NASCIO 2007 Recognition Awards Program – Award Nomination

Data, Information and Knowledge Management Category

Pennsylvania's Enterprise Asset Repository (PEAR)

Executive Summary

The Pennsylvania's Justice Network (JNET) is the Commonwealth's primary public safety and criminal justice information broker. Conceived in 1997 by the Governor's Office of Administration to provide a "virtual single system" for the sharing of protected information, JNET's secure integrated web portal offers a common online environment to over 30,500 authorized practitioners throughout the Commonwealth's 67 counties.

Electronic data exchange and real-time event messaging services have proven to be the cornerstone of JNET. Dating back to 1999, the JNET Steering Committee established XML as a messaging standard and JNET began supporting data exchange between agency data systems. By leveraging existing systems, JNET was able to ensure that each agency independently controlled their data without compromising the ability to share critical information. Although agencies began sharing data, information was shared without standard reference points, and delivery failure resulting from information validation became a key issue resulting from non-standardized data exchanges.

In 2006, JNET implemented a statewide Global Justice XML Data Model (GJXDM) 3.0 document creation and procedure process that resulted in the development of standardized data exchange documentation and schemas. Agencies were positioned to create, manage, and implement exchange points using repeatable processes thereby maximizing organizational efficiency while reducing development costs.

As JNET services and exchanges are requested or change, JNET staff and business partners were frequently required to spend time locating documentation and understanding JNET requirements for these services. In order to overcome some of the enterprise schema and versioning concerns, JNET initiated two new projects that would aid in the achievement of an enterprise wide asset repository; the *Metadata Message Clean Up* initiative and the implementation of the *Pennsylvania Enterprise Asset Repository (PEAR)*. The goal of these objectives would result in the review of existing message documentation and provide a central administration point for documentation access.

The Message Clean Up project allowed JNET to ensure that metadata and message documentation was complete, accurate, and prepared to be loaded into the centralized asset repository for reference by JNET constituents, integration, and technical resources.

PEAR was designed for state agencies who desire to create applications that produce or consume XML messages defined by schemas and procedures. This message repository contains the cleansed schema and provides starting points for new message exchanges. Once completely loaded, PEAR will be exposed to the Commonwealth's entire enterprise where Executive State agencies and authorized Commonwealth practitioners will be afforded the opportunity to securely inquire and view information in the message library repository.

As a result of the Metadata Message Clean Up initiative and the implementation of PEAR, the library has helped to promote a consistent use of GJXDM throughout the Commonwealth and enables Pennsylvania to easily share information throughout the United States. The Commonwealth is now able to implement

new services and exchanges across the secure JNET infrastructure in an expeditious manner, with fewer resources, and at a considerable savings to Commonwealth citizens.

The message research, development, and implementation process prior to PEAR would take an agency an average of nine months to design, develop, and implement. As a result of JNET's efforts, the annual return on investment for message development at JNET is $158,613.

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Category: Data, Information and Knowledge Management

A. Title: Pennsylvania's Enterprise Asset Repository (PEAR)

B. Business Problem and Solution

Introduction

In 2006, the Commonwealth of Pennsylvania Justice Network (JNET) implemented a statewide Global Justice XML Data Model (GJXDM) 3.0 document creation and procedure process that resulted in the development of standardized data exchange documentation and schemas. Agencies were positioned to create, manage, and implement exchange points using repeatable processes thereby maximizing organizational efficiency while reducing development costs.

Building upon this exchange foundation, JNET, in conjunction with the Enterprise Architecture and Business Solutions Center of Excellence Teams, recognized the need to effectively share schemas and documentation, to allow visual referencing from topological diagrams of the Commonwealth's entire architectural framework, and to allow for the timely and accurate exchange of schemas. In early 2007, the teams began the design and implementation phase of a statewide metadata repository.

