SAMSUNG

A Guide

Mobile Point of Sale (MPOS)

An introductory guide for businesses, sponsored by Samsung Asia and authored by Tech Research Asia.

Introduction

This report covers the fundamentals of Mobile Point of Sale (MPOS) including the current state of the market, device characteristics, key players and some of the common use cases. It is designed as an introduction for people not familiar with MPOS solutions or the MPOS market.

In January 2020 TRA conducted a survey of over 1300 businesses in eight countries (Australia, Indonesia, Malaysia, New Zealand, Philippines, Singapore, Thailand and Vietnam) to understand their usage and views of MPOS. Throughout this guide we will reference relevant data from that survey to provide additional insights.

Except where otherwise indicated, the information contained in this guide is based on TRA's research and survey.

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1 Executive Summary

Mobile Point of Sale (MPOS) solutions have seen strong growth in the Asia Pacific region in the last few years. Our survey of more than 1,370 technology buyers and influencers across 8 countries in the region showed that

more than 2/3 of businesses are currently using MPOS solutions today.

Adoption was strongest in Customer Service, Retail, Manufacturing, Field service and Transport/Logistics and there were use cases across a broad mix of industries and roles indicating the broad relevance of MPOS solutions in today's evolving, digital economy.

Importantly, more than 1/3 of respondents said they had been able to measure the specific business benefits

they realised as a result of adopting MPOS solutions with faster customer service and improved customer experience the top 2 benefits reported, as well as higher workforce productivity and improved data gathering and accuracy.

The research also showed a clear preference for devices to be multi-purpose with **68% agreeing that MPOS devices need to be capable of performing more than one role.**

Smartphones were the most popular form factor for MPOS solution deployment at 41% with a further 25% preferring tablet - notably in retail and food and beverage environments.

The MPOS market is growing fast, driven by advances in devices, software and electronic payment technologies with several disrupters entering the market.

Refresh rates are also high with 78% expecting to purchase new devices in the next 12 months.

Businesses are looking to specialist providers for education on the benefits of MPOS and how they can embrace the new solutions in their business. Regional variations in consumer behaviour, banking, payment systems and finance legislation means solutions have to be tailored by country and specific to vertical industries in most cases.

The future of MPOS is positive. The familiarity of multi-use devices like smartphones are making solution adoption easier and more cost effective for all businesses. With clear business benefits reported and continued advancements in multi-purpose devices, software and payment solutions, we expect to see continued adoption in the region across a wide variety of industries and use cases.

2 What is MPOS?

A typical mobile Point of Sale (MPOS) system is lightweight, portable, easy to set-up and can process sales and card payments. There are a variety of devices on the market with different form factors and specifications to meet various use cases and this report will highlight some of these further on.

It is important to note that most MPOS solutions consist of different components working together e.g. an MPOS device from one manufacturer used in conjunction with a card reader and payment processing technology from another manufacturer.

The most common scenario for MPOS systems is a combination of a smart portable device (usually smartphone or tablet based) combined with a card reader that is connected wirelessly or physically (via USB or other means).

The key components of MPOS solutions are:

- A handheld MPOS device.
- MPOS software.
- A 'card' reader to capture payment details.
- An internet connection.

A payment processing service.

Each of these components can be sourced separately but are often combined for ease of deployment and support. There are a wide variety of options for each of the components above, usually targeting specific use cases.

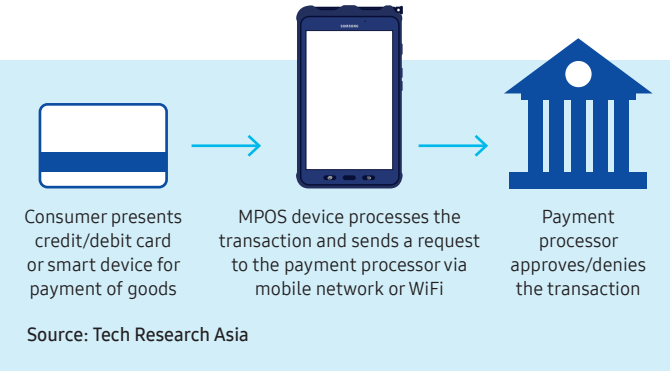


Fig 1: MPOS solution overview.

It is important to note the difference between mobile POS solutions and mobile payment solutions that can include mobile wallets and technologies like Samsung Pay™ and other forms of electronic payment, depending on country.

3 What are the current market trends?

Traditional POS devices were large, expensive and hard to set-up. They were typically based on PC form factor technology and included a range of peripherals for printing receipts, storing cash and scanning barcodes. Prices ranged from US$2,000 to over US$5,000 including peripherals and software.

Fig 2b: Tablet based POS.

Fig 2a: A traditional POS system.

As mobile devices and payment technologies have evolved it has enabled a range of smaller, more cost effective solutions to be developed including solutions utilising tablet form factors which are more cost effective and also take up less space. Demand is also driven by merchants looking for solutions that can be used at business premises, on the road and at pop up stores and markets to accommodate changing retail trends and this has led to the rise of solutions also utilising smartphone form factors.

Many countries in the region (excluding Australia and New Zealand) have large populations, high smartphone penetration and low bank account adoption. This combination of factors is accelerating cashless and e-payment adoption. Some of the early movers include Indonesia, which allows small businesses to accept payments via mobile payment apps.

The biggest reason stated for those organisations not using MPOS currently (48%) was no perceived need. For many, this is likely caused by a lack of awareness of how the technology could be applied to their specific business and can be addressed with greater education and leadership in market.

