

# CRACKING THE PAYMENTS CODE

CELEBRATING  
20 YEARS OF PAYMENTS

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By **2c2p**

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# Foreword

In the fast-moving world of technology, 20 years can sound like a lifetime and a half. The year 2023 marks this special anniversary for 2C2P, which attests to the number of changes our payments company has witnessed and weathered.

2C2P was born in 2003, one year after the first payment authentication protocol was designed to facilitate secure online payments globally. The digital payments space was still very new then, and smartphones – which would popularise digital wallets – had yet to arrive on the market.

When we started, cash was absolutely king, brick-and-mortar stores dominated the retail space, and mobile networks still relied on 2G.

Fast-forward to the post-pandemic present-day, and the cashless revolution is accelerating. Southeast Asia has gone digital, with eight in 10 consumers now online, propelling a booming US\$200 billion digital economy that's on course to achieve 20 per cent year-over-year growth.



**US\$200 billion**

Digital economy that's on course to achieve **20%** year-over-year growth



Eight in **10 consumers** now online

In 2003, I fell into the payments industry by accident after being asked to code a 3D Secure solution enabling users to transact over the internet safely. Since then, 2C2P has quietly gone about our business, slowly and steadily becoming a leading payment gateway and continuing to expand across Southeast Asia and beyond. Along the way, we've notched up notable successes, such as achieving profitability each year since 2019.

I like to compare 2C2P's progress to the hare and the tortoise, as countless fintechs have come and gone during our company's lifetime. Many have spent millions of dollars trying to acquire users and are still far from becoming profitable.

## | Foreword

The word “pioneer” comes to mind. Over the past two decades, our payment solutions have reached millions of people across Southeast Asia. We’ve evolved our products to empower businesses, enabling them to adapt to the rapidly changing and increasingly fragmented payments space. And while expanding to emerging markets, we’ve helped fast-growing global enterprises reach their customers anywhere.

2C2P’s history encompasses an extraordinary digital transformation of the finance, consumer, and retail sectors. As we celebrate this year’s milestone, we have the fantastic opportunity to reflect on some of the most pivotal technological, geographical, and environmental shifts that influenced the role of payments over the past 20 years.

“Cracking the Payments Code” aims to expand our understanding of the remarkable changes that have brought the industry to where it is today. It features articles with insights contributed by our team of experts with deep payments knowledge – people I’ve been lucky to work with during 2C2P’s 20-year journey. It should be invaluable for anyone wanting to understand the evolution of the payments sector in Southeast Asia, especially those wishing to make their mark in the future.

The e-book also allows us to look at where we might go next. The emergence of new solutions like real-time payments, digital goods, and CBDCs promises tremendous opportunities.

2C2P has come a long way in 20 years, and we have yet to come close to reaching our peak. Following our recent partnership with Ant Group, our growth plans extend beyond Southeast Asia to help enterprises in other major global markets. With your valued trust and support, there’s no limit to what we can achieve going forward.

Enjoy reading, and we look forward to hearing what you think.



**Aung Kyaw Moe**  
Founder & Group Chief Executive Officer

Chapter 1:

# Ushering in the Millennium of Fintech (2C2P's Beginnings)



# Ushering in the Millennium of Fintech (2C2P's Beginnings)

Contributed by



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In the early 2000s, a massive freight train was leaving the station: it was becoming increasingly clear that the world was moving online for commerce as internet adoption became widespread, thanks to the increasing availability and affordability of high-speed broadband internet. In Thailand, for example, the number of people using the internet soared 400 per cent between 2000 to 2007.<sup>1</sup>

More people were becoming used to buying things off the internet. This made it essential for payments to adapt from a card-present offline environment to a card-not-present online environment. With each passing day, more and more individuals and businesses were hopping on board, recognising the speed and efficiency that online payments offer. Customers began to expect the convenience of being able to access their accounts and perform transactions from anywhere, at any time.

Thereafter, agile fintech startups emerged, offering new and innovative financial services that threatened to disrupt the traditional banking industry. To stay competitive, banks would need to learn how to guarantee that these transactions could be facilitated; there was no choice in the matter.



Just as a train needs tracks to guide it on its journey, the move to e-commerce required a secure and reliable payment infrastructure to seal the deal and confirm transactions. One of the main challenges for banks was ensuring that online transactions were secure and protected against fraud.

The banking infrastructure at the time was not designed to handle the volume of online transactions that were expected to occur. Many banks had to invest heavily in upgrading their IT systems to ensure that online payments could be processed quickly and efficiently. While there were basic standards for online card payments, such as inputting card numbers, expiry dates, and CVV codes, security was weak. There was no authentication layer then to verify the cardholder, such as through two-factor authentication like one-time passwords. This made it difficult for banks to guarantee that the transaction being processed was initiated by the authentic cardholder.



# Getting Around the Big Players

At the time, I was working for a bank, and a new security standard called 3D Secure (3DS) had just been announced. To minimise the risk of missing business opportunities, it was crucial to comply with these updated protocols.

The problem was the only vendors available were charging US\$1 million to US\$2 million for the proper technology. This sum was far too pricey for the bank I worked at, mainly because credit card penetration in Southeast Asia was quite low back then – and remains so today – which made paying for such a service illogical. Banks, financial institutions, and merchants were still testing out online technology and did not see its full value at this stage. I had to find a cheaper solution.

I knew Aung Kyaw Moe (who would become the founder and CEO of 2C2P) from his job as a developer at a mobile payment company. I approached him with the idea of developing a card authentication protocol (i.e., 3DS 1.0). My proposal was a significant risk for Aung: I told him that I could only pay him one baht but that the bank could be a good reference, and I would introduce his new company to many banks in Thailand if it worked out. Surprisingly, he said yes! Little did I know he had no idea what 3DS was when he took the job.

It took Aung three months to build the certified product. Eventually, he was able to sell the product to many banks in Thailand, generating enough revenue to kickstart 2C2P.





It was some years before I would decide to join 2C2P permanently. Aung kept pitching me to take a job there, but I was still working to accomplish some goals I had set out in my youth. While I was keeping close tabs on the company, I had yet to decide to make 2C2P my career.

Then, one day over lunch, Aung told me something unforgettable that inspired me to embark on an exciting new career. He said, "Khun Piyachart, whatever you can sell, I can build it." His words stayed with me and sparked a desire to challenge myself to try something new – online payments.

We were at the forefront of a fintech revolution that was gathering momentum, about to sweep through the region like a powerful and unstoppable force. The early signs of this wave were already palpable, and we could feel its energy building with each passing day.

There is a phrase in business called the "blue ocean strategy", where the biggest challenge companies face is the creation of a new market.

2C2P was entering the bluest of oceans.

# Sailing Into Uncharted Waters

We were entering a world in which online payments were still quite new. Over the course of many sessions, we worked with the Bank of Thailand to build a better understanding of these new services.

At that point in history, banks were struggling to battle fraud because all it took to make a transaction was the credit card number, expiry date, and CVV code.

A common fraud scheme was to bug payment terminals so that criminals could steal credit card information when the card was swiped. Security systems were so weak that a fraudster could buy whatever they wanted if they got their hands on basic information.





Card fraud incidents rose as digital payment methods proliferated and became available on multiple devices. Criminals had more avenues to exploit and more opportunities to increase the sophistication of their attacks, making detection more difficult.

These security concerns depressed the proliferation of credit cards in Southeast Asia. In 2021, Asia's credit card penetration rate was about 13 per cent – but 13 per cent of billions of people is still big business. 2C2P spent a huge amount of time and energy tackling merchant security concerns. We convinced a handful of e-commerce companies to come on board, and they helped us to survive until we nabbed our first airline. That first airline helped validate that 2C2P could handle high-value card transactions with security and convenience.

# Building Traction

Those first customers became crucial because they proved our product worked; they were an essential source of referrals that helped us to gain momentum.

Nobody should underestimate the importance of travel and tourism. It is one of Thailand's most significant revenue drivers, and for a young company like 2C2P, getting traction in this industry was a big deal.

References from travel industry clients gave us legitimacy, and we were able to use that to branch out to other industries.

At this point in the company's history, 2C2P had officially gained a foothold at the cutting edge of what would later become known as the fintech industry.

We were so early that the term "fintech" wasn't coined yet. We considered ourselves a payment facilitator, and while we were undoubtedly a fintech company, there was no organised sector around this environment.

Fast forward to today. Thirty-nine per cent of global bank revenue comes from online payments, according to McKinsey. In Asia, that percentage translates to US\$210 billion in total revenue. Fintech has arrived and flourished.

The other crucial moment for 2C2P was recognising the importance of smartphones. We saw it early and instructed all employees that their work must be built for smartphones first and that PCs would be a secondary consideration.

If online payments were the first wave that 2C2P rode, the rise of mobile payments was the second. Those devices in our pockets fundamentally changed how the internet worked in Southeast Asia, as tens – if not hundreds – of millions of people got online for the first time, skipping desktops or laptops. For a payment processor, this opened an entirely new opportunity.



**US\$210 billion**

Total global bank revenue coming from online payments.

# A New World With Fresh Challenges

Today, fintech dominates every aspect of our lives. In 2015, [Forrester](#)<sup>2</sup> predicted that online and mobile-based purchases in Southeast Asia would surge to US\$22 billion that year, with 175 million consumers in the region having access to smartphones. By 2025, a [study](#)<sup>3</sup> reported that Southeast Asia's internet economy is expected to reach US\$360 billion, fuelling digital payments adoption.



**400 million+**

The number of internet users in Southeast Asia by 2020.

As much as digital payments have improved our society, however, there are many challenges and complexities to address, especially as more payment players and technologies enter the fray.

These include navigating the growing fragmentation of the payments landscape, where multiple operators vie for market dominance, simplifying cross-border payments as more companies adopt digital payments, and learning how to leverage new payment methods.

We are fortunate to be at the forefront of payments technology. Our experience enables us to fill the gap for banks and merchants – to be the first port of call when they choose to embark on their fintech journey.

We are still in the early days of digital payments, as hundreds of millions of people have yet to use the technology. Their adoption – plus improvements in creativity and technology – make it a fascinating ecosystem to watch for the next decade.

Chapter 2:

# How Travel and E-commerce's Rise Impacted Payments



# How Travel and E-commerce's Rise Impacted Payments

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When the World Wide Web was released into the public domain in 1993, few could have predicted its tremendous impact on society. Today, the internet has influenced every aspect of our lives, enabling us to trade and communicate in many new and different ways – and at an exponentially faster pace than before.

In the early days, the internet was still uncharted territory. Beyond creating a digital page to showcase their products and services to drive traffic to their physical shops, most businesses were unsure what else it could be used for.

There were those, however, who understood the internet's untapped potential and adopted a more enterprising approach. They used the tools of the web and built new, innovative business models. Some of these young startups, such as Amazon and eBay, would become major players in the world of commerce today.





These internet companies revolutionised consumer behaviour, particularly in the travel and e-commerce sectors. Through their online platforms, they offered consumers the convenience of booking airline tickets or ordering household necessities from the comfort of their homes.

To attract customers to their platforms, these internet companies sought ways to make the online payment process as intuitive and secure as possible. Achieving this required a robust digital payment infrastructure, which was not available at the time.

This pursuit of a seamless payment experience ushered in a new era of payment innovation, leading to a surge in digital payment adoption.

# Establishing Trust: The Early Stages of Digital Payments

Today, making purchases and payments online has become second nature. However, back in the 1990s and 2000s, digital payments were a new and unfamiliar concept, and consumers were sceptical. Concerns arose regarding the potential theft of bank details or other sensitive financial information, as well as uncertainties surrounding the delivery of purchases and the possibility of obtaining refunds.

These worries were not unfounded. The nascent digital payment infrastructure was rudimentary and fragmented, lacking standardised protocols and a robust security framework. Additionally, the absence of a regulatory body to oversee and govern its development exacerbated these challenges.

To further compound that problem, in Southeast Asia, many residents – especially those in developing regions – did not have access to credit cards or bank accounts, making buying online nearly impossible.





Still, global card schemes like Visa and Mastercard saw the internet's potential and worked alongside technology companies to create a common protocol that would make online card payments more secure, resulting in the first payment security protocol, Secure Electronic Transactions (SET).

With SET, the buyer's card details were encrypted during each transaction. Merchants could not view the customer's card details and instead received a special code to verify the transaction with the bank.

SET was the precursor to the 3D Secure (3DS) protocol, developed by Arcot Systems in 1999. 3DS added an additional layer of security by verifying cardholder transactions using an XML-based (Extensible Markup Language) protocol sent over an SSL (Secure Sockets Layer) connection, which offers stronger authentication and encryption mechanisms. Developing 3DS software for a bank was also our first foray into the payments world in Southeast Asia in 2003.

# E-commerce Begins Changing the Game

Online shopping was one of the earliest drivers of digital payments growth, especially in the West. American e-commerce players like Amazon and eBay would become some of the biggest online shopping platforms in the world.

In the 90s, paying for products bought online could be a hassle. eBay required users to mail money checks or make bank transfers to pay for the items they won in auctions. This was a long and cumbersome process. eBay briefly experimented with Billpoint, a peer-to-peer money transfer service that allowed users to pay each other using their credit cards without revealing card details, but eventually acquired PayPal in 2002 due to its popularity with its users.

One key contributor to PayPal's widespread adoption in the West was its advanced fraud protection function. It operated an escrow service, or a holding account for funds. When the buyer initiates a transaction, their money is sent to that holding account, and the merchant only receives the funds once they have shipped the items, assuring customers of the reliability of online transactions.

In Southeast Asia, in the early days, consumers were not accustomed to paying online. Hence, marketplaces allowed customers to finalise payments at alternative payment touchpoints such as ATMs, convenience stores,





and other kiosks. Using familiar and trusted offline payment points helped less tech-savvy users feel more secure with making online purchases.

