

2026

Mapping the Journey into Mainstream Market Adoption of SoftPOS

Mypinpad Whitepaper

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Foreword

Mypinpad has put this whitepaper together not only to mark the mainstream adoption of SoftPOS across the world but also to help understand how we got this far, this quickly.

Throughout we have tried to describe the key events, turning points, innovations, players, and changes in market dynamics which enabled this. Many of these events were technology driven. Some were about improving customer experience and optimising the use of the smartphone. However, more importantly we have tried to explain why these key events contributed to pushing SoftPOS into mainstream, even ubiquitous, adoption around the world by the end of 2025.

We hope you find it a useful guide to why and how SoftPOS has spearheaded a mobile-first payments revolution.

Barry Levett
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Mypinpad

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CHAPTER 1

Why and How SoftPOS came of age



Before we get into the detail of how SoftPOS has seen mainstream market adoption today, it is important to take a step back to answer the higher-level question: Why SoftPOS? What problems does SoftPOS solve for which stakeholders?

The answer lies in a closer examination of three key benefits it offers: merchant device choice, greater reach and speed to market, and 'business first' workflows.

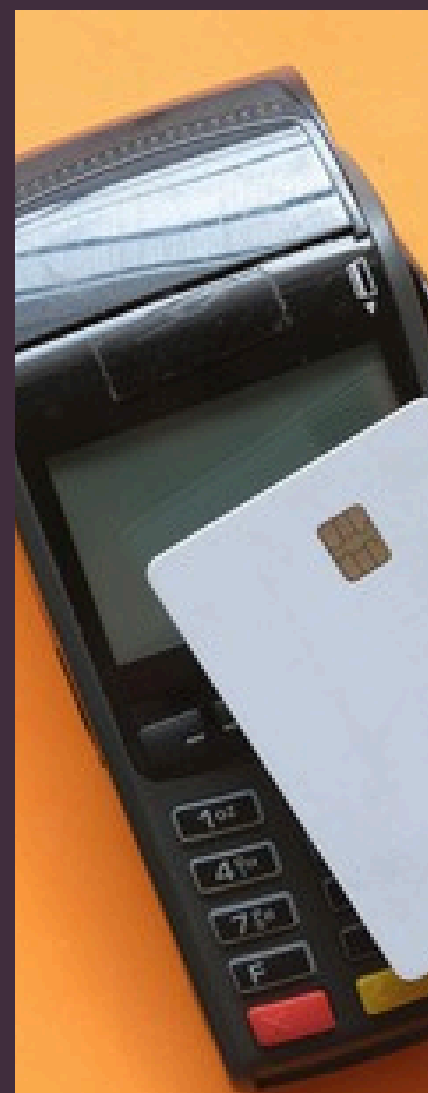
Introduction

For more than a decade, card acceptance has been constrained by hardware: PTS (PIN Transaction Security) terminals that had to be ordered, shipped, installed, maintained, tracked, reported on, and eventually replaced. Acquirers are obligated by the PCI to maintain a complete and accurate inventory of every PTS device they deploy. Records of device models, their versions, serial numbers, PCI-PTS approval class and expiry dates, chain of custody records, device swaps, replacement and returns, and even secure destruction of devices, must be auditable by PCI assessors, schemes and regulators. Monitoring, inspection and record retention requirements run for several pages.

The costs associated with all this are initially borne by the PSP or acquirer and passed on within rental contracts to merchants. The onerous nature of all this is evident right now in the reported problems of payment service providers (PSPs) the world over, with the expiring PTS POI v5 terminal fleets and their inability to roll out new v5 terminals after 30 April 2027.

SoftPOS represents a potential break with that model – giving the merchant the control and choice of which hardware to use as their payment terminal.

So, the PSP can still come to the merchant and say: ‘we have a SoftPOS-enabled terminal under this new rental agreement for you to sign’ or, more importantly, they can instead say, ‘here is a mobile app or SDK and you now have the freedom to select the device of your choice’, in much the same way a mobile network operator like Vodafone today also offers the customer the option of having a SIM-only contract – paying them for ‘airtime’ and volume of data consumed on your own device, which you might buy direct from the manufacturer.





SoftPOS offers a simpler, faster way to accept digital payments anywhere, with the same reliability as traditional terminals, while potentially reducing costs traditionally associated with PTS terminal provision. By reducing operating costs in this way, SoftPOS enables small, even pop up-style merchants that otherwise would have accepted cash only payments, to take more money by accepting card payments as well. SoftPOS also offers a cost-effective way to modernise larger merchants' customer experience while reducing dependence on relatively expensive proprietary hardware.

Let's take a closer look at the three core benefits of SoftPOS below:

Merchant device control and choice

The savings from use of SoftPOS start with the potential reduction in hardware capital expenditure (capex) and total cost of ownership. As detailed above, PCI currently governs how PTS terminals must meet onerous security and compliance minimums. This drives up cost, especially given the standards changes over time. These compliance requirements result in virtually all terminals being purchased by PSPs and then rented out to merchants – hence the high capex and administration burden for the PSP, and low choice and flexibility for the merchant.

For SMEs, using personal Commercial Off The Shelf (COTS) devices is now a viable strategy. However, for larger merchants a dedicated payments device is still needed and manufacturers are meeting this demand. This represents both a threat and an opportunity for PSPs. There is no required connection between the PSP and the device used by the merchant with SoftPOS. The same payments device could be used with more than one PSP, and if a merchant does change PSPs there is no hardware swap out required.

So, essentially SoftPOS flips the script – giving merchants much more control and choice over which terminals to use and how to pay for them. SoftPOS alters dynamics of who pays and who makes the device choice change too.

That additional choice does not necessarily mean that merchants will pay less for those new SoftPOS-enabled devices in their stores. Indeed, it is entirely possible that some merchants will pay more for their hardware. But if they choose wisely, they should be able to unlock increased functionality.

For example, some larger merchants are already using the SoftPOS switch to increase the amount of self service and self-checkout devices in each of their stores. They are enabling queue busting and pop-up promotional experiences within their stores. Essentially, they can use this new choice to address staff shortages in peak periods and generally improve the in-store customer experience.

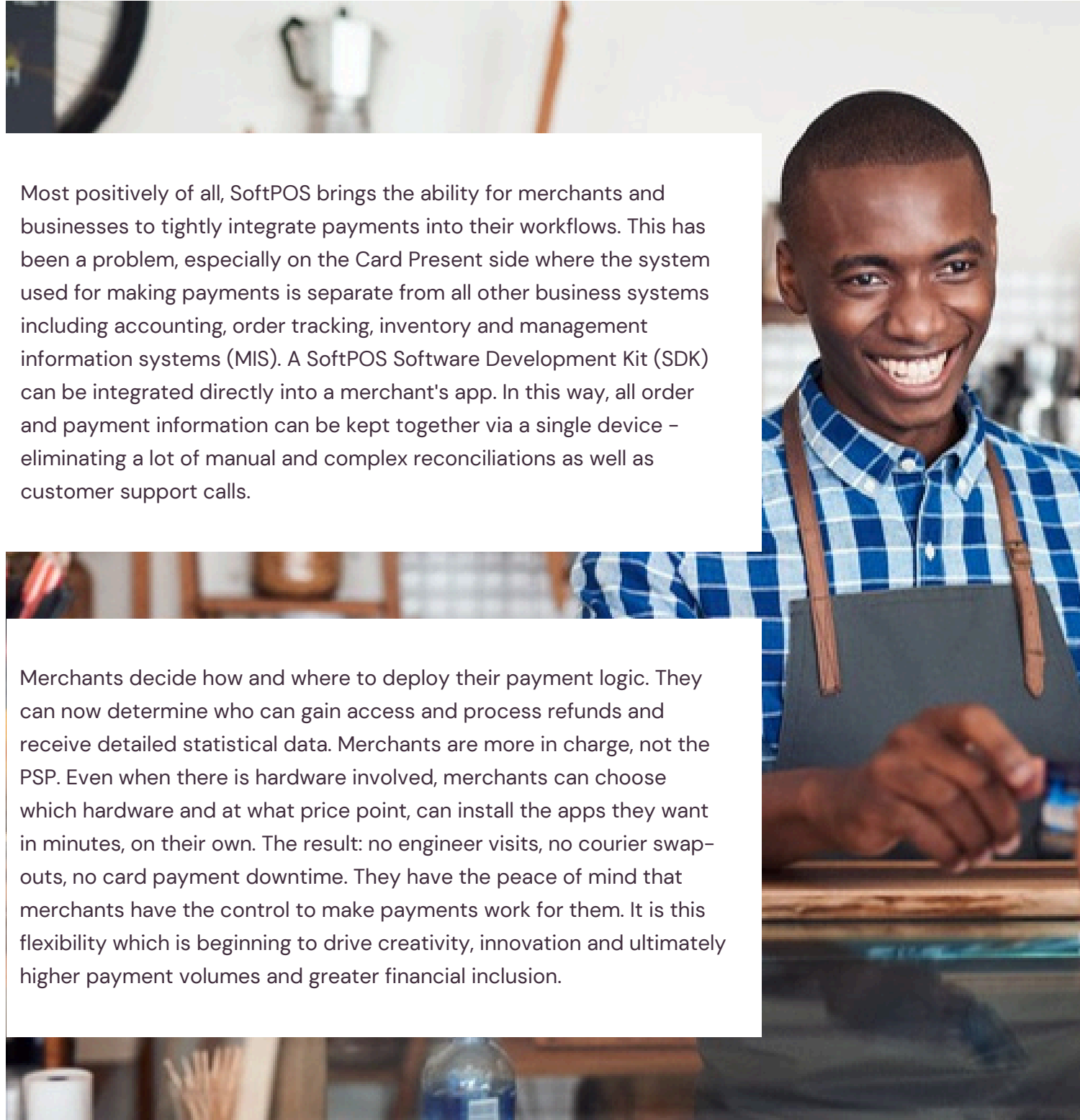
And because SoftPOS is software-led, it means that updates can be completed digitally via app stores or Mobile Device Management (MDM) tools, rather than requiring hardware recalls, firmware updates and PCI certification renewals.

