KPMG
cutting through complexity

CAPITAL MARKETS 2015

Embracing technology for rapid transformation

Data, digitization, and disruption

DATA, DIGITIZATION, AND DISRUPTION

"The financial services industry is … built mostly on spreadsheets, Rolodexes®, and phone calls."[1] An assessment of the industry uttered in the 1970s? No.

That blunt characterization came in September 2014. It was from a venture capitalist who specializes in investments in start-up software companies that serve banks and securities institutions that make up the heart of the capital markets industry.

A harsh evaluation of the current state of businesses in the capital markets? Maybe.

Still, it would be difficult to argue against the point that quite a few capital markets businesses—investment banks, exchanges, clearing organizations, and others—have a lot of distance ahead of them on the road to leveraging better technology for faster business transformation that so many entities seek.

Much of the transformation work deals with three areas: enhancing skills at data capture and management, improving the digitization of a wide variety of the current manual process, and grasping a better understanding of (and reacting to) the escalating number of "disruptors" that continue to force change in the traditional industry business models.

Our view is that by focusing on those vital areas, firms in the capital markets industry can improve the quality of critical regulatory compliance reporting demands, gain better transparency that both regulators and customers are demanding, and reduce costs while improving overall profitability.

"We see the traditional firms addressing issues of their older, legacy technology in response to the regulatory, cost, and competitive pressures. But the burden of the scope of regulation is slowing them down. That has allowed the nonregulated businesses—the disruptors—to move in and grab parts of the business. In 2015, we expect that the established capital markets businesses will focus as much energy as possible on key areas in data and digitization in order to pick up the pace of growth and meet the challenge from the nonregulated entities."

– Michael Conover, KPMG LLP (KPMG)
Global Sector Leader for Capital Markets

KPMG's view:

Our thesis on 2015's prospects builds on our 2014 observations: Transformation of fundamental business and operating models and simplification of organizations and processes are essential to establish competitive advantage in an increasingly complex world. In 2015, we believe progress relies on management and boards deciding to pick up the pace of change while ensuring the business case for change is unambiguously tied to a holistic view of the long-term strategy of the business.

[1] "Fintech Reshapes Wall Street," Crain's New York, September 2, 2014

REVENUE SNAPSHOT: A CHOPPY RIDE/UNCERTAIN ROAD AHEAD

Even with the financial picture brightening with a much-needed boost in revenue through a return of volatility and an uptick in mergers and acquisitions (M&A) and initial public offerings (IPO) as 2014 came to a close, management and boards in the industry still should continue to push hard on the path of transformation to focus on creating a more sustainable generation of revenue in this changing industry.

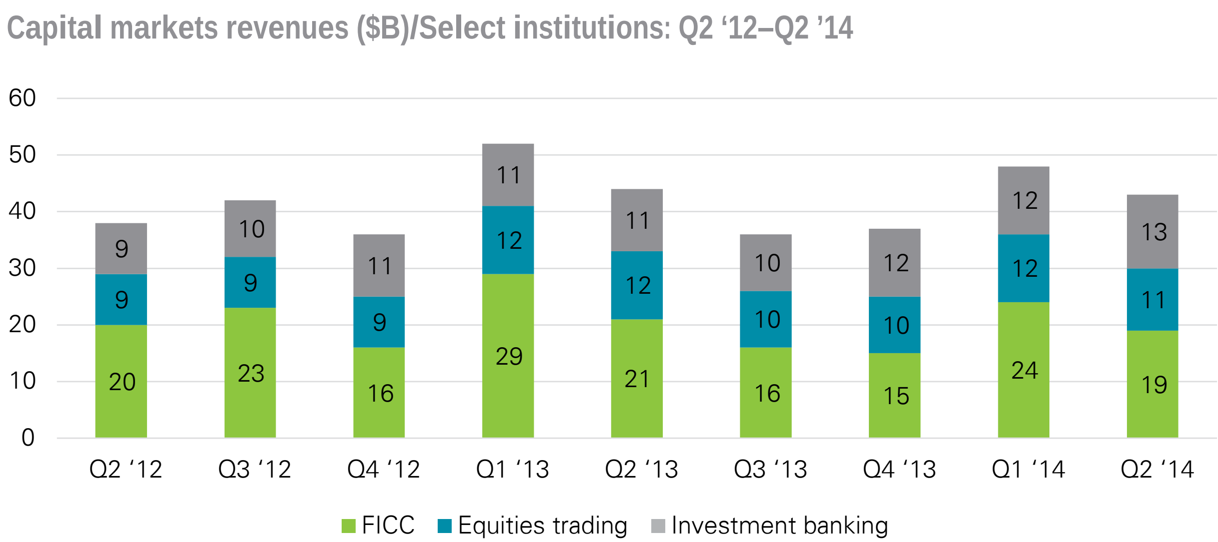
The business and operating models in place across the industry remain generally outdated and mismatched against demands to improve risk and data management capabilities, grow profits, enhance governance and regulatory compliance programs, get much better at cybersecurity efforts, and wring out excess costs

That ongoing focus is especially critical because of an expected uninterrupted increase in regulatory demands, ongoing advances in disruptive technologies, and demands for better service from customers in 2015.

Following is a chart that plots revenue results from the second quarter of 2012 through the second quarter of 2014 from 10 selected investment banks' capital market operations. The scope of the capital markets operations reflected in the chart include the following:

- Investment banking: Primary market offerings such as equity and debt underwriting, M&A advisory, and syndicated lending.
- Sales and trading: Equities and fixed income, currencies, and commodities (FICC) operations for secondary markets comprising brokerage and market-making activities.

Figure 1 (*Source: KPMG Capital Markets Monitor, 2012–2014*)



- A majority of the 10 institutions examined reported a decline in revenues in the second quarter of 2014 in comparison to the first quarter of 2014. Combined quarter-to-quarter revenues slipped more than 8 percent, with the largest drop in FICC trading.
- Aggregate revenue for the first half of 2014 of the 10 institutions decreased by slightly more than 5 percent compared to the first half of 2013.
- Despite weak performance in the first half of 2014, fixed income constituted a healthy share of 40 percent to 65 percent in revenues for most players, with the exception of three of the institutions examined.
- There was a decline in the profitability in 3 of the 10 institutions in 2014 compared the same period a year earlier.

Trading

Though full results for the second half of 2014 were not available at the time of the production of this report, there is evidence from ongoing published reports that revenue and net income ticked upward through the third and into the fourth quarter—but still are choppy on the whole among some of the largest banks in the capital markets.

The good feelings generated by such positive results, however, were tempered by the elevated litigation and compliance charges imposed these past years, and by the pressures presented by continued low interest rates.[2] Structural headwinds have raised long-term questions regarding the profitability of FICC, a traditionally significant source of revenue for the well-established institutions that has been diminished because some of that business has been grabbed by new, mostly nonregulated market entrants.

[2] "U.S. Banking Quarterly Comment: Q3'14," Fitch Ratings, October 24, 2014

In making those observations, we do not intend to paint an entirely bleak picture neither about the overall industry's operational and technological progress nor profitability. But it is important to recognize that revenue and profitability improvements in 2014 at investment banks were not entirely driven by transformation efforts. Instead, it appears that at least some of it is a direct result of the release of pent-up M&A demand and IPO activity.

Moreover, the industry is benefiting by an improving U.S. economy, although—as always—there is a caveat: While KPMG's chief economist, Constance L. Hunter, is generally upbeat about steady but slow improvement in the U.S. economy, other major mature economies (in Japan and among some in the European Union) could create a global drag, making what she calls the United States, "***the nicest house in a bad neighborhood.***" That scenario could make any sustained improvement in the near term in the global capital markets problematic.

Additionally, industry revenues may be negatively affected by regulators who are vowing to toughen oversight on the complex and fragmented system of stock trading, exchange fees, and rebates that has developed in the United States during the past 10 years. Today the number of trading venues in the United States stands at more than 50, with more in development here and in other parts of the world.