The new enterprise library was subsequently established to house metadata for message exchanges and associated documentation. Support for the Pennsylvania Enterprise Asset Repository (PEAR) steadily increased, and it is now the standardized repository for all Commonwealth enterprise assets. The new library allows agencies to federate user assertions with the Commonwealth's enterprise library, thereby allowing authorized individuals to view available JNET messages, saving time and resources.

Several state agencies, including organizations from the Commonwealth's Business Solutions Center of Excellence, Enterprise Architecture, JNET and all of the current Local Centers of Excellence, embraced the opportunity to implement the enterprise metadata repository. PEAR has provided JNET and its constituents with a cost-effective solution for ongoing criminal justice and public safety integration initiatives. Most importantly, PEAR has increased the visibility of enterprise assets and has resulted in tangible cost savings to the Commonwealth.

Background

JNET is the Commonwealth's primary public safety and criminal justice information broker. Conceived in 1997 by the Governor's Office of Administration to provide a "virtual single system" for sharing criminal justice and public safety information, JNET's secure integrated Web portal offers a common online environment to over 30,500 authorized practitioners throughout the Commonwealth's 67 counties.

JNET provides over 850 municipal police departments, all 67 counties, 54 state agencies, and 42 federal agencies with the ability to conduct secure investigations in a web-based portal environment, invoke web services, participate in electronic data exchange, and subscribe to real-time event messaging services. JNET's business partner and virtual private network infrastructure provides secure access to the following agency data sources:

- Commonwealth Law Enforcement Assistance Network (CLEAN)
- National Crime Information Center (NCIC)
- National Law Enforcement Telecommunications System (NLETS)
- Interstate Identification Index (III)
- NY/NJ High Intensity Drug Trafficking Area (HIDTA)
- Pennsylvania State Police (PSP)
- Administrative Office of Pennsylvania Courts (AOPC)
- Pennsylvania Board of Probation and Parole (PBPP)
- Pennsylvania Department of Corrections (DOC)

- Pennsylvania Department of Transportation (PennDOT)
- Pennsylvania Juvenile Court Judges Commission (JCJC)
- Pennsylvania Commission on Sentencing (PCS)
- Pennsylvania Commission on Crime and Delinquency (PCCD)
- Pennsylvania Chiefs of Police Association (PCPA)
- Pennsylvania Coalition Against Domestic Violence (PCADV)
- Pennsylvania Department of Public Welfare (DPW)

Problem

Electronic data exchange and real-time event messaging services have proven to be the cornerstone of JNET. Dating back to 1999, the JNET Steering Committee established XML as an internal messaging standard and JNET began supporting the concept of "case file transfers" between agency data systems. By leveraging existing agency systems, JNET was able to ensure that each agency independently controlled their data without compromising the ability to share critical information amongst JNET partners. This allowed JNET to avoid traditional data ownership issues, and contributing agencies were positioned to focus on the utilization of information and resources.

During 2000, the JNET Steering Committee created the JNET Data Conflict Subcommittee to facilitate the use of agency data and provide governance for the effective use and exchange of information between systems and users. The committee was challenged to identify when legitimate information discrepancies need to be maintained and when differences mandate modifications to data structure in order to account for more accurate or reliable data.

Agencies began sharing information through Document Type Definitions (DTD's). Information was shared without standard reference points, and delivery failure resulting from information validation became a key issue resulting from non-standardized data exchanges. As a result of these two deficiencies, the committee recognized that effective justice data exchange demanded a common "data dictionary" to address data conflict and help to support inter-agency data compatibility concerns.

To minimize data conflict and in order to standardize message development between justice agencies, JNET adopted the Global Justice XML Data Model 3.0 (GJXDM) IOC compliance guidelines. JNET also embraced the SEARCH Consortium's Justice Information Exchange Model (JIEM) tool to improve information exchange efficiencies.