Customers who did pay online were wary; they sometimes called merchants and payment service providers directly to check if their payment had gone through. Many marketplaces added escrow features to assuage this fear, with an acknowledgement step to let customers know that they had successfully completed payment.

As people got more comfortable ordering online and were able to pay using a wider variety of payment methods, this new world became more approachable to the average user.

# Digital Transformation of the Travel Industry

The travel industry was yet another successful use case and early adopter of digital payments in Southeast Asia. To comprehend the impact of digital payments on the travel industry, we must delve into the industry's journey towards digitalisation. For this, let's rewind to the year 2001.

The aftermath of 9/11 saw demand for air travel drop drastically, causing record losses for many airlines worldwide. Most full-service airlines faced tightened security measures, higher airport fees, and fewer passengers, especially at major airports. As a result, the cost of operating full-service airlines shot up, and their efficiency dropped.

Low-cost carriers, however, were able to weather the downturn more effectively. These airlines could offer lower-priced tickets by trimming creature comforts like free onboard meals. By staying lean, low-cost airlines

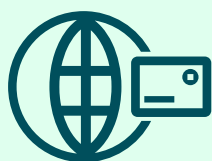


## | Fuelling Travel and E-commerce Growth

could be profitable even if they had to make budget cuts during turbulent times.

Low-cost airlines also developed an innovative model to trim overhead costs like ticket distribution: selling tickets directly to the consumer via the internet and call centres instead of using an intermediary, such as a travel agent, which is often used by full-service carriers.

In Thailand, low-cost airline Nok Air, founded in 2004, employed this model to reach consumers. But adoption was slow because the model, at the time, only allowed for payments made through credit cards.



**0.25 cards per capita**

Credit card ownership in Thailand



**3 cards per capita**

Credit card ownership in the US

This was a significant challenge in Southeast Asia because credit cards were not as popular and accessible. Credit card ownership in Thailand, for example, is much lower than in Western countries. As recently as 2021, credit card penetration in the country stood at about 23 per cent,<sup>1</sup> compared to countries with more advanced credit card ecosystems, such as the United States, which logged over three credit card accounts<sup>2</sup> per person in 2020.

# An Alternative Way to Make Travel Purchases

Nok Air tackled this pain point by implementing an alternative payment acceptance system powered by 2C2P. The Book Online Pay Offline (BOPO) system allowed consumers to make seat reservations on the airline's website and then head to a convenience store to pay in cash.

Customers had to pay within a 24-hour or 48-hour period; otherwise, the airline would release tickets to other potential buyers. This system minimised the opportunity loss from unpaid and unconfirmed tickets, which is critical to low-cost airline seat inventory management.

This was one of the earliest forms of e-commerce transactions: the ticket existed in a digital form (which could also be printed), and airlines simply needed to scan the unique barcode to verify the purchase.

Using the BOPO system enabled airlines to expand their distribution and payment collection networks easily; they could rely on partnerships with existing retailers instead of building their own physical ticketing outlets.

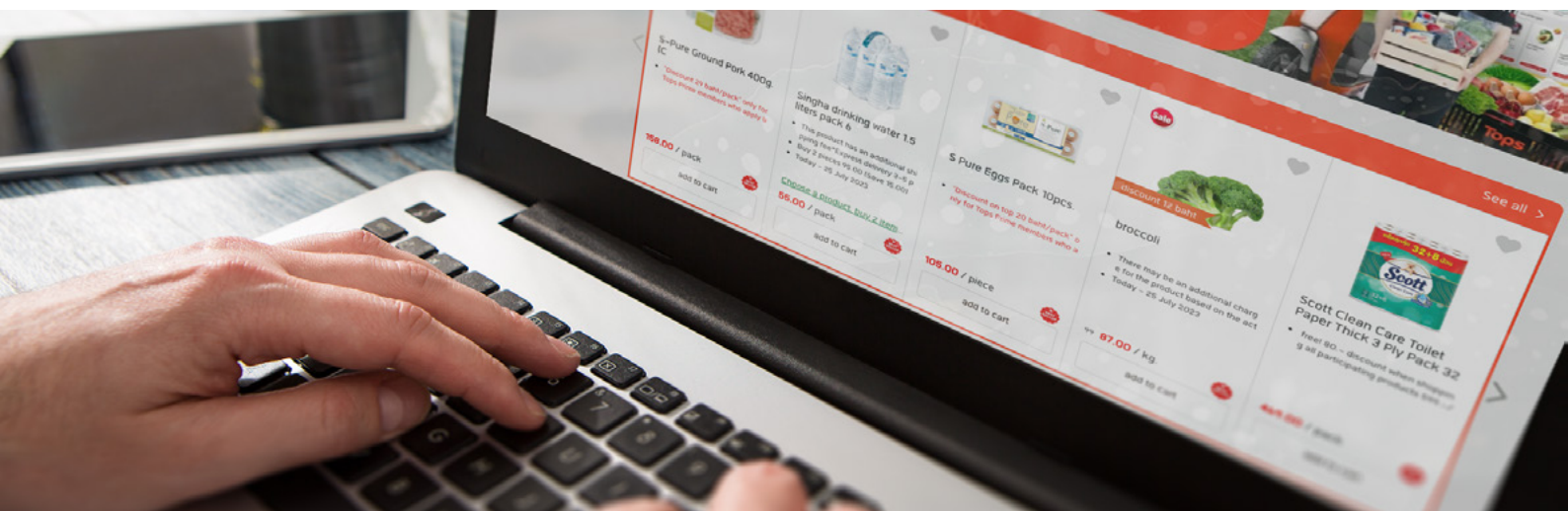




## | Fuelling Travel and E-commerce Growth

In the travel industry, the rise of online travel agencies (OTAs) such as Expedia and Agoda – one-stop shops for travellers to book flights, hotels, activities, and even purchase overseas SIM cards – further accelerated the usage of digital payments.

Improvements in digital payment technology allowed for and could cater to complex payment operational needs at the backend. For example, as airlines expanded their online product range to include ancillary products such as airport transfer, insurance, and hotel booking services, they leveraged payment service providers like 2C2P to connect with downstream/affiliate partners, such as hotels, car rentals, or retail shops, to get discounts on their products. Payment providers were able to support the splitting of payments or making payouts to multiple merchants simultaneously – enabling business processes to run more smoothly.



Payment service providers also enabled airlines and OTAs to accept local payments from customers globally while ensuring settlement in their local currencies.

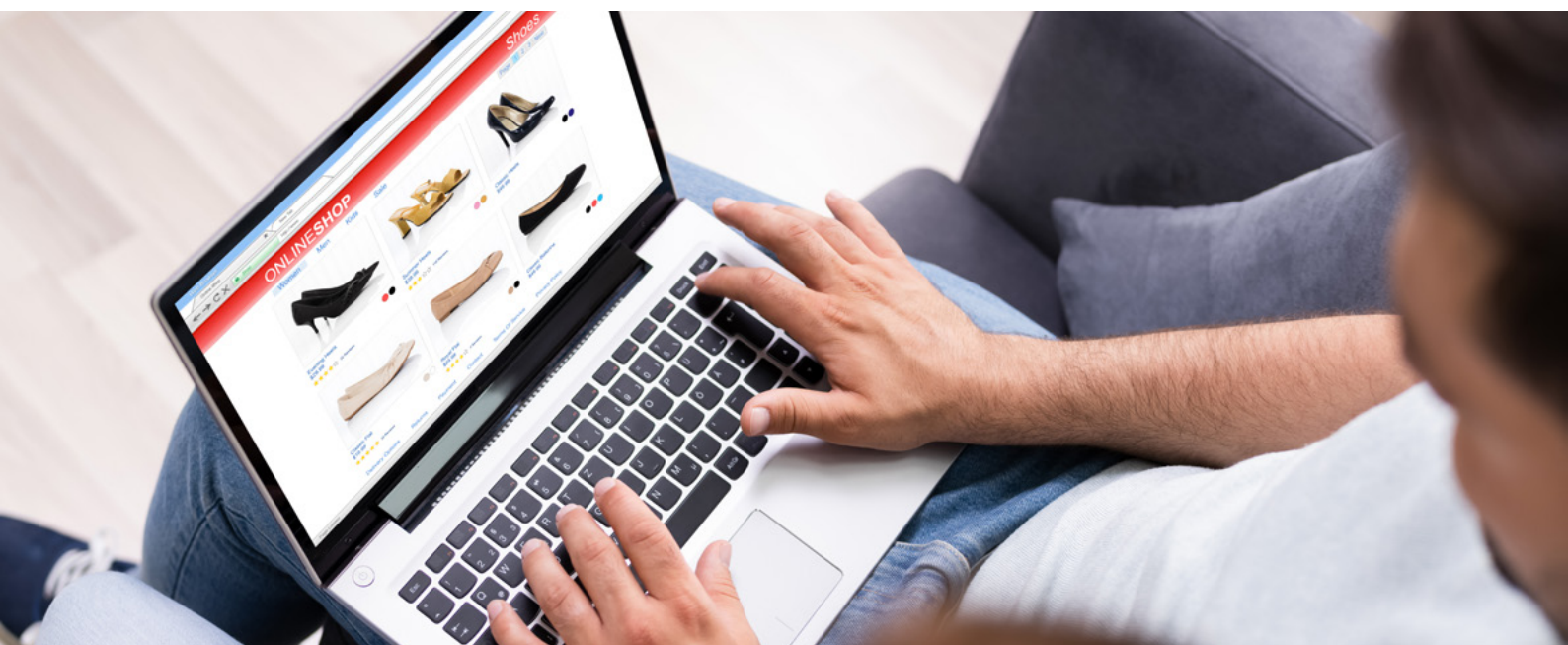
Airlines were amongst 2C2P's earliest customers. To date, we have worked with almost 30 regional and national airlines as well as the International Air Transport Association (IATA) to help them serve their customers effectively and tap into the full potential of digital payments.

# From Adoption to Acceleration

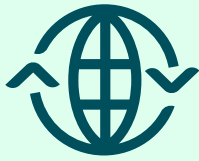
By the 2010s, making online payments had become mainstream practice. Consumers developed confidence in using their credit cards to pay online and transmitting money across the web, trusting merchants to safeguard their card details and process payments securely, and dispense goods and services efficiently.

Online marketplaces were taking off in Southeast Asia. Galvanised by the widespread adoption of smartphones and high-speed internet in the region, German startup incubator Rocket Internet began replicating eBay's and Amazon's business models across Southeast Asia. These platforms brought many domestic merchants into the digital economy for the first time.

Using platforms like fashion marketplace Zalora and e-commerce marketplace Lazada, merchants could reach more customers in their domestic market and across their borders. In addition, they now had more tools to deliver, market, and sell their products efficiently.



## | Fuelling Travel and E-commerce Growth



**US\$3 trillion**

Value of global digital payment transactions in 2017.



**3.38 billion by 2027**

Projected number of e-commerce consumers in Asia.

In 2017, global digital payment revenue surged to a remarkable value of nearly US\$1.9 trillion.<sup>3</sup> The number of e-commerce consumers in Asia also experienced an exponential rise and is projected to reach a staggering 3.38 billion by 2027.<sup>4</sup>



**91 per cent of consumers expressed that a satisfying checkout experience would motivate them to return to a merchant.”**

### **PYMNTS**

Subsequent developments in digital payments focused on providing a seamless user experience, optimising the payment journey, and scaling across markets. Companies embarked on improving the checkout process to facilitate quick and straightforward payments, which, in turn, fostered brand loyalty. According to a 2022 Pymnts survey,<sup>5</sup> 91 per cent of consumers expressed that a satisfying checkout experience would motivate them to return to a merchant.

## | Fuelling Travel and E-commerce Growth

Through payment service providers like 2C2P, online marketplaces in Southeast Asia embraced this strategy by enabling a tokenisation feature. Like the encryption technology utilised in SET, this feature bolsters data security by masking the customer's card details with a randomised string of characters. This token is securely stored in a virtual vault by the payment service provider, allowing customers to make future purchases without the need to re-enter their card information.

The advancement of payment protocols, particularly the EMV 3-D Secure, also known as 3DS 2.0, further boosted customers' ease of use and security by enhancing the mobile experience as well as prompting additional verification only when risk is assessed to be high. The multi-factor authentication process was rolled out to more platforms, including apps and digital wallets. New authentication methods, such as biometric authentication and decoupled authentication, allowed customers to verify their identity securely and conveniently.

Aside from streamlining the payment process, 2C2P also empowered marketplaces and travel businesses to enhance the user experience by expanding the range of available payment methods, as well as enabling





functions that would cultivate brand and customer loyalty. These included supporting online gift cards, vouchers, and proprietary mobile wallets. These functions proved effective in driving increased traffic and fostering recurring usage on marketplaces.

Payment innovation was not confined to the online space. As consumers became more digital-savvy, omnichannel capabilities took on greater importance. Consumers were engaging in practices such as showrooming, where customers would try products in-store before comparing their prices and purchasing online, and webrooming, where customers would conduct online research before visiting a brick-and-mortar store and buying an item. Businesses had to leverage digital tools (e.g., inventory and payment infrastructure) to adapt to these emergent trends and give customers a consistent, seamless payment experience across online and offline channels.

# Strengthening Payment Infrastructure for Scalability

The advancement of payment infrastructure empowered marketplaces and travel businesses to optimise their business processes. As these businesses expanded across the region and beyond, backend payment operations became more complex. Marketplaces, for example, aggregated vendors from different locations and would thus need to make payouts in foreign currencies.

Developments in digital payment infrastructure that simplified merchant payouts and enabled easy split payments played a critical role in accommodating the growing diversity and number of merchants and consumers.





Without a robust digital payment infrastructure, marketplaces would not have been able to expand their operations and serve multiple markets as efficiently.