Greater reach and speed to market

A knee-jerk reaction by PSPs is to be fearful of merchants selecting their own hardware since they are, at first glance, relinquishing some control. But releasing hardware control, they eliminate a lot of cost and administrative overhead. Furthermore, agile PSPs can then focus on higher margin value added services across multiple channels (not just card rails), rather than being caught in the race to zero – competing with one another on per transaction fees and hardware rentals.

SoftPOS also means faster time-to-market for new propositions going forward. Because the payments logic is in software, new features such as biometric authentication, Tap to Add Loyalty, Tap to Confirm Identity or Tap to Activate IoT devices can be added without hardware replacement or heavy integration costs. As standards such as PCI MPoC secure wider acceptance and ecosystems such as Apple's and Android's open further to third party apps, the reliability and interoperability of SoftPOS solutions expands, extends and improves. Banks that are going through digital transformation, can use SoftPOS to help reach new merchant segments and improve digital banking integration.

Business first (not payment second) workflows



Most positively of all, SoftPOS brings the ability for merchants and businesses to tightly integrate payments into their workflows. This has been a problem, especially on the Card Present side where the system used for making payments is separate from all other business systems including accounting, order tracking, inventory and management information systems (MIS). A SoftPOS Software Development Kit (SDK) can be integrated directly into a merchant's app. In this way, all order and payment information can be kept together via a single device – eliminating a lot of manual and complex reconciliations as well as customer support calls.

Merchants decide how and where to deploy their payment logic. They can now determine who can gain access and process refunds and receive detailed statistical data. Merchants are more in charge, not the PSP. Even when there is hardware involved, merchants can choose which hardware and at what price point, can install the apps they want in minutes, on their own. The result: no engineer visits, no courier swap-outs, no card payment downtime. They have the peace of mind that merchants have the control to make payments work for them. It is this flexibility which is beginning to drive creativity, innovation and ultimately higher payment volumes and greater financial inclusion.

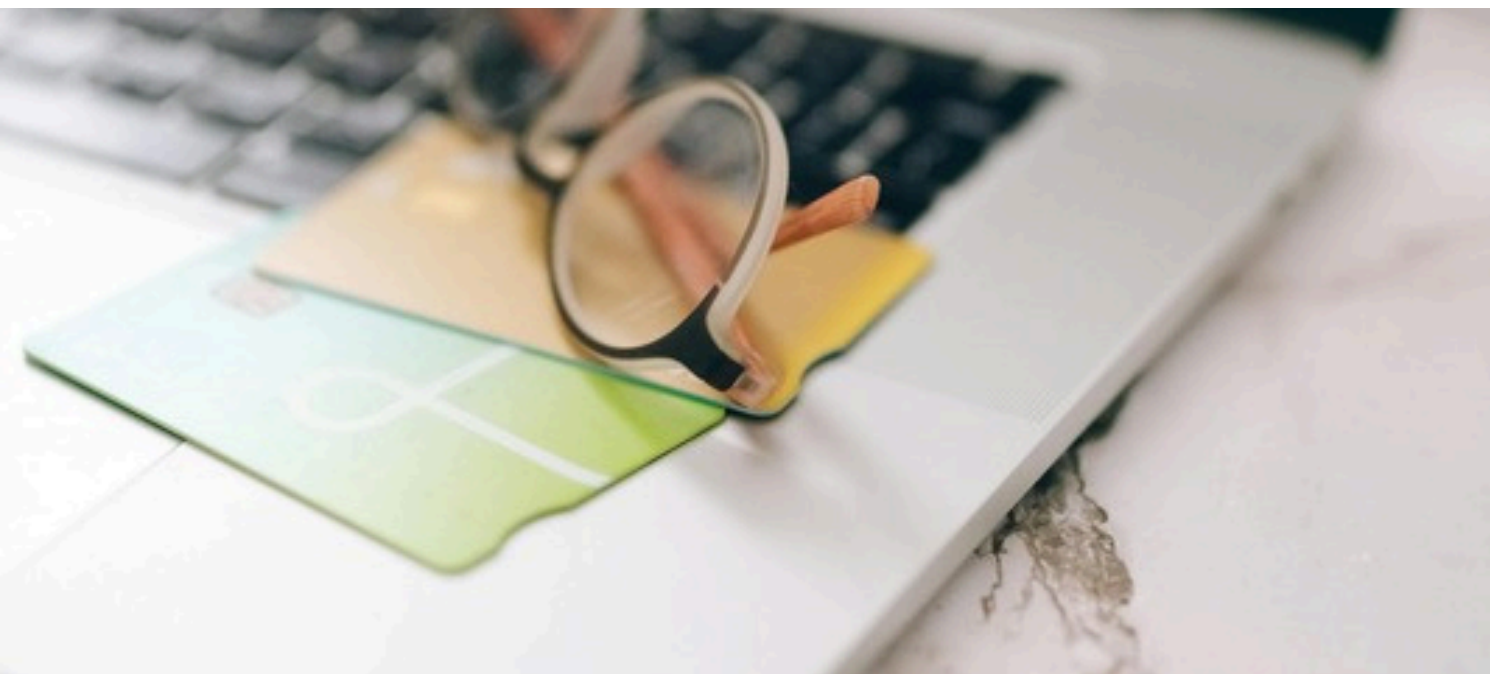
How SoftPOS reached maturity

It is clear that SoftPOS, the software-only payment acceptance solution, has now reached mainstream market adoption. SoftPOS transforms an 'ordinary' consumer smartphone or tablet into a contactless payment terminal. It enables merchants to take contactless payments (via cards, smartphones, or wearables) using a standard Android or iOS device equipped with NFC (Near Field Communication) technology.

So, if SoftPOS has *Crossed the Chasm into Early Majority* or possibly even *Late Majority* adoption; in the parlance of Geoffrey A. Moore who wrote the seminal technology sales and marketing book 'Crossing the Chasm' more than 30 years ago; what were the key market events which enabled it to cross that chasm and enter mainstream adoption so quickly and relatively painlessly? What were the breakthroughs which enabled this to happen? After all, we are only 14 years on since the launch of Google Wallet (in 2011) and 11 years since the launch of Apple Pay which enabled contactless payment on the iPhone 6 (launched in September 2014). 'Tap to Pay on iPhone' was itself not launched until 2022.

In view of this timeline, adoption and acceptance of SoftPOS by merchants and consumers alike has been extraordinarily rapid. So, we decided it was worth putting together this Mypinpad Whitepaper to map out the developments and breakthroughs which enabled SoftPOS to make such rapid progress through the technology adoption lifecycle – crossing the chasm into mainstream adoption globally in less than a dozen years.





