

Modernizing Payments

Keep pace with commercial demand and regulatory requirements for real-time payments with smart data center investment



In the UK, the Faster Payments Scheme enables person-to-person transfer of funds in 30 seconds. In some countries, the process can still take days.

Industry Strategic Challenges

In today's commercial and financial worlds, patience is short. Customers want instant gratification and expect basic daily tasks, like making an online purchase, to 'just happen'. Internet-based disruptors are pushing up the pace of innovation and challenging established players to keep up. Meanwhile, regulations such as the revised Payment Services Directive (PSD2) in the EU are opening up the market to third-party payment companies and creating more competition. They also require banks to provide broader access to their data. A natural consequence of many of these changes is a shift towards greater protection of data, and a stronger demand for real-time payment capabilities.

For many, this is a difficult challenge because existing processes and IT infrastructures are not built to provide the performance, scalability or flexibility needed to carry out real-time processing and analytics on today's high volume of transaction data.

However, by taking a holistic approach to data center modernization and making smart investments in technologies that will support future growth, banks can turn PSD2 from a compliance challenge into a catalyst for business growth.

A widespread push for faster transactions

In today's commercial landscape, we are witnessing a shift towards the real-time processing of payments. Beyond the natural evolution of payments technologies, this change is driven by a number of factors.

Firstly, consumers have come to expect instant gratification of their needs, thanks to the ubiquitous availability of the Internet and the ubiquity of smartphones and other connected devices. This expectation is likely to become stronger as the millennial generation, with its intolerance of slow or 'old fashioned' service models, comes to play a more significant role in the economy.

At the same time, modern eCommerce business models and supply chain processes can only reach their full potential when real-time payment is possible. For example, online retailers are now able to deliver goods within one day – in some cases on the same day – of the order being placed. Unfortunately, the financial supply chain has not reached the same speed for the digital delivery of funds. While the process of debiting one bank account and crediting another might, in the eyes of the consumer or small business, seem to be a fairly straightforward one, it often takes significantly longer than the physical movement of goods.

Regulations, particularly the EU's PSD2, are also emerging to improve consumer protection and increase competition and innovation in payments. PSD2 seeks to do this by introducing stricter security requirements for the initiation and processing of electronic payments, and the protection of customers' financial data. One

element of this is the requirement for real-time payments in order to enable additional protective measures such as real-time fraud detection and anti-money laundering.

Whilst PSD2 is a European initiative, it will impact the banking industry globally. Elsewhere around the world, there are various initiatives afoot which could have similar impact. The USA is evaluating proposals, with a pilot expected in late 2016. NACHA is mandating same-day automated clearing house (ACH) payments. The Federal Reserve Bank has launched the Faster Payments Task Force, which is engaging a diverse array of stakeholders in advancing the work outlined in [Strategies for Improving the U.S. Payment System](#). Canada, and a number of other countries globally, are also committed to real-time payments.

It is this current and impending regulatory pressure which makes the need to address real-time payments an urgent priority for banks. Compliance is compulsory, but financial organizations are also challenged to ensure that they are still adding value for customers and staying competitive as they implement their real-time payments systems. This may be a particularly difficult proposition for more established organizations, which are being pressured by internet-based challengers and disintermediators.

Balancing business imperatives and IT challenges to drive real-time payment innovation

Implementing an immediate payments capability will have wide-ranging impact across a bank's operations, so it is essential to approach the challenge holistically. This is complicated by the fact that many banks' systems are decades old. Many operations are run as inefficient batch jobs and the applications they use may be written in old programming languages, where the original authors are long gone, making it hard to implement or test modifications. There are well-publicized cases of ATM network outages, for example, which were not related to the resilience or reliability of any hardware, but due to being introduced into ageing applications.

The first thing a bank needs to do in starting its journey to real-time payments is assess its own technological real estate. Most financial organizations have extensive legacy systems that are siloed by line of business, geography, or both. This makes it impossible to form a holistic view of the customer, which is critical for supporting real-time payments. Centralizing all systems and data into one unified view of truth is essential.

Processes may also need to be modernized. Many existing practices are incompatible with the real-time payments model, such as overnight batch processing of transactions. While this is common practice today, and often the only way a bank's data center resources can cope with the volumes of data generated every day, they create an unacceptable delay from the perspective of real-time payments. In-memory processing is essential in order to enable large volumes of transaction data to be processed quickly.

In addition to getting their data centers in order for their own use, banks must also consider the implications of the PSD2 requirement for them to open up customer account data to third-party providers (TPPs). The regulation does not specify exactly how this should be done, and debate continues about whether established banks should make their data available

through the cloud, or through on-premise application programming interface (API) access for TPPs.