The ability to route payments through different acquirers was also important. It allowed merchants to accept various payment methods and ensured that they could obtain the most optimal currency conversion rates and costs. Additionally, merchants could automatically switch to another payment acquirer if one became unavailable, ensuring uninterrupted business operations.

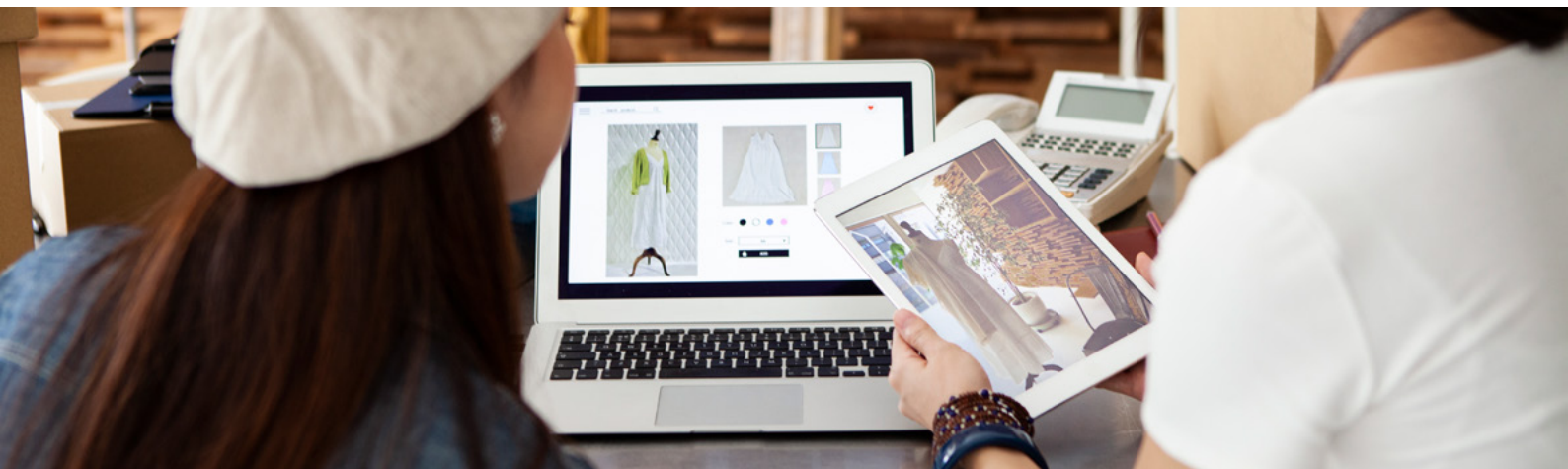
For a time-sensitive industry like the airline sector, meanwhile, it was equally essential for them to service a large and diverse base and manoeuvre between different payment service providers to get the optimal currency conversion rates. An airline needed to be able to process bookings from across multiple countries in real-time to manage their fleets and flight capacities better.

We developed our Airline Controller (ALC) solution for this purpose. Using one orchestration platform, we can smartly route payment transactions in a mix of payment modes, such as transactions of cash mixed with miles or via instalments, to different payment providers according to configurable business logic. Over 25 regional airlines and 20 OTAs are currently utilising our ALC solution.

# Synchronisation Across Multiple Channels

Today, payment technology has become more sophisticated, enabling marketplaces and travel businesses to develop an integrated system that can facilitate omnichannel management of inventory, distribution, and sales returns. Doing so allows customers to pay in-store and arrange to have items shipped back home, or buy online via an app or website and then collect these purchases in-store.

An omnichannel approach also allows merchants to manage transactions and customer data across all touchpoints easily. Merchants can optimise inventory management by tracking popular items or readjusting prices using this data.



To illustrate the flexibility and convenience an integrated merchant ecosystem offers, let's take the example of a clothing retailer. Based on transaction patterns, the retailer can more accurately stock popular or regular sizes in their physical stores while making less trending sizes available online instead. Retailers can also leverage this mechanism to order specific sizes or items from another branch and deliver them to the customer's preferred store.





# Transformative Shift

The emergence of the online travel and e-commerce industries marked a significant turning point for the payments industry. Within years, consumers adapted to making payments online via cards and, later, smartphones, revolutionising how they engage with merchants. It's remarkable to consider how cash, which has been the primary mode of payment for centuries, has been rapidly displaced by digitalisation.

As technology advances, customer preferences and business demands change, leading to corresponding developments in the payments landscape. These are truly thrilling times for us to witness and support the digitalisation of businesses and their evolving needs.

Chapter 3:

# The Advent of Alternative Payment Methods in Southeast Asia



# The Advent of Alternative Payment Methods in Southeast Asia

Contributed by



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Chief Product Officer

Even as recently as a decade ago, the idea of living in Southeast Asia without, at the very least, some “emergency cash” would have been unthinkable.

Cash would have been a requirement for anyone who wanted to eat at the local hawker stall, visit a night market, or pay for groceries at the wet market.

Credit and debit cards have been a mainstay in developed countries; that is not the case with emerging markets like Southeast Asia, where there is a large unbanked population and a lack of credit scoring processes and credit bureau coverage. Comparing the United States to Indonesia, for example, the former has a credit card penetration rate of nearly 80 per cent,<sup>1</sup> more than seven times the latter.<sup>2</sup>

## | Growth of Alternative Payment Methods in Southeast Asia

The Asian financial crisis in 1997 profoundly shocked banking institutions in the region, with the impact especially pronounced in countries with a weaker regulatory structure. For the underbanked, the instability, opaqueness, and inefficiencies of the financial ecosystem, combined with high transaction fees, meant they had little reason to switch from cash to credit cards.

That is not to say that consumers were restricted to only using cash. Before digital payment systems came into play, some alternatives to bank notes and credit cards existed. These include prepaid cards and cash vouchers, which consumers could use to top up their mobile phone credits and buy gifts.



# The Internet and the Digital Payments Revolution

Besides the low take-up of bank accounts and cards, a number of catalysts converged for innovative digital payment solutions to fill infrastructural gaps and speed up financial inclusion.

The first was skyrocketing internet penetration rates, driven by affordable smartphones and a more tech-savvy generation. In Indonesia, for example, internet users increased fivefold to 200 million between 2011 and 2021<sup>3</sup>; in the same period, smartphone users in the country shot up nearly eight times to around 86 million.<sup>4</sup> The pace of growth has only increased, with mobile internet penetration in Indonesia set to hit 80 per cent this year.<sup>5</sup>



**200 million**

Internet users in Indonesia in 2021, a **fivefold increase** since 2011.



**86 million**

Smartphone users in Indonesia in 2021, nearly **eight times** the total in 2011.

The second was that global card schemes dominated cross-border payments for a long time. Their far-reaching and sophisticated payment infrastructure and technology enabled them to determine fee structures for banks, merchants, and, subsequently, cardholding consumers. While offering unparalleled convenience for those with spending power, this also inadvertently isolated those who did not have the means to own a card or have access to a bank account.

## | Growth of Alternative Payment Methods in Southeast Asia

Geopolitical interests encouraged governments everywhere, including Southeast Asia, to construct their own domestic payment networks. These networks granted them greater control, security, and tailored offerings for local consumers and businesses, paving the way for alternative payment methods to flourish.

The development of domestic payment networks not only improved access to banks and cards, it also laid the groundwork for alternative digital payment methods to grow, pushing the advancement of traditional point-of-sale (POS) terminals and the proliferation of online payment gateways.

In the last decade, taking a cue from popular payment services in China such as WeChat Pay and Alipay, digital payment methods such as QR code payments began to take off in Southeast Asia. Across the region, mobile payment apps, such as digital wallets, grew exponentially, signalling a major shift from cash.

Today, with the growing popularity of mobile wallet players like GrabPay, Alipay, ShopeePay, and domestic real-time payment rails like Singapore's PayNow or Thailand's PromptPay, a local business owner may be genuinely surprised by a customer trying to pay with cash.



## I Growth of Alternative Payment Methods in Southeast Asia

The variety of alternative payments in the region today is massive. As a payments aggregator, 2C2P offers over 250 payment channels, including alternative payments at over 400,000 touchpoints across Asia Pacific.

In Singapore, 32 per cent of residents<sup>6</sup> use mobile wallets as a primary form of payment, while 28 per cent of people in Thailand<sup>7</sup> said they consistently use bank transfers. In the Philippines, improvements in banking infrastructure and incentives such as reward programmes helped stimulate growth in card payments, with an estimated increase of 10.1 per cent to US\$45.3 billion in 2023.<sup>8</sup>

These types of statistics could be expanded to every country in the region, highlighting how diverse it has become.



**32%**

Percentage of Singapore residents using mobile wallets as a primary form of payment.



**28%**

Percentage of people in Thailand who consistently use bank transfers.

Furthermore, even for a similar payment method like mobile wallets, there are multiple operators, each with its own standards, terminals, and integration mechanism for merchants, resulting in intense competition and fragmentation.

This was why building a single point of access to multiple payment types was so important. It reduces technical overhead and allows businesses to cater to the preferred payment method of each customer.

2C2P hence sought to make alternative payments or non-carded payment options 'Easy and Safe' for our merchants and their customers.

# Why ‘Easy and Safe’ is Core to the Mission

Making alternative payments ‘Easy and Safe’ for customers was crucial to support the spread of e-commerce in the region. It boils down to a simple question: could a grandma, or a tech-averse business owner, figure out how to use alternative payments without reading a user manual? We wanted to ensure that the answer was “Yes”.

For example, in Thailand, where we started, we turned to a technology that everyone had become familiar with, the barcode.





## | Growth of Alternative Payment Methods in Southeast Asia

We diligently followed the Thai barcode standards that had been in place for years. The merchant could simply display a barcode, and all the customer had to do was scan it with their mobile phone to pay.

The goal was to move users away from cash using a familiar and user-friendly system.

We built an alternative payment solution called '123' to help people without credit cards purchase goods online. Through 123, customers could use their preferred alternative payment method – cash over the counter, mobile wallet, mobile banking, and more.

The 123 infrastructure would allow people to commit to booking an air ticket online, receive an invoice, and then visit an ATM or convenience store to scan the barcode and finalise the purchase. Little did they know they were already using online payments.

Parts of Asia had built a habit of paying for expenses like bills at convenience stores or ATM kiosks, and it would have been difficult to immediately change this habit. In tech, it is essential to meet people where they are, so instead of fighting the convenience store or kiosk payment habit, we decided to include it as one of the options in our arsenal of payments.

Allowing people to continue their usual payment habit and use it for products bought online meant they could participate in e-commerce without fundamentally changing how they lived their lives.

Today, alternative payments like mobile wallets and mobile banking or direct debit are more user-friendly because users can customise the login interface to accept their facial and biometric details. This streamlines the





authentication process without compromising security. Compare this to cards where users have to enter their card details and a one-time password occasionally when they make a transaction.

To make it even more convenient to use alternative payments for e-commerce, 2C2P is extending the tokenization feature to include mobile wallets. This will enable customers to save and encrypt their mobile wallet details, making repeat purchases simple and secure.

As a payments player for over two decades, we have witnessed and supported the shift in how people make payments in Southeast Asia. Whether online or offline, trust remains a pivotal part of the process. Making sure our merchants' customers can access their preferred payment method and feel secure making a purchase are key reasons for our continued success.

# Unique Opportunities on the Horizon

The rising prominence of a cashless Southeast Asia is exemplified by a new reality that would have been unthinkable a decade ago: local governments are pushing for nationalised payment systems and integrating each other's systems.

The popularity of national payment systems presents opportunities and challenges to the industry.

National initiatives have played a significant part in overcoming fragmentation and making digital payments seamless. Governments have developed initiatives to standardise transactions between banks and payment apps, such as India's Unified Payments Interface (UPI) or Thailand's National Interbank Transfer Management and Exchange (ITMX).



These real-time domestic payment systems complement existing alternative payment solutions like 123, allowing the local population to make payments using smartphones and other existing payment methods such as cash over the counter and mobile banking.

This will greatly increase the usage of digital payments, as customers can easily access and make payments online and offline as long as they have a bank account or are using an accredited mobile wallet participating in the domestic payment scheme.



At the same time, the growing popularity of these national initiatives, as well as the push for their integration, could also diminish the need for other solutions already trying to support those gaps. For example, initiatives like the PayNow-PromptPay linkage could reduce the need for cross-border mobile wallets or traditional remittance solutions serving the same corridor.

There is no doubt that the increased adoption and usage of domestic real-time payments will transform how Southeast Asian economies operate. Another payment trend that has emerged in recent times is a movement towards Buy Now, Pay Later (BNPL), in which consumers can pay for their products in zero-fee instalments without owning a credit card. While credit card instalment plans have existed since a while back, BNPL enables the younger and uncarded population to break down larger ticket size purchases into smaller, more manageable sums.

Technological improvements have made this trend possible by giving providers different means to assess a customer's credit score and behaviour instead of relying solely on card or bank statements.

This spin on a conventional payment type reminded us of something we already knew: adaptation is key.

## | Growth of Alternative Payment Methods in Southeast Asia

Meeting merchants and customers where they are has always been a fundamental factor in our success. Whether this means helping people pay for goods and services through ATMs or convenience stores, facilitating credit card payments, or adapting to domestic real-time payment systems, 2C2P supports the growth of the digital payment infrastructure in the region.

Two decades ago, it would have been impossible to imagine a world where entire populations moved away from cash, where simply placing a phone near a payment terminal could buy a coffee. What was considered science fiction decades ago – using facial or thumbprint recognition technologies to pay for goods in real-time – is now so commonplace we barely register it as a modern miracle of technology. Surely, there will be continued technological developments in the next 20 years.

