

# Repository-Centric Enterprise Architecture

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***Abstract** - Enterprise Architecture modeling tools are used to capture complex knowledge about organizations and technology. Recently, the focus of enterprise architecture has shifted to a more holistic view necessitating the use of a repository-centric approach to analyze and optimize the portfolio of business strategies, organizational structures, business processes / tasks and activities, information flows, applications, and technology infrastructures across disparate modeling tools. This paper discusses the business value realized from consolidating of enterprise architecture artifacts into a single repository to support enterprise analysis and optimization using the Elements Repository.*

## **1 Introduction**

Enterprise architecture (EA) is the vision, direction, and force which propels the Systems and Technical Architectures. When properly implemented, EA provides an understanding of where IT dollars are being spent; what technologies support business processes, who is responsible for, and therefore impacted by process or technological change; and what technology standards projects should employ today and in the tactical and strategic future. EA aligns disparate business and information technology operational elements to business strategies leading to streamlined internal operations, prioritized information technology (IT) investments, integrated products and services, and improved service levels to customers. EA delivers business value as an enterprise-wide knowledge base that can significantly reduce searching time when deciding to build new or leverage existing capabilities. The knowledge base meets statutory requirements such as from the Clinger-Cohen Act and OMB budget submission requirements, as well as reduces defects and rework in solution architectures and in process improvement.

Current model-centric approaches to enterprise architecture result in stove-piped islands of metadata which can not be leveraged as an enterprise-wide knowledge base. Vendor modeling tools are typically optimized for different methods and frameworks and are often implemented by modelers with slight metamodel variations further complicating metadata integration. Pure metadata repository approaches to enterprise architecture also have their drawbacks. Often the information needs of these centralized repositories result in the creation of unsustainable solutions. In addition, many centralized repositories provide only a singular view of enterprise information rather than a tailored role-based experience.

Ideally, any repository-centric enterprise architecture solution should leverage data collected by multiple vendor modeling tools with disparate metamodel schemas and frameworks. The solution should easily allow the consolidation of various ad hoc data stores of enterprise architecture artifacts that have become common in most enterprises. The solution should provide a tailored role-based experience and data-driven visualization of the enterprise data. When properly implemented, the solution should clearly document the alignment of IT investments with business needs of the Department and also shows the integration and alignment with the other enterprise architectures being developed within the Department and across the Federal Government. The solution should consolidate pockets of business and technical knowledge

residing through out the Department into a strategic information base that provides business leaders the enterprise-wide knowledge needed to make better and more informed management decisions. It is our contention that the Elements Repository meets the requirements of an ideal repository-centric solution with features and capabilities not addressed by any current metadata repository or modeling tool vendor.

## 2 The Elements Repository

The Elements Repository is a highly scalable Web-based repository specifically designed for the management and analysis of dynamic, highly-interrelated data and metadata of complex systems and enterprises. Different stakeholder views of the information can be provided with strict role-based access, versioning, workflow, and graphical visualization. The Elements Repository can manage and enforce the complete lifecycle of information according to defined processes. Each type of information in Elements Repository can be configured to flow through a different set of states throughout its lifecycle. The processes can be configured and applied to any level in the Repository.

