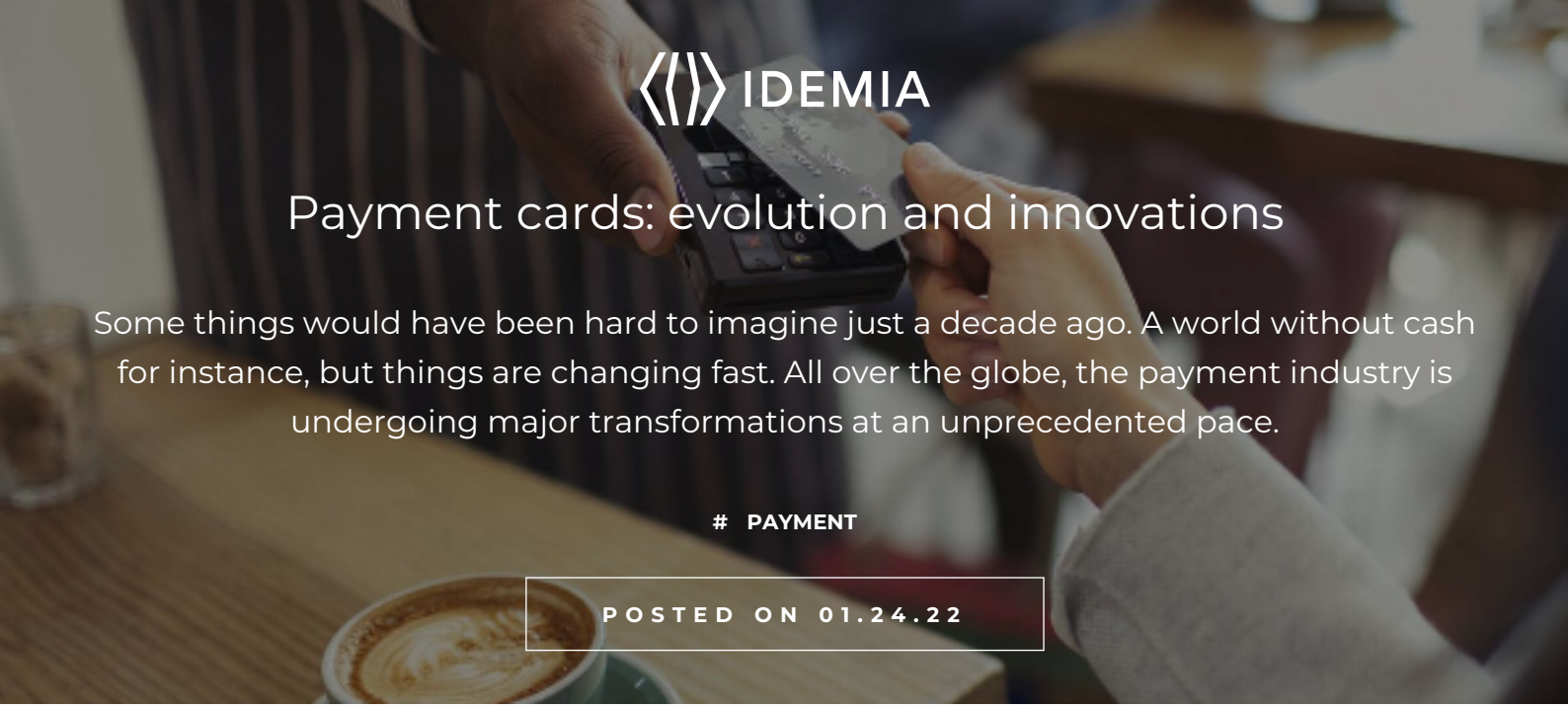

Payment cards: evolution and innovations

Some things would have been hard to imagine just a decade ago. A world without cash for instance, but things are changing fast. All over the globe, the payment industry is undergoing major transformations at an unprecedented pace.

PAYMENT

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In 2016, for the first time in history, card payments surpassed cash payments. Many stores in Scandinavia and even street vendors in China no longer accept cash! The way we pay is evolving, along with our means of payment. Born in the 50s, the payment card gets the lion's share of global payment volumes today. It has only been around for a few decades, yet it has never ceased to reinvent itself. The latest payment cards integrate new technologies (contactless, biometrics, dynamic cryptogram) and innovative designs, be they personalized, eco-friendly or prestigious—think metal cards. So, what are the most recent trends in payment cards? What will they look like in the future? How can card issuers and consumers benefit from the latest innovations?

