

#Newpayments Use Cases for the Evolving Ecosystem

ACI Worldwide[®]
Real-Time Payments



What Happens When You Combine the Power of Fifty Real-World Payment Superheroes? You Unlock the Answers to Today's Most Demanding Innovation Scenarios.

ACI brought together a team of payment experts comprised of customers and ACI internal staff to tackle some of the biggest challenges in modern payments.

These real-world use cases span retail and transaction banking, mobile payments, point of sale (POS), ATMs and more, and have been captured to help you meet the evolving demands of your customers in the New Payments Ecosystem.

1 | Digital DNA — Biometrics for Payments Authentication and Authorization

CHALLENGE

Create a more convenient, safer way to pay that offers maximum value to customers across all their payment types.

CONSIDERATIONS

1. **Where to store the biometric identifiers?** State-operated “vaults,” a global registry or bank scheme?
2. **How to manage changes or anomalies in those biometrics?** Identical twins, those whose appearance changes cosmetically or available biometrics change.
3. **Who owns the data?** How to put the customer in control of their digital DNA and educate them on the management of the portfolio.

SOLUTION

1. The ideal “vault” for the biometric data is debatable, but the protection and anonymization of that data can be achieved by combining biometric identifiers into a single cryptokey, which no one party holds. The creation of that cryptokey can be achieved with existing high number encryption processes or new applications of distributed ledger technology, such as blockchain.

2. The biometric identifiers themselves should be varied to allow for two-step secure customer authentication in scenarios where the customer needs or wants to add fraud prevention controls into their personalized payments experience. Multiple identifiers also make it possible to “update” your personal biometrics portfolio, if some of those should change.

Digital DNA would need to be composed of multiple strands to allow you to identify yourself via two options to the “vault” operator in order to update a third identifier within your profile.



Iris profile changes after surgery or transplant



Fingerprints no longer viable from injury or faded with age



Facial surgery, cosmetic or medical post-accident



3. The ownership of the biometric identifiers and associated data would always reside with the customer. Associated data could include payment preferences, such as maximizing usage of payment instruments that deliver loyalty points, or choosing the lowest cost payment type, or requiring twostep strong customer authentication (SCA) for transactions above a specific limit or at a certain merchant category. Customers could also choose to opt in to apply artificial intelligence (AI) to their payments transaction and behavior history to recommend the best preference settings for their personal needs.

The management of the identifiers and preferences data would be in a mobile or web app that allows real-time updates and notifications to put the consumer in control of their digital DNA. The app should also include

educational information presented in bite-sized formats to support customers in making the best possible decisions for their desired outcomes.

CUSTOMER EXPERIENCE (CX) OPTIMIZATION

Leverage next-gen technologies to ensure that biometric readers meet customer needs and keep ahead of fraudsters. For example, POS fingerprint scanners can now recognize a pulse in the finger presented; this kind of reader would need to be standard.

Offer personalization in the link between the presentation of the identifier and the preferred payment type or rules by adding movement patterns (similar to sign language) and leveraging perceptual computing that “overrides” usual set preferences associated with a fingerprint-authenticated payment.

2 | Post-Purchase 2.0 — Beyond Paperless Receipts

CHALLENGE

Create a better consumer and merchant post-purchase experience by integrating transaction, receipt, guarantee and reconciliation data at both ends of the interaction.

CONSIDERATIONS

1. **How to maintain the “high” the customer feels at point of purchase?** Tackling consumer frustrations post-purchase around locating information for returns, exchanges and repairs to maintain a positive consumer-merchant relationship and drive loyalty.
2. **How to remove cost for the merchant?** Streamlining and automating more of the post-purchase activities, including reconciliation, stock check and customer service interactions, to reduce manual processing costs.
3. **How to drive consumer spending with the merchant?** Optimizing the merchant-consumer relationship with accurate post-purchase data to enable timely communications.

SOLUTION

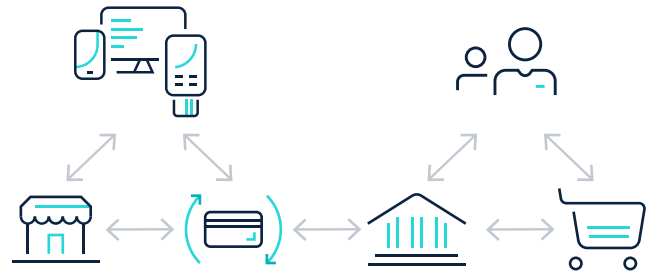
1. By linking eReceipts to line items in the transaction purchase data, they can automatically be added to a mobile wallet linked to the initial payments method. Remove the friction currently involved at POS email-address-based digital receipts, which are easily lost. Integration of receipts into easily searchable payment records in a mobile app could be extended to include other digital documentation, such as the guarantee or instructions for an item to maximize self-serve options for an “uber-esque” customer experience.

Further improvements to customer experience would come from linking the purchase data with categorization of spend across any method or merchant from a single location, including credit card reconciliation to support consumer controls and awareness around spend management.
2. Better self-serve options would help reduce customer frustration during post-transaction dealings with the merchant, as well as reduce costs associated with customer service calls.



The implementation of a standard interface to export the receipts to other systems, such as corporate expense management systems, via spreadsheet and photographic outputs, would create a chargeable model for corporate banking customers that helps remove expense and productivity losses at the customer end to provide a strong business case.