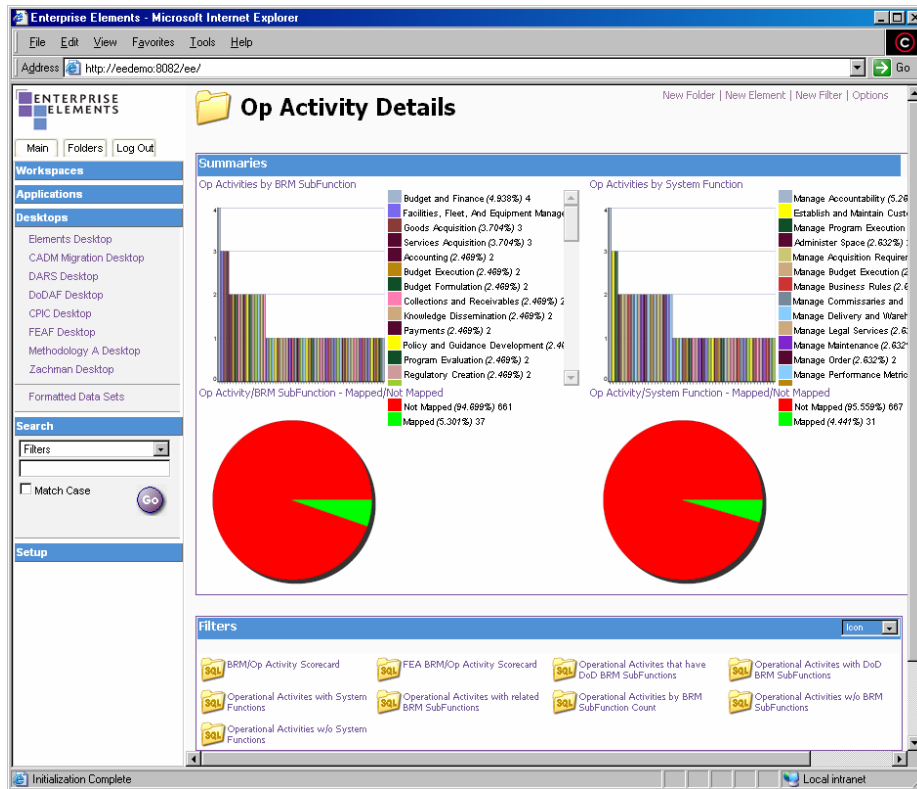


Figure 1: Elements Repository Portal View

On-line HTML reports are generated on the fly from XSL-transformed XML, allowing easy customization to suit any need. Elements Repository's access control model supports restriction of create, read, update and delete permissions from the project down to object attribute level. Rights to individual application components can also be defined. The Elements Repository provides a historical record of all changes made to all objects is maintained in the on-line repository. A visual comparison tool is provided that shows attribute-level difference between

versions using color-coding and markup to indicate changes. All changes are date, time and user-ID stamped for full audit trail capability.

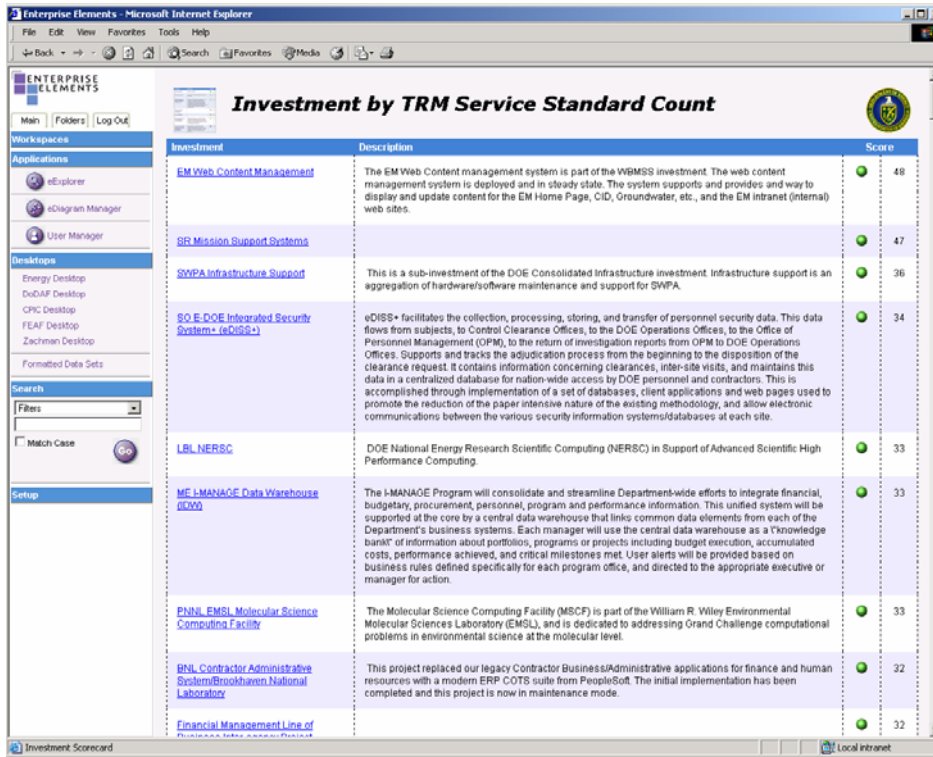
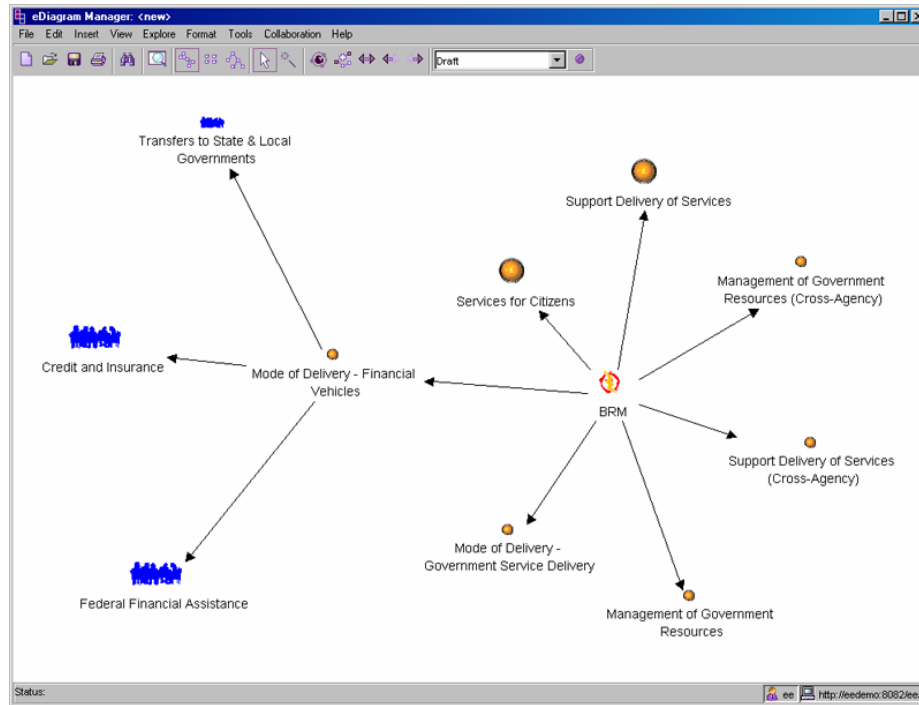


