forrester

reducing friction in the authentication phase and taking advantage of exemptions: opportunities offered by the legislation itself.

In order to help merchants, some service payment providers have introduced **tools capable of making the most of the opportunities offered by the PSD2 regulation by managing exemptions**. These tools are able to provide a transaction risk analysis (TRA) compliant with PSD2 to request an exemption from the application of the regular flow of 3DS protocols. Reducing the number of SCAs can be a differentiating element for an Ecommerce, because it increases customer loyalty and can help acquire new customers potentially looking for alternatives from websites that mismanage the authentication part.

Thanks to the effectiveness of the TRA performed by third parties, the merchant can prevent transactions from being rejected during authentication, improving both the user experience offered to its customers and the overall conversion rate.

Ecommerce Tokenization

The concept of tokenization, in the context of payments, identifies a service for which the payer's card data are replaced by a string of numeric or alphanumeric codes called tokens, which can be used to finalize payments to replace the data of the card.

This solution allows the merchant to save codes on their servers which, by themselves have no value, but, once forwarded to the payment gateway, are translated into the underlying card data. Tokens are also a fundamental element for managing transactions associated with billing services and MITs, i.e. payments initiated by the merchant without the real-time presence of the buyer.

The advantages of tokenization are more than one and in particular have a positive impact on the security and shopping experience offered to customers:

- **Safety:** thanks to the adoption of tokens, security increases both for the merchant -

because of the card data being saved on the payment provider's servers, reducing the degree of PCI certification required by the merchant - and for the buyer, who doesn't need to enter the card details again from the second purchase onwards, thus avoiding possible inconveniences in the event that he had stumbled upon a phishing site.

- **User Experience:** with this solution, the time required for the purchase process is reduced, considering that the data entry phase of the payment instrument is no longer necessary. Payments with fewer barriers result in a higher conversion rates for the merchant.

There are two categories of tokens: those offered directly by the payment service provider and those introduced more recently by circuits such as Visa and Mastercard. In both cases, the way they work is what was shown at the beginning of the chapter, so the advantages of adopting either ones are similar. Circuit tokens, however, offer some more opportunities:

- they can contribute to a further **increase in authentication and authorization rates**, since they have been developed according to international standard principles;
- the data of the cards underlying the tokens may be subject to changes, for example the expiration date. In the case of circuit tokens, **these data are updated automatically**, without the need to involve the buyer;
- the saving of data on tools developed by the circuits could be **perceived as safer** than those offered by the payment provider, probably less known than these international brands.

Ultimately, tokens can make the difference in an increasingly complex and global competitive context, which is why their integration is becoming a must have and less of an innovative factor to simply take into consideration.

Axerve's approach: anticipate and speed up, safely and without friction

Axerve constantly invests in research and development to anticipate the needs of merchants, responding promptly to changes in consumer payment habits with innovative collection solutions. Not only that, Axerve's proposal has the dual objective of making the payment process more seamless for the buyers while extremely reliable for merchants, by combining cutting-edge features that ensure maximum security for both parties involved.

All Axerve platforms respond to the needs of a market that, due to events such as COVID-19, have transformed and are transforming the entire online and offline retail world, reducing the distances between digital and physical purchasing channels, making it necessary to adopt an increasingly **multi-channel and hyper-personalized approach**, especially if we consider the growing fragmentation of consumers who no longer fall under individual purchasing channels.

Axerve's answer is Payment Orchestra™

In order to fully understand the advantages of the [Payment Orchestra™](#) platform, we need to start from the meaning of the expression payment orchestration that we have detailed in the dedicated chapter.

Payment Orchestra™ is a global payment gateway aggregator, which allows the merchant to orchestrate international online payments through a single platform quickly and securely. Flexibility, intuitiveness and ease of integration of payment service providers, today for the online channel but

in its future evolutions also for the offline, are just some of the opportunities offered by the platform. The solution also allows you to save resources and significantly reduce costs because it manages payment flows by redirecting them to the most efficient provider through machine learning, offering automatic reconciliation and allowing you to have control of all transactions from a single access point, regardless of the payment method used for the purchase.

As written earlier, when choosing the best payment infrastructure for your business, routing is an important part of the equation. Smart routing as integrated in **Payment Orchestra™** is the ideal solution to minimize failed transactions by reducing the costs of integration and manual reconciliation.