2C2P aims to be there throughout the entire process, constantly adapting, innovating, and improving to be the go-to payment infrastructure for the internet era. If we have learned anything in the past two decades, the goal is not to change how our customers behave but to build products that help them seamlessly adapt to an ever-changing digital world.



Chapter 4:

# From Web to Mobile - Impact on Digital Payments



# From Web to Mobile - Impact on Digital Payments

Contributed by



**Myo Zaw**

Chief Technology Officer

It has been many years, but I still remember the tactile feeling of my Nokia 3310 phone keypad with great fondness. Unlike the sleek smartphones of today with their innumerable apps, mobile phones of the past were mostly tools for communication, with little or no bells and whistles (though I certainly had a great deal of fun with the game Snake!).

When I joined 2C2P as a developer in 2005, using a phone to pay was unheard of in Southeast Asia. That is unless you count calling as a mode of transaction.



## | Payments Going From Web to Mobile

Developing payment apps for these feature phones was challenging for several reasons:

1. Their screens were much smaller
2. Their numeric keypads or T9 keyboards were tiny and not ergonomic
3. They had no WiFi capability, and using SIM data to go online was excruciatingly slow
4. They did not have the computing power to process digital transactions securely.

Back then, consumers only used desktops or laptops to pay digitally via websites. These computers had the CPU and memory capacity to power applications that could encrypt and decrypt financial data.

While 2C2P was focused on developing payment applications and protocols for the web, we also started exploring mobile integrations. One of these was an SMS-based one-time-password (OTP) authentication protocol for card payments on the web.

When we entered Nokia's "Call All Innovators" global contest in 2009, we created a mobile credit card terminal that allowed business owners to charge a credit or debit card and manage transactions securely from Nokia S60 devices without additional equipment. The application used a standard card-not-present message format, bypassing the need for the cardholder's signature. It was a novel concept, and we managed to clinch the grand prize!

This system was helpful because it removed the complicated proof-of-identity protocols and reduced fraud, building customer trust. But it was still a clunky and expensive process that required multiple devices, and people struggled to confirm their identity when travelling overseas because they couldn't receive text messages.



# The Advent of Smartphones

While we focused on developing payments for the web, we also kept a close eye on advances in mobile phone technology. As the BlackBerry phones – with their QWERTY keyboard, advanced operating system (OS), and internet service – gained steam among consumers, we realised that mobile phones could herald the next wave of digital payments.

The arrival and proliferation of smartphones a few years later confirmed this hypothesis. Since Apple unveiled the first iPhone in 2007, smartphones have become the most important story of the last 15 years, and 2C2P is successful today in part because it managed to ride this wave.

Smartphones were a giant technological leap over their mobile phone predecessors. They were essentially miniaturised computers, offering users a new world of possibilities, which included making e-commerce purchases on the go.



## | Payments Going From Web to Mobile



Smartphones gained traction in Asia – fast. Within two years of launching the iPhone in Asia in 2008,<sup>1</sup> Apple became the market leader in the region’s mobile phone space, alongside Nokia and BlackBerry. Taiwanese smartphone maker HTC followed the iPhone’s launch shortly with their release of the first Android smartphone.

The key to rapid smartphone adoption in Southeast Asia lies in Google’s decision to make its Android OS open source. This widened the playing field and lowered the barrier to entry for smartphone manufacturers worldwide. With increased brand competition came more affordable prices for consumers across the board.



**40 per cent of ASEAN was considered “online” in 2013. By the next four years, the smartphone penetration rate in Asia had topped 50 per cent.”**

### **Insider Intelligence**

Greater access to smartphones meant that more consumers could go online. According to Insider Intelligence, 40 per cent of ASEAN was considered “online” in 2013. By the next four years, the smartphone penetration rate in Asia had topped 50 per cent.

# Payments Made Smart

Payments made great strides with the introduction of smartphones. The early mobilePOS systems in the late 2000s utilised simple mobile devices or dongles that could read information from a card's magnetic chip. Merchants could also connect to these dongles via a smartphone app over WiFi, allowing them to easily record and organise all transactions and send records to a central cloud database.



**US\$25 billion**

MobilePOS systems market size in 2022.

By the early 2010s, mobilePOS systems evolved to become integrated checkout and card processing machines, with the ability to issue physical or electronic receipts. MobilePOS systems have become widely used today, with their market size surpassing US\$25 billion in 2022.<sup>2</sup>

An important driving force behind smartphone-powered payments is radio frequency identification (RFID) technology and Near Field Communication (NFC) chips.

These add short-range wireless communication capabilities to devices, enabling near-instantaneous data transfers between them. These chips also offer a card emulation mode that allows smartphones to act as contactless smart cards, facilitating payments.



## | Payments Going From Web to Mobile

However, in the early days of smartphone adoption, NFC technology was still nascent and costly to develop. As a result, only some smartphones had NFC chips installed, and many merchants did not have the resources – nor saw the need – to implement NFC payments in their point-of-sale (POS) systems.

On the other hand, QR codes, invented in Japan in 1994, were far cheaper to develop and did not require additional equipment to scale. All customers and merchants needed were their inbuilt phone cameras. Merchants could generate QR codes in a matter of seconds, and customers could access these merchants' payment details by scanning the code with their phone's camera.

QR codes helped democratise the digital economy in Southeast Asia and have been a boon for smaller merchants who did not have the means to set up expensive POS systems. For example, hawkers who traditionally only accepted cash could now accept bank transfers and digital payments without incurring extra overhead costs; all they needed to do was generate a QR code to display at their counter.





Over the years, more companies adopted NFC technologies, such as Apple (which integrated NFC tech into the iPhone 6 in 2014). With the infrastructure and ecosystem in place, paying using NFC became a viable option. Through NFC technology, users can pay for their purchases quickly by placing their mobile phones near the merchant's NFC terminal, without needing to key in their credit card pins or digital signatures. This benefits businesses as they can process more customers in the same amount of time, resulting in increased sales.

The secure chips embedded in smartphones also allow personal information to be tokenised and stored securely. Biometric authentication (i.e., fingerprints), facial recognition, or numerical authentication gave users more tools to prevent unauthorised access. At the same time, these enabled users to access payment services quickly and securely without reentering their information every time.

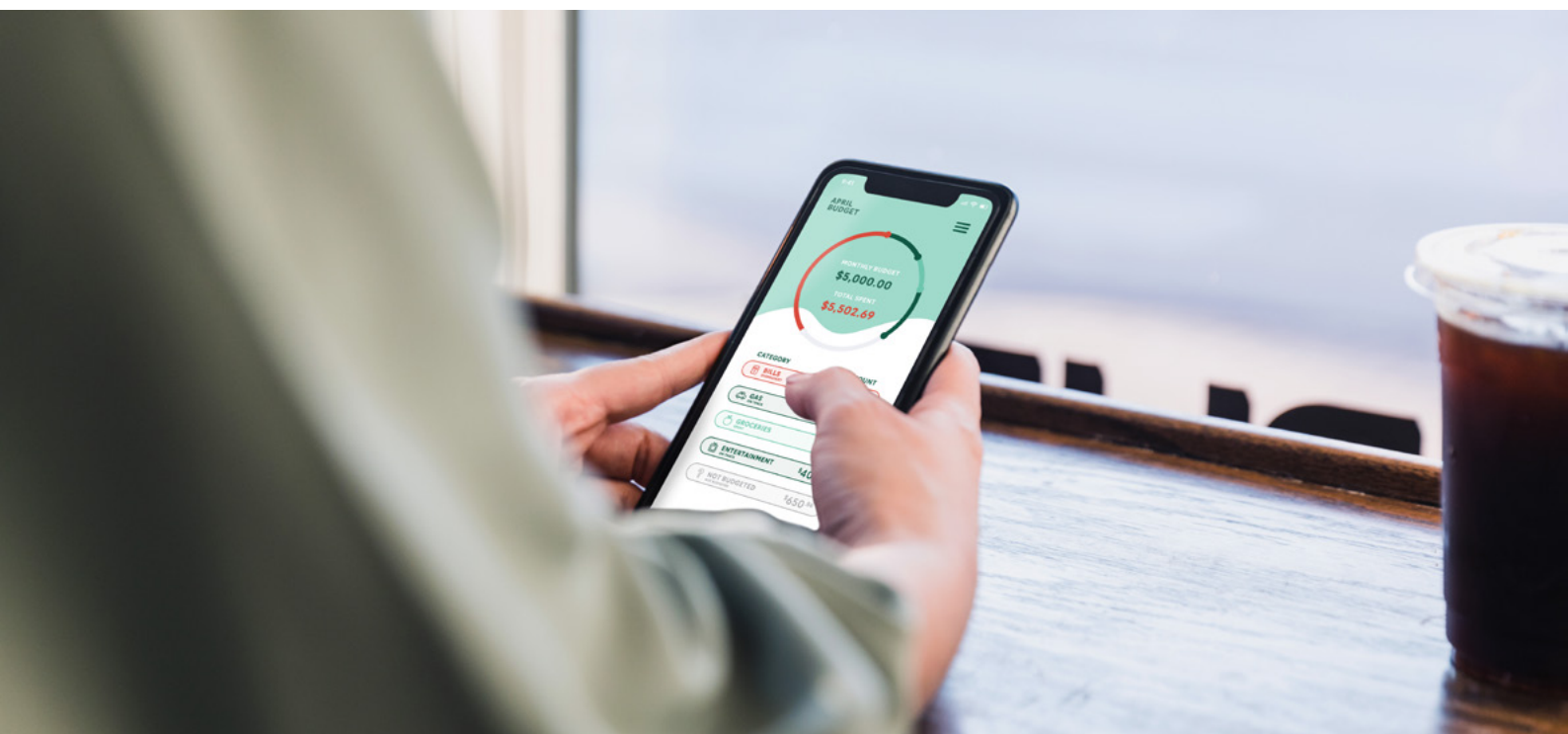
Apple Pay is one example: users can store multiple credit card details on one app and only access them through fingerprint or facial recognition.

# Personalisation Using Apps

As smartphones became more advanced, so did their operating system and apps. Subsequently, the experiences and functions they could support expanded. Instead of relying on the mobile web, which was slower and difficult to navigate, banks and merchants could develop apps that gave users a more customised, convenient, and secure experience.

With banking apps, for example, consumers can get personalised transaction alerts, track spending and deposit history, make bank transfers, open new accounts, and apply for new credit cards, all on a single platform.

What catalysed this development was the shift from native apps and Application Programming Interfaces (API) – which are designed for a specific system and purpose for optimisation – to mobile Software Development Kits (SDK), which offer a comprehensive set of tools for customisation.



## | Payments Going From Web to Mobile

Think of APIs as single Lego bricks and SDKs as whole Lego sets with instruction manuals – allowing creators to design and piece together various components as they see fit. By using SDKs like the Android SDK and iOS SDK, merchants could tailor the payment process to their business needs.

When merchants use our SDKs, we can connect them to external mobile banking and wallet applications through deep linking and redirecting. This means the customer will be automatically redirected to another payment app or gateway and then back to the merchant app once the payment is confirmed. This creates a seamless experience for merchants and customers and, in turn, encourages brand loyalty and returning customers.



Additionally, SDKs help developers document and track updates of their software systematically, enabling them to seamlessly build and integrate new functionalities on top of existing applications. This is crucial as platforms and development teams scale. SDKs create a conducive environment for effective cross-functional collaboration across multiple geographies by offering standardised tools and workflows. This enables merchants to fix bugs or vulnerabilities and implement new patches quickly – a crucial factor, given the time-sensitivity of customer transactions.

# Mobile Payments Go Mainstream

Today, banking apps have become indispensable in the banking sector. Twice as many consumers worldwide prefer banking via mobile apps instead of desktop browsers, according to a report by [Entrust in 2022](#).<sup>3</sup> Southeast Asian residents have also been among the most eager adopters: 65 per cent of consumers in Singapore prefer to use mobile banking apps, for example; in Indonesia, that figure was 71 per cent.

The same report also highlighted that consumers worldwide see mobile app availability as their second top consideration when choosing a bank, just below online banking capabilities.



65%



71%

Percentage of consumers that prefer to use mobile banking apps in Singapore and Indonesia.

Mobile wallets have also played a vital role in spurring mobile payments – whether card wallets or stored-value wallets. A 2021 Boku report forecasted a bright future for mobile wallets in Asia. It stated that the number of mobile wallet users in Asia Pacific [is expected to hit 2.6 billion by 2025](#)<sup>4</sup> – with Southeast Asia being the fastest-growing region globally. In addition, the value of mobile wallet transactions in Asia Pacific is expected to hit a whopping US\$7 trillion in the same year, a 41.4 per cent increase from 2020.

This is partly due to the immense popularity of Chinese payment services Alipay and WeChat Pay. These two apps are expected to log [nearly 2.5 billion users by 2025](#)<sup>5</sup>. These applications have become the de facto standard of payment for China's over 1.4 billion residents, allowing users to buy goods online and send money to their friends and families. Because of Alipay and WeChat Pay's large user base and the growing economic wealth of Chinese



## | Payments Going From Web to Mobile

tourists, overseas merchants have partnered with them, enabling Chinese consumers to make foreign currency payments in other countries without registering for a new service.

Google also saw huge potential in this space with the launch of Google Wallet, which enabled peer-to-peer transactions in 2011. Google Wallet users were required to link their bank or Google Pay accounts to an email or phone number to receive funds.

Subsequent mobile wallets were developed as ancillary components to other services, such as ride-hailing or food delivery, as in the case of Southeast Asian superapps Grab and Gojek. Companies like Starbucks and AirAsia also rolled out digital wallets to let users pay for goods and services in-person or online and earn rewards and discounts at the same time. This keeps the user within the brand's ecosystem, thus increasing customer loyalty.





