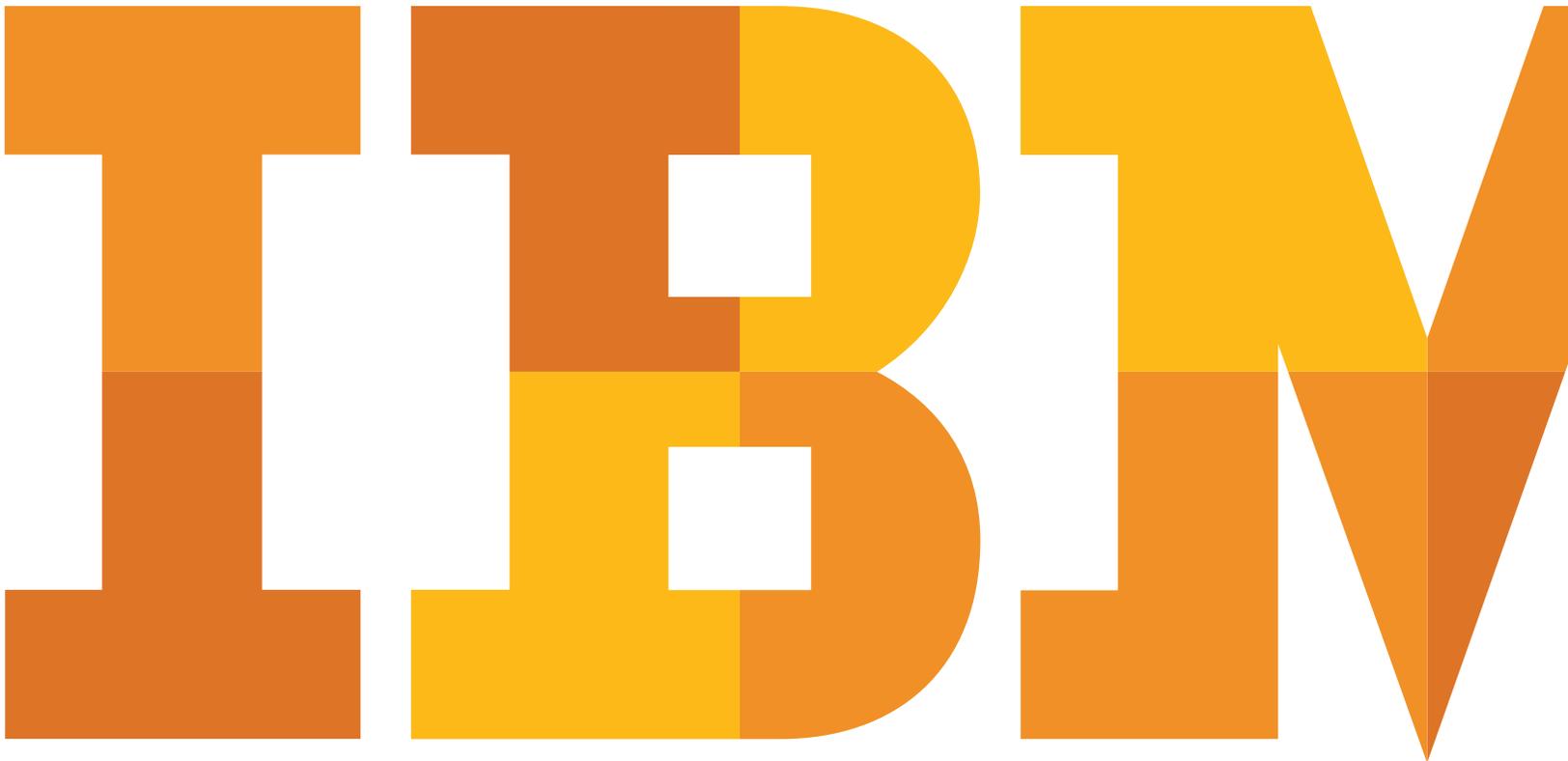


The challenge for a competitive edge in transaction banking

Expanding core capabilities



Despite a return to profitability for many banks, the industry still needs to identify new sources of revenue to compensate for declining investment banking activities. For a number of universal banks strapped by regulations, transaction banking has emerged as a key to revenue and profits, requiring relatively little capital. But to capitalize on this opportunity, banks need to transform their business, operating and sourcing models to respond to changing customer expectations, regulatory demands and increased competition from aggressive but nimble new entrants.

