EVOLUTION OF ATM ACQUIRING SOFTWARE

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Contents

Context

Traditional ATM acquiring architecture needs an infrastructure upgrade to be able to remain relevant within the context of an increasingly wide range of digital channels and changing customer behaviours. Happily, technology has evolved and a **channel integration** model has emerged, which looks to be able to solve many of the problems that ATMs are coming up against. In a digital first world, the ATM of the future has the potential to be pivotal, and to complement, enhance and even replace branches, helping banks meet the challenges they face from all quarters.

Auriga has recognized for some considerable time the inherent weaknesses in the traditional ATM architectural model for anything other than the limited cash-dispensing role for which it was originally designed.

The introduction of new technologies and innovation in the financial services sector has prompted banks and other deployers to start to break down channel-based silos and offer true cross-channel services in order to reduce costs while providing a set of common integrated services across all digital channels.

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.* [...]
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 (eXtentions for Financial Services). [...]
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, card-less transactions, advanced encryption, and even EMV chip cards were hardly in consideration."
(ATM and Self-Service Software Trends 2019)

The basic architecture on which most of the world's three million ATMs still operate on, however, has not evolved. For years, banks have had to manage multiple vendors with incompatible applications and estate upgrades largely dictated by a Microsoft Windows operating system at the end of its life cycle. The eXtensions for Financial Services (XFS) standard, which was an attempt to free operators from hardware vendor lock-in, has been available since the beginning of 2000. However, despite being a big step forward, it has not yet radically changed the basic ATM acquiring architecture and hence the industry. Its authors could not, after all, have foreseen the arrival of mobile and tokenised payments, EMV and contactless cards, cryptocurrency and the rich ecosystem into which ATMs are now expected to fit.

Evolution of ATM Acquiring Software

In considering the possibilities and roles for future standards, it is highly instructive to learn from the past, particularly the reasons behind the creation of de-facto standards like hardware vendor defined protocols such as NDC (NCR Direct Connect) or DDC (Diebold Direct Connect) and the CEN/XFS standard.

HARDWARE VENDOR CENTRIC MODEL

Back end

Switch

Monitoring

Terminal handler

Marketing

Standard e.g. NDC, DDC

ATM Vendor Application 1

ATM Vendor Application 2

ATM Vendor Application 3

ATM
Vendor 1

ATM
Vendor 2

ATM
Vendor 3

HARDWARE VENDOR CENTRIC MODEL

As most current deployments are based on the decades-old legacy NDC/DDC architecture, there is a strong separation between the ATM software and its terminal handler counterpart at server level. This derives historically from the fact that originally only the hardware vendors had access to the API to be able to manage the ATM. Typically, therefore, any bank wishing to deploy ATMs from different vendors (for obvious competitive reasons) was felt obliged also to get a software solution from each of the vendors and hence multiple ATM applications.

