

Executive Summary

In early 2001, the New York State Department of Taxation and Finance (DTF) embarked on an aggressive mission to re-think its technology and application architecture from the ground up. This effort arose out of a recognition that the Department's computing infrastructure would not be able to timely support the rapidly growing needs of tax administration and inter-agency data sharing and communications. Built primarily during the 1970s and 1980s to support the processing of tax returns in a "batch" environment, there also was concern that the infrastructure would not be able to support the accelerating trend of citizen requests to access tax account information and file tax return information via the Internet. There was serious question as to the vendor's ability to continue to support one of the major technology platforms hosting critical agency applications. Finally, each of the 33 taxes administered by DTF was processed either manually or by stand-alone applications running on a number of technology platforms.

A project, code-named e-MPIRE (**e-Managed Processes for an Integrated Revenue Enterprise**), was initiated to develop an architecture designed to leverage the substantial assets hosted on the IBM platforms while taking advantage of newer technologies to deliver data and functionality to internal business users, external agency partners and the citizens of New York State. The infrastructure and core applications had to be developed and delivered without disrupting Department operations and the \$67 billion revenue stream supported by those operations.

In January 2006, DTF successfully completed the implementation of the core infrastructure and application suite and deployed the system within the Department and other State agencies (e.g., Department of Labor, Department of State, and Office of the State Comptroller). Immediate benefits were realized upon implementation. For example, DTF was able to deploy legislatively mandated changes to Corporation Tax law within 60 days. In the past, typical deployment timeframes would require a minimum of six months. Work flow components deployed as part of e-MPIRE have enabled managers to automate the distribution of work and identify bottlenecks and reassign staff to the most critical work. When piloted on an existing tax processing system prior to deployment in e-MPIRE, work flow components caused inventories to fall by over 70% within a six month period.

Four (4) additional application releases are scheduled through Spring 2008. With completion of the e-MPIRE project, DTF anticipates that its business units will benefit from its web-based access, work flow automation, sophisticated management reporting capabilities, data availability, and less extensive training requirements due to the intuitive nature of the user interface. External agencies will benefit from improved data interfaces and online, real-time access to appropriate data stores. Information services groups will benefit from the standardization of computing platforms and configurations deployed in the future. Perhaps most importantly, taxpayers will benefit from the web-enabled services (i.e. - account management, tax return preparation, and real-time customer service) that will be implemented within the e-MPIRE framework within the next few years. With e-MPIRE in place, DTF will advance its strategic goal of enhanced voluntary tax filing compliance.

**NASCIO Nomination Submission – 2006 Enterprise Architecture Award
New York State Department of Taxation and Finance**

A. Concise description of the business problem and solution.

Immediately following the successful transition through the Year 2000 issues, the New York State Department of Taxation and Finance (DTF) recognized that its computing infrastructure would not be able to timely support the rapidly growing needs of tax administration and inter-agency data sharing and communications. Built primarily during the 1970s and 1980s to support the annual processing of millions of tax returns in a "batch" environment, there also was serious question whether the infrastructure would be able to support the accelerating trend of citizen requests to access tax account information and file tax return information via the Internet. Underlying these issues was a looming concern as to the vendor's ability to continue to support one of the major technology platforms hosting critical agency applications. Finally, each of the 33 taxes administered by DTF was processed either by a stand-alone application on one of many technology platforms or manually.

A project, code-named e-MPIRE (e-Managed Processes for an Integrated Revenue Enterprise), was initiated to develop a three-tiered architecture. This architecture was designed to leverage the substantial assets hosted on the IBM platforms while taking advantage of newer technologies to deliver data and functionality to internal business users, external trading partners and the citizens of New York State. The attached diagram ("NYS Department of Taxation and Finance – Architecture Overview") identifies the key elements of the technology.

