HOW BIOMETRIC IN-STORE PAYMENTS ARE REVIVING RETAIL

Whitepaper

FINTECH & PAYMENTS

JUNIPER RESEARCH

1.1 Introduction

Juniper Research defines a biometric in-store payment as an in-person payment that is authenticated using a biometric verification, such as iris scan, fingerprint, palm vein scan, facial recognition or other biometric scan.

Among biometric payment methods, fingerprint scanning is the most common. In some systems, two-factor authentication is implemented, in which the finger scan is used instead of the swipe of the card, and the user types in their PIN as usual. A digital wallet stored on a smartphone or mobile device may also be used by consumers to make payments. Despite fingerprint recognition being the most common application for biometrics, facial recognition technology is rapidly gaining popularity.

Over time, advancements in biometric technology have improved accuracy, speed, and reliability in authenticating transactions. Today, we see biometric authentication seamlessly integrated into mobile devices, making it possible for customers to pay in-store using their smartphones. A smooth checkout process, a reduction in wait time, and frictionless payment enable seamless transactions for the customers. The integration of biometric into existing payment infrastructure can be challenging for retailers, but is crucial for wider adoption. As biometric payments decrease reliance on physical cards, they contribute to a more secure payment ecosystem. Additionally, it can help reduce costs associated with fraud, theft, and chargebacks.

1.1.1 Using Biometric for In-store Payments

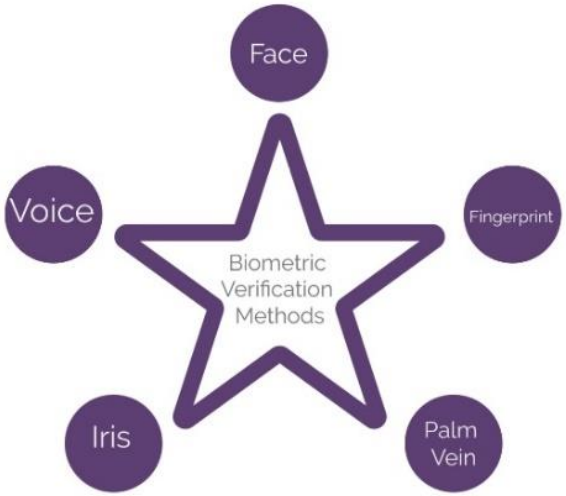
i. The Biometric In-store Payment Process

Biometric information about a person is first entered into a biometric system at a point known as enrolment. As part of the enrolment process, a characteristic is collected to serve as a biometric reference for the individual. Data may be recorded in the form of raw data, for example, an image of the fingerprint or in the form of a digital template. A digital template is created by extracting and processing key features of a biometric characteristic and storing the template in a database.

Whenever biometric information is presented at a later stage, also called authentication, the same process occurs: it detects the individual's characteristics, extracts key features, and matches them against existing templates in the database in order to authenticate or identify the individual.

In the context of a biometric-enabled payments, this would translate into a shopper registering for a biometric payment card programme at a store kiosk by providing information about his or her identity and bank account. Customers scan their index fingers using a finger scan reader, and the store's centralised database encrypts multiple fingerprint measurements along with their banking information. POS (Point of Sale) registers now offer biometric payment options that allow shoppers to scan their fingers and input a PIN code. When the new scan is compared with encrypted data in the database for payment authentication, the reader approves or declines the transaction, and debits the shopper's account accordingly.

Figure 1: Main Biometric Verification Methods



Source: Juniper Research

The image of the physical biometric is not typically stored in most biometric systems. Occasionally, however, the original images of enrolment characteristics can also be retained, such as fingerprints. In the event that re-verification is required later, some operators consider this a necessary step.

Most biometric solutions generate and store templates that are unique to the particular model of recognition engine and even to the biometric solution itself. Templates generated by one manufacturer's biometric engine will not be recognised by another manufacturer's system. Some templates created by earlier versions of software from a single manufacturer cannot be read by later versions. Therefore, storing templates is much safer than storing raw biometric characteristics such as fingerprint images. Templates should, however, still be encrypted regardless of the lower risk. Raw images of biometric must be protected from unauthorised access, and those controls must be monitored and audited regularly. Criminals may also use biometric data to steal identity from organisations. The risk of becoming a victim themselves must be considered by organisations.

ii. Reason to Authenticate Payments Using Biometrics

Besides enhanced security compared to conventional authentication methods, biometric authentication in payment systems offers a number of benefits, including a user friendly approach. Indeed, using biometric authentication simplifies the user experience and makes transactions more intuitive and accessible by eliminating the need to remember multiple passwords or PINs. Both consumers and businesses will benefit from this acceleration, as it streamlines the payment process considerably.

Overall, biometric authentication within payment systems is a transformative innovation, since it emphasises user convenience while simultaneously fortifying security measures. Moreover, this adaptive technology fosters a robust and future-ready payment landscape, gradually replacing older authentication methods while maintaining a sense of security for early adopters.

