

## WHITE PAPER

# The Strategic Value of Centrally Managing Bank Payment Systems

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## FINANCIAL INSIGHTS OPINION

Market conditions are pressuring banks to seek new ways to grow profits while providing premium customer service, improving operational efficiencies, and handling complex regulations. Old and new payment systems coexist in an environment that is consistently challenged by new compliance requirements, increasing third-party competition, and ongoing customer demands for better service.

Financial Insights believes that banks, under the leadership of their chief information officers, can play a strategic role in the resolution of the current payments challenge. While the ideal state — a unified *enterprise payments* system — may be years or even decades away, much of the benefit of such a system can be gained by implementing common management infrastructure. This infrastructure then becomes the basis for actual legacy system replacement in the future. Centralized management of payment processing offers five immediate benefits:

- ☒ Information to make processes more efficient by eliminating bottlenecks and focusing IT investments on problem areas.
- ☒ More effective management of IT operational risk, facilitating compliance with Basel II, Sarbanes-Oxley, and other regulations.
- ☒ Quicker response to problems that may arise during the day that could cost the bank money, either by missing its cutoff time for submitting transactions or allowing fraud to occur.
- ☒ Lower costs for payment system integration through more rapid identification and resolution of problems that arise from changes to existing systems and processes.
- ☒ Greater visibility for customers into the status of their payments, which is in demand by corporate customers around the world.

Banks that view the market pressures as opportunities to improve their payment operations will ultimately have the advantage over their less efficient competition.



## IN THIS WHITE PAPER

In this white paper, we discuss the business challenges that are leading banks to consider fundamental restructuring of their payment systems. We shall see that all payment systems share common concepts, data elements, and process steps that make a centralized approach feasible. However, it is important to follow an incremental approach to reduce risk and cost. This white paper presents two different first steps that complement each other: a central payments database and a central messaging hub. The paper then shows how either of these first steps can be leveraged to move the bank toward a true enterprise payments infrastructure. Finally, we review the major benefits following from these changes.

## SITUATION OVERVIEW

Banks around the world are experiencing profit pressures related to their payment systems, such that continuing with the existing siloed infrastructure is increasingly untenable. Among these pressures are the following:

- ☒ **Lower prices.** As more payment processing steps become automated, cost is driven out of the system and excess capacity is created, compelling banks and processors to lower prices in an effort to gain market share.
- ☒ **Shifting payments mix.** Over time, consumers and businesses have naturally gravitated from high-cost payment methods like checks to low-cost electronic payment methods like ACH and cards. Banks must continue to support the high-cost methods, limiting their flexibility to respond.
- ☒ **Regulations and compliance.** In Europe, the Single European Payment Area (SEPA) initiative has produced EU Rule 2560/2001, which requires banks to charge the same price for cross-border and domestic payments. As a result, all European banks are losing money on cross-border payments until they can convert them to a more efficient and automated processing system. Regulators in Europe and Australia have imposed price controls on card products, and there is growing pressure in the United States for similar regulations. Compliance with new regulations on financial controls and money laundering has also added cost without creating new revenue opportunities.
- ☒ **Proliferation of new products and channels.** New payments products, such as stored value cards, account-to-account transfers, and cross-border remittances, represent important growth areas for banks, yet the inflexible payments infrastructure makes it more costly and slow to add the support for these products. As a result, many banks are simply missing out on the opportunities. New channels, such as the Internet and mobile devices, require the creation and maintenance of new interfaces and support tools.

In response to these challenges, banks have adopted a variety of strategies, each with its own liabilities:

- ☒ **Grow faster to achieve economies of scale.** While banks can lower their unit costs by spreading the fixed costs over higher transaction volumes, gaining this volume requires either lower prices or increased marketing spend, neither of which is easy in a low-margin environment. Growth by acquisition avoids these problems but makes the duplication and integration problems worse.
- ☒ **Utilize outsourcing/offshoring.** Banks can cut costs by taking advantage of an outsourcer's scale efficiencies or the lower labor costs available outside the United States. However, banks are generally reluctant to outsource payments processing because they see it as a critical function. Only certain process steps can be offshored, due to data privacy and security concerns.
- ☒ **Cut costs.** Unfortunately, banks have become so efficient over the years at processing payments that there are very few savings left to be wrung out of the existing systems.

