

2019

ATM and self-service software trends

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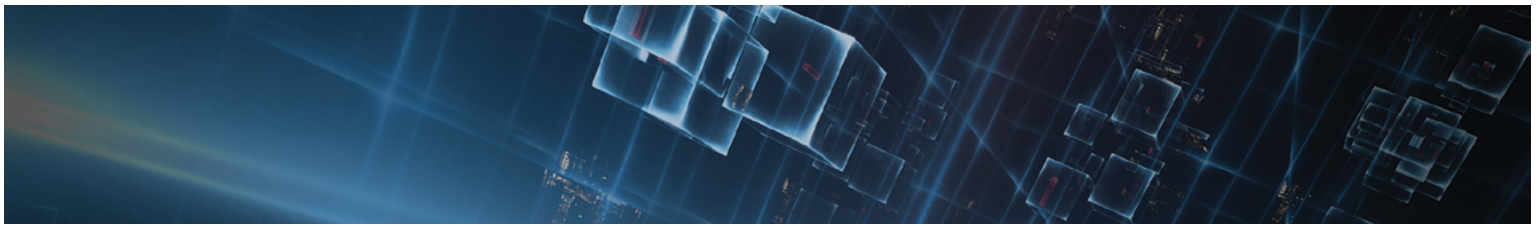
ATM Software



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INTRODUCTION

Welcome to the 2019 edition of the ATM and Self-Service Software Trends report. Now in its 12th edition, our study again finds the ATM industry in a state of flux.

The end of support for Microsoft Windows 7 draws closer by the day, with a deadline of January 14, 2020.

Financial institutions that were obliged to upgrade from Windows XP just five years ago to ensure the security of their ATMs are once more confronted with costly and often complicated decisions about their ATM estate and its functionality — not to mention months of disruption for their IT and ATM management teams.

A fractured focus

In this year's survey, which builds on [findings from previous years](#), 64% of respondents indicated that ATM hardware upgrades are prompted by OS migrations.

If this is the case, it follows that, driven by the dictates of Microsoft's end-of-life schedule, many ATM managers are finding it next to impossible to build thoughtfully and strategically planned fleets that truly respond to their customers' — and their bank's — specific needs.

Instead, they find themselves needing to allocate a large part of their current ATM channel budget to the next round of upgrade-related costs. And once the upcoming round is finished, they can look forward to beginning the cycle all over again with the next OS update.

"It is just very expensive for the banks to do it," KAL CEO Aravinda Korala explained. "But, of course, it involves much more than just cost. It's also a very complicated project that requires the management of a host of vendors and moving parts."

Korala said that the tendency to point a finger at Microsoft for the cycle of ATM upgrades is somewhat unfair, given consumers' enormous appetite for technological improvement and software and hardware vendors' untenable costs for providing eternal support for outdated products.

"There simply is no alternative to doing upgrades," he said. "In the modern world, you cannot buy Windows software or PCs or anything else and hope to run them for 20 years. Unfortunately, that just isn't an option."

According to Korala, forward-thinking banks cope with issues of ATM software and hardware obsolescence by implementing a "rolling process" of ATM replacements, with a certain percentage of the fleet marked for upgrade and replacement each year.



By so doing, the bank avoids the expense and drama of overhauling its entire ATM fleet in one big lump every time a forced operating system upgrade comes along.

These rolling replacements take the “lumpiness” out of ATM fleet planning and facilitate a smoother process of everyday fleet management, Korala said.

“Instead of being something of a crisis, the OS upgrade now becomes an opportunity to add capabilities that allow the fleet to better serve both the bank and the customer,” he explained.

Ultimately, Korala said, “It’s facing reality and doing what needs to be done in little chunks. It’s answering the question, ‘What do we need to do each year if we want to maintain compliance and make improvements?’”

This year’s survey participants identified those desired improvements as being new features and functions (25%), improved ATM availability (25%), reduced cost of operation (22%) and an improved overall customer experience (19%).

Further to an improved customer experience, banks want to concentrate on the important management and monitoring functions of fraud prevention (24%), software distribution and version control (18%), cash forecasting (14%) and management information reporting (14%).

The end of upgrades?

With the 2020 Windows 10 migration deadline looming, this year’s software trends study naturally placed a focus on upgrades, which have provoked rising frustration among bankers looking for an alternative to OS upgrades.

The good news is that software developers serving the retail banking industry have been listening. You’ll find more on that in chapter 4 of the report.

This year’s report also follows up on trends in branch transformation and branch network rationalization that have both enabled and required the ATM channel to evolve into something far more sophisticated than the traditional, decades-old cash delivery and deposit network. More on that in chapter 1.

In chapters 2 and 3, we present survey results and analysis related to the industry’s top ATM network priorities, including features and functionalities, digital integration and the delivery of a seamless omnichannel customer experience.

Throughout, we bring you the personal perspectives of more than 30 ATM specialists from markets all around the globe, offering a view to the diverse and dynamic ways that ATMs are connecting banks and their customers the world over.



This year, in a fresh approach, we've included extensive comments gleaned from our interviews with industry executives.

These observations, which you'll find at the end of each section, provide a firsthand narrative describing the on-the-ground challenges, opportunities and consumer demands that are defining and driving ATM and self-service trends across global markets.



SURVEY DEMOGRAPHICS

A total of 420 ATM and self-service industry members participated in this year's survey — a dip of approximately 10% from the 2018 report, but roughly consistent with response numbers in most recent years.

Of this year's survey respondents, 211 (50.2%) represented financial institutions. This compares with 51% representing FIs in 2018 and 44.5% in 2017.

The remaining 49.8% of 2019 respondents identified as "other," a group comprised largely of ATM and self-service equipment vendors, service providers, independent ATM deployers and processors.

These nonbank providers comprised 55.5% of survey respondents in 2017, but leveled out with banks in 2018, at 49%. For all practical purposes, 2019 produced an even split, as at 50.2% FIs and 49.8% other.

Following historical precedent, North America represented the largest share of respondents in the 2019 software survey, at 34 percent. This compares with 31% in 2018.

North America was followed by Europe (23%); the Middle East and Africa (18%); Asia-Pacific (15%); and Central and South America (8%).

This year, 2% of survey respondents hailed from financial institutions in the Caribbean, a region that was not represented in 2018.

Asia saw a marked reduction in representation this year at 15%, compared with 26% in 2018, while Africa saw a notable increase at 15%, compared with 8% in 2018. The Middle East saw a substantial decrease in representation at 3%, compared with 6% in 2018.

Together, North America and Europe accounted for 57% of survey respondents, continuing the historical trend of majority representation by mature markets.

In terms of ATM fleet size, smaller fleets (1–200) were most heavily represented in this year's survey, with 30% of respondents. The small fleet category was the biggest gainer in 2019, adding eight percentage points over the 2018 survey.

After dropping 7 percentage points between 2017 and 2018, representation from FIs with fleets of 2,000 or more ATMs remained stable this year, at 22%.

Between these two bookends of smallest and largest, ATM fleets numbering 101–500, 501–1,000 and 1,001–2,000 were fairly evenly arrayed at 16%, 17% and 14%, respectively.



CHAPTER 1

ATMs and branches: A (re)balancing act

The trend in bank branch closures gained momentum during the Great Recession in the late 2000s and early 2010s, and has continued through the global economic recovery.

Indeed, the British watchdog group Which [reports](#) that the United Kingdom saw approximately 2,900 branches shuttered between 2015 and 2018, with closures ongoing at the rate of 60 per month.

Since 2012, in fact, U.K. banks have cut back their branch networks 27 percent in total. Closures have hit small rural communities especially hard and many have been left without a single banking facility.

At the same time, the dominant ATM processing provider in the U.K., the fee-free Link network, has been ratcheting down the transaction fees paid to off-us providers across the network, resulting in an alarming number of ATM closures across the country, as well as the implementation of transaction fees by some independent ATM deployers pressed to ensure the continuing viability of their fleets.

U.S. banks and credit unions have trimmed their branch networks as well, closing a combined total of more than 7,200 locations since 2015, with total closings on a steady upward march year after year.

Still, the 14% decline in U.S. bank branches — from 83,071 FDIC-insured institutions in 2012 to 78,774 in 2017 (the most recent data available) — has been less acute than the 27% reduction in the U.K.

Different regions, different requirements

The [trend toward declining branch numbers](#) is much the same across all developed markets: In one region after another, physical facilities have closed as banked populations around the world have taken up mobile and online banking.

Developing markets are another story. In countries such as Brazil and India, whose governments have worked to expand participation in the formal banking system, branch networks continue to expand to serve newly banked populations.



“In India, banks are continuing to set up more branches, though at a very measured pace,” according to Puneet Kapoor, senior executive vice president at Kotak Mahindra Bank Ltd., whose current footprint includes 1,503 branches and 2,394 ATMs across India.

Kapoor said that customers place great trust in brick and mortar branches, and he pointed out that a completely digital banking model has yet to evolve. “We follow a ‘phygital’ approach, where digital branches, combined with e-lobbies offering 24/7 smart banking, complement our traditional branch banking network,” he said.

Meanwhile, other developing nations have leapfrogged to digital money transfer systems. For instance, Kenya has embraced the M-Pesa mobile system for payments, financing and microfinancing. This direct-to-digital movement has resulted in little to no growth in branch networks.

The smart ATM: A branch in a box?

In some markets where branch networks are contracting, banks are deploying self-service banking devices to help meet their customers’ needs for branch services. These leave-behind solutions range from simple cash-dispensing ATMs to sophisticated remote teller machines that can perform up to 90% of the transactions normally offered at the branch. New Zealand’s Westpac NZ is one bank that is using this approach.

“In New Zealand, branches are being consolidated and smart ATMs are being put in place as a replacement for the branches that are removed,” said Arvindas Kaletla, a senior developer at Westpac.

Banks are also using “smart ATMs” (devices that accept cash and check deposits, recycle deposited cash and, in some cases, provide video teller services) as a way to expand their service footprint without having to invest in branch facilities and staff.


Survey findings

The shifting and variable landscape of branch and ATM networks is reflected in answers to a question about the near-term outlook for branch and ATM numbers.

Overall, 80% of financial institution-based respondents said they expected that their ATM networks would remain the same size (15%) or grow (65%), while more than two-thirds (67%) of respondents said branch numbers would remain the same (37%) or decline (30%).

A little more than one-third (35%) of respondents said that both branch and ATM networks would grow, while 30% predicted that only their ATM networks would grow.

Overall, just 5% of financial institutions expected to downsize their ATM networks, compared with 36% overall who expected to see an actual reduction in the number of branches.



Survey participants from nonfinancial segments of the ATM industry (e.g., nonbank deployers, ATM manufacturers, maintenance and service companies, hardware and software suppliers and ATM processors) were less likely to forecast expansion in bank ATM fleets.

Overall, 56% of nonbank respondents predicted that banks' ATM networks would grow (compared with 65% of banks), while one-third thought they would either shrink (30%, compared with 5% for banks) or stay the same size (3%, compared with 18% for banks).

Interview insights

In follow-up interviews, financial and nonfinancial ATM industry members offered their regional perspectives in answer to the question “Do you see a shift in the role the ATM plays in relation to the branch?” Following are selected remarks, lightly edited for clarity:

More than likely banks will keep the same number of ATMs, but will replace the existing dispense-only ATMs with recycling ATMs. This cash automation will help them reduce manpower and also eliminate manual processing of transactions. This gives customers flexibility to use ATMs outside of operating hours to beat the rush hour.