We see SoftPOS' successful adoption as hinging on the removal of three key barriers and relying on the addition of two further 'accelerants' to enable it to cross that chasm into mainstream adoption so successfully. The barriers that have been lifted are:

01 Consumer device and technology infrastructure improvements

02 Setting, fine-tuning and widespread acceptance of PCI standards

03 Contactless payments usage reached critical mass globally during pandemic

The additional market acceptance 'accelerants' are:

04 Apple

05 The Rise of the neobanks

These five factors together form the spine of this whitepaper and deserve a chapter each.

CHAPTER 2

Barrier #1 Removed: Mobile consumer device improvements enabled mass adoption of contactless secure payments via smartphones

There is no doubt that rapid improvements in the technology inside smartphones and other mobile devices, including adding Near Field Communication (NFC) chips and Trusted Execution Environment (TEE) provided the platform which enabled SoftPOS to experience rapid adoption. It was these elements which enabled trust in payments via mobile phones to be built so fast. What was the journey for these technologies?

Rise of the NFC-enabled smartphones

The first commercially-available smartphone with NFC on board – the Nokia 6131 NFC – was launched way back in early 2007. The device was notably used in a six-month trial with Transport for London (TfL) from November 2007 to May 2008, to enable participants to use their phone to pay for journeys across London via the city's then new Oyster card system.

The Samsung Nexus S smartphone, launched in early December 2010, was considered the first Android phone with NFC hardware built in. This device was closely followed by NFC-enabled smartphone launches from Nokia (C7), BlackBerry (Bold 9900) and Samsung (Galaxy S II NFC); all launched worldwide before the end of 2011. We had to wait until September 2014 for the first iPhones with NFC chips built-in, with the arrival of the iPhone 6.



Trusted Execution Environment (TEE) provides high levels of security flexibly and at low cost

TEE provided the vital mobile device vendor agnostic breakthrough in terms of providing hardware-backed security which enabled the safe storage and use of mobile payments information to prevent fraudulent theft and misuse of payments records and keys. It enabled us to trust paying via our smartphone.

First developed in 2003, TEE represented a new architectural model for securing sensitive operations directly within the main processor (System on a Chip or SoC), rather than relying solely on external SEs or SIM-based hardware. From 2013 onwards the market began deploying it on smartphones.

TEE effectively bridged the gap between hardware-grade security and software flexibility – rendering secure payments possible on any smartphone without needing a separate Secure Element (SE) chip. For example, in 2013 we saw the first real operating system-level use for hardware-backed key storage when Google adopted TrustZone for Android KeyStore (Android 4.3+). The same year Apple introduced Secure Enclave in its iPhone 5s to underpin TouchID, and later to protect Apple Pay transactions.

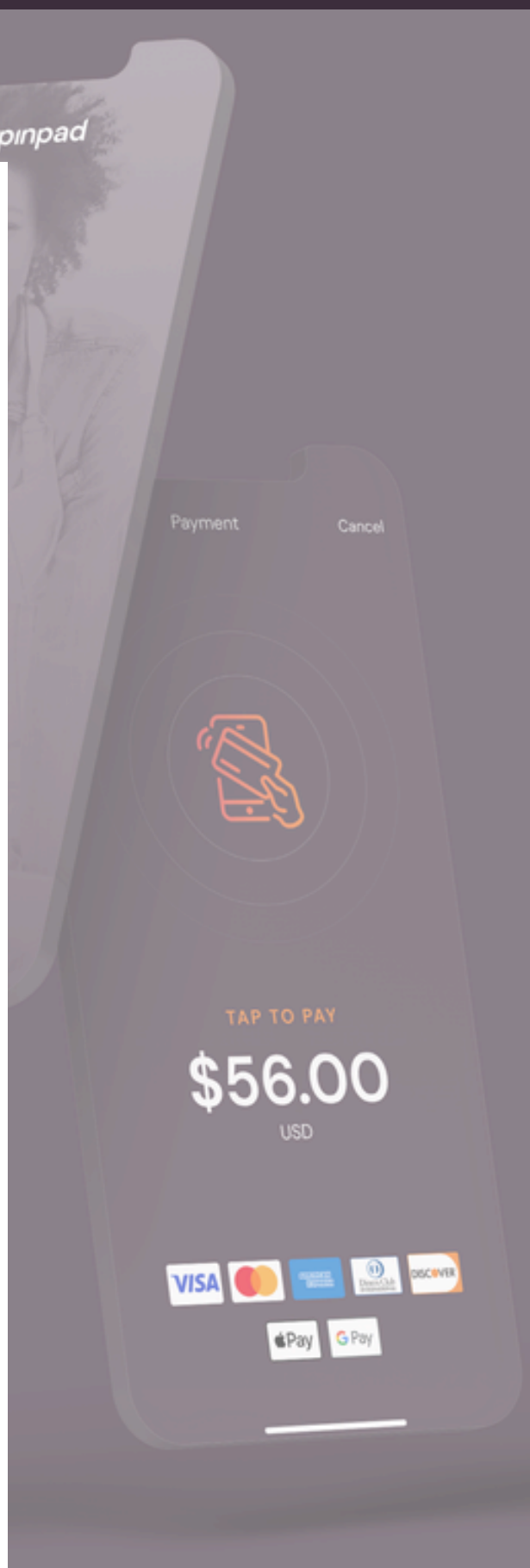


Table 1

TEE vs Secure Element (SE)

Feature	Trusted Execution Environment (TEE)	Secure Element (SE)
Location	Inside main processor (SoC)	Separate chip (e.g., NXP, embedded on PCB or SIM)
Purpose	Run trusted code securely (PIN entry, biometrics, token ops)	Store and protect credentials and keys permanently
Speed/Performance	Faster (closer to CPU, shared memory)	Slower but ultra-secure (physically isolated)
Management	Controlled by device OEM (e.g., ARM TrustZone, Qualcomm)	Often certified (GlobalPlatform, EMVCo), managed by banks, telco, OEMs
Example	ARM TrustZone, Qualcomm Secure Execution, Apple Secure Enclave	NXP SE, STMicro, Gemalto eSE, SIM/UICC-based SE
Use Cases	Biometric match-on device, token processing, key derivation	Secure credential storage, EMV payments, access control

Table 2

Key security improvements introduced by TEE

Area	Traditional Model (Pre-TEE)	TEE-Enabled Model	Security Implication
Isolation	Relied on physically separate SE or SIM (highly secure but rigid)	TEE creates an <i>isolated zone</i> in the CPU itself, sealed off from Android or iOS	Maintains hardware-backed isolation without needing external chips
Attack Surface	External SEs protected keys well, but data paths to/from OS could be vulnerable	TEE eliminated those “bridging” weaknesses by confining key operations entirely inside the SoC	Reduces exposure to OS-level or app-level malware
PIN/Biometric Handling	SE handled card credentials, but PIN/biometric often managed elsewhere	TEE now securely executes biometric matching, PIN entry, and token cryptography	Prevents data leakage even if OS is compromised
Scalability (SoftPOS)	Hardware-based SE approach required expensive provisioning per merchant device	TEE-based security scales to millions of consumer-grade phones under PCI CPoC/MPoC	Makes large-scale, low-cost merchant acceptance feasible
Flexibility	SEs required pre-provisioned keys and complex lifecycle management	TEE can be updated and attested remotely with trusted firmware	Enables agile deployment of new payment models

The adoption of both SE, and later TEE security architecture within new consumer devices proved rapid as great swathes of the population got into the habit of upgrading their smart phones every two to three years.

Android dominance eased path for SoftPOS

The dominance of Android as the global operating system for smartphones and smart devices was one of the most important enablers of the SoftPOS revolution, precisely because it lowered the technical, economic, and certification barriers for new entrants to develop and deploy Tap to Pay solutions. The economies of scale which this generated for developers was vital for easing the path to widespread adoption of SoftPOS. It meant that an ISV (Independent Software Vendor) is able to write an SDK using Android as the operating system and have it work equally well on both a PCI PTS terminal and COTS device. The barriers to choice and innovation consequently fell dramatically.

By 2015, Android powered over 82 per cent of smartphones shipped worldwide (Source: IDC). This meant that developers could focus for the last 10 years or so on a common platform. Consequently, payments terminal developers, for example, when asked to build an integration for a SoftPOS system, found the technical barriers to building SoftPOS SDKs were low. This harmonisation on Android eased the path to SoftPOS adoption. Today, most PTS devices run Android.

With Android, the hardware already existed. The OS had the necessary security primitives (TEE, Keystore) and certification framework standards (like PCI CPoC in 2019 and PCI MPoC in 2022) legitimised software-only POS on Android.

