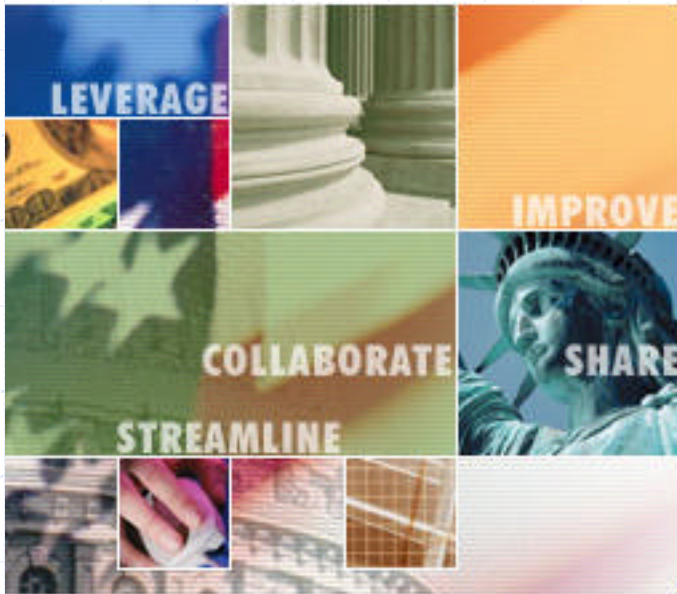


United States  
**R**ailroad **R**etirement **B**oard



**E**nterprise  
**A**rchitecture  
**S**trategic **P**lan

*Leveraging RRB's Legacy Assets  
2003-2010*

June 2003



**Enterprise Architecture Strategic Plan:  
*Leveraging RRB's Legacy Assets FY 2003-2010***

---

## Table of Contents

EXECUTIVE SUMMARY .....	i
INTRODUCTION.....	1
ENTERPRISE ARCHITECTURE: TAKING AIM AT THE TARGET ARCHITECTURE.....	2
EA Strategic Issue One: Platform .....	5
EA Strategic Issue Two: Database Management System .....	6
EA Strategic Issue Three: Application Development Languages.....	8
EA Strategic Issue Four: Metadata Repository .....	10
EA Strategic Issue Five: Legacy Assets.....	11
IT HUMAN CAPITAL .....	13
SUMMARY .....	14



**Enterprise Architecture Strategic Plan:**  
*Leveraging RRB's Legacy Assets FY 2003-2010*

---



## **Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010***

---

### **EXECUTIVE SUMMARY**

This document describes the Bureau of Information Services' vision to develop an agency-wide information strategy that reflects our architectural goals of fostering information sharing effectively and economically across BIS and the communities it serves. Furthermore, it identifies the technologies that will be employed to improve the agency's efficiency. The accomplishment of this objective will position BIS to more successfully address skill and staffing needs.

The Office of Management and Budget requires that any request for IT funding be in conformance with the agency's enterprise architecture. In accordance, BIS has introduced strategies that are essential to modeling the agency's future technical direction to match the identified target architecture.

The recommended architectural strategic direction is to create an information environment that ultimately can support the interoperability of all-electronic operations, effective internal and external communications, an adaptive and flexible infrastructure that is proactive in addressing business needs and challenges, all with appropriate levels of security. BIS's strategy for achieving this vision is embodied in five specific goals; primary among them is the agency's move towards an effective, efficient distributed environment that will enable the integration and transparency of data and applications, the institution of a proactive rapid response development environment and the fostering of the assessment and reengineering of processes to incorporate architectural principles such as reuse, component design, and consolidation. (The full recommendations are provided in the body of this document.)

The vision and strategy were developed from the results of an agency-wide collaboration utilizing the architecture development effort. The completed components are as follows:

**Common Requirements Vision-** Defines a set of common cohesive enterprise-level requirements to achieve the agency's business strategies. It links the RRB Strategic Plan with the Strategic Information Resource Management Plan.

**Conceptual Architectural Principles-** Principles were derived from the business requirements and RRB's mission and business functions. These principles provide a stable foundation that provides guidance for Business Analysts and RRB's Information Technology staff for IT system design and implementation decisions.



## **Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010***

---

**Domain Architectures-** Driven by the Conceptual Architecture, it provides logical consistency across groupings of related technologies or domains.