— Kiran Pidugu, Product Manager, Prosegur Australia

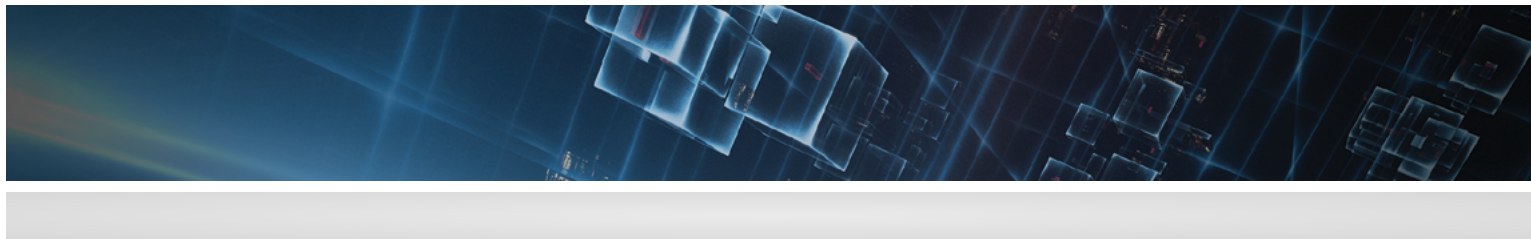
In traditional branches, most ATMs are for cash transactions, but now the function of self-service machines is expanding more and more. Eighty percent of counter and teller transactions already can be done on self-service machines.

In our bank, we reduced the number of both teller counters and ATMs, but increased other self-service machines (e.g., cash recyclers, self-service bankcard issuance kiosks, smart teller machines, etc.)

— Tang Guojun, General Manager, Bank of ShiZuiShan (China)

There is one thing mobile apps and online account access cannot provide — hard cash. For fast and easy access to real funds, heavy users of online and mobile avenues turn to the most convenient, quick and easy solution — the ATM.

— Nguyễn Việt Hưng, Executive Vice President, Bank for Investment and Development of Vietnam Bank Card Center



With respect to ATMs, there are some concerns related to the increasing costs linked to directives issued by both the government and the central bank, which makes the viability of running an ATM network more challenging.

There is a need to educate customers to visualize an ATM as a mini branch where a lot of transactions can be done in DIY mode. There is a clear opportunity of shifting some of the traffic from the branch to the ATM zone.

**– Puneet Kapoor, Senior Executive Vice President,
Kotak Mahindra Bank Ltd. (India)**

Banks are closing more and more stores, as customers rarely need a direct local contact as before.

Often branches are closed and only the ATMs are kept to ensure the availability of cash. Therefore, the availability of ATMs will play an important role in the future, since the machine is the initial touch point for the customers.

**– Daniel Dorna, Product manager, IC Cash Services GmbH
(Germany)**

In my opinion, the number of ATMs will decrease with the branch numbers because every branch has two to three ATMs in it. Moreover, banks tend to decrease the number of ATMs with ATM efficiency reports and tools. It is not important to have an excess of ATMs, but it is important to have efficient and more customer-serving ATMs.

**– Tolga Özdemir, ATM Application Development Manager,
Ziraat Teknoloji (Turkey)**

Banks in China are all reducing the number of ATMs; some banks have a clear plan to reduce ATMs by 20% to 30%. Meantime, banks are transforming branches also, increasing the use of smart teller machines and non-cash kiosks. In future years, ATM numbers will keep shrinking, because average transaction numbers per ATM in China are getting lower and lower. Also, ATM life is being extended, with few new purchases of ATMs.

**– Chen Guodong, Deputy General Manager of R&D Center;
Zhong Cheng, Technical Officer, Zijin Technology (China)**



There is a significant opportunity for smart ATMs to provide a transitional pathway for financial organizations to move away from the historical branch/physical presences — especially in uneconomical locations.

Smart ATMs also support ongoing capability within locations rather than the organization “abandoning” the site. This is a significant and very political issue at regional and remote locations.

— Michael Axarlis, Independent Consultant, Australia

While some may believe that bank branches are dying out, this is actually not the case — they are simply transforming. The influx of new software innovations, evolving customer behaviors and global regulations have led to a dramatic change in how we view and interact with digital payment processes throughout the traditional banking branch.

While some consumers are still amenable to the traditional in-person teller experience, many prefer to leverage ATMs as their one-stop-shop for their banking transactions. To remain at the forefront of the changing digital landscape, ATMs must now focus on enhancing and leveraging technology and upgraded software solutions to create a frictionless digital banking experience for the end-user. In turn, this also allows bank branch employees to focus on more personalized service.

**— Alan Kerr, Senior Vice President of Software,
Diebold Nixdorf Inc.**



CHAPTER 2

Added features, improved availability

“The more new features added, the more satisfied customers are,” said Nguyễn Việt Hưng, executive vice president for the bank card center at BIDV, Vietnam’s state-owned bank for investment and development.

“It is possible that we could see ATMs breaking entirely new ground in the near future, as the diverse range of transactions offered to consumers continues to change. Be it transactions such as multicurrency cash dispense, account opening, loan repayments or ticket dispensing, the ATM is clearly one of the most flexible self-service channels that a financial institution can look to deploy to not only reduce costs but also to drive convenience for consumers.”

For a wide swath of consumers, ATM accessibility has long been as important as — or even more important than — branch proximity.

Indeed, as banks pare down their branch numbers, ATMs represent the opportunity to maintain customer contact and loyalty through a wide spectrum of services that previously would have required a branch visit.

And, completing the circle, the ability to transfer valued services from the branch to the less expensive ATM channel — without diminishing customer convenience or satisfaction — can provide an ongoing *raison d’être* for an ATM estate even in the face of falling cash demand.


“It’s always been important, but developing new functionality in a world where cash use is expected to decline is critical,” said Nigel Constable, managing director of NoteMachine Technologies, a U.K.-based IAD that serves markets throughout Europe.

Or, as succinctly expressed by Mario Gaete Jiggins, electronic channels manager for Belltech, a Chile-based provider of ATM services across South America, “If they do not adapt to the reality of today, where everything is fully digitized, ATMs will not have a place. They must be transformed, just as companies must transform to survive.”

Survey findings

In a world where transactions are mobile-based, biometric authentication at an ATM may have become redundant — at least according to many of this year’s survey participants.

Neither bank nor nonbank survey participants rated biometrics as a top-three future priority in the 2019 survey, a departure from 2018 results for both groups.



Instead, both banks (53%) and nonbanks (also 53%) named cardless ATM transactions as the No. 1 functionality to support within the next three years.

It stands to reason. Now that smartphones routinely employ fingerprint or facial ID technology, banks seem entirely willing to let mobile device manufacturers take on the task of user verification for banking transactions.

Priority 1: Cardless transactions

Today, the ATM networks of banks both large and small are enabled for cardless cash withdrawal. Large independent ATM deployers such as Payment Alliance International and Cardtronics are also angling for a piece of the action.

In the United States, the trend is supported by mobile phone ownership among adults at 96% and smartphone ownership at 81% as of this June, according to [Pew Research Center](#). (Additionally, 1 in 5 uses a smartphone as the primary means of internet access at home, too, which helps to explain the continuing growth of mobile banking.)

Elsewhere around the world, smartphone ownership is at 76% in developed economies and at 45% among developing economies, also according to [Pew](#). Mobile phone ownership overall stands at 93% and 78%, respectively.

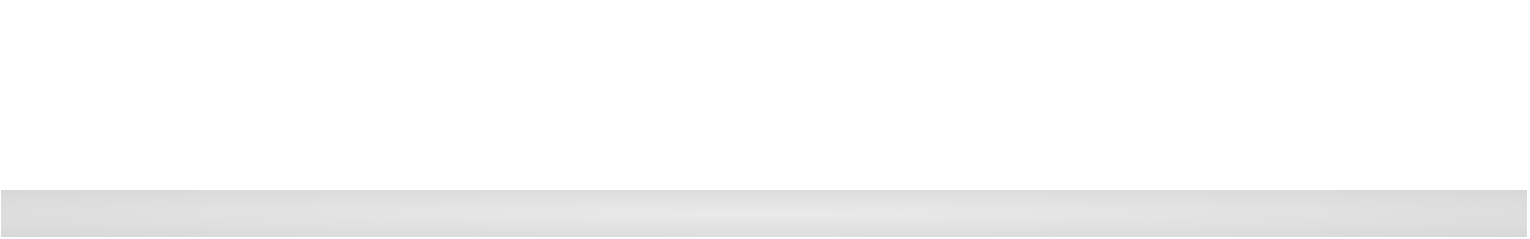
“With the mobile phone taking over most of our other daily use devices, customers are eager to ditch cards and use their magic wands (phones) wherever they can,” said Arvindas Kaletla, senior developer at New Zealand bank Westpac NZ. “So it is imperative that mobile features must be enabled by all banks, otherwise they might even start losing their customer base.”

Particularly in the U.S., the mobile trend promises to grow even more, fueled by ATMs, POS devices and, increasingly, fuel pumps upgrading to mobile capability as they migrate to the EMV card standard.

“Our society will only continue to grow increasingly familiar with cardless transactions, with more and more restaurants, department stores and retail businesses accepting digital payments over cash,” Kerr said. “It is imperative that ATMs implement features that are designed to accept these types of payments. If self-service channels are unable to prioritize these enhanced software features, they run the risk of falling behind other institutions that are leading the way with innovative offerings.”

Priority 2: Contactless transactions

Across Europe, contactless transactions have been the norm for several years now, and users seem quite content with this mode of transacting. Excluding the U.S., contactless cards are the payment [method of choice](#) for 48% of Visa cardholders, the company has said. Compare this with 0.18% in the United States.



Again excluding the U.S., 90% of transit fees on the Visa network are made via contactless cards. Transit has been an especially big promoter of contact card use, due to the speed of the transaction, which can beat even mobile.

That said, the ubiquity of smartphones in the United States, combined with the country's tardy adoption of EMV and contactless transactions, might well mean that the U.S. will leapfrog other developed countries in the adoption of mobile transactions.

Still, with a firm push from Visa and Mastercard, a growing number of U.S. banks are now issuing contactless cards — among them megabanks such as Bank of America, Capital One, Chase, Citi and Wells Fargo, as well as American Express and Discover. The same banks are also offering their customers the option of contactless ATM transactions.

It remains to be seen whether U.S. cardholders will find a slim card more convenient than a comparatively bulky mobile device in the transaction process. Either way, the ATM industry wins with transactions that are increasingly secure and, no less importantly, more convenient than ever for consumers.

Priority 3: Cash recycling

Cardless and contactless ATM transactions might be all about convenience for the customer, but cash recycling is all about cost-efficiency for the financial institution. And as such, cash recycling becomes ever more important for banks as cash transactions wane in many markets. This fact helped lift cash recycling into the top three as a focus for bank ATM networks.

“New features are expected to increase transaction numbers, hence reducing the cost per transaction,” said Arief Marleman, business and product development advisor at PT Sarana Yukti Bandhana, an Indonesian payments solution provider. “Cash recycling is very important to significantly reducing the costs related to cash management and idle money.”

But it's not only a matter of cost. With some high-traffic ATMs, cash recycling is also an important component of uptime, hence “an integral part of enhancing the customer experience,” said Ayman Basha, regional business unit director for BFSI, a Middle East-based provider of computer network support and services.



Interview insights

In follow-up interviews, bank and nonbank industry members explained why this year's top three priorities are so important, and why new ATM functionalities and increased availability in general should be targets for improvement in the short term.

Those priorities are important in so far as they influence a rise of client loyalty and the speed and simplicity of transaction completion.

— **Oleg Semenko, ATM and POS Monitoring and Development Team, TBC Bank (Georgia)**

ATM availability and new features become more and more critical for customers not to feel the pain of the vanishing branches. And if other banks' customers use your ATMs, you would certainly want to stand out as well and attract them.

