

# A new architecture and production model for ATM and self-service software: Enhancing revenue opportunities and reducing cost of channel delivery

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## **ABSTRACT**

*Surveys, such as a recent one conducted by Level Four Software, reveal that financial institutions are increasingly interested in new business models and services for their ATM channel. The rise of open standards that abstract the services and presentation software on the ATM from the proprietary hardware mean that financial institutions now have an opportunity to change the way they produce and distribute ATM services and make it a much more dynamic customer touch-point. But to achieve this, ATM deployers will have to embrace a new approach that draws on some lessons learned in the automotive industry over the past few decades. If correctly harnessed,*

*banks and ATM deployers can use software built on these principles as the key to unlocking considerable business value from the ATM channel, offering a greater range of personalised customer services at their ATMs, and opening up new revenue opportunities. The basics of this approach and the benefits it could yield are outlined in this paper, along with a high-level view of the recent technology changes that are making it possible.*

**Keywords:** ATM software, ATM customer service, ATM advertising, IFX, XFS, J/XFS, distributed network architectures, componentised ATM services

## **INTRODUCTION**

With 2.7 billion cash withdrawals from ATMs in the UK alone in 2005,<sup>1</sup> banks are more aware than ever of the increasing opportunities they offer as the single most significant point of contact with their customers.

Consequently, new business models for ATMs are the focus of much interest. New banking services are emerging as customer demands extend beyond simply convenience and speed of transaction.

There are, however, still a number of



issues that are holding back progress in this area. Some concerns from the financial community centre on the security issues that new technologies and services potentially introduce. The ATMs are a frequent target for crime, and industry decision makers are concerned that the more new services or features are added to ATMs, the more vulnerable or unstable they become.

Another issue is that ATMs are traditionally built on legacy or proprietary software, which usually offers the security that is so important in financial services, but does not integrate easily with new services or systems.

Yet each time a customer inserts a card into a machine, banks are losing out on significant opportunities. Senior managers and marketing teams increasingly want to use the information they hold on that customer and engage them further by personalising the service, widening the available options, advertising or promoting new services.

A recent survey conducted by Level Four Software illustrates the services that the industry can expect to see introduced to the ATM channel in the coming years. Thirty-six banks and third-party processors in 15 countries were interviewed. They all showed a marked interest in a series of new service concepts which, introduced correctly, promise to maximise their existing investments in ATM technology and revolutionise the way they think about the ATM as a point of contact to customers.

### **PERSONALISED CUSTOMER SERVICE**

The concept of more personalised customer service focuses on a bank's ability to provide individualised, relevant promotions to customers as they insert their cards into the ATM.

The automatic promotion, which focuses on the customer's unique needs, is based on the information that the bank holds on that particular customer. It promises to be an extremely effective method of targeted advertising. Not only does the screen demand the customer's complete attention for the duration of a transaction, but providing a more personal service is a proven method of offering a more positive customer experience.

This personalisation concept can also extend to the Internet banking channel. For example, while banking online at home, a customer might wish to stipulate how they would like services to be presented to them at the ATM next time they use it. In other words, they personalise their own ATM experience, from any Internet connected computer, ensuring they are more likely to return to the bank or machine that offers that service.

### **ADVERTISING PROMOTIONS**

A number of studies conducted by ATM advertising specialists i-design compare the effectiveness of direct mail with that of ATM promotions. The results show that using ATMs for advertising is as much as four times more effective than the traditional mail shot approach.

For example, an ATM ad campaign for Kit Kat, which was run at ASDA supermarkets in the UK, resulted in

- 91 per cent prompted recall
- 62 per cent spontaneous/unprompted recall
- one in four customers was more likely to buy as a result of seeing the advert.

Similarly, a campaign for British Airways, run on ATMs at London Underground stations, resulted in

- 72 per cent prompted recall

- 44 per cent of those ‘ad aware’ were more likely to use British Airways as a direct result of seeing the ATM ad campaign.

The effectiveness rating was even higher with interactive campaigns that enabled customers to respond to the campaign, effectively registering their interest.<sup>2</sup>

These results show that financial institutions cannot ignore the opportunities this kind of advertising offers. It generates not only new interest from customers, but also increased revenue from sponsors, who will compete for advertising space on a channel that promises high impact through one-on-one contact with consumers.