Executive summary

A number of banks are looking to offer new services around supply chain finance and faster customer onboarding through improved integrated portals that deliver access to all services where and when clients need them, including mobile devices. However, shrinking budgets are further constrained by compliance and mandatory changes. As a result, collaborative partnerships, cloud services, industry utilities and outsourcing have become increasingly attractive. But no one solution fits all activities.

To take advantages of all options, institutions must analyze each component in terms of the core competencies for the specific line of business and across the enterprise, as well as realistically assess the contribution to competitive differentiation. Sourcing alternatives, including within the line-of-business, mutualized across the enterprise, outsourcing, and private or public cloud, can then best be identified for each component.

But banks' ultimate competitive edge is their information advantage – their customer data. However, few are leveraging this data to its full extent. Predictive analytics can help banks gain insights to better manage their customers' and their own liquidity, as well as develop unparalleled customer-centric services.

Failure to rationalize their operations and leverage the use of real-time data to transform from product-centric to customer-centric organizations could result in banks being reduced to the role of a utility or, worse, settlement agent of last resort. This paper examines these issues and provides guidance to help banks make the changes and choices necessary for transformation.

Today's transaction banking environment

Although many banks are returning to profitability, they still need to rebuild revenues. Global revenues from investment banking declined by a third between 2009 and 2012 (from US\$341 billion to US\$233 billion), primarily due to net interest income depletion from shrinking trading spreads and regulations imposing heavier capital requirements, limiting proprietary trading and ring fencing cheap retail deposits.¹ Institutions should optimize their services portfolio and move to recurring fee-based services, priced to reflect actual costs and risk. Beyond increasing the profitability of existing clients, banks should also seek fruitful new segments, such as the more profitable small and medium enterprise (SME) segment, as well as explore opportunities in emerging markets.

Transaction banking revenues (including payments and securities processing) rose to an estimated US\$200 billion by 2012, outperforming investment and commercial banking in terms of revenue growth.² Payment services, until recently viewed disparagingly as “plumbing,” are now considered “the belle of the ball,” as they require low capital, generate recurring revenues and offer increasing opportunities for cross selling. In fact, transaction banking clients spend up to five times more on bank services than credit-only clients.³

But as banks seek more capital-efficient returns, they also need to focus on improving the client experience. A recent survey revealed that 65 percent of corporations feel that their financial institutions do not understand their needs.⁴ With access to more data, today's customers are more aware. The digital age has brought with it information ubiquity, which can result in the clients being as informed as the banks' advisory staff!

In the wake of the credit crunch, corporate clients are anxious to optimize their balances and working capital; therefore, they expect real-time payments, reporting and reconciliation. Treasurers are increasingly pressing for integrated services across all activities, including payments, cash management, foreign exchange, trade finance and derivatives. They seek a single view over the entire relationship with all their banking partners – i.e., consolidated global multi-bank reporting. They also expect the same dashboards, real-time information and payment authorization facilities available at their desks to be accessible on their smartphones or mobile tablets. Finally, major corporations seek to integrate physical and financial supply chains, optimizing working capital throughout each step of the commercial cycle: ordering, manufacturing, shipment, inventory and payment.

Retail customers, on the other hand, are moving toward mobile payments from smartphones and also demanding instant account crediting and notification. Mobile payments are broadening financial inclusion by extending services to the unbanked in emerging economies.

Securities processing is also facing major regulatory pressure and increasing client expectations of reduced costs. Back offices are struggling to settle trades in the backdrop of increased compliance costs and erratic trading volumes with limited human and IT resources. With heavy penalties and negative publicity for errors, failed settlements or service interruptions, financial institutions have to carefully manage the balance between maintaining adequate resources versus the costs associated with them.

Competition from new entrants outside the financial sector, including social networks, communications services providers and retailers, is a constant threat. Originating in the person-to-person (P2P) market, these new players are steadily moving into the SME and corporate segments, escalating disintermediation.

Banks, however, hold one major competitive advantage over the non-bank new entrants – data on their clients. Albeit many times siloed and unstructured, this data could be used to provide banks with a powerful advantage if mined and managed properly.

