The Business Imperative for Modernization

Accelerating Business Outcomes.
EXECUTIVE SUMMARY

For more than 45 years, organizations have been designing, developing and enhancing applications portfolios and associated infrastructure to increase productivity, lower costs, and assist in the attainment of business objectives. These components encompassed the essential business rules, data, and processes required to run most organizations. As ensuing waves of newer technology came to fruition, enterprises and individual departments began to leverage these improvements to gain competitive advantage. These efforts most often took the form of new development, package implementation, migrations or conversions, integrations, and re-platforming initiatives.

Over the years, this patchwork approach often resulted in a Balkanization of technology within the enterprise and the inefficient stove piping of information. More recently, enterprise software suites were installed and customized in order to help standardize platforms, rationalize applications portfolios, and easily distribute needed data throughout the organization. However, in many organizations, older technologies in the form of industrial strength systems remained behind the curtain.

This cumulative technological portfolio and the continuing stratification of technology demanded an ever-increasing percentage of IT budgets simply to operate and maintain. According to a benchmark study of 180 global companies by the Corporate Executive Board (Board October 2012), 67% of average IT annual expenditures is now allocated to maintenance and mandatory spending, leaving precious few budget dollars to leverage the convergence of new disruptive technologies, such as cloud, mobile, social media, and big data.

About NTT DATA

NTT DATA is your Innovation Partner anywhere around the world, with operations in more than 40 countries. NTT DATA emphasizes long-term commitment and combines global reach and local intimacy to provide premier professional services, from consulting, application services, business process and IT outsourcing to cloud-based solutions.

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The Growing Consensus for Modernization

Corporate IT directors, technology leaders, and industry pundits now consider modernization the most viable solution to this technological morass, reducing the need for organizations to continually evolve their applications portfolios. Today, modernization is not simply a matter of converting or migrating code, or discarding and replacing targeted applications. Rather, it is a process initiated from a business perspective that takes a holistic approach to analyzing application portfolios and related infrastructure together with existing business processes. Modernization enables enterprises to migrate and enhance their systems’ functionality and data to capitalize on more business-relevant, flexible, and cost-effective technologies. It aligns business goals, user needs and technology capabilities, allowing the transformation to a future state using a predefined technology roadmap. These undeniable benefits are leading to increasing numbers of new modernization programs within a growing number of enterprises.

Gartner 2012 user data shows the growing demand for modernization due to the dynamic nature of organizations’ enterprise application environments: On average, nearly 78% of current enterprise application portfolios will experience some level of change in the coming two years – retire, replace or upgrade – while only 22% of the portfolio will remain unchanged. (Gartner Inc., “Market Trends: New Imperatives for Application Modernization to Support Business-Led Value,” Allie Young, Patrick J. Sullivan, 1 August 2013).

Application of Knowledge is the Key Competitive Advantage

With the advent of Big Data and sophisticated analytics to enable the mining of infinite amounts of customer data, the major source of competitive advantage has shifted from product and service differentiation toward the application of knowledge and information. As a result, organizations are requiring their IT departments to respond to changing environmental requirements and business needs in record time. Evolving government regulations and competition from startups leveraging new technology have made organizational agility a critical core competency.
Moreover, enterprises are increasingly dependent on technology to:

» Drive sales growth or meet mission objectives
» Develop innovative new products and services
» Attract, serve, and retain customers
» Mitigate risk
» Improve efficiency
» Support widespread access to information

These factors have combined to make some type of modernization program a necessity in today’s business environment rather than an optional initiative.

The Changing Role of Modernization – A Business-Focused Approach

Unlike previous methodologies for modernization, which focused almost exclusively on cost-reduction and technical issues, the new approach begins at the top of the organization with an analysis of business issues and user objectives, including ease of use, increased job efficiency and productivity, and cost control. These business drivers, together with an analysis of technical challenges, drive the optimum path for modernization. This approach is process-centric and tool-agnostic, following a pre-defined evolutionary roadmap for applications portfolios and the associated supporting infrastructure. Among the benefits it delivers are enhanced functionality, cost reduction, organizational agility, decreased time to market, enhanced business ROI, and risk mitigation.

