



iSeries to .NET: Legacy Modernization and Migration

Sensible strategies for evolving legacy systems while managing the critical elements of your portfolio; applications, data, business processes, and people.

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Summary

Business Process Modeling, “Organic IT,” and Service Oriented Architectures; these are the key technologies that are fundamentally changing the way firms will build their internal systems—those that support their organizations—and how companies and their internal and external information systems will interact.

A Technology Infrastructure that adapts to the on-demand needs of business – a move that will help slash IT costs; promises even greater return when firms leverage existing technology with emerging Internet standards to extend specific business services to other applications, companies, and business processes; introducing a new level of balance between maintenance and responsiveness – a new level of business agility.

Building "plug-compatible" software components will reduce the costs of software systems at the same time increasing the capabilities of the systems. These components are the foundation of Web services; applications combined in a loosely coupled way in order to achieve complex operations.

With Web services, the whole is greater than the sum of its parts - programs providing simple services interact with each other in order to deliver sophisticated added-value services between departments, businesses, their customers, and their trading partners.

The Starting Point

IT technologies rarely change the fundamentals of a business. However, the *rules* of business are changing, and so too are the business imperatives.

The role of IT, then, is to provide the infrastructures to enable the evolution of the business. Often times we use the term “Information Technology Systems” to describe the combination of hardware, operating systems, databases, and software applications under management. Limiting the review of these systems to this narrow definition may cloak the investment made in a portfolio that also includes business processes and the people who understand and support this complex ecosystem. Any evolution undertaken must include consideration for the “four pillars” of your IT organization:

Business Applications

Business Process

Application Data

Human Capital

The technologies employed by IT are fundamental to this achievement.

This paper addresses two paths for planning the remodeling of your legacy systems. The Four Pillars (or elements) underpin both paths of your IT technologies: business process, data, business applications, and human capital.

We will also show that to these ends, ASNA products reflect good business practices, as well as good technology.

The Four Pillars

Your Legacy Business Applications are reliable, stable, secure, comprehensive, and of course, germane to your organization's business structure. Although "rock solid", these legacy systems may conceal an impending burden as you prepare to modernize applications or to introduce them to new environments, customers and business partners.

Eventually, the benefits of your business applications – as they exist today – erode, as the ability to move forward increases and managing the balance becomes too difficult. The process is insidious, and it has crept up on you until the day you may face these sobering facts:

- Your legacy systems are increasingly expensive and require too large a portion of your budget – preventing you from pursuing important initiatives
- The value of your critical applications and business processes are not readily extended to other applications, interfaces and web services
- The complexity created from legacy applications, legacy data sources, legacy business process and legacy programming resources seems insurmountable

This is called your Legacy Portfolio. To overcome the limitations this "legacy portfolio" places upon your firm's ability to do business, it is imperative to address these material questions:

- How can IT help drive revenue and profits, not just cut costs?
- How will IT integrate with the outside world (suppliers, partners, customers)?
- How do I create a roadmap for change and evolution?
- These systems must address all parts of my business: front office, back office, web, remote operations, etc. How do I extend these systems so that they will support cross-functional business processes?
- How do I support and implement forced imperatives like regulatory compliance, internationalization, mergers, or consolidation?
- How reliant am I upon "tribal knowledge" – including programming practitioners – for application development and support, as well as for business process?
- How do I extend the skills and experience of my company's human resource to new initiatives and environments?
- How do I retain the high performance my user community has come to expect from dedicated systems and data sources?
- Finally, how do I know when to replace rather than extend and modernize?

Business Applications

Clearly, your business applications represent the sum total of your company's IT existence. These applications reflect not only your business process, but your business's personality and uniqueness. They are typically complex and certainly comprehensive – the latter feature a reflection of their maturity.

Moreover, many of your legacy business applications may reflect historical methods of software development or programming that often created monolithic and unwieldy applications. The structure of these monolithic applications often resist attempts to present granular elements of the application to customers or trading partners through web services.

Reinventing your business applications presents a revolutionary, long-term, high-investment, and perhaps even high-risk process of substantial magnitude. Reengineering, on the other hand, allows you to evolve your business application asset in a short-term, reduced-risk, lower-cost, controlled process.