The limitations of the traditional approaches are what have led many banks to consider more radical restructuring of their payment systems. An ideal state would be an *enterprise payment* system, or one integrated solution that could process all payment types. However, nearly all banks we have spoken to, while supportive of the enterprise payments concept, have doubts about its feasibility. Banks are generally loathe to tamper with systems that have been functioning reliably for decades and are critical to their existence. In recent years, several banks have suffered well-publicized problems with upgrades or modifications to their payment systems. For example, in June 2004, the Royal Bank of Canada made a routine update to its software that caused an error preventing client transactions, such as withdrawals, payments and deposits, from showing up in account balances. Direct deposit of paychecks was delayed while 245 bank staff worked round-the-clock to reenter the transactions. About 2.5 million accounts were affected.

To avoid such catastrophes, banks are looking for ways to address their problems without replacing existing payment systems. This requires working around the legacy systems, making the connections between them more useful, efficient, orderly, and flexible. Two alternative approaches being pursued by banks today are data-centric and message-centric.

In the data-centric approach, a centralized payment database is created, which contains transaction data from a selected set of mission-critical payment systems. The goal is to enable management to analyze the effect of changing costs, prices, and transaction volumes on their business and to estimate the impact of proposed strategies.

In the message-centric approach, the bank implements a messaging hub that permits it to coordinate payment functions more efficiently. For example, rather than having a network of multiple overlapping interfaces, all communications between payment systems go through a common hub using a common message format. This can also enable central monitoring of payments, alerting managers to problem areas before they impact customers. Long-term analysis of the process data can help identify bottlenecks or brittle components, which then become priorities for upgrades.

Both of these approaches rely on the essential similarities between all payment systems, as outlined in the following section.

### **Payment Methods Share Common Elements and Processes**

All payment methods share a common set of elements and processes. While an ATM card and wire transaction may seem very different on the surface, they are actually quite similar. Both have a source of funds, a security model, and a clearing and settlement network. Table 1 outlines the three most significant payment types, except for check — ATM, ACH, and wire — and common elements they share.

<b>TABLE 1</b>			
Common Elements of Payment Methods			
	ACH	Wire	ATM
Source of Funds	<ul style="list-style-type: none"> <li>• Deposit account</li> </ul>	<ul style="list-style-type: none"> <li>• Deposit account</li> </ul>	<ul style="list-style-type: none"> <li>• Deposit account</li> </ul>
Security Model	<ul style="list-style-type: none"> <li>• Signature</li> <li>• Debit block</li> <li>• Fraud models</li> </ul>	<ul style="list-style-type: none"> <li>• Signature</li> <li>• ID card</li> <li>• Token</li> </ul>	<ul style="list-style-type: none"> <li>• Signature or PIN</li> <li>• Expiration date</li> <li>• Fraud models</li> </ul>
Data Elements	<ul style="list-style-type: none"> <li>• Account number/bank routing number</li> <li>• Transaction date</li> <li>• Currency</li> <li>• Amount</li> <li>• Payee account number</li> </ul>	<ul style="list-style-type: none"> <li>• Account number/ bank routing number</li> <li>• Transaction date</li> <li>• Currency</li> <li>• Amount</li> <li>• Payee account number</li> </ul>	<ul style="list-style-type: none"> <li>• Card number</li> <li>• Transaction date</li> <li>• Currency</li> <li>• Amount</li> <li>• Payee account number</li> </ul>

**TABLE 1**

## Common Elements of Payment Methods

	ACH	Wire	ATM
Settlement Network	<ul style="list-style-type: none"> <li>• Federal Reserve</li> <li>• Regional clearing-houses</li> </ul>	<ul style="list-style-type: none"> <li>• SWIFT</li> <li>• Fedwire</li> </ul>	<ul style="list-style-type: none"> <li>• Visa</li> <li>• MasterCard</li> <li>• American Express</li> <li>• Star/First Data</li> <li>• Interlink</li> <li>• Maestro</li> <li>• NYCE</li> <li>• Pulse</li> </ul>

