

Case study:

Topic 3.2 **INFORMATION AND DATA MANAGEMENT BY THE TAX
ADMINISTRATION**

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CONTENTS: Introduction.- Background and History.- Business Perspective.- Modernized Organizational Structure.- Modernized business processes.- Business information and data.- Enterprise Architecture Perspective.- Principles, assumptions, and constraints for data management.- Key Technical Components.- Conclusions and Summary.

INTRODUCTION

This paper presents a brief background, history, and current plans of the IRS modernization program, which involves an enterprise-wide examination of the agency's business processes, organizational structure, and IT infrastructure. The key goals of the IRS modernization program are to increase fairness of compliance across all taxpayers and to increase overall compliance.

Background and History

The IRS has been evolving its business systems for more than 25 years. At the outset, modernization consisted of applying then-current information technology to address problems on a system-by-system basis. This produced individual "stovepipe" systems that supported major business functions in a non-integrated fashion. Over time, several planning initiatives and task forces addressed the challenge of integrating these systems into a cohesive whole as a means to improve performance and service. In 1997, these planning initiatives culminated in the creation of the IRS Modernization Blueprint.

The IRS approach to modernizing tax administration and its underlying information and data management are described from two key perspectives: the business perspective and the enterprise architecture perspective. The enterprise architecture matches technical approaches to enable business objectives. In addition, two key technical components of the modernized IRS architecture are highlighted.

Business Perspective

The IRS Restructuring and Reform Act of 1998 mandated the migration of the traditional, geographic organizational structure to an organization based on business units serving particular groups of taxpayers with similar needs. The IRS Organizational Blueprint defines the modernized organizational structure, business processes, roles and responsibilities of managers in this future organization, and an implementation plan for each organizational unit.

Modernized Organizational Structure

The new organizational structure consists of four business operating divisions, four functional units (including Chief Counsel), two shared services organizations, and the National Headquarters.

Modernized Business Processes

The high-level business processes supporting all of the business operating divisions have been partitioned into four process areas: pre-filing, filing, post-filing, and internal management.

Business Information and Data

The IRS business processes involve collecting, creating, and using information and data. IRS enterprise data has been grouped into six data categories.

Enterprise Architecture Perspective

The modernized IRS tax administration system applies modern enterprise architecture concepts to define how IT will support business needs. The IRS is developing an Enterprise Architecture, a set of Enterprise Requirements, and an Enterprise Transition Strategy to provide focus and guidance for developers. The Enterprise Architecture, Requirements, and Transition Strategy facilitate effective investment decision management for the integration of all modernization business and technical components.

Principles, Assumptions, and Constraints for Data Management

The Enterprise Architecture includes principles, assumptions, and constraints to guide decisions for information and data management in the modernized IRS enterprise architecture.

Key Technical Components

Two key technical components are crucial to understanding the Enterprise Architecture. The Customer Account Data Engine (CADE) will provide complete, accurate, and timely taxpayer account and tax return data to all modernized applications. Similarly, the CRM Core component offers a complete, accurate, and timely case history to IRS users, as well as the mechanisms to manage cases and case workloads.

Key Points

- The goal of IRS tax systems modernization will require a viable Enterprise Architecture, as well as a disciplined risk management program. These risks involve migration, maintenance, user access, and tax law revision of current (legacy) and new systems.
- IRS is adopting and applying best industry practices for information and data management during the modernization of its systems supporting tax administration and other enterprise functions. The approach addresses this challenge from three perspectives: IRS organization and business processes, enterprise architecture, and technical issues.

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INTRODUCTION

The IRS is modernizing both its organizational structure and its information technology (IT) base to more efficiently discharge its responsibilities. This paper presents a brief background, history, and current plans of the IRS modernization program, which involves an enterprise-wide examination of the agency's business processes, organizational structure, and IT infrastructure.