Business Process

From receiving orders to accounting for money received, business processes depends upon IT technologies for support. Business processes will depend upon an individual process and it, in turn, will depend on other processes.

Today's business process contemplates Service Oriented Architectures, and at its root are Distributed Web Services. Leaner, integrated methodologies are supplanting older methodologies. Not only is this IT-driven, but new processes require change and adaptation throughout your organization from the executive level to the shop floor.

Application Data

Data content is one of your company's greatest assets and the integrity of that data is critical to business performance. Historically, IBM's iSeries/400 has been unquestioned as the best-of-breed application host and database engine. Your business operations depend upon the integrity of your data and high performance access to this data from applications the people using those applications.

Human Capital

People are the linchpin of IT. Your IT development personnel probably possess more knowledge of your business process than any other group in the company. Most of this "tribal knowledge" has been acquired and developed over time.

Business systems application design and programming is an apprenticed trade. Interestingly, experience has shown it easier for application developers to absorb new technologies than for trained computer scientists to assimilate business methods.

Any strategy undertaken to capitalize on the promise of Service Oriented Architectures must include a plan for extending the critical contributions and knowledge of these human assets we know as legacy application programmers.

Modernization to .NET

Simply put, leveraging your organization's investment in legacy systems and augmenting them with modern solutions increases the productivity and responsiveness of your IT organization while providing important options for shifting your expenditures from maintenance to advancement.

Modernization begins with the extension of your legacy applications using modern platforms. The rewards of this straightforward goal are many:

- It is a comprehensive, cost-effective and safe way to preserve critical elements of the investment in your legacy assets
- It mitigates the costs of maintaining systems in their current state
- It provides the right tools for the right tasks
- It capitalizes on your human resources and extends their capability, productivity and accomplishment
- It avoids the business impact of switching to an entirely new environment
- It can be implemented a step at a time; even starting simply and growing in depth and breadth; returning the management of evolution to the organization

Modernization may be implemented in a variety of ways, and frequently each implementation sets the stage for the next growth step. Modernization is not limited only to business applications, benefit, competitiveness, and bottom line.

Your developers become modernized, as well. They can forge ahead into all the new technologies with greater ability, capability, and productivity. Moreover, they hit the ground running. They are a known asset to your business, and, above all, they know your business.

The .NET initiative

Through Microsoft's .NET initiative, companies are adding business value overall, and specifically with web services – building, deploying, operating, integrating, aggregating and consuming them.

Adoption of .NET as an architecture for Service Oriented Architectures allows your organization to address the requirement to increase your business agility; evolving from a world where solutions are standalone nodes – whether applications, devices, systems, services, sites – to a world where solutions are constellations of multiple applications, device, and services working together.

Microsoft is providing best-of-breed development tools with Visual Studio .NET and the .NET Framework. The .NET development model embraces many programming

languages, so that developers can use whichever language is most appropriate for them and for the project.

ASNA Technology Ties IT Together

ASNA products combine IBM iSeries, Microsoft .NET and your Legacy Portfolio into a formidable engine to power your IT modernization, moving it forward rapidly and affordably.

The ASNA-Microsoft-IBM amalgam provides virtually risk-free modernization architecture. ASNA's product suite is the only proven solution for companies with iSeries/400 systems who must find a way forward to support the evolution of their people, processes, applications, and data to Service Oriented Architectures.

- ✓ **Visual RPG for .NET** – Completely .NET compliant, this is the most modern version of RPG ever. It not only embraces the original data processing foundation of the language, it is a fully object oriented language. In .NET, it is second to none for commercial application development.
- ✓ **DataGate iSeries/400 for .NET** – Fast, native (record-level) database access to DB2 UDB from the client application. DataGate retains native iSeries security and speed.
- ✓ **DataGate SQL Server for .NET** – Fast, record-level database access to SQL Server 2000 – 2005. With DataGate, applications targeted to the iSeries employ MS SQL Server with complete transparency.
- ✓ **ASNA Monarch** - ASNA Monarch™ transforms iSeries applications originally written in ILE RPG or RPG/400, into a native Microsoft .NET application. For a complete re-platforming, Monarch will migrate your iSeries database to SQL Server.