3. Merchants can find further value in the data aggregation against the purchases by linking upsell activities into the same post-purchase communications cycle that still drives customer experience. Offering cost-effective insurance packages, easy warranty extensions, simplified product recalls or upgrade special offers that continue the merchant-customer relationship, as well as boosting customer satisfaction and loyalty. Direct alerts through the same post-purchase mobile-app interface, controlled by consumer preferences, ensures timely and relevant communications that enhance the merchant customer relationship and drives consumer spending.



CX OPTIMIZATION

Ensure the experience is seamless across all purchasing locations (online and in-store), payment types and payment providers. It needs to be automatically available in real time across a synchronous mobile wallet, online account and bank statement. This necessitates a single provider that could be the bank, or a new fintech, providing this value-added service to banking customers via Open APIs that either integrate the fintech as a partner or white-label the new offering.

3 | Loyalty That Pays — Aggregated Loyalty Rewards With Added Intelligence

CHALLENGE

Create an intelligent loyalty aggregator integrated with the consumer payment for a clear, single view that supports customers to extract maximum value and delivers on merchant targets for loyalty programs.

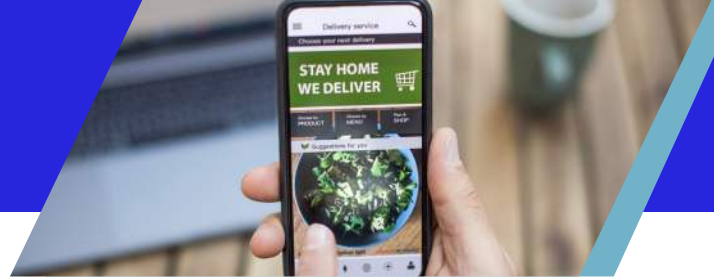
CONSIDERATIONS

1. **How to deliver a great customer experience to drive loyalty?** Rewards aren't delivered in real time and aren't tailored enough to customer desires and needs.
2. **How to drive loyalty and increased consumer spending?** Reward programs are fragmented and opaque, making it difficult for consumers to identify the value and for merchants to build a positive customer relationship.

3. **How to reduce the cost of operating loyalty and rewards programs?** Traditional programs are too broad-brush in their approach to customers, totaling high cost for low returns.

SOLUTION

1. Create a modern loyalty program with an aggregated portal that plugs into a customer's preferred existing payments interface, where they can leverage a single view of all their loyalty programs, offers and collected rewards in real time in order to make informed choices about spending by merchant or payments instrument. Include simple controls that allow the customer to set preferences on spending in order to maximize rewards, "save" loyalty towards preferred targets and to feel truly rewarded for their custom.



2. Aggregated spending data, including how customers choose to spend their rewards, gives a fuller picture to the banks, merchants and fintechs as to how to market to that customer. Traditional rewards have been too paper-based, removing the ability for the rewarder to understand what drove the consumer spending in the first place: luxury goods, once-in-a-lifetime experiences or simply discounts on everyday items to relieve pressure on squeezed budgets. The portal and the data it holds should work to return the joy to the relationships between customer and bank, merchant or new service provider. This, in turn, will drive consumer spending.
3. Include clear, granular-level controls that allow consumers to grant transaction and behavioral data access by individual business, or business type, for limited time periods or only for specific transactions or transaction types, e.g., debit not credit. Banks, fintechs

and merchants can reward this data access and use it to become highly segmented in their approach, better identify which customers are a good match for their services (saving costs) and offer them rewards that are tailored to deliver value to them as an individual (driving acquisition, retention and profit.)

CX OPTIMIZATION

Make the integration of loyalty into payments seamless. This will be key to delivering on the aims of loyalty programs — increased consumer spending.

The combination of improved visibility and clarity, combined with free in-app “advice” on how to extract the maximum value for the consumer as an individual, is key to making loyalty and rewards programs pay for both consumers and merchants.

4 | “SWIFT” AI — Machine Learning for High-Value Payments Repair

CHALLENGE

Real-time gross settlement (RTGS) and SWIFT payments often need manual intervention to repair incorrect or missing data, adding high cost for the bank and delays for the customer.

CONSIDERATIONS

1. **How to mitigate risk in RTGS?** RTGS payments are often high-value payments for high-value customers, so issues need to be rectified, but manual intervention adds risk of human error.
2. **How to improve CX?** Manual intervention adds delays and uncertainty into the process for time-critical payments.
3. **How to reduce costs?** Manual intervention necessitates multiple rounds of edits and checks, increasing associated service costs exponentially.

SOLUTION

1. Making better use of existing technologies, such as fuzzy logic, combined with ever-improving machine learning and AI, could enable the bank to leverage rules written

across the entire payments chain. The implementation of machine learning across consortium data could be used to build rules built on macro- and micro-trends analysis by segment, payment type, beneficiary or initiator that allow for auto-completion or augmentation of payments data in order to remove the need for manual intervention.

2. Leveraging new payment messaging types and standards for cross-border and real-time payments (e.g., SWIFT gpi or ISO 20022) allows for enriched data to be included at the payments initiation level. The CX of inputting that data correctly could be improved with strong front-end innovation in the user interface, as well as leveraging the in-flight tracking available from these technologies to provide real-time updates on status, including push notifications to the customer, removing the “where is my payment” uncertainty from the equation.
3. Reducing the risk of human error and the need for support staff to respond to ad-hoc status requests from



customers will reduce the cost to operate, allowing banks to redeploy human resources on tasks that add value to the customer and the bottom line. As real-time payment rails increase their transaction limits, corporate banks need to increase their SLAs, improve the customer experience for RTGS and innovate on overlay services in order to protect these revenues.

