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An Oracle White Paper
November 2012

Oracle Hyperion Data Relationship Management
Implemented at a Large Government
Organization Responsible for Managing the US
Armed Forces

Executive Overview

Any agency responsible for the disbursement of funds to support US Armed forces programs must be able to accommodate the stringent processes for obtaining approvals from differing chains of command, while providing full transparency into the funding decisions made. The data from the resulting decisions must be efficiently interfaced to a heterogeneous mix of downstream applications. This agency selected Oracle Hyperion Data Relationship Management to accommodate metadata management across its wide range of applications, due to the product's ability to provide data governance, rationalization, consolidation, and distribution. In this paper, you will read about the business case defining the requirements for the product selected, the strategy for data governance, the high level approach to the implementation, and the results which were achieved.

Introduction

The programming and budgeting agency within this large governmental organization responsible for managing the United States Armed Forces needed to modernize their architecture to decrease the labor costs associated with the operations and maintenance of the agency's IT infrastructure. This agency manages systems that facilitate key programming and budgeting processes which set the funding levels for major initiatives that are operated within the Armed Forces. The process for planning, programming and budgeting of funds is a collaborative effort spanning multiple agencies. With each new budgeting cycle, strategic plans are formulated, and the funding levels for the life of each new program, procurement project, or research and development project are planned. Budgets typically consist of the amount of manpower and the costs for procurements, research & development and other programs necessary to successfully meet the mission of the organization. Ultimately, the budget for each fiscal year must be agreed upon and submitted to the United States Congress.

There are many systems involved in the programming and budgeting process described above, which made a master data management system critical to the success of the modernization effort. It was expected that a successful master data management architecture

would keep all downstream systems in synch, minimizing validation errors for final budget submission.

The modernization effort included the following components:

- a system to create and maintain key programming and budgeting data elements

- a system to facilitate the process for allocating funds to different programs within the organization

- an enterprise data warehouse for the analysis of programming and budgeting data

At the start of the project, a legacy master data management system existed, which was a custom developed application built using PowerBuilder and Microsoft SQL server that maintained over 100 tables of master data elements, including tables that stored information about programs to be planned for as well as the workforce or manpower structure to carry out these initiatives. Most of these data elements were made up of thousands of records or dimension members and the largest to be migrated stored ~45,000 records. There were eight critical data elements that required workflow approval processes prior to being distributed to other systems. The workflows included members of external departments to ensure each data element addition or change was aligned to their reporting requirements. In addition, there was a legacy budgeting system developed using .Net and Microsoft SQL Server. The enterprise data warehouse that holds budget and actual data was initially designed to use Oracle business intelligence with the Oracle database.

Requirements

Prior to embarking on the systems evaluation, the requirements were thoroughly scoped. In order to successfully meet the master data management needs of the organization, the new system needed to satisfy the following functional requirements:

- Ability to utilize Public Key Infrastructure (PKI) authentication

- Ability to create and easily maintain complicated workflows to approve the creation and modification of data elements

- Ability to maintain versions of different sets of data elements for different budgeting cycles

- Ability to maintain data elements within hierarchical structures

- Ability to maintain all business rules within the master data management system

- Ability to receive and integrate sets of master data from different sources independent of platform

- Ability to distribute sets of master data to downstream systems independent of platform

Analysis

To reduce the overall cost of the project, the implementation partner Definitive Logic, opted to evaluate a number of solutions which could be configured to meet the needs of the organization. As a result, Oracle Hyperion Data Relationship Management (DRM) was selected to be implemented as the master data management (MDM) solution for the organization. DRM provides four categories of capabilities: Data Governance, Data Rationalization, Data Consolidation and Data Sharing (figure 1). These elements made the product an ideal choice to address the organization's MDM needs. Concurrent with the DRM implementation, the agency also decided to implement Oracle Hyperion Planning to replace the legacy programming and budgeting application.
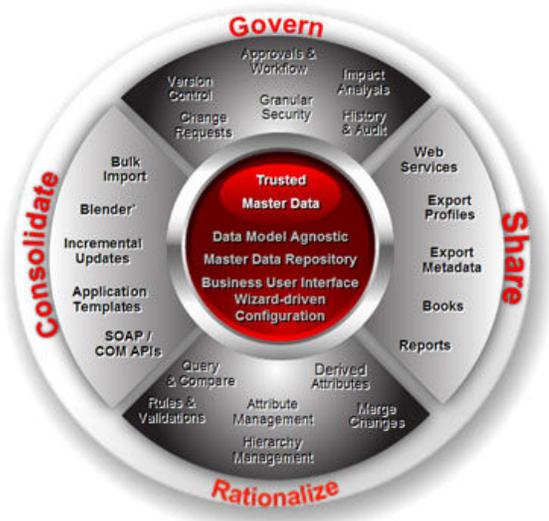
Figure 1: Elements of Oracle Hyperion Data Relationship Management