Source: Financial Insights, 2006

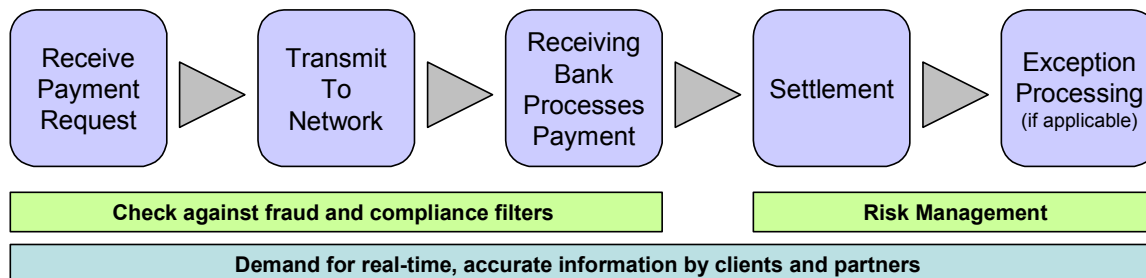
The similarities between payment methods extend beyond data elements to the process steps themselves. Figure 1 describes four common steps (plus a conditional, fifth step) that are part of every payment transaction.

1. **Receive payment request.** Each payment transaction begins with a request to transfer funds, which is received by the originating bank. This request must be validated against fraud filters and payment system rules and the identity of its sender verified.
2. **Transmit to network.** Once the request is received, instructions are sent to the appropriate payment network in that network's proprietary format. The network validates the transaction against its own fraud filters and business rules and passes it on to the receiving bank.
3. **Receiving bank processes payment.** the receiving bank again validates the transaction; if it is a debit, the receiving bank checks to see if there are sufficient funds in the target account. The receiving bank sends either an approval or a return of the transaction through the payment network.

4. **Settlement.** The payment network settles all approved transactions. This can be done two ways: In a "net settlement" system, all banks belonging to the network maintain accounts with the network at the central bank. The network adds up all the debits and credits for each bank, and transfers the net amount in or out. This occurs outside of the business day, using a batch process. The other method is "gross settlement," which settles each transaction separately, either in real time or at regular intervals. A real-time gross settlement network, like a wire transfer network, is the most demanding on the bank's ability to manage its cash flows because it can pull money out of the bank rapidly if there happens to be a large number of outgoing fund transfers all at once.
  
5. **Exception processing.** This step will only occur in cases where a transaction was returned by the receiving bank, and is typically a costly manual process. Since banks are usually under tight deadlines to settle transactions, any errors must be corrected as soon as possible. One of the principal objectives of a payment management system is to identify causes of exceptions and eliminate them to reduce costs.

**FIGURE 1**

Common Steps in Payment Methods



Source: Financial Insights, 2006

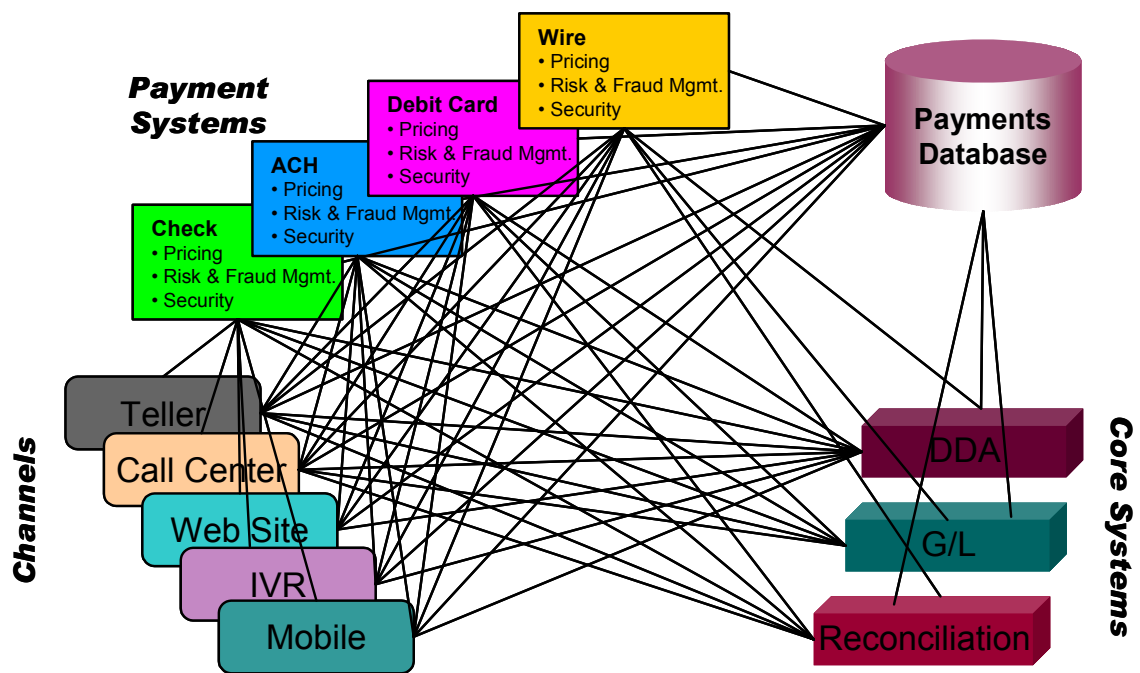
These common data elements and process steps are what make centralized management of payment systems possible because they enable a common message format and database schema.