**Gap Analysis Result-** A report was developed through extensive collaboration with decision-makers throughout the RRB. It contains industry best practices that adhere to the RRB's IT objectives and architectural principles. This document describes ten initiatives that would provide the IT staff with the means and support to develop and implement the Target Architecture.

The next step in the reiterative architecture process includes the Migration Plan. The migration plan is a roadmap or sequence of steps to assist the Railroad Retirement Board in moving from its current state to the target enterprise architecture. The migration plan provides an actionable set of steps derived from the strategic goals to guide project teams. Senior managers will also be able to use these migration plans as guides to complete the initiatives.

With respect to implementation, BIS's strategy will be to build incrementally on many efforts across the agency that is consonant with the IT recommendations. This approach to implementation leverages resources throughout the agency and is likely to be the lowest cost-effective approach.

In times of rapid IT advances, an additional important aspect of BIS's implementation effort will be to identify and resolve the most pressing "high return" issues first. For example, we will seek opportunities to reengineer or convert individual IDMS applications that are approaching the natural end of their life-cycle or need major new business functionality in an effort to increase interoperability, and internet accessibility.

This document outlines five key issues that will critically impact our sustained ability to support the agency's mission with technological acumen and acuity. These issues were derived from the Gap Analysis report and provided us with the rationale for developing this plan. Each issue is described, noting industry best practices and its impact on the RRB. A strategy is then presented detailing an overview of a systematic approach to address these issues over the next seven years. The strategies are designed to ensure that the RRB, acting in a unified manner, improves the efficiency and effectiveness of its IT support operation.



## Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010*

---

### INTRODUCTION

The *Information Resource Management (IRM) Strategic Plan* is strategic in nature and addresses all information resource management of the agency. The Paperwork Reduction Act requires agencies to develop and maintain an IRM Strategic Plan. The purpose of the Strategic IRM Plan is to support the agency's Strategic Business Plan, provide a description of how information resources management activities help accomplish agency missions, and ensure that IRM decisions are integrated with organizational planning, budget, procurement, financial management, human resources management, and program decisions.

Guidance received from the Office of Management and Budget (OMB) requires that the IRM Strategic Plan incorporate technology and automation objectives into the following four major Information Technology (IT) components:

- RRB's Enterprise Architecture – modeling the agency's business enterprise and future technical direction;
- Information Security – assuring continuous protected information to RRB customers especially for mission critical systems;
- E-government – providing customer-centric services, information, and products using the Internet and other electronic media; and
- Capital Planning and Investment Control – aligning mission and program technical requirements with budget formulation and execution of IT capital investment acquisitions.

Two of these areas, E-government and IT Security, have been spotlighted by the Administration through the approval of major E-government plans and the establishment of a central point for coordinating cyber security within OMB. Agency intentions and progress in these areas are reported in separate annual documents to OMB. The Capital Planning and Investment Control process is the method used by the Chief Information Officer and the Information Technology Steering Committee to assess e-government, information security and other technology and automation investment requests.

*The purpose of this document* is to address the major findings in the Enterprise Architecture Gap Analysis Results Report and to set the strategies to begin modeling the agency's future technical direction to match the identified target architecture for inclusion in the agency's IRM Strategic Plan.



## Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010*

---

### ENTERPRISE ARCHITECTURE: TAKING AIM AT THE TARGET ARCHITECTURE

The RRB's future IT direction is composed of the agency's Business Objectives, IT Vision, IT Objectives and Architectural Guiding Principles, which collectively provide direction to the IT organization in fulfilling the technology mission in support of its business goals.

The key to the agency's success in developing an IT organization that responds to the business needs is the consistent and active participation of all RRB components in defining, instituting and supporting the designated initiatives. Through nearly a year of collaborative meetings, the RRB Enterprise Architecture (EA) was developed.

Through extensive collaboration with decision-makers throughout the RRB, research into industry best practices and adherence to the RRB's IT objectives and architectural principles, the Architecture and Planning Group (APG) documented ten initiatives that provide the IT staff with the means and support to develop and implement the *Target Architecture*. These ten initiatives are identified in the *Gap Analysis Results* report. The identified gaps in our IT structures need to be bridged in order to reach our Target ("to be") Architecture. This gap analysis, as part of the architecture process, identified projects or initiatives that provide for the consolidation, obsolescence, or migration of new or existing applications or data to the target architectures. Its main focus is to identify un-addressed business functionality gaps. The updated IRM Strategic Plan will identify five significant functional areas that must be addressed before significant gap closure can be made.