Implementation

Data Governance

Oracle Hyperion Data Relationship Management offers a Workflow Development Kit (WDK) that utilizes the Business Process Execution Language (BPEL) of the Oracle Service Oriented Architecture (SOA) Suite to implement user defined approval processes. The WDK is an open-source framework that is deployed on Weblogic infrastructure and provides a set of extensible components that can be used to meet organizations' the data governance requirements.

The agency's system was architected such that each change request to update master data elements is input into DRM, but the organization's master data is not impacted until final approval in the workflow process. Upon final approval of each change request, downstream systems are notified of the updates and have the ability to pull the data to their systems and synchronize with a centralized master data source.
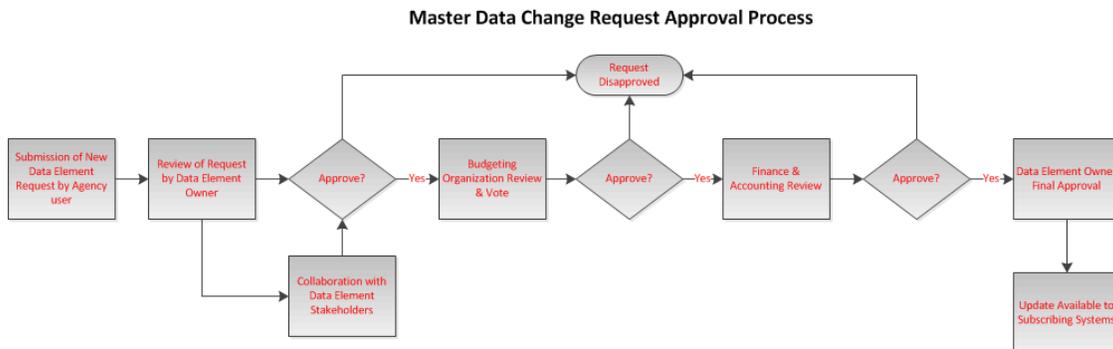

Figure 2: Sample Data Element Approval Process

The agency required complicated workflows, as outlined in the Figure 2 above, which incorporated multiple levels of approval to ensure that each new data element is categorized properly for external department reporting needs. Approvals can be performed serially or in parallel. In addition, the organizational process within the agency is set up to allow multiple people to contribute to the decision to approve, or not, changes to data elements. Certain users are able to vote on the change, while others can only provide comments when requested. Seamless integration with the organization's custom developed application for management of user roles was a necessary requirement of the MDM application. Each workflow that was implemented utilized the groups and users provisioned to those groups to determine where to route the request throughout the approval process.

From a user perspective, the workflow system uses Single Sign-On (SSO) and is accessible through the agency's portal. Additionally, as a change request moves through the approval process, email notifications are sent to the appropriate parties. The workflow approval user interface features a task list format that allows users to easily scroll through change requests that are currently assigned to them. The interface provided for users to view change requests was a large improvement over the legacy system, because it consolidates all requests for all data elements in one view that the users can filter by status or data element. Also, the utilization of Oracle Business Intelligence provides users with the ability to view the related data elements necessary to make decisions on whether or not to approve each change request.

The organization needed to version the data elements by budget cycle and to provide comparative reports to analyze changes to the data across the different versions. DRM's capability to provide comparisons of hierarchies between versions provided an automated way for end users to spot differences between versions of the master data. Previously this was time consuming and had to be performed manually in their legacy system. Additionally, the data is exported to a relational database so that Oracle business intelligence can be used as a front-end for the agency's user community to report on the data. The Definitive Logic (DL) team implemented these complicated workflow requirements for the agency utilizing a combination of DRM, the WDK and Oracle business intelligence.