From cardboard to EMV cards

Nowadays, we use payment cards so often, they are so intricated in our daily lives that we seldom leave our homes without at least one. Yet they are still relatively new. The world's first multipurpose charge card was created as recently as 1950 when businessman Frank McNamara forgot his wallet while dining out at a New York restaurant. An embarrassment he resolved never to face again, he developed a small cardboard card, today known as the Diners Club Card.

In 1966, Barclays issued cards for its first automated teller machines (ATM)—cheques matched against a PIN (Personal Identification Number) code. In the following years, credit cards as we know them today were invented, magnetic stripes were added, and cards started to conquer our world.

In 1993, to increase convenience and security, three companies – Europay, Mastercard and Visa – created a technical standard for smart payment cards, payment terminals and automated teller machines: the EMV™. **EMV cards, also called chip cards or smart cards**, store data on integrated circuit chips as well as magnetic stripes, greatly improving security compared to magnetic stripe card transactions that rely on the holder's signature. The last two major migrations to EMV took place in the USA and India, and card fraud has gone down spectacularly in both countries.

How payment cards keep reinventing themselves

This brief history reminds us that ever since their invention, payment cards have kept on changing and improving. The physical card has become **more than a payment device**. It represents status, financial stability, financial responsibility and much more. Its embedded technologies, its look and feel, color and weight, even the way it reflects the light are all

important factors: they separate a card that never leaves the wallet from one that people are proud to own—and use. The good news is that all consumers and issuers can now find a card to suit their needs: innovation, far from slowing down, is accelerating in three different fields: technologies, design and services.

What are the most advanced payment card technologies?

Several trends are changing the payment experience today including three key payment card technologies: contactless, dynamic cryptograms and fingerprint sensors.

The advantages of contactless payment cards

No need to enter a PIN code, simply tap your card on the payment terminal and that's it. Contactless payments are made in close physical proximity—a few centimeters. The cards use radio-frequency identification (RFID) or **near field communication** (NFC) with an integrated circuit chip and an antenna to communicate with the point-of-sale terminal, securely transmitting the transaction information. As they can be used with or without contact, they are called dual-interface cards.

All this magic happens in 300 milliseconds. It's so convenient that all over the world, people equipped with a contactless card tend to use it more frequently for their everyday purchases. All stakeholders benefit from this innovation. Banks generate more revenue, retailers make faster transactions with more security (the amount of cash kept in their cash register is reduced) and deliver a better customer experience, and consumers highly appreciate this faster, easier means of payment. It's much more convenient than paying with cash and handling change or having to enter their PIN just to buy a cup of coffee or a snack. Paying without contact **requires less physical interaction**, so it's more hygienic too. This fact has convinced people all over the world to start paying with just a tap… and prompted several countries to raise the payment threshold.

It has gone from 20 to 50 euros in France and 30 to 45 pounds in the UK, where contactless payments have become more popular than PIN-based transactions[1]. In Australia, you can wave your bank card above a payment terminal to make purchases of up to AU$200 without inserting your card or entering your PIN! The number of card payments in the country grew from 6.6 billion in 2015 to 10.5 billion in 2019 and are expected to reach 14.9 billion in 2023[2]. Among the ten member countries of the Bank for International Settlements, the share of contactless payments increased from about 30% to more than 65% between September 2019 and June 2020. According to a study carried out by Mastercard, it has become "the cleaner way to pay."

Innovative, secure and hygienic: contactless technology is changing the way we use EMV cards. As cardholders prefer to minimize contact with card readers, dual-interface cards have become a must-have for issuers.

The lowdown on dynamic cryptogram payment cards

Why refreshing the code?

The popularity of e-commerce has never been so great and keeps increasing. The average consumer in the United States or the European Union shops online as often as once a week. American consumers spent $601.75 billion online with U.S. merchants in 2019[3]—up 30% versus 2017 and accelerating.

But the e-commerce boom comes with new fears and challenges. Some online consumers are hesitant to share their payment card details, wary of how their information will be used, stored and potentially reused. Others, multiplying their online purchases, feel more exposed to Card-Not-Present (CNP) fraud.

Today, most standard CNP transactions are secured by the static 3-digit or 4-digit security code on the back of payment cards: the card verification value (CVV) or Card Verification Code (CVC). But this data could be copied, stolen or reused. **Payment cards with dynamic code solve this issue** and therefore boost buyer confidence and security, without requiring any change in behavior or additional hoops to jump through.

How does a dynamic CVV/CVC work?