This has worked, to a point, but it has been problematic.
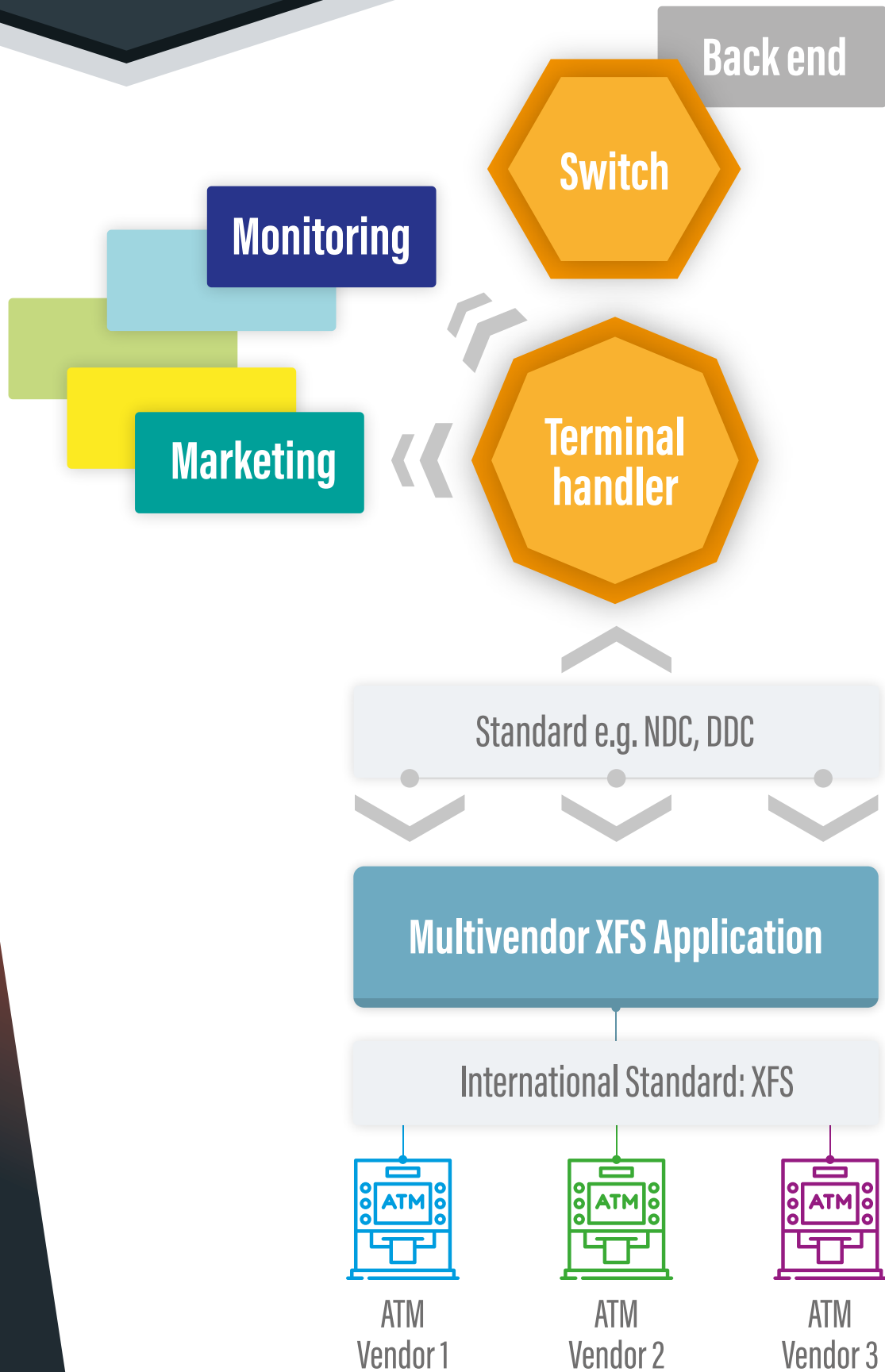
Mark Aldred

VP of International Sales of Auriga, comments:

*"This first generation was dominated by the hardware vendors.
They also wrote the software and so dominated the market.
The hardware vendors gave the market the end product rather than
the banks setting the agenda."*

In such an environment, the only layer where it was possible to define any standardization was in between the ATM with its application (provided by each hardware vendor) and the terminal handler (typically part of the switch solution). This drove the success of protocols between ATM and central host environments (in particular NDC or DDC) and created these de-facto standards with a HW vendor centric model.

This model obviously restricted and limited the possibility to evolve following market needs. Furthermore, it forced financial institutions, in order to benefit from competition among different hardware providers, to deploy ATM applications from different vendors causing operational complexity and compatibility issues.