Axerve Advice and external TRA

Knowing how to seize the opportunities of PSD2 is one of the challenges that the most advanced tools for managing the online payments process, such as Axerve Advice, are trying to respond to.

Today, a fraud prevention service must have tools capable of providing a PSD2-compliant risk analysis to take advantage of the opportunity to request [an exemption from applying the regular flow of 3DS protocols](#). This translates into the opportunity for the merchant to access a valuable tool to prevent transactions from being rejected during authentication, improving the user experience offered to their customers by the overall conversion rate.

Axerve Advice is able to carry out a very effective risk analysis (TRA), so much so that it allows payments to be sent to the issuer free of charge.

Axerve Advice (TRA)

Axerve Advice performs a real time risk analysis, allowing for a **TRA exemption** to be requested whenever it is possible.

Authentication

Authorization

Axerve Guaranteed

After the authorization, a second fraud check is performed with Axerve Guaranteed Payments in order **to lift any fraud-related risk** from you.

Furthermore, being an integrated service to the [Axerve Guaranteed Payment](#) fraud prevention platform, any fraud not identified as such is **100% reimbursed to the merchant**, effectively making the service infallible for any fraud faced by the merchant.

The reliability of the platform is demonstrated by the data processed by Axerve on the customer base who have integrated the solution.

98.9% of the total transactions managed by Axerve Advice in 2021 were sent exempt to issuers, who did not apply two-factor authentication in 89% of cases. Of these, **2.9%** received a **soft decline** from issuers; however, it should be considered that **80.2%** of these payments were subsequently sent with the **SCA request** and in all cases the outcome was positive. Therefore, most of the transactions deemed potentially fraudulent by the issuer have actually turned out to be genuine, as reported by Axerve Advice.

Total transactions managed by Axerve Advice

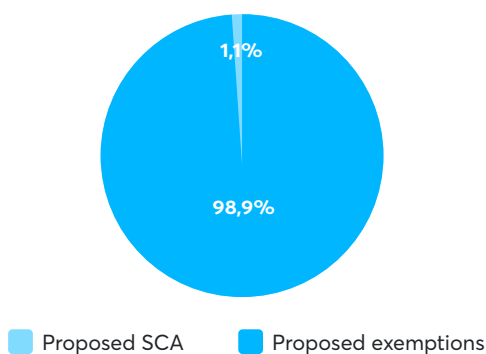


Figure 10 – Source: Axerve data

In any case, **99.9%** of the total **soft decline** subsequently passed the authentication phase either because the SCA was applied to the transactions or because they were managed directly by the ACS as frictionless, i.e. without authentication. **Only** a number of transactions as low as **0.08%** of the total did not pass the authentication phase.

Let us now examine all the transactions that Axerve Advice has deemed appropriate to send to the issuer, **requiring two-factor authentication**, to ensure greater security for the merchant and the buyer. Of the total number of transactions considered, **only 1.1%** required the application of the SCA, according to the analysis of the platform. Of these, **65.7%** passed the authentication phase while **30.9%** was managed frictionless by the ACS. **Only 3.4%** of the remaining transactions did not pass the challenge, i.e. the strong authentication phase.

This analysis shows a **high reliability rate of the solution**, considering that **96.6%** of the transactions, for which control was requested via the 3DS protocols, **passed the authentication phase**, a sign that the transaction was requested by card holders, therefore it was not fraudulent or in any case the issuer considered that it was not.

Of the total payments for which Axerve Advice suggested the application of the 3DS protocols, **only 3.4%** did not pass the authentication phase. Although this is a relatively low rate, the figure is higher than for failed authentications in the case of exemptions, a sign that Axerve's TRA platform has

Total SCA proposed

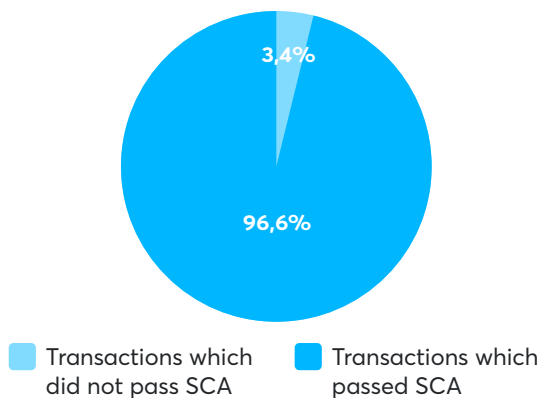


Figure 11 – Source: Axerve data

correctly signaled the need to verify the payment with the SCA before sending it for authorization, excluding failed authentications due to the incorrect entry of the OTP by the buyers. In order to offer flexible services and meet the needs of all merchants, Axerve also offers the possibility of carrying out an "external TRA", ie in the case in which the merchant wants to perform the risk analysis of the transaction independently or through a third party.