Highlights include, but are not limited to:

- (1) the use of industry standard processes and techniques across all three tiers to foster an environment of rapid delivery of applications;
- (2) the use of commercial products to the extent possible to minimize custom development costs;
- (3) application of Service Oriented Architecture (SOA) principles throughout the design, regardless of the platform, reducing overall development and maintenance resourcing;
- (4) centralization, standardization and schema portability of the data structures to ensure that data can be delivered anywhere, anytime;
- (5) browser-based GUI front-end to provide system users with a familiar and comfortable experience, reducing training time and on-site support requirements;
- (6) full integration of image data collected at the front-end of the tax return processing cycle with the core application suite, reducing the Department's paper requirements;
- (7) the capability for on-line "real time" processing for all transactions;
- (8) integration of the statewide security infrastructure that centralizes the application access security capabilities for the entire New York State work force;
- (9) migration from COBOL program code to JAVA program code, thereby leveraging the up and coming work force within governmental and private sectors;

- (10) an integrated platform capable of supporting an unlimited range of applications to service the taxpayers of New York; and
- (11) deployment of an integrated and automated work flow product suite to provide Department managers with the best tools available to manage the significant workloads and inventories associated with processing 24 million tax returns and accounting for over \$67 billion in revenue each year.

The core applications implemented in association with the technology consist of the following components:

- (1) taxpayer account management for over 14 million entities;
- (2) multiple flexible interfaces to account information for internal and external business partners;
- (3) integrated tax processing for Corporation Tax (completed to date) and the core functions for all business and personal income taxes;
- (4) comprehensive management reporting capabilities utilizing the latest report generation tools and technologies to provide the requisite reports and sophisticated predictive models to appropriate Department managers;
- (5) integration of manual data correction with commercial automated workflow software;
- (6) integration of a business rules engine that externalizes the computation of tax forms, processing that had previously been built using COBOL programs, migrating the development and maintenance of much of the tax processing into the hands of the users; and
- (7) integration of all tax processing into a single system to provide a single view to a taxpayer's account across all 33 tax types.

In January 2006, DTF successfully completed the implementation of the core infrastructure and application suite and deployed the system within the Department and other State agencies (e.g., Department of Labor, Department of State, and Office of the State Comptroller). Immediate benefits were realized upon implementation. For instance, DTF was able to deploy legislatively mandated changes to Corporation Tax law within 60 days. In the past, typical deployment timeframes would require a minimum of six months.

Four (4) additional application releases are scheduled through Spring 2008 which will complete the implementation of the architecture and applications. Given the success of the initial deployment, the citizens of New York can look forward to significantly-enhanced Internet-based capabilities supporting their ability to meet their tax obligations. Moreover, with e-MPIRE in place, DTF can further advance its strategic goal of enhanced voluntary tax filing compliance.

Creative development processes played a key role in the timely delivery of this complicated solution set. During the early stages of the project, a team of graphic designers, communication specialists, and trainers was established to focus on communicating e-MPIRE project information throughout the Department. One of the more critical deliverables consisted of providing general project information to as many employees as possible as quickly as possible. Two mechanisms proved to be very successful:

- (a) Special posters displayed throughout DTF buildings containing project information or slogans (e.g., "One Department, One System"); and
- (b) the DTF Intranet site.

This site is used to deliver more detailed project information as well as on-line interactive training for employees who cannot attend formal classroom training. This approach enabled DTF to deliver an abundance of critical information quickly and efficiently without disrupting critical business operations. Additionally, DTF senior management provided undaunting support of the project, consistently encouraging their staff to engage in project activities.

One of the critical success factors for any large project is a functional governance structure that is inclusive across the organization. For the e-MPIRE project the structure consists of:

- (a) the Executive Steering Committee that includes the Commissioner, Executive Deputy Commissioner, Deputy Commissioners and Project Directors;
- (b) the Leadership Team that includes the Executive Deputy Commissioner, Project Directors, and the CIO; and
- (c) the Core Team that includes senior managers and leaders within the business units who are responsible for approving the system design.