4 What does the MPOS vendor landscape look like?

The MPOS market is highly fragmented. The proliferation of Android devices and growth in mobile developer skills across the region has led to a wide variety of solutions being available.

This has driven high levels of competition and numerous new market entrants. This dynamic nature has made it difficult for businesses to determine which vendors will be successful and which will depart the market in the medium to long term.

There are 5 core groups of MPOS providers that cover one or more aspects of the solution:

Major Banks and Credit card providers (often referred to as the 'acquirer') offering merchant services including payment devices as a one-stop solution. In the last few years, banks have seen their market share decline due to a sharp increase in the number of solutions in the market and the slow and cumbersome merchant approval processes. In Southeast Asia, bank account adoption is low meaning the banks aren't as influential vs. more mature countries and many disruptors have appeared to fill the space. The credit card providers have also jumped into the space.

Specialist device manufacturers, often located in China with customised handheld MPOS devices and some with payment functionality. Typically, these are Android based devices and although they can look appealing, longevity and support are often cited as issues.

POS solution providers including: Mobeewave™, SmartPesa™, Soft Space™ offering MPOS solutions that include hardware, industry-based software and devices, and increasingly payment processing services. These providers continue to see growth driven by their industry understanding being translated into software that is easy to use. POS solutions and providers vary widely by country and vertical market.

Proprietary payment specialists are focused primarily on the payment platform with integration to the leading POS systems. Although they have seen good growth, they are not as easy to set-up as some of the disruptors and their devices often utilise proprietary operating systems which are less capable of running other applications, limiting their functionality outside of payments. Again, we see huge variations by country as e-payments and cashless transactions accelerate.

MPOS disrupters offering integrated MPOS and payment solutions. These providers have seen the strongest growth globally over the last few years by combining industry focused POS software with simple, smart payment solutions. Their Achilles heel remains their relatively high transaction fees, though this typically includes the credit card provider fees from Visa, Mastercard etc. They have also fared less well in developing countries.

Although the specialist POS providers are also continuing to do well, the market is highly fragmented despite several global players being involved and no single vendor has any significant market share globally.

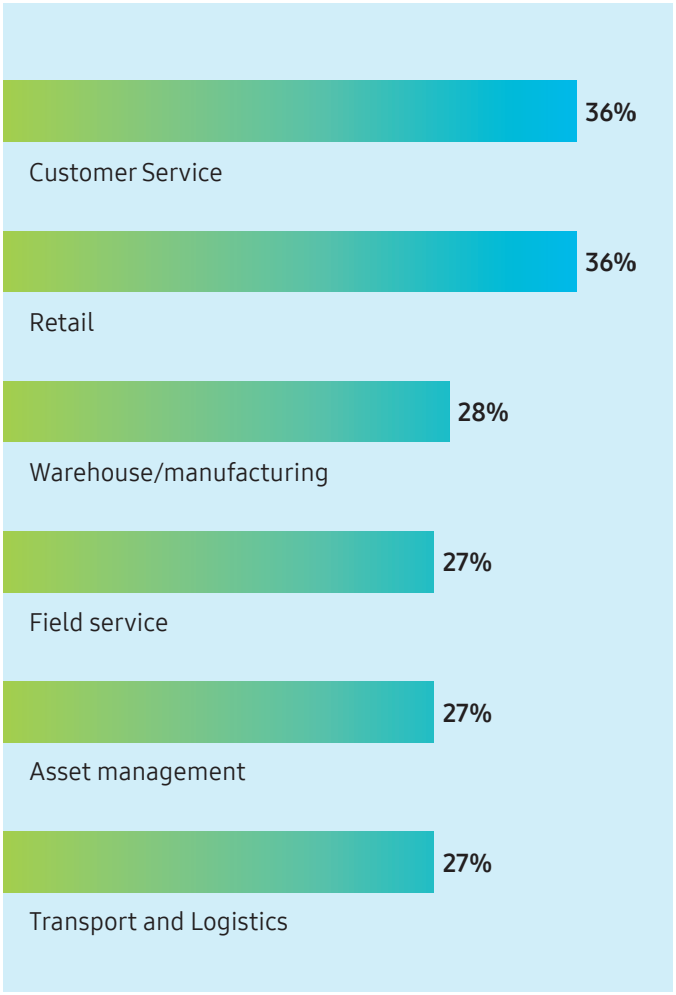
Samsung has partnered with some of these MPOS solution providers to provide an end-to-end offering to small businesses, making it easy for them to accept mobile payments with an easily accessible, highly secure, low-cost and easy-to-use mobile payment acceptance solution. This integrated one-stop approach meets the needs of small businesses that can leverage familiar devices and move quickly to realise value by simply downloading an app from the store.

Samsung POS™ offering currently launched in Canada also provides an effective solution for small businesses by using nominated NFC-enabled Samsung devices in conjunction with POS software to process sales and take payments on a single device.

5 Which market sectors or industries are most likely to adopt MPOS?

The proliferation of new, multi-purpose capable devices has driven the market across a very wide set of industries. Our research highlighted the most popular industries and use cases:

Common Uses for MPOS



Source: Tech Research Asia

Service Industries Taking payment is one of the main issues facing most service oriented businesses including electricians, plumbers and other tradespeople receiving payments. MPOS solutions allow for simultaneous service delivery and payment processing, which frees up administration time at the end of the day and supports easier banking reconciliation and benefits cashflow.