XFS MODEL

Back end

Switch

Monitoring

Marketing

Terminal handler

Standard e.g. NDC, DDC

Multivendor XFS Application

International Standard: XFS

ATM
Vendor 1

ATM
Vendor 2

ATM
Vendor 3

XFS MODEL

Since 2000, eXtensions for Financial Services (XFS) was introduced more and more widely as an integration layer between the ATM hardware and the application software driving the terminal to allow applications from many providers to be used at the ATM; in much the same way as a banking platform allows for open banking.

As a result, most (if not all) ATMs currently support XFS and similarly, a large majority of ATM applications are built on XFS. Any application making use of XFS should ideally be "multivendor", meaning it can run equally efficiently on any ATM from any vendor.

RBR report "ATM Software 2018" distinguishes between applications just making use of XFS and applications making use of XFS that actually run and are certified on ATMs from different vendors, and hence can properly be called multivendor; the latter yet represent only 40% of the total market.

Multivendor applications can be provided either by the companies that produce ATM hardware or by independent companies with no commercial ties to hardware vendors. In practice, only true (independent) multivendor applications supporting any hardware vendor allow banks and other deployers to exploit the real competition between hardware vendors. This allows them to break any monopoly or duopoly they have been forced to accept over the years.

Aldred comments: *"The XFS standard was built around Microsoft and should have opened up the software market, breaking up the hegemony of the hardware vendors. What actually happened was that the hardware vendors moved to create software that was, at least theoretically, multivendor. However, in practice it best supported only the already established ATM hardware vendors and as a result they retained their market dominance."*

Instead, real multivendor applications have resulted in a significant reduction in customer investments into ATM applications, as a single application can run on any hardware. Not only has it been cost saving, but customers have also benefited from being able to independently select their hardware and software, resulting in greater competition among both hardware and software vendors alike.

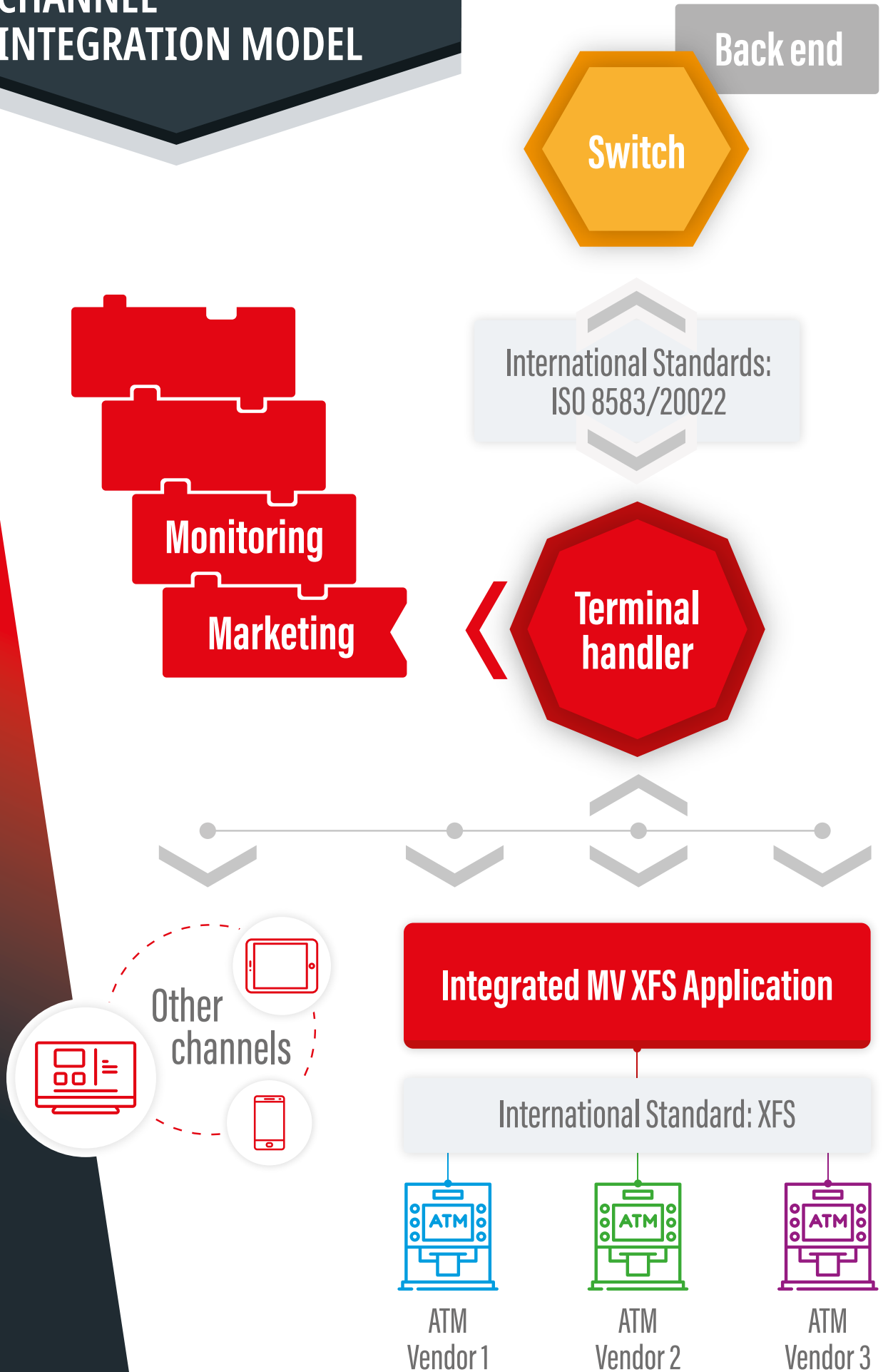In this respect, the CEN/XFS standard can be openly endorsed as an innovation-positive standard.