Proprietary standalone mobile wallets also grew in popularity. 2C2P worked with Myanmar's Mandalay City Development Committee to develop Mandalay Smart Pay, a mobile wallet that allowed residents to pay taxes and bills on their mobile phones. This makes mobile wallets more indispensable as users can use them to pay for essential services.

We also worked with the Thailand Post to develop a mobile wallet that enables local merchants to receive cash-on-delivery (COD) payments for e-commerce and social commerce purchases. In addition, we developed a prepaid card with Mastercard and Thailand Post that enables merchants to speed up the fund transfer process, gain more flexibility in conducting local and overseas transactions, and boost their credit rating.

As the pandemic swept across the world and COVID-19 movement restriction protocols came into effect, online spending surged, leading to higher mobile wallet usage. Southeast Asia's strong affinity with mobile wallets is partly due to low bank account or credit card adoption rates in emerging markets like Indonesia. Some mobile wallets, such as Lazada's e-wallet, allow users to top up their credits through cash transactions at convenience stores or physical kiosks, enabling many to pay online.

# Fuelling E-commerce Growth

Though I occasionally miss the simple functionalities of a feature phone, smartphones have undoubtedly made life better and more convenient. In 2023, around two-thirds of Southeast Asia is online, with 90 per cent of those people regularly accessing the internet through their phones, according to [Insider Intelligence](#).<sup>6</sup> With more users coming online every second, digital payments have become embedded in our daily lives and sped up financial inclusion and accessibility.

Given their increased mobility, affordability, and advanced capabilities, smartphones have played an essential role in enabling online transactions, allowing users to bypass traditional payment mechanisms like credit cards.

Since 2C2P's founding, we have consistently adapted to and supported the latest payment innovations and trends. This has enabled us to develop a robust payment infrastructure to support seamless customer-merchant experiences in a mobile-first era. By giving merchants the ability to process a range of payment methods across multiple platforms, we enable them to accelerate the growth of their businesses and acquire more customers. We are excited to see what the future holds for payments technology, as artificial intelligence (AI) and augmented reality (AR)/virtual reality (VR) advancements promise to transform the consumer experience.

In the following chapters, we will dive deeper into how advances in digital payment technology have supercharged the growth of e-commerce and continue to redefine the merchant and consumer dynamic.

Chapter 5:

# How Digital Goods and Services Transformed Consumer Habits in Southeast Asia



# How Digital Goods and Services Transformed Consumer Habits in Southeast Asia

Contributed by



**Jerry Wee**  
Director, Digital Goods

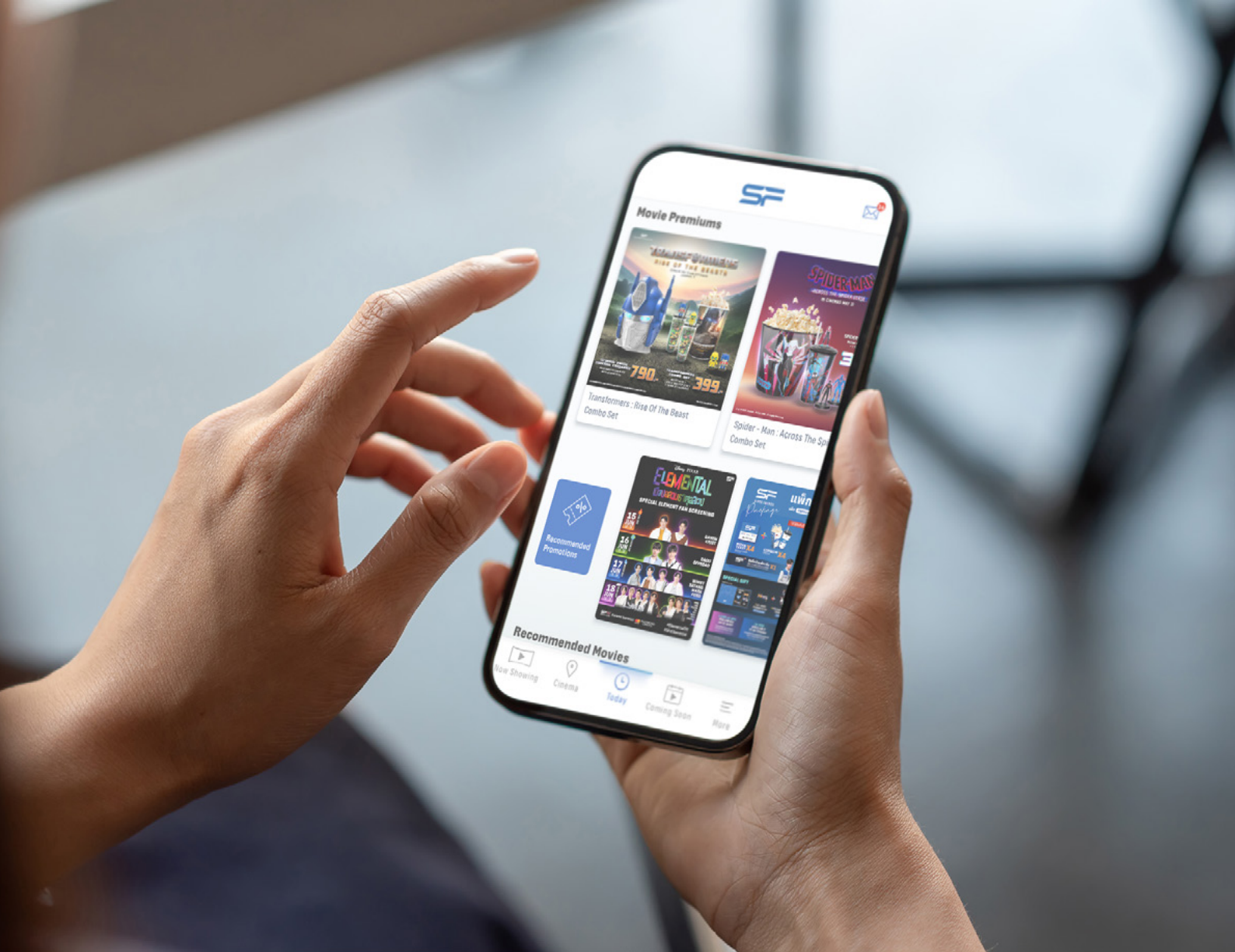


**Lynn Htaik Aung**  
Chief Product Officer

Do you remember the days when purchasing mobile top-ups for your prepaid phone or getting a gift card for Christmas involved endless queueing at the store? It's hard to believe how far we've come and how technology has made these processes so much easier and more convenient.

As highlighted in earlier chapters, the rise of digital payments ushered in a new era of unparalleled convenience and helped spark new ways for businesses to reach their customers.

This groundbreaking technological shift naturally supported the digital provision of goods and services. Consumers could buy digital goods like mobile top-ups and game tokens on their electronic devices with just a few taps. It also meant that consumers could pay for digital services like household bills and movie tickets online.



At 2C2P, we help many businesses integrate digital goods and services into their business model. This is a natural extension of the payment services we offer, with the common objective of bringing convenience to consumers and allowing businesses to grow using technology.

Our digital goods and services solutions open new possibilities for businesses, helping them to expand their product and service offerings with minimal hassle. For large enterprises, this can be done via advanced system integration; for small businesses, a simple mobile plug-in will do. By following these easy steps, businesses can focus on providing a better consumer experience.

# What are Digital Goods and Services?

Digital goods refer to a broad category of products that do not have a physical, tangible form. We see them as a stored-value form of alternative currency, including mobile top-ups, electronic gift cards, digital vouchers, and loyalty points.

Digital services, on the other hand, involve the provision or delivery of content and information between a provider and a customer, for instance, online bills or ticket purchases.

Most of these digital goods and services can be purchased and used directly on a smartphone. In fact, for many consumers in mobile-first markets, phones are their sole touchpoint.



Mobile Top-ups



Electronic Gift Cards



Digital Vouchers



Loyalty Points



Online Bills



Ticket Purchases

In Southeast Asia, where many people (especially in rural areas) remain unbanked and rely on cash, the digital goods market plays a significant role – it allows them to participate in the digital economy without needing a credit or debit card.

There are typically two processes to digital goods: issuing and distribution. Issuing involves the creation or digitisation of physical inventory to produce digital goods. Then, distribution allows global digital goods to be spread across different ecosystems, whether through physical or alternative digital means.

For instance, physical post offices and major retailers can distribute global digital goods, while smaller mom-and-pop shops can do the same. Additionally, digital platforms such as mobile wallets and mobile banking apps can distribute digital goods through their respective ecosystems.

# What are the Benefits of Digital Goods and Services?

The ease of creating and selling digital goods encouraged companies to enlarge their inventory and offer greater convenience for their customers.

Think mobile data top-ups. Instead of waiting in line to buy a physical scratch card from a retail staff member, consumers can now easily purchase their top-ups online.

The same goes for services like household bills. Consumers no longer need to plan their schedules around postal and bank branch opening hours to pay their utility bills; all they need is to log in to a website – such as online banking portals – or mobile app, enter their account details, and make the payment.

The ubiquity of digital goods and services has streamlined the customer journey: a process that took hours can now be accomplished in a minute or less. For example, the manufacturing of physical gift cards and paper vouchers typically involves extensive supply chains and administrative and inventory management processes. However, with digital gift cards and vouchers, the process is simplified, taking place digitally via electronic devices. This drastically reduces business costs and allows resources to be used for better and speedier customer experiences.





## | Digital Goods Transforming Consumer Habits

For many businesses, digital goods and services have become a vital source of revenue and enabled them to use their business resources, such as storefronts, cash flow and manpower, more efficiently.

Let's take a neighbourhood mom-and-pop shop as an example. In addition to selling physical goods, store owners could also offer digital goods and services such as prepaid mobile top-ups, digital gift vouchers, and bill payments, allowing owners to increase their product offerings with the same amount of resources and physical space.

To top it off, having a larger product offering can help store owners increase their engagement with their customers, which would lead to greater customer loyalty as they would be incentivised to patronise the store more often. The same logic can also apply to digital businesses like e-wallets or online banking applications.

Digital goods and services have also catalysed a paradigm shift in business models for several industries. For example, in the past, computer, console and mobile games traditionally made money only through one-time sales.





Nowadays, game developers sell in-game credits and game products to deliver a more personalised experience for their players, with great success. For example, the mobile gaming industry, which derives a large portion of its income from in-game digital goods, generated US\$89.6 billion in revenue in 2021.<sup>1</sup>



**The mobile gaming industry, which derives a large portion of its income from in-game digital goods, generated US\$89.6 billion in revenue in 2021.”**

Players are kept engaged with new in-game digital goods like limited-time avatars and mini-tournaments, leading to highly personalised gaming experiences. This prolongs the players' game tenure, thus allowing developers to focus on enhancing features for higher and recurring revenue instead of one-time sales.

# When did 2C2P Venture into Digital Goods and Services?

Back in 2013, we realised over discussions with merchants in Myanmar that digital goods could help them to better serve and grow their customer base.

At that point, the country, like other developing nations in Southeast Asia, had many mom-and-pop stores scattered throughout rural areas, often not serviced by large retail chains. These little stores served as one-stop shops for consumers to get groceries and access services such as mobile phone credit top-ups.



## | Digital Goods Transforming Consumer Habits

Consumers primarily used physical scratch cards to top up their mobile phone credits and paid for them using cash. There were a couple of problems with this arrangement. These stores were spread out nationwide and had significant logistical inefficiencies, so suppliers (such as billers and mobile operators) faced a distribution challenge.

Because digital goods and services were still a nascent product category, consumers were naturally sceptical at first, especially when mobile penetration rates were still low. In 2015, we started providing over-the-counter (OTC) mobile wallets to retailers, enabling customers to access digital goods at the shops.

Education was a key phase of the onboarding journey; we took time to meet with the retail store owners to explain the value proposition of OTC mobile wallets and digital goods and address any queries or technical challenges they had.

Patience was also critical. We worked with one of the biggest retail chains in Myanmar to integrate digital goods into their point-of-sale (POS) systems. At first, they were hesitant to roll them out, but after two to three years, digital goods became their highest-selling items.

The market opportunity for digital goods in Southeast Asia is massive. We have partnered with thousands of local small and medium-sized enterprises (SMEs) to distribute digital goods across Thailand, Myanmar, and the Philippines, with plans to grow into Vietnam and Indonesia.

In addition, we are helping digital goods issuers make further inroads into Southeast Asia by connecting them with more distribution channels, allowing more consumers to purchase their digital goods easily.



# The Future of Digital Goods and Services



Across the region, our technology is helping retailers plug a gap in their infrastructure. As a major digital ecosystem player, witnessing this transformation unfold over the last few years has been a fantastic journey. We will continue to find new ways to strengthen the value of digital goods and services – creating more synergy between suppliers, distributors and consumers.



**The rise of digital goods and services represents a marked shift in how consumers buy and access essential and lifestyle goods and services.** ”

Chapter 6:

# Real-Time Payment Networks: Born From Necessity



# Real-Time Payment Networks: Born From Necessity

Contributed by



**Jade Yuen Lim**  
Director, Product



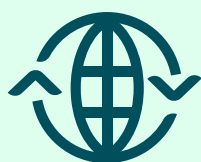
**Piyawit Manpanpanich**  
Deputy Director, Product

Sometimes digital disruption can happen so smoothly and efficiently that we carry on as if it's always been there. We were both pleasantly surprised when we first encountered real-time payments, whether it was the ease of using PayNow in Singapore to buy items via Facebook livestreaming or the speed of receiving Thai tax returns through PromptPay. Our first impressions were that it made our lives far more straightforward and better – real-time payments immediately became our new normal.

More often than not, people drive digital transformation. Across Southeast Asia, we've seen how consumers have been quick to embrace digital disruption and alter hard-held habits and traditions if it solved real-world problems and brought beneficial outcomes.