As stated in *Modernizing America's Tax Agency*¹, the key goals of the IRS modernization program are to increase fairness of compliance across all taxpayers and to increase overall compliance. The effective use of modern IT is essential to achieving these objectives. In particular, the IRS will build its business systems on a technical infrastructure that combines modern database management systems, data warehousing, and customer relationship management (CRM) products. System modernization must be phased-in incrementally and must operate in parallel with existing legacy systems. Design principles, assumptions, and constraints guide the selection of the architecture to implement modernization activities. To facilitate updates and evolution over time without impacting taxpayer and analytical data, data streams are reorganized and separated from the existing application software. Throughout this program, the IRS is committed to using the Internet and related web-based technologies to link the IRS with individual and corporate taxpayers and with third-party providers operating on their behalf.

BACKGROUND AND HISTORY

The IRS has been evolving its business systems for more than 25 years. At the outset, modernization consisted of applying then-current information technology to address problems on a system-by-system basis. This produced individual "stovepipe" systems that supported major business functions in a non-integrated fashion.

For example, today's IRS production systems consist of technologies, concepts, and incremental improvements made over several decades. The core data files reflect the tape-based, sequential processing model of the 1960s, and are manipulated using assembly language programs that are difficult to modify and maintain. Each week, selected taxpayer accounts are extracted from these master files and loaded into an online case management system, the Integrated Data Retrieval System (IDRS), which was created in the 1970s. Other specialized, and in some cases duplicative, systems that were built in the 1980s and 1990s use data extracted from the master files and IDRS. Consequently, there is no single, online authoritative source of data among these systems. In addition, the business applications to access this data operate on different platforms with different user interfaces, and require the use of arcane computer

¹ *Modernizing America's Tax Agency*, IRS Publication 3349, Rev. 1-2000, Catalog No. 27171U, <http://www.irs.gov/welcome/modern2.html>

command codes. The result for the taxpayer is delay and inconsistency in answering their questions.

Over time, several planning initiatives and task forces addressed the challenge of integrating these systems into a cohesive whole as a means to improve performance and service. In 1997, these planning initiatives culminated in the creation of the IRS Modernization Blueprint. Modernization efforts included IT modernization activities and organization design teams that concentrated on organizational and business process modernization.

The Blueprint 1997 master plan for IT modernization consisted of a logical implementation sequence for new and enhanced business systems. While the plan was well thought out, there was concern that it would take too long to replace the sequential master files with the modern database technology needed to manage and quickly deliver the core data required for most business processes.

The IRS resolved this issue by developing a phased segmentation-based approach for migrating taxpayer files to the modernized system environment. Under this approach, the most uncomplicated taxpayer returns would be the first returns routed to the replacement system. Over time, the agency intends to route progressively more complex taxpayer accounts to the replacement system. When all accounts are processed there, the agency will retire the old system.

In 1998, IRS awarded a prime contract for modernization. The IRS and its contracting team are implementing the IT and organizational modernization plans.

This paper describes the IRS approach to modernizing tax administration, and its underlying information and data management from two key perspectives: the business perspective and the enterprise architecture perspective. The enterprise architecture matches technical approaches to enable business objectives. Two key technical components of the modernized IRS architecture are highlighted.

Business Perspective

The IRS Restructuring and Reform Act of 1998 mandated the migration of the traditional, geographic organizational structure to an organization based on business units serving particular groups of taxpayers with similar needs. The IRS Organization Blueprint² was developed to implement the Restructuring and Reform Act, and is an essential element of IRS modernization. The Organizational Blueprint defines the modernized organizational structure, business processes, roles and responsibilities of

² *IRS Organization Blueprint*, 1999 Phase IIA, Document 11052 (5-1999), Catalog No. 27877P
<http://www.irs.gov/prod/welcome/27877e99.pdf>

managers in the future organization, and an implementation plan and sequencing of events for each organizational unit.