To successfully create a Target Enterprise Architecture, the closure of gaps as described in this document will require the coordination of multiple groups and activities across the agency. At a minimum, the coordination of the APG, IT Managers, strategic planning and business unit resources will be required.

This EA Strategic Plan<sup>1</sup> outlines five key issues associated with the Gap Analysis and lays the foundation for a strategic vision of what the RRB's application development target architecture will look like in 2010. The closing of these gaps is necessary in order to continue to support the agency's Strategic Plan goals. The key issues discussed are:

---

<sup>1</sup> This paper makes broad use of a variety of Gartner research available to the RRB as a client. The use of their copyrighted materials is permitted for our limited internal, non-commercial use.



**Enterprise Architecture Strategic Plan:  
Leveraging RRB's Legacy Assets FY 2003-2010**

<b>Platform:</b>	<i>Gap Analysis Result 10 -- Enable an Effective, Efficient Distributed Environment.</i> We must determine whether the mainframe platform remains a viable option to move the agency to the new environment calling for Government-to-Government (G2G) and Government-to-Citizen (G2C) e-Government initiatives.
<b>Database:</b>	<i>Gap Analysis Results 2 and 4 --Software Engineering (Re-Engineering of Development Environment) and Enable Distributed Environment--</i> Concerns over the long-term viability of IDMS and the limitations of its non-relational structure imposed on application development has forced us to seek relational database alternatives. We must determine those alternatives and how we can begin the migration.
<b>Metadata<sup>2</sup>:</b>	<i>Gap Analysis Result 3 -- Corporately Manage Data.</i> In order to develop inter-governmental and internal data-sharing services, we must integrate our applications. Systematic integration strategies require integration metadata. We must adopt a strategy to develop an effective metadata repository.
<b>Languages:</b>	<i>Gap Analysis Results 4 &amp; 6 -- Adopt Software Engineering Model and Enable Research and Development.</i> Development of newer development languages is calling into question the continued viability of COBOL. We must determine how long COBOL will continue to be a large part of the RRB's IT technical landscape and what might replace it.
<b>Legacy Assets:</b>	<i>Gap Analysis Results 2 &amp; 9 -- Adopt Software Engineering Models &amp; Develop an Efficient Reuse Policy.</i> We must take advantage of 20+ years of legacy system knowledge by using the knowledge base in pursuing a more flexible, "componentized" methodology of application design. However, mixing and matching the old with the new will not be a trivial matter.

The identified key issues not only offer the RRB a blueprint to reaching its Target Architecture and Strategic Plan goals, but also permit the agency to efficiently address the President's vision of expanded use of the Internet and computer resources to provide improved Government services.

The ability to integrate historically independent application systems with each other, as well as with new applications, in an e-government environment offers significant challenges. We must view application redesign beyond the traditional challenges of programming, database structure, networking and performance.

<sup>2</sup> Metadata is data about data. The term refers to any data used to aid the identification, description and location of networked electronic resources. Metadata is used to describe the content, quality, condition and other characteristics of data used in an electronic environment. The value of metadata is that it is a documentation of cooperate memory.





## **Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010***

---

These are still important but they are no longer sufficient. Application redesign in an e-government world must fundamentally restructure the technological underpinnings of legacy business processes based on changes in strategic workflow. This is the essence of the President's message to use e-government to improve the efficiency of agency operations.

The primary driver of application redesign is the need to extend the reach of traditional, internally directed business processes to external constituents. E-government initiatives open up traditional "closed" business processes to the RRB's external employer/employee relationships. Increasing the speed and ease of information exchange is important to railroad employers, while managing the flexibility of service delivery choices is important to railroad employees. The RRB's traditional processes of taking applications for benefits and employer reporting still exist, and their technological implementations are still running, and running extremely well. The challenge is to leverage these technology investments in the more demanding world of e-government.

The technological difficulties of redesigning legacy systems together with new development or acquiring application packages are many. Different application paradigms, unstructured and unorganized systems with few design characteristics for integration, the constant allure of the new over the old, declining skill sets and technological incompatibilities make integration of legacy systems difficult. Our past experience has taught us that e-government approaches to provide short-term solutions without addressing long-term problems are shortsighted.