Real-time, predictive and natural language analytics can help banks turn data into valuable insights – insights that can help them better manage their own liquidity, proactively optimize their clients' balances and working capital, reduce fraud and risk, improve operational performance and optimize their product/services portfolio. Above all, customer analytics help fuel client centricity across all segments and channels by providing deep insights into client behavior, which can be used to offer improved personalized or enterprise-specific services. A recent big data survey by IBM and the Saïd Business School at Oxford found that 71 percent of financial institutions surveyed use information and analytics to create competitive advantage, compared to 63 percent of cross-industry respondents.⁵

So, banks need to transform their IT, data architectures, policies and processes to comply with increased regulation, satisfy client demands for real-time mobile payments and information, reduce operating costs and rapidly bring revenue-generating products to market. Scalability, resilience and reliability are essential to avoid heavy fines for service interruptions, and cyberthreats have emerged as a major contributor to operational risk and security. Unfortunately, many institutions' processing systems are aged, siloed or patched together following mergers. In the words of a senior Dutch banker at a recent conference, "We need to move from spaghetti to lasagne," by creating layers. These layers can then be evaluated in terms of cost, performance, scalability and contribution to competitive differentiation, as a basis to review sourcing.

According to a recent report by the IBM Center for Applied Insights in collaboration with Broadridge Financial Solutions, "The one-two punch of overwhelming regulatory change and rapidly rising client expectations is putting tremendous pressure on the operating models of financial markets firms. Making matters worse, these two drivers often compete for the same resources. Between the cost to run the business and the expense of complying with mandates, firms have little left to invest in change-the-business initiatives that could create competitive advantage."⁶ So, partnerships, outsourcing and shared industry utilities are increasingly viewed as attractive alternatives to in-house development and operation.

The group chief executive of Standard Chartered recently wrote in the Financial Times: "Of course banks have invested huge sums in technology – automating processes and enabling customers to bank online – but we have not yet seen the fundamental transformation of business models that have taken place in other sectors, such as music... Banks are the primary intermediaries in the financial world, so their margins will fall unless they reinvent what they offer their customers and how they work... Whether they like it or not, banks and regulators are going to have to embrace technology-driven innovation. Otherwise it will simply happen by stealth, driven by players outside the industry."⁷

IBM has been collaborating with a number of universities, including Imperial College Business School, on the nature of disruptive business models with the potential to create new market opportunities. One key focus is the development of a core platform that facilitates a flexible, open combination of service owner functionality combined with third-party complementary functionality to provide new and potentially unique services. Cloud technologies are accelerating this transition, especially hybrid cloud models.

The following paragraphs examine how to develop customer centricity and the new services that bank clients expect across multiple channels, as well as the implementation of the necessary back-office and sourcing transformations.

Industry parallel

A look at the airline industry reveals that the former national and dominant carriers are in a precarious financial situation while many of the new low-cost no-frills airlines are thriving. What can other industries learn from these operators? Below are some of the ways that low-cost airlines have driven competitive advantage:

- **Process transformation:** Cabin crews collect rubbish, eliminating cleaning crews at stopovers and thereby reducing turnaround time to 30 minutes.
- **Exclusive use of new customer channels** (such as Internet and mobile), rather than traditional channels.
- **Knowledge of costs and unbundled pricing:** Additional charges for checked-in luggage, food, drinks, etc.
- **Creation of new markets:** Use of regional airports with lower landing fees.
- **Cross selling beyond hotels, car rentals, insurance** (e.g., ground transportation, SIM cards, vouchers, etc.)
- **Focus:** No intercontinental flights where the short-medium haul operating model would not apply.
- **Fleet standardization and renewal:** Fuel-efficient planes; a major aero engine manufacturer has also evolved from traditional capital-intensive sales to a new disruptive model combining engines, financing and maintenance.

It's worth noting that while many airlines have been successful with these tactics, passengers sometimes feel that the balance between customer care and low fares could be improved.

Developing customer centricity

Banks that wish to better meet customer needs must become customer-focused enterprises: Agile organizations that harness client information, leverage customer insights and take the right actions during critical client interactions. These interactions are vital as banks look to improve customer loyalty, reduce their acquisition costs and drive more revenue and profits from each account holder. The risks are more severe, too. Reputations can be lit afire on social networks, hard-earned loyalty can be abandoned in moments, and making big bets on the wrong emerging technologies can be disastrous.

In the most recent IBM analytics study, 55 percent of financial sector respondents identified client-centric objectives as the top priority of their big data efforts (compared with 49 percent of total respondents), ahead of operational optimization and risk/financial management.⁸ Smart enterprises are looking to three fundamental themes to meet the opportunities and challenges of becoming more customer centric: Information, insight and interaction.