Modernized Organizational Structure

The new organizational structure consists of four business operating divisions, four functional units (including Chief Counsel), two shared services organizations, and the National Headquarters, as depicted in Figure 1.

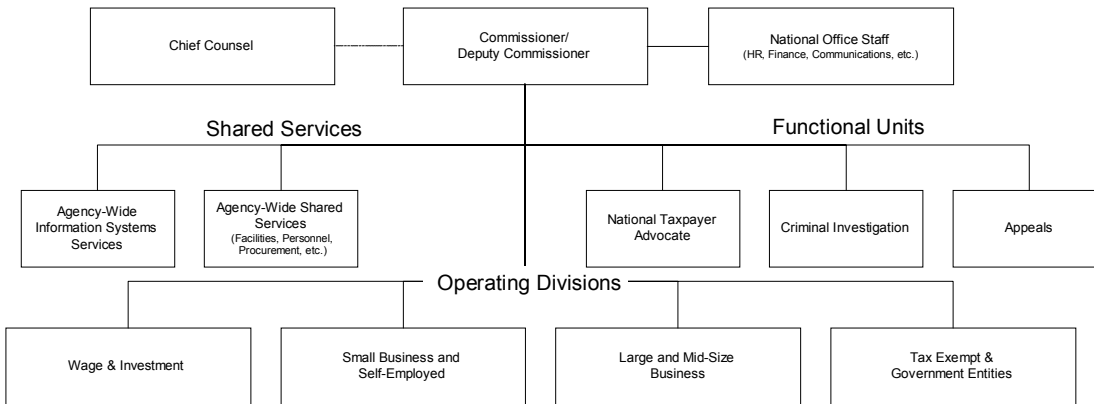


Figure 1. Modernized IRS Organizational Structure

Each of the four business operating divisions is responsible for a different taxpayer community: Wage and Investment; Small Business and Self-Employed; Large and Mid-size Businesses; and Tax Exempt and Government Entities.

The **Wage and Investment** Operating Division will serve some 90 million filers with a total tax liability of \$265 billion. This group represents 116 million individual taxpayers, including those who file jointly, with wage and investment income only, almost all of which is reported by third parties. Most of these taxpayers interact with the IRS once a year to file a return, and most receive refunds. The structure of this operating division focuses on meeting the filing, pre-filing, and post-filing needs of these individuals.

The **Small Business and Self-Employed** Operating Division will serve approximately 40 million taxpayers, consisting of fully or partially self-employed individuals and small businesses, with a total tax liability of \$816 billion. These taxpayers deal more frequently with the IRS on more complex issues and pay the IRS nearly 40 percent of the total cash collected each year. This operating division's structure focuses on meeting the pre-filing, filing, and post-filing needs of these taxpayers.

The **Large and Mid-size Business** Operating Division includes roughly 180,000 of the largest filers, with assets over \$5 million, and with a total tax liability of \$395 billion. While collection issues are rare, this division encounters many complex issues of tax law interpretation, accounting, and regulation. Frequently, these issues have international ramifications. This operating division is being organized into industry segments to best address the needs of unique groups of large corporations.

The **Tax Exempt and Government Entities** Operating Division includes pension plans, exempt organizations, and governmental entities, representing a large economic sector with unique needs. These 1.9 million filers generally pay no income tax. They do pay more than \$198 billion in employment tax and income tax withholding. This operating division will be organized around the distinct groups of taxpayers it serves with common supporting elements.

The four functional entities—Counsel, Appeals, Taxpayer Advocate, and Criminal Investigation—are nationwide organizations that address specific issues and cases. Two internal service organizations provide agency-wide support: Information Systems Services and Agency-Wide Shared Services. The National Headquarters assumes an overall role of setting broad policy, reviewing plans and goals of the operating units, and developing major improvement initiatives.

Modernized Business Processes

The high-level business processes supporting all of the business operating divisions have been partitioned into four process areas: pre-filing, filing, post-filing, and internal management. Figure 2 depicts the business process hierarchies for pre-filing, filing, and post-filing.