Project status communication occurs monthly through reports from the Project Director and the CIO to the Commissioner and frequent meetings with the Executive Deputy and the business leaders. Project management and system development life cycle (SDLC) have been implemented using the New York State Office for Technology models with a separate Project Management Office (PMO) that is responsible for developing and managing the detailed project plans, issues and risks. All of these capabilities were crucial to the successful deployment of this architecture.

B. Significance to the improvement of the operation of government.

DTF is responsible for the administration of over 30 taxes in varying complexities, volumes and value. The components of the e-MPIRE architecture installed to date are used by over 3,500 employees. Most of these employees utilize the Taxpayer Identification sub-system for functions that include, but are not limited to, taxpayer information inquiry, account maintenance, new taxpayer registrations, mail handling (e.g., undeliverable addresses), certificate printing (e.g. Sales Tax Certificates), and business incorporations. These activities ensure that, when tax returns are submitted by the taxpayers, DTF has the most current information available on the account which supports the computation of the tax liability and processing of associated payments. Approximately 200 of the 3,500 employees are focused on activities that relate to errors in submitted tax returns (e.g., repair computation error, misapplied payments) to complete the processing of the return. When Personal Income Tax is implemented beginning in October 2006, approximately 1,000 additional employees will be utilizing the system with the focus on ensuring that the estimated 5 million refunds are processed accurately and timely.

C. Benefits realized by service recipients, taxpayers, agency, or state.

Benefits of the implementation of e-MPIRE are significant and widespread throughout the Department and other State agencies. One of the noteworthy benefits of e-MPIRE is the reduction of effort required to implement changes based on legislative and executive office

mandates. Historically, these changes (usually implemented once per year) would require a minimum of six months of design, development and testing. The implementation of the business rules engine drastically reduced the implementation effort for changes required during calendar year 2006. This reduction in effort was primarily a result of the minimization of application program coding and the more efficient introduction of new business rules into the tax processing system. The changes for this year have only been applied to Corporation Tax, as it is currently the only tax in e-MPIRE. However, with over 30 taxes managed by DTF, the long-term benefit of externalizing the business rules will be dramatic as taxes are added to the application.

Many groups benefit now and will into the future from the implementation of e-MPIRE. Specifically, DTF business units benefit from the web-based access, work flow automation, sophisticated management reporting capabilities, data availability, and less extensive training requirements due to the intuitive nature of the user interface. Likewise, external agencies (i.e., Department of State, Division of Budget, and Office of the State Comptroller) benefit from improved data interfaces and management as well as online, real-time access to appropriate data stores. Taxpayers will benefit from the web-enabled services (i.e. - account management, tax return preparation, and real-time customer service) that will be implemented within the e-MPIRE framework within the next few years. Furthermore, information services groups will benefit from the standardization of computing platforms and configurations deployed in the future. They will also be at an advantage with service oriented architecture and access to a broader work force pool more familiar with the technologies implemented within the e-MPIRE framework.

D. Realized return on investment, short-term/long-term payback.

Data to support the measurements of improvement are scarce at this time as the integrated tax system has only been in production for a few months. In preparation for the development of the core system components, however, DTF implemented identical work flow components on an existing tax processing system to measure the potential benefits of automating inventory management (previously, inventories were determined based on the average number of work items in a stack of paper multiplied by the number of stacks). Within six months, inventories fell by over 70 percent, primarily due to the automated distribution of work and management's ability to identify inventory bottlenecks and re-assign staff to the most critical work.

It should be emphasized the return on investment due to moving to the new architecture will be measured differently than typical system implementations. Overall, the technology investments in the new architecture will be smaller and, when capacity needs to be increased, the incremental costs will be significantly less due to the nature of the infrastructure (e.g., add a number of blades vs. upgrading to a new mainframe). Maintenance of the new architecture and application will be more manageable given the migration to modern programming platforms to take advantage of the available work force across the public and private sectors. Finally, the architecture deployed at DTF is hoped to be a model for the rest of New York State, reducing development and implementation costs throughout the State.

NYS Department of Taxation and Finance Architecture Overview