## Implementing an Enterprise Payments System

As was pointed out earlier, banks will need to use an incremental strategy to implement a centrally managed enterprise payment system. Figures 2 and 3 show high-level diagrams of the two most common first steps: a payments database and a messaging hub.

**FIGURE 2**

Payments Database Architecture: Consolidating Reporting but Not Interfaces

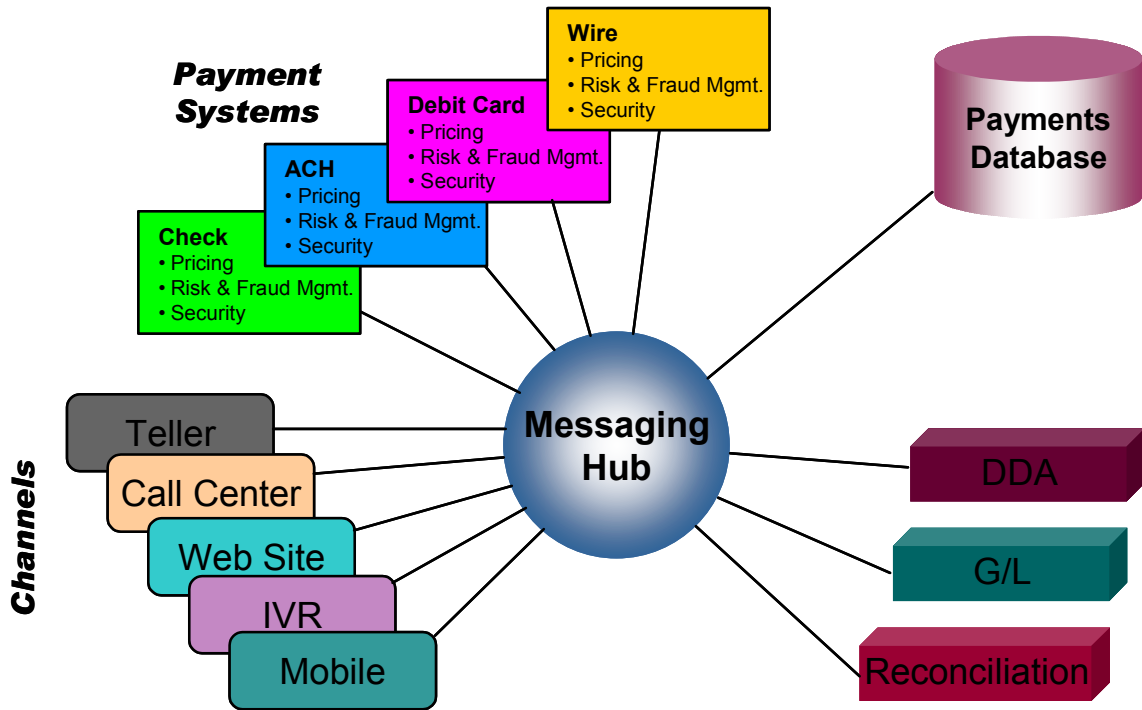


Source: Financial Insights, 2006

While a payments database does improve information flow, it actually adds more interfaces and complexity to the IT environment. To cut through the spiderweb of interfaces, a messaging hub can be used, as shown in Figure 3. All infrastructure components are connected to the hub, which converts proprietary messaging formats to a common format and contains business logic allowing it to route transactions appropriately.