KPMG's view:

With regulation driving so much change among buy- and sell-side participants, financial technology providers, the array of organizations comprising the market infrastructure, and the myriad custodians, boosting revenue may well be a major challenge in 2015.

If nothing else, the ability to move quickly and adapt to rapid changes in response to regulation and market dynamics will provide a leg up for industry participants. We believe that when turmoil is rampant, opportunities abound. Institutions that can immediately recognize and react to opportunities can get out in front. Laggards risk irrelevance and, eventually, displacement.

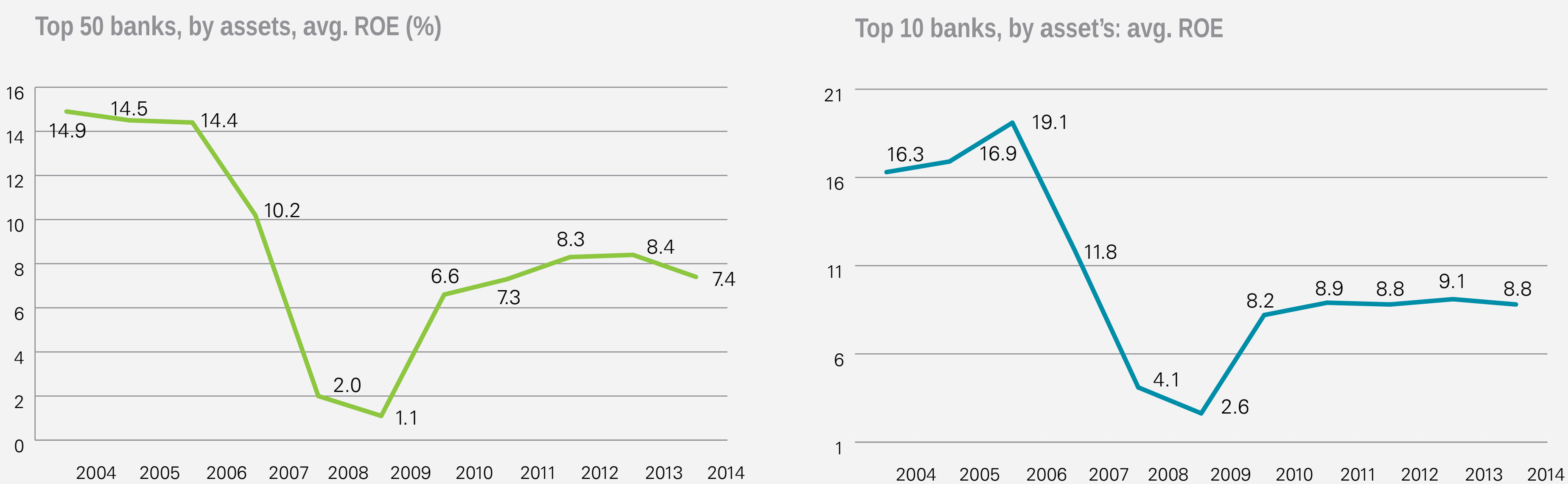
ROE remains a major challenge

We have examined return on equity (ROE) of today's top 50 banks by assets in 2004 and then compared those figures to the ROE at those same banks over the past decade.

- The average ROE of the group was half the level attained in 2004 **(see Figure 2)**.
- Among the top 50 banks in the United States, at the end of the second quarter in 2014, only 28 percent had a ROE of 10 percent or greater, and none had any higher than 13.9 percent.
- Among those same 50 banks in 2004, 84 percent of banks had a ROE in double digits, with 49 percent having a ROE of 15 percent or greater and 10 percent having a ROE of 20 percent or greater.
- Among the top 10 banks in the United States (by assets) at the end of the second quarter **(see Figure 2)**, the average ROE was 8.8 percent; the average ROE of that same group of banks in 2004 was 16.16 percent.

> "The conversation about the future really should not be only focused on cost and revenue. Although those issues are very important, leaders need to be talking about how to change from a reactive mode to being agile.
>
> The need to focus on moving from vision to execution. The conversation should deal with the art of the possible, and how to get there."
>
> – Tim Ramsey, KPMG LLP
> Managing Director, Financial Services

Figure 2 (*Source: SNL, KPMG Research, October 2014*)



THE HERE AND NOW OF TRANSFORMATION

Even as we witness the rapid evolution of the capital markets industry, sparked in large part by the introduction of powerful new technologies from agile new entrants, it is prudent to keep in mind that transformation is much more than installing new software and hardware to improve industry economics and program processes.

That said, it is important that capital markets firms enhance technological capabilities in this industry, where better data analysis can improve such vital aspects as the quality of regulatory compliance reporting on liquidity, leverage, transparency, and regulatory capital adequacy.

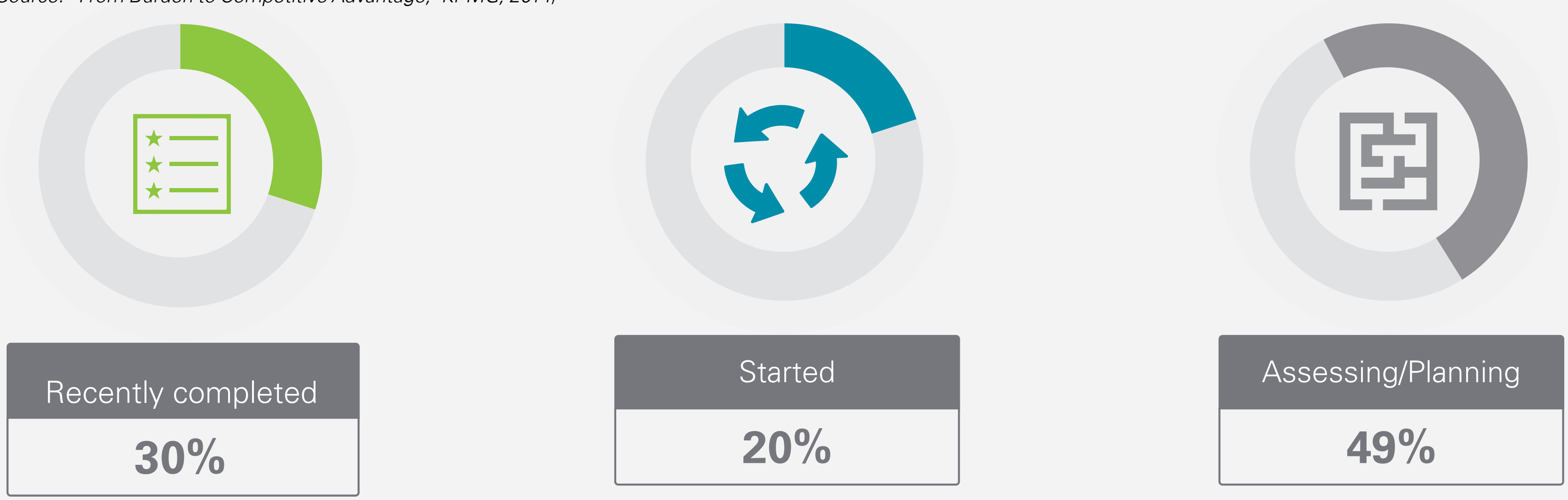
The evidence is clear that investments by banks and securities businesses in technology is happening. Gartner, the technology research and advisory company, estimates that banking and securities institutions' information technology (IT) investments will have grown 3.6 percent in 2014 compared to the previous year, to about $480 billion. In addition to regulatory compliance and reporting purposes, those funds have been targeted to address cost-reduction strategies, such as middle- and back-office simplification consolidation, as well as customer centricity programs needed to continue driving growth.[3]

The question that lingers is whether the investments have been effective.

From our interaction with industry executives, regulators, and industry observers, it appears there is still quite a road ahead in transformation. A 2014 KPMG survey on transformation revealed that nearly half of the capital markets businesses are still in the ''assessing and planning" stage **(see Figure 3)** of transformation. Another 20 percent admitted to only having just begun.

Many businesses comprising the capital markets value chain have shed noncore, capital-intensive, and low-return business units, and have reduced headcount in the tens of thousands. Only time will tell whether those efforts will prove to be strategic or if they were undertaken in a one-off—instead of comprehensive—manner.