### **A GREATER VARIETY OF SERVICES FOR DIFFERENT CUSTOMERS**

This concept goes a step beyond customising the personal experience. It groups customer types according to their needs and uses for banking services. A large bank, for example, has several different cardholder groups. This concept would enable the bank to provide a different service to the customer, depending on the type of card they insert or account they hold.

Third-party networks — those organisations that provide ATM services on behalf of more than one bank — also benefit from this concept. At the moment, they work with organisations individually. But these one-on-one relationships could be things of the past, with substantial interest already focusing on the idea of ‘white label’ ATMs. These machines would be generic in appearance, which means they can be used by any financial organisation. The act of inserting a particular card activates the branded screen, advertising and personalised service of the corresponding bank.

Some may be concerned that losing the branding and personalised nature of ATM hardware may be a loss of identity to the bank. But in this way, single machines become treated as commodities, taken on by any organisation, used by more people, and essentially become more cost-effective to operate.

Alternatively, large banks with a variety of cardholder statuses or account types could take advantage of this kind of service, and be able to introduce an entirely new interface, tools, branding and advertising, depending on the customer using the machine.

It should, of course, be noted that achieving the greatest benefit from a targeted advertising and promotion strategy will be largely dependent on the bank’s or deployer’s ability to use customer information intelligently. Information is gathered at the enterprise level across different product lines, but the key to unlocking the value lies in being able to analyse and mine these data in an effective and timely way in order to take advantage of the consumer interaction with the self-service device.

### **DIRECT CONTROL OVER CONTENT AND PRESENTATION**

Financial institutions currently rely on technical professionals to control, maintain and update their ATM services. Introducing new content is complex and time consuming. Ageing technology prevents them from getting more from a one-size-fits-all, fixed service that no longer meets their needs.

By enabling new content to be designed and prototyped by their business and marketing teams, financial institutions will be able to shorten delivery timescales and increase the diversity of services offered at their ATMs.

Third-party networks can enable

financial institutions to retain control of the content of their network, while allowing the infrastructure to be managed separately.

## INDUSTRY TRENDS

The next step is to examine how technology will support these concepts. Many changes have occurred in this area, which need to be taken into consideration when deciding on the best platforms and standards to support new ATM functionality and help businesses take advantage of these new opportunities.

### IFX

The Interactive Financial Exchange (IFX) — a universal standard for electronic communications in banking channels — has come a long way in the ATM marketplace. It is now an agreed standard that is being driven by banks and suppliers.

Open standards such as IFX help banks to improve communications, streamline business processes and reduce costs and development time. This simplified development means businesses no longer have to rely on specialised technical professionals to customise and control their systems.

Yet with different networks and proprietary architectures currently supporting ATM systems, there is still a steep learning curve affecting the adoption of this new standard. Despite this, strategy consultancy Celent estimates that the global penetration of the IFX standard will reach 60 per cent of financial institutions by 2009.<sup>3</sup>

### XFS and J/XFS

The steady adoption of Microsoft Windows operating systems is also contributing to the growth of open standards technology in the ATM market. Level Four's research showed that around 75 per

cent of respondents expected to convert to Windows XP by June 2006.

There have been some concerns that Windows may not be the most suitable platform for the ATM. Despite this, Windows has enabled the rise of the CEN/XFS open software layer, which abstracts the ATM hardware from the application software that drives it.

But as well as Windows XFS, there is another flavour of the standard available to the market, J/XFS, which makes use of Java. This provides a means of enjoying the same open benefits without being tied to Windows. And given that 79 per cent of respondents to the survey said they expect open source software to play a greater role in ATMs in the coming years, this could be significant.

By keeping an open mind about the best supporting solutions for their services, financial organisations can secure the stability and flexibility of their products in the future. Some banks are adopting Windows ATMs now, but implementing a J/XFS interface to their ATM hardware would mean they could unplug from Windows and plug in to Linux at a later date, for example.

### Distributed Network Architectures

Open standards have well and truly earned their place in the role of supporting ATM technology. The move towards open systems is a move towards open communication, allowing banks to make use of effective distributed networks to deliver some of the new services and capabilities discussed at the beginning of this paper.

