



Real-time payments processing

Reshaping the payments industry landscape

“I predict the next decade will bring more change in mainstream institutions than we have seen in the past decade or two. I think many of those changes will be in payments.”

– Jeffrey Neubert, President and CEO, New York Clearing House

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Executive summary

24 hours: the time it takes for planet Earth to complete its 40,000-kilometre rotation and the time it takes most banks to complete the processing of a payment.

In a rapidly evolving business world there may be some people who want to increase the number of hours in a day, but many more believe 24 hours is far too long for payment processing. Why, how and when banks can reduce the time it takes is the focus of this report.

For several decades, banks in most developed countries have processed payments using virtually the same batch technologies and methodologies they have used since mainframe computers were introduced.

But as banks cope with more stringent regulation, they also face a changing business environment increasingly fixated on competition, innovation and immediacy. All of this has put pressure on financial institutions to embrace real-time payments processing.

Real-time payments processing moves a bank from overnight batch processing to automatically transferring payments as they are keyed into the system – a workflow process that brings electronic payments into synch with the rest of the world's computerised business activities.

Banks have been reluctant to change because of the proven safety and reliability of the traditional systems they use in the day-to-day execution of core payments activity. However, there are now modern standards-based software systems that can provide banks with the stable and reliable technology they need to support a safe and orderly upgrade to real-time payments processing.

“Existing payment systems that have long met the needs of an earlier generation of financial services users are now increasingly expensive to maintain and isolated from mainstream advances in technology.”

– Financial Services Technology Consortium (FSTC)

The importance of payments

Banks are the arteries of society's financial body. They play a crucial role in the health and wellbeing of an efficient economy and contemporary society. No aspect of this role is more important than the payments system, because a safe and reliable payments system is essential to the day-to-day operations of any reputable financial institution and financial markets around the world.

However the role of banks is changing and this new century has seen unprecedented demand for transformation within the sector. Thanks to ubiquitous information on the internet, consumers have never been better informed nor more demanding about what they need and want from banks. They are more sophisticated in their buying habits and more demanding of services and products that fit their specific financial needs and schedules.

For banks, new business pressures are coming from all directions: regulation, non-banking institutions providing similar products and services, and the increasing number of foreign banks entering domestic markets. Evolution within the banking system itself – the ongoing increase in the volume of payments, the convergence of payments types and the increasing rate of change of payments requirements – is also creating pressure for change.

To effectively accommodate all these demands and stay abreast or ahead of competitors, the batch-processing methodology most banks still use to process time-critical payments must change. Taking 24 hours to process these payments is no longer acceptable in today's ultra-competitive 'now' business environment.

To stay in the game in any meaningful way, banks must embrace real-time payments processing.

“There is a compelling case for banks to grow their payments businesses with serious intent. In the US, the UK and Australia, payments revenues account for 25 to 35 per cent of total bank revenues. But the importance of these payments is typically hidden by the banks' accounting methods. For example only 30 per cent of banks bother to track the profitability of their payments business.”

– David Morgan, CEO, Westpac, October 2006

What is real-time payments processing?

In practical terms, real-time payments processing is about processing bank payments as they happen rather than many hours later, as most banks do today. In strategic terms, it is about moving with customers to meet their growing demands and changing regulatory requirements.

Since the 1970s, bank payments processing has been carried out in much the same way. Banks use batch-processing hardware and software, which is supported by a back-office infrastructure geared to match this delayed methodology. During the day, payments information accumulates in bulk in data silos where it remains largely dormant until it is processed in batches 12 to 24 hours later.

Real-time payments processing removes the waiting period before payments information is processed and available for analysis. It provides always-on online authentication, switching and authorisation of electronic payment transactions. And because it runs in real time, it provides a continuous view of all payments activities.

The challenge for such real-time solutions is that the software intelligence at the core of these new payment processing systems must provide the highest levels of performance, availability, reliability and disaster recovery capabilities. These are essential elements within such a mission critical environment.