This document takes a step back to recognize that application redesign today is going to be an evolutionary process. We need to leverage legacy system assets because they are an accurate, extant representation of our refined business processes. To accept that packaged solutions or new development can re-implement these processes with the same level of accuracy and specificity, reducing either short-term or long-term costs is presumptuous. It is neither entirely true, nor entirely false. We cannot propose that, for example, mainframes are the correct platforms for all new development. We also cannot propose they are no longer the correct platform for anything. Some applications need the quality of service characteristics of this platform and others do not. Application redesign is about connecting the ones that do with the ones that do not. But before we can address application integration, other more fundamental issues need to be addressed.



**Enterprise Architecture Strategic Plan:  
*Leveraging RRB's Legacy Assets FY 2003-2010***

---

**EA Strategic Issue One: Platform**

The dilemma of application redesign can be seen in the size of our legacy-installed base and the variety of hardware or software platforms we need to connect. The role of legacy OS/390 enterprise applications in this integration is critical. Enterprise computing is big computing, and that suits the mainframe's traditional strengths. However, our current mainframe is reaching the end of its useful life and OS/390 support is questionable as the majority of IBM's client base moves to z/OS platforms. In fact, IBM announced that it would stop new sales of the OS/390 on December 17, 2002. IBM has indicated that OS/390 support will continue to be provided at least through September 2004.

On the opposite side of the playing field we have the enthusiasm and the sheer volume of Microsoft-based solutions of distributed e-business systems. The operational challenges and reliability issues, once considered limiting for this platform, have largely been resolved with the introduction of the .NET environment.

The new architecture of .NET is a fundamental and ambitious enterprise-computing environment. The first user experiences with .NET Framework are encouraging. It appears that Microsoft has greatly improved its quality process in the last three years and has delivered relatively stable and dependable software. By starting the technology from scratch, Microsoft has given itself the opportunity for innovation in system design. Gartner suggests that by 2005, .NET will be technically proven to run large (more than 5,000 concurrent users) enterprise applications.

There are definite advantages in moving toward a .NET scenario. However, the successful adoption of reuse policies for legacy systems and recognition of the mission-critical nature of these applications has revitalized the mainframe platform. Application integration on a mainframe results in very different solutions than on the .NET platform. Consequently, **we need to establish our future platform in order to either prepare legacy systems for retirement, or re-engineer the application interfaces to support programmatic integration with new standards-based solutions.**

The introduction of the z800 Series in February 2002 has strengthened IBM's case for the relevancy of mainframe computers in the Internet era. The z800 is priced to be competitive when performing equivalent workloads at equivalent qualities of service. The z800 with its 64-bit z/Architecture represents a major shift from the 31-bit architecture introduced more than 10 years ago. For compatibility with established



## **Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010***

---

applications developed for S/390, the z800 can also run in 31-bit mode. Application programs that ran in 31-bit mode on S/390 systems should run unmodified in 64-bit mode on the z800.

Gartner believes that the z800 system will have a reasonable useful life, is a significant commitment for IBM and will hold its value reasonably. They believe that users procuring a z800 could probably comfortably plan for a five-year useful life.

On the OS/390, the RRB makes extensive use of Computer Associates' IDMS/DC as its primary high-performance teleprocessing monitor. It is fully integrated with CA-IDMS/DB and provides a wide range of services to facilitate the development and execution of online transaction-oriented applications. To a lesser extent, the RRB also uses IBM's CICS. CICS Transaction Server (TS) is IBM's "flagship" online transaction processing (OLTP) application platform and has dominated the enterprise-class application platform. CICS TS continues to be one of the most scalable, secure and highly available application environments because of its deep integration with the underlying operating system, z/OS, and, in turn, z/OS's integration with the underlying hardware architecture, zSeries (formerly S/390).

### **Platform Strategy:**

- The RRB will commit to upgrading the RRB mainframe capabilities to the z800 series server, anticipating a useful life into 2010.
- The RRB will reduce the near complete reliance on the use of CA-IDMS/DC in favor of IBM-CICS wherever feasible.
- The RRB will begin to deploy .NET servers and new features as introduced until full potential for enterprise applications is realized.

### **EA Strategic Issue Two: Database Management System**

The outlook for CA IDMS has changed very little. The number of IDMS licenses in the industry has declined steadily. New license revenues for CA mainframe database management system (DBMS) products are trending downwards.