**FIGURE 3**

**Messaging Hub Architecture: Combining Interfaces, Leaving Duplicate Functions**



Source: Financial Insights, 2006

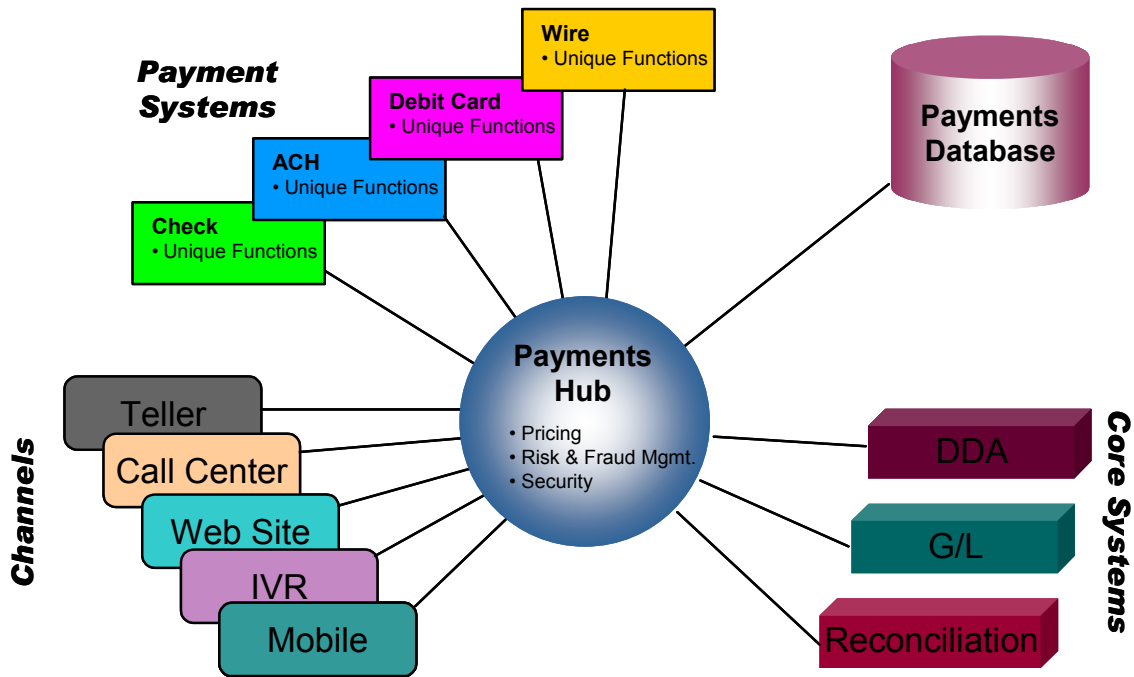
Without any direct connections between components, it is possible to modify or replace one component without affecting the others. This frees the bank to focus on areas of maximum benefit with reduced cost and risk.

However, the duplication of payment system functions remains; in addition, the hub can become a bottleneck due to the number of messages that must be sent between it and the payment systems. Since all of the processing logic remains in the legacy systems, a message must be sent to the hub at each step in order to allow it to provide real-time data for monitoring purposes. Over time, the messaging hub must evolve into a *payments hub*, a specialized software system capable of shouldering more of the actual payments processing itself.

Figure 4 shows the first step in the evolution of a payments hub: the consolidation of common functions from the various legacy systems. Pricing, risk, and fraud management, and security are now done centrally, allowing for the elimination of duplicate resources and alignment of processes with industry best practices.