CX OPTIMIZATION

Create an international know-beneficiary database for banks within the consortium to match against, a “closed-loop confirmation of payee,” especially for cross-border payments, to reduce errors and improve straight-through processing rates, reduce cost to operate and augment the CX within the frontend initiation portal.

5 | Self Authenticate — Global Identity Registry

CHALLENGE

In a more complex, open, digital payments environment, customers need a simple and safe way to authenticate themselves across all payment types, anywhere in the world.

CONSIDERATIONS

1. **How to prove your identity?** Identity needs to be a universal standard across all payment types.
2. **How to make it ubiquitous?** Sign up and self management needs to be available in all countries and location types.
3. **How to protect the customer experience and the merchant?** Seamless, intuitive, personalized management and application that enhances fraud prevention.

SOLUTION

1. Leverage a global identity registry for payments that enables customers to authenticate themselves across all payment types, even ones that are not yet commonplace in their country of residence. The current authentication piece of the new payments ecosystem is highly fragmented and confusing for the consumer, which can lead to fraud instances as they fail to protect themselves from fraudsters. A single identity registry with clear and simple controls helps consumers to understand and regain control of their identity and payments.

A single standard would reduce perceived risk around unfamiliar payment options and security experiences to drive consumer spending in a globalized digital economy.

2. Create an omnichannel sign-up and management process to cater to all demographics. A fully digital registration process initiated via fingerprint and managed via a smart device might work well for the tech-savvy in developed, urban environments. But for the elderly, an in-branch assisted self-service process where they can receive trusted guidance face to face could be more beneficial for the customer experience.

For lower density population areas or developing nations without high smartphone penetration, physical registration and management booths that allow on-demand access to a full digital experience could support featurephone distribution of identity tokens that local merchants can accept.

Create certainty in the transaction for both the consumer and merchant with a single, global identity registry to authenticate against for all payment types, including card-not-present (CNP) eCommerce transactions across borders. Merchants can rest assured that the payment is not fraudulent and consumers are confident that their payments will complete and they will receive their goods.

Even familiar payment types can be riskier for both consumers and merchants when parties are unknown or transaction values are high. Use of blockchain or other distributed ledger technology to protect the data can also contribute to a more secure, improved experience for payments.



CX OPTIMIZATION

Apply the same globally accepted identity that is leveraged for payments authentication to other universal authentication networks to allow travel, without paperwork and improved visa applications.

Better authentication would also enable the creation of new ways to pay that leverage the security of a single source of authentication truth.



6 | The Great Unbanked — Cash Elimination From Informal Economies

CHALLENGE

Cash is expensive and carries security risks for all parties in the payments chain. Cash is often used by the most underprivileged and underbanked, which often leads to more expensive cost of services.

CONSIDERATIONS

1. **How to incentivize usage?** Previous digital payment projects have failed in townships, favelas and barrios due to the acceptance versus issuance conundrum.
2. **Which format is best?** Residents of informal settlements primarily have access to basic feature phones, but mobile coverage is good.
3. **Who to partner with?** Financial inclusion projects are complex and require a unified, multipronged approach.

SOLUTION

1. Distribute free mobile POS devices and offer discounts for digital SME banking, partner with the merchants to push digital discounts to customers who transact electronically. Make it simple for merchants to participate and avoid the registration barrier that reduces ubiquitous acceptance. Use digital discounts to drive and track loyalty in the mobile app so consumers see benefit of moving from cash. The reduced cost to operate ATMs and manage cash for the bank can fund the mobile POS distribution and customer offers. It becomes a first rung on the digital ladder for both SMEs and consumers.

2. Issue a mobile app to consumers available on smartphone or featurephone that allows peer-to-peer (P2P) currency payments from a digital wallet mapped to the individual's government-issued identity already leveraged by banks for accounts. This avoids the previous failings of mobile payments that transferred value to airtime on cell phones or credits that couldn't be spent in the same way as cash.

Through digital payments, they can have access to reduced costs around regular payments, such as utilities, as well as better budget controls in app. Many families in these environments share a single mobile phone, so the app needs to allow for multiple profiles stored on the same device. Those profiles may be separate accounts, or hierarchies within a single household account, that allow for the parent or budget holder to monitor and manage spending across their family. The alias for the account must be the government identity, perhaps combined with biometric log-ins built into the smartphone, but it cannot be the cell phone number.

3. Secure government participation to promote the financial inclusion element; education of consumers and merchants is vital. There needs to be regulation, rewards or both for accelerating the cashless environment. These could be around discounts on government taxes for paying digitally. Many informal economies operate on cash because the individuals like it; cash is anonymous, ubiquitous and there is a direct connection in the trade



relationship. It is simple and tangible. They often believe they will be better off in terms of associated costs, but the risks associated with theft or loss of cash are also very real in these environments. A multipronged approach that emphasizes the reduced risks, reduced cost to live and associated rewards is necessary to create a cashless economy.

The elimination of cash also captures a new customer base that is going to become valuable. These communities are the future middle classes in their countries, and offering them a service tailored to their current needs is a low cost acquisition model to capture their future business.

CX OPTIMIZATION

Introduce more advanced spending control personalization in the app to allow families on a tight budget to restrict transactions across their account hierarchy based on merchant type, location, transaction values and more.

Leverage real-time payments to ensure a real-time balance for users who live on a daily or weekly wage, and overlay request-for-payment services for utilities/ bills, taxes or installment plans, allowing them to better control their cashflow. Offer in-app, low-cost international money transfers for migrant workers who send most of their earnings home.

7 | Peer Payments — Pay per Use of Community Goods and Services

CHALLENGE

Make access to goods and services more cost-effective for those on a tight budget.