There are two dominant ATM infrastructure models currently on the market. Some systems confine all control of an ATM to a central host, keeping the actual ATM essentially a dumb terminal. These systems adopt manufacturer-proprietary software in the ATM and can be limiting in terms of flexibility.

The alternative ‘thick client’ model puts all the control on the ATM itself. This method is even harder to control. Each time a change is needed, new software needs to be downloaded and the new version distributed. A large, complex application that resides in the ATM is also hard to test, and reliability is compromised.

ATMs and self-service terminals need a new software model to unlock the channel, making control more accessible to financial organisations. The answer lies in ‘smart client’ technology and distributed IP-based networks. Here, control remains centralised, so an administrator can change, modify or upgrade services through a network server and distribute them to individual users. Dynamic service ‘components’ can also reside on the ATMs themselves, and core ATM transaction functionality can be handled between the financial host and the ATM, using the IFX protocol. Additional services that require linking to other systems, such as Internet banking, CRM systems or even external systems running a loyalty scheme, for example, can be handled using a standard web-services interface.

The distributed network enables the business to create new services as individual entities, and distribute them through the server or withdraw them just as quickly. This approach opens up the marketplace to a myriad of new business services that ATMs can offer. For example, an ATM can be used to promote a charity during an appeal period. A sporting event, such as the Olympics could prompt a series of promotions on ATMs in the vicinity of venues. Or the type of customer might be identified by the time of day and targeted accordingly with a relevant promotion or service.

At present, this level of dynamic promotion would require a complete rebuild and replacement of the ATM

software. But why should a bank not be able to add a service for a period of time and withdraw it quickly and easily, offering a tailored service that meets each new change in the marketplace as it happens?

Dynamic service components over distributed networks give financial organisations more flexibility as to how their ATMs run and the services they offer. Deployment of new services is faster and more efficient, with personalised presentation, customisation and multiple services at a single point of access. Third-party products are easily accessible and new services can be deployed and withdrawn easily.

## **WHERE DO ATM DEPLOYERS GO FROM HERE?**

Getting to this point need not be as complicated as it seems. The approach to the problem can be illustrated by the one that the Japanese car manufacturing industry has perfected.

In the 1960s, the UK produced quality cars that were respected worldwide. But to build one of these cars demanded several isolated phases of production that involved different groups of people. With each new design, a new production line and new parts were required. The time and cost that the UK manufacturers poured into making a single car meant that new models were slow to emerge, and a lot of cars had to be sold before companies saw substantial returns.

The mid-1960s saw the arrival of Japanese-built cars, which, at first, seemed to offer little in comparison with the British cars. But what the UK industry did not see was that the Japanese manufacturers had approached the manufacture of these cars in a completely different way.

They adopted a holistic approach to building cars, linking all their processes

together. Each time a new car was built, the manufacturers reused the production line, the parts, the proven systems and approaches, and integrated all phases of the production cycle, to ensure a single, seamless process every time. These manufacturers not only sold a lot of cars, they were able to reduce the timescales to produce any new model, dramatically cut costs, and deliver a range of vehicles to meet market demand.

Not only that, but they were able to improve the reliability of their vehicles incrementally because instead of reinventing each new stage in the cycle — which introduces new problems each time — they used the same approach as a basis for further refinement.

### **Applying the Vehicle Manufacturing Methodology to ATM Development**

There is a lot to learn from this approach that is relevant to the ATM industry. A fractured development process does not currently allow new ATM services to be prototyped, implemented, tested and deployed in an effective manner. Deployment involves the complete development of an entire system, before the whole network is upgraded and retested.

By taking the same approach as the Japanese car companies, ATM deployers can view a problem from end to end. Graphical tools can be used to build ‘production lines’ that can be re-used. New concepts can be taken from prototype to reality quickly. Testing or reconfiguring a service simply involves taking a process back to an earlier stage in the production cycle, instead of rebuilding it from scratch. New services can be deployed onto the network without taking the network down. By following this model, ATMs will stay in service when they are being upgraded, and a new service will simply appear on the menu when it is introduced.