Gartner's overall view is that CA will provide adequate, but not strong support for IDMS as long as the install base remains large enough to generate maintenance revenue greater than CA's cost of maintaining the product.



**Enterprise Architecture Strategic Plan:  
*Leveraging RRB's Legacy Assets FY 2003-2010***

---

In other words, major releases will become fewer and further between. CA faces the same issue as its customers, which is growing scarcity of IDMS skills (for development and support) as the current crop of IDMS experts retire or migrate into more modern technologies. It is in CA's self-interest not to reveal any plans or contingencies for eventual de-support of IDMS until the latest possible moment. As the customer base shrinks, CA will be under pressure to raise maintenance fees for the remainder. It is likely that at some point, the cost to CA of continuing IDMS support and development will outweigh the revenues generated, and CA will arrive at a purely business decision to sunset the product.

In addition to concerns over the long-term viability of IDMS, its non-relational structure imposes limitations on application development options. This has forced us to seek relational database alternatives. The RRB currently has two installed DBMS alternatives to IDMS. IBM's DB2 for the OS/390 was recently installed, primarily for the conversion of the Tesseract (payroll and personnel) system from the IDMS that will cease to be supported by the vendor after September 2003. A Microsoft SQL Server 2000 environment (development/testing/production) has also been recently created. SQL applications such as the eiStream document imaging system, Magic Help Desk software, Courion password management system and others are being migrated to this new environment.

While there is no urgency to migrate off of IDMS, it is only prudent to seek opportunities to re-engineer or convert individual IDMS applications that are approaching the natural end of their life-cycle or need major new business functionality. This will begin to reduce the size of the IDMS portfolio while seeding the needed conversion skills and experience. Fortunately, IDMS is one of the few DBMSs for which tools are commercially available to convert programs to other DBMSs on other platforms such as IBM's DB2 and Microsoft's SQL. A "Request For Information" was released in late FY 2002 to determine the marketplace of such conversion tools and services.

**Database Management System Strategy:**

- Until applications are rewritten in DB2 or SQL, the RRB will facilitate encapsulation and integration of established IDMS applications to keep them deployed, maintained and modernized.
- The RRB will freeze any new database and major application development using IDMS in favor of the new DBMS standards of DB2 or SQL.
- The RRB will conduct an IDMS Migration Assessment based on the results of the RFI released in FY 2002 to obtain a perspective on available approaches.



## Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010*

---

- The RRB will plan for an IDMS Migration proof-of-concept (POC) project by selecting and migrating an appropriate application as determined in the Assessment Phase.
- The RRB will develop a plan for migrating the balance of the IDMS applications based on the outcome of the POC project.

### **EA Strategic Issue Three: Application Development Languages**

The evolution from one generation of application development (AD) to the next is made necessary by the greater demands of constituents for systems that wrap themselves around individual needs and provide integrated functions that can adapt as the needs change and evolve.

The evolution to the new application development is not going to be easy. The next generation of applications will require new methods, architectures and technologies combined in new ways. In addition, they will need to coexist with well-established best practices. The biggest challenge for enterprises will be to manage the transition successfully. This transition needs to occur while we maintain demands for system delivery amid this IT evolution. Gartner suggests that this painful metamorphosis of application development will continue through 2005.

**COBOL** – Gartner recently surveyed more than 400 U.S. enterprises to assess the use of languages. They found that the most popular language used for application development projects were: Visual Basic (82 percent); Java (80 percent); C++ (68 percent); and, COBOL (63 percent).

Gartner classifies COBOL as a mature language (i.e., one that still has at least 10 years of life left). This should factor in not only the maintenance of legacy COBOL applications, but also the use of COBOL-based systems in Web and other new development. We need to keep in mind that a balance must be struck between legacy and more cutting-edge skills. An enterprise that does not reduce its dependence on legacy systems will have difficulty finding and retaining programming talent in the long term because it will be unable to provide the challenging work and career paths that IT professionals seek. Although it may lack the exotic appeal of newer languages, COBOL will, however, continue to be a large part of the RRB's IT technical landscape at least through 2010.

The landscape of COBOL replacement languages is becoming clearer. Gartner has stated that they believe that the .NET vision of Web services is in line with and, in some ways, ahead of industry and business trends.



## **Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010***

---

When delivered, it will move the Microsoft platform forward in flexibility and power. The popularity of Visual Basic will transfer to Visual Studio(VS).NET, as will the next generation of C++ be transferred to C#.