New modernization techniques utilize best-of-breed accelerators, adaptors, and tools and leverage open source, cloud, outsourcing, and reusability of architectural components to support business processes. A successful initiative therefore should be delivered via an experienced cross-functional team comprised of enterprise architects, domain subject matter experts (SMEs), and technology SMEs working in a global environment. Modernization efforts usually can be self-funding since the reduction in costs for application and data center expenses typically offsets the costs of the program. This approach to modernization also builds organizational consensus and executive support, without which such efforts cannot succeed over the long term. In short, today’s modernization programs are designed to optimize value, cost, and risk.

The Technological Convergence

A series of new, disruptive technologies has been quietly converging over the past several years, threatening to impede enterprises unable to leverage them due to outdated application portfolios and infrastructure. The accelerated adoption and amalgamation of these technologies – cloud, social media, mobile and big data – together with dramatically accelerating technology change cycles are seriously squeezing IT organizations and budgets.

With zero-based budgeting and little to no increase in technology spending, enterprises must scramble to secure funds to invest in these breakthrough technologies. This budgetary pressure requires the optimization of ROI from existing IT assets, particularly with respect to application portfolios.
In addition, corporations must mitigate their risk of depending too heavily on legacy applications and users as baby boomers increasingly retire and their skills become obsolete.

Modernization can address these issues without material capital expense by leveraging new technologies and extending the life of existing applications, which in turn lowers the total cost of ownership (TCO). The simplification of systems and reduction in hardware increases efficiencies and lowers costs, while simultaneously mitigating risk. Modernization also can accelerate desired business outcomes and is non-disruptive to end users. Finally a modernization initiative can be aligned with a business transformation process in order to comprehensively streamline an enterprise.

Developing a Roadmap for Success

To be effective, modernization cannot be achieved in a vacuum but must be an integral part of an application lifecycle management (ALM) approach. It must be guided by a modernization framework and a predetermined roadmap of the desired future state. An application lifecycle approach encompasses the practices, processes, and tools that aid in managing the application development life cycle, specifically the workflow and assets associated with producing or maintaining a custom software application. Modernization leverages a portfolio management approach in order to more effectively manage enterprise systems throughout the application’s development lifecycle. The modernization framework provides a methodology to build a business case, define a baseline, and delineate the most appropriate tools and techniques to use, incorporating quality-by-design into the process. Perhaps most important, successful implementation follows a carefully pre-defined modernization roadmap.

The Need for Application Lifecycle Management

Application lifecycle management (ALM) is the concept of actively managing an application throughout its usable life, including the processes and assets associated with producing and maintaining software applications. Critical organizational competencies include change management, workflow and work item management, and an integration plan that enables traceability and accountability across multiple processes, locations, tool types, and tools across diverse stages of development and delivery. ALM must also include sophisticated project and portfolio management and IT service management tools and techniques, which assist in planning, measurement, control, and reporting.

For example, the Information Technology Infrastructure Library (ITIL) (ITIL Official Site 2007-13, The APM Group), which is a set of best practices for IT services management, includes the following ALM standard phases within its documentation:

» Requirements: requirements gathered based on the business needs of the organization

» Design: requirements translated into specifications
» **Build**: application and operational model are made ready for deployment

» **Deploy**: operational model and application are put into the existing IT environment

» **Operate**: the IT service provider operates the application as part of the business service

» **Optimize**: performance is measured, improvements discussed, and additional development is initiated if needed

### The Role of a Modernization Framework

An Application Modernization Framework (AMF) aligned with the ALM is vital to the long-term success of any enterprise-wide modernization initiative. An AMF integrates best-of-breed tools with proven accelerators and a robust methodology to optimize portfolio technology and cost of ownership. Typical frameworks include these stages: investigating the issues, establishing a baseline, defining needed transformational elements, and selecting the most appropriate tools and methods.