Wherever they hold their data, it will continue to grow both in volume and complexity. New financial products will emerge with new payment message types. These new message types are likely to be considerably larger and more data-rich than those used today. For example, Single Euro Payment Area (SEPA) messages are around four times the size of older types. This creates more potential for faster and deeper analysis of risk exposure and customer insight, but this will only be possible with strong data center performance and analytic capabilities in place.

Another significant consideration for PSD2-affected banks is security. Opening up customer account data to TPPs presents challenges around user identification and authentication, and will also increase banks' exposure to risk. They will have to ensure stringent user authentication measures are in place, but again these are not specifically defined in the PSD2 guidelines. It has yet to be confirmed where the responsibility for risk lies in this scenario – with the bank or the TPP. Either way, banks should look to their data center security and encryption capabilities to ensure their, and their customers', data is protected.

As many of the challenger banks flooding the industry now are internet-based, most of these challenges will mainly be experienced by established banks whose payments systems are ageing and for whom it will be more difficult to implement these changes. Choosing the right technologies is, therefore, critical.

Considerations for an integrated solution

When implementing a real-time payments solution, it is worth considering the end-to-end environment and how the three major domains work together, as outlined in Fig 3 of SWIFT's [Guidelines for the Next Generation of Real-Time Retail Payments Systems](#).

Core and Value-Added Services

Payment Core Services are fundamental to any retail bank, and include processing credit transfers, debits, and check clearing. In many cases, these services have existed for decades, are written in old programming languages, and running in environments that are simply not suited for the demands of real-time operations.

Alongside delivering these core services, banks now need to build out value-added services. This is partly driven by the regulatory requirement to implement services to monitor for fraud and other types of financial crime. Another driver is banks' desires to deepen their customer insight so they can better retain existing customers and attract new ones.

These requirements in turn drive the need to consider new database technologies. Those payment systems that have been in place for decades have traditionally relied on transactional databases. These may still work for transaction processing, but are not fit for the types of analytical processing required for financial crime and customer insight analytics, or archiving. Independent solution vendors who are building payment and core banking solutions are now moving towards a database layer that may use more than one database technology so that different functional requirements may be addressed.

Application integration is also a consideration. It is essential to integrate both existing core services and new value-added services into other applications, but this can be challenging with old application environments that do not benefit from architectures with APIs available for such integration.

Payment Sources

Payment sources include in-bank or high-street ATMs and kiosks, internet banking and online retailers, mobile device banking (for instance, smartphones or mobile wallets) and in-retailer Point of Sales (PoS) devices.

Payments Schemes

According to the [European Central Bank](#), a clearing system is “a set of rules and procedures whereby financial institutions present and exchange data and/or documents relating to the transfer of funds or securities to other financial

institutions at a single location (e.g. a clearing house).” It defines a settlement system as “a system used to facilitate the settlement or transfer of funds, assets or financial instruments”.

The mechanisms for clearing and settlement, and the organizations that perform these actions, vary considerably from geography to geography, and they can be complex. Just as real-time payments are rising up the agenda for many, real-time gross settlement (RTGS) is also a priority, as part of modernization of settlement systems initiatives. RTGS is the transfer of money (or securities) from one bank to another on a ‘real time’ and ‘gross’ basis. This means that transactions are not subjected to any waiting period, and they are settled as soon as they are processed. ‘Gross settlement’ means the transaction is settled on a one-to-one basis rather than bundling or netting out with other transactions.

