

Arkin Software Technologies' Whitepaper Series

Legacy Modernization – Transformation into an Agile Enterprise



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Introduction

Many research analysts agree that over 75% of corporate business systems today can be classified as legacy systems. They are widely used as the core systems of companies, and have reliably delivered good results over a long period. However, as a result of steady changes over many years, they have become inflexible and fatigued by obsolete equipment/architecture, increasing maintenance costs, lack of skilled resources, and system rigidity. In most organizations, bulk of the annual budgets (upto 80%) are consumed by the existing IT operations, leaving very little for new initiatives that are critical for continued ability to innovate and be agile.

Historically, legacy systems meant systems configured with mainframes and mid-range systems. However, that definition has substantially expanded now, to include also the systems that are hovering in the technological obsolescence, or on the verge of being discontinued from vendor support programs. Organizations have made huge investments in building the legacy applications and maintaining such critical systems that they depend on to run their businesses. These legacy systems contain vital industry and organization-specific business rules. But, the legacy systems often lack the flexibility to help businesses accelerate their time to market, improve customer service, automate business processes, consolidate multiple businesses and expand into new markets.

Now, the enterprise managers increasingly are being forced to address as they seek to optimize information security, business continuity, efficiency and effectiveness. Because of this, legacy systems are moving over to lower cost, flexible open systems that offer reductions in systems maintenance costs and that can flexibly adapt to different management strategies. This movement is being referred to as legacy modernization.

Legacy modernization is not simply a technology challenge but a business imperative. With the accent on flexibility, it supports business growth, allowing companies to seek solutions such as replatforming, migration, remediation, reverse and re-engineering.

Legacy modernization requires less investment in time, money and people than traditional alternatives, if approached systematically. This paper presents some of the proven approaches and best practices for embarking on large-scale legacy modernization initiatives, to allow organizations to reuse and extend the functionality of the existing assets while minimizing the risk. Legacy modernization enables organizations to be agile not only in intent, but in capability too.

Why Modernize?

The decision to necessitate modernization of legacy systems is influenced by several factors, including –

Business agility:

Market dynamics and regulatory pressures are forcing organizations to adopt an agile enterprise approach-built around systems and processes that enable an organization to react quickly to changes in the market and tightly focus the information technology budgets on developing and enhancing the functionality of its systems. These characteristics are increasingly being achieved through agile approaches like the move to a service-oriented architecture (SOA), which in turn is most successful when supported by modernized application services.

Business necessities:

Enterprises' success in the global market largely depends upon their processes and ability with which they can compose new and change the existing processes. An important aspect of the process is to be able to seamlessly integrate information flows among partners, vendors, customers and employees. Legacy systems largely limit the possibilities for such seamless and agile integration.

Eliminate inefficiencies:

Over a period of time, most legacy applications accumulate lot of dead code, inefficient programming, and inadequate documentation updates making continued maintenance even more expensive.

Dwindling legacy skills:

There is a serious shortage of skills in the legacy technologies, driving up the support costs steeply. In many organizations, experienced programmers who understand the legacy applications are reaching retirement age. In many instances, support for these old systems is obtained from retired IT personnel. The diminishing pool of capable and available professionals for maintenance is putting many organizations at a growing level of risk.

Risks:

Businesses face significant risks associated with running potentially unsupported hardware or software. With legacy systems, something or other slipping out of vendor support is quite high.

High costs:

In most organizations, bulk of the annual IT budgets (upto 80%) are spent to just support the existing IT, leaving very little for new initiatives that are critical for continued ability to innovate and be agile. Legacy modernization will relieve some of the maintenance budget for newer and most-needed other initiatives.

Partial modernization makes it more complex:

In some cases, legacy applications have been ‘face-lifted’ through techniques such as ‘wrapping’, or custom application integration through a package implementation, or providing just a rich client user-interface etc. Such changes substantially increase the ongoing maintenance of systems.

Return on investment:

Compared to system replacement, legacy modernization leverages organization’s existing IT assets and in-house skills, and largely eliminates disruptions to the business and IT operations.