An AMF should include a bottom-up information-gathering approach to align recommendations with specific strategic and operating metrics. The framework should also incorporate a proven retirement acceleration element, a rigorous estimation model, and a cost-effective factory-like approach for applications that leverages open source and cloud re-hosting opportunities whenever possible. Importantly, an AMF must contain a systematic approach to application analysis that identifies each application’s retirement scope, process and priority, incorporating fundamental elements of people, process, technology, and change management.

A typical AMF should include the following phases:

#### Figure 2: Application Modernization Framework (AMF) – Phases

<table>
<thead>
<tr>
<th>Assess &amp; Plan</th>
<th>Architect &amp; Build</th>
<th>QA &amp; Deploy</th>
<th>Maintain &amp; Evolve</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investigate</strong></td>
<td><strong>Analyze &amp; Document</strong></td>
<td><strong>Code &amp; DB Transformation</strong></td>
<td><strong>QA, Performance Tuning</strong></td>
</tr>
<tr>
<td><strong>Investigation</strong>: developing a fact-based prioritization and sound business case to optimize value and minimize risk</td>
<td><strong>Analysis and documentation</strong>: establishing an “as is” baseline of systems and processes and identifying transformational elements needed for “to be” scenario</td>
<td><strong>Coding and data transformation</strong>: leveraging leading-edge tools and methods to accelerate code and data migration, refactoring, architecture modernization, and mobility of data</td>
<td><strong>QA and performance tuning</strong>: incorporating quality by design, performance, and latency management and tuning</td>
</tr>
<tr>
<td><strong>Transition, re-host, or sunset</strong>: integrating innovation with the modernization lifecycle to optimize the portfolio landscape</td>
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Selecting the Right Provider

Many enterprises do not have significant experience building the business case for and implementing a comprehensive modernization program, nor do they have a proven APL or Modernization Framework. Thus, having a trusted modernization partner provides a significant advantage. Questions to consider when evaluating and selecting such a partner include: Does the provider have the necessary experience? Can you trust the provider to put your organization’s interests first and foremost? It is also wise to look at the vendor’s overall strategy for modernization. Does it begin with unique business and strategic requirements or is it more technically focused? For example, does the vendor include both business and technical analysts on the initial team?

The following checklist of vendor qualifications should help guide organizations in identifying the right partner for their modernization initiatives:

» A large global footprint that can support a worldwide enterprise
» Appropriate vertical industry expertise and a deep understanding of the organization’s business
» A proven application management methodology and Modernization Framework
» The ability to assist in building a persuasive business case
» Expertise in establishing baseline assessments and planning the evolution of existing application portfolio and infrastructure

» Relevant first-hand experience in leveraging new technologies and approaches, such as cloud, social, mobile, and big data
» A profound understanding of legacy applications and infrastructure
» A broad spectrum of modernization tools, techniques, and best practices

The Time to Act is Now

The role of modernization is being transformed as enterprises face an acute need to improve agility, flexibility, time to market, and risk mitigation. Despite the stratification of technology built over many years, enterprises need and expect a real-time response from IT organizations to help support growth, the acquisition and retention of customers, and the development of innovative products and services. This is especially true given the competitive shift in recent years from product and service differentiation to the effective application of knowledge and information. Additionally, enterprises must facilitate ubiquitous access to information and adopt and leverage new, disruptive technologies such as cloud, social media, big data, and mobile. Consequently, organizations are increasingly turning towards modernization as the most viable solution to these technological challenges, as well as a clear business imperative.

Today’s modernization philosophy employs a holistic approach that not only focuses on improving efficiencies and lowering costs, but also helps solve business problems and achieve user objectives. To successfully transition towards a pre-defined evolutionary roadmap
for the applications portfolio and supporting infrastructure, the modernization program must be both process-centric and tool-agnostic.

