Implementing Account-Based Ticketing (ABT)

How open, non-proprietary standards can bridge the transport ticketing innovation gap

ospt™
ALLIANCE

Public transport users are demanding increasingly flexible ways to travel and pay

Travellers accustomed to on-demand services and the convenience of 'tap-to-pay' technology in other markets want the same flexibility, efficiency, loyalty and time-saving benefits from their transport ticketing. To deliver the same convenient, seamless payment experience, transport operators need to evaluate how they can overcome the cost, security, interoperability and other logistical barriers currently preventing them from fully embracing these opportunities.

A discrepancy has emerged between what users expect and the service they are receiving. And most importantly for operators, new areas for revenue generation and cost savings are failing to be fully capitalised on. To tackle this gap in user experience and realise exciting new prospects, the key question is this: how can transport ticketing be improved to advance fare collection innovation?

Industry buzz has been growing surrounding account-based ticketing (ABT). Offering a more seamless passenger experience, the capacity to cut costs, simplify maintenance logistics and improve security, ABT could offer a way to super-charge ticketing solutions and promote a better travelling experience. But to fully realize the benefits of ABT, there needs to be a change in industry approach.

In this eBook, we'll be exploring the benefits of implementing ABT functionality and why adopting a non-proprietary open standard is essential to ensuring implementations are cost-effective and realize their full potential. Namely, we'll be illustrating why the CIPURSE™ standard is best equipped to support the secure adoption of a wide range of transport payment and transaction methods, and how an industry moving away from proprietary system approaches can continue to innovate by adopting open standards.

"ABT could offer a way to super-charge ticketing solutions and promote a better travelling experience."

ospt
ALLIANCE ™

Addressing the innovation gap in transportation

We're in the midst of what many would call a contactless and mobile evolution. Consumers are increasingly 'tapping' during their daily lives, with rapidly rising use cases of contactless technologies such as smartcards, wearables and NFC-enabled devices such as smartphones.

Take the UK London transit market for example, where spending on contactless systems accounts for the vast majority of fare payment transactions. The Oyster™ card is the primary contactless card of choice. However, the use of contactless bankcards is on the rise, followed by the use of smartphone contactless payments. The contactless technological rollout on the Transport for London (TfL) network has proven to be a consistent driver of growth in the expansion of contactless payments in other markets. London's TfL contactless payments now represent a staggering 11% of all contactless transactions in the UK. Nevertheless, despite this growing evolution in the way we pay and the success of London's deployment, the contactless evolution has yet to really reach other transit and retail markets on a wide scale.

Why? Despite a sincere desire to support innovation and deliver superior experiences for passengers, transportation agencies have struggled to make many significant advances thus far. Consequently, the transportation experience is falling behind in the expectations of sophisticated travellers who have become accustomed to mobile payments and on-demand transportation services, such as Uber, Lyft and Grab.

To meet the expectations of travellers, the industry needs to adopt a fresh approach.

Note: The information on TfL is based primarily on "The London Toolkit" reference 2017 London Oyster Card, a well-respected Traveller's Guide to London. Also from published info from TfL from 2015/16.

"We're in the midst of what many would call a contactless and mobile evolution."

Introducing ABT

In recent years, ABT has seen a spike in interest. But before we explore the facts behind the buzz, it's worth first taking a high-level look at what ABT is all about.

A definition frequently cited by US-based industry body, the Secure Technology Alliance[1], defines ABT as: *"the transit fare collection system architecture that uses the back-office system to apply relevant business rules, determine the fare, and settle the transaction."*

So, instead of a ticket and its value being held on a paper ticket, a stored value card or a virtual smartcard hosted on a smartphone, the traveller has an account in the back-office and 'payment' occurs either during or after travel. The traveller simply carries fare media with an identifier which authenticates them with the back-office and links to their prefunded account.

[1]http://www.securetechalliance.org/resources/pdf/Open_Payments_WP_110811.pdf

"Instead of a ticket and its value being held on a paper ticket, a stored value card or a virtual smartcard hosted on a smartphone, the traveller has an account in the back-office and 'payment' occurs either during or after travel."