Figure 3 (*Source: "From Burden to Competitive Advantage," KPMG, 2014*)



[3] "Forecast: Enterprise IT Spending for the Banking and Securities Market, Worldwide", Gartner, April 23, 2014

We believe a strategic approach, beginning with a holistic assessment of gaps and opportunities, is essential, given a backdrop of:

- Evolving regulatory demands that are adding costs and requiring more resources for compliance
- The expectation of relatively low interest rates
- Intricate complexity and connectivity of round-the-clock and sometimes opaque global markets
- Escalating demands for better and faster customer service
- Elusive growth in revenues
- Declining profitability in certain core products and services of the industry.

Separately, each has been on the agenda of capital markets businesses for several years. At the moment, however, the challenges are simultaneously (and quickly) converging. That convergence, therefore, is creating significant profitability and operational implications for virtually every traditional player in the capital markets ecosystem.

Numerous financial institutions in the capital markets remain saddled with IT systems fit for another era and change-management challenges **(see Figure 4)**.

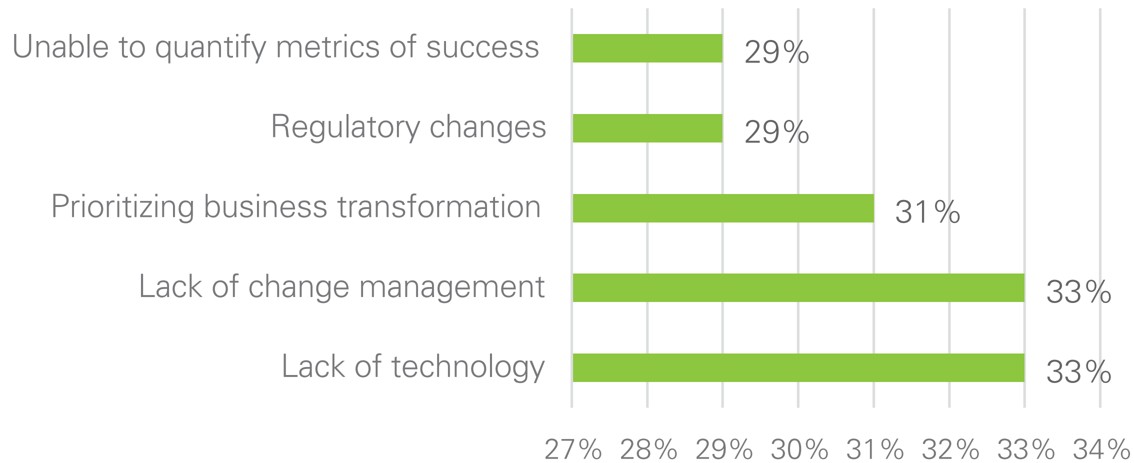
Further, they are seeking solutions to streamline duplicative, siloed, and inefficient middle- and back-office operations. Those situations are exacerbating fixed-cost challenges and may be hindering such imperatives as transparency and cybersecurity efforts.

Agility

Successful execution of transformation will depend heavily on organizations being able to hone agility skills, being able to step out of reactive mode, and being proactive as new challenges and opportunities crop up.

Figure 4 (*Source: "From Burden to Competitive Advantage," KPMG, 2014*)

What are the main obstacles to business transformation in your organization?



The process of bridging the gulf that separates vision and execution can start by recognizing that choosing just a few areas for focus can bring an important initial success. Early wins can help build momentum and foster buy-in for change plans.

Moreover, we view it as critical for transformation programs to have metrics in place before the program is launched, instead of integrating data analytics after the transformation program is defined. By starting with metrics—rather than measuring after specific milestones are reached—organizations can avoid the "ready-fire-aim" scenario, where regulatory pressures sometimes result in financial-services organizations first building a solution and then deciding later how to measure its success. Another benefit of metrics is that it can provide clarity on interdependencies.

A sustained approach

With banks under pressure to pursue ongoing cost efficiencies and comply with the demands associated with an evolving regulatory landscape, a sustained approach can help support the overall business strategy.

KPMG's view:

A sustained approach is designed to allow organizations to recognize and act on certain important needs:

- A robust and tested transformation framework that coordinates across the program life cycle on multiple dimensions
- Tools to drive consistency and transparency throughout the program life cycle, with a strong focus on interdependencies
- Key performance indicators and measures that anticipate potential failure points and utilize reliable data sets for objective, data-driven reporting
- A dedicated team whose performance is tied to the success of the program and has leadership engagement and commitment throughout the organization
- Leadership that can make the difficult decisions, enable steady and sustained progress, and inspire the team throughout the journey.

"We take the perspective that the concept and the execution of transformation are never complete because the marketplace changes, and so do the needs of our clients and customers—and the digital era just accelerates all of that."

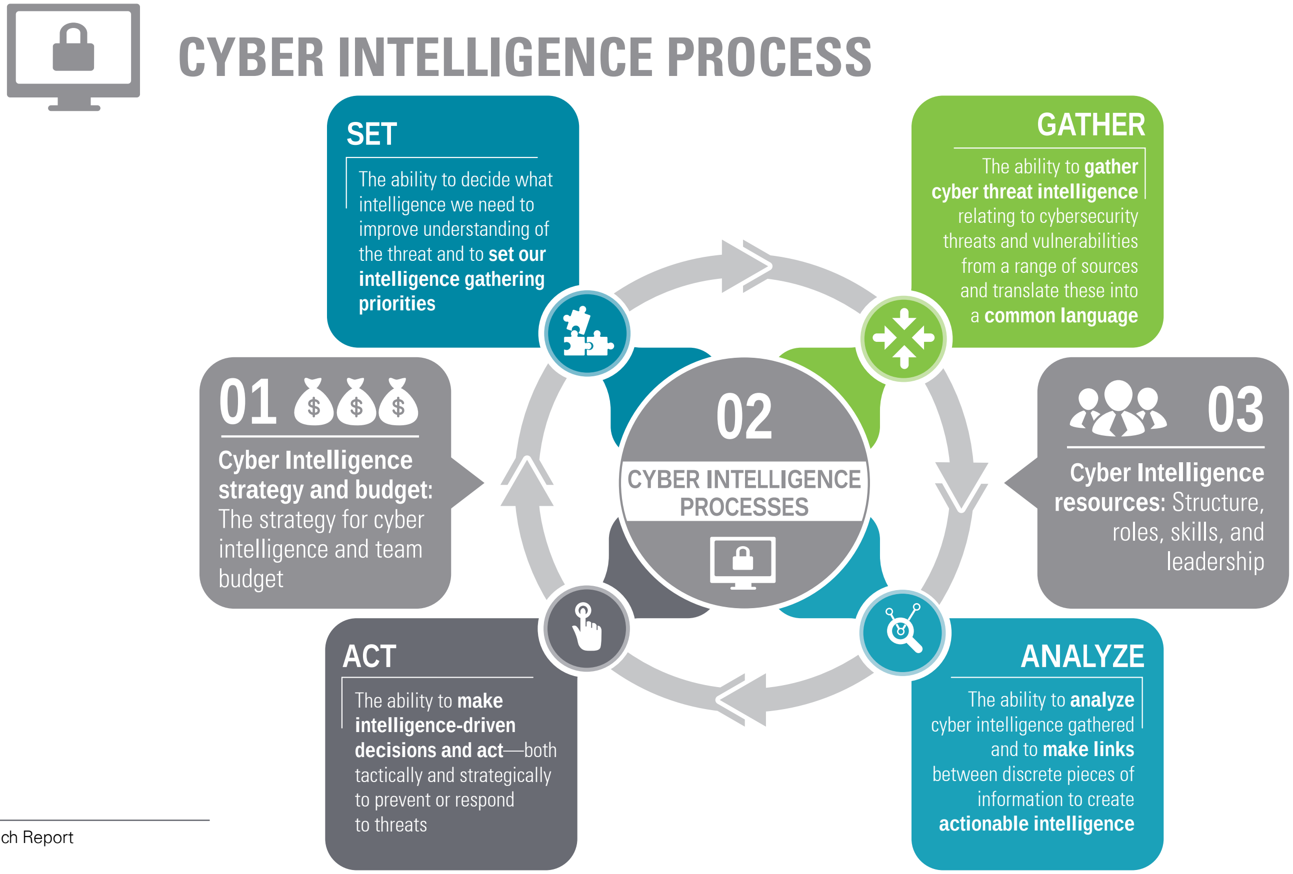
– Catherine Bessant
Bank of America
Global Technology and Operations Executive