— **Arvindas Kaletla, Senior Developer, Westpac NZ (New Zealand)**

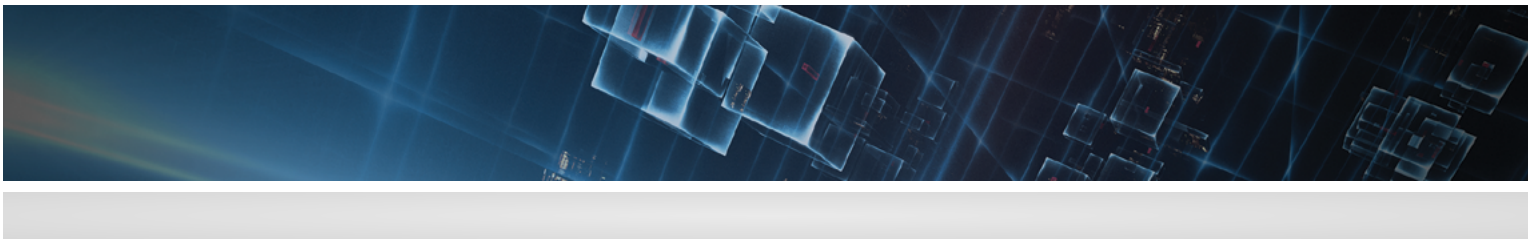
The use of contactless technologies is important mainly for security issues (e.g., card cloning, PIN theft, etc.), in addition to increasing the use of the bank's mobile app, allowing the customer to make transactions in the app and finish them in ATMs without using cards and keys.

Regarding recycling, Ecuador is a pioneer in this. Other countries are beginning to look at this technology, specifically to lower operating costs associated with cash in transit and the availability of money for customers.

— **Rodrigo Burgos Mansilla, Country Manager, Bell Technologies Ecuador**

Cash recycling is becoming more important because it is the most efficient way to automate cash deposits. Cash deposit is becoming more and more important as banks automate this function to reduce costs, or because they are closing branches.

— **Georg Rechberger, Business Development, KEBA AG (Austria)**



Contactless technology was adopted very quickly in the Czech Republic. Numbers are showing that quick contactless payments play an important role, so the introduction of contactless transactions on ATMs was just an additional step. Contactless technology can also reduce some security risks related to card skimming.

We will see whether the pressure from regulatory bodies that leads to additional taps or PIN entry will slow down or completely block implementations of additional contactless ATM services within Europe.

Personally, I can see the benefit of contactless technology on ATMs, especially for NFC mobile phone users. But it becomes a nightmare for card issuers because they are losing contact with their cards — the bank cannot reset offline counters or send a script to the card via a contactless interface.

— Martin Chlumsky, Solution Architect, Česká spořitelna (Czech Republic)

With these top three ATM features, consumers don't need to carry their card and remember their password. Cardless transactions and contactless transactions such as those using a QR code can also reduce the time spent at the ATM by setting up the transaction in advance with a mobile device. In addition, cash recycling is decreasing operating costs considerably. For these reasons, these features will continue to be important in the near future.

— Mert Yagiz, Turkey

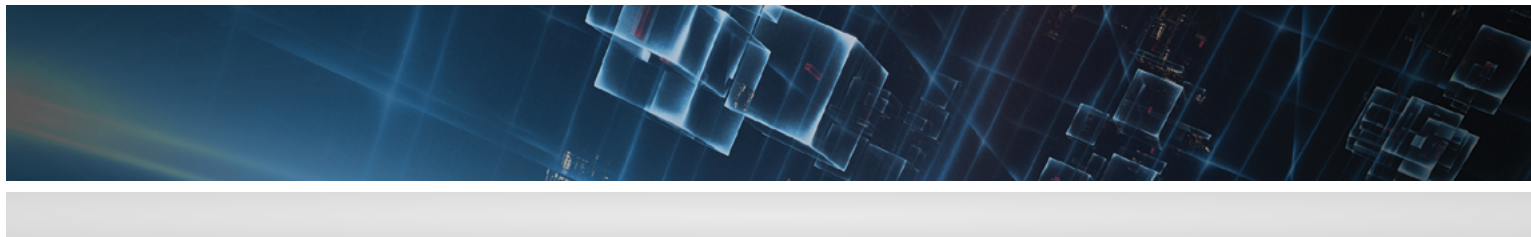
Cash recycling will allow venues to recycle their cash takings, thereby avoiding the need to visit a branch to deposit cash. However, as venues are increasingly going cashless and consumers are transacting over digital payment and card rails, the level of cash handling and holdings will considerably decline.

As such, significant innovation in smart ATM products and services will need to be seen to ensure they remain relevant as traditional cash deposit and withdrawal functions decrease.

— Michael Axarlis, Independent Consultant, Australia

Cardless, contactless and recycling were the main functions of 10 years ago in China. Now banks are working on omnichannel integration, biometric cash withdrawal via face recognition, WeChat withdrawal, one-on-one targeting, etc.

— Chen Guodong, Deputy General Manager of R&D Center; Zhong Cheng, Technical Officer, Zijin Technology (China)



Both cardless and contactless help mitigate the risk of skimming, which is one of the biggest challenges that ATM operators are trying to grapple with. It also enhances customer convenience.

In the instance of cardless, one can also create a third-party transaction and manage different types of person-to-person transactions.

Given the costs attached to running an ATM, break-even comes at a reasonably high use. Converting an ATM into a recycler enables the opportunity for twice as many transactions, auto balancing, cost rationalization and makes it that much more viable.

**– Puneet Kapoor, Senior Executive Vice President,
Kotak Mahindra Bank Ltd. (India)**

These days, ATMs are more than money-dispensing devices. New features such as recycling, marketing campaigns, WeChat Pay, Ali Pay, and crypto ATMs will play a vital role moving forward. ATMs will become a one-stop shop for transactions, bill payment, etc.

– Kiran Pidugu, Product Manager, Prosegur Australia



CHAPTER 3

ATMs and the wider digital strategy

In the 2007–2008 ATM Software Trends Analysis, the first edition of this annual report, the ATM Marketplace editor at the time, Tracy Kitten, wrote that multichannel integration was a notion that “sounds ideal in theory but remains highly unlikely in practice.”

That was then.

More than a decade later, multichannel integration is not only likely, but also more than probably essential to the future of the ATM — and it’s equally true that the ATM is essential to a bank’s multichannel digital strategy.

In an age of cloud-based services, consumers have come to expect cross-channel access to their data, whether it’s a book on their Kindle reader or their bank balance on their iPhone, laptop, iPad or conveniently located ATM.

And, says Nguyễn Việt Hưng of the Vietnam investment and development bank, those cross-channel services can equal or exceed those available online or through a mobile device.

“To save management costs and to be able to serve customers 24/7, many banks are now considering using ATMs and more modern devices (e.g., video teller and assisted teller machines) to expand their network,” he explained.

“ATM technology has evolved; many newer ATMs offer a wider range of convenient services — including cash and check deposits, cardless transactions, person- to-person payments and check cashing — and cardholders are taking notice.

“ATMs can also offer an omnichannel experience. Some advanced ATMs can help bridge the communication gap with specialized upload-and-delivery software. These systems provide an additional way for banks to display event reminders, special offers, and other messaging — and target that message directly to an individual cardholder.”

And then there’s the fact that ATMs can do what no other digital channel can do: dispense cash.



Survey findings

As they consider their omnichannel digital strategy, banks are asking themselves two key questions, “Where does the ATM fit in?” and “What can we do to ensure that it’s a seamless fit for the consumer?”

The big picture

As to the ATM’s place in financial institutions’ overall digital strategies, responses from bank and nonbank survey participants were strikingly similar. The same percentage in each group (47%) said that banks viewed ATMs as a crucial piece of their wider digital strategy. Among banks, another 41% said it was somewhat important, compared with 38% among nonbanks.

Much smaller numbers — 12% of banks and 11% of nonbanks — said it plays just a small part. Only 3% and 1%, respectively, said it plays no part at all.

These responses about digital strategy could be a reflection, to some degree, of cash demand regionally. Ask bankers in India and China the same question and you’ll get two very different answers.

According to Puneet Kapoor of Indian bank Kotak Mahindra, “There is a large percentage of customers who continue to use cash as the primary means of payment. It is therefore relevant to engage with them and give them a positive experience when they interact with the ATM as a channel.

“Further, evolving technology — including biometric-based ATMs and enhanced features — allows banks to extend the non-human interaction at a more engaging level.”

On the other hand, according to Tang Guojun, general manager of China’s Bank of ShiZuiShan, “In China, the ATM’s role is less important than before. Mobile banking and internet banking are the most important channels in most Chinese banks’ wider digital strategy.

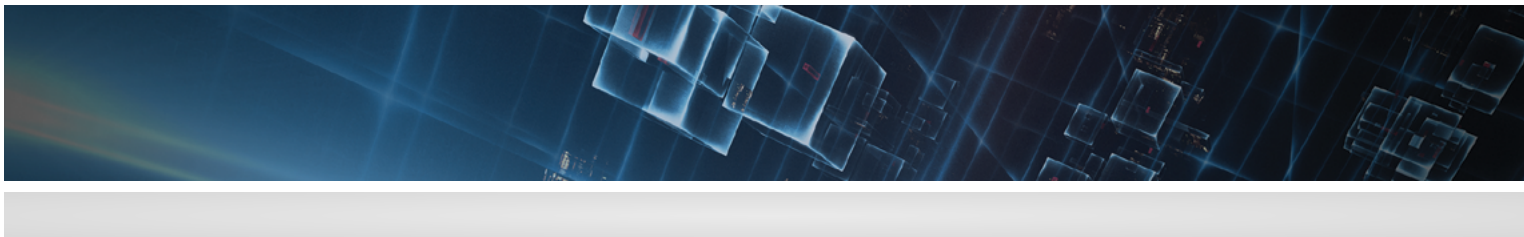
“ATMs only play the main role in cash transactions. But in the payment field, mobile payment is the mainstream, taking more than 80% share.”

The consumer-facing picture

In this year’s survey, bankers and nonbankers saw the importance of the ATM user interface through much the same lens, as they did the bank’s larger digital strategy.

Nearly three-quarters (73%) of bank respondents and nearly two-thirds (63%) of nonbank respondents identified the ATM user interface as an area of focus that had either been addressed or was being addressed by financial institutions.

Much smaller numbers (23% of banks and 31% of nonbanks) said it was only somewhat important and only 5% of each group said it was not important enough to address.



Clearly, just as the vast majority of bankers see ATMs figuring in the success of their digital strategy, they see the ATM user interface as an integral aspect of the ATM's success within a digital strategy.

“Part of enhancing the customer experience is to have a seamless user interface and user experience across all channels,” said Ayman Basha, regional business unit director at BFSI, a provider of computer network support and services in the Middle East.

A highly navigable and predictably consistent and user interface can also help the customer feel more comfortable and confident using their bank's digital tools, regardless of the channel, opening up additional platforms for customer outreach and product sales.

“The general user interface concept allows clients to conveniently and rapidly use an already-known visual side of the bank's service spectrum,” said Oleg Semenenko of the ATM and POS monitoring and development team at Tbilisi, Georgia-based TBC Bank.

It's also worth remembering that there's more in it for the bank than the experience created for the customer: A consistent cross-channel UI also makes a deeper subconscious impression on the user, said Marcus Lim Wooi Loon, head of shared ATM network and self-service terminals at Payments Network Malaysia Sdn Bhd.

“Aligning the look and feel of user interfaces is important to project the banks' brand correctly,” he said.


And there's a lot that banks can do to please their multichannel-adept customers, according to Wang Xiang Dong, chief editor for the Chinese publication China Financial Consulting 365: “The user interface is very important. Compared with the traditional boring ATM UI, there's quite a lot of room for ATMs to improve the UI so that it is more user friendly, with more new experiences offered.”