Evolving as Agile Organization

Legacy modernization, when viewed from long-term organization agility point of view, requires an integrated and end-to-end approach. Only with such an approach, it is possible to evolve the IT systems to keep pace with the rapid pace of today’s business environment. Driving cost efficiencies by retiring and re-engineering applications alone will not be sufficient to make an organization agile – rearchitecting will deliver the ultimate business value. In short, the approach is from Enterprise Architecture – a business driven view from the top.

Evolution of IT systems for an agile enterprise will require the following –

- cleanly separate the business logic, the database, the user interface, and inter-application communications
- standardizing interfaces between layers and components
- standardized components or commercial off-the-shelf software (COTS)
- constructing applications from finer software components (‘Services’) as much as possible

Such an open architecture reduces the dependencies among the layers and component services, making the application collaboration layer much more adaptable. It provides a highly flexible environment that supplies reusable services as enablers of best practice business process support. Such architecture enables quick composition of adaptable applications that can respond competitively to changing circumstances, the essence of the agile enterprise. This is essentially the concept of Services Oriented Architecture (SOA). SOA is helping in re-using legacy assets alongside new applications, by creating a layer of re-usable business services on top of the legacy applications. In turn, these services are dynamically orchestrated to execute business processes that remain agile. This eventually translates to rationalized IT portfolio and helps organizations to retire bleeding applications and processes.

Modernization options

Over the years, several different options have come intorange of possibilities, as explained below, and there is no being for legacy modernization – each of them met with“the option” for all legacy transformation initiatives. varying success and adoption. Even now, there are a

Migration: Migration of languages (3GL or 4GL), databases (legacy to RDBMS, and one RDBMS to another), platform (from one OS to another OS), often using automated parsers and converters for high efficiency. This is quick and cost-effective way of transforming legacy systems.

Re-engineering: A technique to rebuild legacy applications in a new technology or platform, with same or enhanced functionality – usually by adopting Services Oriented Architecture (SOA). This is the most efficient and agile way of transforming legacy applications.

Re-hosting: Running the legacy applications, with no major changes, on a different platform. This is often used as an intermediate step to eliminate legacy and expensive hardware. Most common examples include mainframe applications being rehosted on UNIX or Wintel platform.

Package Implementation: Replacement of legacy applications, in whole or part, with off-the-shelf software (COTS) such as ERP, CRM, SCM, Billing software etc.



Integration: Extracting business rules from legacy systems in a quick and cost-effective way, for fulfillment of business processes, often using package integration solutions with application adapters.

There are other frequently used techniques such as interface modernization – which aims to enhance the user interface only, leaving the business logic as it is. It is often employed for quick enhancement of user experience.

The modernization process begins with the applications assessment process, during which the migration status and priorities for a portfolio of legacy applications are determined. At that time, options for modernization approaches are assessed, carefully balancing the value of various methodologies with the associated operational and financial costs and risks. The ultimate modernization road map additionally takes into account each modernization project's fit to key business strategies, and prioritizes project executions based on each project's business case.

Challenges in legacy modernization

Legacy systems are typically in existence for several years, which poses significant challenges for modernization. While the challenges are not major road-bumps, it helps to be aware of them so as to manage the transition effectively.

Co-existence of old and new systems: In most organizations, legacy systems are quite huge. Modernization of such large foot-prints can not happen at once and they require phased approach. This, in turn, brings challenges of maintaining old and new without affecting business or technology processes (assured business continuity).

Change management: Users reorientation on the newer systems needs to be taken into account, particularly if the User-Interface undergoes major uplift or complete replacement.

Scope definition: System requirements specification (SRS), which is a part of requirements gathering phase, can be a challenge for Legacy modernization. In many cases, documentation of the existing systems is either incomplete, inadequate, out-of-date or simply does not exist. As a result, it can be a challenge to get users to commit to a scope, without having to revisit it several times over.