1.2 The Retail Market

As consumers begin shifting their purchasing activities from bricks-and-mortar stores to online retailers, eCommerce is gaining an ever larger share of the market. Smartphones have accelerated this shift by making instant shopping possible anytime, anywhere. Consumers are still seeking convenience, but are increasingly looking for premium products and services. Therefore, when it comes to bricks-and-mortar stores today, focusing on improving the customer experience is essential.

1.2.1 Evolution of Biometrics in the Retail Market

As the retail industry faces fiercer competition than ever before, retailers must differentiate their user experience to attract and retain customers. The future of bricks-and-mortar retail is being reimagined by forward-thinking companies who are creating engaging in-store customer experiences and near-real-time delivery of products. These innovations provide a memorable customer experience to encourage repeat business.

A number of technologies are being implemented to streamline the complexity of retail operations, due to the rapid growth of the retail industry. The retail sector is also implementing biometric technology as a cutting-edge technology.

Increasingly, retailers are utilising biometric and digital wallets as part of the digitalisation process. As far as biometric payments are concerned, the retail industry has concentrated mainly on facial recognition for loss prevention and security purposes. Self-checkout machines that integrate biometric authentication technology enable customers to pay instantly without reaching for their wallets. Through biometric authentication, individuals are identified and verified based on their unique characteristics. When a biometric payment system is used to identify a customer, funds are automatically transferred from the associated account at the point of sale. Biometric payment systems will become more prevalent at retail locations, as retailers seek innovative ways to increase customer satisfaction by speeding up the checkout process and eliminating queues.

1.2.2 How Biometric In-store Payments Are Transforming the Retail Industry

With the growing frequency of data breaches in retail transactions, safeguarding data integrity has become a critical concern. To combat fraud, businesses around the

world are adopting a variety of security measures. In order to address these challenges, biometric authentication has emerged as a promising solution within the retail sector. When integrated into in-store payment systems, it has the potential to revolutionise retail. A biometric payment system has the potential to transform in-store retail transactions as follows

i. Heightened Transaction Security

In contrast to traditional authentication methods based on possession or knowledge, biometric authentication makes use of unique physical characteristics to verify identities, providing a more secure alternative to traditional methods. As a result, the risk of data theft, loss, or replication is significantly reduced.

ii. Seamless Customer Experience

The use of biometric not only enhances security, but also enhances the shopping experience. With biometric authentication, customers do not need to remember passwords or PINs, which simplifies the payment process. Quick and effortless transactions facilitate a convenient retail experience.

iii. Personalised Shopping Experiences

Retailers are able to provide personalised shopping experiences and targeted marketing for their customers through the use of biometric. A retailer can recognise and identify individual customers by leveraging biometric data in order to tailor product recommendations, discounts, and promotions to meet their preferences and past purchase histories. As a result of this customisation, customer satisfaction is enhanced and long-term loyalty is fostered.

iv. Enhanced Loyalty Programmes with Seamless Enrolment

Customers can enrol in loyalty programmes through fingerprint or facial recognition, which simplifies registration and rewards access. This also enables payment and loyalty to be combined into a single step.

v. Rapid Customer Onboarding

The process of onboarding new customers is simplified by biometric identification. By scanning a fingerprint, swift verification can be achieved, enabling customers to access and utilise retail services promptly.

vi. Diverse Authentication Options

There are a wide range of biometric methods available, ranging from facial recognition to voiceprints and fingerprints. Mobile banking apps, for example, offer a fast and hassle-free way to make in-store payments using fingerprint recognition or facial recognition.

vii. Competitive Edge

The enhanced security offered by biometric payment systems increases customer confidence in retail establishments. Thus, businesses are able to maintain a competitive advantage by keeping up with evolving security trends, thereby enhancing opportunities for growth and customer loyalty.

viii. Customer Service Improvement with Efficient Returns/Exchanges

By quickly confirming the client's identity and purchase history, biometric simplifies return or exchange processes.

Overall, biometric can help retailers differentiate and enhance user experiences that cater to individual preferences, provide greater convenience, and increase customer loyalty through these areas. The benefits must, however, be balanced with an awareness of privacy and security concerns.