Interview insights

In follow-up interviews, bank and nonbank industry members explained why they felt ATMs did or didn't play a vital role in an omnichannel digital strategy, and how important a seamless user experience was in determining its success within the channel and across other channels as well.

Though internet and mobile banking is the focus, the banks still have customer bases that depend on ATMs for certain transactions and it is inevitable that the banks' digital strategies include ATMs for the foreseeable future.

**— Arvindas Kaletla, Senior Developer, Westpac NZ
(New Zealand, bank)**



ATMs and self-service kiosks are helping to migrate traditional banks to a digital approach. However, those traditional banks are threatened by the native digital banks. To use an analogy, Netflix is beating cable and telecom operators, however Netflix's streaming service will not survive without the telecom operators' infrastructure. In the same way, cash and ATMs from traditional banks will be necessary for digital banks.

**– Felipe Ibarguen, Commercial Manager, Belltech
(South America)**

ATMs will become more and more important to connect the digital with the analog worlds. Banks are running mobile and other digital channels, which somehow can be merged together on the ATM. Pre-staging of transactions, etc, are common in some countries already and will become more popular in the future.

**– Georg Rechberger, Business Development,
KEBA AG (Austria)**

The one service that only an ATM can provide is cash. As long as cash is needed, the ATM is still a better channel to reach the customer. In the future, ATMs can also offer services at the branch to create a closer customer relationship.

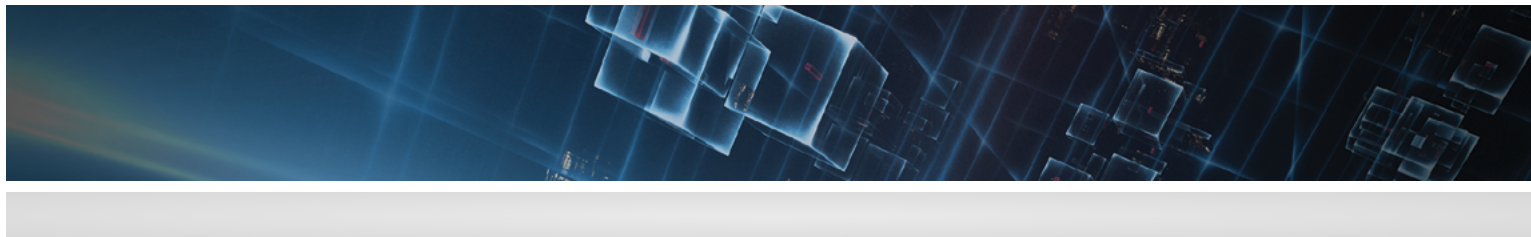
**– Johanes Taufan, Senior IT Analyst at Customer Touchpoint
Solutions Application for ATMs, BCA Bank Indonesia**

The ATM is important as it can become an extension of the bank. However, vendors will have to evolve to devices that are more digital and that utilize the cash of the businesses as in the case of the remote teller machine.

**– Luis Razo, Director of ATM Business Unit, Moneta Money
Bank (Czech Republic)**

In my opinion, the ATM is still an important touchpoint. More thought should be given as to how that consumer experience can be tailored in shared networks so that the banks can optimize the ATM's role in their digital strategy without actually having to operate them.

**– Nigel Constable, Managing Director, NoteMachine
Technologies (United Kingdom)**



The user interface and its consistency in all other channels will enhance the user experience in ATM systems. This is very important in user stickiness.

– **Sampath Fernando, Chief Manager IT, Seylan Bank PLC (Sri Lanka)**

A simple user interface is still preferable; transaction speed is more important than a modern UI. Other channels' user interfaces are becoming more complex and are not suitable to be implemented in the ATMs. Integration to other channels is more important than UI.

– **Arief Marleman, Business and Product Development Advisor, PT SYB (Indonesia)**

The ATM UI should be aligned with other channels. It represents the brand, philosophy — the bank's approach to customers. However, the UI has to be evaluated by UX experts with the goal to provide easy-to-use services. Limitations of specific input/output ATM interfaces (i.e., screen size, keyboard, etc.) and also expected security level may lead to some discrepancies with other channels.

– **Martin Chlumsky, Solution Architect, Česká spořitelna (Czech Republic)**

Banks are continuously looking for ways to connect the dots between systems and processes, and an important component of that is the ATM. According to multiple studies, more than half of consumers visit an ATM at least once a month, and of those, more than one-third visit once a week or more.

As the ATM evolves to become more streamlined, the user interface must be upgraded to ensure consistent cross-platform channel integration to create the seamless, intuitive experience consumers expect. With a consistent interface, the ATM user journey is improved and the ATM is positioned as a leading digitally connected payment solution that offers a services-driven model, personalized for the average consumer.

– **Alan Kerr, Senior Vice President of Software, Diebold Nixdorf Inc.**

It is quite easy for customers to abandon channels if they are hard to use and not intuitive. The back-end complexity of core systems is irrelevant to the customer — it's all about the customer experience and this is supported by considerable attention to human-centered design concepts and methods.

– **Michael Axarlis, Independent Consultant**

Customer experience is the key to success.

– **Indika Galabada, Head of Cards and Digital Banking, SDB Bank (Sri Lanka)**



CHAPTER 4

Windows 10 and the search for an intelligent alternative

When the first software trends report was published in 2008, the global ATM industry was preoccupied with migration from IBM's OS/2 operating platform to Microsoft Windows NT.

At that point, less than half of the bank-owned ATMs in the U.S. had made the transition and research analysts at Celent LLC predicted it would be a few more years before the migration would be complete.

With the transition came the promise of multivendor software, the Holy Grail of ATM operations. Windows was the knight in shining armor that would gallop in and provide the gift of interoperability of ATM software and hardware.

KAL CEO Aravinda Korala correctly predicted that with multivendor capability now a reality, banks everywhere would begin to implement services such as remote management and remote software distribution. In the 2008 report, he observed that “a number of new functions, such as deposit automation, and services, like remote key loading, are helping FIs cut costs.”

They could also begin to add new ATM features to enhance the customer experience — from envelope-free deposits to bill payment to personalized marketing messages to stamp and lottery ticket sales to charitable donations to direct currency conversion and more.

But for all its promise, Microsoft Windows also came with its own set of problems — chief among them, persistent and highly disruptive upgrades.

After Windows NT came Windows 2000 and Windows XP. Then, on April 1, 2014, Microsoft discontinued support for XP, forcing an upgrade to Windows 7.

On Jan. 14, 2020, support for Windows 7 will cease, necessitating another upgrade to Windows 10, which Microsoft promises to support until 2026. And then? Ongoing OS upgrades as Microsoft opts for “Long-Term Servicing Channel” (LTSC) packages, which the company plans to release every three years, or even more frequently.

With each OS upgrade, banks must engage in an expensive process of assessing the PC capacity of each of their ATMs; determining whether a machine can be upgraded with a new



motherboard to support the new OS; deciding whether a machine should be upgraded or junked; replacing obsolete ATMs; updating all software applications to run on the new OS; testing, testing and testing again to ensure that everything plays nicely together; and, finally, installing the new OS and apps across the fleet and praying that nothing goes wrong and customers continue to experience seamless, convenient ATM service.

Seeking an end to this multibillion-dollar merry-go-round, the ATM Industry Association in 2017 formed a coalition of 170 industry members — including ATM manufacturers, suppliers, service providers and software developers like KAL — with the common goal of creating a “future-proof” ATM operating system. Their aim was to ensure that the Windows 10 upgrade would be the last that banks would be obliged to undertake.

Some banks have begun to take interest in Linux as a possible alternative to Microsoft Windows for a variety of reasons.

“Firstly, is the use cost. The upgrade of Windows versions brings lots of cost to banks,” according to Chen Guodong, deputy general manager of the R&D center at China-based Zijin Technology, and Zhong Cheng, the company’s technical officer.

“Secondly, because Windows is not open source, there are issues from the system security side and the government monitoring policy side. Thirdly, Microsoft has moved its business focus to cloud, and Windows OS is not the core business of Microsoft anymore, so banks have concerns about future technical support.”

The two pointed out that “all kinds” of other operating systems, including Android, are already using Linux, and that software providers and ATM applications are already using multiple OS platforms, “so it’s not that important anymore to choose a certain OS.”

But other industry members stress that Linux, too, has shortcomings.

“Banks like to standardize their entire platform,” said Franklyn Ferreira, CEO and general manager of Dominican Republic-based Grupo Efrain & Co, a provider of ATM and IT services and technologies in the Caribbean and Central America. “To have an environment under MS Windows on desktop PCs and Linux in ATMs, is possible, but very unlikely.”

Intent on offering a solution that banks can use now to meet their immediate need for a less stressful migration to Windows 10, KAL went to work, in partnership with Red Hat, to create an answer to the never-ending ATM hardware upgrade cycle.

The result was OS-virtualization using hypervisor, a technology that separates the hardware motherboard from the operating system, allowing software drivers that are unsupported under Windows 10 or a later OS to be supported by the hypervisor software, instead.



“So, for instance, if you take ATMs that today are running Windows 7, those can run the hypervisor and Windows 10, even if they’re not supported by the hardware vendor or Intel,” KAL CEO Aravinda Korala said. “We can now support it, so they don’t have to upgrade to Windows 10 this year or next year. This means they can take that ‘lumpiness’ out of fleet upgrades and make it the smooth process I mentioned earlier.”

Banks will still need to upgrade their ATMs in order to add functionality, increase speed and remain competitive, but they will not have to do it in one fell swoop with a fleet-wide overhaul that might be mandated by Windows 10 migration.

“They’re going to have to move to new hardware at some point,” he said. “It goes without saying. But they can do it at their own pace. They can budget it; they can think it through and be smart about it.”

In the meantime, hypervisor technology protects the bank’s investment in software and hardware while maintaining compliance with PCI.

“One of the critical requirements of PCI is that you cannot have anything unsupported in the ATM,” Korala said. “No software, no hardware. You can’t have a card reader that’s not supported, you can’t have firmware inside the card reader that’s not supported, you can’t have a chipset from Intel that’s not supported. The whole point of PCI is to avoid a situation where you have to sort out who’s responsible if malware strikes and one aspect of the ATM is unsupported. You need that support chain.”

OS-virtualization with hypervisor helps complete that support chain.

Importantly, the technology will not only help banks avoid significant expense and disruption in the migration to Windows 10, but also will continue to serve them through future LTSC software releases, which could require even more frequent hardware upgrades, Korala said.

“You could buy a brand new Windows 10 ATM today and next year Microsoft might deliver an LTSC update,” he said. “And the way to look at an LTSC is that it’s like going from XP to Windows 7 or from Windows 7 to 10 — it’s a major upgrade.”

OS-virtualization with hypervisor will support the ATM through these LTSC updates, as well, Korala explained.

Although KAL’s hypervisor concept was introduced just before ATM Marketplace conducted the survey for the 2019 ATM and Self-service Software Trends report, more than one-quarter (28%) said they would consider it as an alternative to ATM hardware upgrades.

“Hypervisor would definitely help ATM operators upgrade to Windows 10 without upgrading the hardware,” said Kiran Pidugu, product manager for Australia at Prosegur, a multinational security company. “This will be a huge cost-saving measure and an easy transition.”



Interview insights

In follow-up interviews, bank and nonbank respondents offered their thoughts on potential OS or hypervisor alternatives to a continued cycle of Microsoft upgrades. Their comments are lightly edited for clarity.

The pace of the ever-changing technologies and related dependencies does put a burden on the ATM fleets to keep pace with the changes, hence Linux or a hypervisor environment and similar abstraction layers would help absorb the change implications through all the layers.