To maximize ROI and minimize risk, enterprises are urged to select an experienced modernization provider that can bring significant first-hand expertise in leveraging new technologies, legacy applications, and infrastructure. The chosen vendor should have a mature and proven application management methodology and modernization framework as well as corresponding tools, techniques, and best practices. The ideal modernization provider should become a trusted advisor and partner that can support a growing global enterprise over the long-term.

**Common Modernization Missteps**

1. Assuming you know what you need before you complete an assessment
2. Believing you must dispose of all your current systems
3. Focusing on technology rather than alignment with C-level agendas
4. Adhering to the original plan at all costs
5. Choosing team members based on availability rather than skills
6. Minimizing the potential impact of disruptive technologies
7. Stressing technical processes over architecture and design

**Five Basic Strategies for Application Modernization**

1. **Improve**: modernize selected components to extend legacy value
2. **Encapsulate**: expose business processes through service-oriented architecture (SOA) to extend legacy value, reduce costs, and improve transparency
3. **Augment**: extend legacy systems’ value and functionality by using external components wherever possible
4. **Migrate**: transition to modern language platforms to reduce costs and mitigate the impact of workforce retirements
5. **Replace**: Use commercial off-the-shelf (COTS) or custom solutions to gain new functionality and agility, and lessen the impact of impending retirements
Case Study A

Banking: Integration and Modernization Enhances Application Functionality for Global Bank

This transfer agency application has over 800 user corporations and 9 million shareholders, providing a range of services through its web-based solutions. Most of these applications were maintained and hosted by a variety of vendors with widely distributed technology support infrastructures. The client wanted to better align the applications portfolio with its long-term strategy by consolidating and integrating the existing set of applications and reducing its costs for development, maintenance, and support.

NTT DATA carried out a comprehensive assessment of the client’s current applications and explored a scenario of best-fit options. The solution included an analysis of shortcomings and needs in existing functionality, a feasibility assessment, a comprehensive competitive analysis, a long-term modernization strategy and implementation roadmap, a unified technical architecture, and the addition of new features and functions.

Key benefits of the integrated application portfolio model include:

» Web-based application that allows shareholders to access their account details, balances, dividend enrollments, tax information, and historical transactions, and to purchase and sell stock

» Client Connect application that enables corporate clients to access individual shareholder account information

» Customer Service Workstation that can be used by service center representatives to quickly resolve shareholder queries

» Provided interactive user interfaces

» Improved scalability, maintainability, accessibility, and workflow processes

» Shared data services that improve data quality for corporate decision-making

» Standardized and enhanced reporting capabilities

» Management of electronic voting, online proxy material requests, and other transactions
Case Study B

Retail: System Modernization Yields Increased Capabilities for Retail Grocers Cooperative

A cooperative of retail grocers that provides procurement, quality assurance, packaging, and other services to supermarket retailers, wholesalers, and food service companies engaged NTT DATA to modernize its aging IT systems. A critical legacy application based on an AS/400-COBOL-DB2 midrange system, supported pricing, promotions, procurement, accounting, and freight operations, yet it was plagued by business process inefficiencies, poor data quality, and significant functionality gaps. The company needed to develop a long-term strategy for providing enhanced usability, functionality, business intelligence capabilities, and process efficiencies, and also sought to reduce its cost of operations and increase organizational agility.

NTT DATA completed a comprehensive analysis of the company’s legacy applications, including an evaluation of its basic architecture, a summary of re-architect/modify/replace recommendations by module, areas for replacing coding with table-driven logic, opportunities for database redesign, and improvements in user interfaces. The NTT DATA team also identified key challenges and gaps, and formulated an architectural roadmap for modernization. In addition, the company conducted a series of workshops and user interviews to assess future pricing requirements and build support for the modernization initiative.

