Gearing Up for the Internet of Payments

Made possible by the Internet of Things, a host of IP-instrumented devices and appliances are opening vast opportunities for banks to play a bigger role in the lives of their customers.
Executive Summary

Cars that pay tolls, thermostats that pay bills based on projected monthly usage, airline baggage tags that authorize payments for luggage allowances – while these capabilities might have seemed like science fiction not too long ago, the IoT is making them possible now. In doing so, it is giving rise to the Internet of Payments (IoP), embedding digital payments deeply into consumers’ daily lives via an assortment of wearable devices – watches, wellness monitors and augmented reality glasses – that are moving from mild curiosity to commonplace status. Combined with crypto-currencies, the IoP will also give life to micropayments, an idea that has kicked around for years but has yet to go mainstream due to the lack of an enabling technology.

Premised on consumers’ growing acceptance of digital payments, and a boom in connected device technology, the IoP is emerging as a force to be reckoned with. Consumers are now more willing to try devices that may be able to handle payments autonomously in the future. Research indicates that consumers are interested in devices such as connected security systems, smart thermostats, smart meters and smart cars.

Some banks have begun efforts to incorporate the IoP into their digital offerings. For banks, the IoP will create more digital touchpoints that will send back large amounts of data that can be analyzed for greater insights into consumer behavior. Adopting this approach – what we call Code Halo™ thinking1 – will enable banks to track changing customer preferences and create differentiated offerings.

The benefits of IoT will extend to improving other performance metrics, as well. Banks that have implemented machine-to-machine2 (M2M) solutions have experienced improved customer service and competitive advantage. For most banks, however, legacy systems impede efforts to upgrade to M2M technologies.

As banks face competition from nimble-footed non-bank businesses that benefit from fewer regulations and agile business models, a proactive approach to innovating in this area will boost incumbents’ competitiveness. A bigger threat to banks is emerging in the form of crypto-currency startups, whose solutions negate the need for a bank altogether. Crypto-currencies are ideally suited to online micropayments; in fact, a number of startups are developing coin-mining devices that can be embedded into Internet-enabled consumer products to make payments.

It is clear that banks must defend their turf in the payments arena. They need to devise a digitization strategy to scale their offerings to meet the consumer demand of the IoT era, while prioritizing data security and privacy. This means looking beyond the smartphone into the realm of machines that can communicate with one another and enable payments. To do this, banks will need to:

- Make the IoT central to their digital payments strategy.
- Create capabilities to incorporate new types of devices into the payments strategy.
- Improve their understanding of customer behavior using Code Halo thinking.
- Prioritize security and privacy.
- Partner with manufacturers of connected devices to create payment offerings.

The Future of Payments

The rise of the IoP is being fueled by the growth in connected things and consumer interest in a host of new applications, from fitness trackers and smartwatches, to IP-instrumented home appliances (see Figure 1, next page). The number of M2M connections, for example, is set to reach 18 billion by 2022 from 2 billion in 2011.3 Connected devices, meanwhile, will grow to 50 billion by 2020.4 On the consumer side, there is a notable uptake of connected devices – 33% of early adopters in the U.S. monitor their daily activity using connected fitness trackers; families in the U.S. and UK own an average of seven connected devices.5

Market followers believe the IoP will be the next stage in the evolution of digital payments. IoT-powered devices that can make payments promise greater convenience than ever before – for consumers as well as payees. Take the growing adoption of mobile payments. In-store mobile payment volumes are expected to surge in the next few years, growing at a CAGR of 154%.6 Mobile payments, of course, are part of the larger digital payments landscape, which will also be impacted by the IoP.
Micropayments Enabled by Crypto-Currencies

Micropayments (i.e., payments made in very small denominations), have been discussed for almost two decades but have had limited success on the Internet, due primarily to high transaction costs (typically 2% to 3%) applied by payments processors. Companies such as Apple have been able to make micro-transactions work (individual songs can be bought for anywhere between 69 cents to $1.29) but within the limits of their walled-garden ecosystems.