A primary goal of tax system modernization is to increase voluntary compliance through the established filing processes. This will be accomplished by educating taxpayers and communicating information through several channels including the Internet. In addition, direct assistance will be provided to taxpayers through IRS customer service representatives.

The filing processes address the acceptance of tax filings and payments that arrive either on paper or electronically. IRS is aiming to increase electronic submissions. This will speed up the refund process for tax overpayments and will advance management of taxpayer data in digital form without the need for converting paper forms to electronic formats. Electronic submissions also facilitate the construction of an authoritative taxpayer database, permitting selection and extraction of data for storage in data warehouses and data marts for downstream analyses.

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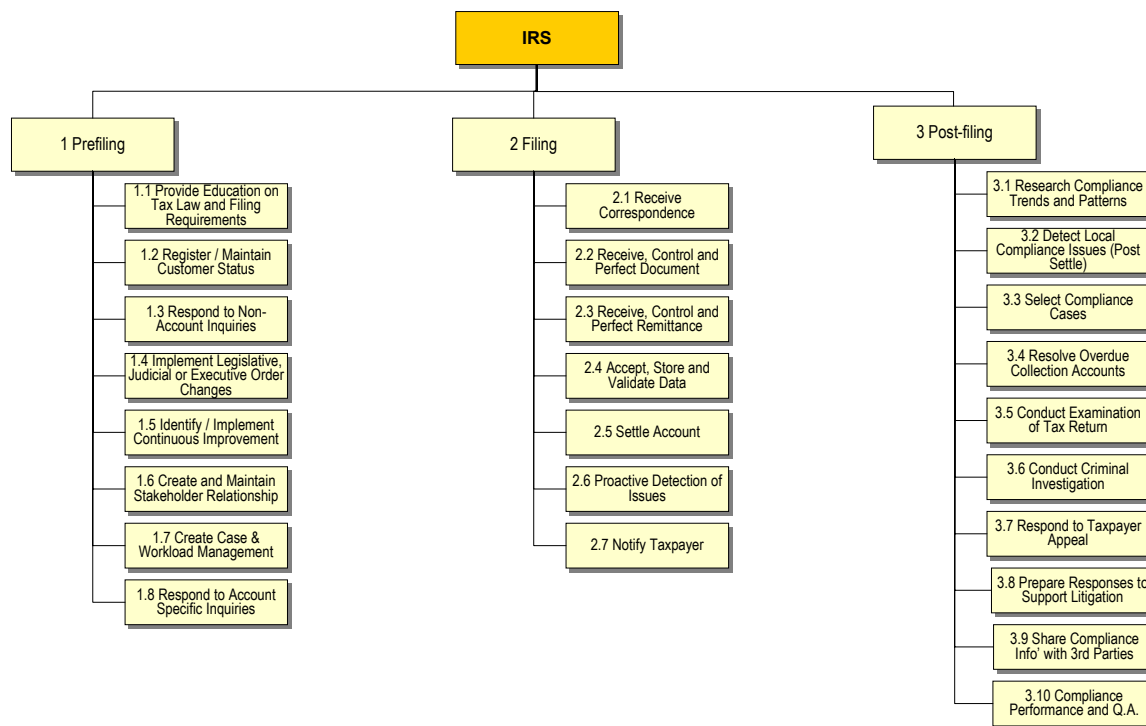


Figure 2. Business Process Hierarchies for Pre-filing, Filing, and Post-filing

Post-filing processes use high-quality (reliable) taxpayer data to help correct non-filing and under-reporting and to collect unpaid and overdue balances. The collection of taxes due is supported by analysis tools that enable the IRS employee to make assessments of risk and prioritize work. Many events warrant collection of taxes due, such as under-reporting and non-filing.