The SOA modernization project integrated new and existing functionality, wrapping the current business logic in host integration-enabled services using a .NET technology platform. Benefits of the modernization initiative included:

» Integrated interface that allows users to view, share, and download information quickly and easily
» An architectural model that can integrate future applications with minimal business disruption
» Enhanced data quality through master data management
» An efficient platform for remediating functionality gaps
» Ability to view data at both summary and detail levels
» Real-time data to help member-owners gain valuable financial insights
» Mapping and charting capability to quickly and easily display statistical information
The business benefits of this modernization initiative included:

» Reduced administrative and operational costs
» Increased processing efficiency
» Enhanced responsiveness of customer service
» Improved response time to business changes
» Elimination of system overlap
» Improved data for analysis and decision-making
» Employed SOA and ETL integration approaches
» Retirement of legacy and unsupported technologies
» Successful database migration to Oracle 10g

Case Study C
Healthcare: Streamlined Modernization Initiative Integrates Legacy Systems and Improves Data Access for Healthcare Payer

This healthcare payer was experiencing high costs of system ownership and inefficient data access that negatively impacted its customer service and responsiveness to industry demands. As a result of merger and acquisition activities, the company was supporting two legacy portfolios of membership and enrollment systems, leading to significant inefficiencies and high costs. To remedy the situation, company executives wanted to consolidate membership and enrollment systems onto a forward-looking platform, with the goal of reducing costs, streamlining operations, and keeping pace with competitors by offering innovative, new products.

NTT DATA enterprise and data architects worked closely with the client to establish a future-state system vision built on n-tiers. The new solution included enterprise business services, Service-Oriented Architecture (SOA) orchestration for business processes, SOA data access, and a BI layer for reporting analytics. Over 140 individual applications were driven through an integration patterning process to determine future state dispositions.
Case Study D

A Large City’s Property Records System Gets a 21st Century Makeover

The online land records solution of a large US city manages more than 16 million mortgages, deeds, and other land-related documents. The tool had become indispensable to constituents, businesses, and the city government, receiving up to six million hits per day.

The large and complex system contained more than 40 modules, including public-facing, back office, workflow, and government-to-business components. Updating the system to accommodate statutory and regulatory changes became more and more difficult because code was written in outdated languages and because the tool included third-party components that were no longer supported. The agency needed to modernize the online tool to ensure swift creation, search, and retrieval of land records for years to come.

NTT DATA’s proposed a hybrid modernization solution rather than a time-consuming and costly “rip and replace” – which could negatively impact city property operations. NTT DATA’s hybrid approach used an automated tool and a manual rewrite to renovate the code. This approach enabled NTT DATA to retain the system’s user interface components while re-architecting the system supporting them and equipping it to take advantage of newer technologies including document management and workflow technologies. The solution was completed within budget in only 24 months and without disruption, using NTT DATA’s modernization methodology.

The city government now has a high-performance, highly available, scalable, and integrated solution with enhanced functionality while preserving the internal and external user experience and meeting the city’s goals for maintainability and future extensibility. The agency can now implement enhancements to the online land records tool quickly and affordably, and the user community has benefited from gaining the ability to submit documents electronically, which reduces the time and labor formerly required for department staff to scan and process paper documents.

References


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Many commercial Fortune 500 organizations and public sector agencies have used the NTT DATA Application Modernization Framework to fast-track modernization while simultaneously reducing cost and risk.

NTT DATA brings together all of the elements necessary to become your trusted modernization provider:

» Business focused, innovation-led, holistic approach
» Large global footprint
» Deep industry expertise
» Experience with both new technologies and legacy applications and infrastructure
» Proven application management methodology and modernization framework
» Flexible solutions, including SaaS, custom, lift and shift
» Near real-time analytics
» Modernization tools and techniques for both application portfolios and infrastructure
» A dynamic application management and outsourcing offering