



Biometric payment cards: what every issuer needs to know

Now is the time to deliver effortless authentication into cardholders' hands, with easy, scalable production, and seamless enrollment

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What benefits can biometric authentication bring to our daily life?

Physical cards continue to offer **unprecedented payment reliability** globally, unrivalled consumer **familiarity**, and robust, **universal security**.

Biometric cards provide an enhanced offer. They provide **strong authentication** to each cardholder, strengthening trust. This level of authentication is **hyper-personalized**; it's unique to every individual based on something the cardholder is and not something they know.

Remembering multiple PINs and passwords is becoming harder and **authentication apathy** is a genuine threat to your customers' security. Biometric cards can save customers from experiencing password overload.

While one-time-passcodes are widely used online, they are costly to implement and maintain, and vulnerable to phishing attacks or interceptions.

Thanks to the increasing use of biometrics in different environments, your customers trust and are familiar with their use; across, for example, identity documents, such as passports, and as a passkey to unlock laptops and smartphones.

The value of biometric payment cards

Adopting the technology as a cardholder verification method (CVM) helps to support robust security and mitigate malicious misuse if a card is stolen.

It also offers a smooth user experience to your customers, allowing them to easily and quickly authenticate themselves at points-of-sale.

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Passwords are the root of so many problems for banks, merchants and consumers. Think data breaches, social engineering, account takeovers and cart abandonment. Generative AI is making a lot of these threats worse.

We've seen time and again that if you introduce multi-factor authentication that's too difficult to use, people simply won't use it. Passkeys, combined with biometrics, offer a simpler, trusted and more convenient way to authenticate.

For merchants and issuers, it's a win-win: authentication happens in a more seamless manner for the consumer, without requiring added forms of step-up.

Andrew Shikiar, CEO, FIDO Alliance



Pilot, launch and scale a biometric card offer, without the complexities and expense of the past

Embedding a biometric sensor into a payment card is not new. Several pilot projects have been launched by banks before, but three major challenges hindered wider rollout:

1. Complicated enrollment combined with a poor user experience

Users either had to enroll at a bank branch, or use an expensive, bulky sleeve at home. Card configuration was inflexible, creating a poor user experience in the field.

2. Expensive production and complex issuer onboarding

The time and cost to manufacture biometric cards deterred banks from launching pilots and testing demand with their customers. Issuers had to follow a dedicated biometric card onboarding process, which was significantly more complex than standard dual-interface card onboarding and had only limited support available.

3. Customer unease of using biometrics

Cardholders often misunderstood how their biometric data would be stored and used. Without clarity, there could be no trust.

Today, these challenges have been overcome, with:

1. Easy, inexpensive enrollment
2. Improved flexibility in card configuration
3. Design innovation and turnkey solutions
4. Growing consumer familiarity with biometrics

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Deployment of biometric cards has become easier due to turnkey production innovations, enhancements to the onboarding process and significantly simpler cardholder enrollment.

Issuers can now take advantage of the phenomenal, untapped opportunity offered by card manufacturers. Biometric payment cards enable differentiation from competitors by providing a very real, tactile value-add to cardholders.

And what's most exciting is that the possibilities offered by biometric cards for online and in-store payment and identity authentication are only starting to be explored. The coming years will see identity verification and digital payment inextricably linked, bringing greater trust to payment services worldwide.

Tolgahan Yildiz, Vice President of Trusted Mobile Connectivity & Transactions, Infineon



Simplified production. Seamless enrollment.

“ Enrollment was a major barrier to adoption in the past; expensive and complicated for users and banks alike. Now, it's seamless: cardholders can enroll in seconds using their smartphone or even automatically during purchases. No hardware, no branches, no friction. This shift alone opens the door to mass adoption.

Arne Rehm, Senior Product Manager, SECORA™ Pay Bio, Infineon

1. Easy, simple, cost-effective enrollment at home or via the merchant POS

Cardholder enrollment now takes place either via the user's smartphone or in their favorite stores.

No dedicated device or bulky sleeves

No need to visit a bank branch

Customers seamlessly register at home or in-store while shopping

How it works

After receiving their cards, customers can either:

1. Use their iOS or Android phone to enroll in seconds.
2. Use the biometric card each time they shop. They are automatically enrolled after a set number of purchases and a final activation using PIN authentication.



2. Improved flexibility in card configuration

To maximize user convenience and create a **smooth payment experience**, biometric payment card applications can be easily configured for 'Do Not Decline Transaction'.

This means that if a biometric verification is unsuccessful (such as verification failed or no fingerprint was presented), then transactions can behave in the same way as traditional contactless payment, **avoiding rejected transactions**.



3. Design innovation and manufacturing advancements to lower TCO

Innovation from Infineon enables simplified card architecture, based on single module that contains the fingerprint sensor and an enhanced Secure Element (SE).

This means the EMV® Chip and the Fingerprints sensor are packaged together within the Biometric Coil on Module (BCoM) packaging: there is no need for a wired connection between the card antenna and the module.