CONSIDERATIONS

1. **How do you structure the pricing model?** Surge pricing, o-peak rates, premium services.
2. **How do you manage the operating model?** Overlay services enabled by Open APIs, maintenance management.
3. **How do you optimize the customer experience?** Highly connected digital services with seamless payments.

SOLUTION

1. Offer digital, app-based, pay-per-use micro-payments for community owned goods and services, such as laundromats, pushbikes and shared cars, to enable access to goods and services that have a high cost of ownership and capitalize on the uber-ization of the economy to drive consumer spending and digital transaction volumes.

Make it easy to locate and reserve services and goods, as well as pay for usage. A smartphone app can leverage the Internet of Things (IoT) to improve the customer experience

by offering personalized push notifications of availability, customer ratings and reservations, and clear choice of pricing models based on surge and off-peak pricing, as well as pay-for-premium models based on user ratings.

2. Apply advanced data analytics to optimize location of goods and services, as well as maintenance and replacement cycles for automated inventory management. Goods and models can be smart devices connected via the IoT for real-time diagnostics and remote repairs. Depreciation value of the quality of goods can be automatically applied by synchronizing the replacement cycle information with the pricing algorithm.
3. Leveraging the community purchasing power, or local government or private entities ownership of the goods and services, makes them available to all in a personalized way based on the individual's preference for price point, convenience or quality, all indicated and managed through the app.

CX OPTIMIZATION

Offering group-based loans via micropayment community outreach, while keeping the bottom line whole. Providers could offer unsecured, low-risk microloans to build credit ratings for the young or underbanked and identify high-value future customers.



8 | Cash in the Cloud — Drone Delivery of Currency and Purchases

CHALLENGE

In some rural or developing world locations, cash is still a necessary evil, but ATMs are not safe to use; they can be expensive or inconveniently placed.

CONSIDERATIONS

1. **How to drive down the cost of cash?** Reducing the cost of an ATM network.
2. **How to better service customers who need cash?** Reducing risk and improving the customer experience around spending.
3. **How to accelerate the move to cashlessness?** Bridging the current need for cash with the digital payments future.

SOLUTION

1. Develop a drone network for on-demand delivery of currency or goods linked to in-app payments authenticated by smartphone-based biometrics. Eliminate the need to provide ATMs for cash-dependent customers and use the resulting cost savings and

available resources to innovate around new digital services for customers.

2. Integrate a digital receipt system and GPS location service to deliver directly to the customer. Use machine learning to improve the customer experience with push notification of special offers based on transaction and behavioral history. Learn the best routes to regular locations that avoid obstacles, such as power lines and reduce the time to delivery.
3. Drive the move to digital payments by offering discounts for eCommerce purchases delivered by drone that can be same-day delivery to rural locations that are failed by the traditional postal network. Include loyalty rewards for non-cash transactions that support the drive to lower-cost digital payments.

CX OPTIMIZATION

Optimize the customer experience by offering the service globally so that customers can get deliveries of foreign currency as they arrive in a new location for business or vacation.

9 | Transacting With Transparency — Leveraging Real-Time Payments for Digital Transformation and Differentiation in Transaction Banking

CHALLENGE

Real-time payments are about more than just payment flows — they are the catalyst to bringing the whole bank into the digital, real-time world. Banks must deliver a better experience for corporates if they want to retain customers, but disparate, legacy systems and limited budgets restrict the realization of real-time.

CONSIDERATIONS

1. **How to orchestrate new information across all systems in real time, without adding load to overworked legacy systems?** Payments cannot fail, so additional information must respect existing engines and processes.
2. **How to make better use of the data available through real-time standards and message formats?** Data needs to be made available in real time to customers and other systems within the bank.



3. **How to achieve this through incremental improvements, not rip and replace?** Business must continue as usual alongside an accelerated path to new value-added services based on real-time payments and information.

SOLUTION

1. Implementing an intelligent middleware layer built specifically for payments and mission-critical systems enables the orchestration, translation and transformation of payment messages (both financial and non-financial), to onboard or offboard data within a message flow without impacting existing processes and payment flows within the bank.

Banks need to be able to accept messages in any format and translate them to meet their internal needs, while returning messages back to the external ecosystem in the modern global standards. With a two-sided canonical model, banks can accept a data-rich message, extract and convert the salient information for their various internal systems, orchestrate those new simple messages out to internal systems, accept the return messages and convert them back to a data-rich format, or translate them into another simple message for another internal system.

E.g., ISO 20022 (data rich) >> 8583 or other (simple) << ISO 20022 (data rich)

These internal systems may include connections to back-end systems that are not yet digital, but the process must happen as a seamless, multitrack workflow.

2. Leveraging an orchestration layer built for Open APIs ensures the “always-on” nature of the real-time ecosystem. This layer creates real-time visibility and availability of payments information, both for current and predicted-future status.

The shift from batch to real-time must be realized across all data within the bank, not just payment messages. Open APIs can expose data to customerfacing systems for real-time consumption by other applications, such as treasury management tools in online customer portals, allowing banks to create value from real-time payments

information. Not only will customers be able to see where their payments are, they will be able to make business decisions based on the predicted clearing and settlement of the payment. Drive the move to digital payments by offering discounts for eCommerce purchases delivered by drone that can be same-day delivery to rural locations that are failed by the traditional postal network. Include loyalty rewards for non-cash transactions that support the drive to lower-cost digital payments.

3. Reducing hard coding and continual maintenance allows banks to speed time to market and accelerate innovation. Solutions based on configuration of an endpoint creation toolkit will allow for sustainable evolution of payment services.