## | Real-Time Payment Networks: Born From Necessity

In Singapore, for example, it's a Chinese New Year (CNY) tradition for married individuals and elders to hand out ang bao (red packets) to juniors and singles to wish them luck and happiness. Social distancing concerns amid the COVID-19 pandemic temporarily stopped this practice, encouraging the adoption of CNY e-gifting. The shift seems to have become popular, with banks reporting a 30 per cent year-on-year rise in digital red packets in 2023.<sup>1</sup> More and more individuals – including older people – are enjoying the ease and convenience of sending e-angbaos to recipients via PayNow, Singapore's real-time payment (RTPs) network, using just a mobile number.



### 8X

RTPs will shape the future Southeast Asian payments landscape, with transaction values climbing eight times from **US\$1.4 trillion** to **US\$12.9 trillion** between 2021 to 2026.

RTPs have proved an incredible success story in record time, with PayNow, for example, only launching in 2017. From buying kopi (local coffee beverage) on the way to work and paying friends for lunch to settling household bills online, PayNow has rapidly become integrated into Singaporeans' daily lives. According to the IDC InfoBrief, "How Southeast Asia Buys and Pays 2022: New Opportunities, Connectivity, and Risks", RTPs will shape the future Southeast Asian payments landscape, with transaction values climbing eight times from US\$1.4 trillion to US\$12.9 trillion between 2021 to 2026.

So how did this payment method become so popular with consumers and businesses in such a short time?



# The Rise of RTPs

RTPs were born from a need for swift, reliable, transparent local payment networks. With cash payments losing popularity as many transactions no longer occur in person, consumers and merchants needed new payment methods. The increasing adoption of smartphones and fast-growing e-commerce has also driven the uptake of RTPs. Conventional transaction methods like wire transfers could take several days to clear and lack transparency, with friction leading to uncertainty and low levels of trust. Overcoming this friction was crucial for digital payments to succeed.

“Real-time payment” refers to a near-instant account-to-account fund transfer initiated and settled between banks. RTPs operate 24/7, 365 days a year, making it possible for consumers to make payments at any time, according to their convenience. When a domestic payment is made, the initiating institution sends a message to the receiving institution, after which the transfer is settled electronically. As such, domestic payments can often be settled instantly or within 24 hours.

## Real-Time Payments (RTPs)



Local payment networks provide lower-cost options to international payment networks, too. Cross-border payments are typically made using the correspondent banking model, in which payments pass along a payment chain that often spans three to four banks. Cross-border payments pass through many hands and thus typically cost more to process than domestic payments. RTPs can eliminate potential delays,



mistakes, and unnecessary charges due to incorrect details provided for wire transfers.

RTP networks are also open-loop, meaning that transactions are not limited to a specific financial institution. Users can make payments as long as their bank participates in the network.

A few decades ago, international credit card schemes or networks reigned supreme. However, their decision not to extend their network for cash withdrawal – an ATM network, in other words – proved highly significant due to the high costs involved. That's because the ATM network is a crucial infrastructure that came to power domestic RTP networks.

Governments of larger nations had begun to consider the need to take charge of domestic payments. Developing a domestic payment network was driven by national interest to maintain sovereignty over local-to-local transactions for these countries.

Russia came up with Mir, India with RuPay. Today, over 60 live RTP systems cover 65 countries and territories worldwide, including PayNow in Singapore, PromptPay in Thailand, and InstaPay in the Philippines. All these markets upgraded their domestic ATM systems into RTP networks.

Given how rapidly the RTP landscape has evolved, it's clear that catering to RTPs is no longer simply a nice-to-have. Instead, it is now a must-have in every merchant's business strategy.

# What's Driving the Growth of RTPs?

While government intervention paved the way for RTPs to flourish, other factors have also contributed to their growth.

According to [Deloitte's real-time payments report](#),<sup>2</sup> technological innovation is a key driver of RTPs growth. Everyday users' needs spur developers to innovate further and transform RTPs.

We already see this playing out through QR code payments. You only need a camera-enabled smartphone to scan these iconic black-and-white pixelated squares of code to make payments. Once a code is scanned and the transaction is confirmed, the payment is instantly delivered to your intended recipient in real time.

With over 86 per cent of the global population owning smartphones today, QR code payments are helping to drive financial inclusion, giving the unbanked and underserved access to efficient and easy digital payments.

According to [Juniper Research](#),<sup>3</sup> the global spend via QR code payments is projected to reach over US\$3 trillion by 2025, up from US\$2.4 trillion in 2022. Much of this projected growth can be attributed to an uptick in accessibility and adoption in developing regions and the provision of a viable payment alternative in developed areas.

The same report also found that national schemes are pivotal to the growth of QR code payments. This is because national schemes tend to encourage ease of use for the consumer and prioritise increased interoperability.

Undoubtedly, RTPs will continue making strides to make payments easier and more accessible for everyone.

It's interesting to see how different examples of RTP networks operate in Asia. Let's take a look at three examples.

# India's UPI

Launched in 2016, India's UPI was developed by the National Payments Corporation of India (NPCI), a specialised division of the Reserve Bank of India.

UPI is a world leader in RTPs, racking up US\$173 billion worth of transactions<sup>4</sup> in May 2023 alone. A real-time payments report<sup>5</sup> by ACI Worldwide found that India's UPI processed 89.5 billion RTP transactions in 2022, which accounted for nearly half of the global total.

What makes UPI such a compelling success are its convenience and speed. With UPI, the fuss of remembering long bank account numbers is eliminated – all that's needed is the intended recipient's name and linked phone number, along with the applicable login and UPI PINs.

Furthermore, UPI's versatility means you don't have to go through the hassle of downloading too many apps: you can use it with every payment service provider (PSP) app in India.



**US\$180 billion**

Approximate value of consumer transactions facilitated by UPI in May 2023.

**89.5 billion**

RTP transactions in 2022, which accounted for nearly half of the global total.

## | Real-Time Payment Networks: Born From Necessity



More recently, a new UPI 123 service was launched, which lets you make RTPs offline. With this service, real-time payments can be made via feature phones, which lack the sophistication of smartphones.

These phones are much cheaper, accounting for the 320 million feature phone users recorded in India in 2021. UPI 123 serves as a way to enhance the inclusivity of India's financial system, giving people with limited to no internet access to digital payments.

UPI and India's RTPs capabilities have also been augmented with QR code functionality. This helps pave the way for further digitalisation of India's payments ecosystem.

QR code payments have been very well received in India. The previously cited Juniper Research projected that the transaction value of QR code payments in India will rise from US\$62 billion in 2022 to US\$125 billion in 2026.

Given how UPI has developed and continues to evolve, its position as a role model in the world of RTPs is well-deserved. Its success has inspired Southeast Asia to follow its example, with many countries in the region developing their own RTP systems.



**US\$125 billion**

The projected transaction value of QR code payments in India in 2026, double the figure in 2022.

# Thailand's PromptPay

PromptPay is one of Thailand's most popular payment methods. According to the same ACI Worldwide report mentioned earlier, Thailand ranked fourth globally for RTP transactions in 2022. That's 9.7 billion transactions, facilitating 2.08 per cent of Thailand's GDP that year.

PromptPay was launched as part of the Bank of Thailand's broader Payment Systems Roadmap, which aims to make digital payments the preferred choice for Thais.



Like India's UPI, Thailand's PromptPay is easy to use with a national ID card or phone number. Money transfers are nearly instant, too, making payments that much faster.

The speedy ease of PromptPay coupled with Thailand's tech-savvy population is a perfect match. PromptPay was very well received by the Thais, who transferred at least 4 billion baht in 7.5 million transactions just four months after its launch.

**4 billion baht**

in 7.5 million transactions just four months after its launch.

**13 million**

Number of transactions using Thai QR by 2020.

Similar to India, Thailand further boosted its RTPs capabilities with QR code functionality. The Thai population widely embraced Thai QR. By 2020, Thai QR was used to make over 13 million transactions.

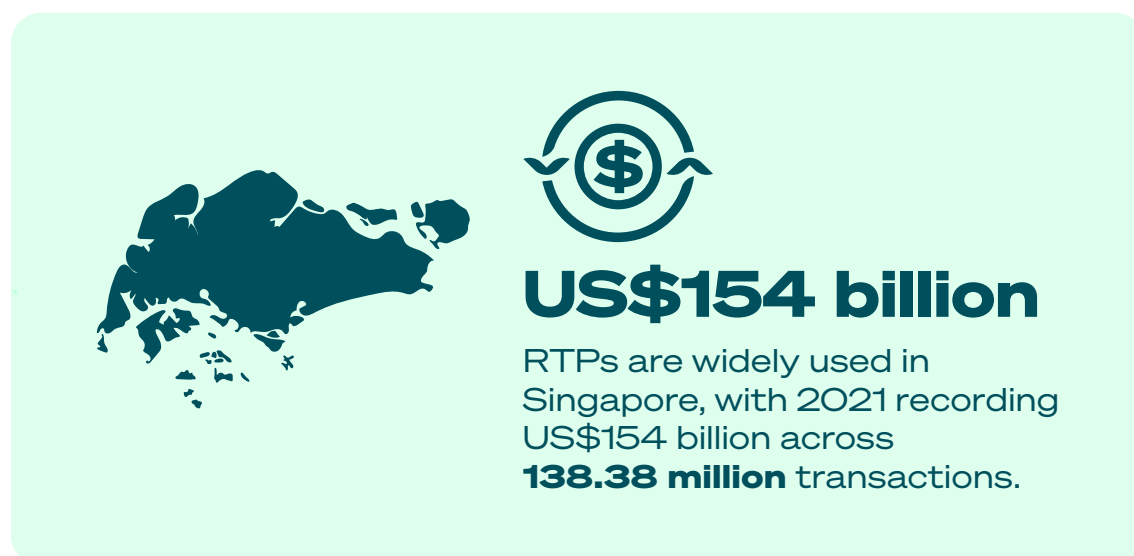
# Singapore's FAST and PayNow

Singapore was an early adopter of RTPs, with Fast And Secure Transfers (FAST) launched in 2014 and PayNow in 2017. Today, RTPs are widely used in Singapore, with 2021 recording US\$154 billion across 138.38 million transactions. This is up from US\$110 billion across 93.24 million transactions in 2020.

PayNow is a more streamlined version of FAST. While FAST requires users to know their recipient's bank account number, PayNow removes this friction. Like UPI and PromptPay, one only needs the recipient's phone number to transact.

Like its RTP neighbours, PayNow has also been augmented with QR code functionality. Consolidated under SGQR along with other payment schemes, PayNow is available as a real-time payment option at most merchants like hawker centres and shopping malls in Singapore.

While RTP networks have already been a resounding success in many countries, they continue to evolve to enhance their usability.



# EMVCo's QR Standards

The proliferation of QR payments and RTP networks has necessitated the industry coming together and putting forward a common set of guidelines for participating players. EMVCo has done precisely that. The global technical body facilitating the worldwide interoperability and acceptance of card-based payment products, EMVCo is collectively owned by American Express, Discover, JCB, Mastercard, UnionPay, and Visa. It is the go-to for all payments standards, whether card-present, contactless, mobile, or others. The success of QR real-time payments has long caught their eye, beginning with Alipay and WeChat Pay's use of this technology.

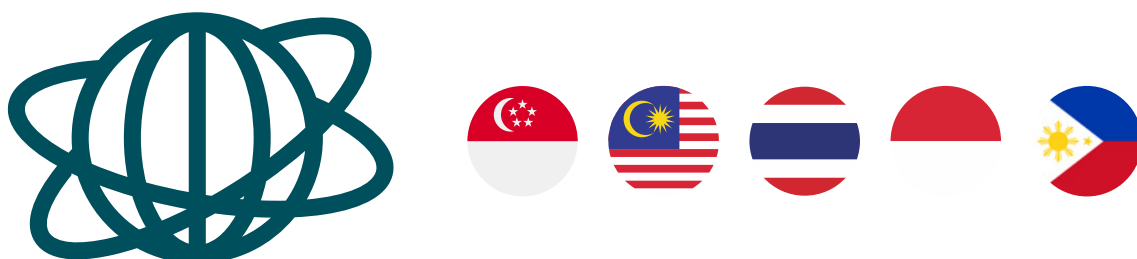
This led to the birth of the EMV QR Code standard in 2017. Available to every country worldwide, it standardised QR code payments through common guidelines, simplifying their development and expanding global acceptance.

This standard was the catalyst for many QR payment systems around the world. Southeast Asia was no exception, with Singapore's SGQR and Thailand's PromptPay QR quickly entering the scene.





# Interoperability of QR Payments Across Southeast Asia



EMVCo's common QR standard helped more countries kickstart their own QR payment networks and paved the way for all these networks to be connected. We already see this unfolding in Southeast Asia. In July 2022, the central banks of five Southeast Asian countries forged an agreement to link their payment systems – an answer to the region's fragmented payments landscape.

This agreement – connecting Singapore, Malaysia, Thailand, Indonesia, and the Philippines – will enable cross-border QR payments in people's local currencies without having to use US dollars as an intermediary currency. This means that there will be seamless interoperability between the five markets, where currencies are directly exchanged.

In turn, hidden fees and unfavourable exchange rates are eliminated from the payment equation. Your money is debited directly from your home bank account to the merchant's local account. This process is completed in a snap with your smartphone and the relevant QR codes.

In the future, a Thai tourist could be dining at a restaurant with some friends in Indonesia, and they will use PromptPay to settle the bill. Their payment

## | Real-Time Payment Networks: Born From Necessity

will be directly exchanged between Thai baht and Indonesian rupiah. US dollars won't factor into the equation, which means no extra costs incurred from poor exchange rates.