Android allowed controlled developer access to:	This openness allowed fintechs and payment ISVs to:	Reduced cost and development friction:
- NFC APIs for Tap-to-Pay and Tap-to-Phone use cases - TEE and Keystore APIs for secure key handling	- Build SoftPOS apps that turned off-the-shelf phones into certified acceptance devices. - Leverage the TEE as the new root of trust, replacing the older hardware SE. - Use cloud-based security to meet relevant PCI standards	Previously, launching a payment terminal product meant: - Custom hardware design - Complex EMV and PCI certification - Tight integration with banks or schemes Now, a startup could build a certified SoftPOS solution with an app and a compliance partner, rather than in a chip factory.

Strong global developer ecosystem and app distribution model:

Because Android already had Google Play Store distribution, familiar development tools (Java/Kotlin SDK) and global OEM diversity it became possible to scale SoftPOS internationally faster than any proprietary POS platform. Regional integrators could localise and certify apps with domestic acquirers while using the same Android codebase.



Table 3

Android impact and how it helped SoftPOS

Factor	Android Impact	Result for SoftPOS Developers
Market share	82%+ global smartphone base	Huge potential terminal pool
Openness	Access to NFC, TEE APIs	Freedom to innovate & integrate
Security evolution	Mature TEE/Keystore, Google Play Protect	PCI MPoC compliance achievable
Ecosystem maturity	Millions of skilled Android developers	Fast time-to-market
Certification cost	No custom hardware needed	Lower barrier to entry & higher ROI

The dominance of Android from 2015 onwards turned the consumer smartphone ecosystem into a de facto payment terminal platform. This democratised payment acceptance, enabling thousands of fintechs and ISVs to build SoftPOS, Tap-to-Activate (TTA), and Tap-to-Verify (TTV) solutions rapidly and compliantly.

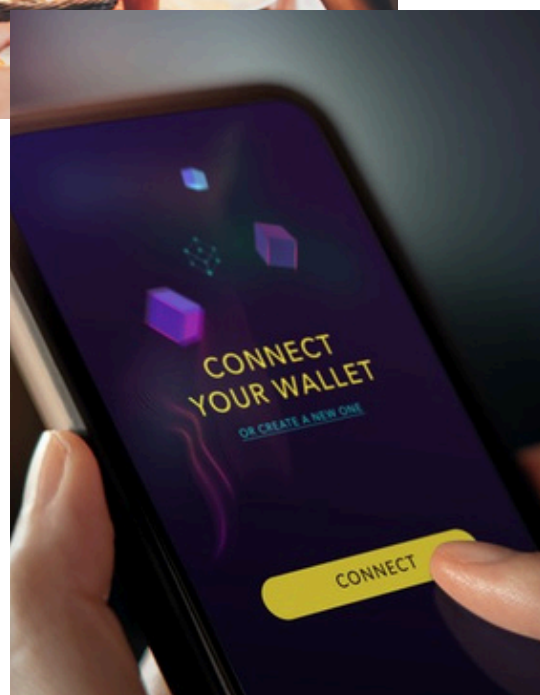
CHAPTER 3

Barrier #2 Removed: Standards fine-tuned and widely adopted

For successful adoption of SoftPOS, it was vital to have industry-wide standards for securing and managing payment on COTS devices as well as PTS devices. The Payment Card Industry Security Standards Council (PCI SSC) enabled that through major efforts and ultimately close engagement with the industry over the last seven years in particular.

PCI SSC was founded in 2006 by the major card networks (Visa, Mastercard, American Express, Discover and JCB) to:

- Set global security standards for how cardholder data is processed
- Certify payment solutions, devices, and software, and
- Protect the integrity of the payments ecosystem from fraud and data compromise.



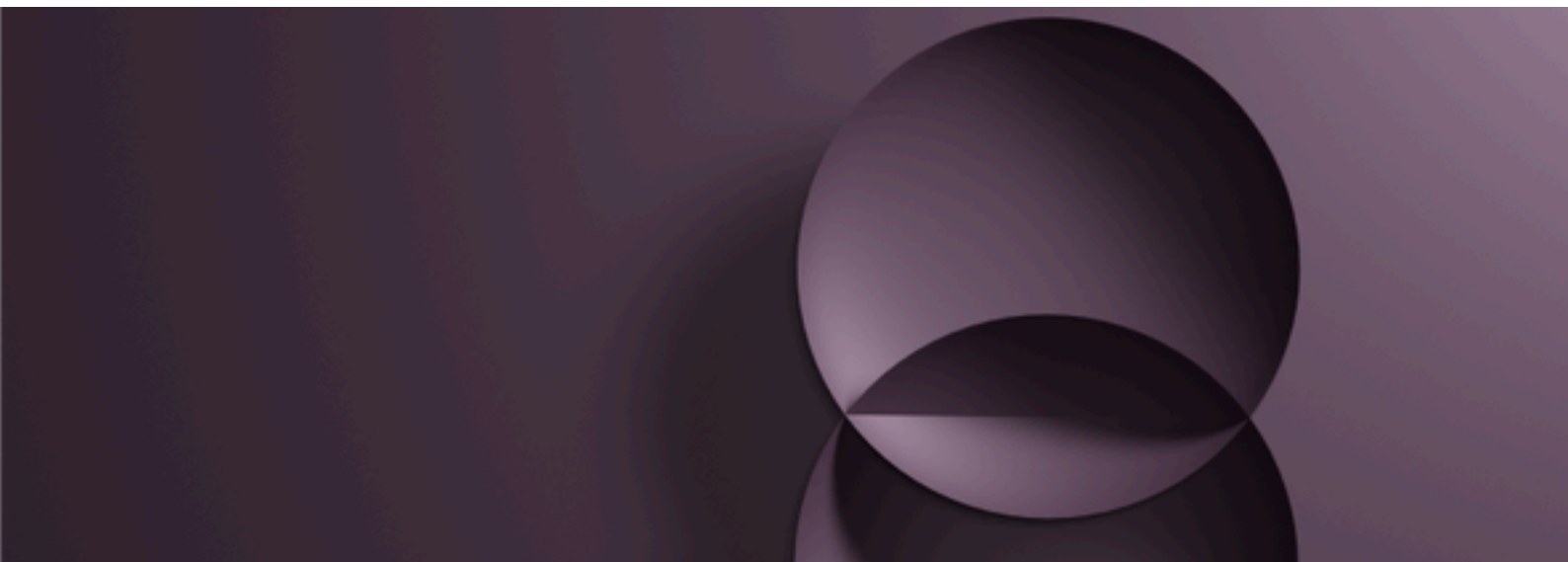


Table 4

Core PCI Standards and what each of them governs

Standard	Full Name	Purpose	Relevance to Mobile & SoftPOS
PCI DSS	Data Security Standard	Sets baseline security controls for any entity that stores, processes or transmits cardholder data	Applies to backend systems of merchants and payment processors
PCI PTS	PIN Transaction Security	Governs physical payment terminals – hardwarebased PIN entry devices (PEDs)	Legacy standard for <i>hardware terminals</i> (Ingenico, Verifone, etc.)
PCI P2PE	Point-to-Point Encryption	Defines encryption and key management between devices and payment processors	Relevant for encrypting card data in transit
PCI SPoC	Software-based PIN on COTS (Commercial Off-The-Shelf)	First std (2018) allowing cardholder PIN entry on a consumer device <i>with a</i> secure card reader	Early step toward mobile-based acceptance; required external card reader dongle
PCI CPoC	Contactless Payments on COTS	2019 standard enabling contactless acceptance on smartphones (no PIN entry)	Laid groundwork for SoftPOS; no SE required
PCI MPoC	Mobile Payments on COTS	Released November 2022 , merging SPoC + CPoC into a unified, flexible standard	Core standard now enabling full SoftPOS with PIN and Tap-to-Everything use cases

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2019**PCI CPoC standard goes live**

In 2019, PCI launched Contactless Payments on COTS (Commercial off the shelf), or PCI CPoC devices, which enabled contactless acceptance on smartphones (demanding no PIN entry). This required a TEE but not a SE.

2022**PCI MPoC Standard unveiled**

Then just three years later in late 2022, PCI MPoC began completing the standards jigsaw for mobile payments security. It was billed as follows:

"PCI MPoC is a new, flexible mobile standard and program for payment solution development. It provides a modular, objective-based, security standard that supports various types of payment acceptance channels and consumer verification methods on COTS devices. PCI MPoC combines many of the aspects of the existing PCI SPoC and PCI CPoC standards, primarily by including the entry of both PIN and contactless cardholder data on the same COTS device."

