The Road to Renewal: Modernizing Aging Core Systems at Financial Institutions
Executive Summary

At their core, financial services industry (FSI) companies are technology businesses. Every product and service they offer is technology-enabled, and the rapid evolution of mobile banking and digitization of processing in general makes technology even more critical. At the core of these technology businesses, however, sits a long-standing, and growing, problem: outdated information systems. Layer upon layer of aging information technology (IT) systems, including mainframe computers dating back to the 1960s, pose significant problems – excessive maintenance costs, process and decision-making friction, degraded business agility and more – that can easily degenerate into strategic risks.

To prevent these risks, FSI companies need to modernize their cores. Too few of these companies are considering modernization efforts, however: Less than one-third, according to the latest Protiviti research.1 The widespread reluctance is understandable. Core modernization projects are typically measured in years and hundreds of millions, even billions, of dollars. To overcome this reluctance and successfully modernize aging cores, IT executives and teams responsible for modernization projects should understand – and communicate clearly to stakeholders – the benefits and risks of these endeavors, and then put together a road map for moving forward that is suited to the unique environment and needs of their company.

In this white paper, we examine the need for this type of renewal, assess the risks and benefits of core modernization, and identify five approaches to this undertaking.

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1 Amid Ongoing Transformation and Compliance Challenges, Cybersecurity Represents Top IT Concern in Financial Services Industry, Protiviti, 2015: www.Protiviti.com/FS.
THE NEED FOR RENEWAL

The response to a 19th-century catastrophe offers surprisingly useful insights for 21st-century financial institutions grappling with the need to modernize layers of decades-old core IT systems.

Before the Great Seattle Fire of 1889 gutted the heart of the city, urban planners were primarily concerned about floods. Seattle’s founders built the original city center on tidelands that were periodically swamped. The post-fire blueprint for the city’s renewal was underpinned by two strategic risk-management decisions. First, there would be no more wooden buildings; structures would be made of stone or brick. Second, the entire neighborhood would be raised, 12 feet or more, to withstand floods. Streets were lined with high concrete walls, filled with earth sluiced down from surrounding hills, and graded. During another phase of this massive renewal endeavor, new sidewalks – supported by brick archways between the new street and the second stories of adjacent buildings – were installed.

To this day, those rebuilt sidewalks contain some elegant coding: Blocks of clear glass were installed to let pedestrians peer down through outdated infrastructure to see the old sidewalks and the original entrances of the few buildings that survived the fire. Some merchants carried on business in this subterranean space, which later became known as the Seattle Underground.

If similar windows could be installed on current FSI IT environments, viewers would peer into layers of information systems that have amassed through decades of implementations, mergers and acquisitions, spinoffs and restructuring. These systems support basic services such as deposit account processing, security accounting, trading, payments and loan servicing. Despite the critical importance of these core systems, most corporate citizens would be shocked to learn that these systems are relics, constructed in the era of paper-based transactions. Those who probe to the very core of this technological sediment will unearth mainframe technology, some of which has been in place since the 1960s. The upkeep of this mainframe technology requires grizzled technologists fluent in archaic languages like Assembler and COBOL.

The risk of flood and fires may not keep FSI chief information officers (CIOs) awake at night, but the threats of ever-increasing core-technology complexity and the fast-shrinking supply of IT professionals with expertise in these aging core systems has caused sleepless nights for some time. The growing pressure on FSI IT functions to modernize aging core systems is due to several reasons: 1) a growing strategic need for financial institutions to operate in a more agile manner; 2) the need to adopt new technologies, such as cloud computing, to take advantage of new capabilities and save costs; 3) the need to simplify complex operations to derive cost savings and improve customer experience; and 4) the need to manage the risk and cost of maintaining this aging infrastructure. The urgency for modernization is underscored further by the emergence of next-generation financial companies and businesses, such as Simple (an online-only bank), which enjoy the advantage of starting from scratch, unburdened by outdated legacy systems, and so are able to reap the advantages of new technology from day one.

Of the expected benefits of core modernization, risk mitigation (mostly technological and workforce-related) figures as the most commonly cited benefit, but FSI CIOs and IT professionals also point to reduced operating costs, as well as opportunities for revenue generation (via faster time to market and new opportunities for product and service innovation) as primary drivers behind the need for this transformation (see “Top Drivers of IT Core Modernization Initiatives”). Although not identified as a primary driver, regulatory compliance is a motivating factor for financial institutions, as modernized platforms provide a more suitable foundation for the compliance updates that the industry is facing on an ongoing basis.