Cost: While legacy modernization guarantees significant cost savings in the long-term, it does need capital outlay to transform which needs to be budgeted from the available resources.

Benefits of legacy modernization

- Improved support for automation of business processes
- Improved flexibility, with better underlying architecture
- Agile enterprise that can respond to business changes efficiently
- Reduced cost for support and maintenance
- Easier and faster integration with newer technologies and initiatives
- Reduced risks

Arkin Software Technologies' approach

Arkin Software Technologies follows a mature and well-tested approach to legacy modernization, which is also consistent with evolving business needs during the transformation life cycle. Arkin Software Technologies' approach is to provide a complete and comprehensive transformation solution using –

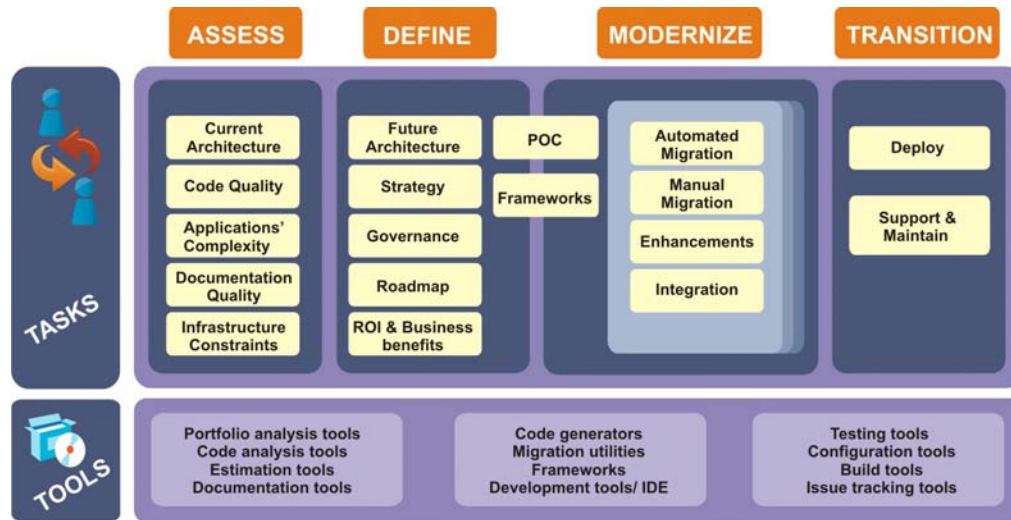
- proprietary parsing and conversion tools
- well-developed methodology, templates, and knowledge-base
- and experienced consultants

Arkin Software Technologies' legacy modernization methodology involves iterative model with 'slicing' of the legacy system to be modernized. Slicing allows flexibility to take up one or more slices at a time, depending upon the desired schedule. Additionally, slicing allows continued changes or enhancements to the application during modernization cycle, if needed. Slicing further allows freezing the target architecture early-on, with the first application slice acting as proof-of-concept. This helps avoid any costly surprises down the road in terms of performance and scalability of the application, upon modernization.

During legacy modernization implementation life cycle, Arkin Software Technologies embraces active participation with clients – through complete knowledge transfer at every stage, transparency in the process and high value to clients in terms of the Cost, Quality and Time.



Although each modernization engagement is reasonably unique, Arkin Software Technologies' modernization approach generally follows a typical set of steps as shown in the figure here, while it is not necessary that each project has to follow same set of steps and in the same sequence.



The Arkin Software Technologies approach involves Assess >> Define >> Modernize >> Transition phases, with typically the following activities.