Figure 2: Elements Repository Scorecard

Enterprise Elements' repository-centric approach to enterprise architecture allows model artifacts, local data stores, and domain-specific repositories (i.e. security, asset management, investments, systems) to be mined, abstracted, and readily accessed across the enterprise. The repository facilitates the collection, classification, visualization, and maintenance of enterprise metadata. Collections of information can be grouped, labeled and managed to allow sequencing, alternative analysis, what-if analysis and baseline management. The repository facilitates collaboration with a hierarchical, threaded discussion facility embedded in Elements Repository, allowing groups of users or stakeholders to collaborate on the development of content.



*Figure 3: Elements Repository eDiagram*

The company's current focus is on Enterprise Architecture within the U.S. Federal government. Enterprise Elements offers a DoDAF implementation of the Elements Repository that allows customers to manage and gather EA data in exact accordance with the CADM standard. The solution can also auto-configure based on the metadata in modeling tools such as Popkin System Architect® so legacy data can be easily loaded, analyzed and managed. Multiple metamodels can be simultaneously supported facilitating the integration of heterogeneous modeling environments.

### **3 The Enterprise Elements Development Platform**

The Elements Repository is based on the Enterprise Elements platform which is a powerful platform for developing custom repository-based applications. The Enterprise Elements platform is well suited to the development of repository-centric enterprise architecture applications that allows model artifacts, local data stores, and domain-specific repositories (i.e. security, asset management, investments, systems) to be mined, abstracted, and readily accessed across the enterprise. Different stakeholder views of the information can be provided with strict role-based access, versioning, workflow, and graphical visualization. All that is required to “customize” the Enterprise Elements environment to suit the needs of a specific information management challenge is to configure the logical schema and information lifecycles. The physical database implementation and the application of all the above capabilities will occur automatically. The look and feel of the portal is controlled with stylesheets, so only configuration, not programming, is required to meet customer or market needs. If custom user interface components are needed in a specific situation, Java applets can be coded and easily plugged in. Applications based on the Enterprise Elements platform feature:

- Web-based reporting and portal access with role-based views, auto-generated data entry forms, gap analysis, score cards and detailed reports;
- Extensions to the physical database model that natively enable features such as history, version management, audit trail, and process enforcement;
- Industrial-strength security (configurable to the attribute level) and enterprise class scalability;
- XSLT-based report formatting and Web Services-based integration;
- Extensive set of collaboration features including polling and discussion threads;
- Automatic physical database implementation and application of capabilities;
- Process and activity monitoring and management;
- Leverages the full power of a relational database, while still providing the customizability of proprietary solutions;
- Flexible user interface to make the information actionable; and
- Version and variant sequencing and analysis support in one operational data store

#### **4 Concluding Remarks**

The Elements Repository can integrate metadata from different tools, different model schemas, and different methodologies within a single repository to provide an integrated and coherent view of enterprise information. The Elements Repository Provides facilitates the collection and classification of enterprise metadata from existing data sources and subject matter experts, including elements and relationships that make up the business, logical, and physical layers of the business.

The Enterprise Elements repository-centric approach to enterprise architecture allows model artifacts, local data stores, and domain-specific repositories (i.e. security, asset management, investments, systems) to be mined, abstracted, and readily accessed across the enterprise. Different stakeholder views of the information can be provided with strict role-based access, versioning, workflow, and graphical visualization.

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