Source: KPMG LLP, *"Business Transformation and the Corporate Agenda, 2014"*

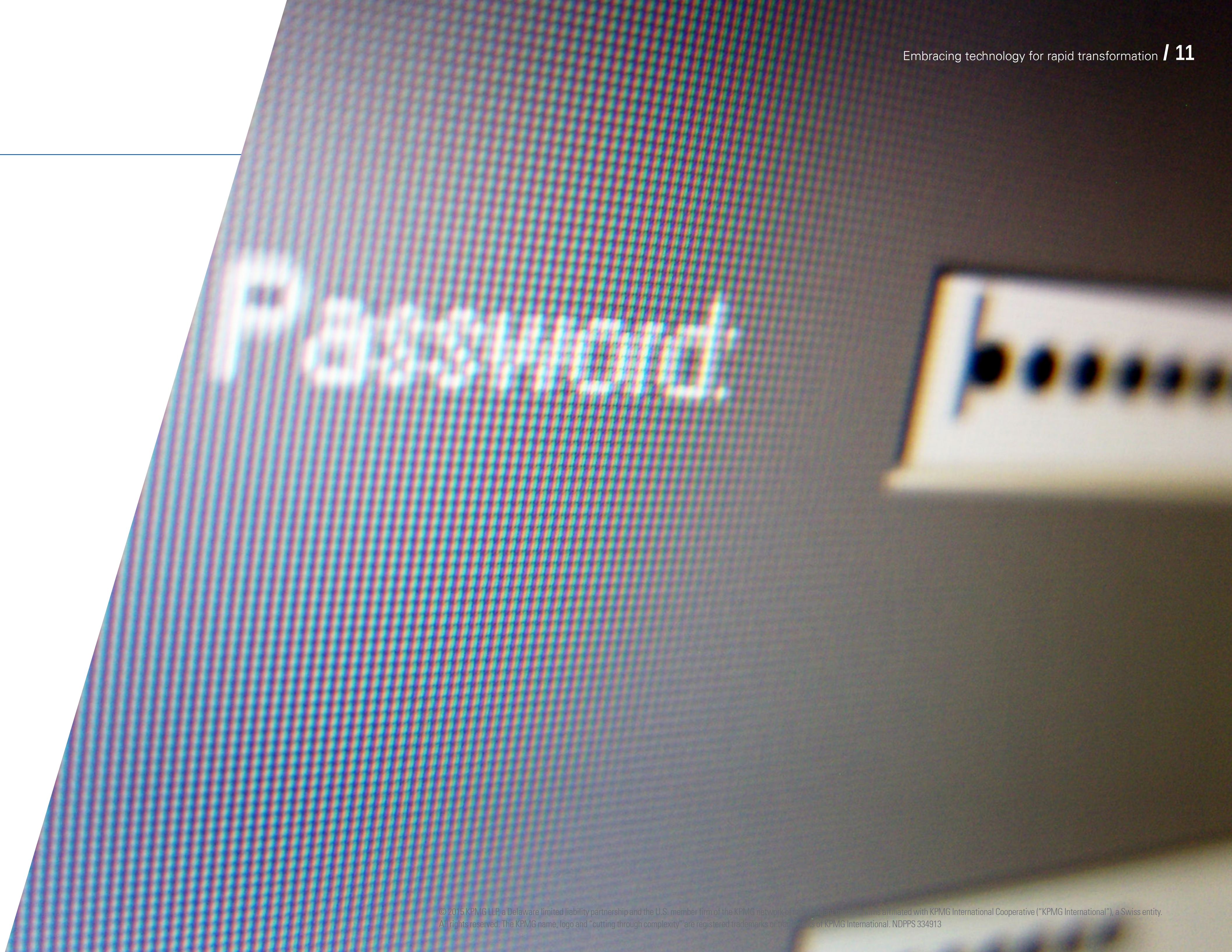
CYBERSECURITY IS NOT A TECHNOLOGY ISSUE

In a conference room with more than 200 financial institution executives, Ronald Plesco, KPMG's national leader of Cyber Investigations, Intelligence, and Analytics, brought the room to a hush when he rattled off a series of comments and statistics about the state of cybersecurity at financial institutions late in 2014:

- Cyber criminals are targeting insider data at financial institutions and publicly traded businesses in order to trade on the information before the data is public.
- Most business organizations take 229 days to figure out that their business has been breached by cyber criminals.
- In the third quarter of 2014, more than 183 million records[4] (mostly personally identifiable information) were stolen from financial services companies.
- The average cost of each data breach for financial services companies was $206 per record.
- 42 percent of breaches came from outside the organization—the remaining 58 percent came from the inside due to negligence/bad behavior in the organization.[5]
- Not long ago, when the topic of cyber crime was discussed with financial institutions, the question raised was when, not if, you will be struck. Now, it is when will you find out.



[4] 2014 Verizon Data Breach Report
[5] Ibid


Password

As the amount of data continues to grow exponentially in the capital markets, so does the rate at which organizations share data through online networks. With tens of millions of people interacting with their financial institutions by using tablets, smartphones, and much more, the implications relating to cybersecurity are enormous. As banks increasingly open their IT systems to a wide range of machines, the risk of losing direct control of data security continues to increase. Furthermore, business continuity of banks is increasingly dependent on IT and disruption to these core processes can have a major impact on service availability.

But it is a mistake to view this challenge only through the lens of technology. Cybersecurity is not a department of people—it is an attitude.

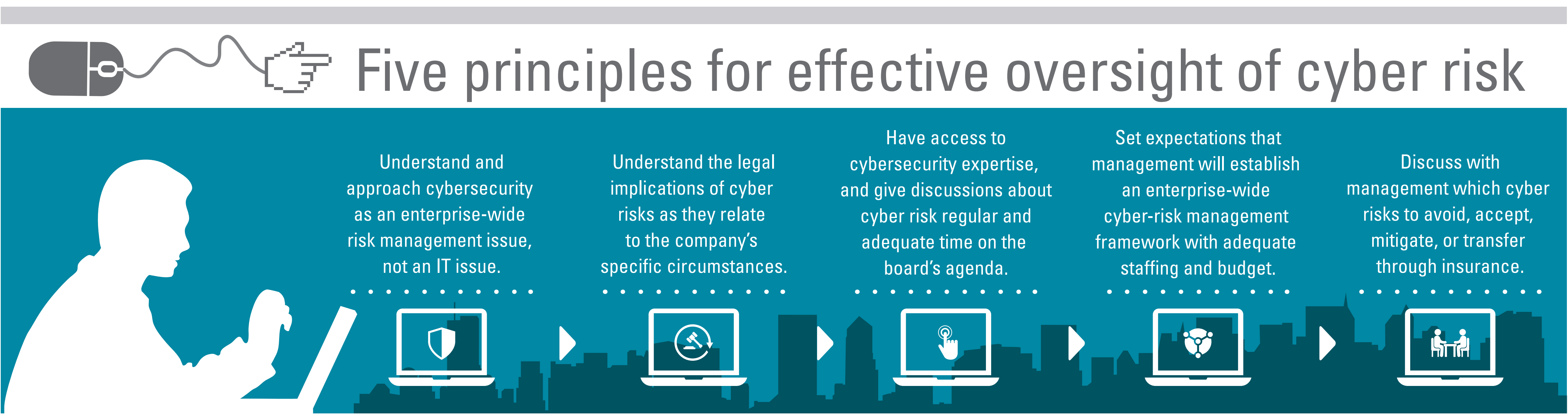
Plesco's message is blunt: Cybersecurity is a board-level issue. Financial institutions do not have the people or technologies to fight it because their cybersecurity processes are old and their tools are inadequate. Much of the issue centers on data management capabilities, but most organizations are drowning in data and cannot keep track of some of the most critical stores of data. And finally, "this problem has only just begun."