The orchestration layer must include isolation capabilities to enable innovation that doesn't impact your core. This intelligent wrapper will bring together disparate systems and eventually evolve to a real-time transaction hub focused on reusable capabilities, enabling banks to move away from monolithic products for individual payment types. This reflects the convergence of payment types and customer needs that we see in the market. The real-time transaction hub is the way to bring together the old corporate banking and retail payments silos to serve their customers at a more personalized level.

CX OPTIMIZATION

Banks must orchestrate across more than payments to create a connected, smart bank. The real-time transaction hub leverages Open APIs that connect to all bank-owned systems to create an automated intelligence layer for clientcentric visibility. Banks can then begin to focus on what clients need rather than their own limitations of business silos or technology.

A true real-time bank is always-on and flexible, meaning these capabilities can be reapplied to augment services based on customer need. In the corporate world, this means mapping real-time payments information against new Big Data analytics technologies, such as machine learning and AI, to mine data across disparate systems and transactions.



New real-time liquidity insight means banks will also have better visibility. They can offer tailored services, such as “micro business loans,” that match information on incoming and outgoing payments, and potential charges for corporate customers. They can also proactively address liquidity gaps through bridging loans, giving customers better control over banking costs and improving the customer experience.

Owing to real-time payments, improved liquidity management services will flag available funds that can be paired with investment advice based on analysis of similar businesses’ history, segmented by vertical, industry, time period, etc. Banks can support corporates to make more effective decisions with their money, achieving competitive advantage, generating more profit for reinvestment and maintaining regulatory compliance in an ever-changing environment.

10 Know Your Customer Consent — Permission Controls for Open Banking Differentiation

CHALLENGE

Banks must avoid disintermediation from new payment initiation service providers (PISPs) and drive customer loyalty in the new open banking ecosystem.

CONSIDERATIONS

1. **How much do customers want to be known?** Customers don’t want to feel that banks are intruding upon their lives or becoming overly familiar with data insight.
2. **How do we bring customers on the journey?** Banks want to retain and grow customer relationships over the financial services lifecycle, so they need to establish themselves as trusted advisors.
3. **How can we consume data from internal sources, as well as expose bank data?** This must be controlled and secure to protect the customer, protect the bank and create services that leverage the complete customer view.

SOLUTION

1. Understand the cultural dynamics of the regions where you do business, as well as segmenting your customer base. Begin with an opt-in beta trial that allows customers to self-segment. Ensure new permissions controls are well signposted within banking applications and accompanied by clear educational material about the potential benefits of leveraging open banking permissions, as well as customer advice on protecting personal data.

Begin by creating a business case internally that speaks to key stakeholders:

- **Data officer:** Involve a stakeholder focused on consumer data to support the flow of independent data lakes into the orchestration layer
- **Head of digital channels:** Partner with digital to deploy new controls into mobile and web banking applications
- **Head of payments:** Leverage the head of payments as the lynchpin between the wider group, as well as the richer data available in modern payment standards

Begin with a proof of concept based around an opt-in beta testing group. Create an opt-in method for customers to choose what kinds of data they share and for what purpose, to comply with regulation such as General Data Protection Regulation (GDPR). The applications should include notification controls, as well as the option to restrict length of time of access. For customers to fully consent, they need to understand the implications of those permissions, so customer education materials and campaigns will be critical to the success of a beta trial.

2. Map customer desires to the potential services and offerings the bank could provide. Consider why customers use banking services: to save for a house, to care for their families, to travel, etc. This enables the bank to identify specific use cases where a trusted financial partner’s advice might be best received.



For example, young customers might look to be empowered with information before making their first large financial decision. Guide them towards information sources, both the bank's own and from independent organizations, as well as pushing offers for free face-to-face in-branch consulting.

The end goal is for the bank to be viewed as a trusted financial partner to encourage customer stickiness and drive upsell and cross-sell rates. Measure success via metrics such as the opt-in rate for data sharing, customer attrition levels and customer acquisition via evangelization from current customers.

Leverage APIs for both payments and nonpayments data, both internally and externally to expose and consume data. An API gateway can simplify the ongoing maintenance of the API library for exposure. To generate the APIs for internal connectivity and external exposure requires a strong data orchestration and management layer. This should be more than an enterprise service bus, as in a banking scenario many messages will be payments-related. A solution built for payments will maintain the non-functional requirements (NFRs) necessary for a two-sided canonical model.

Leverage existing solutions beyond their original purpose. For example, a fraud prevention and management solution may include tools for two-way customer

communication. These can be repurposed to deliver the financial services advice opted into by the customer. In fact, an advanced fraud prevention solution will leverage machine learning capabilities that could be repurposed to create models slanted towards CX.

CX OPTIMIZATION

Move towards proactive advice that pre-empts potential poor CX and works to counteract. For example, send an offer to move money from a savings account into a current account to avoid the customer being overdrawn and charged fees.

As the customer confidence grows and consumers opt into wider data sharing, begin to integrate data from external sources. These should improve the customer experience beyond pure financial services advice, as well as grow into other areas of the bank's business, such as merchant acquiring.

Transport network journey data generated when customers tap in and out using their contactless card or smart device. This could include route choices and usual travel times. Based on this known customer routine, geo location data, known spending patterns and merchant location information, banks could push offers and discounts for a "pick me up" after a delayed journey that can be redeemed at an in-station merchant.

11 | Virtually Universal Payments — Tokenization of Payment Instruments for Complete Customer Choice and Flexibility

CHALLENGE

Provide the customer with a full range of payment instruments without adding complexity to physical and virtual wallets.