**— Arvindas Kaletla, Senior Developer, Westpac NZ
(New Zealand)**

Yes, we can imagine a different OS, but all participants have to play along. It does not help if theoretically a virtualization would be possible, but the ATM manufacturer does not offer — or rejects — software support.

Linux is, in my view at the moment, too far away. The variant hypervisor seems to be an interesting topic for the future.

**— Daniel Dorna, Product manager, IC Cash Services GmbH
(Germany)**

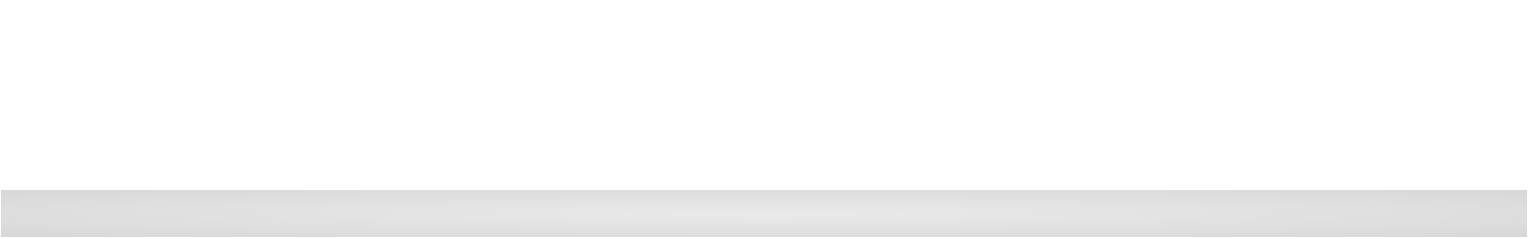
With the current costs of updating Windows operating systems, it is a great advantage if, through other systems, you can find ways of saving both in renewal of installed bases of ATMs and in rollout of new software versions due to the need to update the OS.

— David Rodriguez, Sales Manager, Belltech (Colombia)

Despite the conservatism of the banks of Belarus and the high requirements for the security of information resources, many banks are gradually beginning to transfer their computing resources to the cloud.

The very concept of operating system virtualization is absolutely progressive. In Belarus there is an opportunity to implement such a project for the local market. I think in our market other operating systems are not considered.

— Igor Bazilik, Director, SaleServiceSolutions LLC (Belarus)



Every operating system change costs the banks with OS cost, operation cost, terminal application support cost and testing cost. Therefore, many banks are researching other operating systems supporting XFS for their ATMs. Linux is the most preferred operating system against Windows.

**– Tolga Özdemir, ATM Application Development Manager,
Ziraat Teknoloji (Turkey)**

As long as banks continue to expand their technology, operating systems will be a high expense for them. Banks need to find another OS solution that can reduce their expense while still offering good performance.

**– Johanes Taufan, Senior IT Analyst at Customer Touchpoint
Solutions Application for ATMs, BCA Bank Indonesia**

The use of hypervisor is becoming relevant because it is an intelligent solution that performs what is expected for the Windows upgrade and the security it provides.

The savings it generates when it ends the need to invest in expensive hardware will undoubtedly generate a great demand shortly.

**– Luis Razo, ATM Business Unit Director, Moneta Money
Bank (Czech Republic)**

I believe the use of Linux or a hypervisor environment will certainly gain interest in the banks, as it will solve the support issue currently faced by banks when the operating system in the ATM comes to an end of support every few years.

Linux or its hypervisor technology is an open source OS which is supported and enhanced by the IT community. I believe any OS which does not have fixed lifecycle support might be of interest for ATMs.

**– Ricky Fang, Managing Director, Impromptu Solutions
Sdn Bhd (Malaysia)**



SUMMARY

If necessity is the mother of invention, then frustration must be the father.

Necessity — spurred by branch network and staffing reductions, cash-handling and transport expense, inventive criminal minds and tech-savvy consumers — has resulted in the introduction of an impressive range of self-service devices and applications in the past few decades.

Today, more than 3 million ATMs and their myriad functionalities serve an ever-widening array of needs for banks and their customers from teeming cities to rural outposts all over the world, ranging from simple, reliable cash dispensing to sophisticated, reliable remote teller operations.

But ...

Frustration — spurred by an inefficient ecosystem of closed platforms, machine-based operations, incompatible applications, endless OS upgrades and more — is now driving the all-out pursuit of a new and improved system for running ATMs, one that invites innovation and promises unlimited opportunity for digital integration and interoperability.

In her commentary for the 2018 ATM and Self-Service Software Trends report, Nancy Gail Daniels, Managing Partner and board chair of HTx Holdings LLC, got to the crux of the issue:

The basic architecture of ATMs, independent of OEM, has remained the same since the mid-1990s as a consequence of a standard we agreed upon, called XFS (eXtensions for Financial Services).

This standard, which began as the result of a joint industry-Microsoft working committee in 1993, was designed to make the then-difficult job of developing ATM software easier.

It did that job, and it did it well through three major revisions of Microsoft Windows: NT; XT; and Windows 7.

However, when XFS was defined, it was impossible for us to anticipate what banking and customer expectations would look like 25 years later. Mobile, deposit automation, cardless transactions, advanced encryption and even EMV chip cards were hardly in consideration.

In his commentary for the same report, Mike Lee, CEO of the ATM Industry Association, got to the heart of the issue. “The move towards an industry-wide OS agnostic platform, API standardization and enablement of a full cloud environment for ATM operations will create a powerful, more cost-efficient and flexible future for ATMs,” he wrote.

With the introduction of OS-virtualization, that future is now closer than expected and gaining ground fast.

Perhaps in the not so distant future, the ATM and Self-service Software Trends report will document industry advancements enabled by the end of incessant upgrades.

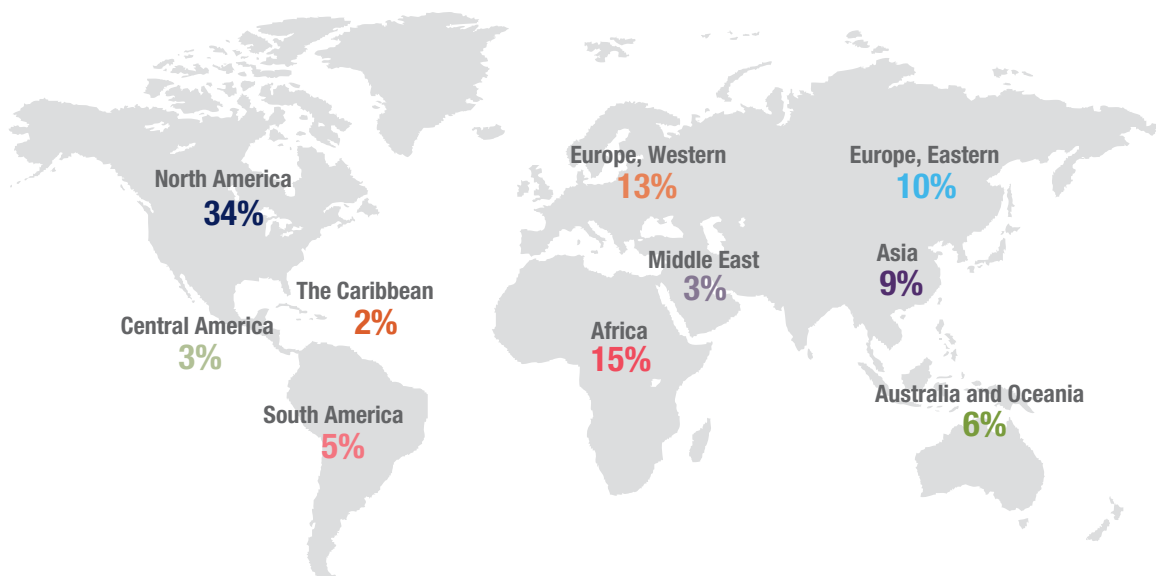
APPENDIX

Note: Not all data will add up to 100% due to rounding

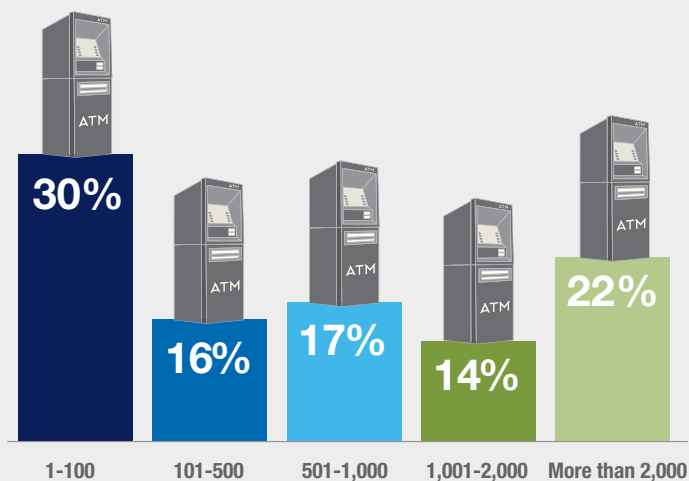
Analysis of financial institution survey results