Cybersecurity at the board level

As it did in 2014, cybersecurity will continue to hold a high position on the agenda of banks' boards of directors, at the audit or risk committee level or at the overall board level.

Here are some thoughts about cybersecurity from a recent KPMG Audit Committee Institute Webcast about cyber issues for boards to consider. The Webcast was offered in coordination with the National Association of Corporate Directors.[6]

[6] "Cyber Risk Oversight Handbook," National Association of Corporate Directors, June 2014



RIGOROUS REGULATION AND RISK

In addition to compliance with regulatory demands placed on financial institutions in the wake of the financial crisis of 2008 proving to be costly, many observers expect the new rules also could limit revenue growth and profitability options because of the impact that the regulations have had on the cost of capital and on the ability to continue to offer or create certain revenue-producing products.

Over the past several years, it has become obvious that regulations are expensive in terms of compliance, as companies need to transform data tracking and gathering systems, reporting functions and, in some cases, their organizational structures.

At the same time, these regulations have limited revenue growth and profitability by, for example, increasing capital and leverage ratio requirements, or limiting certain products or activities, such as the Dodd-Frank Wall Street Reform and Consumer Protection Act's (Dodd-Frank) Volcker Rule, which restricts proprietary trading.

Some estimates put the costs of Dodd-Frank compliance for the largest eight U.S. banks alone at up to $34 billion annually.[7] The Volcker Rule alone could collectively cost the 10 largest U.S. banks up to $10 billion annually.[8]

The sheer amount of regulations coming at financial services companies can be hard to grasp. It is not only Dodd-Frank with its Volcker Rule but also the routine rulemaking of up to eight different federal regulators,[9] as well other domestic and foreign regulators.

Fines and settlement costs associated with noncompliance of rules, such as Anti-Money Laundering/Know Your Client, and some bad behaviors (such as those associated with rate fixing and others) have amounted to the more than $128 billion[10] since the onset of the financial crisis for some of the largest institutions, with some individual recent fines reaching the double-digit billion-dollar level.

"The entire business model [of the financial services firms] is being challenged right now. They're having to hold higher capital than before, in a restrained economic environment, which has dampened their earnings and revenue potential."

– Pamela Martin, KPMG LLP
Managing Director, Regulatory Risk

KPMG's view:

In focusing on regulation and risk, it is essential for capital markets institutions in 2015 to upgrade technologies—either in-house or through joint ventures, strategic alliances, or acquisitions of "permitted" technology firms that are closely aligned with banking—in order to make valuable operational and financial decisions associated with:

- Real-time analysis for risk and pricing purposes
- Portfolio composition decisions
- Executing trades that take advantage of fast movements in markets around the world
- Deploying accurate and quick hedging strategies
- Maintaining compliance with regulations
- Constructing optimized cost processes and structures
- Enabling and/or monitoring established internal governance discipline
- Enhancing cybersecurity capabilities.

7 "Two Years On, Reassessing the Cost of Dodd-Frank for the Largest U.S. Banks," Standard & Poor's Financial Services, August 9, 2012
8 Ibid
9 Ibid
10 "Foreign Exchange Manipulation Allegations Erode Public Opinion," *Los Angeles Times*, November 12, 2014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In 2015, the highly complex regulatory mandates that are meant to address a host of supervisory issues will continue to place a significant premium on deft capital management. The mandates that directly impact capital include stress testing requirements under Dodd-Frank; Comprehensive Capital Analysis and Review exercises conducted by the Federal Reserve Board (the Fed); and international revision and implementation of Basel II and Basel III regulatory capital frameworks, as directed by the Basel Committee on Banking Supervision (Basel Committee) and the much-talked about "ring-fencing" rules. Other regulatory efforts, such as the recovery and resolution planning (RRP) requirements under Dodd-Frank and Basel Committee guidance and the Fed's supervisory framework for foreign banking organizations, which includes the RRP and enhanced prudential standards, would be incomplete without capital considerations.

KPMG's view:

To gain competitive advantage through a transformation, financial services firms need to design strategy and an operating model based on a regulatory framework by:

- Recognizing that the regulatory framework is not only a trigger for regulatory transformation, but also underlies transformations aimed at industry consolidation, impacting global footprint and increasing efficiency and profitability
- Embedding the regulatory framework in the operating model early on, when possible, at the beginning stages of transformation. For best results, the regulatory framework should be considered while assessing the need for transformation or planning it
- Empowering compliance and risk executives in the process of transformation and securing company-wide sponsorship for consideration of regulatory issues. The tone from the top should guide every single person in the organization to be conscious of risk management for both compliance and business purposes
- Establishing a system to track applicable regulations and gather data for compliance and gaining an understanding of how to turn regulations into a competitive advantage
- Implementing governance, regulatory, and compliance (GRC) tools that use automated data feeds to update institutions policies as regulations change.

PREPARING FOR FUTURE ADVANTAGE

Much of the debate in the capital markets during 2015 will be whether today's major institutions will be able to maintain (or increase) the positions they held during the pre-financial-crisis years. A number of participants will not, and it will have been due to design: they have shed noncore businesses or have decided that regulatory constraints have made certain activities they pursued in the past not worth the effort.

Our vision of future growth in financial services is built on a structure **(see Figure 5)** that takes into account three broad areas:

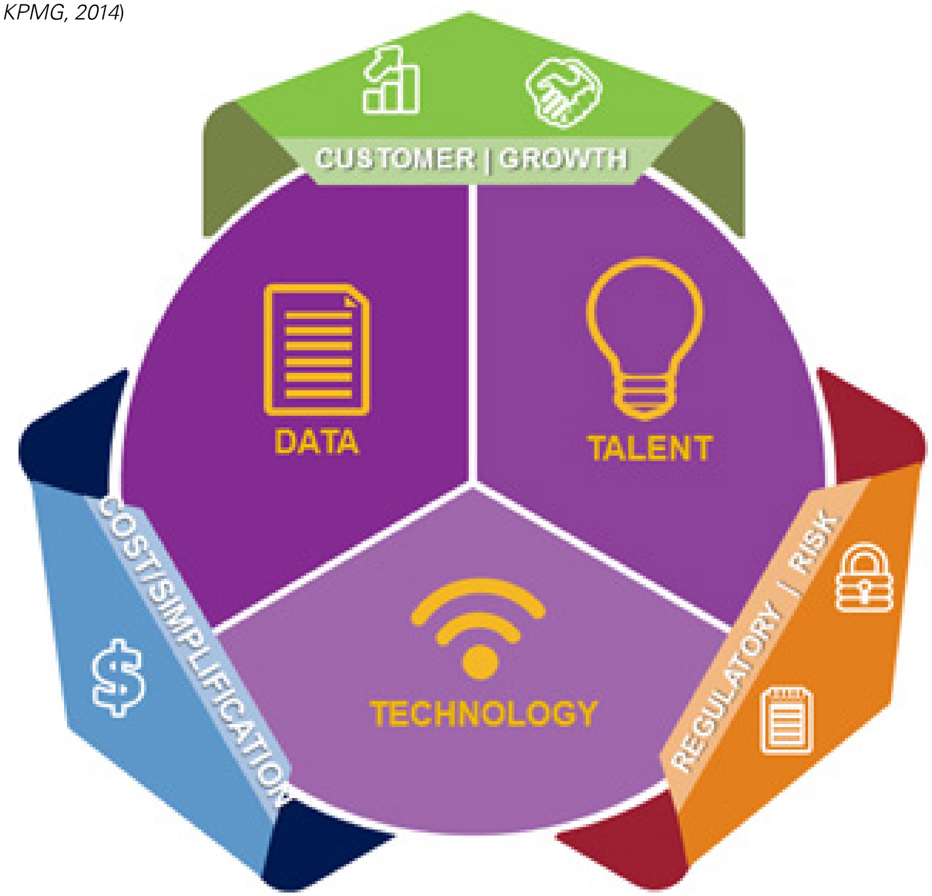
- Customer and growth
- Regulation and risk
- Cost and simplification.