Information can be thought of as the foundational practices and the raw asset itself, derived from interactions, transactions and social data that the bank gathers. A bank begins the journey with integrated customer information, an authoritative source of data that provides a single view of the customer. From this pool of data, deep customer insights can help banks constantly improve their understanding of product usage, profitability, risk, buying behavior and client-financial needs. Using real-time events and customer data, banks can offer cross-channel marketing campaigns where “moments of truth,” or key customer interactions, are capitalized on as a way to effectively generate more revenue. The obvious challenge is that customer data is everywhere, growing fast and found in many forms – structured, unstructured, social, e-mails, audio, images, etc. Concentrating these data types, the best banks are now addressing their data-driven opportunities, knowing there are insights within their information stores if they can apply the right analytical tools quickly and adeptly enough.

Insights can be predictive and provide banks with the ability to sense and respond. Insights are applied to influence and drive interactions at the point of customer contact – such as in the branch, at a portal, while using a mobile app or on the Web – to create an engaging customer experience. Leading banks develop and use deep insights to attract and retain profitable customers with compelling product offerings and multichannel experiences across all touch points. They also use the power of social media to build constituency and confidence in the brand among clients and prospects.

Interactions are where and how these insights manifest themselves in communications, transactions and the customer experience. The organization must then capture and notice new customer data at all touchpoints and channels to create authoritative customer information. In doing this, it creates a superior customer experience that differentiates it from competitors to offer value for both the bank and the customer.

But perhaps most importantly, making profound customer-oriented changes must be about positioning the bank to be able to smartly, speedily and dexterously sense and respond to unknown changes in customer behavior and the environment. The big data survey previously mentioned highlighted, however, that banks lag behind cross-industry counterparts in core capabilities to analyze audio data from call centers, text analytics and data visualisation.⁹

In short, financial institutions must be able to build the flexibility to respond. This requires having the fundamentals of customer information, insight and interaction in place so new opportunities can be capitalized on at the right time. It can transform a “fear of the future” into a sense of confidence that views rapid customer change as an asset to be exploited, not an emergency to be mitigated.

Customer services and channels

Mobile money

As mobile money adoption grows, customers demand not only an increased set of mobile services and products (P2P, bill pay, domestic remittances, credit, etc.), but also flexibility across payment types – from stored value to debit and credit. Retailers track consumer demand accurately for their loyalty and coupon schemes, and apps abound for location-based campaigns and services. Thus, an open-ecosystem approach is important not only to drive increased business-to-consumer (B2C) and business-to-business (B2B) transaction volumes within the borders of specific countries, but also to facilitate cross-border payment flows such as international remittances – which often have dependencies on support from correspondent banks and, increasingly, telecommunication and retail partnerships.

By combining data capture with mobile banking, a large bank in India is now able to build special offers for targeted customers and cross sell its offerings based on trends.

Supply chain finance (SCF)

For corporations, payments and cash management are only the final steps of the commercial cycle, which usually starts when an enterprise issues a purchase order. Source-to-pay for the buyer and supply-to-cash for the vendor involve two parallel sequences of interlocked processes requiring constant interchange of information. Trading partnerships are increasingly collaborative, but only a few enterprises have implemented predictive analytics to manage their risks: Supplier/buyer default, changes, quality, logistics, inventory, accounts receivables.

Traditional invoice discounting is increasingly being replaced by approved payables finance (also known as reverse factoring), whereby finance is based on the credit rating of the buyer following buyer approval of the invoice, at a lower cost for the often smaller supplier. New technologies enable the correlation

between the physical management of goods, information and financial flows: Event-driven supply chain finance (SCF). This has given birth to new instruments such as the ICC - SWIFT Bank Payment Obligation (BPO), an irrevocable undertaking given by one bank to another bank that payment will be made on a specified date after a successful electronic matching of data according to an industry-wide set of rules.¹⁰

Successful SCF requires managing a portfolio of credit, information and transaction services across all stakeholders. Predictive analytics can be applied to optimize working capital and to identify potential defaults. Few banks today offer services adding value to both buyer and seller, so opportunities abound for interactive collaboration and for industry utilities to share information on a need-to-know basis.