2024**MPoC V1.1 improvements**

Then in November 2024, the release of MPoC Version 1.1 brought further vital enhancements around tech flexibility (e.g. modular SDK embedding, non-isolating SDKs); reduced validation burden in certain areas; improved clarity (especially in offline, fallback, detection/response); broader device type support; and refined self-testing and integration rules – all of which were significant steps forward from Mypinpad's perspective.

More importantly for the paytech ecosystem as a whole, this evolution signalled PCI SSC's responsiveness to market feedback and its attempt to balance security with practicability. In short, PCI standards helped accelerate adoption of SoftPOS on merchant and consumer devices, particularly over the last year, and arguably hastened the start of 'late majority' adoption, as Crossing the Chasm's Geoffrey A. Moore termed the second half of mainstream adoption of new technology more than 30 years ago. To this end, Mypinpad was particularly pleased to be invited to join PCI Security Standards Council Board of Advisors back in May 2025.

CHAPTER 4

Barrier #3 Removed: Strong Contactless Payments Growth

Many technologies, as Geoffrey A. Moore tells us in *Crossing the Chasm*, fail to achieve mainstream adoption because they bring 'discontinuous' or 'disruptive innovation' to the market which might be loved by the highly technical enthusiasts (which make up the 'Innovators' in Moore's technology adoption lifecycle), as well as the visionary 'early adopters', but could still fail to cross the chasm into early majority adoption for a number of reasons, which Moore lays out early in his book .

The pitfalls are around failure to have the product fully finished and ready before launching, and/or failure to market it effectively. There is no doubt that Apple's involvement in the payments space from the launch of Apple Pay on its iPhone 6 and all the tech groundwork it did to secure mobile payments and with the improvement in design and user experience which it brought to smartphones in general, contributed considerably to rapid worldwide increase in the use of contactless payments from 2014 onwards.

Apple arguably took up where Nokia left off and moved acceptance of Tap to Pay on very considerably, very rapidly. In addition, its

worldwide reach meant that all over the world we got used to waving our phones over payment terminals and completing contactless payments from then onwards. Pretty soon we were counting the value of contactless payments in stores in the billions of dollars. This was a worldwide phenomenon.

It is also clear that although much of the groundwork for rapid adoption of contactless payments was done in the 2011–2014 period with the arrival of Google Wallet and Apple Pay, it was not until the pandemic that we saw ubiquitous growth in the volume and value of contactless transactions, such that over a third of all card-based transactions were completed this way in many parts of the world by the time the pandemic abated. So, arguably it was the perceived hygiene factor of not having to tap your PIN number into a PTS in-store which pushed contactless payments deep into mainstream adoption across the world by 2023.

So, over the past decade, contactless adoption has accelerated from a regional phenomenon into a near-universal consumer behaviour, fundamentally reshaping expectations at the point of sale and removing one of the most significant barriers to SoftPOS entering the mainstream.

By 2024, Tap to Pay became the dominant in-person payment method across Australasia, Europe, Canada, and key markets in Asia; while the United States, Latin America, and parts of Africa have followed with steep late-curve adoption.

This shift has normalised 'tap-by-default' behaviour among consumers and merchants, creating a behavioural foundation where smartphone-based acceptance feels entirely natural. In Geoffrey Moore's Crossing the Chasm terminology, this represents the moment when a critical adjacent technology—contactless cards and wallets—achieved deep penetration within the Early Majority, eliminating interoperability concerns and collapsing the perceived risk of adopting SoftPOS.

As tapping became ubiquitous, merchants no longer questioned whether consumers would use contactless on a phone; instead, they questioned why they should continue relying on traditional hardware at all. This widespread global shift in payment behaviour effectively removed a fundamental psychological and operational barrier, enabling SoftPOS to present itself not as a novel technology but as the logical extension of the dominant payment habit already shared by hundreds of millions of consumers worldwide.



Table 5

Growth in Contactless Adoption and SoftPOS Readiness by Region

Region / Cluster	Approx. Contactless Share of In-Person Card Transactions (2018)	Approx. Share (2024/25)	Adoption Growth Signal	Adoption Growth Signal
Australasia (Australia & New Zealand)	60–70%	90–95%	High base → near-universal adoption	Very High – Consumers expect to tap by default; merchants accustomed to mobile-first acquiring; regulatory & scheme support strong
Africa	5–10%	25–35% (SA >60%)	Early → rapid growth	Medium – Huge potential; mobile-first economies; Android dominance favours SoftPOS, but merchant education & infrastructure vary widely
APAC region (Hong Kong, Singapore, China, Korea, Taiwan, Japan, Philippines)	15–25% (high pockets)	50–60% average; Singapore/HK >95%	Mixed → high/very high	High to Very High – Mature mobile wallet ecosystems, transit-led behaviour change, high Android share; Japan & Philippines moderate but rising
Eurasia (W. Europe, E. Europe, S. Europe, N. Europe, Scandinavia, UK)	20–30%	70–85% (UK & Nordics ~90%+)	Mid → near universal	Very High – Strong regulatory alignment, high merchant acceptance, broad Android base, and early SoftPOS pilots now scaling
North America (US & Canada)	5–10%	50–65%	Low → high, steepest curve	High – US lagging but now aggressively catching up; Android penetration strong in SMBs; card schemes pushing SoftPOS for SME digitisation
Central & Southern America (Latin America & Caribbean)	<5–10%	50–70%	Low → high; one of fastest globally	High – Market leapfrogging towards tap; Android overwhelmingly dominant; SoftPOS attractive for micro-merchants & street commerce

CHAPTER 5

The Apple Accelerant

Apple as the enabler of wider Tap to Pay market acceptance

We owe a great deal to Apple for educating the market to use Tap to Pay within apps and digital wallets to complete transactions. The company, together with a new breed of neobanks, effectively re-trained consumers and merchants to expect digital simplicity, invisibility of technology and absolute reliability in the security around mobile payments. Apple created the psychological and technical conditions that allowed SoftPOS to flourish.

When Apple Pay launched in 2014, it did something extraordinary: it turned an abstract, complex process: EMV tokenisation, biometric authentication, and secure element (SE) encryption into a single intuitive gesture: Tap to Pay.

Apple didn't invent contactless or network tokenisation (as we explain later in this chapter). What it did was make them trustworthy. By embedding security in the device's DNA (via the Secure Element, then the embedded Secure Element and later the TEE), Apple created what is sometimes called 'invisible security', that is security that works without troubling the user or delaying the transaction process. It made secure, mobile payments frictionless.

For the first time, consumers and merchants both trusted mobile contactless payments because Apple guaranteed that the experience was:

- Consistent (every iPhone worked the same way globally)
- Frictionless (no PIN pad, no app launching, no guesswork);
- Safe by design (biometrics, tokenisation, and device-bound credentials).

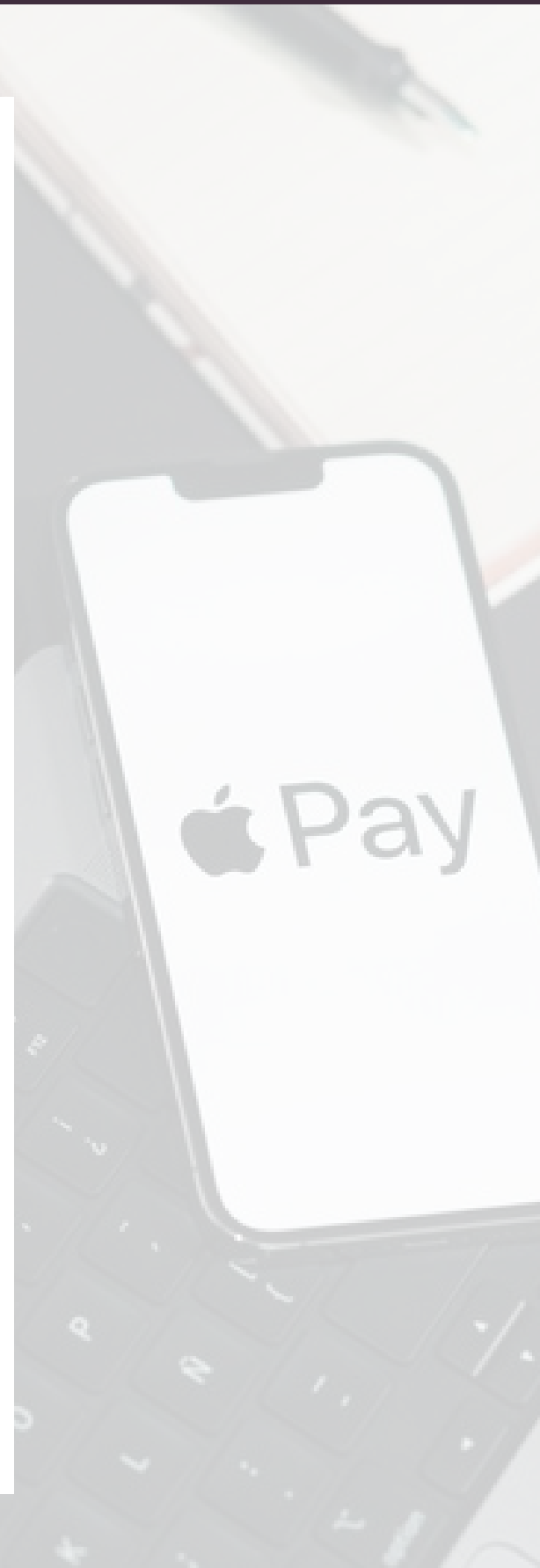
This was the 'trust dividend'. Apple gave consumers the confidence to tap, and merchants the confidence to accept taps. That cultural and behavioural shift was vital groundwork for SoftPOS.