The underlying triggers for all three include reliance on new technologies to streamline processes and facilitate connection with internal and external stakeholders, a focus on data quality and management, and the recruitment of new talent that can appreciate the nexus of all of the elements in order to coordinate the strategic, operational, and technical imperatives that are at the foundation of today's new marketplace.

As business leaders know all too well, organizations in many industries undergoing radical changes by forces of data, digitalization, and disruption, have spent many millions of dollars on transformation efforts—on everything from management tools to methods to resources. Yet, they still struggle to deliver complex change. We very often see entities comprising a web of organizations rife with disparate business units, separate cultures, and redundant processes—each ensconced in stout organization silos that seem indestructible and resistant to change.

For most, transformational change is driven at two separate levels: at the "externally facing" business model level and at the more "internal" operating model. For us, business model change focuses on the features that impact the firm's revenue: the markets, propositions and brands, and clients, whereas operating model change focuses on the features that impact the firm's costs: core business processes, operational infrastructure and technology, organizational structure, governance and risk controls, and people and culture. Of course, they are intrinsically linked, and transformation must be driven across both. Organizations that keep the business model and the operating model closely aligned increase shareholder value more quickly than those that do not.

Figure 5 (*Source: KPMG, 2014*)



INFORMATION TECHNOLOGY: TOOLS OF THE TRADE

Growth among capital markets businesses in 2015 and beyond will require even more reliance on the newest-generation IT tools. Not only will technology be vital in the through execution of the estimated 5 billion equity shares traded each day on U.S. exchanges but also the billions of dollars' worth of transactions involving government and corporate bonds, over-the-counter swaps and options products, credit derivatives, and foreign exchange products.

There now are 11 exchanges and 45 alternative trading platforms (dark pools) operating in the United States, with dark pools accounting for 40 percent of stock trading volume.[11] With such a sharp rise in the number of trading venues and the proliferation of dark pools, it is no wonder that regulators have announced intentions to cast a sharp eye on the dark pools' operations and pricing schedules. Regulators appear to be ratcheting up oversight after being stung by criticism that they were not doing enough to examine the perceived pools' opacity, riskiness, and possible uneven treatment of investors.

As the activities involved in the interplay of all of those investment instruments have become much more complex, and as the number of platforms and venues upon which the trading is taking place grows, the data that is critical for making decisions has become much more valuable.

At the same time, there are many people—including investors, traders, regulators, and more—who have raised serious concerns that, as the work continues to be more automated, the data has become much more opaque, thus raising concerns about organizations' capabilities involving data management, risk management, transparency—and even fairness. Consequently, the need for automated controls is increasing lock-stop with the automation of the transaction processes.

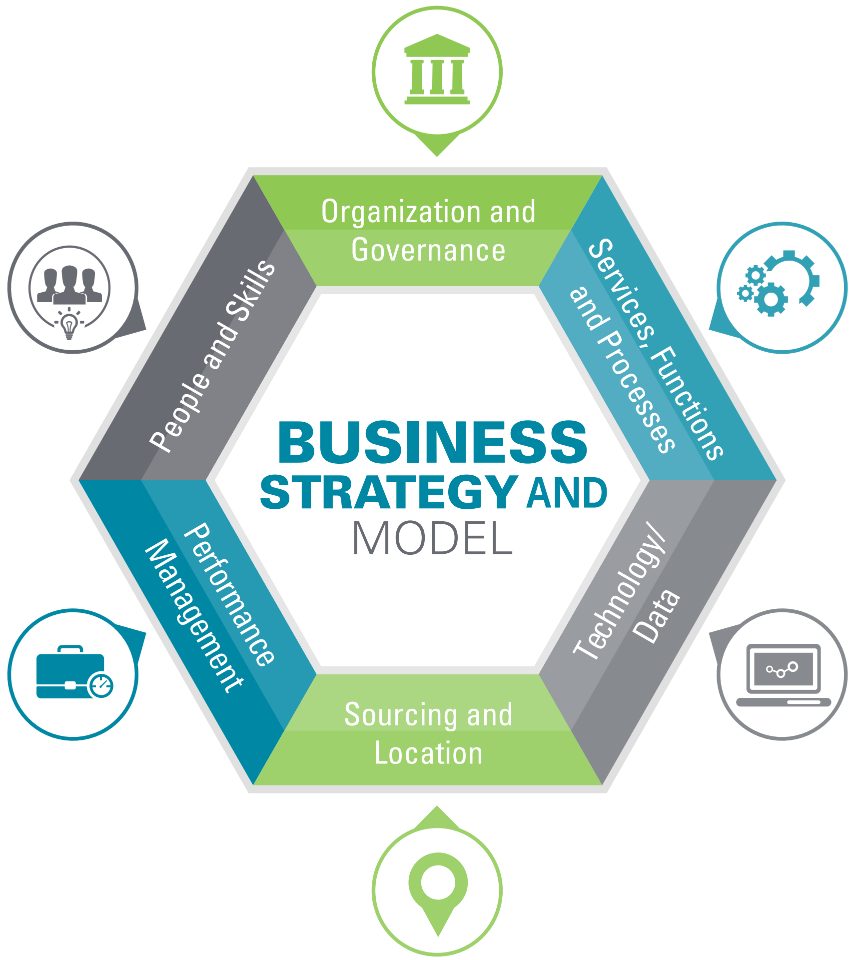
While tools are only as good as the people who use them, there are concerns that too much of the technology forming the backbone of the industry was made for another era. Moreover, even as the capital markets have become much more of a digital business in the past two years, there are even more concerns that some institutions remain stuck in an analog mindset. If nothing else, the reversal of that mindset is heavily dependent on accepting a culture of change—a concept where progress has sometimes appears to be grudging, at best.

[11] "Nasdaq Names 14 Stocks to Test Lower Fee and Rebate Program," Reuters, November 14, 2014

TRIGGERS OF COST/FOCUS ON OPERATING MODEL

Figure 6 (*Source: KPMG, 2014*)

Financial service organizations must transform to a new operating model that includes numerous critical dimensions such as:



KPMG's view:

Done with rigor and focus, we believe this operating model can address current-state processes and help release value. At the same time, following this model cab help achieve a "step-change" that heightens the possibility of removing costly and wasted efforts from the system, automating numerous processes, and establishing strong sources of delivery. It bears repeating, however, that achievement of these goals hinges on the establishment of a culture—a mindset change—that avoids a short-term focus of unit cost to one that provides a more balanced view of unit value.

Make no mistake, matters involving digitization, customer connectivity, and data and analytics today in the industry are much different than just a few years ago, and the pace of change continues to accelerate. There is an extremely valuable premium available today for businesses that are resilient, nimble, and adaptive.

Financial service organizations must transform to a new operating model **(see Figure 6)** that includes numerous critical dimensions such as:

- Organization and governance
- Services, functions, and processes
- Technology and data
- Sourcing and location
- Performance management
- People and skills.

This operating model perspective allows for organizations to deal with all aspects of operations. Also, consideration of all six attributes can help create a pathway that allows for greater focus and that moves from a "more-with-less" operation to an optimized operation that reduces operation cost, help cut costs, and improve the chances of enhancing results.

KEY TRIGGERS
IMPACT COSTS IN FINANCIAL SERVICES:

- Expansion of regulatory requirements
- Organizational complexity
- Changing customer expectations
- Scope of digital and mobile revolution
- Global footprint
- Redundancy of process, support, and service across multiple LOBs
- Heavy manual, human error factors
- Lack of automation

CLOUD AS A CAPITAL MARKETS DATA TOOL

Innovation does not come cheap. Technology upgrades require significant investments of funds, people, and time to meet competitive challenges, and in-house resources may not be up to the task. Increasingly, broker-dealers and investment banks, asset managers, and exchanges are either already using cloud computing solutions or are seriously considering adopting them.

