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Reducing the Risks of Legacy Modernization

– An Incremental Approach



Reducing the risks of Legacy modernization: An Incremental Approach

IT executives, responsible for providing mission critical functionality to their user community while operating on older legacy mainframe systems, face significant challenges today. Such challenges typically include:

1. Soaring costs associated with maintenance of “ageing” systems
2. Difficulty in integrating web-based or mobile capabilities
3. Sharing of critical data across multiple business functions
4. Inflexible means of modifying, updating or evolving existing applications

Users and stakeholders are clamoring for lower costs and modern features such as a Graphical User Interface and secure internet access. When the required functionality is currently hosted on a proprietary mainframe platform and maintained in an older source language and database management system, modernization is certainly indicated. However the approach to achieving modernization objectives can be unnecessarily risky. Frequently these projects have failed, or produced disappointing results through significant schedule slippage, failure to meet initial project objectives, and/or significant cost over-runs. Consequently, responsible decision makers should consider an incremental approach that:

1. Provides significant, beneficial progress toward ultimate objectives with each increment
2. Reduces risks by progressing with manageable increments and validating results before proceeding forward so that

each increment becomes a validated baseline for the next increment

3. Provides an enhanced, deployable system with each increment

Typically, modernization projects can be categorized in the following ways:

1. Replace legacy application with Commercial Off-the-shelf (COTS) package
2. Completely re-write application from scratch in new language
3. Re-use existing business rules with modernized application infrastructure

Many studies indicate that categories #1 and #2 above involve the highest degree of risk and related cost of the available options (e.g. see Standish Group International Case Study – “*Modernization: Clearing a Pathway to Success*”). Problems encountered with these options generally include:

1. Failure to provide or re-establish required functionality
2. Underestimating the time and cost magnitude of the effort
3. Disruption to application users
4. Data Integrity

Once a decision is taken to implement a category #3 strategy (Re-use and modernize), an incremental approach can further reduce risks and provide significant benefits with the completion of each increment. When you consider that this modernization approach can involve conversion of the database from an older structure (such as CA-Datcom) to a modern, relational structure, replacing or enhancing the User Interface,



migrating the hosting platform from mainframe to mid-tier (Unix, Linux, or Windows), and converting the source language and data, in whole or in part, the advantages of an incremental, phased approach become compelling.

A robust testing capability is a precept to effectively implementing this approach as testing must be conducted on each increment to assure required functionality is delivered. Testing procedures should be reviewed and refined with each increment to reflect changes in infrastructure.

Increment 1 – Source Language Consolidation, Web-enablement, and Integrated Development Environment (IDE) Implementation

Most applications developed in the 1960's through the early 2000's were developed in COBOL and these applications continue to provide mission critical functionality today. While COBOL was the predominant source language, many of these applications also had components of other languages such as pockets of assembler code and 4GL's (CA-Ideal, CA-ADS/O) which were productivity aids, enabling applications to be implemented more rapidly than COBOL. These proprietary non-COBOL components now represent a significant impediment to modernization and should be replaced/converted to COBOL so that the entire application is comprised of the same homogeneous source language environment.

Several tools exist that can effectively automate significant aspects of these conversions, including the Integrated Conversion Solutions (ICONS) toolset from Information Analysis Incorporated (IAI).

While consolidation of the source language into COBOL will still require maintenance to be done in

COBOL, an important innovation for Developers is the new, desktop based, Integrated Development Environment (IDE) that enables COBOL developers to perform their tasks utilizing the same GUI (drag and drop, etc.) features that Developers of Java and C# utilize in the primary development platforms of Visual Studio and Eclipse. Automated code analysis features available in modern IDE's improve maintenance accuracy and productivity and reduce mainframe utilization by handling Developer/code interaction on the desktop. Application documentation capability is enhanced via automated generation of current, source code-based documentation. Non-COBOL developers can become comfortable and conversant with COBOL in an accelerated timeframe which serves to mitigate the perceived dwindling of available COBOL resources.

Internet Access

If there is an urgent requirement for internet access to these applications, several technologies, such as Rumba from Micro Focus, can effectively, and with no changes to the underlying screen/transaction handling component (CICS), web-enable the existing user interface and provide the user with many of the inherent browser features (drop downs, radio buttons, etc.) that can improve user accuracy and productivity, without significant change to the look and feel of the existing user interface. Because these tools automatically generate the screen presentation from the underlying source (CICS), this capability can be generated rapidly and with little to no user disruption.

Most of the software products providing this capability can be utilized on both mainframe and mid-tier platforms so that this capability could continue to be utilized in any ensuing increment involving migration from the mainframe. It should



be noted that this web access solution provides a screen for screen web accessible version of the existing user interface and not a re-engineered native-level Java/JSP or .Net/ASP user interface. If the objective is to re-engineer the user interface, that should be deferred to an ensuing increment.

Completion of Increment 1 will facilitate additional modernization and provide significant stand-alone benefit for applications that exist with these characteristics, including:

1. Reduction or elimination of license and maintenance fees associated with the older proprietary components
2. Reduced mainframe utilization, improved maintenance accuracy and productivity, and enhanced automated documentation generation with desktop IDE
3. Elimination of requirement for esoteric Developer support skillsets (CA-Ideal, assembler) which, in many cases, are no longer even being taught
4. Internet Access with minimal to no user disruption
5. Single source language baseline established

Increment 2 – Re-Platform and Database Conversion

Many organizations continue to spend a significant portion of the IT budget just to operate their applications on a mainframe platform, when a readily attainable alternative is available. The processing power, performance, and security capability that is available today in UNIX, Linux, and Windows-based systems, can provide an uncompromising alternative for applications that require mainframe MIPS ranging up to 2500 or more. These alternatives generally can reduce

costs for processing significantly. Many case studies have documented savings of 60% or more.