As well as the efficiency gains and wider range of revenue-generating services, the ATM deployer is able to offer, the cost savings could also be substantial. Having better operational efficiency throughout the network as less downtime occurs to maintain software releases, less reliance on third-party vendors, and using industry standard open interfaces to other applications will help reduce overall cost of operation of the network.

### **Componentised Services**

This method combines seamlessly with the concept raised earlier in this paper, of creating individual, componentised services that can perform in isolation. The idea of an ATM network containing encapsulated services is quickly becoming seen as the future of ATM software infrastructure. It is a model that needs to be adopted to improve the development of ATMs and offer flexible, manageable services to their financial institution clients.

Rather than try to combine lots of software components that work and communicate in different ways, which inevitably becomes complex and unreliable, everything inside this design philosophy looks the same. Services are contained in identical bundles that can be created and tested using a production line approach. The tools that install the components are the same — to the point where the process can be automated, no matter what the service is that is being added or removed. This network is more predictable and can be easily queried and modified.

The bundle, neither too small nor too large, contains the data and the code of a complete service. When a new service is injected into the network, all other services remain stable. These bundles can be managed easily, but are still sufficiently self-contained to ensure that a technical professional does not need to retest the

infrastructure around it once it has been deployed. Time to deliver new services is reduced, market demands can be adhered to, and production time cut.

The ATM services that are based on this model become quicker, cheaper and more reliable. Banks can choose where new services are deployed and when. Processes and services can be refined continually, making a bank's software investment more worthwhile than ever before. Customised services can be created dynamically, which can be introduced to ATMs seamlessly, appearing instantly on the menu being viewed by the customer as they insert their cards.

High availability of ATMs has become even more critical, as customers are used to 24-hour service. With this model, new services can be removed as effortlessly as they arrived — simply unplugged from the network and deregistered without downtime or affecting the existing services on the machine.

Above all, security is ensured. Each component is signed, verified and secured properly, and has to undergo thorough tests each time it is introduced by the network. This kind of system is more transparent. Technical professionals know exactly what is in each component, whereas the traditional approach can potentially harbour hidden problems.

### **Implementation issues**

While these methods are relatively nascent, the ATM and self-service industry seems to be embracing the distributed 'smart-client' concept as well as a continued move towards open standards, as key industry drivers. Increased competition in the ATM software market from independent providers is helping to spur innovation in the channel, as software is no longer the exclusive preserve of the terminal manufacturers, and yet is seen to be the key to unlocking value in the channel.

Obviously, there are technology infrastructure elements that need to be in place before such a strategy could be effectively pursued. These include high bandwidth TCP/IP networks, appropriate network security, as well as an estate of modern ATMs capable of supporting the aspirations of the business area. Many institutions that have been through the recent round of hardware and network upgrades to support Windows as the operating system at the ATM, however, have already made this investment, and so are well placed to consider new software architectures.

Banks and ATM deployers also need to consider the human resource profile that would be required to deploy and maintain such a network. Many deployers have previously either relied on the professional services teams of ATM hardware vendors to customise and maintain ATM applications, or use limited functionality ATM applications that can be configured by an in-house team. Only a relatively small number of banks have actually written and deployed their own ATM applications in-house — making resourcing a factor to consider ahead of embarking down this route, if control over the ATM services is to be preserved within the organisation.

### **CONCLUSION**

These concepts open new doors for ATM deployers, allowing them to offer their customers multidimensional ATM services. These systems run on flexible, secure and reliable technologies, which allow the deployers to redefine the way they manage and control their ATM networks. Their use of distributed architectures and open standards extend functionality to customers while maintaining consistency. Standards such as IFX offer secure financial transaction processing, while componentised serv-

ices ensure that updates and management are seamless and secure.

The ATM industry will continue to expand rapidly. According to the Apacs report, cash machines will provide more than four-fifths of cash requirements in the UK by 2015. It forecasts that around 40 million people will be regular cash machines users by then, making around 3.1 billion withdrawals annually.

For obvious reasons, this predicted growth cannot be ignored. Existing software models used in ATMs can only hold the industry back. By creating open

standards-based solutions and implementing them now, ATM deployers can fully take advantage of the opportunity of ATMs as a channel to reach their growing customer base with dynamic new services, cut costs and increase revenues.

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