As Ravi Menon, managing director of the Monetary Authority of Singapore (MAS), remarked:



**[The agreement is a] public good infrastructure which improves financial inclusion, enhances efficiency, and creates new business opportunities for all citizens.”**

### **Ravi Menon**

Managing Director, Monetary Authority of Singapore (MAS)

Indeed, interoperable QR payments are the first big step in bringing the world closer together through cross-border payment functionality. This interoperability is set to expand to real-time bank transfers and even the rest of the world. It has already begun with the reciprocal link between Thailand's PromptPay and Singapore's PayNow. PromptPay has since been connected with Indonesia, Malaysia, Vietnam, Cambodia, and Japan. In Singapore, PayNow is planning a link with Malaysia's DuitNow.

As yet, it bears mentioning that such linkages do come with limitations. For example, the Singapore-Thailand linkage has a transfer amount capped at up to US\$800. Some other vital pieces of the puzzle have yet to be defined entirely, so there's still plenty of room for all stakeholders to figure out a common standard.



That said, by achieving seamless RTP interoperability across borders, we can realistically see the elimination of the costly and complex correspondent banking system.

Thanks to these government-initiated real-time payment networks, the private sector can make paying within and across borders cheaper and faster.

With RTPs and QR payment systems already expanding globally, it will be interesting to see how they continue to develop.

# RTPs Set to Grow

Currently, RTPs require the customer to initiate the transaction, log in with their ID/password and provide authorisation or confirmation for the transaction to be processed. Further technological advances that can secure a customer's bank/wallet information will likely be introduced. These factors will encourage RTPs to provide tokenization services to merchants and payment processors. At the same time, merchants increasingly need to provide a more streamlined shopping experience to retain time-poor customers.

Overall, as more and more new RTP services come along, we can expect consolidation between them. This is likely to have a positive impact on the payment industry, creating a better user experience.



Chapter 7:

# New Digital Normal: How the Pandemic Accelerated Digital Payments



# New Digital Normal: How the Pandemic Accelerated Digital Payments

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The impact of COVID-19 was unforeseen, unprecedented, and indiscriminate.

In mere months, hotels and airlines across the world saw their bookings nosedive. International arrivals to Southeast Asia logged a 98 per cent drop<sup>1</sup> between 2019 and 2021. Retailers were forced to slash their opening hours, and sales plunged; malls became ghost towns.

The lockdowns and social distancing restrictions enacted in 2020 caught all businesses flat-footed; income streams dried up, and scores of workers were furloughed. Companies had no choice but to be nimble and find new ways to generate sustainable sources of funds to remain afloat and stay relevant.



**98%**

Drop in international arrivals to Southeast Asia between 2019 and 2021.

Without any physical traffic, many businesses ramped up their online efforts to keep customers coming in. In many cases, this also meant offering new products and services requiring additional infrastructure.

To build this infrastructure and ensure an enriching customer experience, several fundamental components were needed: an intuitive user interface, enticing products, and a robust and secure payment gateway that supported a range of popular payment methods.

# For Sale: Prepaid Bookings and Airplane Souvenirs

Like many others, one of our clients, a major hotel group, was faced with the problem of generating enough funds to keep their properties afloat. With travel at a standstill and lockdown policies in place, rooms were left empty.

But what if the company could get money from potential future occupants immediately?

Our relationship with this hotel group began in 2019, when we were asked to install a suite of digital payment solutions to process its hotel bookings. It was fortuitous timing since COVID-19 struck soon after. That short but precious period gave us enough time to become familiar with the hotel's backend systems and think of complementary solutions.

After several consultations, we decided to implement a customised virtual voucher system. These vouchers offered prepaid hotel bookings. In addition, customers could get additional benefits like discounts on bookings.

The vouchers represented a future commitment to the hotel group's customers; we needed to ensure





## | Pandemic Accelerating Digital Payments

that they could easily validate and redeem their vouchers at a future date. More importantly, the entire process had to be seamless so properties could receive the funds promptly.

Using our consolidated payment gateway and virtual card issuing capability, the hotel could process transactions fast and disperse the funds to its portfolio of hundreds of properties across multiple markets.

Besides that hotel group, we worked with another major travel player, a national airline, to scale its digital efforts. When its fleet was forced to sit idle at the airports, it turned to alternative e-commerce channels to build new revenue streams. The national airline started selling souvenirs from its planes, from napkins to in-flight meals and even actual aircraft seats. During this period, the airline auctioned off these goods on social media.



We implemented a system that generated a payment link for the customer. A customer representative from the airline would log in to our payments portal and create a new invoice. They would then input the sum of money to be paid and send the URL (web address) of that invoice to the customer.

It was a simple process, and it helped the airline weather the pandemic before it could take to the skies again.

# Pivoting from Foot Traffic to Online Traffic

Beyond travel businesses, we saw many brick-and-mortar retailers turn to e-commerce, even those in the luxury line. With malls closed during the lockdown, retailers that relied on walk-in customers, such as F&B outlets and clothing stores, could not generate income.

These companies needed to pivot their business model to reach a sustainable level of transaction volume. It was imperative for them to take advantage of the pandemic-fuelled online shopping surge. This meant relying less on cash transactions and adopting various online payment options like QR codes and mobile wallets.

We helped a luxury fashion brand in Singapore include a payment option in its promotional emails. This simple add-on enabled customers to quickly order and pay for their items online. We also advised them on the most suitable digital payment methods. For example, while popular amongst many e-commerce and retail brands, Buy Now Pay Later (BNPL) was unsuitable for this particular brand due to its low transaction cap limit.

Automobile dealerships also started putting their cars online as showroom traffic dwindled. Using online payment methods, they could take deposits on new orders and payments for car servicing. Using our email payments solution, QuickPay, as an example, dealerships could process transactions just by logging in to our merchant portal.

For smaller dealerships that did not have an in-house digital payments system, our QuickPay solution saved them the trouble of sourcing a new payment vendor and onboarding them to their website, which could take one to two months. Without any physical transactions coming in, even a week's delay could result in a substantial loss of income.



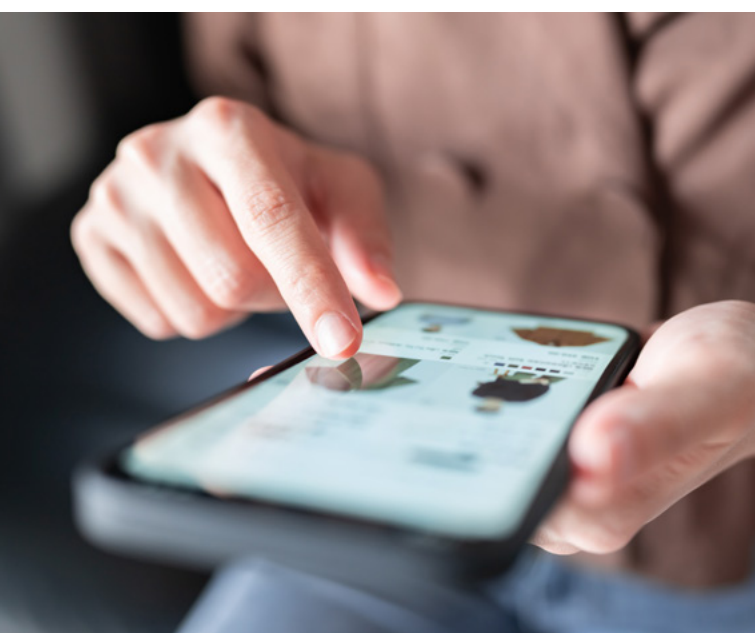
# Supporting Government Initiatives

As governments began cautiously opening up after the lockdown, domestic travel slowly picked up. But given the unpredictability of COVID-19 infections, people were afraid to make bookings.

In Thailand, the government introduced an initiative to assuage travellers' fears and incentivise them to book hotel stays. Called Rao Tiew Duay Kan, or We Travel Together, this scheme subsidised booking costs by 40 per cent.

To participate in this scheme, travellers had to use Pao Tang, an e-commerce app developed by the Thai government. The app was also used by merchants who applied to the Thai government's 50:50 co-payment scheme, which enabled customers to get subsidies on purchases.

When it was first developed, the Pao Tang app could onboard merchants but didn't have payment options. So, the Thai government approached 2C2P for help. Here's how it worked: The customer would contact the hotel and make a booking. Once confirmed, the hotel would log in to the Pao Tang app to generate the payment links and manage the booking.



As 2C2P's payment links could process a variety of payment methods, including bank transfers, e-wallets, and QR code payments, hotels could reach more customers, especially those who did not have access to credit cards.

Today, with the reopening of several Asian markets where e-wallet players are dominant, having a system in place to accept various modes of payment has become critical.

# An Exciting New World... With Caveats

The spike in digital spending and the surge of merchants coming online in the pandemic era opened up a new world of opportunities. But that also came with fresh problems.

At 2C2P, we were logging thousands of new merchant requests a month, and we needed to onboard them quickly or risk having a bottleneck. This meant expediting due diligence processes like Know Your Customer (KYC) and Anti Money Laundering (AML) checks.

Under normal circumstances, we would have done it manually as we usually worked with large corporate clients. This time-consuming process involved a lot of paperwork. We had to overhaul the system and migrate the process to the digital space to speed things up and accommodate for scale.

So, we developed a system that incorporated eKYC and Automated AML. It used sophisticated algorithms to automatically comb through large volumes of transaction data and flag potential illegal activity. This shortened the verification process from days to hours, allowing us to take on more clients easily.

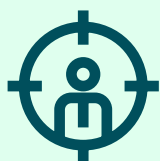
The second snag we faced was the increase in fraudulent transactions. In 2020, one in three in Southeast Asia<sup>2</sup> encountered e-commerce fraud. With over 93 per cent of consumers in Southeast Asia<sup>3</sup> using cashless payments now, this has become an increasingly worrying problem.

Thankfully, cybersecurity technologies are always a step ahead of these fraudsters. The latest 3D Secure (3DS) protocol, EMV 3DS 2.0, enhances security at the checkout process by using two-factor authentication methods, such as unique token-based and biometric authentication, instead of static passwords that can be easily guessed or stolen.

## | Pandemic Accelerating Digital Payments

Our Merchant Plug-in also checks if the customer's card and account number are verified with a 3DS protocol to protect against chargebacks. These new security protocols have the added benefit of providing shoppers with a more frictionless payment process. It's a win-win situation for the merchants because it makes their platform more secure and trustworthy while enhancing the user experience and reducing the chances of cart abandonment.

But while we have taken every step to ensure our payments platform is fortified with the latest security protocols, we cannot make absolute guarantees to our merchants because e-commerce fraud can happen at any stage of the customer journey, and not just at the payments endpoint.



### 1 in 3 consumers

In 2020, one in three in Southeast Asia encountered e-commerce fraud. With over **93 per cent** of consumers in Southeast Asia using cashless payments now, this has become an increasingly worrying problem.

We advise our merchants to safeguard themselves against other types of transaction fraud, including non-delivery and non-fulfillments. Security is a broad issue; as consultants, we can educate them on the best practices for e-commerce transactions.

The pandemic has ushered in a brave new world for businesses. With e-commerce spending reaching new heights, having a robust and seamless digital payments platform is key to attracting and retaining customers. One main takeaway from our conversations with merchants is that consumer habits have changed dramatically during the pandemic, and keeping in step with them is crucial at risk of falling behind.

Chapter 8:

# The Future of Payments



# The Future of Payments

Contributed by



**Aung Kyaw Moe**

Founder & Group Chief Executive Officer

In the 1990s, when the internet was in its early adoption phase in Asia, card payments were manual and time-consuming. Advanced payment technologies like EMV, NFC, or QR code-based payments didn't exist.

I vividly remember those days working as a butler in a hotel in my home country Myanmar. Since there were no electronic terminals to accept payments, the hotel staff would use a credit card imprinter (known as a ZipZap machine) to imprint the embossed number of the guest's credit card on an invoice, which we would then send to a clearinghouse. It took several days to clear a single transaction.

Fraudulent transactions were not uncommon, but there was no automated process to detect and deter them. The hotel subscribed to a "black list update" service, a service that sends a list of fraudulent and no longer creditworthy card numbers periodically by fax. The finance team would copy the list and pin it to a notice board for front desk staff to manually compare the digits.

The advent of the internet and digital payments changed everything.

# Paving the Way for Quick, Secure Transfers

As covered in earlier chapters, the early days of the digital payment era were challenging for businesses. Consumer trust was low because of concerns about the risk of fraud and the security of transactions.

As an example, when I moved from Myanmar to Thailand, I observed that in the mid-2000s, Thai consumers who purchased flight tickets online with credit cards desired a human touch. They preferred that customer service representatives contact them by phone to confirm that their transactions had been successfully processed. If they didn't receive the call, they would ring up the call centre to confirm their transaction. Consumers wanted reassurance that they were interacting with a real person on the other end of the website.

Today, digital payments are quick, secure, and widely adopted, and the industry is rapidly growing. As the number and types of digital payment methods increase with the advancement of technology, the future of digital payments looks to centre around the concepts of consolidation and interoperability.





# Maximising Efficiency Through Consolidation

In Asia, China and India are spearheading consolidation efforts. Private sector players like WeChat Pay and Alipay have taken the lead in China's digital payment sector. Meanwhile, India's collaborative Unified Payments Interface (UPI), led by the government, is driving the country's digital payment push. India's initiative has encouraged private firms like Google to adopt and utilise its payment rails, further promoting adoption and usability.



In Southeast Asia, the Thai government rolled out its national money transfer and payment system, PromptPay, in 2017 as part of a roadmap to create a cashless society and boost its digital economy. Singapore combined multiple payment QR codes into a single label Singapore Quick Response Code (SGQR) in 2018 to simplify QR code-based payments. This

## | The Future of Payments

lets merchants accept payments from a dizzying array of applications, from GrabPay to ShopeePay, using just a single QR code.

