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Introducing the **Legacy Systems Modernization Framework**

February 2016

The Legacy System Problem

Legacy systems are typically large, complex, custom built systems that deliver mission critical services, designed and built decades ago. Over the years they have tied the organization to outdated hardware platforms, programming languages and databases that are not part of the organization's future IT strategy. These systems pose increasing risk due to attrition of key resources, lack of flexibility to changing business demands and the complexity of the environment that has evolved around them. Recent news articles highlight the extent of the problem:

- "Incredibly, almost three quarters of the federal government's $80 billion IT budget goes toward keeping legacy systems up and running. The people that understand, built and are running them are leaving every day," said Scott. We're not building capacity with those skill sets." - Tony Scott, Obama Administration IT Chief[1]
- "This is a government-wide problem. Many of the financial and administrative systems that are central to the agencies' daily operations use the nearly 60-year old COBOL. Most agency CIOs have targeted those systems for replacement, but it's not a simple rip-and-replace job-any mistake could have a severe impact on the agency's ability to fulfill its mission." Gov't Computer News[2]

Drivers for Change

On average, 80 percent of time, energy, and budgets are consumed by the care and feeding of an organization's existing IT stack[3]. Within it, unwanted technical debt and complexity often exist, with systems at various stages of health, maturity, and architectural sophistication. Organizations have compelling reasons to consider modernizing their core legacy systems, and each situation should be handled based on the specific drivers and circumstances:

- **Flexibility to Changing Business Demands:** Web and mobile self-service capabilities cannot be accommodated by legacy technology
- **Complexity:** Legacy system changes are difficult and time-consuming. The systems are not well understood due to years of fixes, enhancements and "bolt-ons" that were not part of the original design.
- **Increasing Costs:** The cost of sustaining outdated hardware platforms and resources with difficult to find skill sets continues to rise year over year.
- **Maintainability:** The pool of resources that can make changes to outdated technologies is shrinking and it is difficult to find, hire, and train replacements.
- **Fear of the Unknown:** Critical business functions depend on a complex ecosystem that is not well-understood.

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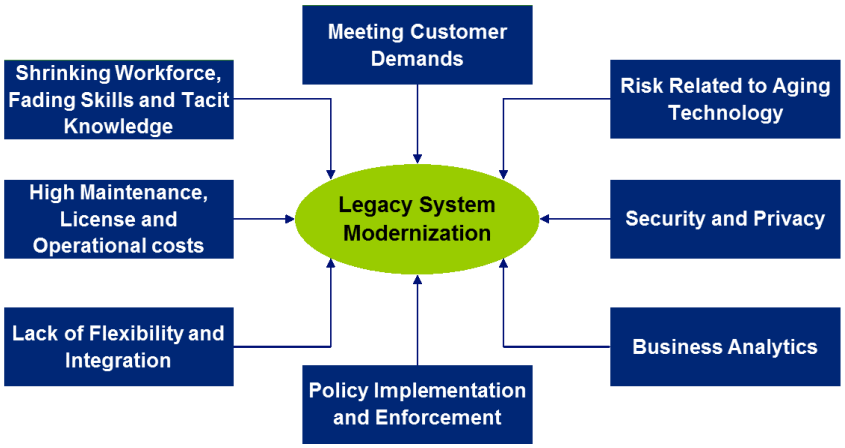
[1] Moore, Jack, "The Crisis in Federal IT That's Scarier Than Y2K Ever Was." Nextgov. 20 Nov. 2015. http://www.nextgov.com/cio-briefing/2015/11/crisis-federal-it-rivals-y2k/123908/.

[2] Robinson, Brian, "What's Worse: Living with Legacy Systems or Replacing Them."Government Computer News. 19 June 2015. https://gcn.com/blogs/cybereye/2015/06/legacy-systems.aspx.

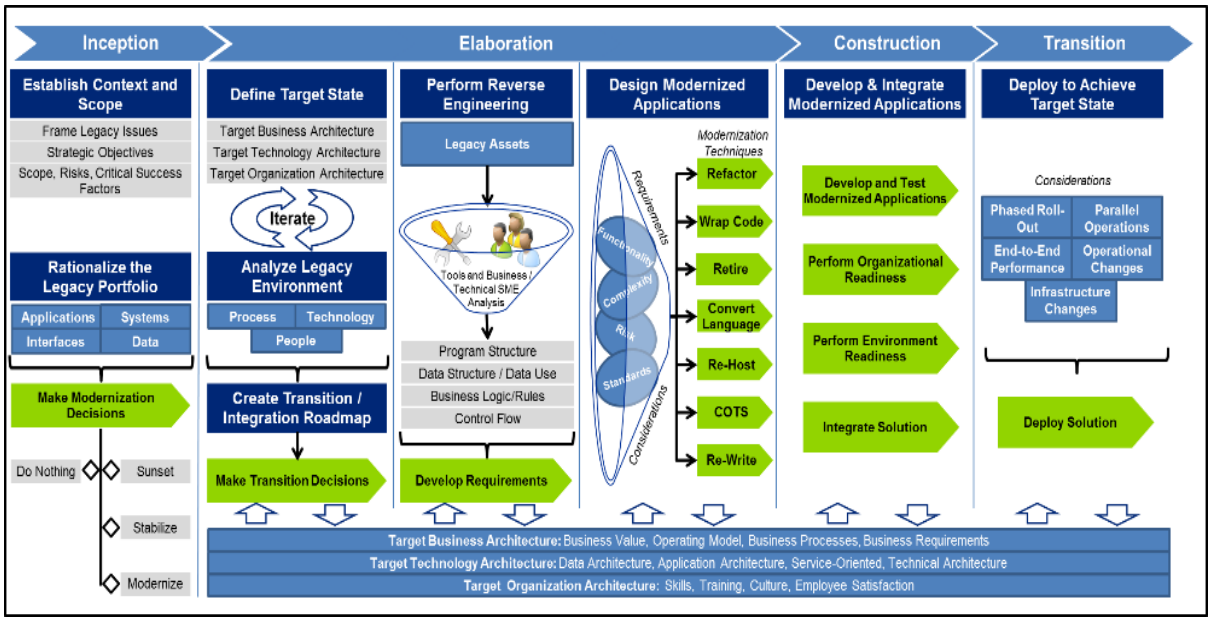
[3] Bob Evans, "Dear CIO: Is the time bomb in your IT budget about to explode?." Forbes, 22 Jan. 2013. http://www.forbes.com/sites/oracle/2013/01/22/dear-cio-is-the-time-bomb-in-your-it-budget-about-to-explode/#190c8b5d5c4d