Corporate portals

As mentioned earlier, the wide adoption of smartphones and mobile tablets is prompting corporate treasurers to demand the same dashboards and services when out of the office as when at their desks. At the same time, only 35 percent of banks are satisfied with their existing corporate online and portal capabilities and 55 percent of Tier-1 and Tier-2 banks consider investment in their corporate portals a “top-three priority.”¹¹

Next-generation portals being planned by many Tier -1 and -2 banks are expected to:

- Be customer-driven, flexible and available to the various stakeholders, including the bank’s treasury
- Share entitlements across product/application offerings
- Provide predictive analytics for cash management and other functions
- Approach real time both for transaction initiation and information access.

In addition, solutions are emerging to meet the challenges presented by corporate customers and to help enhance their banking relationships by:

- Including “all” the information/capability that the corporate customer is expecting in a single location, previously hindered by siloed back-office applications
- Providing the analytical capabilities that the corporate customer needs to be able to manage its total business with the bank, and possibly network of banks
- Concurrently, providing that information to the customer’s relationship manager and possibly the bank treasurer
- Finally, providing the same look and feel across all channels (desktop, smartphone, tablet) and all client segments, as the corporate treasurer or business owner is also likely to be a personal customer of the same bank.

Accelerating customer onboarding

Increasingly, corporate customers are demanding to send mixed payment files containing various payment types (low-value, high-value, domestic and crossborder) in a single transmission. Banks are gradually implementing payment hubs that can handle all electronic payments and checks, although rapid onboarding remains a challenge due to the wide variety of formats used. However, efficient format converters now allow accelerated integration between the banks’ applications and the clients’ ERP and accounting systems. These benefits are particularly welcome as the February 2014 deadline for Single Euro Payments Area (SEPA) approaches. By implementing a payments hub using converters to an internal canonical format based on ISO 20022 specifications, a major North American bank has reduced new customer set-up time by 80 percent.

Treasury services

Advances in technology now enable bankers to accomplish what they could only dream of a few years ago. Envision an environment that enables...

- A bank or corporate treasurer to gain insight into incoming and outgoing cash flows from all payment channels on a real-time basis and to predict what the current cash position will be.
- Alerting corporate treasurers via their smartphones or tablets of predicted potential cash shortfalls.
- A bank to risk-rate each transaction on a real-time basis, based on the client's entire relationship and real-time market data.
- The connection of all the banking relationships of a corporation and third-party trusted advice on the best ways to deploy excess cash or ways to fund shortfalls.
- Customer insight to assist in cross selling additional value-added services and repricing existing services.

Process transformation and sourcing

Many financial institutions are using several legacy and siloed systems, which can affect performance and scalability, as well as lead to high maintenance costs and diversion of management bandwidth. As shrinking budgets and human resources are further consumed by the need to adhere to regulatory compliance, banks are left with fewer resources to develop new initiatives. As such, many firms are looking at complementary partnerships, cloud solutions, outsourcing and the use of industry utilities to cut costs and decommission as many applications as possible.

Component business modeling and related techniques can help evaluate critical success factors, strengths and weaknesses to distinguish between:

- Core competencies for the line of business (e.g., payments, securities processing)
- Core competencies for the entire enterprise (e.g., accounting)
- Components that yield competitive differentiation
- Commoditized components, volume-based and driven by common rules.

Predictive treasury operations

IBM has developed a framework, called iPro, that can help bankers provide intraday predictive operations on a real-time basis. Its core capability is the ability to manage treasury intelligence from all incoming transaction sources and to all outgoing uses of funds on a real-time basis. It has advanced next-generation capabilities to provide value-added services for banks and their corporate clients:

- Intraday liquidity management
- Risk and compliance management
- Customer and market insight management
- Operational and service efficiency

At the heart of iPro is the use of analytics applied in a multi-channel real-time environment for multiple types of payments transactions, including SEPA debits and credits, ACH and SWIFT transactions, wire transfers, checks and other country-specific payment schemes. Payment hubs, real-time data streaming and big data are technology components of the solution.

iPro does not replace any existing applications. It overlays a bank's existing payments infrastructure and integrates all the various payments schemes to create an architectural environment that enables intraday predictive operations. Banks can develop advanced service offerings to drive additional revenue, develop new operating organizations to service clients more effectively and efficiently, and develop enterprise compliance solutions. iPro is a transformational platform to enable the next great leap forward in corporate banking.