Solution: Real-Time Payments

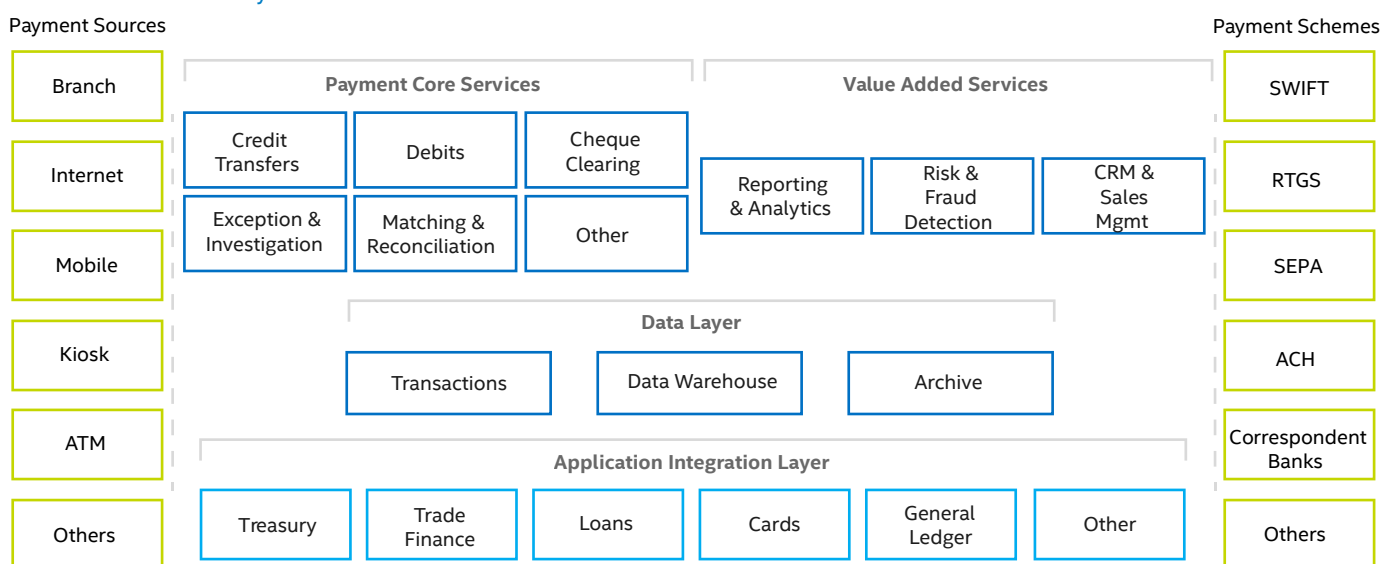


Figure 1. Suggested Real-Time Payments Solution

Build with an expert ecosystem

Constantly evolving business environments within the digital and transitioning-to-digital world, require complex solution architectures. These are comprised of application layers that contain business functions and are built on software infrastructure layers for databases, integration and messaging, which in turn are built on, integrated with and optimized for hardware technologies. An example is outlined in Figure 1.

Intel has a long history of engaging with software providers, cloud service providers and other members of the technology ecosystem that deliver solutions to the financial services industry. These players, including FIS, Infosys, Misys, TCS and Temenos, all take advantage of Intel® technologies for compute, memory, storage and networking, such as Intel® Xeon® processors E5 and E7 families for strong computing performance, scalability and reliability as well as distributed computing environments.

Intel® Solid State Drives (Intel® SSD) with Non-volatile Memory Express (NVMe) provide for complex and real-time analytics operation, whilst Intel networking products support

cloud-ready, open standards environments that support fast, connected business and innovation.

Cloud Services Providers (CSPs) such as Azure, Amazon Web Services, Google, and HP Helion are all based on Intel. Intel works closely with CSPs to enable the deployment of the very latest Intel technology for processing, memory and networking fabric within their service offerings. It also supports advanced big data management and analytics on Hadoop through its collaboration with Cloudera.

Banking solutions based on Intel can take advantage of that technology, whether it be on-premise in the bank’s data center, off-premise in a cloud, or in a hybrid cloud model. Moreover, by running on Intel, the migration from on-premise to off-premise becomes a more seamless and secure operation.

As well as providing leading edge technology to the industry, Intel also drives open standards, participating in many of the open standards bodies in the industry, particularly around software defined infrastructures.

Beyond PSD2 – The Potential of Real-Time Payments

Once in place, banks and the players in their ecosystem can use their real-time payments capabilities for more than just PSD2 compliance. For example:

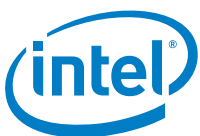
- **Automatic Price Comparison Engine:** A third-party provider (TPP) may choose to offer a service where it monitors customers' utility bill payments in real-time, against all the current tariffs offered by utilities providers, and automatically alerts the customer when they could switch to a better rate.
- **SME Cash Manager:** SMEs operating in multiple countries currently need to transfer cash from one branch to another using their bank's headquarters. A TPP could collect and analyze all transaction data in real-time and use a prediction algorithm to more accurately forecast where and when cash will be required next.

Conclusion

Banks are under pressure to modernize their payment systems. That pressure is coming from four directions:

- Demand from consumers for instant gratification and service at the speed of light
- The need to support eCommerce models that can't work without instant payment. The goods supply chain is accelerating, and the finance supply chain must catch up
- Legislation in the form of PSD2 in the EU, and others to come globally. PSD2 mandates that established banks open up their systems so that TPPs can access customer data. There will be new message types and richer data sets. Banks must use the data they have to innovate and grow their business, but many struggle to centralize and manage data effectively
- Competitive threats from challenger banks and disintermediators

Banks must act. If they do not have digital transformation projects underway already, then now is the time to start those conversations.



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