



BIOMETRIC PAYMENT CARDS: WHERE IS THE MARKET TODAY?

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Biometric-enabled payment cards have been in the market periphery for several years, largely remaining in a dormant phase as vendors continued to research, develop, and ultimately define and understand the potential customer base and benefits of biometric sensor integration.

Rewind to 2012 and the Europay, MasterCard, and Visa (EMV) payment cards market was one of affluent growth. It was driven by a surge in migration from contact to contactless payment cards in established EMV regions, and new large volume opportunities with EMV migration kicking off in China, followed by the United States a few years later. The payment cards market had become somewhat accustomed to Year-over-Year (YoY) shipment growth rates in excess of 28%, but 2016 marked the end of this honeymoon growth period, coinciding with China's migration completion and saturation in the United States, driven by a record 2015, resulting in higher than usual stocking levels, directly impacting its 2016 results. From 2016 onward, YoY growth rates nominalized, not likely to repeat the record levels of issuance growth recorded in 2013, 2014, and 2015, with forecasts returning to levels in the 3% to 5% range annually.

Fast forward to today and several biometric payment card pilots are in effect, marking the beginning of the exploratory and testing phase by issuers. This testing and evaluation phase has arguably arrived at the perfect time, aligned with an overall payment cards market that is slowing, enabling card vendors to use end-user pilots and testing to measure adoption appetites. Established card vendors are hoping to eventu-

ally use them as a higher value proposition, creating a new revenue opportunity in a market where Average Selling Prices (ASPs) continue to be challenged and revenue margins continue to be depleted, while presenting an innovative platform on which they can further differentiate themselves from low-cost competitors.

Leading vendors in the biometric sensor card market continue to expand, spanning card, Integrated Circuit (IC), sensor, inlay, and battery vendors. Those which have placed significant efforts in biometric payment card development and strategies include, but are not limited to: Card Tech, Fingerprints, Gemalto, IDEMIA, IDEX Biometrics, KONA I, KSID, Linxens, MasterCard, MeReal Biometrics, MoriX Co, NEXT Biometrics, Precise Biometrics, SmartMetric, Tactilis, Visa, and Zwipe.

WHAT IS DRIVING THE BIOMETRIC PAYMENT CARDS MARKET TODAY?

There is no one single driver pushing the innovation pertaining to biometric sensor cards, but overall, it can be considered that the biometric sensor cards can be used with existing Point of Sale (POS) infrastructure, which has already been invested in; in some instances, there is no requirement to remember a Personal Identification Number (PIN), replaced by fingerprint authentication, so the cards can provide proof of life, which can be leveraged to help mitigate social/welfare fraud and used against Card-Present (CP) fraud. At the same time, consumers now have a better understanding and are becoming increasingly more comfortable with biometric technology, largely driven by mobile payments, most notably through Apple and Samsung Pay.

DESPITE THE DRIVERS, MANY CHALLENGES REMAIN

The largest and most impactful inhibitor to the biometric payment cards market today remains price. In some instances, a biometric payment card ASP is above the US\$20 mark, significantly more than the US\$1 to US\$2 price point of today's traditional EMV-enabled payment cards. Energy harvesting complexities and possible limitations with certain POS solutions, including Mobile POS (mPOS), unable to draw the required power, continue to be explored. In addition, the enrollment processes remain under debate and procedures need to be put in place to address remote and physical face-to-face enrollment.

HOWEVER, ON A POSITIVE NOTE, THE PAYMENT CARD IS HERE TO STAY

Much noise and hype continue pertaining to the digitization of the payment space and the reduction or demise of the payment card, with other form factors, such as mobile, wearables, and biometrics, potentially replacing and/or impacting it. However, the same has been said for cash and the lowering requirements for cash, driven by contactless payments, specifically designed for lower-value transactions, of which cash was previously king. Despite contactless, cash remains and retains strong usage. There will likely always be a need for cash, no matter how small, to serve those who feel more comfortable handling and transacting in the physical and to serve those who do not have access to digital banking facilities or access to alternative form factors, such as a compatible smartphone or wearable device.