With regulatory compliance, cost control, and client management driving the need for more substantial IT upgrades—and with developing in-house solutions being a pricey and sometimes risky option—cloud as a means to leverage the power of big data has moved beyond the academic debate stage in the capital markets. At the same time, cloud strategies may not always be the solution, there are growing security concerns about cloud and data privacy rules that could limit the use of cloud storage in certain jurisdictions around the world.

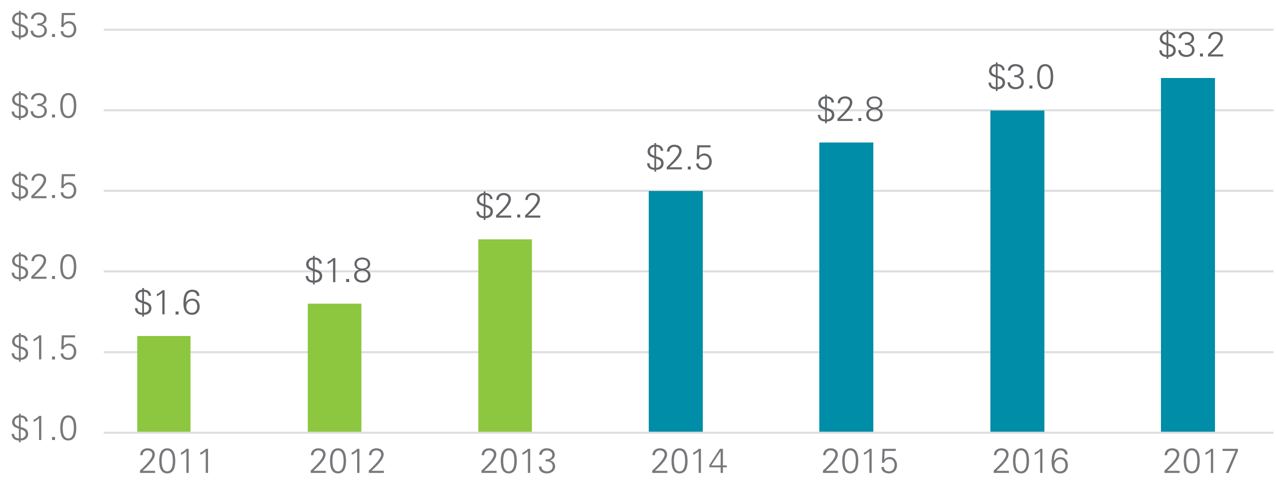
Nevertheless, the chart here **(see Figure 7)** suggests that cloud spending in the capital markets could jump by 20 percent or more in the next three years.

As banks look to build new revenue sources via new product, service, and channel offerings, they will incur costs for new hardware and software—and will almost certainly need to boost staff. An obvious option for mitigating hardware and software costs is to take advantage of cloud computing.

Many banks remain attached to their legacy IT environments and still harbor basic concerns about cloud security, trust, safety, and privacy. But efficient organizations are becoming increasingly confident in their use of cloud technology, both to avoid the high cost of hardware that is often underutilized over time, and to speed time-to-market for new products and services. They recognize that cloud vendors who were once relatively secretive about their operations have become much more open about the types of controls they maintain and the reports they can provide, making it easier for banks to become comfortable with the technology. And they see that cloud vendors employ vastly more people dedicated to data security than they do, suggesting that data in the cloud could actually be more, not less, secure than data held internally. The worldwide cloud computing market is expected to grow at a compounded annual growth rate of 36 percent in 2015, reaching about $118 billion.[12]

Figure 7 (*Source: "Capital Markets in the Cloud: Not Such a Gray Area," Aite Group LLC, July 2014*)

IT spending capital market cloud services in $B (estimates 2014–2017). Source: Aite Group, 2014



[12] "IDC Predicts the 3rd Platform Will Bring Innovation, Growth, and Disruption Across All Industries in 2015," IDC, December 2, 2014.

KPMG's view:

While cloud computing is becoming more common and trusted, banks must still approach the cloud carefully. Among the issues they must consider:

Data strategy and internal controls
Banks taking advantage of cloud computing must develop a robust data strategy that allows them to evaluate cloud service providers empirically. Understanding how much internal control the bank has over its data will help it make intelligent, business-driven decisions about which data and business functions can shift to the cloud.

Data sovereignty
Users of cloud computing may not always know where their data is being housed, or under whose jurisdiction it may fall. There are no global standards governing data sovereignty or residency, and many countries in the EU and Southeast Asia have rules not only around the privacy of that data but also around how that data can or cannot be moved from country to country. Banks must work with cloud service providers to make sure sovereignty issues and risks are addressed in their service contracts.

DATA ANALYTICS – AND TALENT

Long before the term "big data" first appeared in 1997, financial institutions were already struggling to make sense of all of the information piling up in their databases and warehouses. But over the past five years, the focus on big data has started to shift: today the issue is no longer about owning the most data but rather about how to gain the most insight from that data and—in turn—how to convert those insights into real business advantage.

Our experience suggests that most companies are currently focused on just a fraction of the benefits that data and analytics could unlock in the business. Few institutions fully understand the huge potential that resides within their data, and fewer still are making the right changes to their business strategy to take advantage of that potential. The stumbling block, in our opinion, is that existing technology systems and business models represent the greatest challenge to integrating data and analytics programs into their business.

We expect that enhancing data capability—through the use of predictive tools—will be a major focus for capital markets businesses in 2015. A huge challenge associated with those programs will be finding the right (and enough) talent.

Banks that have taken an early lead in harnessing and exploiting social media data are already demonstrating the value that outside data can add.

A critical issue that must be met head-on is to ensure the veracity of data. We believe that, as more unstructured and external data becomes integrated in the bank's analytics, confidence in the accuracy of the data will ensure smarter business decisions.

By doing so, resources can be freed-up and essential investments can be made in such important areas as more revenue-producing products and hiring more specialized data analysts to interpret the torrent of data for a variety of uses.

It is our experience that, in the past, when investments were made in IT and data projects, much of the effort went into the front end of the business. Though front-end investment is vital, IT investment should now be focused on middle- and back-office functions and architectures. Doing so can pay significant dividends in the form of client retention, compliance-function support, and enterprise risk management and governance.

A recent article in *The Wall Street Journal* said data scientists are a hot commodity, and called "unicorns" because of the combination of skills they must possess. The article reported that an ideal candidate "must have more than traditional market-research skills: the ability to find patterns in millions of pieces of data streaming in from different sources, to infer from those patterns how customers behave and to write statistical models that pinpoint behavioral triggers."

Source: *"Big Data's High-Priests of Algorithms," The Wall Street Journal, August 8, 2014*

KPMG's view:

The key to addressing this data deluge is to understand how data flows from source systems to consumption—reporting, analytics, modeling. The objective is to get the right high-quality data to the business in a fast, flexible manner. Optimizing the data supply chain will enable certified reporting because the data will be accurately sourced, clean, relevant, integrated, and broadly available. All these conditions allow management to make timely, information-driven business decisions.

Addressing this challenge is less about technology and more about logistics flow: This is the "business-side" of managing data. It also is about commitment to embrace disruptive approaches to getting work done.

It reminds of a now-famous refrain about competitive advantage, which hinges on cost leadership, differentiation, and focus. Those words did not come out of Silicon Valley in the past few months. Instead, they were published 35 years ago by Michael Porter, the revered Harvard Business School professor, in his influential book, *Competitive Advantage*.

We suggest that the best way for financial institutions to manage this torrent of data is to build a long-term data architecture strategy, based on an optimized data supply chain that will keep pace with the rate of change. The data strategy should be deeply rooted in the overall long-term business strategy and be raised to the board level for discussion.

We recommend firms assess their strategies annually to take into consideration changing conditions and needs. We appreciate that it is difficult to think long term when you are drowning in data, but it is critical to do so, in order to adapt to the rapid changes occurring in technology and in the industry.