Yet, the forecast for micropayments growth is healthy. Pegged at $9.8 billion in 2013, micropayments are expected to reach $13 billion over the next three years. As crypto-currencies gain greater acceptance, companies are working to bring them into the mainstream by incorporating them into digital wallets. This trend points to the possibility of micropayments using crypto-currencies.

The digital nature of crypto-currencies such as Bitcoin allows transactions to occur in exceptionally tiny fractions, starting from a few cents. Moreover, these transactions are validated and recorded on a public ledger.
known as the blockchain. Although challenges with blockchain are still being overcome, the technology is designed to enable fast, secure and cheap transactions by decentralizing the ledger of transactions across user computers, eliminating the need for a centralized accounting system. A startup called BlockCypher recently created an API that enables users to make small payments in Bitcoins. ZipChain, a social network for Bitcoin users, has created an in-house tipping system that allows members to tip the website, thereby generating revenue.

A system like this could transform the way people consume media online and enable content creators to receive payment directly on a pay-per-use basis. Newspapers, which have been struggling to generate revenue on the Internet, for example, would be able to accept Bitcoin payments for each article at the click of a button. An early, albeit crude, example of this is the Chicago Sun-Times, which recently began accepting annual subscription fees in Bitcoins. Crypto-currency micropayments made on the site are then converted to dollars by Coinbase, a Bitcoin transaction processing company.

By taking payments directly from the user, such a system could also reduce content websites’ dependence on ad-based revenue.

Crypto-currency-based micropayments are also likely to play a major role in the payments landscape by allowing machines to autonomously perform small payments; an example is cars that could communicate with parking garages to identify the best option in terms of price and availability. This could be a harbinger for banks, whose role in such transactions today is almost non-existent.

Blockchain Challenges
As blockchains and crypto-currencies evolve, industry participants need to be aware of the challenges that need to be overcome before these technologies are fully embraced:

- **Scalability:** Transaction volume remains constrained compared with conventional payment networks.

- **Float management:** Since blockchains function as pre-paid stored value rather than credit cards, money management can be problematic for some users.

- **Ecosystem biases:** Because blockchains operate as loosely confederated communities without regulatory scrutiny, participants can be subject to discriminatory or exclusionary behavior.

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**IoT Can Help Banks Improve Key Metrics**

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<th>Expected Benefits</th>
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<td><strong>Expected Benefits</strong></td>
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<td>The top expected benefit for banks planning to implement M2M solutions is improved customer service, based on the experience of early adopters that are already realizing benefits.</td>
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<td><img src="sun.png" alt="Sun" /> 85% Improving customer service</td>
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<td><img src="sun.png" alt="Sun" /> 61% Improving customer retention</td>
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<td><img src="sun.png" alt="Sun" /> 57% Extending services beyond branch locations</td>
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<td><img src="sun.png" alt="Sun" /> 57% Reducing costs/ improving profits</td>
<td><img src="sun.png" alt="Sun" /> 64% Competitive advantage</td>
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*Source: Verizon, 2014 Figure 2*
Banks vs. Non-Banks

Many traditional banks are beginning to test the waters of digital payments. As adoption of M2M technologies grows in consumer-facing industries, such as automotive, retail and consumer electronics, for example, banks are taking interest. A study by Verizon found that banks that have implemented M2M have experienced benefits in areas such as improved customer service, as they can extend services beyond branch locations for competitive advantage (see Figure 2). In fact, some leading U.S. institutions have begun to offer services that complement the adoption of M2M technologies.

- Wells Fargo, for example, is testing a connected car concept that will address the needs of 30% of its customers who prefer drive-through banking.

- Wells Fargo and Chase are testing beacon technologies that alert tellers when a particular customer is approaching, enabling them to bypass basic questions.

- Citibank is reaching out to developers and hackers to invite ideas for applications built around the IoT.

- Banks will be helped in these types of efforts by Intel, which has partnered with Ingenico to create tablets that allow secure payments in the IoT space, thereby reducing the risk of credit card fraud.

Banks are also testing offerings built around wearables and biometric technologies that can authenticate customers before they make a payment and enable them to perform hands-free mobile banking.