In addition, there is no evidence to suggest the leading issuers of payment cards will ease or stop issuing payment cards. If this were the case, there would be a mass increase in issuer-owned and branded digital mobile wallets, and although the leveraging of a device to house and digitize a payment credential could reduce the associated costs with payment card issuance, the issuers are using mobile as an alternative

payment form factor and as a payment companion to the traditional bank card, enabling additional payment choice, rather than looking to replace it.

ABI Research believes that payment cards will remain a primary payment form factor for the following reasons:

1. Payment cards are under the direct control of the issuing bank/financial institution. The most successful mobile payment platforms (to date) are Original Equipment Manufacturer (OEM)-led services, with the required secure element and subsequent access under OEM control.
2. The payment card is one media in which an issuer has a direct physical relationship with its customers. Creating more interactive card form factors will further improve this relationship.
3. It is true to say that payment form factor choice is increasing. Choice is the key word here, as not all end users will feel comfortable paying with an alternative mobile device.
4. Mobile contactless transaction values are typically limited to US\$20 to US\$30, thus there remains a requirement for the payment card form factor to facilitate higher-value transactions.

If cards are to remain, then it is important that they evolve alongside the latest security threats in order to keep ahead of the curve as it pertains to CP and Card-Not-Present (CNP) fraud. Due to the reasons listed above, biometric-enabled payment cards are one of the next natural evolutionary steps to help safeguard the payment card, hardening security features via the integration of biometric sensors, providing the technology and means to ensure that the card remains an integral and increasingly secure piece of the payments market.

REMEMBER THE PAYMENTS MARKET IS NOT THE FASTER MOVING ONE

The payments market is not known as a fast-moving tech industry. Over the last 20 years, it is difficult to pinpoint more than three significant changes driven by technology, which include EMV and the introduction of the chip card, contactless payments, and now mobile payments.

20 + YEARS



Introduction of EMV



Contactless



Digital Wallets

Despite the slow tech adoption rate, today's innovation in the payments arena is moving at a quicker rate, further aided by some of the major payment networks, most notably MasterCard, Visa, and UnionPay, which continue to push the envelope of payment technologies and invest in new innovative startups, shifting from payment facilitators to next-generation technology innovator hubs.

BIOMETRIC PAYMENT CARDS ARE MORE THAN A PAYMENT TECHNOLOGY

With almost 2.9 billion payment cards shipped globally in 2017, the payment cards market is certainly considered the “Holy Grail” opportunity, which all biometric sensor ecosystem players are targeting. However, it should be noted that biometric payment cards are more than a payments authentication technology, with synergies shared across multiple other end markets where digital security and authentication are paramount requirements, as described below.

GOVERNMENT ID: WELFARE AND SOCIAL

Most national projects globally require the enrollment of a citizen's biometrics. It could be a single fingerprint, all 10 fingerprints, a facial scan, or a combination of them all.

In Electronic Identification (eID) instances, where fingerprint enrollment is a requirement, significant opportunity exists for biometric sensor cards to merge public and private sector services, offering a platform from which a government can distribute social welfare, using the biometric sensor as proof of life to help mitigate against any associated fraud. This is particularly relevant in emerging regions where social warfare fraud puts a significant strain on welfare funds.

ACCESS CONTROL

Access control is another significant opportunity, notably in physical access control scenarios. Being able to use existing contactless infrastructure could present the required platform for enterprise to consider the biometric-enabled smart card as the next-generation security hardening platform, used in conjunction with infrastructure in which it has already invested.

HEALTHCARE

Biometric-enabled smart cards could have multiple uses within the healthcare industry. They could be leveraged for physical and logical access control, configured to allow access to certain patient records, or used to ensure that only qualified personnel have access to certain medical devices, medication, etc.

THE IOT

Over the longer term, biometric-enabled smart cards could be used as a primary, centralized platform for authentication requirements across a number of Internet of Things (IoT) end markets, including and perhaps most notably the smart home and automotive sectors. A next-generation smart card could also be the dominant authentication platform to enable IoT market adjacencies, using the same card and technology to unlock an automobile, authenticate an in-car payment, or to securely access your home or make any necessary adjustments to a smart home setup or automobile preferences.