**FIGURE 4**

Payments Hub Architecture: Assuming Common Functions



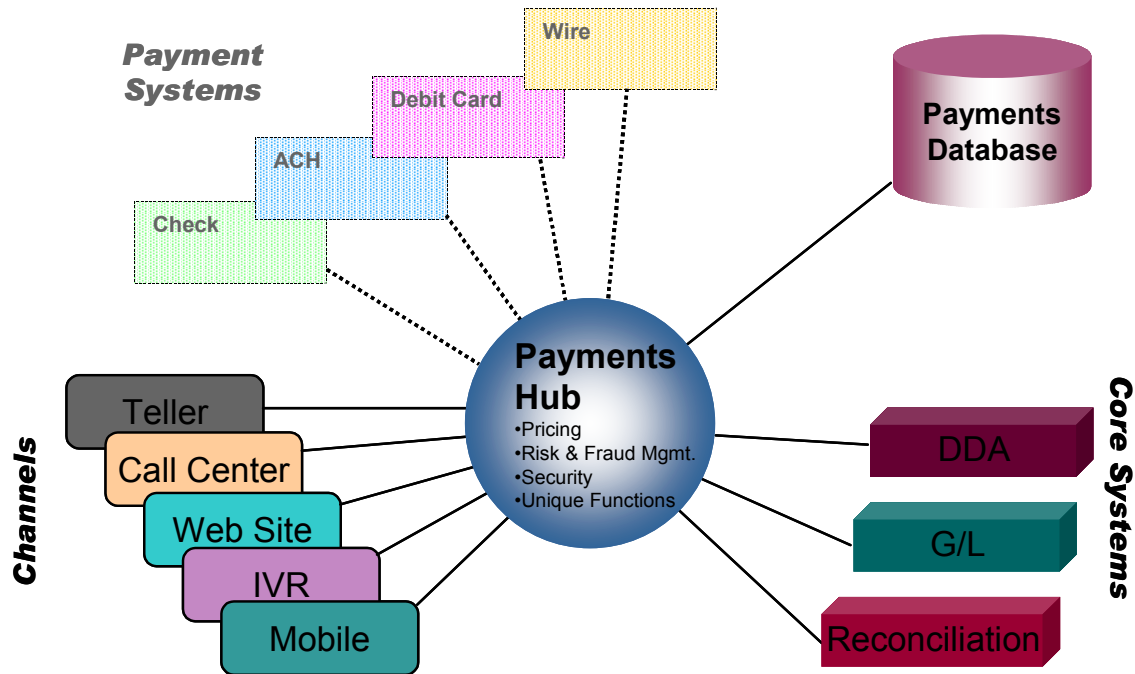
Source: Financial Insights, 2006

The legacy systems have now been reduced to processing only those functions that are unique to each payment type, mainly communications with outside networks and handling of returns or exceptions. Ultimately, even these functions can be assumed by the payments hub, leading to the end state shown in Figure 5.

At this point, the bank's payments transformation is complete; all payments functions are controlled by a single system based on flexible, open technology. In the next section, we discuss in greater detail some of the technologies that will be key to successful payment hubs.

**FIGURE 5**

**Payments Hub Architecture: Replacing Legacy Payment Apps**



Source: Financial Insights, 2006

**FUTURE OUTLOOK**

**The Value of Centralizing the Management of Payments**

Financial Insights believes that problem management and business performance monitoring technology will play a pivotal role in reengineering payment operations. Through the use of a centralized monitoring system, a bank can uniformly monitor and evaluate all its daily payment transaction processes. In order to be successful, banks will need to centrally monitor payment operations on three levels: hardware, applications, and business processes. Only by taking all three levels into account can banks accurately measure processing costs, prioritize opportunities for improvement, quickly identify problem areas, and accurately report the status of payments activities. With the ability to rapidly identify and fix problems, banks can be more aggressive in changing technology and processes, allowing organizations to adapt more quickly to changing market conditions. At the same time, banks can reduce the cost of compliance by improving the control and documentation of their payment processes.

Chief information officers (CIOs), alongside their IT staffs, can initiate discussions among key process owners and senior management. Table 2 offers a snapshot of the value created by a central monitoring and management of payment systems on two levels: strategy and operations.