To more clearly illustrate what that means, let's break down some of the benefits:

➤ *Less complex smartcard profiles needed*

As ABT is based upon the passenger carrying an identifier, operators can issue much less complex smartcard profiles than traditional stored value cards. In addition, because all processing is carried out in the back-office, ticketing gates, fareboxes, validators, or even fare media for that matter, no longer require the same level of intelligence and complexities, delivering significant potential cost savings.

➤ *Streamline operations*

ABT systems enable a more streamlined and flexible business model. It allows operators to better leverage variable pricing models to encourage more even usage around peak hours and deliver smoother, better quality service. With the reduced cost of ticket issuance and support, savings can also be realised here.

➤ *Increased agility and managed commercial risks*

Centralizing ticketing at the back-end enables greater agility, as updates to passenger ticketing needs can be amended without re-issuance of a ticket, and limits can be set on a passenger's account instantly to manage fraud. ABT is also more flexible if there are connectivity issues, as agencies can allow the traveller to enter the system if deemed at low risk by utilizing ABT on-card status registers. These status registers provide additional information as to the level of payment risk a traveller is, minimising operator losses and traveller frustration during connectivity down-time.

➤ *Loss of cards doesn't mean loss of funds*

Because no information regarding fare balance resides on the card or device used in ABT systems, if a traveller loses their card, they no longer lose any stored value, as would occur on unregistered stored value cards.

➤ *Consumer convenience and choice*

ABT is an enabler of mobile and contactless device usage that consumers are increasingly adopting in other verticals. With the ticket managed in the back-office, travellers can choose from a range of media to identify themselves with, whether that is a smartcard, mobile device or a wearable. What's more, travellers electing to take the option of having a pre-funded ABT account no longer have to be concerned about 'topping up' or having enough stored value to get to their destination.

"ABT is an enabler of mobile and contactless device usage that consumers are increasingly adopting in other verticals."

Challenges of implementing ABT

Whilst the benefits of ABT may seem clear, implementation projects have a number of technical complexities to tackle first to ensure implementations are most effective, secure and reliable.

➤ Security

ABT relies upon strong authentication, so the adoption of industry standard cryptography is a must to guarantee the security of implementations. In addition, ABT does not require fare value write backs to the fare media, further reducing the chance for a security breech or a transaction 'tear event' that may cause card corruption.

Note: A tear event may occur when value is written back to the card, as is required in a stored value transaction. If a transaction tear occurs, data can be lost, and the card can potentially become corrupted, something which may require transit staff involvement to repair. Minimizing write backs to the card improves card to reader performance – something ABT takes full advantage of.

➤ Offline risk management

Reliance solely on an online connection poses some challenges and can disrupt business flow in instances of connectivity downtime. Effective offline or slow system processing and network connectivity risk evaluation cannot be achieved with the media's ID or secure token alone, so solutions which use on-media status registers, such as the Customer Convenience Registers (CCR)[2] for CIPURSE, is recommended to enable offline and slow connectivity to update validation and offer a better level of risk management.

➤ Speed

Implementations should strive to meet the international transaction time standard (often referred to as being less than 350ms from tap to approval signal) however, this may be difficult to achieve with reliance on a system that requires online connectivity during offline periods without the use of the CCR.

➤ Upgrading proprietary systems

To integrate any new technology into existing systems, operators face a number of costs and complexities when tied to proprietary systems. An ABT approach implemented with open standards can reduce the time and costs associated with the implementation of new technologies into an existing or new system.

➤ Inclusivity

A real need in emerging markets is for ABT implementations to support those without bank accounts, allowing all users to safely and securely travel on networks and benefit from new systems where the user can prefund the ABT account a number of ways.

[2]To learn more about the CCR, read page 7

" Effective offline or slow system processing and network connectivity risk evaluation cannot be achieved with the media's ID or secure token alone."

Using CIPURSE to super-charge account-based functionality

CIPURSE and CCR: the killer application combination

Overcoming these challenges may seem overwhelming however, by utilizing a small subset of the CIPURSE open standard's pre-existing stored value functionality, the Customer Convenience Registers (CCR), operators can effectively overcome most of the challenges outlined in launching ABT solutions.

So, what is a CCR?

