
White Paper:

From Legacy to the New World

*The Value Proposition for Converting
Legacy Applications to Newer Technology.*

Why Move from Legacy Technology?

Conventional information technology (IT) thinking says that if an application is functioning well, do not fix it. This can lead an enterprise to find itself with applications that have been working for years – even decades – satisfactorily supporting its end users while technological advances quickly cause these systems to be considered “dinosaurs.” More importantly, the availability, accuracy of results, and overall reliability of these legacy systems can decrease over time. This decrease has a direct effect on the ability of end users to perform their mission.

Therefore, organizations with legacy systems find themselves in a quandary: they are faced with legacy applications, platforms, and data stores that have, over years and years, assimilated the complex business rules that define how the enterprise serves its users, with no clear path forward into emerging technologies. To make matters worse, these legacy platforms become more expensive to maintain as the resources required to maintain them become more scarce. As organizations move into the newer technologies, the breadth of expertise required for maintenance of older technology widens as the resource pool shrinks, resulting in inefficient use of resources and increases in the backlog of maintenance requests. Parts and warranties also become scarce and many organizations cannot take advantage of the dropping costs of hardware because they simply cannot move from legacy systems.

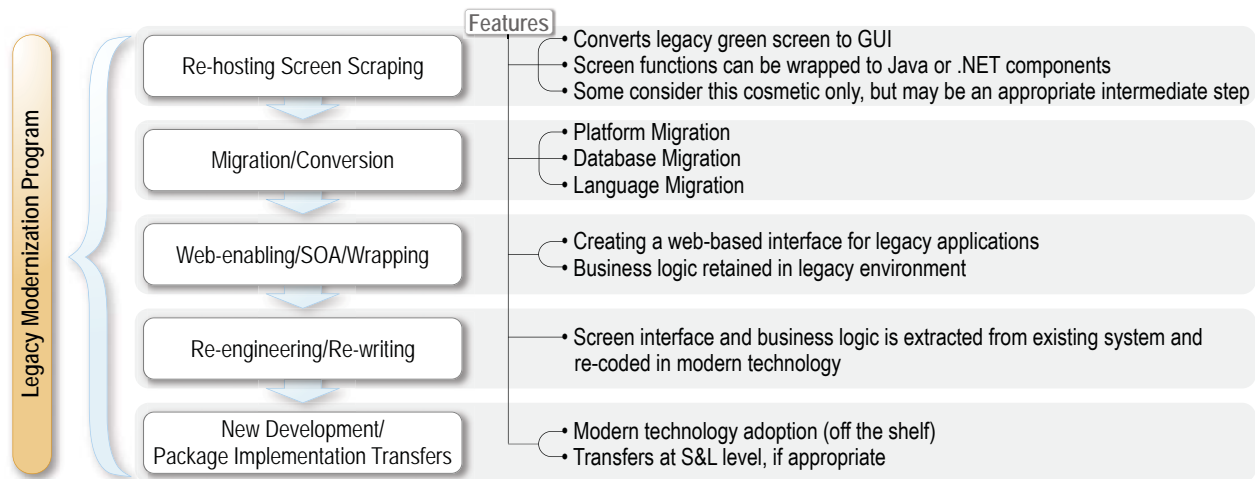
Migrating from the technologies of the past is not simply a desired course of action but a necessity to ensure the provision of accurate and timely information to users and citizen-centric services to constituents. Multiple operating platforms, global networks, instantaneous data access, data sharing requirements, browser-based user interfaces, reduced investments, and data center consolidation initiatives are only a few of the demands businesses and Government agencies place on the IT organization. The migration to modern technology is no longer a choice, but a cost-driven business decision, and in today's world, a strategic demand in constituent data security.

Taking the First Steps

Keane's approach to legacy modernization (LM) starts with an assessment of alternatives, allowing our customers to make initial decisions regarding the disposition of the organization's technological assets. The very first step of that assessment is to change conventional thinking in a basic way, and in doing so, add a new alternative. The entire organization must understand that *applications are valuable organizational assets that must be treated as any other item on the balance sheet; they have a life expectancy, and over-extension of this life expectancy can seriously impair the ability of users and constituents to perform their duties. These assets must represent a return on investment (ROI) just like any other resource that the organization maintains.* For many organizations, this change in attitude can be problematic despite the validity of the business case.