But although the introduction of XFS, coupled with real multivendor applications, now allows for the monopoly in the software space of hardware vendors to be broken; the ATM channel itself, however, remains siloed and unlike any other digital channel in the way it is managed.

In fact, restrictions derived from the use of the de-facto message protocol (e.g. NDC/DDC) have been responsible for delayed time to market for new functionality and limited channel integration. This creates a continuous dependency on hardware providers to produce and publish new standard versions.

The ATM channel remains siloed and unlike any other digital channel in the way it is managed. The introduction of new technologies, integration with other channels like mobile and branch, flexibility to implement both new functionalities and mandates are all still encountering a number of infrastructural obstacles. Specifically, the need to synchronize the three main parts of the current infrastructure (ATM application, terminal handler and the protocol that is the "contract" between the two).

While XFS has not directly solved these issues, it has created a real opportunity to break the legacy hardware vendor centric model in a more flexible, sound and cost effective channel integration model.

CHANNEL INTEGRATION MODEL

Back end

Switch

International Standards:
ISO 8583/20022

Monitoring

Marketing

Terminal handler

Other channels

Integrated MV XFS Application

International Standard: XFS

ATM
Vendor 1

ATM
Vendor 2

ATM
Vendor 3

In this model and architecture, the hardware is isolated through XFS and the software stack can be more logically structured into an integrated ATM solution. This connects more effectively with external entities like other channels or transaction processing layers (e.g. transactional switch, core banking, and services).

In addition, the layers are now clearly defined by proper international standards (XFS and ISO 8583 or ISO 20022) into:

ATM Hardware

Integrated ATM Solution
(ATM software and Terminal Handler)

Switch / Business Services

Benefits from the channel integration model include a much simpler, cost effective, standard and generally accepted interface (usually based on ISO-8583, ISO-20022 or web services) that focuses on the business part, forgetting all the complexity linked to ATM management.

Other positives linked to this standardised and integrated approach include a lower total cost of ownership, increased availability, cross-channel capabilities and more efficient maintenance and management of the ATM estate.