In 2019, Indonesia also launched the Quick Response Code Indonesian Standard (QRIS), its answer to the increasing number of QR payment options in the archipelago. That same year, the Philippines launched QR Ph as the national QR code standard, enabling person-to-person (P2P) transfers across participating banks/providers, with person-to-merchant (P2M) payments following in 2021. Malaysia's interoperable QR standard, DuitNow QR, arrived in 2021, too, along with Vietnam's VietQR trademark allowing payment and money transfer using QR codes via the country's Napas network and its 14 member banks.

Cross-border payment and settlement were the next hurdles. The aim was to connect multiple different national systems efficiently. In 2021, the Monetary Authority of Singapore (MAS) launched the Project Nexus





blueprint to connect the real-time payment systems of the ASEAN-5 (Singapore, Indonesia, Malaysia, the Philippines, and Thailand) with minimal adaptations. It aimed to make instant remittances faster and cheaper, with wider accessibility, greater transparency, and security, to support closer regional economic and financial integration.

As Mr Ravi Menon, managing director at the MAS, eloquently put it, “We want cross-border payments to flow seamlessly like water”. Project Nexus’ latest prototype links the Eurosystem, Malaysia, and Singapore payment systems, enabling payments to be sent across the three using only mobile phone numbers.

Thus, in the same year, the first digital cross-border money transfer service in Southeast Asia – and in the world – between banks was launched. MAS joined forces with the Bank of Thailand, linking Singapore’s PayNow service to the latter’s PromptPay service – enabling cross-border fund transfers to be completed in less than five minutes.

While consolidation enhances efficiency and convenience for end users, fragmentation also offers advantages. It will boost competition amongst various payment operators to retain customers by providing enticing incentives like low fees, rewards, and improved service efficiency.

# Interoperability Unlocks Accessibility and Innovation

Interoperability in payments seeks to achieve a frictionless payment experience for the end user. It's about ensuring that different components and stakeholders can function seamlessly throughout the payment ecosystem, whether it's the integration between merchant to bank or payment provider, merchant to customer, nation to nation, or a more technical component of ensuring consistency in user experience across different systems and digital platforms.

As touchpoints between customers and merchants continue to emerge and evolve, interoperability is required to connect these. Today, QR code-based payments are popular, but this interface will change as biometric technologies, such as face recognition and palm print recognition (now available on Tencent's WeChat Pay), become more advanced.



## | The Future of Payments

Introducing an intuitive and interoperable interface could prompt less tech-savvy communities to use digital payments. Currently, e-commerce platforms sometimes struggle to verify and approve transactions, with genuine customers prevented from transacting if the platform doesn't recognise their profile because the customer comes from a less-developed market or fraud hub. Or the customer may have enough funds but lack access to a credit or debit card.



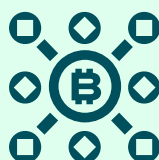
Interoperability allows for integrating security measures across different payment systems, resulting in more comprehensive and robust security and fraud protocols. The jump from the 3D Secure 1.0 authentication protocol to 3D Secure 2.0 and EMV QR standards ensures that different payment providers and payment systems around the world abide by similar principles to authenticate the customer, standardise the payment flow, or ensure that the transaction is legitimate and securely transmitted.

Interoperability is the way forward for the payment industry, making funds transfers easy between different payment rails and systems globally. Just look at the telecom industry. Today, one can make international and domestic calls using one phone number and phone. Payments are headed in the same direction in the long run.

# Disrupting the Incumbents

One of the most important and disruptive breakthroughs in the broader fintech ecosystem in the last few years is decentralised finance (DeFi), built on the blockchain. Blockchains are digital ledgers governed by distributed networks of computers to ensure records and transactions are tamper-free – in short, ensuring authority does not centre on one source, as part of a concept called Web 3.0, also known as Web3.

In the ideal Web 3.0 world, a decentralised financial ecosystem would run like clockwork. It would have widespread acceptance and, in turn, effect an incredible transformation in the world of commerce – and the very foundation of society, by reversing the nature of money and payments being controlled and issued by governmental bodies and financial institutions.



**US\$10,000**

The price of a single Bitcoin hit this milestone in November 2017.

**US\$1.69 billion**

Estimated value of the global cryptocurrency market by 2021.

For a time, the adoption of cryptocurrency in commerce seemed to be gaining traction. It would take nearly 10 years since its conception, but the hype around cryptocurrency was finally reaching a fever pitch. In 2017, Bitcoin crossed the US\$10,000 mark. A few companies, such as livestreaming platform Twitch and coffee chain Starbucks, started integrating crypto payments. By 2022, the global cryptocurrency market was estimated to be worth US\$2.2 billion.<sup>1</sup> But the rosy outlook did not



last forever. After several up-and-down cycles due to the volatility of cryptocurrency values, we are now, as of 2023, in a deep crypto winter.

Cryptocurrencies may have had a bad reputation, but blockchain's underlying technology is still sound, and its potential under-tapped.

Governments worldwide are exploring blockchain technology to launch their own digital currencies. Since each country's central banks have oversight and tie them to their fiat currencies, these government-backed digital currencies, or Central Bank Digital Currencies (CBDCs), offer a potentially safer way to use digital money while allowing transactions and interbank transfers to be made more efficiently through the programmability feature of CBDCs.

# Programmable Money

Traditional physical currencies are not programmable. Through smart contracts, however, this feature can be used with CBDCs to create a variety of new applications, such as:

- **Automated payments:** Smart contracts can automate payments for goods and services. This could be used to pay for things like tolls, parking, and subscriptions.
- **Identity verification:** Smart contracts can be used to verify identities. This could be used to prevent fraud and make accessing financial services easier.
- **Transaction tracking:** Smart contracts can be used to track transactions, monitor suspicious activity, and enforce regulations.

Programmability also allows central banks to control how CBDCs are used. For example, central banks could use programmability to prevent CBDCs from being used for illegal activities.

Overall, programmability is a powerful tool that can be used to create new applications for CBDCs and improve the financial system's efficiency and security.

While CBDCs are still governed by a central authority, they remove many administrative layers and intermediaries, making the process faster, reducing cost, and improving transparency.

More than 100 countries are trialling CBDCs. For example, Brazil is working with Visa to develop a







CBDC project, while China is expanding its CBDC use cases; the country's predominant super-app WeChat is also set to integrate CBDC payments.

Countries in Southeast Asia have jumped on this trend too. Singapore's MAS launched Ubin+ to develop protocols and standards for cross-border FX transactions using CBDCs; in May this year, MAS conducted a cross-border multi-currency payment experiment with the central bank of New York under the Cedar x Ubin+ project. This trial demonstrated that autonomous, secure end-to-end settlements could be achieved in under 30 seconds on average, thanks to blockchain technology.

MAS is also trialling Purpose Bound Money. These digital currencies are programmable and can only be disbursed once certain conditions are fulfilled. Examples of use cases include government subsidies and grants.

At 2C2P, we were the only non-bank financial service provider invited to take part in the Bank of Thailand's retail CBDC pilot project. For this initiative, we developed a mobile wallet app that allowed 10,000 users to test payments for goods and services using CBDCs at selected merchants. This pilot project was a limited test run that ended in August 2023. Through it, we hope to help the Bank of Thailand explore both the business and technical aspects of retail CBDCs, as well as assess whether they are a viable and safe means of transaction in the future.

# Impacting Millions

As the digital payments ecosystem continues to expand, the world becomes more connected, and financial transactions are getting easier and more accessible than ever before. With consolidation in the market and more partnerships between the private sector and governments, we will see innovative new payment solutions emerge, impacting millions of lives worldwide.

The aforementioned linkage of Singapore's PayNow and Thailand's PromptPay and the recent collaboration between MAS and the Reserve Bank of India (RBI) – connecting PayNow to India's Unified Payments Interface (UPI) for real-time cross-border payments – serve as excellent examples of how countries are bridging divides to promote financial inclusion and boost the digital economy.



The increasing adoption of digital payments by consumers and businesses around the world presents challenges and opportunities for the fintech industry. For companies like 2C2P, “cracking the payments code” is not a one-time accomplishment but an ongoing process that requires continuous innovation and adaptation to stay ahead of the curve.

In the coming years, we expect to see a continued shift towards mobile and digital payments and the emergence of disruptive new trends like Web3 and digital currencies. As these technologies become more mainstream, companies like 2C2P must continue to develop new solutions to keep up with changing consumer and business needs and preferences. Overall, the future of payments is exciting and full of possibilities, and 2C2P is well-positioned to play a leading role in shaping this rapidly evolving landscape.

# Contributors



## **Aung Kyaw Moe**

Founder & Group Chief Executive Officer

Aung, a leading industry expert, was recognised as one of FinTech Magazine's 2022 Top 100 Fintech Leaders. Since starting payments platform 2C2P in 2003, he has transformed the company into a profitable organisation with over 500 employees across Asia and Europe.



## **Piyachart Tay Ratanaprasartporn**

Chief Executive Officer, Thailand

Piyachart joined 2C2P in 2012 and currently manages the company's business activities across Thailand. With over two decades of experience in the payments and banking sectors, he previously held the position of General Manager at True Money, an electronic money service provider in Thailand, before joining 2C2P.



## **Myo Zaw**

Chief Technology Officer

With a 15-year career at 2C2P, Myo has played a leading role in developing 2C2P's payment application and ensuring its compliance with the highest global data security standards, including PCI DSS Level-1, ISO 27001, PCI 3DS, and SOC 2. Myo has also led 2C2P's successful cloud adoption on AWS since 2014.



## **Lynn Htaik Aung**

Chief Product Officer

Lynn has been a valued member of the 2C2P team since 2008. During his tenure, he developed the company's alternative payment solution, 123, enabling merchants to accept online-to-offline payments in the region, and successfully launched its Digital Goods platform in Myanmar.

# Contributors



## **Agnes Chua**

Executive Director,  
Business & Product Development

Agnes joined 2C2P in 2015 and currently serves as the country lead for business activities in Singapore, Malaysia, Vietnam and Indonesia. With over 24 years of experience in payments and e-commerce, she led product development and strategy at eNETS, the internet arm of Singapore's payment services company, NETS, before joining 2C2P.



## **Rachelle Alexis Lim**

Executive Director,  
Strategy & Business Development

Rachelle joined 2C2P in 2016, playing a key role in setting up the company's Hong Kong and Philippines offices and expanding partnerships across the region. Prior to joining 2C2P, Rachelle served as the Head of Products at Global Payments Asia Pacific and held various positions within the Retail Banking division of HSBC Philippines.



## **Varin Achariyakulporn**

Executive Director,  
Business Development

Varin has more than 18 years of experience in the payments industry. Before joining 2C2P, he played a pivotal role in product development at K-Payment Gateway, the eBusiness department at Kasikornbank, helping to solidify its status as the leading provider of online payments in Thailand.

# Contributors



## **Jade Yuen Lim**

Director, Product

Jade joined 2C2P in 2016 and currently oversees alternative payments and product development. With previous experience as an Assistant Vice President at NETS, leading product management for EFTPOS and terminal services, she brings invaluable specialist expertise to her role.



## **Jerry Wee**

Director, Digital Goods

Jerry has over 10 years of experience in strategic planning, business management, and commercial and product development. He specialises in leveraging 2C2P's solutions to help businesses deliver digital goods and services. Before joining 2C2P, he led and managed Digital Goods, Mini App and Payments at Lazada Singapore.



## **Nattapote Kuslasayanon**

Director, International Business Development

Nattapote spearheads 2C2P's new digital payment solutions development for the airline, travel and hospitality verticals across Southeast Asia. Prior to joining 2C2P, he co-founded and served as Vice President of Nok Airlines, overseeing direct distribution channels for the low-cost Thai airline.

# Contributors



## **Soohan Han**

Director, Global Marketing

Soohan has nearly 20 years of experience in marketing and driving partnerships for enterprise tech and fintech companies. He has been actively involved in blockchain and crypto since 2017 and has witnessed the evolution of Web 3.0, from the ICO explosion to the DeFi boom and the NFT craze.



## **Piyawit Manpanpanich**

Deputy Director, Product

Piyawit leads business development for 2C2P's EMV 3D-Secure, Payment Gateway and QR Gateway products. Before joining 2C2P, he held a business management position at UnionPay International (UPI) in Thailand. With over eight years of experience in public key infrastructure and payment systems, Piyawit serves as a consultant to Thailand's regulators.



## **Pyisoe Yarzar**

Deputy Director, Product

Since joining 2C2P in 2014, Pyisoe has been at the forefront, guiding teams through the technical requirements, analysis, development and deployment of new features and integrations. His expertise has been particularly valuable in collaborating with banks, payment gateways and digital wallets.

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# About 2C2P

## Every payment solution for every business need

2C2P is a full-suite payments platform trusted by global businesses. Since 2003, we've helped the world's leading companies in emerging markets accept and make payments seamlessly.

Through a single, simple integration with us, your customers have access to nearly every payment option imaginable. Fast-growing businesses everywhere use us to accept payments easily, simply and quickly - from billions of people around the world.



## Navigate payments easily with our extensive and highly reliable network

Over 250 payment channels

Over 400,000 APM acceptance points in Asia

99.97% uptime

Over 45 currencies

Over 30 financial institution partners markets

Certified by all international card schemes

Over 20 countries

Major licences in key markets across Asia

# Trusted by leading global enterprises



We empower your business to reach billions of customers, accept payments and send payouts globally. Our full-suite of solutions encompass:

## Accept Payments

Accept any payment - online, mobile, cards, cash and thousands more of alternative payment methods.

## Make Payments

Pay your local sellers, suppliers and partners easily and in the currency and method they prefer.

## Financial Services & Business Operations

We help you scale and win new business and customers. Easily issue wallets, cards and loyalty programs - turn your customers into your fans. And, we help simplify digital goods and services for businesses of any size.

**Speak to our friendly team today.**

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