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**Top Drivers of IT Core Modernization Initiatives**

FSI respondents to Protiviti’s 2015 IT Priorities Survey identify the following as the primary catalysts driving them to replace core systems:

1. Risk Mitigation (aging technology and/or aging workforce): 64 percent
2. Cost Savings: 20 percent
3. Revenue Generation (e.g., greater product/service innovation, time-to-market): 15 percent

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2 Ibid.
Like urban renewal projects, core modernizations are inevitably multifaceted, controversial, expensive, time-consuming and risk-laden. Organizations should recognize these risks and be prepared to mitigate them; what they shouldn’t do is postpone their critical renewal efforts indefinitely because the risks are seen as too high. Continuing to accumulate and service outdated core and support systems can grind progress to a halt, stymie innovation and drive business to competitors. Despite the size and difficulty of IT modernization, the strategic risks of operating with an aging core are far greater than the project risks of renewing the core.

**IT ISN’T BROKEN (YET) – WHY FIX IT?**

In recent years, a number of vendors, including Accenture, FIS, Fiserv, Infosys, Oracle, SAP, Tata Consultancy Services (TCS) and Temenos, have enticed some banks to replace their aging platforms with more modern technologies. These activities have gained better traction in Europe, Asia and Australia than in North America, where relatively few banks have moved forward – partly because they are aware of notable failures that underscore the risks of this endeavor. Regardless of this cautious, “wait and watch” attitude of U.S. banks, a few well-known financial institutions have embarked on core modernization efforts, and others are evaluating options.

Yet core modernization has generally been more talk than action, and here’s why: First, the problem is buried deep in the IT function, out of sight from most decision-makers beyond those within the function. The problems that an aging core gives rise to – more operational friction, less business agility, generally higher costs – are difficult to attribute directly to the difficult-to-see complexity caused by layers of aging IT systems. The obscured nature of an aging core makes it easier to say “no” when an enterprising IT executive puts forth a proposal for a multibillion-dollar, years-long IT infrastructure renewal initiative. Second, these outdated systems are in some ways a victim of their own success. Despite its age, the technology is relatively stable and has worked relatively well over the years: *The ATMs continue to dispense money to customers, so why should we invest so much time and money untangling and replacing the 25 systems that let a customer withdraw $100?* Third, the risk of such an undertaking is daunting. Past core modernization failures make both IT and business leaders think twice about tackling this problem head on. Given this state of affairs, the reluctance to embark on a highly disruptive, costly and prolonged core modernization process while things are still working “just fine” is understandable.

The answer to the vexing question “Why modernize?” is increasingly strategic in nature, and not limited to the financial services industry. In a recent survey of about 700 business leaders from multiple industries, only slightly more than half (51 percent) of respondents indicated that business simplification (which includes simplifying core technology in IT functions) is of strategic importance to senior leaders; and three out of five (60 percent) of these respondents reported that technology complexity inhibits their company’s ability to meet its goals.\(^1\) The keys to core renewal, therefore, include understanding the long-term and rising risks of continuing to utilize an aging core, the strategic benefits of modernization, as well as the different approaches available for accomplishing that goal. A road map for modernization is also key, as it will provide the answers to crucial questions, set the scope and direction of the undertaking, and carry the project through its long life cycle.

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EXPLORING THE CORE

The IT core of a financial institution is not unlike a geological model of the earth, starting from its center where the oldest systems of record reside and radiating outward to a surface where applications support consumer banking, commercial banking, corporate processes and regulatory activities.

Most banks use multiple “core” banking systems, which can be defined as key pieces of IT infrastructure and serve as source repositories for information regarding customers, accounts and balances. Examples of core systems include customer information systems, demand deposit account (DDA) systems, savings systems, securities accounting systems, trading systems, payment systems, and a variety of accounting systems that support various loan products (including installment loans, commercial loans, and mortgage and home equity loans). These core systems are responsible for delivering fundamental operations for accounts, loans, payments and securities. This technology is central to an FSI company’s ability to deliver services to its customers.
RENEWAL REWARDS – THE BENEFITS OF CORE MODERNIZATION

Recently, Deutsche Bank unveiled a modernization project that includes a $1.1 billion investment in digitization over the next five years, as well as an entirely new IT infrastructure. The primary objective of the endeavor is to improve the overall ability of the organization to scale up or down quickly to meet demands and control costs. This cost-reduction objective, along with the pressing need for risk mitigation and new revenue opportunities, forms the case for most financial institutions’ core modernization projects.

Risk Mitigation

Risk mitigation, specifically the risk resulting from diminishing supplies of talent and expertise available to continuously support decades-old systems, is the most obvious benefit of core modernization. Keeping core systems’ lights on requires significant and ongoing work. These older legacy systems often lack adequate documentation, and the number of COBOL and Assembler programmers who have not yet retired diminishes every year, along with the FSI company’s ability to troubleshoot these systems. If these aging systems do not receive the attention they need, they eventually will require more rigorous, costly and sometimes risky maintenance and fixes.