On a dynamic cryptogram card, the traditional code is replaced with a mini screen displaying a code, which is automatically refreshed according to an algorithm, typically every 4 hours. During a transaction, the dynamic CVC/CVC of the card is compared to the one computed by the issuer's or its processor's authorization server at that specific time. If both code values match, the transaction is accepted.

A dynamic CVV/CVC card is **as simple to use as any normal banking card**: the technology is hidden in the plastic and the battery lasts for at least 3 years. It strikes the balance between convenience and an even higher degree of security. Consumers do not have to change their engraved behavior: they can continue to use their trusted card the way they are used to and comfortable with—and merchants, for their part, don't need to change anything on their check-out pages either.

What are the advantages of payment cards with a fingerprint sensor?

Remember a couple of years ago, when you had to enter a PIN to unlock your smartphone? Ask anybody who can access their mobile device through fingerprint or face recognition: there's just no going back. We got used to using fingerprint technology to unlock our smartphones, then to validate mobile payments. **Now, our fingerprints can also be used to validate our payments with physical payment cards**. It's a more hygienic and secure way to get over the threshold imposed on contactless payment to date, without having to type in your PIN code on a payment terminal.

Using biometrics is easier, faster and secure

Instead of entering a PIN code, the cardholder just needs to apply their thumb on the fingerprint sensor embedded into the EMV card. No need to remember a PIN code, no time wasted to enter it on the teller's terminal. By holding the card pretty much as before, the cardholder performs biometric verification with their enrolled finger and the transaction is completed. This is not just convenient: the use of biometrics further improves security, which is crucial when it comes to making purchases. **Only the legitimate cardholder can authorize payments**. The technology helps prevent fraud, increases approval rates and fosters customer loyalty. Of course, the PIN code can still be used as a fallback solution when the cardholder's fingerprint cannot be used, as is the case for ATM cash withdrawals. Biometric authentication in payments may also enable contactless payments for higher amounts, while guaranteeing total security.

The biometric data never leaves the card

The fingerprint template is not kept on the bank's servers or sent over the air: it is securely stored in the card's secure chip only, and the bank and merchants have no access to this information.

This technology strengthens customer trust

Biometric cards help recruit new customers and reinforce customer loyalty because, at every purchase, cardholders feel exclusive—they enjoy being able to pay in a way that only they can do. Banks can use them to promote themselves as innovative and security-conscious, thereby appealing both to early technology adopters and to security seekers.

What are the latest card body and design innovations?

The future of payment cards is not limited to state-of-the-art technologies. Innovation is also taking place in design. Personalization options, material options, EMV and contactless chip options and other factors can all impact the final card design—and customer satisfaction. So, what are the latest trends?

Truly unique cards for each consumer

Every individual is, by definition, unique. Consumers are more aware and proud of their personal characteristics and tastes than ever before, and they expect personalized experiences and services to match. So why should they all receive the same payment card?
Today, innovative finishing options for plastic card bodies allow banks and FinTechs to issue cards with truly unique graphic designs, such as color on the edge or a neon effect that makes their brand glow in the dark.

Printing customers' own pictures on their payment cards is another way to provide truly unique cards. From their smartphone or PC, they can select or create personalized cards that reflect their interests and personality. They can upload their own photos (of themselves, their kids, their friends or pets…) or choose from a gallery of approved images. Personalized cards increase consumer engagement and loyalty. Consumers are more willing to use cards that are customized with their own images. These cards provide issuers with a competitive advantage in line with today's customer experience personalization trend.

Why are metal cards a must-have for issuers and consumers?

A great innovation in payment card design is the metal payment card. In just a few years, they **have gained a clear popularity** because of the way they look and how they make consumers feel. Metal cards are heavier than common cards, made with premium materials, crafted with sophisticated printing techniques and contemporary designs. The combination of weight and structure gives the card that sharp clink sound when placed on the table or a waiter's tray.

Combining luxurious design and premium services (free international withdraws, hotel room upgrades, travel insurance…), full-metal cards were once reserved for a small elite and used by banks to attract and retain ultra-high-net-worth individuals. Today, they are still a good choice for issuers who want to attract more affluent cardholders, but there are now other options too, just **as innovative and more affordable**. A new generation of metal cards is allowing issuers to extend their features to more and more consumers. These cards offer endless graphic possibilities thanks to their non-magnetic, decorated metal core protected by layers that can be transparent or printed, making consumers feel special. They can also be customized to create exclusive card designs through graphic personalization options like:

- Engraving the cardholder's signature on the front of the card
- Placing the PAN number on the back of the card (rather than on the front)
- Applying vertical personalization to the front and back of the card

More affordable, these cards offer the best of high-end cards while remaining a perfect fit for the mass affluent segment.