However, it is possible to migrate valuable applications from older technologies while realizing a return on investment (ROI) far beyond initial expectations and to allow those maintenance dollars to be spent in ways that are more beneficial to the organization.

To help CIOs, managers, and other professionals who make IT investment decisions understand this new way of thinking about the value of IT assets, we present a short primer on the LM options. As the diagram on page 2 illustrates, there are five methods for executing LM strategies: (1) Re-Hosting/Screen Scraping, (2) Web-Enabling or SOA Wrapping, (3) Re-Engineering or Re-Writing, (4) Custom Development, Package Implementation, or Application Transfer, and (5) Migration or Conversion. The key to legacy modernization success is to make informed decisions, application by application, as to the best disposition of each asset in the organization's portfolio.



Any strategy has to be viewed as a combination of functional and technical modernization

Each LM technique has its advantages and disadvantages. The five techniques are defined as follows:

1. Re-Hosting/Screen Scraping. This technique usually is a temporary fix appropriate for applications that will later be subject to a more permanent approach. This technique provides short-term and illusory benefits for various components of a portfolio while funds are allocated to permanent fixes for more critical applications.

2. Web-Enabling or Service-Oriented Architecture (SOA) Wrapping. This technique represents another form of improving the end user experience without necessarily shifting the legacy application from its existing technology. When using frameworks and SOA techniques, the application continues to support its user community and extend its ROI, without incurring the cost of another approach. This approach is also often used as a stopgap method while other more important applications are addressed, or while additional funding is acquired.

3. Re-Engineering or Re-Writing. This technique may be used when the perceived value of an asset does not support the expense of one of the other LM approaches or when the reliability and availability of

the system mandate its retirement. In some cases, these applications do have some residual value, and re-engineering is used to mine the existing application for business rules and processes which then feed the re-engineering process.

4. Custom Development, Package Implementation, or Application Transfer. This approach is used when neither the application nor the underlying business rules have much value to the organization. This approach involves the most expense and longest time to implement of any LM approach.

5. Migration or Conversion. This approach is more permanent, literally migrating the application to newer platforms, or converting the application to new languages, relational database management systems, or user interfaces by extracting the logic from the legacy application and implementing that same logic in newer technology.

The migration/conversion option should be undertaken when the existing application satisfies the business community to 80 percent. It is of value when the concept of functional equivalency is appropriate. For example, Government entities with Federally mandated applications (like Child Support Enforcement, or Women & Infant Children), operate against Federally

proscribed sets of functionality; while they may have been implemented in a variety of technical platforms, the basic functionality must be federally certified using specific test suites. These types of applications are classic candidates for technical conversions or migrations.

These techniques are not mutually exclusive; in many cases, two or more techniques will be used on a single application. For example, an application that fully satisfies 80 percent of the business unit's needs may be converted to new technology and then augmented by new development activities to satisfy

“Keane can help you plan and then execute any and all of these LM approaches, from plan to final implementation and beyond”

the last 20 percent. A second example might be an application that is not quite ready to be migrated to a new platform – in its case a screen scraping or SOA wrapping initiative could then be followed years later by a migration off the mainframe.

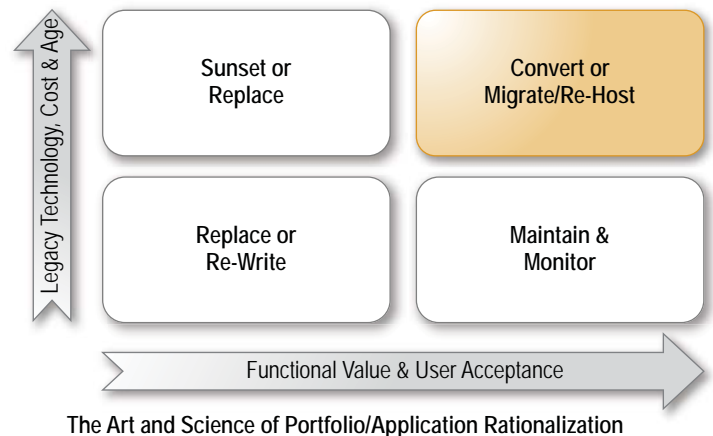
Deciding Which Approach Is Best for Your Organization

Step one is to define the inventory of applications that will be considered, realizing that some must or should continue in their current state for valid business or operational reasons. These applications should be removed from consideration except where they provide data points for later decisions (e.g., a COTS package may influence the organization's decision for the target DBMS platform).