Another benefit of core modernization relates to regulatory risks. In the current era of hyper-regulation, banks are expected to update or modify their IT systems and operations regularly to comply with a dizzying array of new regulations. These rules, which include Basel III, Foreign Account Tax Compliance Act (FATCA) and the Dodd-Frank Act, among others, are designed to enhance risk management and governance procedures and improve transparency of banking operations in customer interaction. Since much of the data that supports the required regulatory reporting resides in the aging core systems, modernization creates an opportunity to improve the speed and effectiveness of compliance risk management practices.

Cost Savings

Some studies estimate that cost savings ranging from approximately one-quarter to one-third of IT operating costs related to core processing can be achieved through a combination of lower-cost computing platforms and application rationalization. These savings may be achievable in situations where core modernization transformations are aimed at consolidating several stand-alone applications and optimizing the costs associated with core applications and hardware processing. This type of consolidation also helps banks to reduce significantly the portfolio of systems that require maintenance, which further lowers maintenance and integration costs.

A second cost reduction opportunity of core modernization relates to the potential for expanded straight-through processing (STP). With STP, transactions that were previously subjected to a series of system validations are passed “straight through” the typical processing stages if they meet defined criteria, eliminating the need for manual exception reviews on these transactions. These transactions are identified as having a high degree of systematic accuracy and may not need an individual review by a specialist to ensure that the transaction was valid. By subjecting more transactions to STP techniques, banking processes can become less labor-intensive over time.

Lastly, a large part of the IT operating budgets of today’s banks support expanded infrastructures built over time in response to the need to offer new products and services to cater to different customer segments. Core modernization efforts, which often include the adoption of modern service-oriented architecture (SOA) and business process management (BPM) solutions, can help IT functions spend less on the maintenance of these structures and invest more in supporting technology for new business functions and activities.

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5 The Cost Benefits of Core Modernization, by Robert Hunt, CEB TowerGroup, April 2014.
These cost-reduction benefits are appealing at a time when many banks believe that they have reached a point where they have taken out about as much costs as possible. “One of [the drivers] is that banks are looking at their profitability model,” says a senior financial technology analyst. “They face restrictions on fee income, greater compliance requests and consumer changeover to digital, all impacting profitability. Without doing something dramatic to reduce your cost base, can you get returns back to 12 to 15 percent returns on equity? Banks are in the nines now. Those that are looking to the future say they need to take out 20 percent of their operating cost.”

**Revenue Generation**

Some argue that a significant portion of the business case for core system replacement should be derived from increased revenue opportunities. Though FSI respondents to Protiviti’s 2015 IT Priorities Survey deemed revenue generation less of a catalyst compared to risk mitigation and cost savings, it is nevertheless a viable and tangible benefit – typically achieved through product/service innovation and/or time-to-market acceleration. Two cases offer a boost for this view: The State Bank of India estimated that it increased business per employee by 250 percent as a result of a massive, eight-year core modernization initiative. Commonwealth Bank of Australia claims it fundamentally changed the way customers interact with its systems, citing significant and measurable customer-focused growth following a five-year core modernization effort.

**THE DEATH AND LIFE AND RISKS OF CORE MODERNIZATION PROJECTS**

Reclamation projects – especially those that fall under the heading of “urban renewal” – are high-risk undertakings that produce outcomes ranging from laudable successes (e.g., New York’s Central Park, The London Docklands) to widely recognized failures (e.g., the infamous razing of Boston’s West End in the 1960s).

Core modernization projects can be great successes, too – and they certainly can go terribly awry if undertaken without a clear vision rooted in the business reality of the institution, a well-defined road map, and solid program and risk management. There have been examples in recent years of core modernization efforts that have squandered tens of millions of dollars without achieving their objectives. Every core modernization effort, regardless of scope, contains risks that should be recognized and mitigated. These include:

- **Customer service risks**: Core systems enable many critical customer-facing services, such as payments, that need to be “always on.” These types of systems need to be handled with great care and detailed customer service considerations when they are replaced.

- **Regulatory risks**: Regulatory compliance is similar to customer service in that it cannot be “switched off” – even as the systems that service the compliance requirements are put out to pasture. Before aging core systems are replaced, all existing regulatory controls must be present in the new systems.

- **Program fatigue**: Like other large-scale, multiyear corporate initiatives, core modernization efforts are prone to program fatigue, which can set in during the lengthy change process.

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• **Competing priorities:** Due to the length and scope of core modernization work, these efforts can disrupt progress on other business priorities for months – or even years. This impact can make core modernization efforts unpopular with business sponsors who would rather invest time and money in their own innovation projects.

Though serious, these challenges are not insurmountable if managed with the proper understanding, preparation and assistance. The magnitude of these risks is less than the impact of delaying or avoiding a core modernization project, which can rise to the level of a strategic risk simply by not being addressed timely. As a recent Knowledge@Wharton-SAP survey report notes: “[M]any corporations are not aligning their actions more effectively with their stated goals of simplifying [their] … IT functions – and, as such, risk falling behind nimble competitors.”