These drivers continue to put increased pressure and risk on organizations over time. They recognize the need to modernize their outdated systems, but are wary of initiating a lengthy and complex undertaking that is full of unknowns. The can may be kicked down the road year after year, worsening the problem over time.

Our Framework

Deloitte's Legacy Systems Modernization Framework (LSMF) provides a comprehensive blueprint for modernization using a structured and pragmatic approach to plan and implement the appropriate steps when modernizing legacy systems. It is based on extensive experience and lessons learned delivering large, complex modernization initiatives across Federal, State and Private Industry. The framework is an all-inclusive set of modernization steps, techniques and tools to guide strategy, implementation, deployment, and long-term maintenance of modernized solutions. It also outlines the key decisions and trade-offs for each step, enabling avoidance of modernization pitfalls while addressing business objectives and managing execution risk. Through our extensive experience, we've learned that each unique situation requires its own tailored modernization approach. As a result, we work with our clients to determine the best approach based on their specific circumstances, drivers and pain points.



The table below describes the critical activities performed in each phase of legacy systems modernization. Deloitte's approach for legacy systems modernization is designed for incremental development and delivery. Early deliveries demonstrate results, minimize risk and build confidence and momentum.

Phase	Steps
Inception 	• **Establish Context and Scope**. Create a shared vision for the desired business and technical benefits of undertaking the modernization effort. • **Rationalize The Legacy Portfolio.** Assess legacy application environment at a high level, including hardware, software, and data.
Elaboration 	• **Define Target State.** Produce plans for "to-be" business and technical architectures as well as the future personnel strategy. • **Analyze Legacy Environment.** Evaluate systems and compare to target architecture; identify gaps. • **Create Transition Roadmap.** Prioritize identified changes and a phased rollout of capabilities with considerations of organizational capacity for change. • **Perform Reverse Engineering**. Decouple complex systems into constituent elements for redesign. • **Design Modernized Application**. Select the tool(s) and processes to be used for system modernization. Prepare detailed technical requirements specifications and detailed designs for modernizing the system.
Construction 	• **Develop and Integrate Modernized Applications**. Select a modernization technique based on assessment of risks and benefits. • Ensure integration of affected systems, new interfaces, pilots, and potentially parallel operations to assure the results modernized solution match those of the legacy system.
Transition 	• **Deploy to Achieve Target State.** Implement chosen solution in conjunction with revamped business processes. Includes deployment readiness, operational readiness and business readiness.

Modernizing to Achieve Business Results

- The ***U.S. Bureau of Engraving and Printing (BEP)*** faced challenges related to non-integrated disparate systems, conflicting data repositories, limited visibility into plant operations, lack of quality control, and reliance on manual processes. Deloitte and BEP planned and implemented a migration to open, scalable, and secure Commercial Off-the-Shelf (COTS) business applications tightly integrated with common technology platforms, Service-Oriented Architecture (SOA), and Cloud-based infrastructure. This enabled BEP leadership to gain an enterprise view of data for improved decision making across the organization, and more efficiently meet its mission of developing and producing U.S. currency notes.
- Deloitte and the ***Internal Revenue Service (IRS)*** collaborated to tackle complex system integration challenges during modernization of the core IRS legacy accounts receivable system. We developed and executed a modernization strategy which implemented data, application and interface modernization across three primary phases. Each phase delivered sizable benefits to taxpayers along the way, including faster refunds, notices, and acceleration of data to Customer Service Representatives for faster resolution of issues.
- Deloitte has partnered with the ***State of Wisconsin's Department of Health Services (DHS)*** and ***Department of Children and Families (DCF)*** in order to transform their COBOL-based CARES mainframe system into a modern, feature-rich web-based application. The modernization streamlined business processes, improved data integrity, and reduced training time. As a result, Wisconsin has improved service delivery channels to benefits programs, increasing customer participation in the process.

The Deloitte Difference

We bring an unmatched combination of legacy modernization experience, expertise, and breadth of services.

Wealth of experience

Deloitte has experience delivering results through large-scale legacy systems modernization programs across all industry sectors:

- Federal Government
- State/Local Government
- Private Industry

Breadth of Services

We have expertise across all industries and functional areas, enabling a deep understanding of your business/mission.

- ✓ Financial Advisory
- ✓ Technology, Strategy, Human Capital Consulting
- ✓ Tax / Audit

Packaged Solutions

Bundle legacy modernization with other Deloitte solutions tailored for your specific needs:

- Cloud
- Security
- Digital & Mobile
- Analytics

Global Recognition

#1 in Consulting for North America (Kennedy, Gartner)

Named *the* **global leader** in business technology transformation consulting (Forrester)

Named *the* **worldwide leader** in Digital Strategy Consulting Services (IDC)

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Contact us for more information on the Legacy Systems Modernization Framework!