Beacon technology will allow banks to further personalize the banking experience by enabling location-based offerings based on a customer’s shopping behavior. Innovations in this area will allow banks to play a bigger role in the daily lives of their customers.

For most banks, however, legacy infrastructure is a major barrier to scaling up their systems to meet the requirements of M2M technologies.

Meanwhile, the largely digitized operations of emerging non-bank competitors allow for faster innovation of M2M-enabled services that simplify more aspects of a customer’s daily spending routine. An example is Amazon’s Wi-Fi-enabled Dash buttons, which can be configured to order specific products from Amazon, with payment made through the user’s chosen online mode. While human intervention is still required, this approach offers a glimpse of how IoP could work.

Retailers such as Walmart have influenced customers to open very low-cost checking accounts in partnership with Green Dot Bank, which offers a $2.95 starter kit to open an account online. In the future, this could enable Walmart, an early adopter of IoT, to create an ecosystem of highly personalized offerings that could obviate the need for a traditional bank checking account.

Innovations around crypto-currencies could be even more disruptive for banks. 21 Inc., a San Francisco-based start-up, has created a Bitcoin miner, BitShare, which can be embedded into any Internet-enabled device to generate Bitcoins by itself and allow device-level authentication. BitShare would allow the Internet-connected device to share portions of mined currency between the user, the retailer, the hardware manufacturer and the carrier. In such a scenario, a bank is completely shut out from the transaction.

Most banks seem to have adopted a wait-and-watch approach toward crypto-currencies, although some are experimenting with blockchain technology for improving data security. Given the possibilities of this technology, it is imperative for banks to closely monitor the unfolding IoP-led future, with strategies that proactively address the threats and challenges of crypto-currencies.

Preparing for the IoP Era

As banks work to retain their payments stronghold, those with a well-defined digitization strategy will ultimately be able to incorporate IoT into their payment offerings, which will also impact other customer-facing bank activities, such as advisory services and branch banking. In this context, payment digitization must extend beyond mobiles and wearables to all the possible touchpoints enabled by consumer adoption of the IoT. Together, these devices/sensors will generate massive caches of data that can help banks further improve the user experience.
To this end, Code Halos will play a critical role in enabling banks to develop a holistic view of customer behavior. The combination of advanced analytics, big data and cloud computing with IoT allows banks to create unique profiles of their customers based on their personal Code Halos. Banks are positioned to generate deep insights from the troves of data in their possession to create a compelling omnichannel banking experience. At the same time, it will be crucial to ensure the security and privacy of customer data. When banks collaborate with device manufacturers, retailers, network providers and intermediaries that handle data, they will need precision data-sharing agreements that ensure curated experiences that respect customer privacy and security.

We offer the following recommendations for banks that are developing an IoP strategy:

- **Digitization** is at the core of IoP, and banks’ digitization initiatives should factor in IoP to help them gear up for the future. Systems must be in place to enhance data management and big data analytics capabilities, aided by cloud computing. The ability to collect and analyze data in real time will allow banks to differentiate themselves with location-based, personalized advice or an analytics-based rewards program.

- **Partnerships** are a key component of an IoP strategy, whether with device makers, retailers or third-party app developers. Banks need to identify and partner with players whose products add value to their own offerings. This will improve customer retention and, more importantly, help ward off non-bank competitive threats.

- **Payments infrastructure** should be continually scaled up as new devices and sensor types are added to the mix.

- **Security** is a key concern for consumers when it comes to digital payments. With more devices added per consumer, closing today’s loopholes and anticipating tomorrow’s will be crucial for banks seeking to regain and/or retain customer trust.

- **Embed Code Halo thinking** to derive insights from combing traditional and new sources of data, such as connected devices. Such insights will enable banks to innovate across all lines of their business, maximize operational efficiencies and enhance the customer experience.

**Footnotes**


2. M2M technologies allow wired and wireless systems to communicate with other devices of the same type. M2M provides the capabilities upon which the IoT is built.


10 PayPal defines a micropayment as a payment less than £5/$7.6.


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