Before Apple Pay, paying with your phone was a novelty. After Apple Pay, it became normal. Once consumers had confidence in tap-based payments, merchants became open to the idea of accepting those same transactions on their own mobile device of choice.

No 'discontinuous disruption' has been felt by consumers or merchants. Apple's work with NFC, Apple Pay, eSE, TEE and more recently with PCI MPoC standards has also eased the path for the development community to build integrations for iOS, as well as for the Android devices they were already developing for. For us as a SoftPOS innovator we have found it very helpful to be able to offer both iOS and Android SDKs. Apple has served to enrich the payments ecosystem.

Apple 'mainstreams' network tokenisation

Although network tokenisation wasn't 'invented' by Apple, the inventor of the iPhone ensured its widespread adoption. Network tokenisation was a collaborative industry innovation led by the global card networks (Visa, Mastercard, Amex) under the governance of EMVCo, the consortium they jointly own. During 2013–2014, EMVCo published the first Payment Tokenisation Specification – Technical Framework (v1.0). This document defined how payment tokens (surrogate Primary Account Numbers or PANs) would be issued, stored, and used — and how they would be mapped back to real PANs within network-controlled token vaults. After publication of this Framework, Apple was the first largescale implementor of network tokenisation in Apple Pay which it brought to market in the iPhone 6 that same year.



Apple helps blur traditional boundary between CP and CNP transactions

Apple also played a decisive role in blurring the historic boundary between Card Present (CP) and Card Not Present (CNP) transactions. They did this not by changing payment scheme rules directly but by introducing a secure, tokenised, device-bound model that made the mobile digital experience as trusted as the physical.

Table 6

The traditional divide: CP versus CNP

Type	Context	Risk Profile	Typical Authentication	Scheme Fees/Rules
Card-Present (CP)	Physical card tapped, dipped, or swiped at a terminal	Low fraud risk	EMV chip cryptogram	Lower fees, liability shift to issuer
Card-Not-Present (CNP)	Online or in-app transaction	High fraud risk	CVV2, 3-D Secure	Higher fraud rate, merchant liability



For decades, CP was seen as a more secure, in-person hardware event, while CNP was for an online, and inherently riskier environment. The successful launch of Apple Pay, combining network tokenisation with secure storing of a device-specific token (DPAN), biometric authentication and dynamic EMV cryptograms generated for each transaction together gave mobile and in-app transactions the same cryptographic assurance as physical EMV transactions — even though there was no physical card or chip contact.

The CP/CNP blurring effect in practice:*In-app and online Apple Pay = EMV-grade*

- Apple Pay 'in-app' (e.g., booking an Uber or buying from a retailer app) uses the same network token and cryptogram model as contactless.
- To the network, the transaction carries an EMV-grade token and dynamic cryptogram, meaning it's treated as a low-risk, device-present transaction, even though no terminal is involved.

Technically CNP, but they were now risk-profiled as CP:*Tokenisation moved trust from physical to digital*

- Before Apple Pay, only CP transactions had EMV cryptograms; online payments relied on static credentials (PAN + CVV).
- With tokenisation and SE protection, Apple Pay allowed the same trust model to extend into e-commerce.
- Payment schemes began introducing Digital Secure Remote Payment (DSRP) and Network Tokenized CNP categories that behave almost identically to CP in terms of risk and liability.

Scheme rule evolution

Visa, Mastercard, and Amex updated their rulebooks post-Apple Pay to introduce:

- Token Assurance Levels (TALs) — signalling how securely a token is stored and authenticated (e.g., biometrics).
- New authorisation indicators distinguishing device-present CNP from traditional CNP.
- These new classes (e.g., DPAN with cryptogram) were given reduced interchange and fraud liability, effectively treating them as if they were CP.

Apple’s ecosystem influence

Apple’s closed, highly secure design gave card networks confidence that:

- The device integrity (via Secure Element + TEE) was assured.
- User authentication (Touch/Face ID) was strong and consistent.
- No merchant ever touched the PAN, so fraud vectors were dramatically reduced.

That trust model was later mirrored by:

- Google Pay, Samsung Pay, and eventually SoftPOS frameworks under PCI MPoC, using similar device-bound cryptography.

Apple’s push on network tokenisation led to wallets adopting it across the board. Merchants then also adopted it for card-on-file transactions. CNP tokenised transactions were reclassified as low risk. This in itself led to charges for device-present CNP transactions falling close to CP fees. Ultimately, PCI DSS and MPoC frameworks adapted to recognise secure digital acceptance paths enabled by SoftPOS. For merchants, checkout workflows were unified as the Apple Pay button worked both in-store and online.

Table 7

How Apple enabled blurring of the lines between CP and CNP transactions

Dimension	Before Apple Pay	After Apple Pay
Authentication	Static credentials (CVV, 3-D Secure)	Biometric + dynamic cryptogram
Risk model	CP low / CNP high	Device-present digital = CP-like
Tokenisation	Rare, merchant-side only	Network-level and universal
Scheme treatment	CP ≠ CNP	Emerging “device-present CNP” category
Consumer experience	Separate online/offline worlds	Seamless, unified Tap-to-Pay / Pay-with-Face experience

In essence, Apple blurred the CP/CNP boundary by proving that a digital transaction could be as secure as a physical one — thanks to network tokenisation, device-level cryptography, and biometric authentication.

This redefined ‘card present’ from being about location and hardware to being about assured digital identity and cryptographic proof — the same foundation that now underpins SoftPOS, Tap-to-Activate, and Tap-to-Everything.

CHAPTER 6

Rise of the Neobanks

While Apple focused on adopting the secure payments technology rapidly and making it a seamless, frictionless process, the neo-banks focused on consumer empowerment: ensuring mobile payments felt easier, slicker and more fun by providing customer experiences which appealed to the next generation of 'Mobile First' consumers.