Retail is one of the largest target markets for MPOS. Retail has undergone significant change as consumer buying behaviours have shifted away from traditional stores to a mixture of e-commerce providers and also smaller, more nimble brands. MPOS solutions enable start-ups to easily set-up stores within markets without the overheads of establishing a fixed business premises. MPOS solutions allow them to easily track inventory, what items are selling best and automatically handle electronic payments electronic payments.

Health & Fitness are utilising MPOS solutions to drive memberships. The flexibility of MPOS solutions allows them to deploy staff in shopping malls and customised versions of MPOS software can support member sign-up and payments.

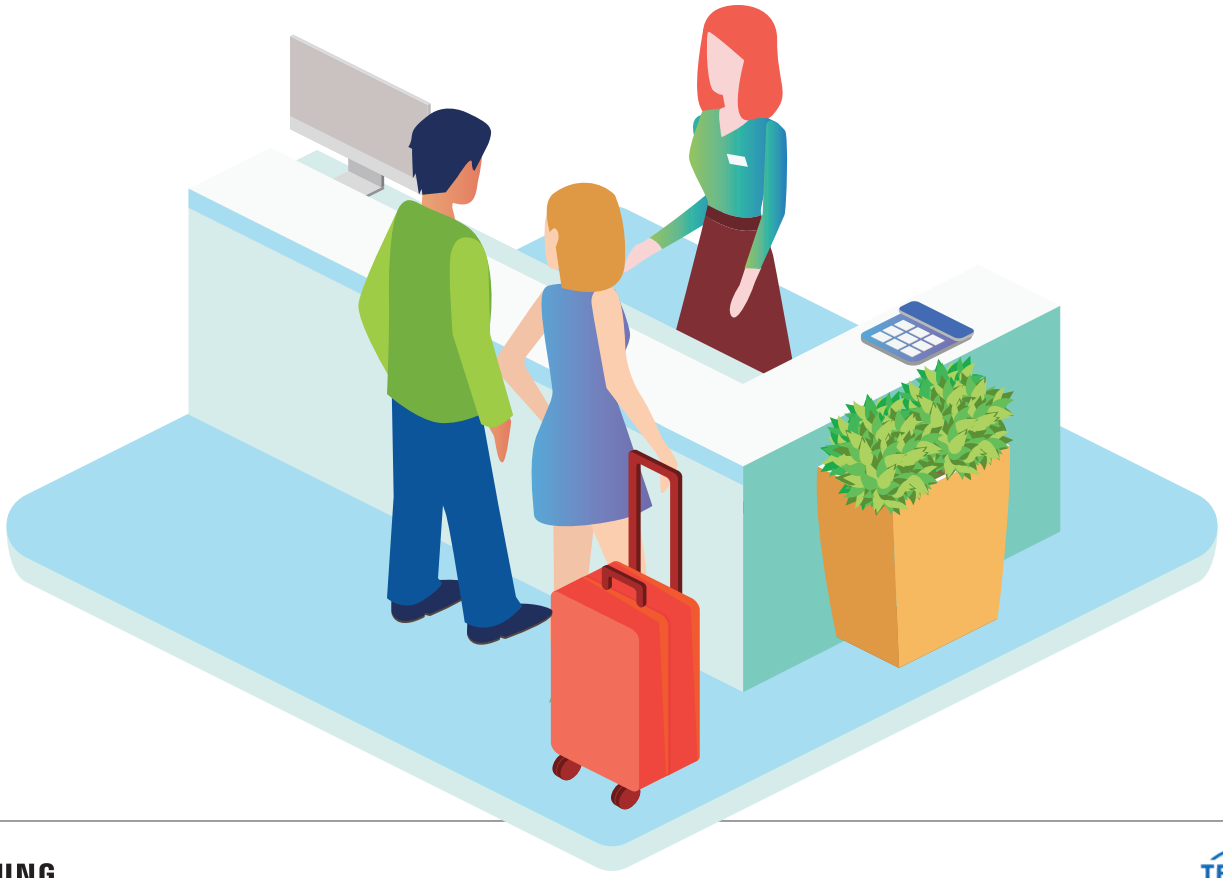
Food & Beverage are increasingly adopting MPOS solutions as opposed to more traditional POS solutions. This is driven by the reduced counter space taken up by tablet-based solutions and the relative ease of configuring these systems such as adding items for sale, tracking inventory etc.

Vietnam showed the highest propensity to adopt amongst those customers not already deployed with 69% planning to implement MPOS in the next 12 months.

There were some variations by country as shown in the following table with a stronger focus on Retail and Customer Service use cases in the more mature markets.

Australia	Retail, Customer Service, Financial.
Indonesia	Financial, Transport/Logistics and Warehousing.
Malaysia	Customer Service, Retail, Financial.
NZ	Retail, Customer Service, Financial.
Singapore	Retail, Field Service, Customer Service.
Philippines	Retail, Customer Service, Financial.
Thailand	Customer Service, Financial, Transport/logistics.
Vietnam	Customer Service, Financial, Transport/logistics.

Source: Tech Research Asia



6 What are the business drivers for MPOS?

In the past, traditional Point of Sale (POS) solutions have been cumbersome, expensive and difficult to set-up and often requiring significant capital outlay and set-up costs.

For many businesses taking credit card payments has until recently also been difficult to set-up and costly to provide. The process of setting up merchant accounts with banks took weeks not days let alone hours with no guarantee of approval.

The new raft of MPOS solutions address these challenges and lowers the barrier to entry, allowing more businesses to take advantage of new selling paradigms. Some examples include a specialist retailer being able to easily lease short term space for a pop up store or kiosk and take part in regional markets on weekends.