It should be noted that this eventuality involves the approval of the acquirer in favor of the merchant to process transactions as TRA after an assessment based on the previous fraud rate and other factors like the merchant's sector, terms and conditions, characteristics of the product / service and the anti-fraud measures implemented. In the event that the fraud rate exceeds the threshold that the acquirer considers reasonable, the approval to process transactions as TRA can be revoked.

PSP and circuit tokens

Tokens are a strategic tool for Ecommerce because they offer the opportunity for merchants to manage recurring payments or deferred payments (Merchant Initiated Transactions) and for buyers to pay with one click.

Axerve offers the possibility of integrating both the tokenization service developed internally or the one offered by the Mastercard circuit. In both cases, the

operation is similar, so the advantages of adopting one or the other are also comparable.

Circuit tokens, however, offer some more opportunities:

1. Increase of authentication and authorization rate

They can contribute to a further increase in authentication and authorization rates, as they have been developed according to international standard principles.

2. Automatic update of tokens

The data of the cards underlying the tokens may be subject to changes, for example the expiration date. In the case of circuit tokens, these data are automatically updated, without the need to involve the buyer.

3. Security perceived by the customer

Saving data on tools developed by the circuits could be perceived as safer than those offered by the payment provider, probably less known than these international brands.

However, the choice of the type of token to integrate is the merchant's and may also depend on the configuration of their systems, integration needs and other specific factors of their ecosystem.

In-store payment solutions: Android POS

Axerve has always chosen to support its customers as a Partner for their growth, to guarantee innovative while safe and reliable solutions. For this reason in particular, today the company is focusing on terminals with the Android operating system*, which combine new elements, such as the operating system itself, the large display and the camera, just to name a few, with the reliability of the more traditional terminal – if compared to other solutions – while being able to guarantee battery longevity and security in the management of payments. At the same time, however, Axerve is working in

* For updates and more information on our current offering in the UK and Europe go to www.axerve.com/en

concert with all the other actors, institutional and non-institutional, to actively participate in the future of payments, not just in-store, and expand the offer with cutting-edge services, which anticipate the times while paying close attention to the security and reliability of payment management.

The solution to digitalise in-store cash: Cashin

When looking at the payments ecosystem in the UK and Europe, digital payments are widely popular. Specifically in the UK debit and credit cards, together with e-wallets and alternative payments, have become the most used payment methods even in brick-and-mortar stores in 2022¹⁴. Also, from a research published by Statista in 2020, out of 38 European countries that were surveyed – before the coronavirus pandemic - the UK was ranked among the least likely to use cash money¹⁵.

Faced with this scenario, which can be explored in the whitepaper "[Use of cash: are we close to a cashless world?](#)", Axerve has developed **Cashins***, smart safes which are installed directly in the point of sale, which are not only containers of money awaiting withdrawal and subsequent payment,

but are also able to manage the flows of money up to crediting the current account, thanks to the integration of digital platforms.

Cashins are, under every aspect, a new way of managing cash and they represent the most advanced solution on the market today. The service allows the merchant to manage and control cash in total safety through the installation of an intelligent safe connected to the systems of the service provider which, thanks to an online dashboard, offers the opportunity to check all relevant information about paid cash in real time.

As mentioned before, the future of digital payments and online and offline collection solutions is destined to evolve according to the needs of a consumer who, also due to exogenous factors, is changing and evolving much faster than expected. Also for this reason, the adoption of platforms capable of managing individual channels in a context in which shopping experiences become more "fluid" and transversal becomes the best choice to compete more effectively, as opposed to the past characterized by more vertical paths that necessarily required a different logic in the management of data and receipts.

* For updates and more information on our current offering in the UK and Europe go to www.axerve.com/en

14 - How have you paid in stores, restaurants and other points of sale in the past 12 months? | Statista, 2022

15 - Estimate of the share of cash in total POS payment transactions in 38 countries in Europe in 2019 | Statista, 2020

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