Assess:

- Understand the over all view of the applications and external integrations
- Identify the complexity of applications
- Establish objectives and expectations from modernization initiative
- Establish the sequence and priority
- Run tools for the application for analysis, where applicable
- Discuss about frameworks - to be developed, applied or discarded
- Discuss security and access requirements

Define:

- Define the target architecture - Master Architecture Plan
- Identify a suitable candidate for proof-of-concept for architecture validation with regards to the performance, scalability and functionality requirements
- Identify common frameworks that can used for logging, exception handling, session management, persistence, caching, events and messages and service instrumentation
- Define Coding standards and documentation standards
- Define customization for parser or conversion tools
- Define the Testing approach, UAT and Deployment Transition approach
- Define the program management framework -including change management, configuration management, quality management, communication & reporting, issue tracking, risk management, infrastructure requirements, etc
- Develop detailed project plan and project management approach

Modernize:

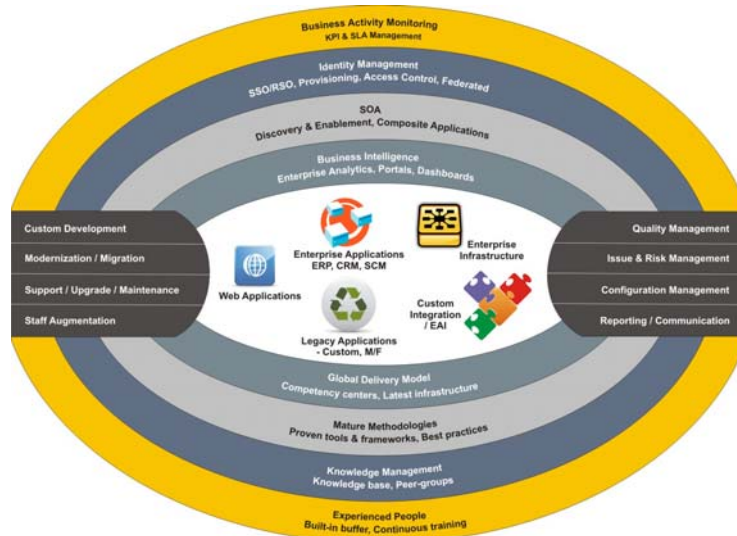
- Modernization using automated tools, followed by re-factoring
- Manual work-around, where needed
- Debug and test.

Transition:

- Generate the scripts for deployment
- User acceptance testing support
- Setting up governance
- Production deployment
- Post-production support and maintenance

Arkin Software Technologies – the right partner

Arkin Software Technologies, formerly known as Goldstone Info Systems, a CMMi Level 3 appraised & ISO 9001:2008 certified company, established in the year 2004, is an integrated service provider specializing in large enterprise Information Technology solutions serving global clients with delivery teams in several continents, and with business and technology specialists across various domains, supported by mature implementation methodologies and Metrics driven project management, Arkin Software Technologies offers comprehensive solutions to help clients to maximize value from their legacy modernization investments.



- Our solutions will be flexible in growth, both functionally and technologically, to meet organization's future needs – essentially helping organizational transformation to agility.
- We have experience of handling several large-scale legacy modernization projects for other global companies, which allowed us extensive familiarity with demands, standards and processes of global companies.
- Our suite of automated parser and conversion tools and our methodologies are well recognized, and are the best in terms of functionality, ease of use, and maturity.
- Our staff and key people are well trained and experienced. They have a thorough understanding of our proven project management techniques, methodologies, and best practices. They have successfully executed a variety of similar projects and are easy to work with, even under stressful situations amidst tight deadlines.
- We have experience in dealing with the technical, behavioral and budgetary issues resulting from the modernization of the large existing systems which very often are associated with highly integrated development and maintenance environments that employ new and extremely technical and complex components.
- Our seasoned global delivery model that draws upon the bandwidth and low-costs from our global centers in India and elsewhere.
- The above differentiators coupled with our ISO 9001:2008 and CMMi Level 3 -appraised and our obsession for customer satisfaction, will result in reduced total cost of successful migration.

Conclusion

Most organizations are saddled with bulk of legacy systems that place considerable strain on organizational resources, while impairing organization's agility. Legacy modernization has come to be accepted as an important initiative to make organizations responsive and competitive. It is important to embark on modernization path, with clearly defined and measurable milestones and results. Arkin Software Technologies offers expertise, experience, tools, methodologies and global talent pool to make the journey to business agility - in a cost-effective and efficient manner.