One of the other core drivers of MPOS in Southeast Asian countries especially, is the rapid adoption of e-payments. Smartphone penetration far exceeds bank account adoption in many countries, and this is accelerating cashless and e-payment adoption in turn requiring businesses to adopt solutions that can handle electronic transactions.

One of the challenges in the region is that much of the legislation is country specific and it is important to ensure that any MPOS solution can address the specific needs of the country in which it is being deployed. As electronic payments become more common, there is an increased focus on security as fraud increases and businesses need to understand how they can manage these risks.

There is a myriad of regulations associated with MPOS, most of these fall into 2 areas:

- Data Privacy: How data belonging to customers is handled and stored.
- Payment Processing: How secure payment data is handled and processed.

In many cases, the adoption of advanced MPOS solutions helps businesses to be compliant in areas like credit card handling and provides better security and traceability for any personally identifiable information they may hold.

PCI-DSS (Payment Card Industry - Data Security Standard)

PCI Compliance is a set of security guidelines for anyone that is processing, transmitting or storing credit card data. PCI ensures that a business is operating in a secure network and that information stored for a customer is secure.

There are 4 different levels of PCI Compliance that can apply to a business depending on the volume of transactions being processed.

Level 1:	Merchants processing >6M card transactions per year.
Level 2:	Merchants processing 1M-6M transactions per year.
Level 3:	Merchants handling 20,000-1M transactions per year.
Level 4:	Merchants handling <20,000 transactions per year.

Source: Tech Research Asia

The requirements for compliance vary from self-assessment options for level 4 through to detailed annual audits for level 1 that focus on a company's security infrastructure and procedures, policies, networks and systems. Non-compliance may result in fines which are typically targeted at the acquiring bank, who in turn can pass along the fines to the offending merchant.

EMV Certification

The EMV certification process ensures that merchants can accept cards with chip technology, which adds an extra layer of security during card-present transactions. EMV enables issuers to be confident that they are definitely processing the customer's card and not a copied version. This means that merchants' funds are guaranteed if processed as an EMV transaction.

EMV cards contain a chip that interacts with POS systems for authentication. The chip is responsible for creating a unique code for each transaction made to ensure that hackers and fraudsters cannot copy the card data.

When a payment terminal is EMV certified, it means that it can process payments made using a chip-based Debit or Credit card. In the certification process, the hardware, core software and the relationship to each payment scheme needs to be tested and certified to achieve an end-to-end EMV payment solution.

EMV Certification Level 1: Hardware

Level 1 certification relates to how the payment device or terminal meets the physical requirements and lower level electromagnetic and communication protocols required, including operating distance tests. EMV Level 1 testing and certification applies to both contact EMV and contactless EMV. The hardware supplier is responsible for Level 1 EMV certification.

EMV Certification Level 2: Kernel

EMV Certification level 2 covers testing of the core device software that communicates with the L1 hardware to ensure it is able to effectively and securely communicate to the EMV chip card.

EMV Certification Level 3: Brand Certification

EMV Level 3 certification consists of hardware that has passed EMV L1 certification, an approved EMV L2 kernel, the payment application, a chosen gateway/processor and approval from the brands. Here, all of the components that make up an EMV transaction have all been tested and approved by the brands.

7 What are the desired characteristics of an MPOS solution?

To be able to meet the needs of the widest audience, MPOS solutions need to be easy to implement, cost-effective and reliable.

Small businesses typically don't have the appetite to take on complicated technology projects. The most successful MPOS solutions allow businesses to **start quickly and grow** their usage as they become more familiar with the solution. For example, they may start by just processing payments on the device but then grow into setting up their product catalog in software to track popular products and combinations of products bought together for marketing purposes.

MPOS solutions should also provide strong security including PCI compliance to minimise the risks associated with handling sensitive credit card or other payment information. Businesses need to be comfortable that the solution they are adopting has sufficient safeguards to prevent security issues.

Options that allow for flexibility to grow, for example, where credit card fees are automatically reduced when volume thresholds are reached, are good for businesses that want to start small and expect to grow fast. Businesses can select to pass transaction fees onto customers for example. This in turn means they can protect their profitability and keep system costs low. Easy banking reconciliation by integration to leading accounting solutions also reduces the administrative burden of adopting new payment types.

Solutions also need to be easy to use, this is especially important as many small businesses employ a lot of casual workers and part-time staff and training is a costly exercise. The proprietary nature of some terminals can lead to very complicated set-ups that are costly to maintain and difficult to educate staff on.

Fig 4: EFTPOS example

Ultimately, MPOS solutions should also be cost-effective with a low point of entry, flexible packaging and comprehensive end-to-end support.

Device Characteristics.

Our survey asked respondents across 8 countries in the Asia-Pacific region what were the most important features when choosing an MPOS device.

Rank	Top 10 MPOS device attributes
1	Connectivity.
2	Integrated security & device management.
3	IP Ratings.
4	Quick access button.
5	Device design.
6	Wireless charging.
7	Scanning capability.
8	Pen/stylus.
9	Using screen when wet.
10	Available accessories.

Source: Tech Research Asia

Connectivity, security and ruggedness were the Top 3 attributes listed by respondents.

These core requirements speak to the need for devices to be flexible enough to work in a wide variety of locations and environments and be able to be utilised by a mix of permanent and casual staff with little to no training required.

For connection, many of the scenarios require at least Wi-Fi connectivity with a best case including 4G (and in the future, 5G) to ensure broadest possible geographic deployments.