Ideas for managing/analyzing data:

- Once there is consensus on business outcome, focus on finding the data required to reach the goals.
- Insist on data quality to help ensure that information can be trusted.
- Develop systems and capabilities that aggregate data across business lines to create a single view of the customer.
- Overcome internal obstacles by managing, measuring, and compensating employees by how well they use relevant data to make business decisions and drive business outcomes.

Gartner defines big data as "high volume, high velocity, and/or high variety information assets that require new forms of processing to enable enhanced decision making, insight discovery and process optimization."

Source: *Gartner IT Glossary, 2013*
http://www.gartner.com/it-glossary/?s=big+data

Big data – Big opportunities

The rapid rate of growth in data makes management of it one of the industry's most complex and demanding jobs. While the precise amount of data inside the financial services industry is incalculable, we estimate that a Tier 1 bank is typically dealing with many petabytes of data.[13] For context, consider this: One petabyte of data is equivalent to 1,000 terabytes of data, which is equivalent to 1,000 gigabytes of data. Put another way, if a byte of information were the size of a single grain of rice, one petabyte of rice would cover the entire land mass of Manhattan.[14]

With data volume that large, a significant reduction in today's manual processes is essential. An example of widespread use of manual work can be seen today in onboarding a new client at an investment bank. The sheer volume of work required to meet regulators' demands regarding transparency and counterparty risk is so large that humans cannot do all of the work.

Much of the discussion about technology involves the identification, storage, and management of unstructured data—such as the tax forms, articles of incorporation, e-mails, customer call center records, and client due diligence documents. An essential capability in next-generation digital tools for processing work will be the ability to quickly (and with a minimal amount of error) capture and extract data from image scans of the identification and documents clients must submit to their financial institutions in order to comply with counterparty risk regulations.

There is very high competitive value for a bank to bring unstructured data into main stream computing. We estimate that as much as 65 percent of the data pouring into banks and other financial services organizations is unstructured.

Structured data

- Defined as numbers and letters; in columns and rows such as in spreadsheets
- Lack of governance and controls in data, resulting in inefficiencies
- Data application systems rarely linked to reporting systems
- Multiple reference points in data limiting enterprise-wide view of key information elements

Unstructured data

- Created in enormous quantities by mobile applications, tablets, and smartphones
- It is e-mails, PDFs, videos, Tweets, Facebook posts, scanned documents—and many, many other forms
- This explosion is creating huge amount of pressure for company networks to consume, index, and integrate the data

[13] "Transforming Client Onboarding," KPMG LLP, November 2014

[14] "What is Big Data?" David Wellman, Slide Share, used with permission

ONBOARDING'S VITAL ROLE

Client onboarding in financial services needs fixing. By definition, it is a process by which a market participant determines, through detailed examination of related risks, whether to do business with a counterparty. But the process in place is anachronistic in today's digital, do-it-now, lightning-quick world, bogged down by a panoply of technological and process issues.

Client onboarding is a largely manual, error-prone, time-consuming, expensive, incomplete, and ineffective process. It often aggravates consumers and financial firms alike, and regulators have found it to be a process rife with ineffective controls that allow breaches of Anti-Money Laundering, Know Your Client, Foreign Account Tax Compliance Act regulations, as well as a host of other global laws and rules aimed at protecting consumers and lowering the risk profile of financial-services institutions.

With multibillion-dollar fines being imposed against institutions that have run afoul of the regulations, we believe market participants must aggressively pursue innovative, technology-based onboarding solutions built on modernized platforms. It must leverage "big-data" to improve the onboarding client experience, reduce cycle time, and embed stronger operational controls.

There is no quick fix, however. The transformation process will take time and plenty of patience. But it is a job that must begin now.

In our view, getting much better at client onboarding is nothing less than a transformational necessity. The stakes are too large. In general, being big is a huge advantage for financial-services institutions. "Bigness" offers the benefits of scale and the ability to leverage enormous assets. But, there is a significant downside, too.

Many of the world's largest banks struggle mightily with agility—a foundational attribute in client onboarding. Blame this onboarding clumsiness on organizational complexity, bureaucracy, and maybe even a cultural resistance to change. Regardless, it is fair to suggest that many of the largest institutions are having a tough time when it comes to nimbly adapting to advances in onboarding technology.

Much of the challenge today in onboarding centers around the extreme difficulty in identifying, collecting, and managing all sorts of data on customers, whether it is structured or the much more ubiquitous unstructured variety of data.

Such advances in client onboarding technology will need to be taken up at financial institutions if for no other reason than the need to manage the steadily increasing workload produced by regulators' demands. There are no signs of a slowdown in that regard.

Getting much better at onboarding, however, cannot be viewed solely from a regulatory perspective. A technology-based solution to onboarding can:

- Enhance and reshape the customer experience
- Reduce operational costs
- Address gaps in regulatory compliance processes
- Improve operational efficiency and controls
- Create a "policy engine" that uses metadata to model policies for complying with regulations
- Foster consistency in policies and data quality across organizational and geographic silos
- Advance data quality and governance
- Move the needle in a positive way on both the bank's top and bottom lines.

What we suggest is a thorough transformation in thinking and in how organizations approach onboarding operations. At its core, this transformation relies on a recognition by an institution's leaders that technology has put the consumer in the position of control, and that consumers will demand that market participants improve the onboarding process. If a bank dawdles, customers will simply go elsewhere with their business. Done well, client onboarding can produce significant business-improvement benefits, not the least of which is making clients happier—and happier clients tend to use more of a bank's products and services.

“A large, Tier 1 bank can spend $100 million a year on client onboarding, when you take into account the information technology and operations considerations. Yet the process largely remains manual, error prone, time consuming, and risky in terms of compliance with global regulations and the client experience.”

– Bill Cline, KPMG LLP
National Industry Leader, Capital Markets

GETTING GOING

The underpinning of the entire data, digitization, and disruption effort is the ability to change behavior—getting people ready, willing, and able to deliver sustainable business benefit. In example after example of our work with financial institutions, we have learned that tools and processes are only things and that the true differentiators in these programs are the people involved.

Large-scale transformation programs are inherently high-risk, and the probability of failure increases if individual and organizational resistance to change is not proactively handled. Failure to manage people well during the change programs is one of the major reasons for falling short of original goals. Examples include:

- Underestimating the intensity of effort and resources required
- Conflicting interdependent change initiatives
- Complacency or lack of individual or organizational motivation to change
- Mixed messages, lack of consistency and supported messaging of leadership.

When these programs make progress, they show evidence of strategic alignment, where organizations have a clear understanding of the business's long-term strategy, given the current and expected market conditions. They also have undertaken the critical analysis that identifies how to link the programs to the strategy, and they also have thought ahead about how they would pivot to help confront the inevitable shift in market forces.

Because change of this magnitude is complex and affects the entire organization, employee involvement at all stages is critical. People perform best in an environment they have been part of designing. That buy-in can increase the possibility of sustained change, which is the primary objective of any change program.

“It is essential for institutions operating in the capital markets to accelerate efforts to simplify and standardize their operational and technological infrastructure. The job will be long term and complex—but the need to pick up the pace is absolutely necessary.”

– Brian Stephens, KPMG LLP
National Sector Leader, Banking and Capital Markets Practice

Contributors

Brian Stephens is the national sector leader of KPMG's Banking and Capital Markets practice, which serves commercial banks, regional and community banks, investment banks and securities firms, and diversified financial companies. He has 35 years of experience in the banking industry serving large multinational and national banks, as well as other global financial services institutions.

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KPMG LLP's Banking and Capital Markets practice

Our Banking and Capital Markets practice is KPMG's largest industry practice, with more than 3,500 experienced professionals in the United States including over 600 partners in audit, tax, and advisory. Our partners and professionals have deep industry experience, which means they bring knowledge and understanding of the issues, enhanced by technical know-how, and a tested track record of proactive client service. We can address the specific demands of your business and apply our extensive resources and industry experience to quickly identify and respond to key issues.

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