Transition/migration to these alternative platforms for applications that have benefitted from Increment #1, above, particularly those that exist in the most common legacy form – COBOL/CICS/Oracle, DB2, and or VSAM, can be re-hosted with little or no change to the source code. Emulator products, available from companies like Micro Focus, have proven to be very effective in re-hosting mainframe-based applications in alternative platforms with minimal or no changes to the COBOL source, CICS, or JCL. Legacy database structures, including VSAM, can be replicated in a new, mid-tier database management system (Oracle, SQL Server, open source My SQL, Enterprise DB) very effectively. This alternative hosting technology has been successfully utilized in thousands of instances worldwide over the last decade, including mission-critical US Department of Defense applications.

Analysis of the source code being migrated can identify instances of non-utilized (“Dead”) code to be removed or commented out so it does not continue to be a burden on the application.

Database conversion will require migration of data to the new structure and conversion from EBCDIC to ASCII but automated support for this critical activity is available.

This re-platform increment can provide very low risk, high reward results and can often be achieved in 8 to 12 months or less, depending on testing.



Stand-alone benefits of achieving Increment 2 include:

1. Cost savings associated with lower-cost, mainframe alternative platform for processing
2. Elimination of costs associated with licensing for mainframe database (CA-Datcom)
3. Applications now hosted on modern, often open-source platform
4. Modern database management system provides SQL query and decision support capability

Increment 3 – Language Translation, Cloud enable, User Interface re-engineering

Organizations having achieved Increments 1 and 2 have realized significant modernization progress for their legacy applications and users, with limited risk and quantifiable Return on Investment (ROI). An operational system is in place running on a modern efficient platform with a modern, decision support database with the structure and content complete and tested. Business rules are intact and validated and supporting source code has been optimized.

Having established this baseline, additional objectives are within reach. Organizations may now look to a language translation of their COBOL business rules in order to assure that future support resources will be available to extend the life of their legacy applications well into the future. Most frequently this involves the translation of the COBOL source code into Java or C#. Automated conversion technologies, supporting this translation, are available from multiple vendors and the state-of-the-art for these technologies has improved significantly. Most of them still provide a program for program translation, but can be a

Developer-acceptable, lower-cost, alternative to a manual re-write.

In addition to the larger pool of future support resources, another emerging advantage for these applications to reside entirely in a Java or C# source language, is that they are optimally “cloud ready” as that processing platform and its Software as a Service (SaaS) capability becomes a preferred platform for many organizations.

Modernization objectives may include the re-engineering of the user interface and, as an alternative to a COTS-based web-enabling technology, as introduced in Increment #1, many organizations have successfully built a redesigned user interface in native Java or .Net and implemented that either as a “front-end” to the re-used COBOL business rules, or integrated with the business rules that are translated to Java or C#. Organizations having successfully achieved this include the US Air Force and the Defense Finance and Accounting Service.

Integrated Conversion Solutions (ICONS)

The use of automated tools has proven to be invaluable in the aforementioned incremental option, which typically involves the analysis and processing of source code and the uniform and repetitive application of a set of rules across a large volume of interrelated source and target code.

IAI’s ICONS tools technology, described below, has evolved from over 20 years of applied automated conversion experience and has been deployed successfully with both private and public clients in need of modernization of legacy applications originally hosted on Unisys as well as IBM mainframes.



The ICONS technology is a rules-based toolset which is utilized to: (a) analyze application source code and database structures, and (b) modernize the systems by applying prescribed changes in an accurate and uniform manner. This capability is effectively employed to convert legacy application systems from older, proprietary source language and database management systems (DBMS) platforms to non-proprietary language and relational databases. This conversion can also enable Web access for these mission-critical systems and free organizations from associated annual maintenance costs.

The product of the ICONS processing is native-level (non-proprietary) application source code that has been converted to execute in the new, targeted database/compiler/user interface environment. ICONS has been successfully utilized, for example, to convert Unisys 2200 mainframe applications to Micro Focus COBOL operating with an Oracle database running in Windows or UNIX environments.

Conclusion

In closing, it should be noted that an incremental approach, even with multiple testing cycles, can be expected to achieve operational status 30% to 50% faster than other modernization options, for less cost and reduced risk. Past results have routinely validated the incremental approach as the most favored means of maximizing user benefits while achieving desired modernization objectives. Leveraging the benefits gained by this approach, IT executives can now apply scarce resources to addressing other critical business needs of their organization.

About IAI

Information Analysis Incorporated, a recognized Micro Focus Migration Solutions Provider, specializes in helping organizations maximize the value of their existing legacy systems through migration and transformation using a combination of specialized internal and 3rd party technology. IAI offers a full range of related services including consulting, training, migration and modernization implementation, and on-site project support. IAI's expertise enables our clients to leverage and extend their legacy assets into modern platforms, including the Cloud, helping to reduce operational and maintenance costs while improving agility for mission-critical systems.

For Additional Information

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