***eXtensible Markup Language (XML)*** – Another format that is gaining rapidly in application development is eXtensible Markup Language (XML). XML has become a universal format. The Federal CIO Council is urging its adoption in agency application development as the means to enhance the opportunities for Government-to-Government Internet applications. Gartner has noted that XML is being used widely in government and in at least 64 sectors in industry to integrate applications, connect government organizations and governments, manage content and knowledge, and accelerate cross organization collaboration.

***CA-ADS for CA-IDMS*** — CA-ADS for CA-IDMS is a language for the development of applications for the IBM mainframe. It expedites the writing of modular online applications that access CA-IDMS Database data. Specification of flow-of-control processing, data storage definition, data verification, editing, error handling and more are achieved with a series of 3270 terminal screens instead of conventional detailed code.

Many of the RRB online applications have been developed using ADS. Much of the application logic is contained in ADS dialogs. While this approach has allowed for development of sophisticated online mainframe applications, ADS dialogs cannot be integrated with PC/web-based applications except through the use of terminal emulation software. ADS dialogs can be used to call COBOL modules, thereby maintaining application logic in reusable components.

***SAS Institute Tools*** – Lastly, the agency has made a substantial investment in tools from the SAS Institute. The SAS programming language is a powerful development 4GL environment for developing analysis applications. SAS is used both to build the data structures and to exploit them. Development productivity is very high, comparing well with SQL, with increased power and flexibility as well as more efficiently executed code. Various SAS products were used in the development of RRB's Employer Internet Reporting Initiative. Gartner has pointed out that the SAS System has for many years been recognized as a comprehensive data collection and storage system, with extensive data analysis and application development capabilities.

### **Application Development Language Strategy:**

- The RRB will continue to utilize its substantial knowledge base and expertise in COBOL, at least through 2010.



**Enterprise Architecture Strategic Plan:  
Leveraging RRB's Legacy Assets FY 2003-2010**

---

- The RRB will increase awareness of the XML possibilities, spur collaboration and identify factors to be considered in making XML investment decisions.
- During FY2003, the Application Design Center will eliminate the practice of embedding program logic in ADS dialogs. Rather, developers will build all program logic into COBOL modules, and call those modules as necessary from ADS applications. This will provide a component-based architecture, which will make mainframe application logic and processes available to PC/web-based applications.
- The RRB's investment in SAS tools has not been focused beyond their use in limited applications. In conjunction with the strategies developed for Issue Five, discussed later, the SAS toolset will be reviewed for greater applicability in crafting our short/long term strategies.

**EA Strategic Issue Four: Metadata Repository**

The centerpiece of any attempt to integrate varied applications, on varied platforms, is to model the data to be exchanged between independently developed application systems. Integration metadata — data about data — contains information about the communication content, the identities of the senders and receivers and the interaction process mechanics and business implications. Systematic integration strategies require integration metadata.

In order to develop inter-governmental and internal data-sharing services, we must integrate applications and focus on an effective metadata management strategy. This must be based on creating a relatively small repository of integration metadata not already held by individual repositories, and on the incremental development of an exchange information model of metadata. Any metadata integration repository project should be scaled to provide a positive return on investment by reducing data duplication, conflicts and errors. An added need and benefit of this effort will be to capture institutional, yet undocumented, knowledge on the data from experienced staff that may be within a few years of retirement.

However, although the benefits of integration metadata are clear, how best to collect and manage this metadata is not clear. XML has become a significant factor in the collection and depositing of metadata. The power of XML and metadata can be found only if communities of interest are using the same XML vocabularies. These vocabularies, when placed in a metadata registry, become available to all interested parties. There are a number of metadata specifications, some emerging and some well established. However, an emerging XML metadata registry specification is being developed by the Organization for the Advancement of Structured



**Enterprise Architecture Strategic Plan:  
*Leveraging RRB's Legacy Assets FY 2003-2010***

---

Information Standards (OASIS) that RRB's Data Architecture Domain Team needs to monitor for possible adoption.