Combining the SE with the fingerprint sensor supports growing consumer preference for contactless.

Encouraging cardholders to shop this way enables more hygienic, convenient payments, while speeding up checkout time for both parties.

These design innovations also free more real estate space on the card for branding or unique designs. Issuers can maximize this space to forge a strong, more emotional bond with cardholders: establishing longer relationships and coveted front of wallet status.

“ For issuers, your card remains the one tangible physical connection to your cardholders today. Not only is it the most marketable device for your brand, but it also forms the basis of many premium offers. Show your customers you care about their individuality, security and privacy, not just today but in the digital world that we’re really only just beginning to explore.

Fang Lu-Ruhbach, Senior Product Marketing Manager, Infineon

Issuers can also benefit from these innovations, as it simplifies the biometric card manufacturing process. Using a single module enables a cost-efficient and frictionless high yield production, significantly lowering the cost for card manufacturers and their customers.

Compatible with existing card production equipment, with only minor adaptations required, the result is a more robust, reliable card that’s easier to produce at scale and which is fully personalizable for banks and cardholders.

Get paper-based approval within just weeks with turnkey solutions

Infineon solutions also comply with Mastercard® and VISA® specifications, bringing more convenient, unique payment experiences to your cardholders.

For card manufacturers and/or banks, this ready-to-go turnkey solution means a quick and simple go-live process. You can get paper-based approval within just weeks, avoiding lengthy certification processes and allowing quick and flexible scaling of projects.

Payment schemes are supporting issuers with biometric card implementation guidance and even developing issuer implementation services, which make the issuer onboarding processes much more efficient. Future services and standardization driven by the industry will lower any implementation effort even further.



4. Growing consumer familiarity with biometrics

An estimated 500 m people have activated Apple Pay on their devices, which is supported by biometric authentication. Consumers are now familiar with storing biometric information and using biometrics to complete transactions, trusting that their personal information will remain secured.



Immediate customer value. Long term innovation.

Biometric cards offer existing and new customers a premium, personalizable card offer that provides additional fraud protection, without sacrificing convenience or security.

Universally accepted payment method, worldwide	Biometrically secured offer for premium customers	Faster, secured checkout experience
Convenient payments that don't compromise security	Transform complex two-factor authentication into a single effortless action	Lower total cost of ownership (TCO)
Easy, inexpensive enrollment in-store or via mobile	Authentication cost savings	Spending that goes beyond current contactless limits

“ In our pilot with young professionals, 50% of users used both biometric cards and mobile payments, and 27% actually preferred biometric cards over smartphones. That’s a powerful signal that physical cards with added convenience and security still matter, even to digital natives.

Manuel Thoma, Head of Marketing, PayCenter

And this is just the beginning ...
Biometric cards have an incredible opportunity and capability to replace passwords and PINs to help secure and authenticate digital identities, enabling access to a diverse range of both online and offline services. This could include:

Support Tap to X
Customers tap your biometric payment card on a smart device to authenticate an online payment, without having to type the password or PIN on a potentially unsecure or tampered device. This simple, highly secured, easy-to-navigate authentication experience is seamless and resistant to phishing and loss or theft.

Store and spend digital currencies
Customers with your biometric card store and manage digital assets, and sign the transactions. Provide them with a well-secured and convenient way to access CBDC or cryptocurrency accounts.

A device-bound passkey adds an extra layer of security, confirming not just that a transaction has been authenticated from the accountholder’s trusted device, but that they are who they say they are.

Physical access control
Customers use your biometric card in a multi-application scenario, such as physical access control. The cardholder’s biometric credentials are verified inside the card itself, providing increased data privacy.

Digital signatures/identities
Cardholders use your biometric card to authenticate their identity electronically for public and private entities, and/or sign digital documents in a legally binding manner.



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Biometric cards sit at the intersection of three major trends: secure payments, digital identity, and user experience. That's a powerful position, driven by user demand. Financial institutions can leverage this technology for their cardholders and take advantage of on-card authentication to support digital identity use cases. Biometric cards are becoming a bridge between how we pay, how we prove who we are and how we securely interact within the digital world, especially in areas that might have limited mobile access.

Amanda Estiverne-Colas, Founder of AGE Advisors, Payment Strategist

We're only just beginning to see what biometric cards can do for security, experience, and brand differentiation. The technology is proven. Consumer trust is there. And the use cases are building. The future is at your fingertips. Reach out and touch it.

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The digital payment market is still young. Issuers enhancing physical cards with biometric authentication not only deliver secured cardholder verification simply and effectively, they open the door to a host of emerging, interconnected digital experiences that require proof of identity. Infineon truly believes in the power of biometric cards and has made significant investments to unlock its full potential.

Tolgahan Yildiz, Vice President of Trusted Mobile Connectivity & Transactions, Infineon



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Published by
Infineon Technologies AG
Am Campeon 1-15, 85579 Neubiberg
Germany

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Public

Version: V1.0_EN
Date: 01/2026



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