Further operational advantages include enhanced customer experience and personalisation via a modular/disparate products approach. As well as accelerated time to market by having a single point of control and modification of the ATM channel without the need to define, agree, publish and implement (both at the ATM and the terminal handler side) new specifications to deploy innovative functionalities.

Not to forget the benefits deriving from a real multivendor application and resulting in increased choice and reduced cost of hardware.

Financial institutions can leverage this moment of disruption by reducing their dependence on legacy and difficult to maintain and evolve solutions. All the above is proven as all the major competitors in the ATM and ATM terminal handling SW space are heavily investing in this new type of architecture.

Having an integrated solution means that the ATM is no longer a distinct silo and, with the right solution, could perform other functions and easily link into banks' other channels.

Business trends and opportunities

RBR's recent report "Global ATM Market and Forecasts to 2025" highlights the importance in investing in advanced software solutions in order to boost the profitability and functionality of ATMs.

"It is clear that ATM operators place a high value on streamlining their processes and maximising uptime at their terminals. Whereas previously deployers might have focused largely on increasing ATM numbers, there is now greater emphasis on investing in robust software solutions. The exponential rise in the digitalisation of banking services has already brought about large-scale branch closures, simultaneously increasing the need for a convenient, secure ATM channel and freeing up funds to help achieve this. As quantity becomes less important and quality increasingly moves to the forefront for deployers and their customers, equipping ATMs with the latest software will help them to stay relevant and secure in an ever-evolving industry".

The RBR Report also revealed that COVID-19 has prompted interest and innovation in card-less ATM withdrawals, as more and more deployers around the world are embracing contactless technologies, and adopting new solutions, like full mobile integration.

Having ATM software that enables seamless alignment with current and future needs is going to be key in the future. Customers demanding consistency between mobile and physical channels, as well as ATMS that meet those needs, will lead to greater usage. This could, therefore, even reduce the cost per transaction of maintaining an ATM system.

Aldred states: *"Today's market requires something that allows the ATM to behave like any other digital channel so that customers are able to access their bank their way and at a time to suit them. It is vital to be able to offer expanded services across self-service and other channels using a framework that was built for that purpose. Auriga's WinWebServer (WWS) solution is a*

leading multivendor integrated solution (ATM application, terminal handler, monitoring, marketing, etc.). It has been designed to align advanced self-service systems such as deposit and recycling systems, assisted self-service terminals, as well as cashless kiosks, and is proven in production. It can accelerate time to market for new products and services, reduce TCO and improve quality and availability".

Other opportunities include the ability to gather integrated, personalised, seasonal and location-based data at the ATM. This provides an opportunity to apply analytics to enhance marketing capabilities and further refine the ATM offering. Again, this brings about operational efficiency by providing only what is actually used and promotes customer loyalty by providing what is needed in a user friendly way. In a digital first future, the ATM of the future will be pivotal alongside branches and digital in helping banks realize their wider transformation initiatives.

Aldred comments: *"Customers want to see banks as a single entity and be able to choose between channels. ATMs need to be one of those channels."* He says, *"As an example, in Portugal the ATM has been deployed as a 'bank in a box' within the branch, supported by bank staff. Once the branch closes the ATM provides remote video support so that the customer can always access human help."*

Summary

In conclusion, the NDC/DDC message protocols between the terminal handler and the ATM application gained a high level of adoption. However, arguably, they significantly constrained the evolution of ATM services, even as the underlying technologies became more flexible.

In many institutions, the proprietary ATM infrastructure that grew up around the "NDC/DDC-thinking" has resulted in the self-service channels becoming isolated from the mainstream digital banking investments. Given the proprietary ownership of NDC and DDC, there was little scope for the industry players to redefine this vital link in the current ATM ecosystem.

Fortunately, the advent of channel integrated solutions, technology and flexible internet protocols has allowed innovative vendors to bypass the structural restrictions of NDC/DDC.

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