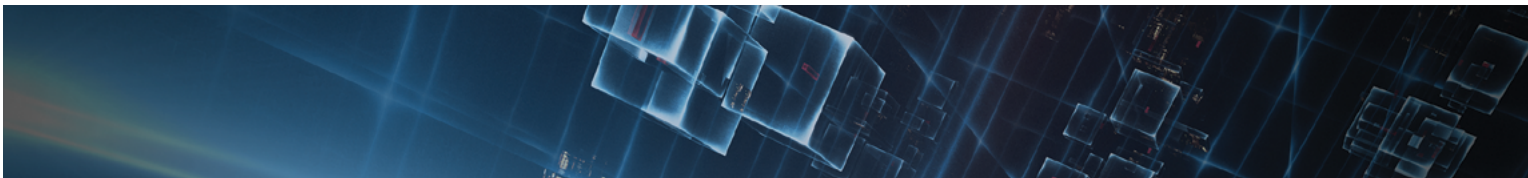
Financial institutions

1. In what global region are you based?

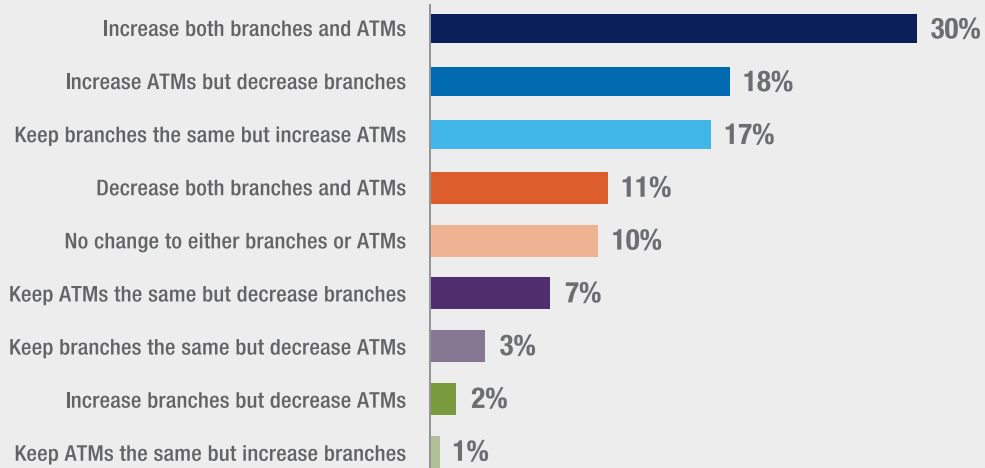


2. How many ATMs do you have?

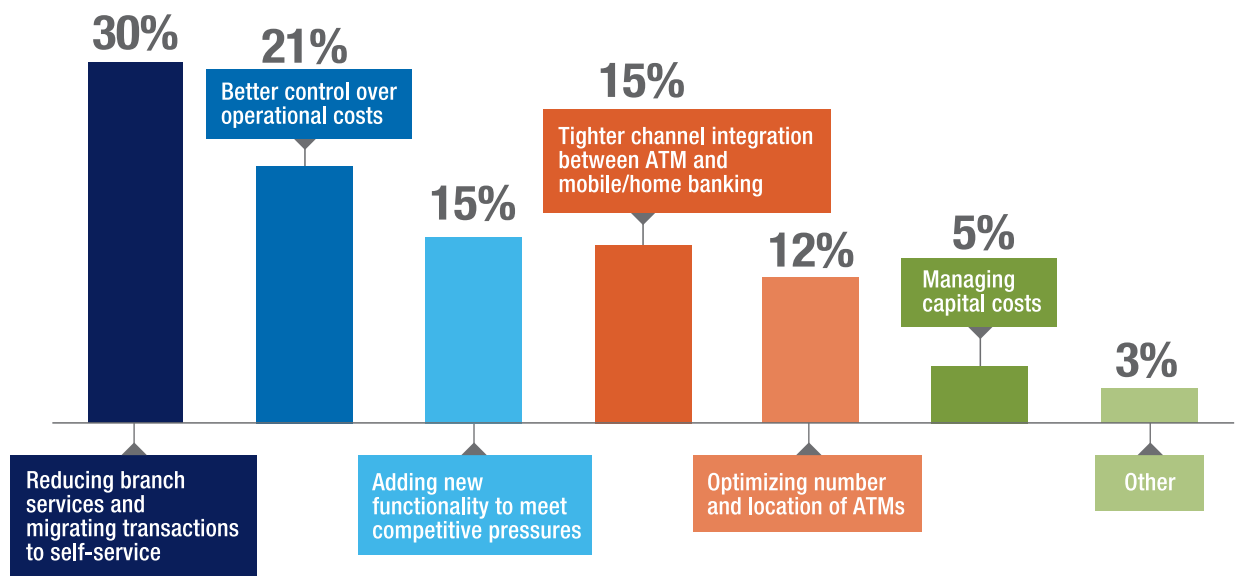


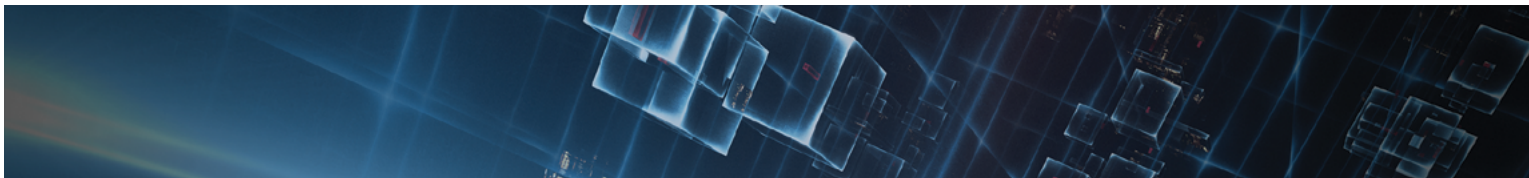


3. What is your bank's strategy for the number of ATMs you will operate over the next few years?

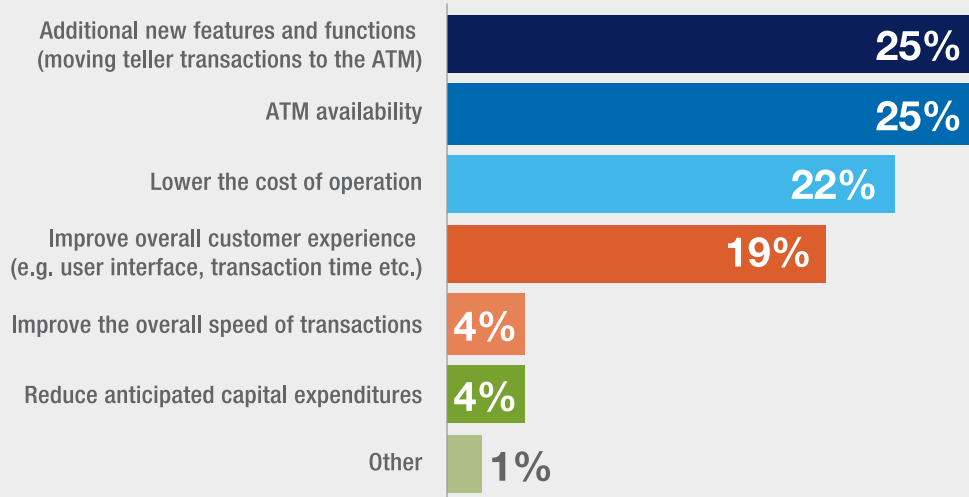


4. What is your biggest priority for your ATM network for the next few years?

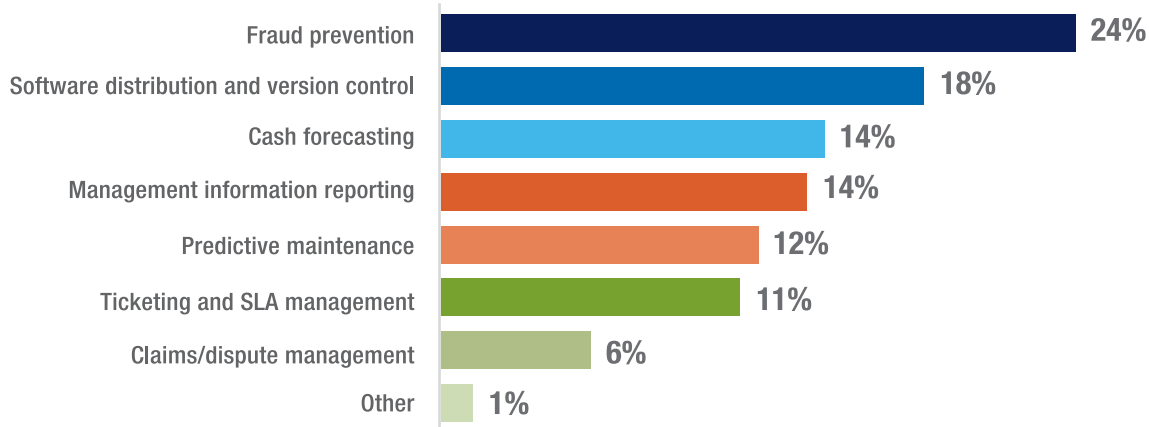




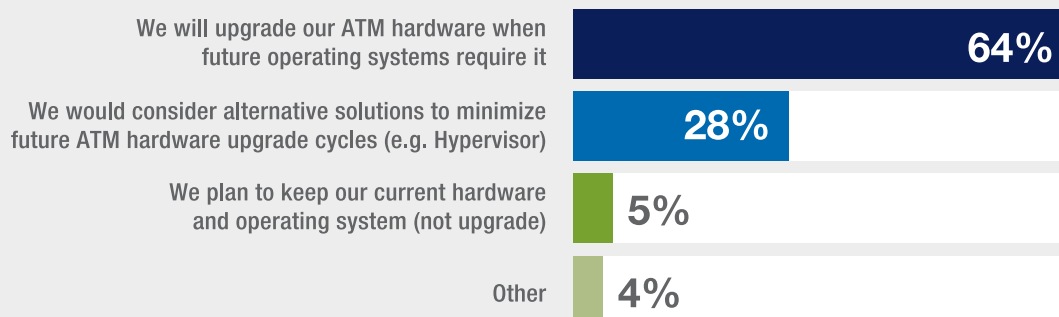
5. If you could improve only one aspect of your ATM channel, which would it be?



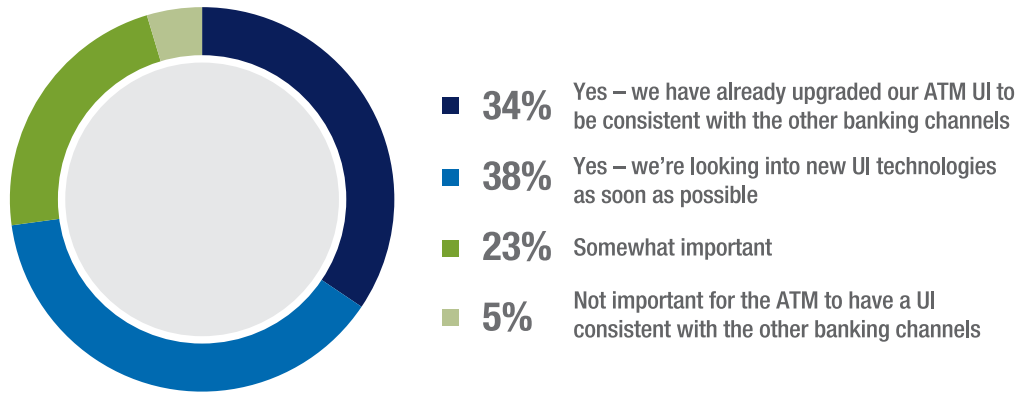
6. Which one management and monitoring feature will be most important to your bank in the next few years?



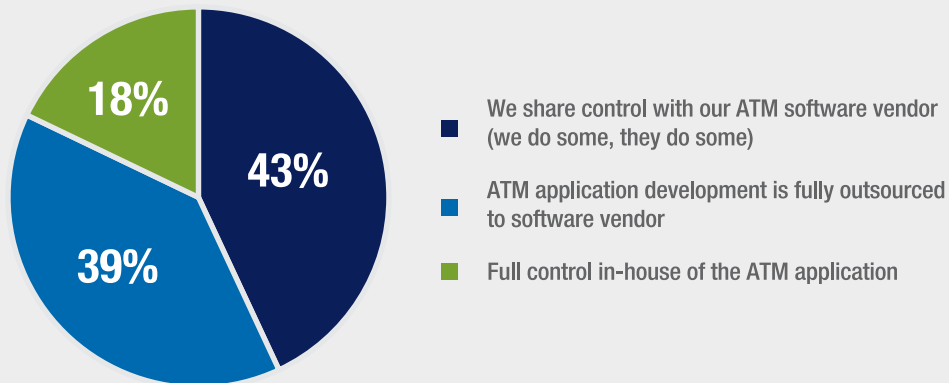
7. Which of the following statements best represents your bank's approach to ATM hardware upgrades?



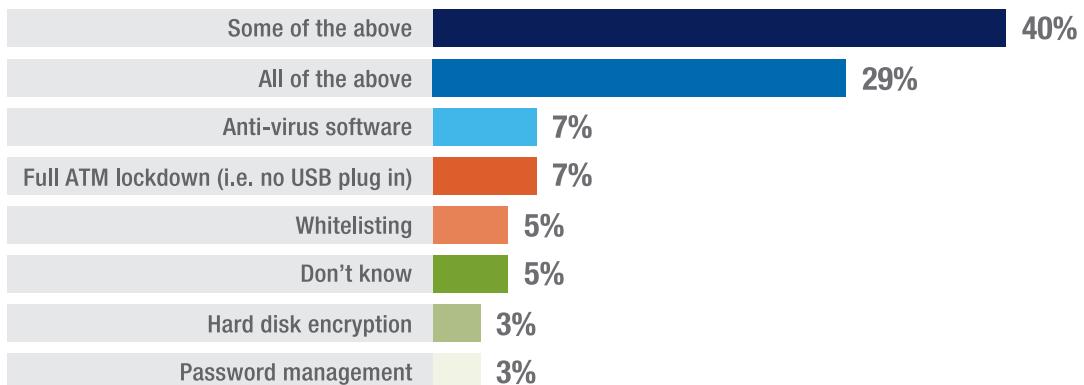
8. Is it important to adapt your ATM user interface (UI) to be consistent with the look and feel of your bank's mobile and home banking channels?