Case management applications, based on commercial CRM products, will play a key role in improving examinations, as will online analytical processing products. The anticipated improvements include a reduction in cycle time for examination completion, which leads to a reduction of costs to taxpayers (i.e., interest). These applications will support risk-based case selection and case management, which enhances employee productivity. The case management applications also integrate case resolution tools, which provide automatic feedback of results to Compliance Research and minimize employee rework.

Internal management processes will help the IRS better control the overall tax administration process. Figure 3 shows the business processes for internal management.

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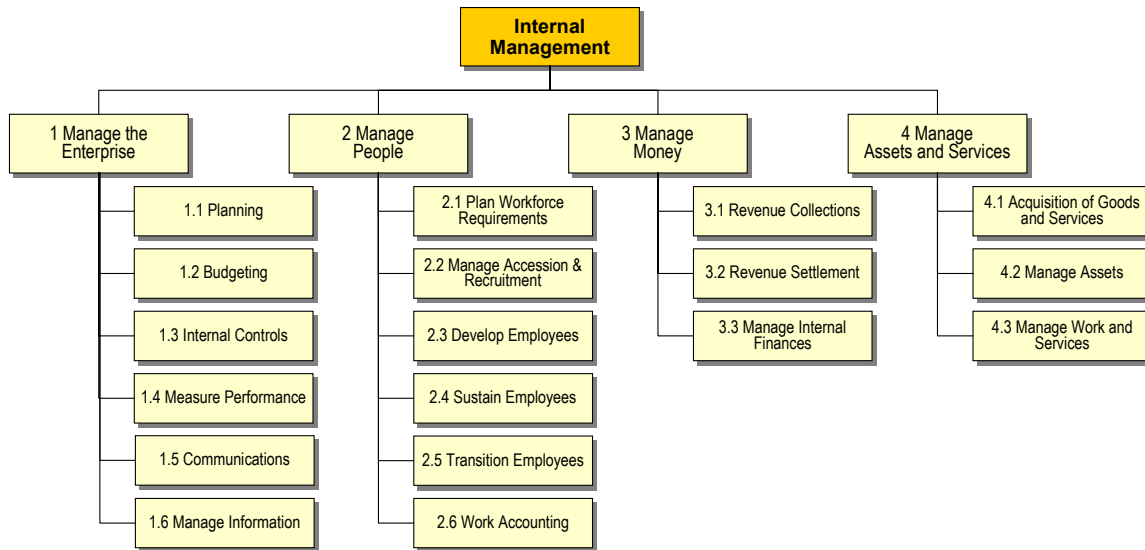


Figure 3. Business Processes for Internal Management

Several key focus areas include financial reporting to oversight organizations, such as Congress, as well as human resource management. In addition to the traditional management tasks required for a 100,000-plus workforce, the IRS will use data describing employee skills in the workflow management process. Internal management processes also will support security through user authentication and access controls.

Business Information and Data

The IRS business processes involve collecting, creating, and using information and data. IRS enterprise data has been grouped into six data categories, see Figure 4.

IRS Enterprise Data					
Data Categories					
Authoritative Taxpayer Data	Taxpayer Analytical Data	Internal Mgmt. & Support Data	Security Data	Technical & Reference Data	Archival Data
<ul style="list-style-type: none"> • Taxpayer Accounts • Tax Returns • Information Returns • Payment Information • Customer Cases • Taxpayer Correspondence 	<ul style="list-style-type: none"> • Statistics of Income • Compliance Research • Third-party Data • Marketing/ Outreach Data 	<ul style="list-style-type: none"> • Personnel Data • Org. Structure • Skills Data • Standard GL & Financial Accounting • Procurement • Assets • Performance Measurement • MIS 	<ul style="list-style-type: none"> • Authentication • Authorization • Audit Trail • Workflow Management 	<ul style="list-style-type: none"> • Static Value Data • Reference Data • Technical Data • Software Development Data 	<ul style="list-style-type: none"> • Archive Text/Records Database • Archive Images • MIS Archives

Figure 4. IRS Enterprise Data

ENTERPRISE ARCHITECTURE PERSPECTIVE

The modernized IRS tax administration system applies modern enterprise architecture concepts to define how IT will support business needs. The IRS is developing an Enterprise Architecture, a set of Enterprise Requirements, and an Enterprise Transition Strategy to provide focus and guidance for developers. The Enterprise Architecture, Requirements, and Transition Strategy facilitate effective investment decision management for the integration of all modernization business and technical components.