Type	Volume	Value (per transaction)	Description/Usage
Mobile Commerce	High	Low (stored) value	Where value is transferred (cleared) from another mechanism in real-time and left for individual (per transaction) distribution. Replacing coins and cash, used for ticketing, tolls, fares etc. Technically not real-time but allows for 'gross value' to be made available to real-time redemption (payment).
Retail Payments	High	Low-mid	ATM/POS where clearing (i.e. has the funds taken from account and held for settlement into merchant account) happens in real-time, typically card based. Replacing checks/cheques.
Consumer / Corporate Direct Payments	Mid-high	Mid	Allows real-time inter- and intra-bank funds transfer. Faster payments is an example here. Replacing traditional bank transfers which are batch (overnight or several day) clearing cycle.
Real Time Gross Settlements	Low	Mid-high	Banks settling with one another in real-time over the course of the day trading e.g. Fedwire (US), CHAPS (UK), RITS (Australia).

Drivers of real-time payments processing

Real-time payments processing technology can help banks address a range of commercial pressures, including:

- **The need for increased visibility.** Central banks such as the Reserve Bank of Australia are instituting regulatory changes in an ongoing effort to make payments processes more transparent. Regulators are also particularly looking for improved risk management in relation to liquidity and fraud. The existing batch-processing systems that most of the world's Tier One banks use provide only limited insight into payments and have especially poor visibility of individual payments as they occur. As a result, a bank's ability to respond to a particular payment is severely reduced until batch processing is completed. In a global sense, banks are not completely aware of what is happening within their payments division until 24 hours after the event – a position that customers, regulators and even other financial institutions are now finding unacceptable.
- **Changing regulations.** History shows that whenever the private sector fails to regulate itself properly, public pressure forces governments to regulate the system. This is what happened in the United Kingdom banking sector recently when regulators responded to the persistent demand from consumer bodies and corporate customers to reduce the three-day delay before certain types of payments cleared to their accounts. The UK Office of Fair Trading agreed and the banking sector has been forced to introduce a faster payments scheme. The service is designed to introduce near real-time transfer of phone, internet and standing-order payments instructions from mid-2008.
- **New competitors.** Payments, once regarded the sole province of banks, have in recent years witnessed the entrance of new competitors. Major retailers, third-party processors and non-traditional players such as telecommunications companies, online auctioneers and micropayment merchants are encroaching on banks' traditional trading territories as they seek ways to break into the payment value chain. These new players are better placed to adopt innovative technologies – such as real-time payments processing – to introduce new and more competitive products and services.
- **Cost.** Pressure to reduce costs is nothing new, but as decades-old mainframe computer systems reach or exceed their use-by dates and maintenance costs – further fuelled by the rarity of the required legacy skills – spiral upwards, banking institutions have been forced to look closely at reliable, cost-effective ways to replace them.
- **Fraud and money laundering.** Criminals or potential terrorists can benefit from the delayed batch processing of payments. To be more effective, authorities need to know what is happening to money as it happens. But stop-start computer systems can take up to 24 hours to inform operators and authorities of suspicious financial activities. Tracking and preventing criminal activity such as fraud and money laundering requires real-time payments processing facilitated by technology that can provide real-time alerts, information and response.

Why the industry has maintained the status quo

To any observer outside of banking, this delayed computer processing of payments is nothing but an odd anachronism. In historical terms it is an electronic replication of retail banking in the pre-computer age; an era when payments records accumulated during the working day had to be sifted and sorted after the bank's doors closed.

Even within banking circles, few doubt that real-time payments processing will eventually become a normal part of the international fiscal landscape. When that happens, it will harmonise the processing operations of banks with the rest of the business world. Banks have resisted moving to real-time payments for a number of sound reasons. However, changes in technology and the competitive landscape have made many of these reasons sound more like excuses.

If it ain't broke ...