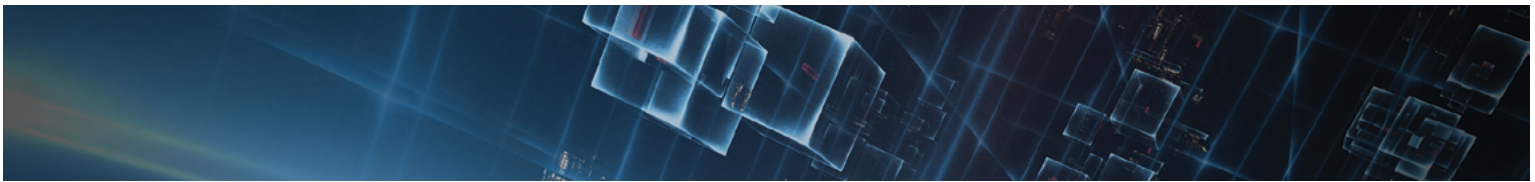


9. What is your bank's ATM software development strategy?

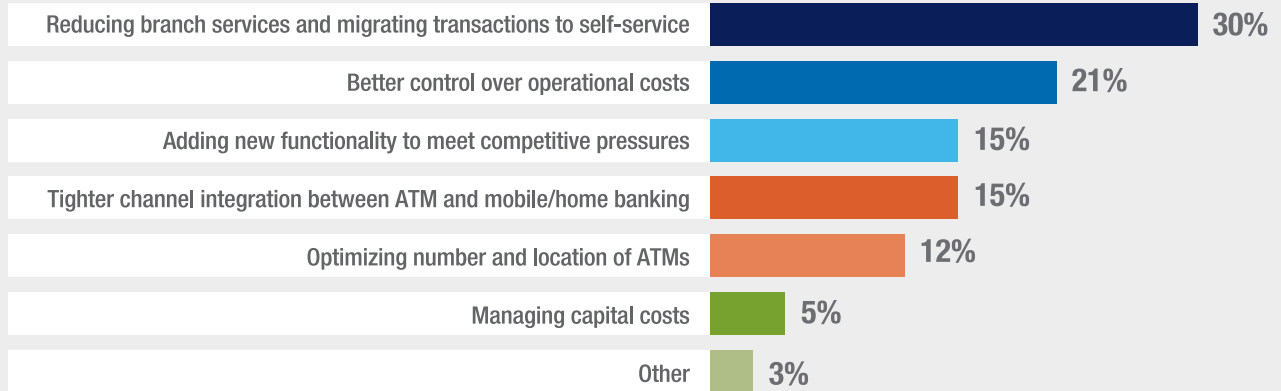


10. Which of the following security measures do you support today?

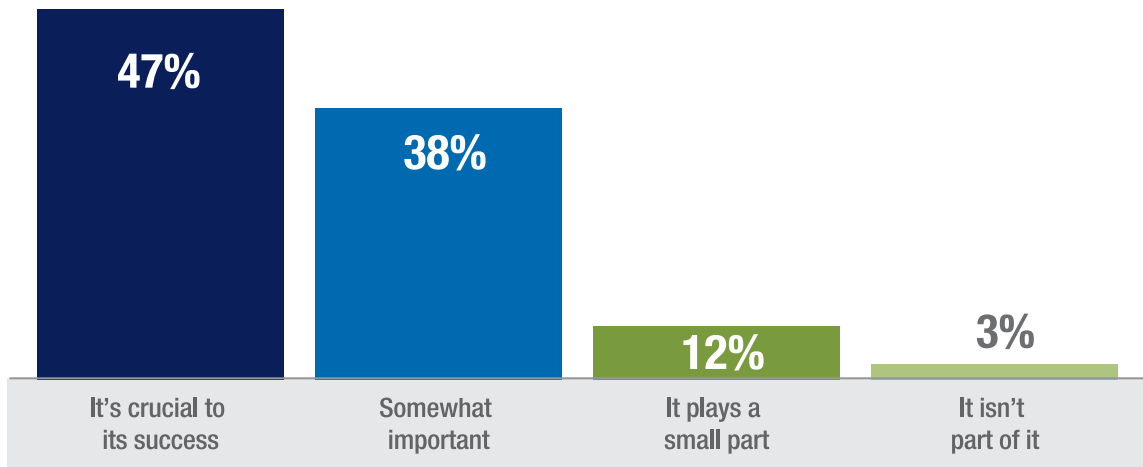




11. What is your biggest priority for your ATM network for the next few years?



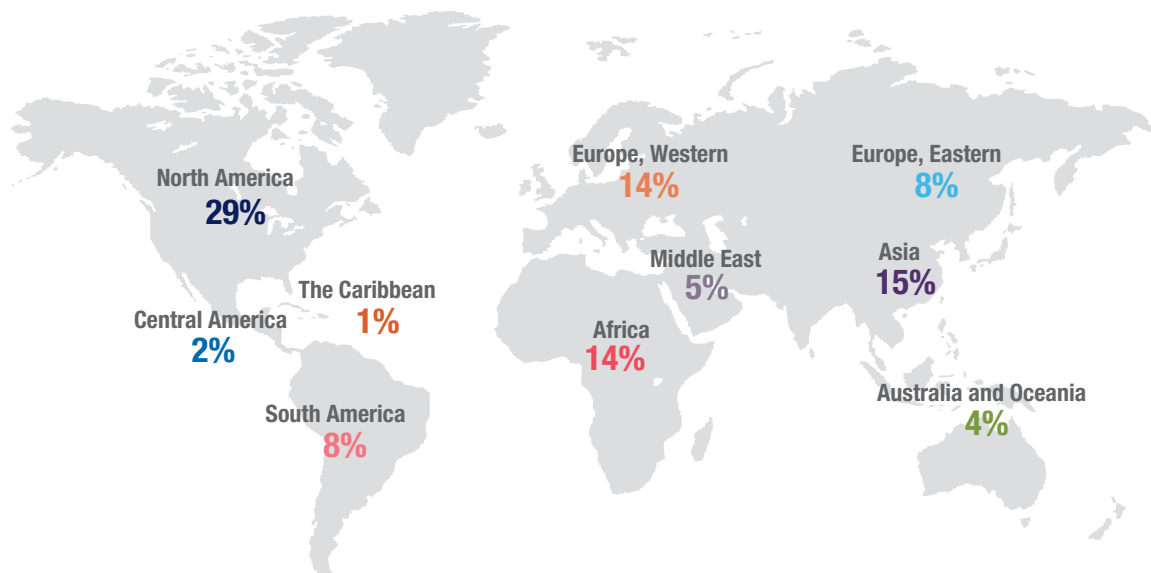
12. How does your ATM network fit into your bank's wider digital strategy?



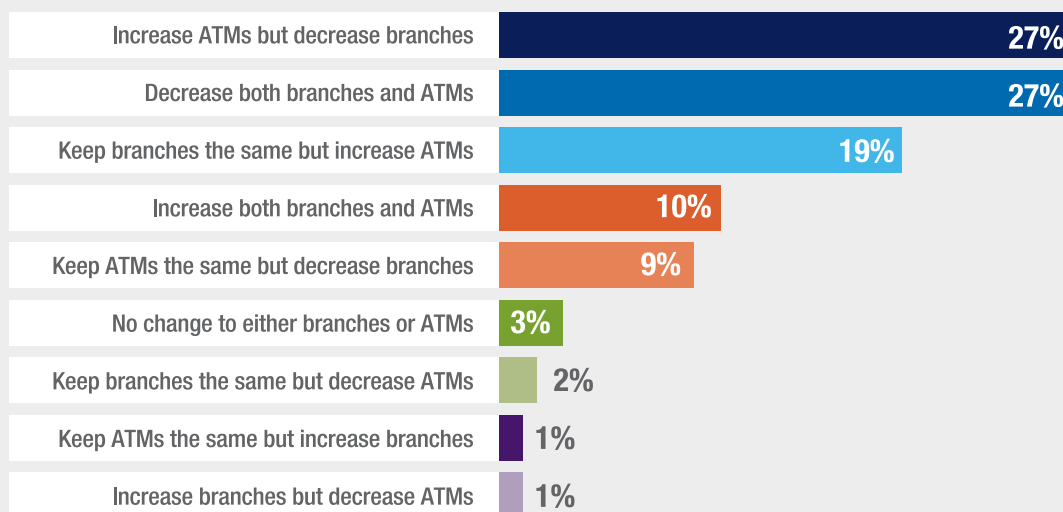


Non-bank deployers, ATM manufacturers, ATM maintenance and service companies, ATM hardware and software suppliers, processors

1. In what global region are you based?

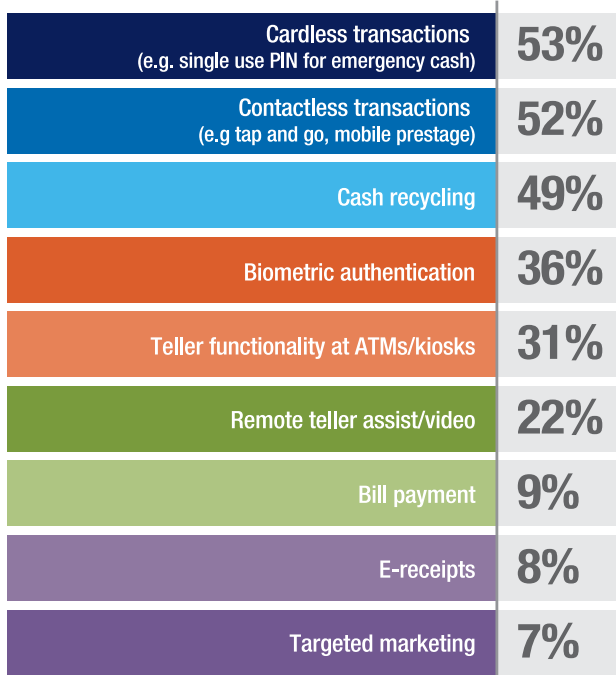


2. What do you think is the bank industry's primary strategy for the number of branches and ATMs they will operate over the next few years? (Participants chose one of the following.)