What payment cards for eco-conscious consumers?

For a growing number of consumers, the environment and its preservation has become a strong preoccupation, including in the payment industry. In fact, 92% of consumers worldwide think their bank should actively contribute to preserving the planet.

Roughly 6 billion plastic payment cards are made each year[4] and the use of alternative materials provides an excellent opportunity for improvement while supporting sustainable development. That's why Mastercard and Visa have both launched dedicated programs to establish environmental best practices and reduce first-use PVC plastic in card

manufacturing.

Different options are available to produce EMV **cards with recycled plastics or bio-sourced materials**:

- **Recycled PVC, or rPVC**, which are made from industrial and packaging waste,
- **Recycled PET and its derivative, recycled PETG**, which are made from everyday items such as water bottles,
- **PLA**, which is a form of plastic derived from biomass sources, such as plant leaves or corn.

Recycled plastics like rPVC, rPET and rPETG have a major impact on environmental preservation by saving landfill space and reducing land and water pollution. They also contribute to reducing oil consumption, saving energy and reducing carbon emissions compared to the use of virgin materials. Bio-sourced plastics like PLA have the advantage of being both recyclable and biodegradable.

Whether they are made of rPVC, rPET, rPETG or PLA, eco-friendly cards use the latest innovations to diminish the strain on the planet's resources. However, **efforts don't stop once the card is issued**: eco-packaging, digital services, card recycling and contribution to sustainable development programs are also essential to protect the environment, and embrace the environmental aspirations of customers at the same time.

In sum, a card's look and feel is just as important as its technologies. Beautiful design, material choices and personalization options help issuers gain top-of-wallet placement, which is the key to maximum usage.

What's new on the services side?

The future of payment cards is not only about the evolution of the cards themselves, it's about the innovative services that come with them too. The financial world has recently undergone major changes due to the emergence of neo-banks and FinTechs, which are disrupting the market as well as consumer habits by offering **a new and more digital customer experience**. Incumbent banks are keeping pace with this evolution. Thanks to instant and digital services, customers can now receive and use their payment cards faster than ever.

Instant card issuance

In today's fast, digital world, issuers can provide any new customer with **a brand-new payment card in just a few minutes**, which increases customer acquisition and satisfaction. Instant card issuance also benefits existing customers who have lost their payment cards, enabling them to get a replacement immediately, at a convenient location. It's a great service—especially if you lose your card just before you go on vacation…

Instant card activation with a smartphone

Innovative digital services continue to facilitate cardholders' lives, to the point that some issuers are now offering their clients the possibility to activate their payment cards instantly using their smartphones. When the cardholder receives their brand-new contactless card, they just need to log into their banking app, tap the card to their smartphone, and the card is activated—simple! Thanks to this innovation, cardholders can start using their new card without delay—they don't have to go out to activate it before being able to use it on their favorite ecommerce site or mobile app.

Instant PIN issuance

Why wait for days for your PIN to arrive in your mailbox? Digital PIN management offers a perfect, quicker, modern solution. **This service enables consumers to receive or select their PIN instantly** in an electronic format instead of waiting for codes to be sent by mail.

By getting their PIN within seconds after receiving their cards, account holders can start using them sooner. Waiting time is reduced and activation rate improved. Traveling consumers can also receive a PIN reminder in real time, wherever they are—a true 2.0 consumer experience.

Digital PIN management creates other competitive advantages. Firstly, reliability: issuers can track PIN codes along the process, and the use of different delivery channels for cards and PINs increases security. Secondly, greater efficiency and less environmental impact thanks to the elimination of paper-based PIN mailers.

A bright future for payment cards

More secure than ever, more convenient and adapted to every need and every consumer segment, payment cards keep reinventing themselves. Always in your pocket or purse, payment cards have become much more than payment devices: they create a **powerful bond between issuers and clients** and foster relationships based on trust. Payment cards represent an invaluable opportunity for issuers to develop customer satisfaction and loyalty. With a wide range of technologies, design and services available, it is now possible to define the perfect payment card and user experience to meet the expectations of each and every cardholder.

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[1] https://www.theguardian.com/money/2018/oct/16/uk-in-store-contactless-payments-overtake-chip-and-pin-worldpay
[2] https://www.globaldata.com/number-of-contactless-cards-in-australia-set-to-reach-68-9-billion-by-2023-says-globaldata/
[3] https://www.digitalcommerce360.com/article/us-ecommerce-sales/
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