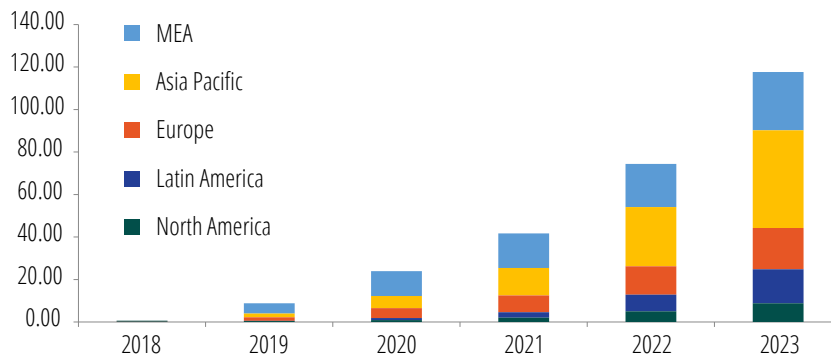
Within the IoT segment, the co-branding opportunity is significant with an issuer potentially able to partner and co-brand with a few other service providers or OEMs. Co-branding opens new market opportunities for those involved. It may enable an issuing bank to play and operate in end markets that previously remained out of reach.

BIOMETRIC PAYMENT CARDS SHIFTING INNOVATION DOWN THE VALUE CHAIN

Biometric-enabled payment cards have brought with them a hive of innovation activity across the value chain. Historically, innovation within the payment cards market has been dominated by the large smart card vendors, including Gemalto, IDEMIA, and G&D. Interestingly, innovation is now being driven down the value chain to the sub-card assembly level with vendors active in biometric sensor manufacture, inlay, and battery solutions, among others, exploring new technologies, including energy harvesting and flexible sensor production to name but a few, in order to pull more value.

If value continues to be pulled lower down the value chain, then an innovation power shift may occur. This will make partnerships of key importance to ensure the acquisition of the most relevant, reliable, and cutting-edge technology at the finished smart card level. This is not to diminish the continued innovative efforts of the leading smart card vendors, which continue to push the innovation envelope, but rather an observation that vendors lower down the value chain are looking to expand and, ultimately, generate additional value. If successful, value will be pushed down the chain and the percentage share in terms of revenue allocation per smart card may shift accordingly.

BIOMETRIC PAYMENT CARD FORECAST EXPECTATIONS



- Nearly 1 million units could ship in 2018, but more significant volumes will not be achieved until 18 to 30 months after successful trial completion. Shipments are expected to reach 24 million worldwide by the end of 2020, but will increase considerably by 2023, reaching 117 million, a quite modest, but nevertheless important, milestone.
- The Middle East & Africa (MEA) region will be driven by social security/welfare applications in a bid to help combat associated fraud, using biometrics as the additional security platform to ensure proof of life, as well as push after competition of a successful pilot project in South Africa.
- The North American payments market will be hindered by the United States, which has only just complete EMV migration. The United States will shift its priorities to contactless migration, placing biometric-enabled payment card adoption further down its priority list.
- Any initial U.S. success will likely reside in high-end access control use cases.

- Europe is cover about biometric sensor card adoption and will focus efforts on address CNP fraud via Dynamic Code Verification (DCV) display cards.
- The Latin American payment cards market continues to struggle. The prime market of Brazil is unlikely to move to higher-value propositions in the short term, continually affected by challenging macroeconomic conditions.
- Asia presents a good mix of well-established payment markets in Japan and Korea, with emerging and growing countries where government and payments are intertwined, including China and India.

In summary, biometric payment card issuance will be limited in the short term. Issuers will likely adopt a targeted approach to issuance, providing them to those considered the highest fraud risks, combining that with a subscription approach, aimed at affluent client bases willing to pay a fee in exchange for the latest technology.

BUSINESS MODEL APPROACH COULD BE THE DEFINING FACTOR IN UNLOCKING THE BIOMETRIC PAYMENT CARDS OPPORTUNITY

Price remains a significant market barrier, as most payment card issuers currently swallow the cost of card issuance and a slight increase in ASP across a multi-million customer portfolio will have a significant cost impact. Focus and strategies need to shift toward business models. A number of business model approaches exist that are designed to help minimize issuance costs, while maximizing Return on Investment (ROI). These approaches can be used as standalone models or in conjunction with one another, with four main business model strategies identified below.