CONSIDERATIONS

1. **How to offer customers all the ways they want to pay?**
Customers have to carry multiple debit cards, credit cards, store cards, travel cards and corporate cards in either

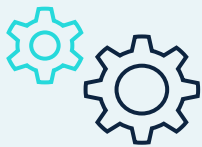
their physical or mobile wallets in order to meet all their payment needs. Not all cards are available in the format they prefer (e.g., contactless or mobile wallet of choice) and not all card schemes are accepted at all POS. But adding multiple schemes to one card is complex.

2. **How to meet customer experience demands?**
Customers like the security and CX benefits that come with credit cards, such as loyalty and rewards,



as well as purchase protection. These benefits are not accessible in all their payment instruments or formats.

3. **How to grow share of customer wallet?** The proliferation of payment instruments across physical and mobile wallets is diluting the customer relationship for account issuers, such as retail banks, driving up customer acquisition and retention costs.



A universal virtual card for all the customer's payment instruments of choice

SOLUTION

1. Create a universal virtual card (UVC) that serves as an umbrella for all the customer's payment instruments of choice. Ensure it runs on a major card scheme so that cards issued by smaller domestic or private networks can be used via the primary virtual card. Ensure the virtual card is available in all major mobile wallets, as well as in a physical form suited to local payment habits, such as, contactless. Consumers are at the stage where they want to leave the house with only their smartphone and carry all their ways to pay in simple format.

Ensure the UVC is a tokenized payments instrument linked to the issuer account, not a traditional card, so that it can make payments across all card and payment schemes.

2. Make the management of the UVC as seamless as possible, with new payment accounts and instruments linked to the UVC in the issuer's smartphone app. Include the option to "reroute" payments post-transaction based on customer preference.

After completing a transaction, a customer should be able to log into the app and select the back-end payments account or card from where they want to fund the transaction. This could be to ensure they don't go overdrawn, or to take advantage of special offers they may have otherwise missed.

Ensure the UVC is clearly branded to the primary issuers to grow customer brand recognition and loyalty, perceived value and overall customer relationship stickiness.

Ensure the UVC is integrated into the issuing bank's online banking channel to further embed the bank into the customer's complete payments experience. Leverage richer data on spending to offer competing products and reduce use of competitor products within the UVC.

CX OPTIMIZATION

Consider adding new payment types, such as real-time payments, into the UVC and developing push notification offers in combination with merchant acquiring customers to drive customer adoption of these. Support consumer customers to make informed decisions about the rewards and benefits of choosing to pay via specific payment types for specific transactions.

12

Smart POS — Seamless and Secure Payments for eCommerce Transactions

CHALLENGE

Dutch banks want to better serve the payments value chain for online purchases to drive consumer spending and enrich the end-customer relationship.

CONSIDERATIONS

1. **How to improve security and remove friction from eCommerce transactions?** Current CNP payment security options are inconsistent across merchants and do not provide a smooth CX for consumers.



2. **How to meet new regulatory requirements?** The Payment Services Directive 2 (PSD2) demands SCA, which has the potential to add further friction to the payments process.
3. **How to implement in line with merchant expectations?** Merchants are looking to embed the authentication process into their shopping experience, necessitating a feedback loop from the payments instrument issuer to the merchant “smart POS.”

SOLUTION

1. Leverage the most familiar and secure elements of the equivalent physical POS or mobile app experience for customers shopping online. A software POS, such as the Maestro offering, can be used to create a physical interaction with a smart device, such as tapping a debit card to a near-field communication (NFC)-enabled personal device for contactless purchases or combined with PIN entry.

Customers are already accustomed to tokenized payments on smart devices, such as mobile phones and wearables. Leveraging a tokenized card with the “smart POS” develops some level of consistency for the customer. For truly seamless payments, the app needs to be at a domestic level, not the bank level. The Dutch market has a strong heritage of interbank initiatives which drive payments modernization in country through non-competitive, consumer adoption programs. In this way, the banks retain the primary customer relationship and avoid disintermediation in the eCommerce environment via other wallets or mobile payment applications.

2. Utilize cardholder device card verification method (CDCVM) alongside the tokenized card and registered device details to satisfy SCA requirements of two-factor authentication. Most modern personal devices are equipped with biometric readers that can be used to identify the known user; fingerprints, face recognition, etc. In this way the card is the token, verified by the “smart POS” on the device itself.

This potentially creates a better customer experience than current CNP step-up authentication methods, which

vary by the combination of merchant, issuer and acquirer involved in the transaction.

Embed payments seamlessly into merchants’ own eCommerce experiences to drive consumer spending and reduce basket abandonment. Many current secure payment methods require the merchant to push the customer to an external authentication application which adds friction to the customer experience and can impact how customers perceive the security.

To embed the new secure payments experience into the shopping flow there needs to be a deep link created between the merchant application and the “smart POS” device application. This would enable the end-to-end payments and messaging flow. The merchant instigates the transaction and must be paid at the end. The consumer device seeks approval from issuer bank, so the request and approval messages must flow to and from the device. To simplify the integration and orchestration of the “smart POS” it should leverage industry standard APIs, in Europe this could be a PSD2 API. Connecting the merchant into the software application is critical to implementing the new way to pay in line with their CX strategy.

In order to achieve the level of security desired, modern data encryption standards must be implemented, such as the latest cryptography Data Encryption Standard (DES) and Triple Data Encryption Standard (3DES) to protect the stored data in the tokenized card or physical card in the NFC-based interaction.