As additional exchange requirements were identified and implemented, JNET recognized a need to establish a repeatable process for the new generation of GJXDM-compliant message exchanges. A process was also needed to define a set of procedures describing the GJXDM message exchange, and

more importantly, the process was required to contain reusable components. In order to ensure that work efforts aligned with the strategic goals of Pennsylvania data exchange standards, technical guidelines were also needed to assist agencies in developing GJXDM schemas and other required documents from the message development procedures. In 2006, the Commonwealth responded to these needs and implemented the Pennsylvania Global XML 3.0 Document Creation Process.

After implementing a standardized process that defined new standards and policies for statewide data, information, and knowledge exchange, agencies began developing exchange points at a rapid pace. However, in order to control the context of schemas and their versioning, a GJXDM message repository was identified as a critical requirement for storing agency message development procedures and approved assets for future discovery and reuse.

Solution

As JNET services and exchanges are requested or change, JNET staff and business partners were frequently required to spend time locating documentation and understanding JNET requirements for these services. In order to overcome some of the enterprise schema and versioning concerns, JNET initiated two projects that would aid in the achievement of an enterprise wide asset repository; the ***Metadata Message Clean Up*** initiative and the implementation of the ***Pennsylvania Enterprise Asset Repository (PEAR)***. The goal of these objectives would result in the review of existing JNET message documentation and provide a mechanism for maintaining information from a central enterprise location.

The Message Clean Up project allowed JNET to ensure that metadata and message documentation was complete, accurate, and prepared to be loaded into the centralized asset repository for reference by JNET constituents, integration, and technical resources.

PEAR was designed for state agencies who desire to create applications that produce or consume XML messages defined by schemas and procedures. This message repository contains the cleansed schema and provides starting points for new message exchanges. Once completely loaded, PEAR will be exposed to the Commonwealth's entire enterprise where Executive State agencies and authorized Commonwealth practitioners will be afforded the opportunity to securely inquire and view information in the message library repository.

As a result of the Metadata Message Clean Up initiative and the implementation of PEAR, the library has helped to promote a consistent use of GJXDM throughout the Commonwealth and enables Pennsylvania to easily share information throughout the United States. The Commonwealth is now able to implement new services and exchanges across the secure JNET infrastructure in an expeditious manner, with fewer resources, and at a considerable savings to Commonwealth citizens.

C. Significance to the Improvement of the Operation of Government

During the 2006 process of collaborating and creating a repeatable process for the generation of GJXDM compliant message exchanges on the JNET infrastructure, a business process defining the creation of new event messages was established. This process defined two major documents to be utilized by JNET partners when publishing a new GJXDM message; The JNET GJXDM Message Development Document and the JNET GJXDM Technical Guidelines Document.

With these defined guidelines for message development and data exchange in place, the Metadata Message Clean Up initiative and the implementation of the Pennsylvania Enterprise Asset Repository (PEAR) allowed agencies to ensure that all schemas were accurate, up to date, and compliant with existing GJXDM and NIEM standards and guidelines. More importantly, all cleansed documentation is

now available for timely exchange between business partners. These two projects have resulted in a significant improvement in the operation of government in the following manner:

1. Metadata Message Clean Up initiative

As the level of the JNET services increases, completeness and clarity of the metadata documentation for these services has become more challenging, and has not kept pace with the extent of the services provided. This frequently requires JNET staff and JNET business partners to spend time unnecessarily locating documentation and understanding JNET requirements for these services.

The Metadata Message Clean Up initiative resulted in:

- A set of standardized message documentation including sample XML, constraint schema, and mapping documentation.
- A standard folder structure that supports an iterative development life-cycle.
- Facilitates the use of a greater number of event messages via JNET.
- Increases the technical interface documentation to JNET business, integration and technical resources and authorized JNET stakeholders.
- Reduces the time and cost to deliver technical information by providing JNET stakeholders information and documentation on JNET Messaging Services quickly and inexpensively.
- Allows for the ability to provide complete message documentation to JNET business partners and constituents.