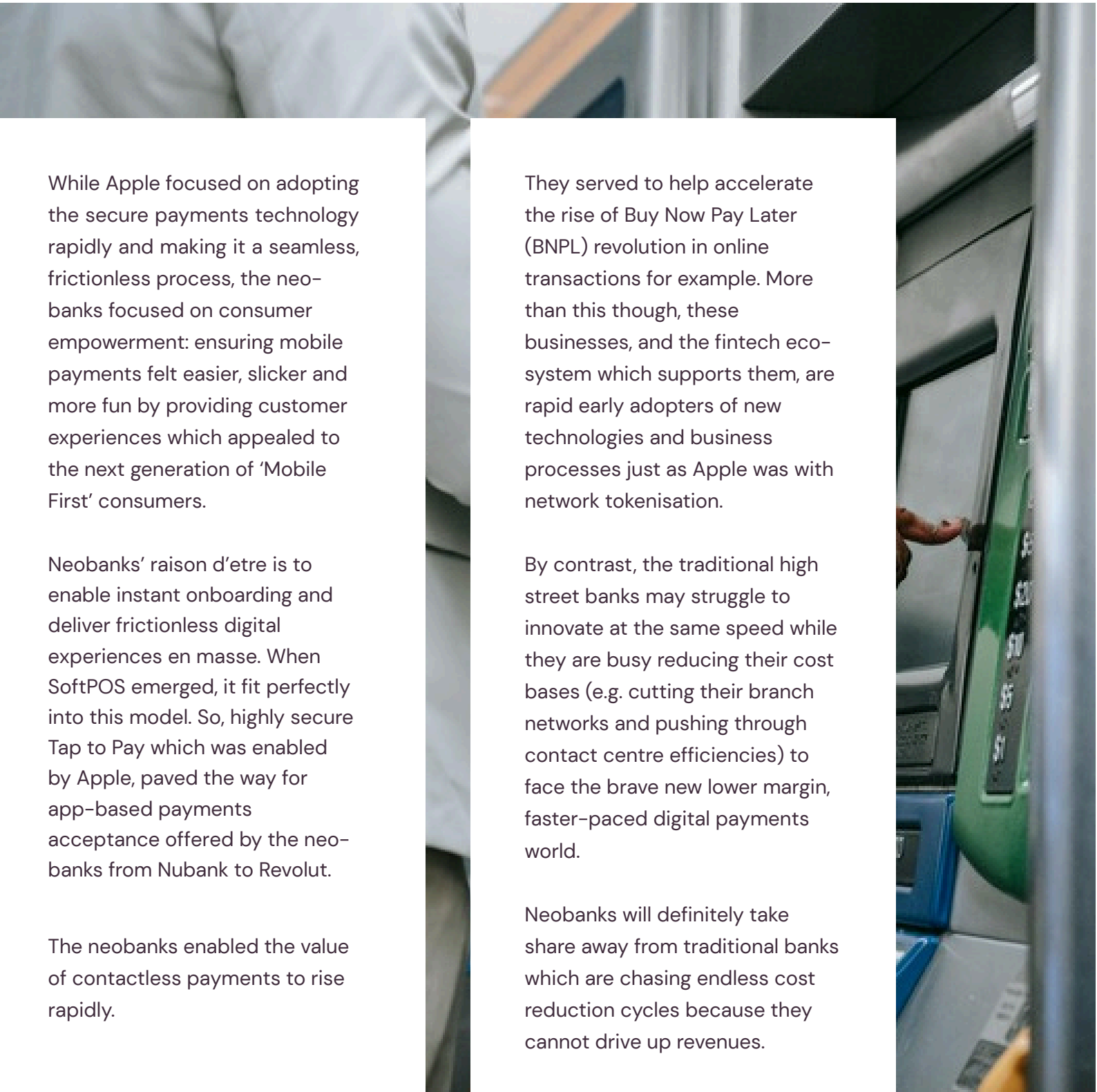
Neobanks' raison d'être is to enable instant onboarding and deliver frictionless digital experiences en masse. When SoftPOS emerged, it fit perfectly into this model. So, highly secure Tap to Pay which was enabled by Apple, paved the way for app-based payments acceptance offered by the neo-banks from Nubank to Revolut.

The neobanks enabled the value of contactless payments to rise rapidly.

They served to help accelerate the rise of Buy Now Pay Later (BNPL) revolution in online transactions for example. More than this though, these businesses, and the fintech ecosystem which supports them, are rapid early adopters of new technologies and business processes just as Apple was with network tokenisation.

By contrast, the traditional high street banks may struggle to innovate at the same speed while they are busy reducing their cost bases (e.g. cutting their branch networks and pushing through contact centre efficiencies) to face the brave new lower margin, faster-paced digital payments world.

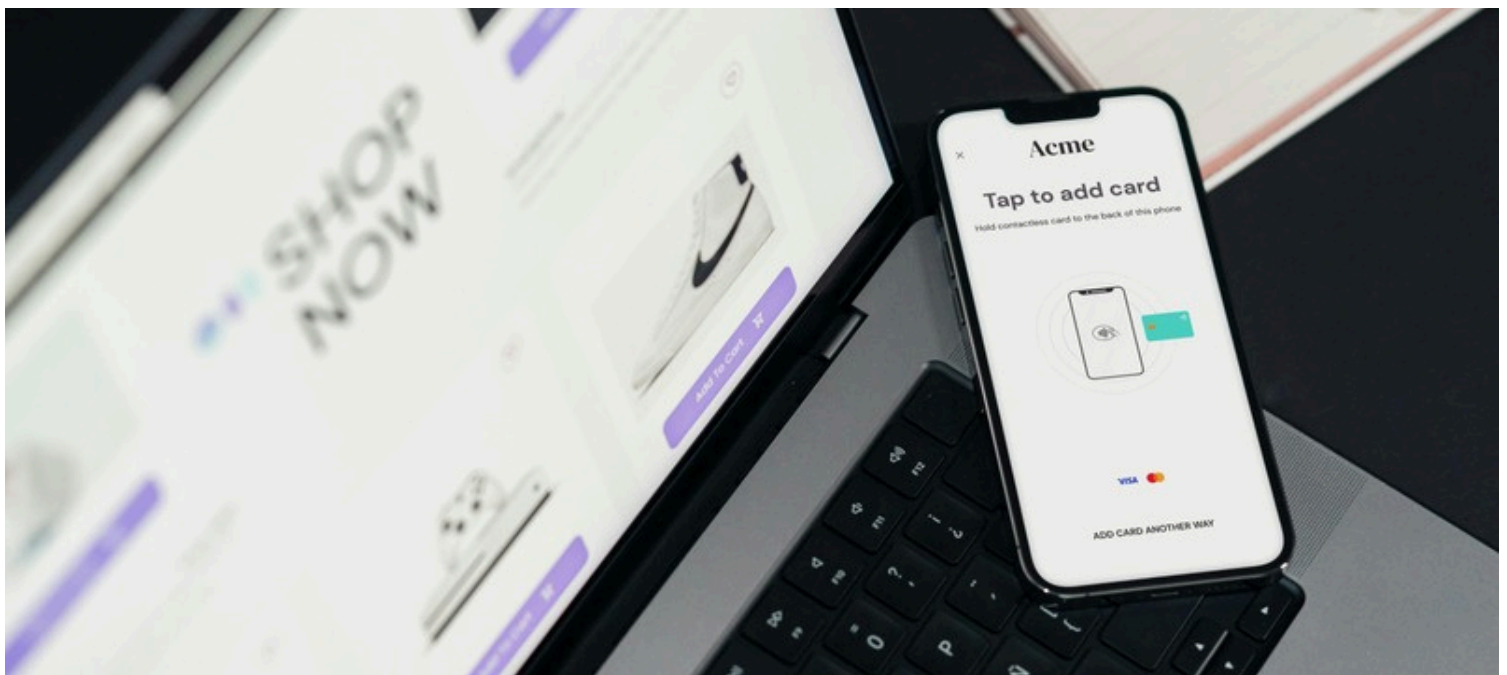
Neobanks will definitely take share away from traditional banks which are chasing endless cost reduction cycles because they cannot drive up revenues.



Tap to Everything illustrates a new dynamic of compounding innovation cycles

Tap to Everything is perhaps the best evidence right now of the degree of innovation that is happening. We are now in continuous cycles of innovation in which there is little pause for breath between cycles. The trick is to remain at, or close to, the leading edge of these cycles as they spin up. However, conversely, if you are behind in adapting to one cycle of innovation brought about by say network tokenisation, you are likely to be even further behind when the next cycle, the Tap to Everything cycle perhaps, comes around.

It's a punishing place to be if you are not able to innovate fast enough. It could push some incumbent banks into 'death spirals' if they cannot keep up with the demands and expectations of the Mobile First Generation. Younger people will turn away from traditional banks that cannot keep up in terms of providing smooth customer experience, online and on the mobile.