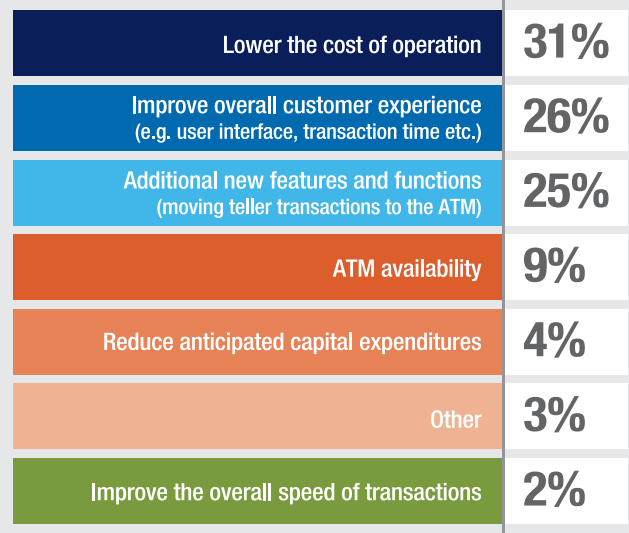


3. Which ATM functions / features will banks plan to support over the next few years?

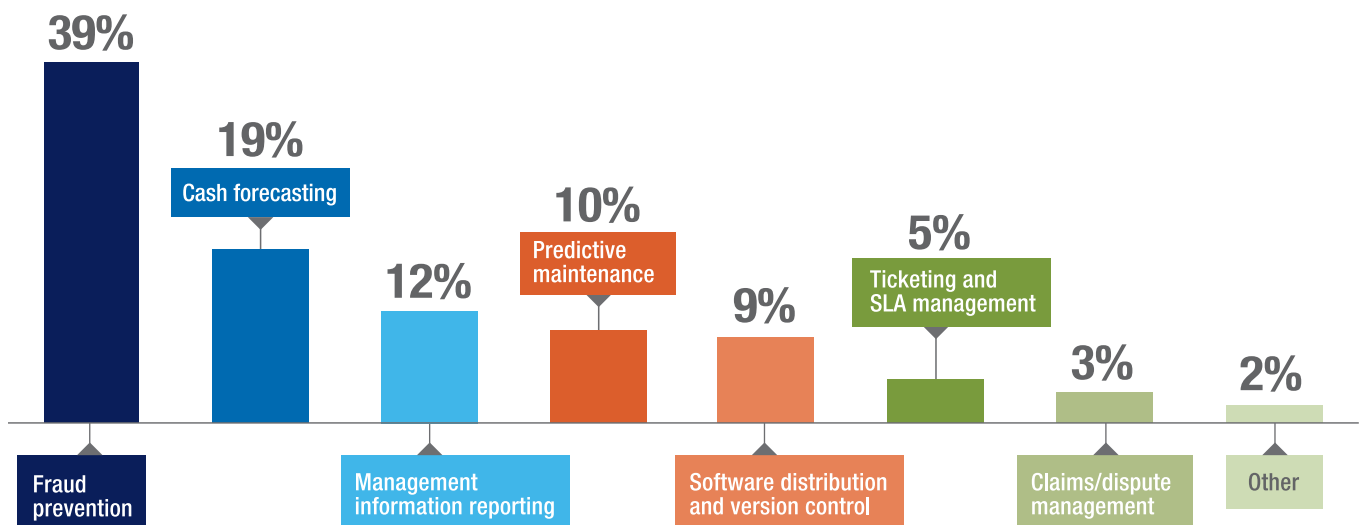
(Participants selected up to 3 responses.)



4. Which one aspect of the banking industry's ATM channel will be their primary focus in the near term?

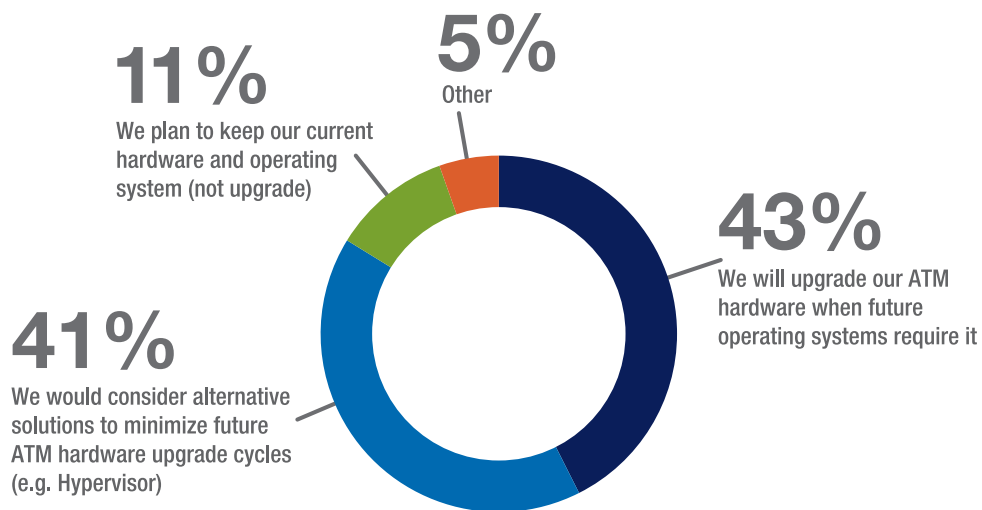


5. Which one management and monitoring feature will be most important for banks in the next few years?

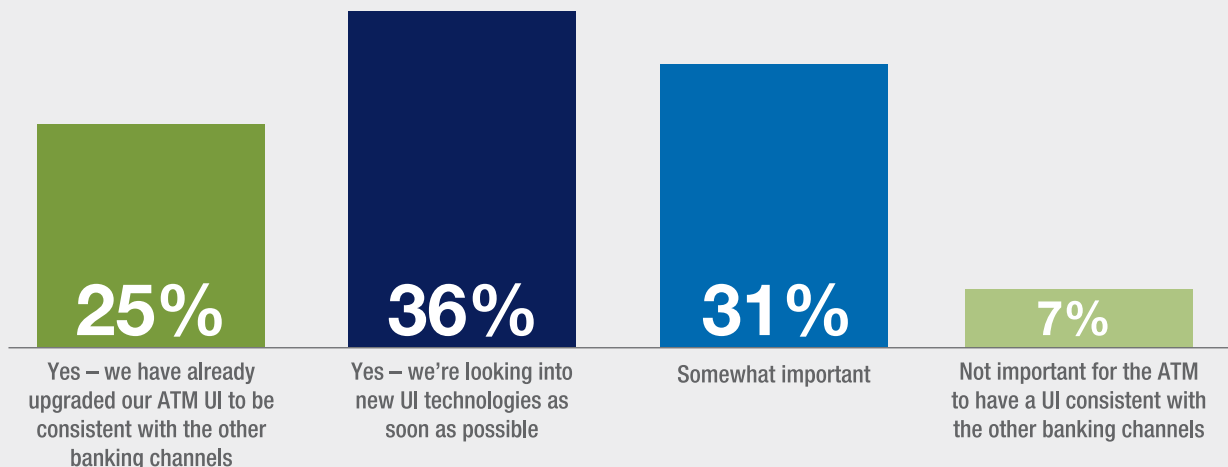




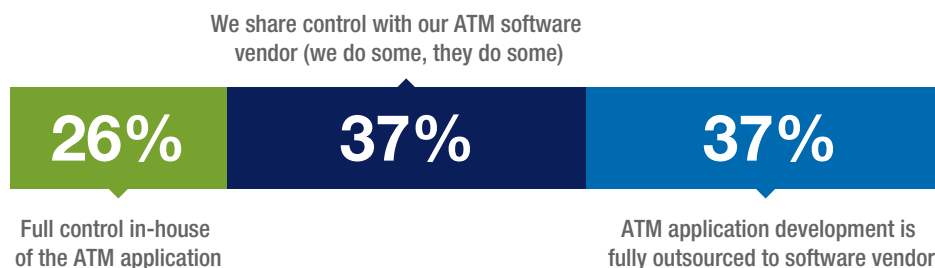
6. Which of the following statements best represents the banking industry's approach to ATM hardware upgrades?



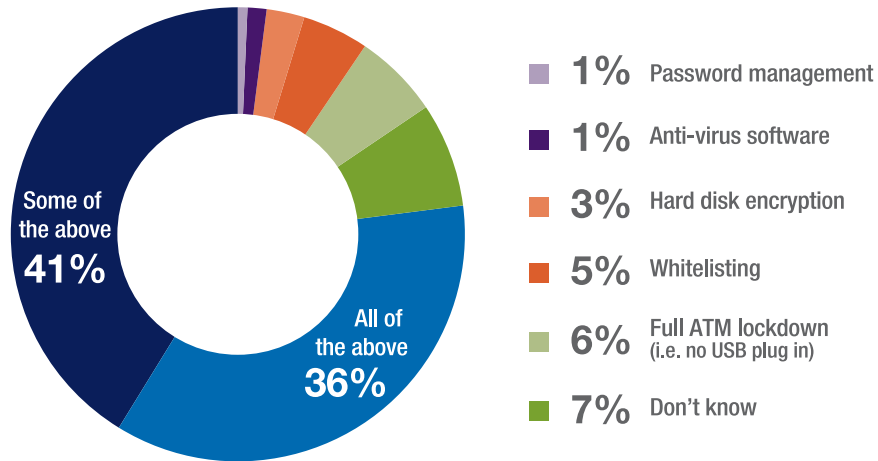
7. Is it important for banks to adapt their ATM user interface (UI) to be consistent with the look and feel of the bank's mobile and home banking channels? Banks would say:



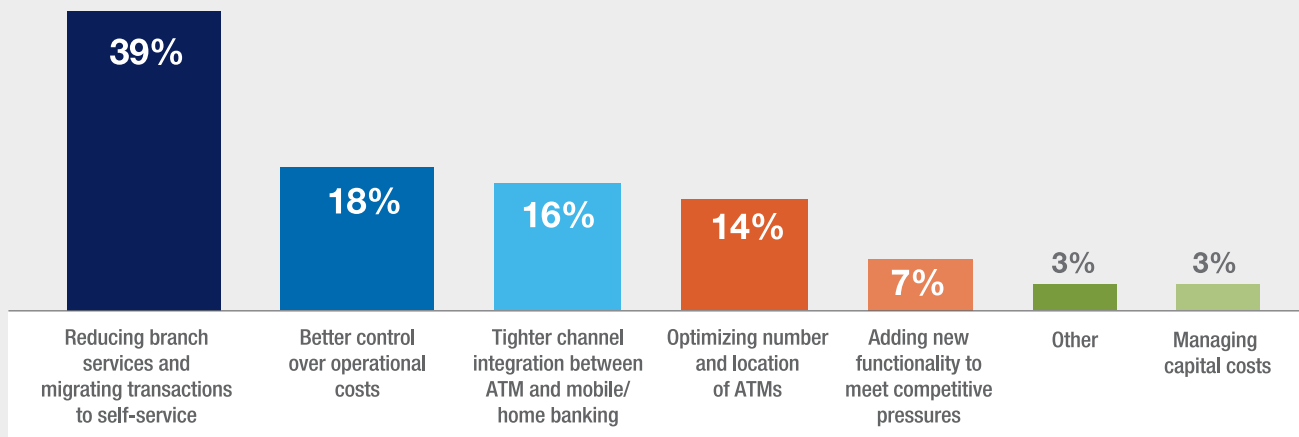
8. What is the most common bank ATM software development strategy? Banks would say:



9. Which of the following security measures do banks support today?

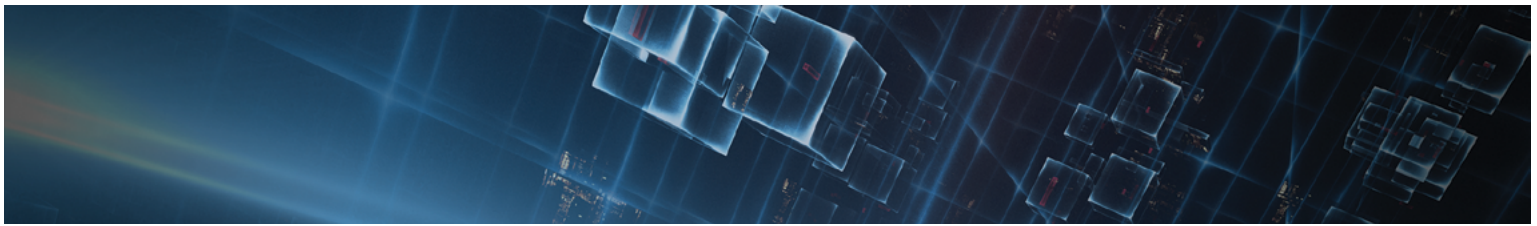


10. What is the banking industry's biggest priority for their ATM network for the next few years?



11. How do banks view their ATM network fitting into their wider digital strategy?





ABOUT THE SPONSORS



ATM Software

KAL is a world-leading ATM software company and preferred supplier to megabanks such as Citibank, ING, UniCredit and China Construction Bank. KAL's standardized ATM software enables banks to regain control of their ATM networks, reducing costs and improving competitiveness. It is installed and supported in over 80 countries and runs on over 300,000 ATMs from nearly 50 different manufacturers.



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