Once the final set of applications to be considered is developed, the “art” of portfolio/application rationalization and disposition analysis can begin. Keane considers this an “art” because the analysis must include both technological and functional assessments to accurately select the best approach. The decision affects assets of the corporation; therefore,

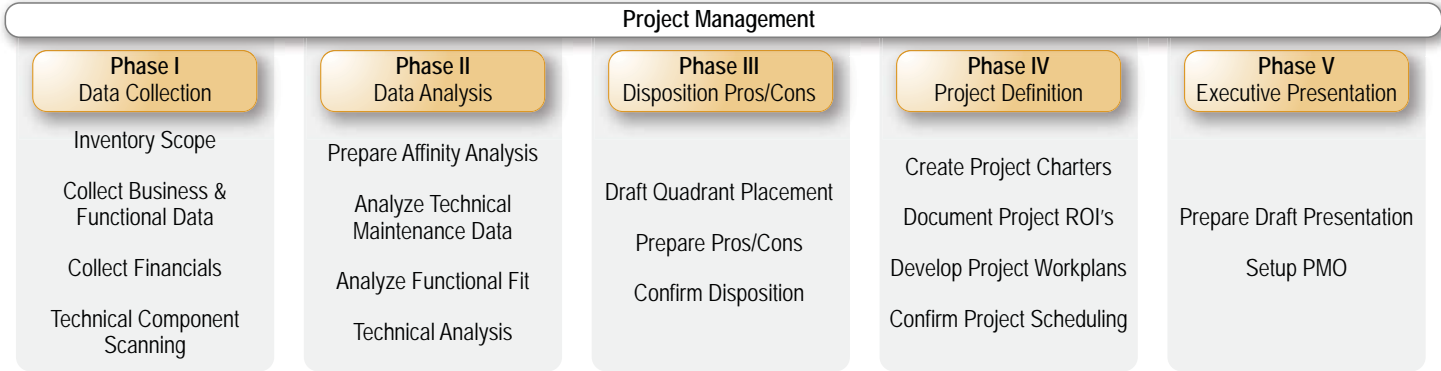
it should be made with the ROI at the forefront of considerations. Reliability, accuracy, and cost are the drivers. To understand the primary difference between the two assessment approaches, they can be equated to “art” (functional) and “science” (technology).

As illustrated by the diagram below, functional assessments (art) are more difficult to measure, but are no less important from the overall organization's perspective. The diagram is drawn in the Gartner quadrant style, but note that there are no scales on either axis; this is completely an intellectual assessment of where an individual application fits on the scales.



Using a combination of technical understanding, organizational and business knowledge, and financials, two points should be plotted – one on each axis. The point where those two lines intersect in the diagram should allow for accurate placement on the grid and informed disposition selections. These data points allow for initial soft decisions about which of the legacy modernization techniques might be best for this given application.

These decisions are based on end user interviews, facilitated sessions, documentation reviews, maintenance backlog requests, financial or cost information, contractual data, and the organization's Information Technology Plan.



Keane's Portfolio/Application Rationalization Methodology

The technological or “science” work stream utilizes more specific and technical data points to drive disposition decisions and legacy modernization technique options. This work stream requires technical analysis of the inventory components to provide detailed, numbers-based information about the applications. In this work, scanning engines are used to collect very specific data about the complexity, brittleness, affinity, size, calling/called programs, and other factors. Simple report programs rank lower on this scale than large programs with complex calculations, many calling/called programs and sophisticated database updates, etc. This detailed technical data is then augmented by interviews with the technical analysts that support the applications.