Summary

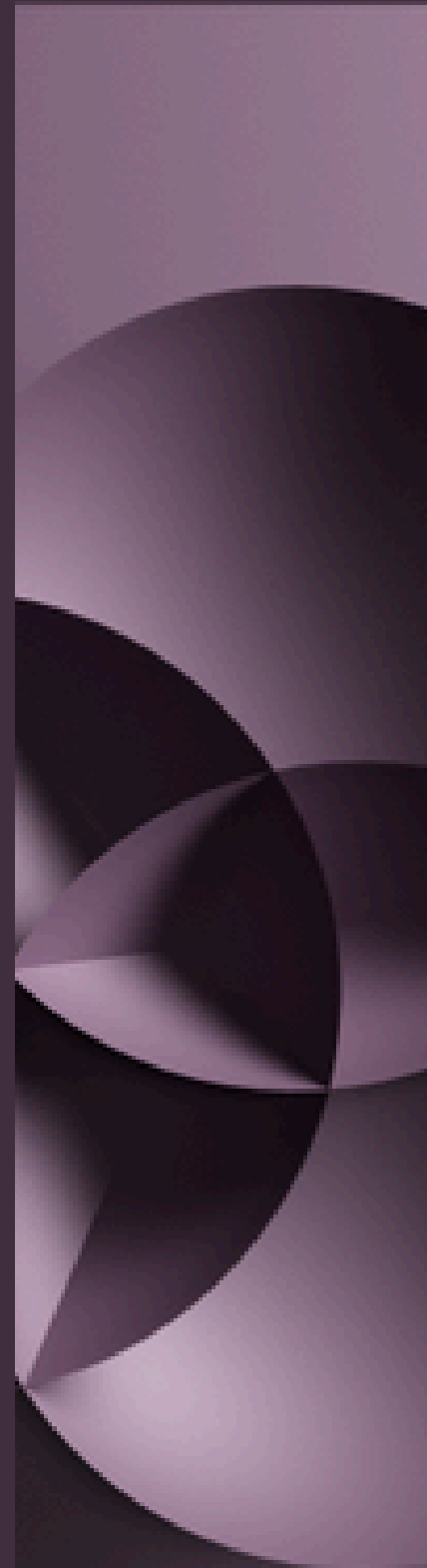
The concept of turning Commercial-Off-The-Shelf (COTS) consumer mobile devices into secure contactless terminals (i.e. SoftPOS) has been underway for more than a decade. It was given a significant boost in 2022 when PCI published its Mobile Payments on COTS (MPoC) Standard.

This built upon previous standards to provide a modular, objective-based approach to SoftPOS security when taking payments on COTS devices. Notably, it overcame the challenge of securely accepting PIN and contactless payment card data on the same device.

So, the agreement and market acceptance of standards for SoftPOS, culminating in PCI MPoC v1.1 (Nov 2024), definitely played its part in enabling SoftPOS to 'Cross the Chasm' into mainstream adoption, as Chapter 3 above details.

The truth is that many pieces of hardware and software technology have enabled SoftPOS to come of age here in 2025. This whitepaper covers many of them: NFC, TEE, Android, as well as the R&D work of mobile device innovators such as Nokia and Apple, and chip innovators including ARM Holdings.

However, to make a big bonfire you need dry wood, tinder or kindling wood, and finally a spark to set it all ablaze. The technology we described in Chapter 2 was the dry wood. The kindling was provided by those early adopters who moved early to champion wider adoption of SoftPOS. However, it's the highly tech-led neobanks and Apple itself which have together brought the creative spark, ambition, determination and consumer focused mindset which has enabled SoftPOS to cross that chasm into mainstream adoption around the world.





The importance of Apple in accelerating acceptance of contactless payments from the launch of the iPhone 6 with NFC chip onboard in September 2014, to the launch of Apple Pay the following month, simultaneous with early adoption of EMVCo's network tokenisation and finally 'Tap to Pay on iPhone' in 2022, cannot be overstated.

Apple has thus enabled the Tap to Pay evolution which has spawned Tap to Everything innovation cycles which we are now seeing. While the fast-growing neobanks have put SoftPOS, combined with Tap to Pay thinking, to work to bring the benefits of the technology to many more people, merchants and consumers alike, at an unprecedented speed.

The result is that SoftPOS market was worth US\$365m in 2024 and is forecast to grow to US\$1.24bn by 2030 (Source: Grand View Research, 2025). Once merchants are introduced to the technology, they quickly embrace it. The number of merchants using SoftPOS is thus expected to explode in the coming years to more than 34.5 million worldwide by 2027, up from six million in 2022, according to a report released in 2022 by Juniper Research. Increased merchant adoption of SoftPOS is also expected to propel contactless payments volumes to \$10 trillion annually in 2027, up from \$4.6 trillion in 2022, the same report states.

Card network Visa recently reported that its own Tap to Phone SoftPOS offering is growing by an approximate average of 200 per cent year-on-year globally. In its key growth markets of US, UK and Brazil it's seeing adoption running at an average of 234 per cent per year, according to [NFCW](#).

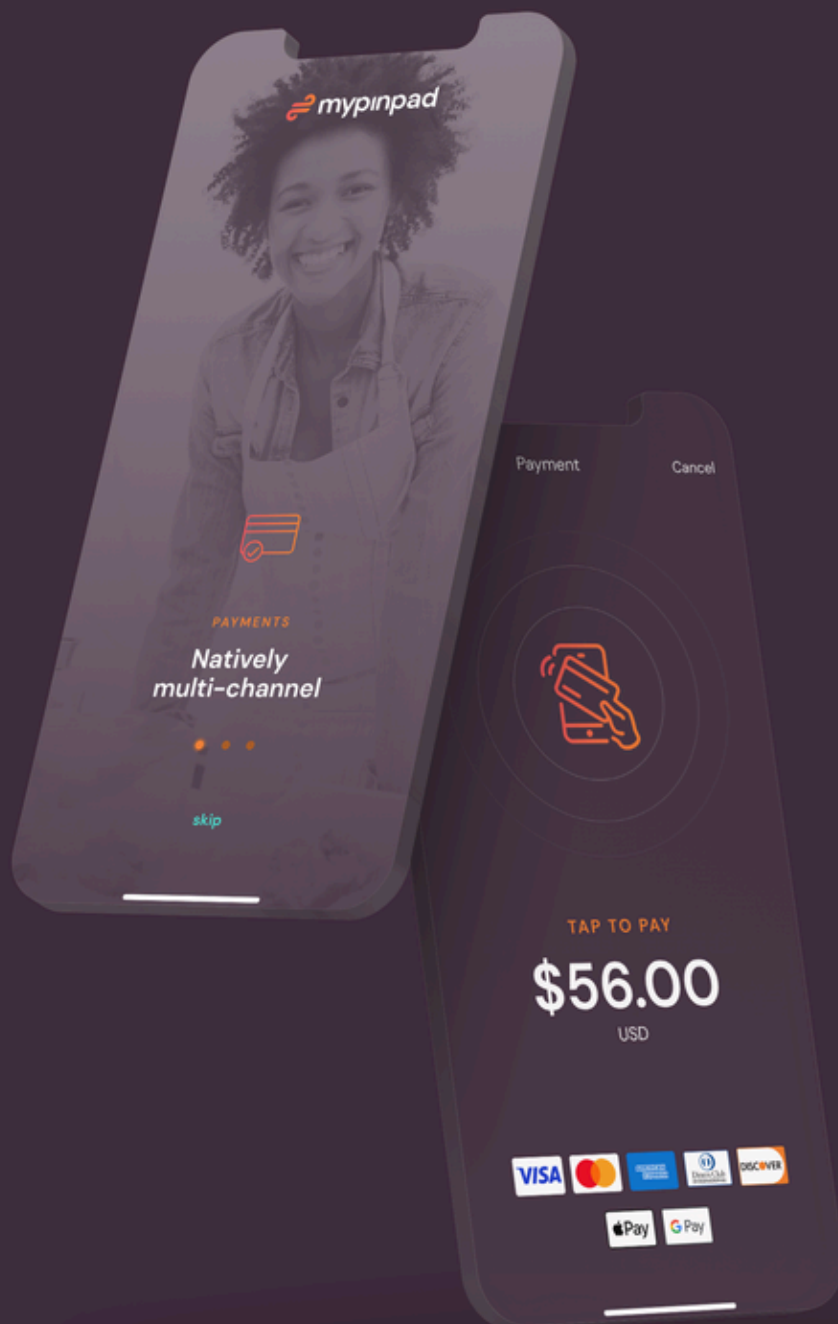
Deployment of SoftPOS is already strong amongst smaller merchants, new entrants and micro-businesses. Mainstream adoption is now seeing penetration into larger chain stores as POS hardware upgrades are greenlit. Full late majority adoption is therefore expected by 2030 at which point SoftPOS will be ubiquitous.

About Mypinpad

Mypinpad is a UK-headquartered B2B SaaS business with customers and employees in 28 countries. Mypinpad secures and processes payment and non-payment transactions for millions of users globally, making mobile transactions safe, easy and enjoyable. Its certified and patented technology is built on cloud-based open systems designed to be bank-grade secure and ready to scale, providing customers with the tools to grow and future-proof their business. By working together with partners, Mypinpad aims to drive financial inclusion for the benefit of millions globally.

To find out more, visit its website:

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