The operating and sourcing model depicted in Figure 1 can be useful in making decisions:

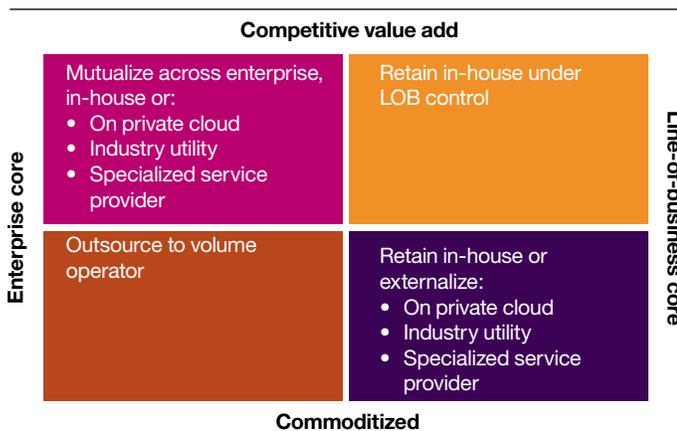


Figure 1: Operating and sourcing model.

Each bank should conduct its own assessment of competencies in light of its individual strategy and competitive strengths. The assessment of core varies. For example, payments and securities settlement are still a core business for most banks, but not all the value chain components may be profitable or mandatory for the bank to perform itself. As such, alternative sourcing models should be investigated. Figures 2 and 3 illustrate proposed operating and sourcing models for payments and securities processing.

Alternative delivery models do not, however, absolve compliance and responsibility. Monitoring and tracking are still mandatory under the new approach and can provide business value by increasing transparency of information that can also be shared with customers. A recent IBM study showed that innovative enterprises are looking for providers that bring advanced analytics capabilities and can help them discover new insights and opportunities. Agreements now include strategic business objectives in addition to the traditional cost reduction criteria.¹²

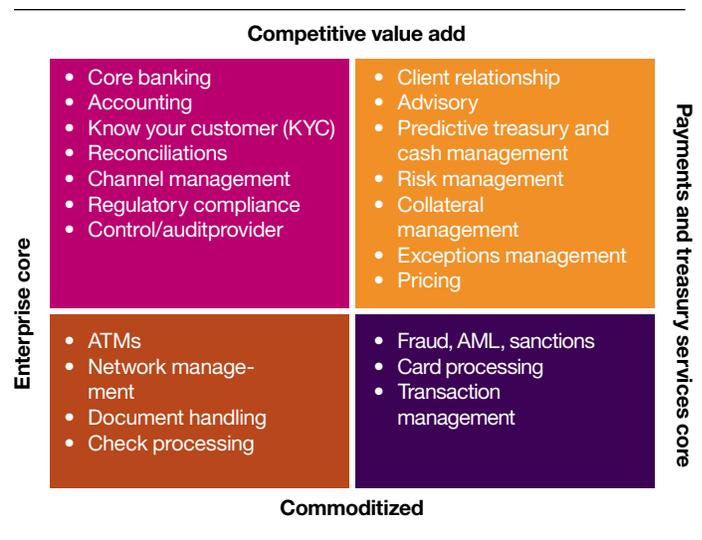


Figure 2: Model for payments and treasury services.

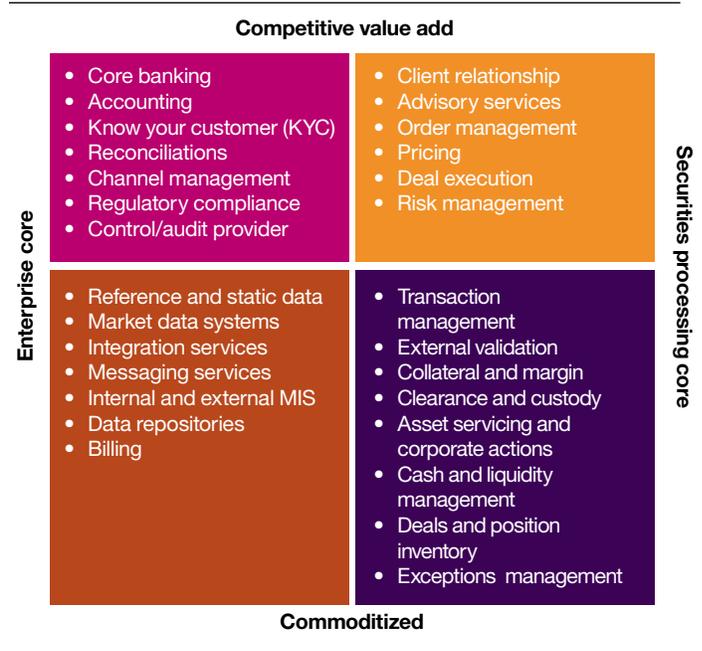


Figure 3: Model for securities processing.