### STRATEGIES FOR CORE MODERNIZATION

Each core modernization project is unique, yet they all have two things in common: They take a long time and they cost a lot. A core modernization effort can span several years, during which time internal and external environments can change, sometimes dramatically. New executives may arrive and depart; strategic priorities and budgetary conditions may change. For these reasons, it behooves FSI organizations committed to modernizing their core systems to develop a road map outlining the specific modernization strategy, and the processes involved and capabilities required during that period, to ensure the success of their projects.

In addition to all of the traditional project management enablers and processes such transformational enterprise initiatives call for (CEO support, an internal project management office, etc.), core modernization also requires rigorous evaluations regarding crucial “who,” “what,” “when,” “why,” “where” and “how” questions: *Why are we doing this? What is the business case? When should we proceed? What will the new enterprise architecture design be? Where will the technology be located (i.e., hosted and/or internal)? Who will help us (our technology and implementation partners)? And, of course, How will we manage a project of this size in a risk-savvy manner? All of these questions should be asked and answered during the business case and road map development process.*

The five strategies briefly summarized below represent the most common approaches to core modernization in FSI companies:

- **“Greenfield” core system development:** This approach requires starting from scratch with a modern, simplified core system and components. This may be the right approach for a brand new company or one that spins off from an established FSI corporation.

- **Preservation and protection:** This approach leaves existing core systems untouched while wrapping the core with a new layer of technology – typically, service-oriented architecture – that can support current and emerging applications. This approach may be appropriate for institutions that have substantial investments in legacy core infrastructure and want to mitigate the risk of change.

- **Simplification:** This approach focuses on taking complexity out of the surrounding layers of the legacy technology environment, but leaves the central core in place and customer-facing layers unchanged. The simplification extends to business processes and back-office technology, as well as to the systems that support regulatory compliance functions. An institution may consider this approach when near-term cost reduction is the primary goal.

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11 BBVA Compass’s core banking system modernization required an investment of $360 million and took several years, according to Forbes. Deutsche Bank has committed a $1.1 billion investment over three to five years to its own core modernization effort, according to American Banker. The State Bank of India’s core modernization lasted approximately five years, according to Tata Consulting Services and TowerGroup.
• **“Big Bang”**: This “rip and replace” approach involves a complete overhaul of the aging core, replacing it with modern systems.

• **Phased core replacement**: In this less drastic version of the Big Bang approach, a new core technology is implemented (usually in support of new business products) in an iterative fashion. This new core grows steadily until it is capable of handling all of the other existing layers of systems and applications, which then can be transferred over in a less disruptive manner.

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The ultimate objective of each of the approaches described above is to renew the core and/or critical systems so that all of the risks posed by those aging systems are mitigated, if not entirely eliminated. The less disruptive approaches save FSI companies from the steep challenges of a pure “rip and replace” approach, but they also may require further renewal efforts down the road.
CONCLUSION

In the aftermath of a devastating crisis, Seattle was forced to address a number of momentous decisions: Should the city center be relocated? Should the buildings that were reduced to heaps of ashes be rebuilt or redesigned? Should fire be the only risk that the rebuilding effort addressed? What, if any, innovations could be incorporated into this unique modernization endeavor?

By addressing those questions, early Seattle ultimately was able to develop a path forward that would spare the city from future disasters of devastating magnitude such as the 1889 fire, and allow it to grow into a thriving metropolis.

FSI organizations that are increasingly hamstrung by 20th-century IT systems at the core of their enterprises ought to take note of this foresight and planning and act before aging cores create full-blown strategic crises. By developing a well thought-out road map for IT core modernization, these organizations will take the first important step in their efforts to mitigate troubling risks, cut costs and, in some cases, stimulate new revenue.

How We Help Companies Succeed

Our research and industry participation point to enormous pressure for IT leaders in financial services companies to develop meaningful plans for core modernization. We help these IT leaders design pragmatic, risk-sensitive solutions to this challenge. With expertise rooted deeply in risk management, we can assist with the development of a road map, program and strategy for core modernization that are risk-savvy, customized to the organization, and deliver the desired benefits. Our core modernization team includes program managers, architects and subject-matter experts from across a wide array of solutions, to help our clients make informed decisions about all aspects of their core modernization projects, including risk, security, privacy, compliance, business performance and service assurance throughout the course of these major transformations.

Ultimately, our goal is to help our clients protect and enhance the value of their enterprises in the face of fast changes and ever-increasing demands. We provide the following services:

- Enterprise target-state architecture definition
- Road map development
- Business case development
- Vendor and integration partner selection
- Program management
- Data governance and migration
- Business process redesign
- Release management
- Organizational change management
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