Integrated security comes out strongly as a key requirement and Samsung's work in developing the Knox solution provides strong differentiation with security starting at the chip layer and extending through the kernel and then securing the applications. This approach provides a greater level of security than most 3rd party solutions encompassing mobile applications deployed onto standard mobile operating systems. PCI DSS Compliance is also key along with adherence to local privacy and data regulations (PII). Many of Samsung's recent devices are EMV Level 1 certified, including the XCover Pro, making them MPOS-ready and Samsung POS solution (where available) is also PCI DSS Compliant and approved by Visa, Mastercard and Interac.

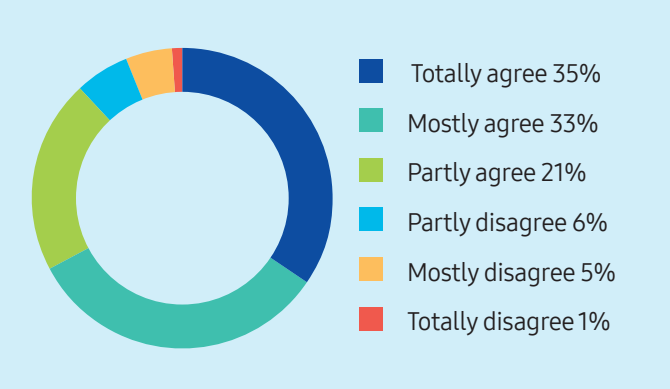
The research did show some differences by country with the following appearing as key features for each respective country:

Australia	Wireless charging. Quick access buttons.
Indonesia	Integrated security/manage. IP rating.
Malaysia	Scanning capability. Integrated security/ manage.
NZ	Device design. Integrated security/manage.
Singapore	Integrated security/manage. Wireless charging.
Philippines	Integrated security/manage. IP rating.
Thailand	Integrated security/ manage. IP rating.
Vietnam	Use screen when wet. Integrated security/manage.

Source: Tech Research Asia

One of the other key requirements highlighted by the survey respondents for MPOS devices was the ability to perform multiple functions.

Results below to the question, **"In today's business environment, MPOS devices need to be capable of performing more than one dedicated role."**

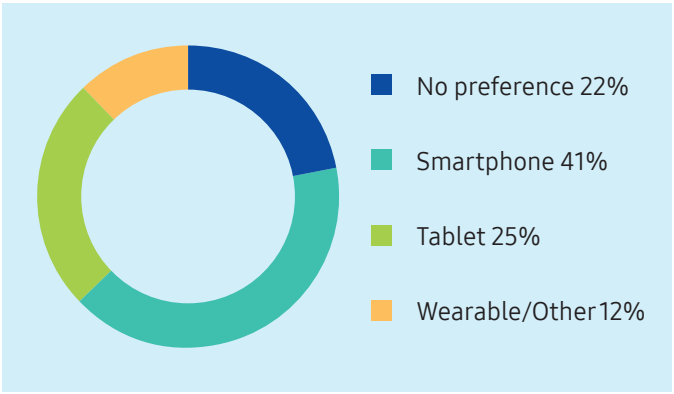


Source: Tech Research Asia

Fig 4: Attitudes towards multi-purpose devices.

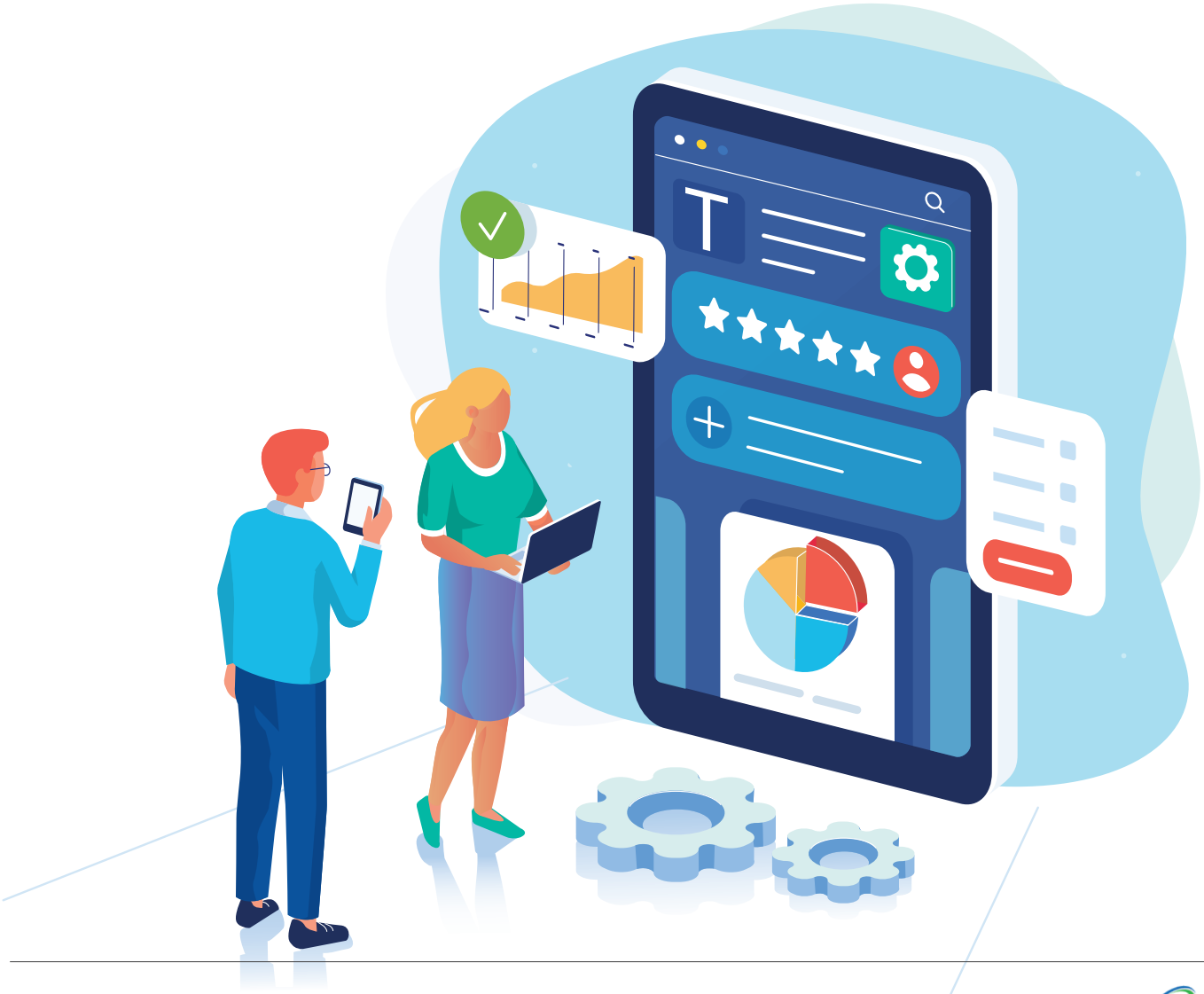
The data indicates a clear preference for MPOS devices to be capable of performing more than one role with 67% indicating they agree or strongly agree with the statement.