**TABLE 2**

The Strategic and Operational Value of a Central Management System

Strategic	Operational
Improve visibility in key payment areas	Increase ability to fix problems faster
Lower cost of processing	Produce accurate, timely management reporting
Increase flexibility to deal with market conditions	Reduce cost of system integration
Improve customer service; higher retention	Quicker product development and roll out
Improve ability to respond to increasing regulatory requirements	Reduce cost of complying with regulations by improving documentation of operations and operational risk management
Ability to identify new revenue sources	Increase system uptime
	Improve ability to manage intraday liquidity
	Meet processing deadlines confidently

Source: Financial Insights, 2006

***Benefits to Payment Operations as a Whole***

A common element to Basel II, Sarbanes-Oxley, the Patriot Act and other recent regulatory changes is a focus on the management of operational risk. While large banks have developed sophisticated tools for managing market and credit risk, operational risk management has lagged behind. Typically, operational risk has been managed on a departmental basis, with considerable variation in tools and procedures. This approach creates significant problems under the new regulations because it complicates the process of documenting compliance and also limits the ability of the bank to manage its capital requirements. By elevating operational risk to the same level as market and capital risk, Basel II has raised the bar for operational risk management, requiring the development of more rigorous and sophisticated control processes. At the same time, Sarbanes-Oxley section 404 requires banks (and other public companies) to document their internal controls and perform an external audit on an annual basis. The Patriot Act instituted requirements for antimoney laundering processes that also require a bank to improve its operational risk management.

Since payment processing naturally involves the movement of large sums of money on a daily basis, it is a critical part of any compliance audit. Centralized identification and resolution of problems that may occur in payment processing, whether externally or internally driven, make compliance easier and less expensive. Instead of approaching each year's audit as a separate process, banks are seeking to reduce costs by installing standard reporting and monitoring tools that automate much of the work. Enlightened banks see compliance as an opportunity to improve their internal operations and controls, which ultimately reduces expenses and improves profitability.

The central payments management and monitoring system described in this paper would address a component of the operational risk problem, which is IT operational risk. Since IT is integrally involved in much of what a bank does day to day, IT operational risk management is critical to the larger task of business operational risk management.

### ***Benefits to ACH Transactions***

Since ACH is a batch system, all transactions must be submitted by a cutoff time to be settled that night. This means that corporate clients and consumer bill payers must submit their payment requests even earlier to allow for processing. By monitoring its ACH process, identifying bottlenecks, and correcting common sources of exceptions, a bank can move its cutoff time later, giving its customers more time to get their transactions in. This is a particularly valuable selling point with customers on the west coast of the U.S., who face cutoff times that are three hours earlier than those on the east coast.

### ***Benefits to Wire Transactions***

The key benefit that wire transactions will gain from a central management system is the ability to improve control over high-value wire transactions. Complying with regulations more cheaply and efficiently will directly reduce operational costs. Having a monitoring system that standardizes fraud prevention and detection will allow banks to respond quicker to emerging patterns and be more alert to potentially illegal transactions.

### ***Benefits to ATM/EFT-POS Transactions***

Real-time monitoring will allow process owners to fix problems and detect fraud patterns quicker. Another key benefit is the easy transition from a paper-based monitoring environment to an electronic real-time operation. Currently some regional banks use a collection of spreadsheets to monitor transactions. The shift to a paperless control system allows banks to adapt quicker to an electronic environment that provides a more integrated view of all payment operations.

## CONCLUSION

Managing payment processing on a centralized basis will:

- ☒ Increase operational efficiencies by directing resources to problem areas.
- ☒ Maximize cash reserves investments by accurately forecasting cash needs for intraday liquidity.
- ☒ Facilitate compliance with Basel II, Sarbanes-Oxley, the Patriot Act, and other regulations by improving operational risk management and making it easier to document these improvements.
- ☒ Respond to problems as they arise, minimizing cost of delays or missed deadlines.
- ☒ Reduce the cost and risk of making changes to existing payment systems through more rapid identification and resolution of problems.
- ☒ Increase corporate customer retention by providing greater visibility of their payment transactions.

By adopting a strategy of centralized monitoring of payment processing, changes to payment systems, and operational risk management tools, banks will make themselves more efficient and effective competitors. Rather than view the increasing market pressures as a problem, banks can view them as an opportunity to correct some problems that have been festering for many years. The fragmented, inconsistent state of payment processing is one of the more serious of these problems, and banks that move aggressively to resolve it will have a big advantage in responding to the changing market environment.

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