Put simply, a CCR is event status information written to the card that helps entrance devices, such as fare gate readers, quickly and effectively determine whether to grant the passenger access.

The CCR profile is the only data on the card other than the unique ID token and this status is updated immediately during significant events, such as adding funds at a ticket vending machine (TVM), applying a positive or negative risk rating accordingly with a recent status event. As this CCR status updates immediately when funds are added, even if the value has not yet been updated in the back-office account, a traveller who has just uploaded funds can be accepted into the network regardless of a lack of or slow network connectivity. When the CCR is present on a mobile application and

funds are uploaded from the same device, this update is also done automatically. Having the CCR is especially useful when the ABT system is offline or the system has not had the chance to update the field devices, such as the farebox or faregate, as it can rely on the risk rating from historical uploads of funds and manage the risk accordingly.

"The CCR profile is the only data on the card other than the unique ID token and this status is updated immediately during significant events."

Example

Traveller loads value (such as 20€ or $20) to their ABT account via a TVM, smartphone application, or kiosk. At this time, the CCR is updated with a recently loaded value event, now reflected on the card or payment device.

➤ Once the back-office account has been updated, this recent uploaded information is shared with connected readers or validators on the next system broadcast. When the smartphone/mobile device or smart card comes into contact with the updated reader or validator, the CCR event status can also be updated. The CCR status on their card or mobile device is securely updated to further lower risk, reflecting value that has recently been added to the back-office account associated with users' fare media. *Notably, no actual funds are stored on the card or smartphone, just transaction status.*

Note: The reason for updating the CCR during the time of value being added is to ensure the revised CCR status is immediately available on the fare media. As a result, in the event of the back office being either offline or taking too long to update the faregate, validators or fareboxes, the user can gain system access based on its CCR status.

➤ Relying on the CCR, the entrance gate, validator or farebox can quickly determine whether the traveller is a low or high-risk rider to the agency or operator.

➤ Traveller is granted access to travel if low risk and likely denied entrance if high risk. In future journeys, this can still work even in the absence of back-office connectivity, as the traveller still has either a low or high-risk status assigned. A low risk status is assigned because of its history of the user uploading funds. This grants entry as an improved, managed risk and payment is deducted post-journey.

"Relying on the CCR, the entrance gate, validator or farebox can quickly determine whether the traveller is a low or high-risk rider to the agency or operator."

ospt ™
ALLIANCE

The CCR is a powerful tool. It minimizes customer frustration caused by network connectivity issues by promoting risk-managed business continuity, whilst also providing assurances for operators that the risk of bad debt is drastically reduced.

Savings here are clear. Paid customers can continue to travel even when back-office connectivity is down in a situation where often, a traveller would need to queue and purchase another ticket to gain access or a travel operator would need to invest resources on the ground to resolve these issues. In addition, without the reliance on online connection, transaction speeds can be significantly increased.

It's also worth noting that another key benefit of CIPURSE and the CCR is the capacity to deliver services to those without bank accounts. For emerging markets, this can be key to delivering new and improved services to a broader sect of the population.

Don't forget security!

Operators don't have to compromise on security to realize these savings either.

With CIPURSE, the CCR status and the token representative of the passenger's account are protected using the latest cryptographic algorithm, NIST 197 based AES 128 cryptography, also used by EMV® compatible bank cards and several security access systems. This provides end-to-end protection of the communications between the entrance fare device, card and back-office, further minimizing fraud. What's more, achieving CIPURSE certification for products is considerably more cost-effective than other leading certification processes of similar security levels.

"Savings here are clear. Paid customers can continue to travel even when back-office connectivity is down."

Open, non-proprietary standards: the facilitator of innovation

It's crucial to address the broader issues in the industry when it comes to innovation. Namely the dominance of proprietary systems and the long-term impact these have had on the operators' ability to innovate when necessary to provide the best user experience.

Bound to customized solutions from a single-source supplier, upgrades to accommodate the new emerging ways to pay are costly and complex and this is slowing down innovation and adoption of new approaches such as ABT.

For the transit ticketing market to truly meet passengers' demand for increased convenience and choice, a new approach is needed that allows operators to upgrade systems in a standardized, open and competitive manner.