Not surprisingly, given the 2 previous data points, respondents showed a preference for smartphones with 41% indicating smartphones as the preferred form factor while 25% preferred tablets for MPOS solutions.

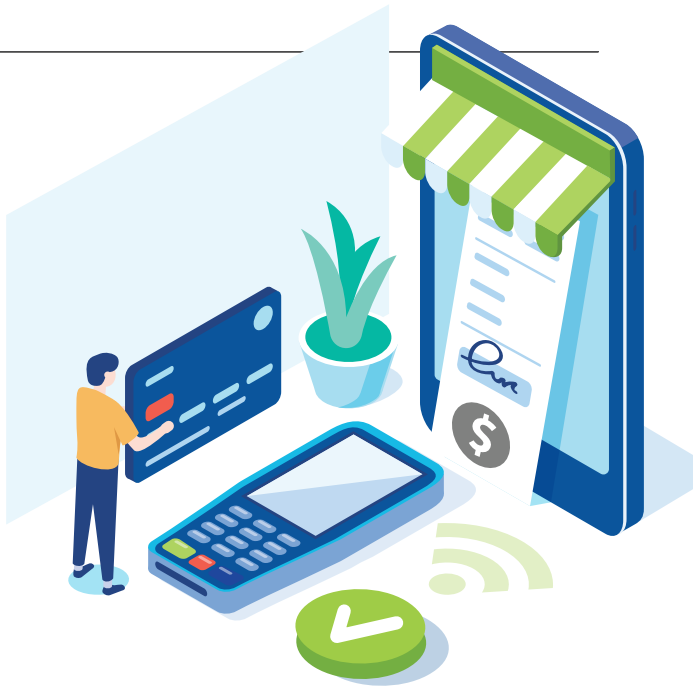


Source: Tech Research Asia

Fig 5: Device preference for MPOS solutions.



8 How are MPOS projects implemented?



Implementation timelines for projects vary of course depending on the use case and size of business.

A simple scenario involving the deployment of a single MPOS device used by a sole trader to collect payments could be implemented in less than a day and may be achieved without involvement from the MPOS provider depending on the business owners' technical understanding.

A more complicated example would involve a cafe where a tablet-based solution is deployed and the business owner needs to set up the inventory of items to be sold in the system first, then allowing staff to select items using pictures to track sales.

The issue for small businesses that have their payment solution provided by the bank is that they may have to wait for the existing contract with the bank to expire before switching to other solution providers.

Use Case 1: Hospitality

A small cafe owner currently uses a cash register and separate credit card terminal or PIN pad to run their business. Although they can still process transactions including credit card payments, they have no visibility of which are the items selling fastest at any time of the day and are unable to process payments made using smartphones or wearables.

In the case of a cafe, a key requirement is the ability to easily set up menu items and pricing. There are a wide variety of POS solutions that have been developed for tablet operating systems including Android™ and the cafe owner can choose from many options, ensuring they pick one that can integrate into a suitable payment system.

They may also elect to have a receipt printer and cash drawer as part of the solution.

Fig 6: Single tablet cafe set-up with receipt printer and cash drawer.

For card and other mobile payments, the tablet device is connected to a payment terminal. These are typically the more traditional devices made available by banks or one of the ranges of newer devices such as Square™ that don't require a merchant account to be set-up with a bank, noting this varies widely by country in Asia.

Payment devices that are connected directly to the POS device are often referred to as 'Integrated'. This means that the amount due is automatically sent to the device from the tablet rather than having to be keyed in again, reducing the risk of human error where a coffee costing $4.00 on the POS system is entered as $40.00 on the payment terminal.

There are a wide range of MPOS solutions for food, beverage and hospitality with advanced features including CRM, staff time and attendance tracking and loyalty program functionality also available.