Conclusion and recommendations

Banks must transform from product-centric to customer-centric organizations, improving their ability to anticipate changing market conditions and customer preferences to deliver targeted services and seize new opportunities. This will require re-architecting channels, processes and systems, and leveraging big data with real-time predictive analytics.

Transaction banking components should be analyzed in terms of their contribution to competitive differentiation. The top layer should be retained within the line of business, mutualized across the enterprise or externalized to a private cloud or a specialized service provider. Commoditized processes should preferably be outsourced to a volume operator or an industry utility to achieve economies of scale.

IBM works with financial institutions and third-party vendors to enable this decoupling of core processes between the lines of business and across the enterprise to improve business efficiency with best-in-class business processes. We help clients decommission old legacy systems, removing volume constraints and, at the same time, offer cost efficiency through volume-based pricing and sharing utility platforms across the enterprise or between financial institutions.

Big data and analytics are core weapons in the competitive game, within each line of business and across the enterprise – and financial institutions should endeavour to extract optimum benefits from their value. To achieve this, we recommend the following approach:

- Commit initial efforts to customer-centric outcomes: Use insights to enhance services, manage risk, adjust pricing, improve customer satisfaction and generate sales leads.
- Define a big data strategy with a business-centric blueprint that aligns the needs of business users with the implementation roadmap.
- Start with existing data to achieve near-term results: Leverage in-house data, skills and tools to demonstrate early benefits and build experience.
- Build analytics capabilities based on business priorities according to each institution's strategy and objectives.
- Create a business case around measurable outcomes: Increased revenues and customer satisfaction, reduced risk and operational costs.

New entrants from outside the financial sector, many “born in the cloud,” are progressing from the consumer market to the more profitable SME and even corporate segment, escalating disintermediation to more profitable markets. Banks that fail to transform and leverage the power of the data they hold could find themselves reduced to the roles of utility or settlement agent of last resort. However, those that capitalize on the data and insights within their reach, re-examine sourcing and evolve from product-centric to customer-centric organizations will position themselves strategically in the competitive value chain.

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References

- 1 Special Report – International Banking. *The Economist*. May 11, 2013.
- 2 Special Report – International Banking. *The Economist*. May 11, 2013; St-Onge, Elizabeth, Axel Miller and Michael Wagner. “Serving the new Corporate Treasurer, Implications for Transaction Banking.” Oliver Wyman. 2011.
- 3 Ibid.
- 4 Barry, Christine. “The Corporate Portal Strategies of Large Banks around the Globe.” Aite Group. June 2013.
- 5 Turner, David, Michael Schroeck and Rebecca Shockley. “Analytics: The real-world use of big data in financial services, How innovative banking and financial markets organizations extract value from uncertain data.” IBM Institute for Business Value in collaboration with the Saïd Business School at the University of Oxford. May 2013. http://www-935.ibm.com/services/multimedia/Analytics_The_real_world_use_of_big_data_in_Financial_services_Mai_2013.pdf
- 6 “Beating market mandates: How winners are re-engineering financial markets operations.” IBM Center for Applied Insights in collaboration with Broadridge Financial Solutions. July 2012.
- 7 Sands, Peter. “Banking is heading for its Spotify moment.” *Financial Times*. July 1, 2013.
- 8 Turner, David, Michael Schroeck and Rebecca Shockley. “Analytics: The real-world use of big data in financial services, How innovative banking and financial markets organizations extract value from uncertain data.” IBM Institute for Business Value in collaboration with the Saïd Business School at the University of Oxford. May 2013. http://www-935.ibm.com/services/multimedia/Analytics_The_real_world_use_of_big_data_in_Financial_services_Mai_2013.pdf
- 9 Ibid.
- 10 “Bank Payment Obligation.” SWIFT, ICC. Swift Web site, accessed August 20, 2012. http://www.swift.com/resources/documents/Bank_payment_obligation.pdf
- 11 Barry, Christine. “The Corporate Portal Strategies of Large Banks around the Globe.” Aite Group. June 2013.
- 12 Lipp, Anthony and Caitlin Halferty. “Partnering for innovation in financial services.” IBM Center for Applied Insights. July 2013.