These solutions work hand in hand with the Four Pillars of your legacy systems, iSeries/400 and .NET Framework.

ASNA Visual RPG for .NET is the iSeries programmer's application development language for the client and middle-tier layers. Embracing and furthering the RPG business programming language, Visual RPG is a fully .NET CLS-compliant, fully object-oriented language. It is the go-to commercial language for the .NET Framework.

ASNA DataGate for iSeries and SQL Server each exploit the respective strength of the database engine to provide fast, record-level data access for business applications. Developers transparently employ familiar, non-set (i.e. "record-level") data access operations. DataGate preserves and promotes the native iSeries database access from the Windows client application without regard to the database engine.

DataGate retains native iSeries security and speed, because it works directly with the iSeries DB2 APIs – the same APIs employed by legacy iSeries-resident applications.

DataGate does not depend upon data duplication or special repositories. All your legacy database files are accessed by DataGate technology “as is”.

Finally, DataGate for .NET provides its high-speed, network-conscience database access and program call mechanics with intelligent bi-directional network blocking and transport optimization mechanics.

The Finished Product

Applications developed in the ASNA solution set are completed .NET works. From Visual RPG for .NET and DataGate iSeries for .NET, your developers create final .NET solutions. The only “next step” to complete is the next project.

Interoperability among multiple systems is the ground force of the .NET Framework, and all of your developers are free to exploit the extensive lead Microsoft has in Web Services¹ and related technologies.

On the other hand, screen-scraping products like WebFacing and HATS may change the look of an iSeries/400 application, but they contribute nothing to IT modernization. Implementing these products is not only very costly in additional hardware, but depletes your human resource asset with the extra work just to maintain status quo.

The same programs exist on the iSeries as before. Your programming staff is working with the same old programming model as before. Your IT technologies are no closer to improving your legacy portfolio than before.

Legacy Migration

As opposed to an evolutionary extension to your legacy systems, migration can be termed revolutionary.

Until now, re-platforming – or migrating - from the iSeries/400 has been impracticable, if not plain infeasible. A look at the methodologies available explains why this has been so.

Emulation

Products that have attempted to emulate the iSeries/400 execution environment have produced nothing more than a green-screen system running in UNIX. Emulation is demonstrably an expensive lateral move, where the most prudent means to reduce the cost of ownership for an AS/400 is simply to replace it with a newer iSeries.

Once accomplished, a platform shift via emulation is no closer than before to exploitation of modernization technologies including Web services.

¹ “Microsoft's vision is the strongest of the major vendors, and it is already producing products incorporating Web services functionality.” – Accenture -

Rip and Replace

Reinventing entire systems in Java has proven to be a high-cost lesson in futility. The few applications that have ultimately been duplicated in Java have been un-scalable. Application programmers who have for years employed the power of commercial languages (i.e., COBOL & RPG) have no truck for low-level programming languages better suited to system level activity.

Transliteration

Products attempting to translate RPG source code to C# or Java claim an RPG programmer can recognize the ghost of the original code. However, the new code becomes virtually impossible for RPG programmers - who understand the application - to maintain.

Interestingly, C# or Java programmers find the resulting code just as un-maintainable. This is because C# and Java are object-oriented languages, while RPG is procedural. The translation results in an abomination to C# and Java language constructs.

Migration to .NET with ASNA's Monarch, Visual RPG, DataGate

Today, the combination of Microsoft .NET Framework with ASNA's .NET & iSeries products make iSeries/400 re-platforming practicable and feasible. The best practice strategy is twofold:

1. Move existing systems to .NET without reinvention, with little reengineering and with no loss of scalability.
2. Be positioned to modernize the migrated .NET application, especially to distributed Web services and SOA.