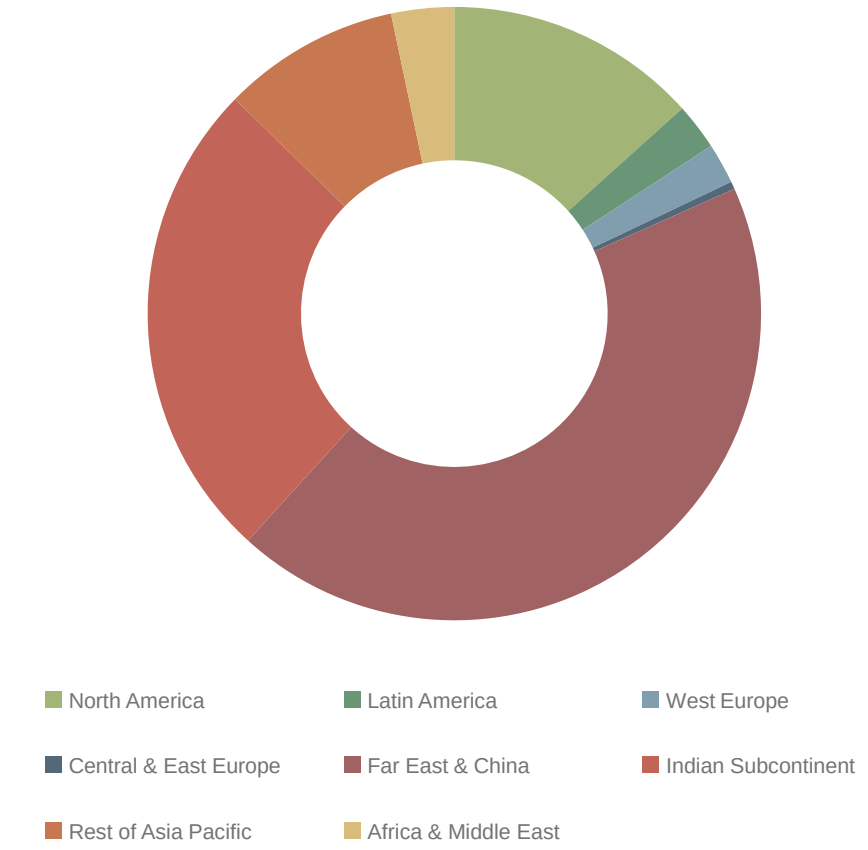
Biometric technology will certainly be implemented in the retail industry as a result of its numerous benefits. It is likely that 90% of the retail industry will use biometric technology in the future, as it is undoubtedly beneficial for retailers to do so. It is essential for retailers to embrace biometric in-store payments in order to remain competitive, reinforce security measures, and ensure that their customers receive a seamless, secure shopping experience.

1.3 Market Summary: Global Biometric-enabled Transaction Volume

By 2028, there will be a substantial growth of 138% in the number of transactions carried out via biometric enabled POS terminals, up from 19.5 billion in 2023. Biometric in-store payments enable consumers to pay in store through different biometrics, including palm vein, facial & iris recognition, and fingerprints.

- In-store biometrics can enable a better consumer experience, allowing retailers to create a highly differentiated in-store offering. This differentiation is key for the under pressure in-store retail sector, which faces stronger than ever competition from eCommerce, alongside reduced consumer spending, due to the cost of living crisis in many markets.
- Biometrics are important when it comes to improving consumer experience in bricks-and-mortar retail. As retailers compete more fiercely for customers, providing a strong in-store experience is vital for success. The physical nature of bricks-and-mortar stores is one of its only remaining competitive edges, therefore stores must implement convenient payment methods like biometrics to maximise this competitive edge. These changes will make retail stores more distinctive destinations for shoppers, boosting their resilience.
- While biometric payment systems have high initial costs, systems can deliver a return on investment in the longer term by further automating checkout processes. While retailers are reluctant to invest at a time of strict budgetary controls, they must prioritise investments in biometric in-store payments now to ensure they do not get left behind by more agile competitors.

Figure 2: Global Biometric-enabled Transaction Volume in 2028: 46 Billion



Source: Juniper Research

Order the Full Research

Unravel critical understanding of this rapidly emerging market in this brand-new report; enabling payment companies, biometric card manufacturers and biometric in-store terminal vendors to shape future business models.

Key Features

- **Market Dynamics:** Insights into key trends and market expansion challenges within the biometric in-store payments market; addressing challenges posed by the technical and costly nature of biometric in-store payments and ongoing consumer fears regarding level of security. It will also analyse the potential benefits it will be able to provide in the challenging in-store retail market.
- **Key Takeaways & Strategic Recommendations:** In-depth analysis of key development opportunities and key findings within the biometric in-store payments market, accompanied by key strategic recommendations for stakeholders.
- **Benchmark Industry Forecasts:** Overview into biometric in-store payments, including forecasts for total number of biometric-enabled POS terminals, transactions and spend via biometric in-store payments, split by mPOS and dedicated POS.
- **Juniper Research Competitor Leaderboard**: Key player capability and capacity assessment for 16 biometric in-store payments vendors, featuring market size for major players in the biometric-in store payments industry including:
    - Amazon
    - IDEMIA
    - J.P. Morgan
    - Mastercard
    - Pop ID
    - Telpo

What's in this Research?

1. **Market Trends & Strategies:** Top-level report evaluating key market challenges and the advantages in the biometric in-store payments industry, such as enhanced security, along with strategic recommendations for vendors in the space.
2. **Future Market Outlook:** Deep dive evaluation of the future of the market; outlining future value-added services, such as improved consumer experience, enhanced loyalty programmes, behavioural biometrics and improved financial inclusion.
3. **Five-year Forecasts:** Extensive forecasts on the total spend through biometric-enabled POS, including the number transactions, and biometric-enabled POS terminals.
4. **Interactive Forecast Excel:** Highly granular dataset comprising of 9,570 datapoints; allied to an interactive scenario tool; giving users the ability to manipulate Juniper Research's data (Interactive XL).
5. ***harvest* Digital Markets Intelligence Centre:** 12 months' access to all the data in our online data platform, including continuous data updates and exportable charts, tables, and graphs (ONLINE).

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