Mainframe computers are the steam engines of the computer world, in their sturdy reliability and technological longevity. The technology supporting much of the world's payments processing systems has served the world's Tier One banks well. For more than 20 years, these early generation batch-processing workhorses have been switching high volumes of payment transactions at a reasonably high rate. They were designed for – and have delivered – impressive reliability and minimum downtime.

Outside of financial institutions, businesspeople are usually surprised to learn that virtually all the world's Tier One banks are still clinging to their original traditional systems run on mainframes. The software intelligence driving mainframe systems is mostly written in arcane programming languages that are as old as the computers themselves. Servicing and maintaining them today is as much art as it is science and finding staff with the required skills is becoming increasingly difficult and costly.

Operational benefits of delayed processing

The delay built into a batch-processing payments regime provides banks and other financial institutions the time they would not otherwise have to maintain these complex data processing systems.

These days, very few computer processing systems enjoy the operational luxury of downtime for system maintenance allowed by the delayed processing cycle. And banks that have already moved to real-time processing have found that in the final analysis, the benefits clearly outweigh the loss of this operational extravagance.

“The banking system should no longer have an interest-free float while certain electronic payments are cleared: customers should receive relevant interest. And there should be greater clarity for customers about clearing times for payments and receipts of funds.”

**– UK Office of Fair Trading,
February 2004**

Reluctance to change

Implementing real-time payments processing will inevitably involve retraining, retooling or replacing the elements that make up an entire payments processing system. These include traditional computer systems, software, business systems and, to some extent, personnel.

However, the transition from batch processing to real-time payments processing need not involve replacing a bank's entire mainframe computer system with new hardware and software. In fact, most of the bank's existing hardware can remain in place if it is in good operational condition. The new infrastructure required to implement real-time payments processing is introduced incrementally and is a relatively minor addition to the overall project.

The profit motive

A delayed processing system also provides financial institutions with a source of revenue, the float, which means the profit motive is another consideration that encourages banks to preserve the status quo. In the US, the float for paper cheques is between two and five days, which banks use to verify the legitimacy of a cheque. In the meantime, the bank or credit union earns interest on dormant cheques. According to a US Federal Reserve Board study, the overnight interest rate for cheques cleared in that country in 1995 averaged about 16 cents per cheque, representing a total of US\$11.7 billion in income for cheque issuers.

Most people in the banking sector realise it is only a matter of time before regulators call a halt to the banks' time-honoured practice of earning interest from other people's money. The UK Office of Fair Trading, for one, believes banks' current behaviour is unfair and should be stopped.

"The transition from batch processing to real-time payments processing need not involve replacing a bank's entire mainframe computer system."

The payments processing platform

A critical element of a modern real-time payments processing environment is the proven technology platform upon which it is built, supported by powerful automated system recovery technology.

In simple terms, real-time payments processing systems handle payments as effectively and efficiently as existing delayed-payments environments. The only difference is, transactions are processed as they are received using a steady-stream processing methodology, rather than the traditional all-at-once batch system.

Real-time processing opens new avenues for research and analysis of system performance. The system can provide live message, transaction, and network management logs and comprehensive real-time, derived and historical metrics and reporting.

It also gives banks the opportunity to react quickly to events using automated processes. As an example, if an ATM captures a credit card, the system can immediately alert the cardholder by SMS, mobile phone or email that a new card will be delivered as soon as possible and that emergency cash facilities are available at the nearest branch.

By its nature, steady-stream processing reduces system stress and increases system capacity. Today's real-time processing software amplifies these natural attributes to produce a fault-tolerant platform of unparalleled stability, capacity and performance. Following are some of elements that make this technology platform unique:

- **Industry-standard software.** The use of modern industry-standard databases and languages such as Java, SQL and XML allow for the safe storage of real-time and configuration data and easier integration with other enterprise systems and data warehousing facilities.
 - **Fail-safe operation.** This system provides fail-safe fault tolerance throughout, delivering higher levels of performance, reliability and availability than is possible with traditional payments processing platforms. Processing is distributed across all available hardware resources, which allows individual components to be upgraded or replaced without bringing down the system.
 - **Accurate reconciliation.** Real-time payments processing systems guarantee that banks' reconciliation and totals positions are always accurate by using the powerful transactional semantics available in modern relational database systems. Live totals for interchange liabilities are also available to allow for accurate intra-day reconciliation.
 - **Regulatory reporting.** Almost any part of a transaction or the runtime context is available for capture and logging as part of normal system operation. This significantly simplifies the task of extending data capture and reporting to meet regulatory requirements.
- **Choice of hardware.** While traditional processing systems rely exclusively on proprietary hardware, real-time payments processing can operate reliably on a range of cost-effective hardware platforms, from commodity and midrange Unix systems to enterprise-class data centres.

Business benefits

The move to real-time payments processing presents a wide range of business benefits for financial institutions.

Increase flexibility and reduce time to market

The use of modern programming languages and component-based architectures in real-time payments processing systems provides the flexibility to easily adapt and rewrite software as regulatory requirements change.

Improve profitability

Running open standards-based systems on modern hardware offers a significant potential for cost saving, which may help to offset the loss of a bank's interest-bearing float. Modern, standards-based systems can help retail bankers meet their business objectives: greater product or service accessibility, customer convenience, better targeted products and services and increased customer wallet share and profit margins.

Leverage real-time intelligence

Once real-time payments processing is implemented, data can be continuously cascaded off from the processing flow and stored in the system's purpose-built data warehouse. From within this intelligent storage environment, near real-time data can be mined and manipulated in myriad ways. The modern language used with real-time systems allows banks to generate a wealth of reporting material, tailor-made to meet the needs of decision makers.

Respond to fraud at the source

Banks can set alerts and alarms to signal unusual or illegal payments activity. They gain the ability to examine, in real time, transactions that fall outside normal parameters and might be fraudulent. Capturing such information as it happens will enable banks to suspend activity until further investigation is carried out, potentially stopping fraud in its tracks.

Deliver personalised customer service

Live monitoring of customer activity and purchasing patterns, made possible by a real-time payments processing system, helps customer relationship management processes more effectively serve banks and their customers. For instance, marketing campaigns can be personalised, linked to individual merchants and offered on the spot at ATMs, at checkouts or online. Internet banking services and ATMs can display tailored customer-service messages.

Enable delivery against payment

Real-time payments facilitate transactions that require cleared funds before goods are delivered or released – as in property and motor vehicle purchases and clearing goods from bond. Banks can confirm delivery of funds by issuing a receipt – a much simpler process than that of obtaining bank cheques or securing guarantees.

Conclusion

The time is right to contemplate the benefits of an orderly transition to a standards-based, contemporary payments technology; a system which can provide the flexibility and speed to facilitate new business models and approaches in a competitive market.

This evolution will also serve the common good; a real-time system allows the authorities to more closely observe the financial activities of international criminals and potential terrorists. It also accelerates the velocity of money, which leads to a significantly increased purchasing power in the economy.

By embracing this change, banks and their customers will enjoy the rewards that come from this inevitable shift.

Veteran technology suppliers, who are keen to protect their own financial interests, still recommend hybrid solutions for existing processing environments. But most organisations that have attempted to modify their existing Model-T legacy system into a real-time processing Ferrari have been disappointed with the results.

The standards-based technology underpinning real-time payments processing has been built from the ground up for reliability and performance. An increasing number of banks attest to this. But what about the recalcitrant remainder?

In 2002, Tower Group's Robert Hunt issued his own cryptic instruction to those who refuse to move forward or are content with cosmetic changes: *"Stop putting lipstick on the pig! Re-architect core payment systems to support a converging industry."*

An industry that needs to know what is happening as it happens.

"Technology will continue to reshape the payments industry landscape. We can see an ongoing move to more open access to payments platforms. Payment systems are at the core of bank's reason for existing, and play a vital role in facilitating wholesale and retail transactions."

– Boston Consulting Group

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