Let's re-examine the four pillars of your Legacy Portfolio against this strategy employing the .NET Framework and these ASNA Products:

- ✓ **ASNA DataGate iSeries/400 for .NET** – Fast, native database access to DB2400 UDB from the client application. As the application's "proxy" running on the iSeries, DataGate retains native iSeries security and speed.
- ✓ **ASNA DataGate SQL Server for .NET** – "Record Level" access to SQL Server database engines. DataGate for SQL Server provides a fast, DB2/400 UDB-like access mechanism to Microsoft's SQL Server from any .NET languages.
- ✓ **ASNA Visual RPG for .NET** – Completely .NET compliant, this is the most modern version of RPG ever. It not only embraces the original data processing foundation of the language, it is a fully object oriented language that is second to none of the .NET languages.
- ✓ **ASNA Monarch** – A comprehensive iSeries/400 to .NET re-platforming analysis and migration engine. Its iSeries to .NET *Migration Agents* include RPG and CL programs, Menus, Database files, Display files, Message files, Data Areas, and Printer files.

Business Applications

Your business applications have been developed in RPG. Their program logic is a known constant. To be able to migrate code “as is,” and without transliteration, is indeed the lowest risk methodology.

Business Process

Migrated applications are immediately extensible to embrace Service Oriented Architectures and Distributed Web Services. Your application processes and application data are now .NET native and take full advantage of the .NET framework.

Application Data

You can have it both ways by retaining the iSeries and the database server or moving the database files to SQL Server. A conservative migration process would begin by leaving the data store on the iSeries during the .NET application’s parallel testing, followed by a relatively straightforward data migration to SQL Server.

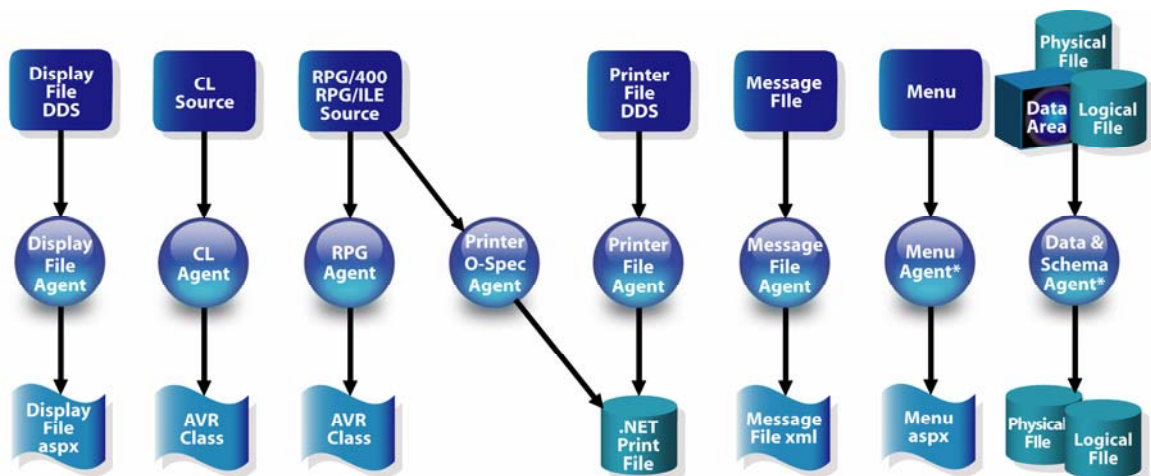
Human Capital

Your existing IT workforces are cardinal during *and after* the migration process.

During the process, they know the application, the business process, the data, and the language.

Following the process, they still know the application, the business process, the data, and the language. Now they are also well into .NET, and prepared to move productively into Web services and all that exists in the promise for .NET.

Monarch



Conclusion

Evolution or revolution, extension or migration, Whichever the strategy, ASNA works with you to leverage your Legacy Portfolio into a Technology Infrastructure that adapts to the on-demand needs of your business and promises to strategically leverage your technology horsepower and the new Internet standards to bring your business services online.

With Web services, interoperability and integration, your IT team will deliver sophisticated added-value services to the depth and breadth of your imagination.

About ASNA

San Antonio-based ASNA (Amalgamated Software of North America) was established in 1982 and develops and markets unique software products that evolve IBM AS/400 and iSeries systems. Aligned with Microsoft's .NET initiative, ASNA is the only company to offer a thoroughly conceived, standards-based extension and migration path that solves its customers' business challenges. For more information about ASNA: <http://www.asna.com/>