As a truly open standard, CIPURSE, developed and managed by industry association OSPT Alliance, is fully configurable and adaptable to the requirements and innovations of the transit ticketing community.

"It's crucial to address the broader issues in the industry when it comes to innovation. Namely the dominance of proprietary systems."

Here's what an open, non-proprietary market can allow operators to do:

➤ Deliver increased functionality

Operators on proprietary systems must wrestle with costly, complex upgrades to their systems when accommodating each emerging payment form factor and/or security scheme.

Completely device agnostic, CIPURSE supports each fare media device with the same security protocols, so there is no need to upgrade CIPURSE compatible readers and terminals when incorporating new payment forms. Systems are future-proof to upgrade easily and accommodate new technologies.

➤ Promote market innovation

With CIPURSE, operators have the freedom to select the best vendors and business models for their solutions. Technology also benefits from increased innovation, as a large number of members share a vested interest in the sustainability and advancement of CIPURSE. Plus, in an open market, new players are given more opportunity to showcase their offering, promoting healthy competition in the industry.

➤ Save more and make more

With increased competition comes more competitive pricing. Plus, with future upgrades easier and cheaper to accommodate, operators can continue to deliver the best available solutions to their consumers cost-effectively, safeguarding and promoting business.

Another side benefit is the capacity of CIPURSE to open up multi-sourced integrated circuit procurement that eventually saves contactless media costs to the transit agencies operational bottom-line.

➤ Simplify integration and future-proof your services

Implementations using CIPURSE are far simpler to integrate both into existing solutions and for future advancements. Open standards enable flexibility to scale up operations simply and cost-effectively. Plus, with interoperability across all sections of the ecosystem, services are further safeguarded for the future.

"Technology also benefits from increased innovation, as a large number of members share a vested interest in the sustainability and advancement of CIPURSE."

ospt
ALLIANCE

The next steps to innovation…

Only CIPURSE, with the optional use of its CCR functionality, can deliver a totally open security solution for fare media with ABT functionality that can operate even when the system is offline, effectively manage operational risk and improve the passenger's transit ticketing experience.

CIPURSE is the simple solution, pre-packed with the functionality needed to ensure the full benefits of ABT implementations are realized.

The future of transport ticketing is exciting, with new fare collection capabilities offering superior passenger experiences, greater security and reduced operating costs.

But to realize these benefits, it's also crucial the market breaks free from expensive, prohibitive proprietary systems. ABT is the perfect example of a system that operators are keen to adopt but have been hesitant to take action on as a result of proprietary complexities. Adopting an open, non-proprietary standard, such as CIPURSE, will undoubtedly provide the catalyst needed to drive innovation, achieve ROI and safeguard future system upgrades.

"The future of transport ticketing is exciting, with new fare collection capabilities offering superior passenger experiences, greater security and reduced operating costs."

Be a part of the future of transit ticketing

Want to help bridge the innovation gap in fare collection solutions? Join the OSPT Alliance to contribute to our work in developing the only open, non-proprietary standard for smart ticketing and ensure your needs are met. Download the CIPURSE Specification and evaluate the potential CIPURSE has to advance your ticketing solutions.

ABT is just one business model which CIPURSE can super-charge. With tailorable levels of functionality, the standard can accommodate stored-value systems, mobile ticketing solutions powered by HCE, enable mobility as a service (MaaS) with a wide-range of multi-application functions, and much more. Based on an open, non-proprietary standard, any solution built with CIPURSE also reaps the same benefits of interoperability, high-level security and ease of upgrade.

For more information, please contact laurent.cremer@osptalliance.org to learn more.

About the OSPT Alliance

The OSPT Alliance is an international association chartered to provide the standard for secure transit ticketing solutions and beyond. It provides industry education, creates workgroup opportunities and catalyzes the development and adoption of innovative fare collection technologies, applications and services. OSPT Alliance membership is open to technology providers, transit operators, consultants, solution vendors, government agencies, reader and terminal manufacturers, system integrators and other stakeholders in the contactless ecosystem. For additional information, please visit www.osptalliance.org.

www.osptalliance.org

ospt
ALLIANCE