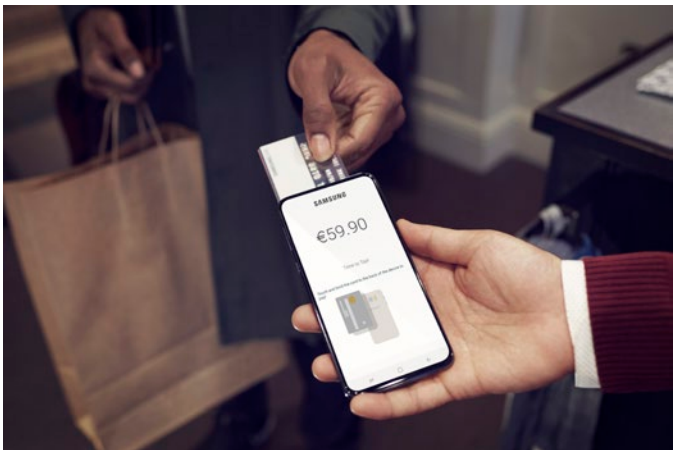


Fig 7: Integrated POS & Payment terminal.

Use Case 2: Professional Services

A self-employed electrician that predominantly handles domestic work and also uses small business accounting software to run his or hers business.

Most new jobs arrive via smartphone and are urgent, leading to a high percentage of jobs being 'time and materials' rather than a fixed price quote. The ability to drive straight to an urgent job, provide an instant quote and also take payment straight afterwards to avoid multiple visits saves a significant amount of time. Utilising software that integrates with the accounting system also means everything is reconciled automatically so there is no need to manually reconcile invoices or fix revenue reports or tax calculations later.

There are 2 primary solutions from a device perspective. One is to use a dedicated mobile payment device such as shown in the image below that uses mobile connectivity to allow connection from any location. This allows for payment processing but can't run any business software to allow invoices to be produced.

Fig 8: Proprietary mobile payment terminal.

The other, more flexible solution is to use an add-on to an existing smartphone. This allows for the use of a specific POS application that can run on the smartphone and capture the customer's details, generate an invoice and link seamlessly to a credit card reader to handle payment. This integration ensures less chance of errors in handling the paperwork and much easier reconciliation with the accounting system.

Fig 9: Mobile payments using a smartphone.

Use Case 3: Retail

A start-up clothes designer has a new range of clothes that are currently made available online for sale across Asia-Pacific. They want to extend from selling online to being able to create pop-up stores in short term lease shops and also at markets across the region through a network of sales associates.

To enable this, they can either enter an agreement for a dedicated payment device or choose to adopt a tablet or smartphone approach. With the latter, this is useful in the scenario where the particular item the customer wants is not available at the pop-up store that day but can be ordered online. Using a smartphone approach also provides more flexibility to handle payments in different countries.

Below is an example of Visa's Tap to Phone MPOS, an integrated offering with Samsung's Galaxy XCover Pro.

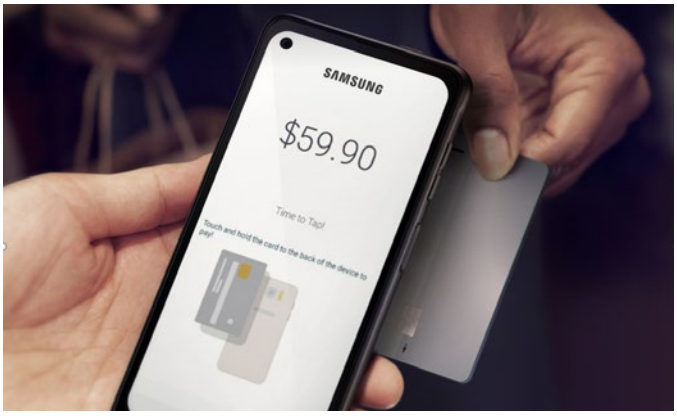
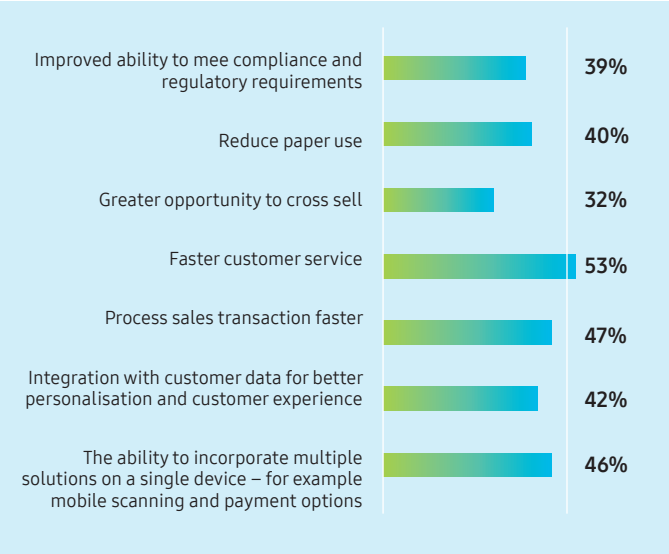


Fig 10: Smartphone payments.

9 What are the outcomes that can be expected?

More than 1/3 of survey respondents reported being able to measure specific benefits for their business as a result of adopting MPOS solutions. Faster customer service, quicker sales transactions and improved personalisation were listed as some of the key benefits of adopting MPOS.



Source: Tech Research Asia

Fig 11: Benefits of deploying MPOS solutions.

Although there were some variations by country with Australia showing the strongest focus on reducing paper use and Philippines the least concerned about improving compliance, the benefits were largely consistent across the region.