THE TARGETED APPROACH

The targeted approach involves the issuance of a biometric payment card to a specific client base. Targets include a bank's or financial institution's affluent client base, a client base considered most at risk of becoming a victim of financial fraud, or specific use cases like using biometric payment cards to help stem fraud in a specific payments industry, such as the distribution of special/welfare benefits. This targeted approach allows the issuer to target a specific user segment, likely a small proportion of its overall client base, minimizing issuance costs while maximizing the ROI.

THE SUBSCRIPTION APPROACH

Typically, the subscription approach would target the affluent banking community, charging a small fee in exchange for the biometric-enabled payment card. This approach may appeal to affluent client bases that are keen to take advantage of the latest security technology to safeguard their accounts. The issuer simply pushes the associated issuance cost directly onto the client.

PAYMENTS/SECURITY-AS-A-SERVICE

The "as-a-service" approach is applied within the Business-to-Business (B2B) landscape. The supplying smart card vendor could distribute a biometric payment card for free or heavily subsidized, generating revenue from an ongoing monthly/annual fee. This is aligned with many smart card vendor strategies, which are keen to move away from rigid one-time hardware-related revenue to a recurring service-based model.

FREE ISSUANCE

The end goal will ultimately be free issuance from banks/financial institutions to end users. This is the model largely used across the globe today and a service most banking customers have come to expect. In the short term, it may be possible to shift the issuance cost directly onto the end user, in exchange for the latest security features, but a large portion of banking users will not be willing to pay for additional banking services or features. Free issuance to end users will not happen until ASPs significantly decline, more aligned with what cards costs today. An issuer might accept a small incremental increase to card ASPs, but as it stands today, the cost is the real limitation to mass rollout.

MARKET CONCLUSIONS

- Requirements for end-user behavior to change must be kept to a minimum.
- Battery charging must be limited; an integrated non-chargeable battery with relevant life span or power harvesting is preferred to minimize any end use impact.
- When necessary, enrollment requires a simplistic approach; not all banks or users will want face-to-face enrollment and secure remote enrollment solutions must be an option.
- The payment card is not going anywhere, and biometric-enabled payment cards are a natural evolutionary step in the payment cards market.
- Understand regional drivers and use cases, such as emerging *versus* affluent regions, different drivers, and the factors that will affect issuance and business model approaches.
- The ability to secure a transaction may not be enough to tempt usage. What added value can be conceived to ensure the biometric payment card is used for a transaction over an alternative form factor?
- The biometric payment cards market is in a chicken and egg situation. Production and ramping up of components is required to reduce Bill of Materials (BOMs), but no one is willing to ramp up until more significant interest/orders are received.
- A cost-down roadmap should be established, with a target price in mind. ABI Research believes that vendors need to initially aim for the US\$5 per card mark to begin breaking down retail pricing barriers, but the ultimate target price should be within the US\$1 to US\$2 range.
- The payment cards market remains the Holy Grail, but active vendors should not limit outreach to payment card issuers. Explore access control, retail, hospitality, government, healthcare, and IoT use cases.
- Continued investment in battery and power harvesting techniques should remain. The biometric payment cards market hinges on the reliance and life of power technology. Poor options or limitations in power will hinder adoption.
- Be realistic. The payment cards market is not a fast-paced technology adopting industry. It is price sensitive and often slow to react, so set expectations accordingly.
- Use biometric payment cards to differentiate from low-cost payment card vendors.
- Ensure the correct business model is in place. The fact remains that payment issuers are not going to foot the issuance bill in the short term and defined business models need setting up to aid issuers in reducing or shifting issuance costs.
- Biometric payment cards could be used as a platform to move from one-off hardware-related revenue to an “as-a-service” recurring revenue business model.

About the Author

Phil Sealy, Principal Analyst at ABI Research, conducts research focusing primarily on smart card and embedded digital security technologies and applications. He reports on new and emerging sectors, products groups, and technologies across the payments, government, SIM, ticketing and IoT end markets.

Regarding digital security, Phil focuses on end-to-end security research from the silicon, to cyber-based applications. He analyzes technology trends, as well as industry-specific implementations.

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