**Metadata Repository Strategy:**

- The Information Resources Management Center – Data Management Group will be responsible for the development and management of the metadata repository and determining the tools and structure necessary for its creation.
- The RRB will follow a strategy that calls for creating a small, new core repository to hold previously un-automated integration metadata, and then relying on references to any in-place, dispersed metadata stores for the remaining details. This will result in little metadata duplication because only the dispersed implementation-specific tools (e.g., applications) hold detailed metadata for the message schemas, syntax, transformation maps and validation rules for the information that is transmitted.
- Key to this strategy is having a group dedicated to facilitating the use and integration of metadata. The E-Government Services Center - Customer Services Group will select, manage and operate the integration-relevant software — e.g., integration broker suites, transformation engines and business process management tools. This ensures that the detailed metadata in the facilities created by the Data Management Group is widely available to all development groups and logically uniform, even if physically stored in disparate tools.
- Metadata management can easily become overwhelmingly complicated if the scope is not aggressively restricted. Therefore, the RRB's effort will move opportunistically, incrementally expanding the variety of external metadata sources encompassed by the virtual repository. The range of attributes or properties that are managed will also be expanded slowly.

**EA Strategic Issue Five: Legacy Assets**

The above discussion leads to the ultimate issues: How do we create an environment that can help us to build new applications that combine the old and the new? What will this mean to future application development efforts? Can distributed applications be implemented on a traditional mainframe platform?

The demand to address the requests for e-government applications, as defined in the agency's Government Paperwork Elimination Act (GPEA) report, for the next three to five years needs to take advantage of 20+ years' worth of installed applications. The integration of these substantial legacy assets into an e-Government environment is a cause of great concern. The application paradigm of the past is very different from today's





## **Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010***

---

approach. The problem is not the platform on which the applications run, but the methodology used to implement the applications.

In the past, the RRB application development environment focused on performance and volume. Consequently, applications have been constructed in a way that maximizes performance and minimizes evolution. The slow degradation of the application code over time, the decline of standards, and the increased intertwining of the presentation, logic and data layers conflict with today's application development environments.

We need to treat application development as an evolving process. Improving the application development process, learning new application development paradigms, extending legacy applications and skill training all represent the application development challenges of the next three to five years. Looking beyond simple and cosmetic legacy extension alternatives requires code understanding. Modifications may include simply changing "presentation" from 3270 to Active Server Page (ASP) applications, and then interfacing these programs with new applications. It may be an evolution of legacy programs to a more component-like form so that they can be used by the old (3270 presentation) and the new (Internet or intranet) without creating duplicate maintenance efforts. This level of change requires strong program understanding, code-slicing tools and a new implementation environment. Although the perception of objects vs. components is often debated, the underlying direction is the same — increasing the level of reuse and, therefore, of application assembly.

The RRB must develop coherent plans to evolve our technology bases to support the IT demands of new business initiatives. Should our legacy systems be maintained minimally while we develop new systems? Should we continue at the current level of enhancement/maintenance? Legacy systems contain much useful business knowledge. The evolution of today's systems must begin with their being placed within the context of business decisions.

### **Legacy Asset Strategy:**

- Mapping the technical underpinnings of legacy business processes to new ones and planning for their evolution are both important. Continuing to postpone the inevitable is the first step on the path to obsolescence. The Application Design Center will be responsible for leading the effort to develop the strategies for the transition of the legacy logic layer.
- Discussions of legacy languages and applications tend to focus on short-term fixes for obvious short-term operational problems or on technology evolution independent of software asset value.



## **Enterprise Architecture Strategic Plan: *Leveraging RRB's Legacy Assets FY 2003-2010***

---

Objectively, our COBOL legacy language has at least another decade of significant use, with few practical alternatives on the horizon. Our objective is to preserve and protect useful software investments while avoiding the disruptions of “forced marches” and hurried language migrations. The use of third-party transitional tools, such as Fujitsu’s NetCOBOL, offers the potential opportunity to merge the old with the new, while providing training in many of the aspects of the newer technologies that may be leveraged into the eventual COBOL replacement language. A proof-of-concept project team will be formed to evaluate the usefulness of such products as part of the transition strategy.