For customers, offering more convenient ways to pay beyond cash in many situations e.g. at markets will provide a business boost. Further enhancing this by accepting payments from mobile devices including phones and watches such as the Samsung Galaxy Watch™ provides even greater flexibility for tech-savvy consumers.

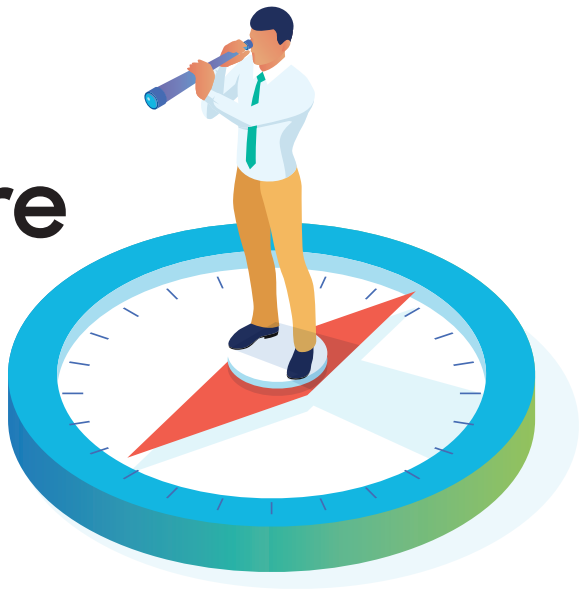
Businesses may also benefit from accepting new payment types and the ability to capture customer details at the point of sale for marketing and loyalty purposes that can drive higher revenue through cross-selling or upselling of products.

Using mobile devices and industry POS softwares, means businesses can achieve better efficiency through generating data related to inventory, sales tracking and invoicing.

Depending on the software, this information can also be automatically synchronised to accounting systems to minimise double handling of information and manual reconciliation.

Of course, leading software vendors also provide powerful analytics that allow business owners to review their business from many angles using all this data to improve performance.

10 What is the future of MPOS?



The MPOS market is continuing to evolve with advances coming in the form of new devices, software and payment processing options.

We expect these advances to continue at this pace as consumers demand new shopping and buying experiences including pop-up and concept stores and the use of mobile devices, such as smartphones and wearables, for mobile payments and electronic wallets.

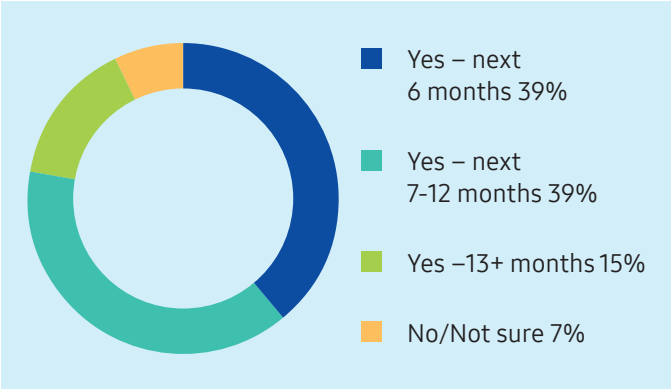
Traditional retailers remain under pressure and need to continue to evolve their in-store experience to stay current. This will drive innovation in kiosk, mobile and tablet style solutions for larger store retailers, and combined with advanced analytics including in-store consumer behaviour allow for smart targeting of offerings and integrated omni-channel experiences.

As more competitors continue to enter the space, we expect to see continued downward pressure on set-up and transaction fees which will all benefit businesses. We also expect to see dramatic consolidation in the market as scale matters in software development and transaction processing and in the medium term, there will likely be a few dominant players that emerge in the MPOS market.

We also expect to see continued innovation in devices with increased focus on rugged, multi-use devices capable of meeting the needs of the B2B market. These devices will be resistant to tough conditions including water, dust and humidity and of course being dropped. Long-lasting batteries and fast charging will also be key along with availability of industry applications such as point of sale, payments and inventory management.

Smartphones are the preferred form factor for MPOS solutions, and this is also driving high refresh cycles as multi-purpose devices become the primary option.

Results below to the question, **"Do you intend to refresh your devices?"**



Source: Tech Research Asia

Fig 12: Expected MPOS device refresh rates.

There were some variations by country with Indonesia, Philippines, Thailand and Vietnam all reporting 40% or higher refresh rates for the next 6 months vs. other countries, indicating the strongest propensity for new or updated MPOS deployments.

The market is evolving rapidly, new devices such as the Galaxy XCover Pro are making MPOS adoption simpler by expanding the capabilities of a single device. Security solutions such as Samsung Knox provide re-assurance to merchants that they can move to digital transactions with minimum risk.

11 A checklist for businesses when assessing MPOS

There are so many providers of MPOS solutions it is easy to become bewildered. Unfortunately, many won't be around for the long term and businesses must be diligent to ensure they are partnering with companies that are sustainable.

- How well established is the company offering the solution - how long have they been in business? Are they public or privately owned?
- What devices are they using, are they industry standard or proprietary?
- How secure is the device and solution? Does it meet the necessary regulations including PCI DSS compliance?
- Can the device work in the conditions required: heat, humidity, vibration, gloves?
- How are devices offered: Lease, financed or purchased outright?
- Who developed the MPOS software and how many users do they have today? Can you talk to an existing customer?
- How many live (not trial) customers do they have today?
- Who is the payment processor? Do they have relationships with the big payment processors: Visa, Mastercard, InstaPay, PromptPay and others?
- What are the transaction fees?
- What are the ongoing support costs?

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