The IRS Enterprise Life Cycle (ELC) methodology and associated work products will be used to model and document the Enterprise Architecture, Requirements, and Transition Strategy. Blueprint 2000 is a release of these guiding documents and will be sufficient to support the development of selected projects.

The Enterprise Architecture captures and integrates the organization and business process information from the IRS Organization Blueprint, the information and data used in those processes, and the applications and IT infrastructure supporting the automation of the business functions.

The conceptual model of the Enterprise Architecture maps business applications to the associated business processes and logically separates those applications from data sources. Data is organized to efficiently support multiple applications but hides its physical structure from the applications. This allows the data structures and underlying hardware and software infrastructure to be improved without affecting business applications and the business processes that they support.

The Enterprise Architecture views the IRS from a number of perspectives. The architecture describes the business processes supporting its operating organizations and the locations for performance of these business processes.

The Enterprise Architecture also depicts the integration of IT components of the overall business system. It describes three primary perspectives: data, applications, and technology. A principal goal of the architecture is to allow for the efficient integration of commercial off-the-shelf (COTS) software and for evolution and technology insertion. Overall, the technical architecture will be loosely coupled, using asynchronous messaging as the preferred application-to-application communications mechanism. Applications will be web browser-based to decouple the presentation of the user interface from specific end-user platforms. Data manipulation by applications is not dependent on the underlying data structures.

Principles, Assumptions, and Constraints for Data Management

The Enterprise Architecture includes the following principles, assumptions, and constraints to guide decisions for information and data management in the modernized IRS enterprise architecture:

Principles and Assumptions:

- Consider, manage, and protect IRS Enterprise Data as a corporate asset
- Present/render IRS Enterprise Data to the business users in the most effective and usable format
- Protect privacy of taxpayer data (most important criterion of data security)
- Organize and store IRS Enterprise Data based upon optimal performance, integrity, and maintainability
- Design a flexible data architecture to reflect evolving or changing requirements from the IRS regulatory environment
- Manage and control metadata at the enterprise level to achieve enterprise-wide data integration
- Centrally control, store, and manage all Authoritative Taxpayer Data
- Provide a backup computer center to assume operations, in the event of failure at a computer center, within a timeframe specified by business requirements

- Store backups of at least two generations of all Authoritative Taxpayer data at a highly secure facility for disaster recovery purposes
- Reconcile and balance all Taxpayer Account Financial data with the inputs and outputs on a daily basis
- Implement Online Transaction Processing data (OLTP) and Online Analytical Processing data (OLAP) on physically separate platforms and databases
- Use the data access service component of the infrastructure architecture for all online application access to databases
- Use direct SQL for all batch application access to databases
- Develop and implement a diagnostic analysis process to track and report data inconsistencies
- Develop and implement a performance analysis process to monitor, track, and report database performance.
- Develop meaningful data standards to facilitate communication and data sharing among different projects

Constraints:

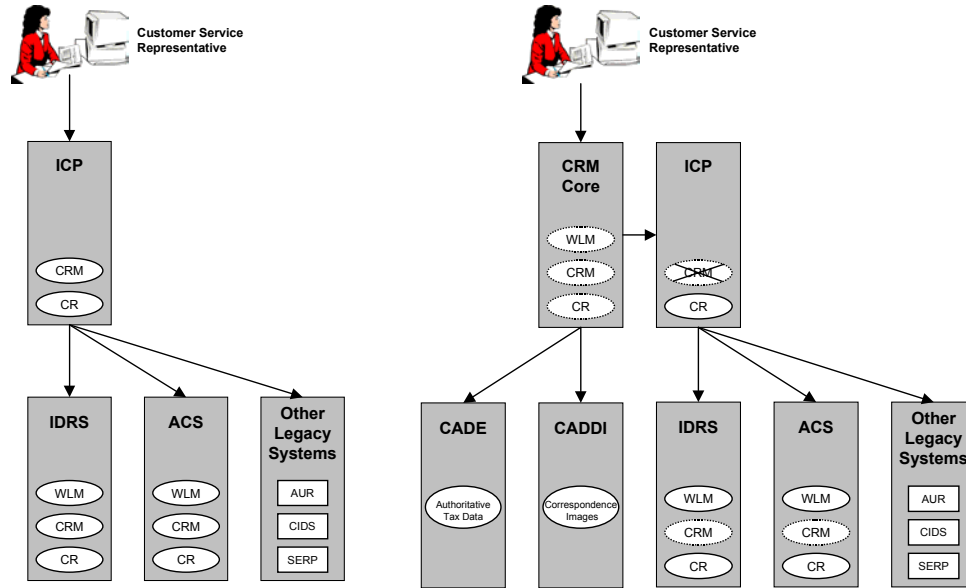
- OLAP data will not update any transaction processing data created within a COTS product may not be directly accessible if the COTS product data model is not extensible and not fully integrated with the IRS Enterprise Data model
- COTS products may present an additional layer of security and authorization for accessing data within their databases.

KEY TECHNICAL COMPONENTS

The principles, assumptions, and constraints of the Enterprise Architecture also guide the technical decisions in developing solutions to support the IRS business needs.

Two key technical components of the modernized IRS business system are crucial to understanding the Enterprise Architecture. The Customer Account Data Engine (CADE) will provide complete, accurate, and timely taxpayer account and tax return data to all modernized applications. Similarly, the CRM Core component offers a complete, accurate, and timely case history to IRS users, as well as the mechanisms to manage cases and case workloads.

Because tax system modernization will proceed over a substantial period, both legacy and modernized systems must operate in parallel until all taxpayer segments are transitioned to the modernized system. Customer Service processes offer an excellent example how this need will be met. Figure 5a illustrates how customer service is currently supported by IT systems. Figure 5b shows how, through the transition period,



customer service representatives will use both the modernized system and the legacy system.

Figure 5a. Current IT Support of Customer Service

Figure 5b. IT Support of Customer Service during Transition

CONCLUSIONS AND SUMMARY

The goal of IRS tax systems modernization will require a viable Enterprise Architecture, as well as a disciplined risk management program. These risks involve migration, maintenance, user access, and tax law revision of current (legacy) and new systems. For example, the age and complexity of legacy IRS systems will make migration difficult. Because incremental transition to modernized systems is the only way to proceed, there will be many touch points between the old and the new systems. This will necessitate the development and maintenance of special bridges and other interfaces. Tax law changes must be applied to both the old and new systems. As shown in the customer services example, IRS users may be required to access both old and new systems. In addition, the potential competition for qualified resources and skill sets because of the concurrent modernization of the IRS organizational structure and IRS business systems must be carefully managed.

IRS is adopting and applying best industry practices for information and data management during the modernization of its systems supporting tax administration and other enterprise functions. The approach addresses this challenge from three perspectives: IRS organization and business processes, enterprise architecture, and technical issues. To capture the complex interrelationships among the business needs

and technical solutions, the IRS is preparing a cohesive Enterprise Architecture to ensure the full integration of business and technical components. The Enterprise Transition Strategy will provide the direction for phasing in modernized systems and databases, while phasing out systems and databases that IRS has developed over the past 25-plus years.