2. Pennsylvania Enterprise Asset Repository (PEAR)

Leveraging the efforts of the message clean up initiative, JNET and the Commonwealth have deployed PEAR components at an enterprise level resulting in:

- A set of standardized message documentation. This documentation consists of a standard set of mandatory documents as approved by agency constituents.
- A standard folder structure that supports an iterative development life-cycle.
- A reduction in cost to deliver technical information to authorized JNET state level stakeholders regarding JNET messages and supporting documentation.
- Provides a single, authoritative JNET message library for State level JNET customers.
- Promotes the reuse of JNET assets through enterprise wide discovery.
- Facilitates the use of a greater number of event messages via JNET.
- Increases the technical interface documentation to authorized JNET stakeholders.
- Increases exposure to JNET messages from disparate authorized state level agencies without the need for specialized coding.

D. Public Value of the Project

Benefits Realized by Service Recipients, Taxpayers, Agency or State

By predefining standards, definitions, procedures, and the guidelines required during the message development process, business owners and stakeholders are able to access PEAR artifacts without a technical understanding of the fundamental details of GJXDM. Technical team members are able to focus on technical guidelines and schemas retained in the PEAR, while stakeholders focus on organizational objectives and their alignment to PEAR's documented business drivers.

JNET documentation on the messaging services is now exposed to other State level agencies for reuse. Prior to PEAR, documentation was found in numerous locations throughout the Commonwealth, and frequently resided within the knowledge base of one or two individuals. Now, JNET partners and other State agencies do not have to spend time and resources unnecessarily locating and obtaining detailed

documentation for the messaging services provided via JNET. Ultimately, the risk of developing inaccurate messaging code has been mitigated for the Commonwealth enterprise.

Public Safety Process Improvements

Law enforcement was looking for notorious outlaw motorcycle club leader Thomas Campbell for more than two years after he failed to show for trial on weapons-offense charges in 1999. Years before the Commonwealth's adaptation of a standardized GJXDM process, before wireless access to JNET and other integrated solutions, and prior to accurate processes for warrant management, Police Officer Dennis McNamara was unnecessarily slain by this career criminal.

The officer was investigating a suspicious vehicle for what he believed was a wanted person. The active warrant, unsubstantiated and inaccessible from his patrol car at the time, contained a warning that the outlaw biker "is armed, very dangerous, and will shoot cops." Campbell saw Officer McNamara examining his vehicle, approached the officer, and struck the officer in the right temple with a bullet fired from his weapon. McNamara died a few hours after the event.

With the advent of accurate and timely data exchange principles being adopted and shared throughout the Commonwealth, Pennsylvania agencies are better prepared to respond to these types of electronic inadequacies. Today, this gap in warrant availability, and hundreds of other public safety scenarios and concerns, has been reduced with the development of new messages according to the GJXDM requirements now housed in PEAR.

Conserving Resources with GJXDM, Resource Savings, Realized Return on Investment, & Short-term/Long-term Payback

The message research, development, and implementation process prior to PEAR would take an agency an average of nine months to design, develop, and implement. Based on the creation of one new message per month at JNET, five resources assigned to message inception, and seven resources involved during each remaining phase, the annual return on investment for message development at the JNET Office is $158,613.

GJXDM process benefits	Estimated Commonwealth savings	Hrs. saved
Defined process, project plan templates, reduction of time required for inception phase.	Savings of 2 hours per person. *5 people x 2 hours x 12 messages = 120 hrs/yr.*	120
Clearly defined project roles keep project on track and require fewer meetings.	Eliminate 2 meetings per project. *7 people x 2 one hr meetings x 12 messages = 168 hrs/yr.*	168
Artifact templates keep users from "reinventing the wheel."	Savings of 20 minutes per document. *3 documents x 20 minutes x 12 messages = 12 hrs/yr.*	12
Messages are clearly documented and cataloged. Components are reused rather than creating new.	Reusable components – approximately 40%. *7 people x 40 hrs/person/message x 12 messages x 40% = 1344 hrs/yr.*	1344
	Total Hours Saved:	**1644**

Average Annual JNET Resource Per Hour ($96.48) x Total Hours Saved:	$158,613