The combination of these art and science analyses results in an initial disposition matrix that is then subject to many other factors (e.g., political, financial, contractual, and scheduling), all of which affect the development of a plan for the organization’s legacy modernization strategy.

Target State

The last part of this planning activity is to define a target end state in terms of technology – specifically, to which RDBMS, language(s), platform(s) and vendor(s) should the organization commit? This commitment will be long term and will affect the organization's bottom line for quite some time.

As with any other activity, a structured methodology keeps the project on track and helps to ensure that all factors have been taken into consideration and necessary steps taken. Keane’s methodology for Portfolio/Application Rationalization methodology is depicted above.

“Keane can help develop this roadmap to the New World and position your organization to achieve its legacy modernization objectives”

Plan Execution

In more and more cases, legacy migration conversion is becoming the best alternative. Complete re-writing and new development or COTS implementations are inherently risky and expensive; screen scraping and web-enablement can be too incremental and temporary. Why not take advantage of the assets you already have that perform the functions they need to? Most would agree it would be ideal to have the exact same functionality the user community already enjoys but built on technology the IT department can support cost-effectively for the long-term. The ideal migration project would also cost less than the legacy system did to build and evolve over the years.

The Keane Approach

Keane's approach to legacy modernization is based on two important concepts: the use of sophisticated conversion engines and the idea of functional equivalency.

First, our legacy modernization practice relies heavily on the use of very sophisticated conversion or migration engines to perform the program modifications required to move the applications into newer platforms, languages, and relational databases. These engines literally "read" the existing inventory components, break them down, and rebuild them in the target technology. Keane partners with several of the tools vendors in this space, selecting the best partner based on the source and target technologies being addressed. While this form of "code generation" has in the past been crude at best, it is now emerging as a very viable solution for legacy modernization.



Not long ago, mission critical applications were strictly safeguarded on the mainframe. As many organizations now utilize simpler, scalable platforms, so, too, have the code generation engines evolved into very viable options when applied correctly.

Second, a key component of any legacy modernization offering is the understanding that the methodologies used by most organizations simply will not be effective in this space.

To be successful, the modernization program must use a methodology that focuses on a "lift and shift" paradigm, one that expects the functionality to remain the same while the technology changes dramatically underneath it. This is what we mean by "functional equivalency."

Success for a legacy modernization project and program is defined in a completely different fashion than most IT initiatives. The concept of functional equivalency is paramount in legacy modernization efforts.

The goal of functional equivalency is to convert, migrate, or change the technological components of the portfolio without altering the functional or business uses of the application. In the case of custom development or packaged implementations, this point is moot, but for most of the legacy modernization techniques, functional equivalency is the definition of success. In the example given above, functional equivalency is achieved first, and then the custom development is executed to achieve the remaining 20 percent of the business requirements.

What Are The Answers?



The Assessment Phase Answers:

What are the complexities that will make this challenging?
Can it be done with acceptable risk?
How big is the effort?

What is the roadmap and plan to the solution?
What is the cost and timeline?

Keane's Assessment and Solution Design Process

Engaging Keane

Keane offers two alternatives to beginning a legacy modernization initiative:

- Portfolio Rationalization for customers addressing their entire inventory, and
- Assessment and Solution Design for customers who are addressing a specific application or group of applications.

The Rationalization Methodology has been illustrated on page 4. The Assessment and Solution Design process is depicted above.

This process is specific to a single application or group of applications and is the design phase where detailed customization of the legacy modernization technique is accomplished. Both of these initiatives are relatively short in duration, provide detailed roadmaps, and position our clients to embark on the rest of their legacy modernization programs successfully.

Conclusion

Organizations are no longer forced to choose between two bad alternatives: maintaining an expensive and outdated legacy technology or executing a complete, high-risk ground up development project. Legacy modernization has reached a level of maturity where it is now a viable alternative. Keane has the experience, breadth of services, project management expertise, and specific content knowledge to help organizations plan and execute a legacy modernization program, moving them from aging, problematic, expensive, and risky technologies to the new world of state-of-the-art technology.

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