- Ultimately, because multi-tiered, multi-language, multi-application paradigm implementations are difficult, legacy understanding, extension and transition tools are a must. Reuse of legacy business functions is appealing, but it is not as simple as middleware or application server vendors would lead us to believe. The RRB will study the methodologies used by the SAS Institute in the development of the Employer Reporting Initiative to determine the implications of software wrapping with SAS tools to our short/long term environment. In addition, the recent acquisition of MQSeries products provides an alternative method for accessing legacy functions that will be explored further.
- The opening-up of legacy systems to external constituencies increases the importance of the presentation layer. The RRB must begin the evolution to isolating this layer through re-engineering. Isolation enables continued use of legacy 3270-access while also providing a programmatic interface to other systems. Flexibility in communication with external processes maximizes leverage and reduces long-term risk. The E-Government Services Center will be responsible for leading the effort to determine the short/long term strategies and tools for presentation layer development.
- We will move to a component-based approach to programming in COBOL, that is, we will no longer include program logic in user interfaces. This is the approach currently used in developing our web-based applications. This follows the reusable component design enterprise architecture principle.

### **IT HUMAN CAPITAL**

The above issues point out that the older generation of developers must broaden application development to include new technologies, and the next generation must pick up best-of-breed development skills through teaching and experience. Both generations need to learn integration skills.

Gartner predicts that the next generation integrator/developer will require many more skills and experiences, and will have to adapt “on the fly,” putting a premium on developers that embrace new challenges and skill sets.



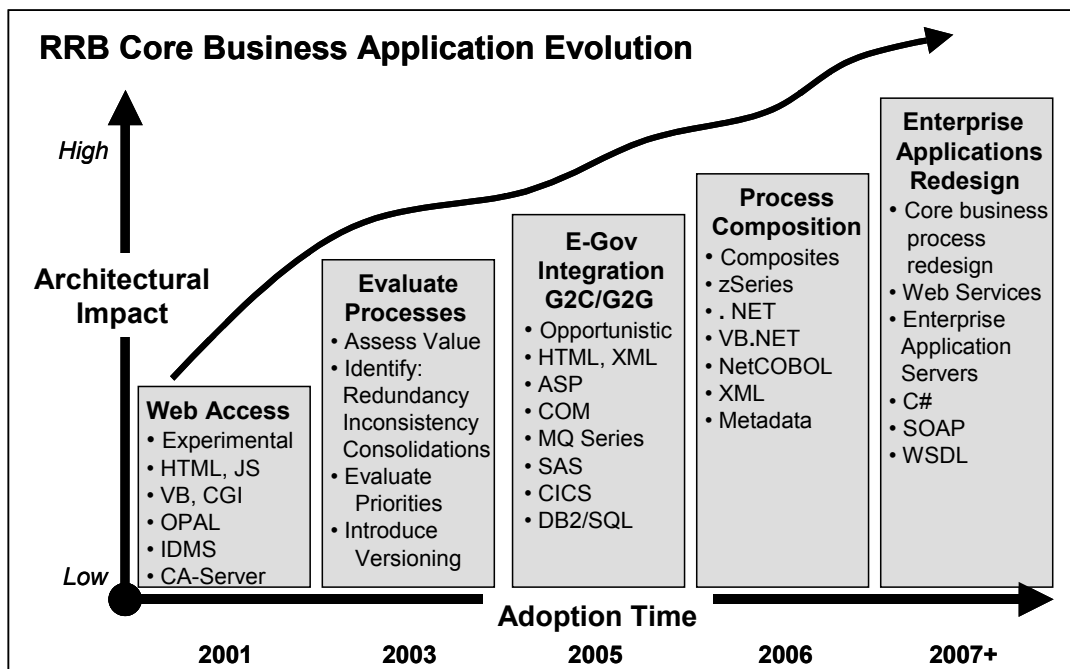
## Enterprise Architecture Strategic Plan: Leveraging RRB's Legacy Assets FY 2003-2010

### IT Human Capital Strategy:

- The RRB will begin to add DB2 and SQL to the developers' skill set
- The RRB will begin to evolve developers' skill set to include VB.NET and possibly C#

### SUMMARY

Within this Plan, the RRB has developed comprehensive enterprise architecture strategies designed to enable the accomplishment of the agency's mission and the President's Management Agenda. These strategies are designed to ensure the RRB contributes to and leverages the broader Federal community resources to improve delivery of services to citizens, while moving toward the Target Architecture. The strategies are also designed to ensure that the RRB, acting in a unified manner, improves the efficiency and effectiveness of its IT support operations.



Enterprise Architecture Strategic Plan:  
*Leveraging RRB's Legacy Assets*  
2003-2010

U. S. Railroad Retirement Board  
Office of Chief Information Officer  
Architecture & Planning Group  
844 North Rush Street  
Chicago, Illinois 60611