CX OPTIMIZATION

The “smart POS” could be leveraged against any payments rail, depending on customer preference. Adding payment methods to a familiar experience drives towards a frictionless future. This could be adding instant payments as a payments option.

Creating the deep links between the merchant and bank applications would pave the way for simple real-time payments in eCommerce transactions. Merchants could further drive consumer spending by offering additional loyalty benefits to customers choosing to pay by instant payments.



13 | P2P Contactless Bank Transfers

CHALLENGE

Reduce use of cash for P2P and small business payments with smart-device-initiated real-time payments.

CONSIDERATIONS

1. **How to remove cash-related inefficiencies and risk for retail customers?** Cash is expensive for both consumer (withdrawal fees) and small businesses (fraud, loss, mistakes, deposit fees), but it does mean a real-time balance and instant liquidity for both parties.
2. **How to enable simple payment instruments?** Small businesses, individuals and independent artisans can't justify POS investment for infrequent transactions. They may only trade for a few hours a day during craft or flea markets.
3. **How to provide a cost-effective service for customers?** Adoption will depend upon ease of use, and associated fees (if any). The solution must look to drive value to the provider from transaction volumes as payers and payees are retail customers accustomed to cash.

SOLUTION

1. Enable a new credit transfer service over real-time payment rails to ensure real-time clearing of funds into a payee's account for an experience that is better than cash.

By removing the need for handling cash, independent sellers remove risk from the business. They often have no tools or experience for identifying fraudulent notes, and they may be operating in an unsecured location such as outside at a busy flea market. Enabling it via real-time payments solves the major problem small traders face: cash flow. Historically, they avoided card payments due to settlement delay, but with real-time payments, the funds are cleared into their account instantly, enabling them to pay out their business expenses. If they receive their payments in cash, then they will pay suppliers in cash, underutilizing their banking services. With a real-time payments service,

they also pass more of their earnings through their banking account, providing improved insight and float benefits for their banking provider.

It's likely to drive purchase conversions from end customers, as they can make spontaneous or larger purchases without needing to preempt these with cash withdrawals. In some economies, it's highly unlikely that potential customers will carry cash daily, so it's critical they can still transact with small merchants. Consumers also prefer to make these kinds of unplanned purchases via a method that allows them to keep easy track of their spending against their budget, a real-time balance is critical to accurate personal finance management.

2. Leverage new PSD2 and open banking regulations to enable payment initiation services via smart devices, linked to a mobile app. NFC-enabled devices are so common, that they are the obvious choice as the replacement physical element in the transaction process.

Investment in POS devices is not realistic for individual consumers, nor independent sellers whose business is just one of their income streams, and therefore they trade infrequently, or for limited time periods. More useful would be innovation to transform existing NFC-enabled devices into payment acquiring tools, as well as their current role as payment initiation instruments. This could be done with a mobile app that allows the payee to send a Request for Payment message based on proximity determined by NFC, or the payer could choose to push a payment to the payee from their mobile app to the next receiving device to come within NFC proximity. Both scenarios require no additional hardware.

3. Embed within the mobile banking app to ensure the service remains connected directly to the bank account, and is not a separate wallet provided by a PISP that dilutes the customer relationship.

Ensure the ability to send a Request for Payment is integrated into the bank's own mobile app to be the primary driver of transactions, and ensure ubiquity for



the customer for whom their banking provider does not offer capabilities. Take advantage of PSD2 and open banking rules to allow an account information inquiry message via NFC so that payments can be pushed from your service to those whose banks have not yet enabled for the service.

Direct account-to-account payments circumnavigate the card networks to increase margin for the payments recipient (in the case of independent traders), as well as negate the need to charge a fee for the payment type. Delivering this new service free of charge for customers

will drive new use cases and new transaction volumes over real-time rails, against an investment already made by the bank.

CX OPTIMIZATION

Work with existing smart device operating system manufactures to incorporate the flows into the native options of the device to negate the need to enter the mobile app for every transaction. Create a CX that is as simple as current cards-based mobile payments to traditional NFC-enabled POS devices.

14 | Seamless Public Payments — Moving Beyond Closed-Loop Cards for Enhanced Public Transport Experiences

CHALLENGE

Improve the CX for the public taking transport and the operating authorities through seamless payments integrated into back-office systems.

CONSIDERATIONS

1. **How to evolve the current ticketing system?** In cities where there is an existing digital ticketing infrastructure, the benefit and experience uplift must be enough to justify the business case and drive adoption. Solutions must work offline, to allow for subway trains and moving buses.
2. **How to improve operational effectiveness for the authorities?** Digital ticketing systems are designed to increase automation and decrease operating costs but must also improve passenger flows through the network and better passenger safety.
3. **How to implement invisible payments?** The exchange of prepaid closed-loop cards for open payment instruments must improve the customer experience, not impede it.

SOLUTION

1. Create a payments solution that leverages existing technologies within digital ticket readers that is also within payment instruments: NFC is already prevalent in contactless cards and mobile payments. This also simplifies the process of creating physical checking instruments for ticket inspectors.

By using the payments instrument directly, the operator can build rules to more effectively charge customers for variable tickets, such as season passes or opeak, and automatically charge the customer the optimum fare based on the route taken, time of journey and other known factors such as student or disabled person’s discount. The operator can automatically issue refunds or partial refunds based on “delay repay” policies, stripping excessive manual processes from the business. payments rails to ensure real-time.
2. Enable all types of payment instruments, all major card networks, mobile payments, even QR codes and users traveling from anywhere in the world can travel without needing to purchase a physical ticket. Operators can remove the need for ticket machines



and drastically reduce the number of staff needed to manage the purchase process, instead redeploying resources in areas that improve passenger safety and experience. They can also align the ticket purchase with an individual and work more effectively with transport and national police to protect the network from those banned from travel.