Data Rationalization

Many of the organization's key data elements were not initially thought of as hierarchies, when in fact they were. Transforming the existing relational data model into a hierarchical structure provided value to the organization since it allowed for the streamlined creation of dimension data in Oracle Hyperion Planning. The new structure laid out all key program data elements into one hierarchy and easily enforced key validations and other business rules required by the data elements, through DRM derived properties.

As part of the budgeting process, the organization is responsible for reporting financial figures to other organizations that use different data elements to view the data. For example, a parent organization may need to report on a data element known as a Budget Activity and each Program would be assigned a Budget Activity. The Decision Logic team used the validation framework within Oracle Hyperion Data Relationship Management to implement these data governance processes. This approach provided the team with the added flexibility to implement complex business rules, satisfying a range of data validation requirements, while still maintaining the integrity of the underlying data.

Data Consolidation

The organization required the ability to collect data sets from other organizations in order to assign them to the internal set of data elements. To satisfy this requirement, the data is loaded into DRM from external sources using a process that stages it and compares against the existing data. In future phases of the project, the organization plans to implement web services to perform these processes.

Data Distribution

The most critical aspect of any MDM system is the ability to provide complete and accurate sets of master data to all of the applications that consume that data. The organization must be able to distribute master data to numerous downstream systems that will be performing programming and budgeting functions, and ultimately to receive back proposed funding allocations. Downstream systems included Oracle Database and Microsoft SQL server-based custom applications, Oracle Hyperion Planning, SAP applications and an Oracle enterprise data warehouse. DRM allows the data sets to be exported in a format that can be utilized by any external system. In future phases, web services are planned to further automate the distribution of the master data to necessary systems.

Results

The implementation of Oracle Hyperion Data Relationship Management (DRM) has provided the organization with the capability to execute approval processes for data element modifications, maintain the business rules associated with the data in one central location, and receive and distribute data between multiple sources and targets. Given the flexibility of DRM within the BPEL architecture and Definitive Logic's expertise with this technology, changes to master data are less time consuming, and cost less than they did with the legacy custom application. Additionally, due to the flexible nature of DRM exports, interfaces with new systems to receive master data can be quickly implemented. With these up-front MDM processes in place, the master data in the final budget submissions is more accurate, which decreases the time spent by operations staff to troubleshoot and correct errors.

As a result of the successful implementation of the DRM application, the organization has been able to implement an additional application for a peer organization to manage IT portfolios. This application provides similar efficiencies, but also had the added capability to validate the funding levels of systems against the amounts in the actual budget. This keeps the budgets proposed in the IT Portfolio Management System aligned with the overall budget, allowing decision makers to make decisions using more accurate inputs. Budget validation was not possible with the previous application tools that were used.

Conclusion

The programming and budgeting agency within a Large Governmental Organization Responsible for Managing the United States Armed Forces required a system which would allow it to efficiently synchronize master data between upstream and downstream systems while providing the capability to support rich and complex workflow approval structures. This organization selected Oracle Hyperion Data Relationship Management (DRM) as a foundation for their modernized architecture, and realized benefits from DRM's ability to provide an infrastructure for data governance, consolidation, sharing, and rationalization of master data. Through the implementation of DRM, the organization was able to reduce the time and cost involved in the management of master data, while improving the accuracy of information.

The organization realized efficiency gains for both the end user and back-office communities as the modernized application provided:

- Improved user interface for users to submit and process change requests

- Automated comparisons between versions of data that was previously performed manually

- Automated distribution of data between systems that previously used manual CD-Rom file copy in legacy systems

- Quick configuration of workflows and data structures to keep up with changing business needs as opposed to code changes in legacy system

About Definitive Logic

Definitive Logic delivers performance-driven solutions and services that directly support the strategic intent of government and commercial customers. Definitive Logic provides comprehensive services to help its clients use technology to maximize the performance and efficiency of their business processes, as well as high-caliber individuals who foster an environment of optimal communication to assure delivery of all work on time and within budget.

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