With this simplified payment process, previously disparate transport networks, such as trains and trams, can be more easily brought together to increase the number of transfers from one to another and create greater economies of scale for the operator with more end-to-end journeys.

3. Integrate payment instruments into customer-facing applications that allow them to extract “statements” regarding fares, routes and refunds, as well as manage the incomplete fare process, should a customer forget to “tap out.” Allow customers to register multiple payment instruments against a single account so they can easily use their method of preference. Ensure customers are educated on any restrictions regarding using multiple payment instruments within a single journey, e.g., switching between.

From a customer point of view, they no longer need to top-up a card or purchase a ticket to travel, smoothing the travel experience and providing more time for the

operators to cross-sell or upsell complementary services. This can range from merchant outlets in stations to push notifications on special offer upgrades to first class that can be purchased in-app or in carriage via contactless payments.

CX OPTIMIZATION

Use live transport network information about the busiest routes to promote discounts to customers based on switching their travel plans to a quieter route. In this way the operator can streamline the flow of passengers across the network and avoid delays and associated fines and refunds due to overcrowding.

Integrate new payment types, such as instant payments, that meet all customers’ desired ways to pay and improve fare margins for the operators.

Expose transport network data out to third parties via APIs to allow fintechs to create overlay propositions such as mapping and planning tools that help customers make the best possible travel plans based on time, cost, crowding and comfort factors. Improving the public transport network experience in this way will increase customer numbers and journeys per customer.

15 | Agile Automation

CHALLENGE

Share environments and processes for seamless automated code delivery to DevOps-ready banks.

CONSIDERATIONS

1. **How to remove manual interventions in code deliveries?** Current processes are slow and prone to human error, but modernization is hindered by governance and business operations.

2. **How to reduce testing complexity without increasing risk?** Testing cycles for updates and new capabilities need to map to risk mitigation strategies.
3. **How to drive innovation?** Current methods absorb resources that could be repurposed, increasing time to market.



SOLUTION

1. Implement alternative delivery mechanisms for software deliveries from vendors, creating a closer technical and process integration between vendor and bank development teams. Leverage proven technologies and processes based on current internal DevOps handoff points from a secure shared bitbucket repository. Require two-layer authentication of those who can access the repository, and manage banks in individual repositories.

Partner with the digital transformation team to align the processes with trusted third-party access strategies for open banking. This will ensure a consistent approach to integrating the bank with outside organizations for the consumption and exposure of data via APIs, governed by the overall platform strategy of the bank. Digital transformation teams are cross-functional with a mandate to improve the operational effectiveness of the bank; they can bring together other parties, such as legal or financial planning and analysis (FP&A), to prevent roadblocks to the technical integration. Legal and financial audit controls for software delivery have to be brought in line with the DevOps strategy. Developing a POC on the benefits via this cross-functional team is a strong way of driving towards a functional resolution.

By integrating with the bank's existing DevOps processes, the bank can reduce the effort associated with delivering critical compliance updates that do not create added value, particularly as many of these network or scheme specifications can be provided with short timelines.

2. Work with vendors to deliver technical frameworks for automation into a shared environment to streamline the testing process. Leverage GITs for version control to enable parties to exactly recreate the image of software at both ends of the process. Sync up on specific versions to exchange latest versions more transparently and with greater flexibility. Drive and control various test tools from a centralized point to create automated checks for fails in the merge, build and test commands.

A standardized template for open source testing environments (such as Jenkins) would originate from

the vendor utilizing underlying assumptions around the technology stack, testing tools, etc. This could be translated into scripts and updated against the bank's own configuration before testing. In this way, the bank only needs to manage the "personalization" of the scripts to their own environment, instead of duplicating the majority of the work contained in the underlying assumptions.

By restricting the tailoring of the template, the vendor can ensure that custom code does not break the standardized drops and updates, thereby protecting the automated testing processes of the bank. Simplification is an overarching aim for many banks, particularly for their software environments, but the reality is most have a hybrid environment where specific customizations have been added to the vendor's vanilla production code with the SDK.

Integrate branch code directly into the continuous integration and delivery (CI/CD) pipeline for testing to accelerate the process to production and optimize the time to market.

Banks that have already made significant investments in creating CI/CD pipelines need to drive further work into these channels to reap the rewards. Uplifting on solution versions is a key example: in traditional development processes, these projects can be risky from a time and cost perspective. Projects tended to run late and therefore over budget, eating into ROI projections. With automated delivery, the bank eliminates manual comparison and merging of files, manual deployment, etc. It becomes a matter of days to uplift and drive value along the entire value chain, with new solution capabilities translating into new services. This creates significant cost savings from maintenance of legacy systems, as well as improving time to market for overall ROI acceleration.

Resource and talent released from manual projects can be reapplied to delivering innovative new services to market, leveraging new solution capabilities. Their focus shifts to value-add projects that drive the bank forward ahead of the competitive curve.



CX OPTIMIZATION

The end goal for the bank is true digital transformation. In the development teams, this would realize itself as a standard solution in testing and production. The banks could pull through new code drops from general availability into production within a week via two sprints, and patch within a single sprint. This would mean new services could be delivered to customers far more quickly. The bank could begin to close the gap between customer feedback and service delivery, could be able to launch and AB test services against customer segments within months, and create a continuous feedback loop for optimization based on insights from the entire lifecycle of a service.

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