EWSolutions Data Warehousing, Metadata Management, Enterprise Data Modeling Case Study
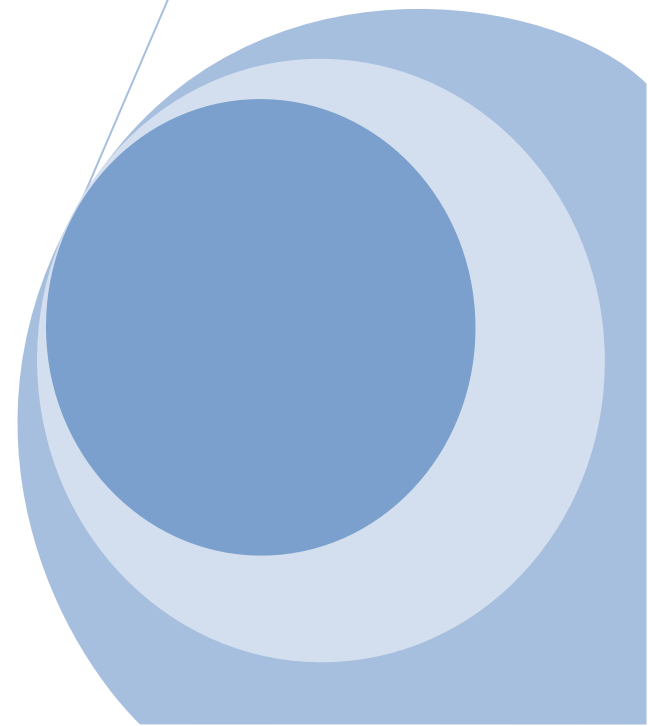
Leveraging Investments in Enterprise Information Management and Business Intelligence / Analytics

Enterprise data warehouse strategy and development, data governance, metadata management, and enterprise data modeling combined to ensure the success of the world's most respected research and patient treatment facility.

EWSolutions, Inc.
1/17/2017

Creating an Enterprise Data Strategy and Implementing it: A Case Study in How EWSolutions Enabled Health Research and Patient Care Success

Patients come to the Mayo Clinic to receive the best care that medicine can offer, supported by research to confirm its efficacy. The Mayo Clinic provides complete care for all its patients, in conjunction with world-class research and education, led by teams of doctors who rank as the best in the world in their specialties. "The needs of the patient come first."

Mayo Clinic is a nonprofit organization committed to clinical practice, education and research, providing expert, whole-person care to everyone who needs healing. Medicine is a knowledge intensive industry; the amount of information that needs to be understood to deliver optimum healthcare is beyond the capability of an individual physician and getting larger all the time.

Continually ranked as one of the United States' top hospitals, and considered as the nation's leading health research center, the mission and values of the Mayo Clinic were formed over 150 years ago by the founding doctors and the Sisters of St. Francis.

Every year, more than one million people, from all 50 US states and over 50 countries come to the Mayo Clinic for treatment, interacting with some 64,000 staff members (staff physicians and scientists, residents and medical fellows, and allied health staff).

The Mayo Clinic continues its mission of service, patient focus and excellence in health care, along with its research activities to ensure that the next 150 years are as fruitful as its past.

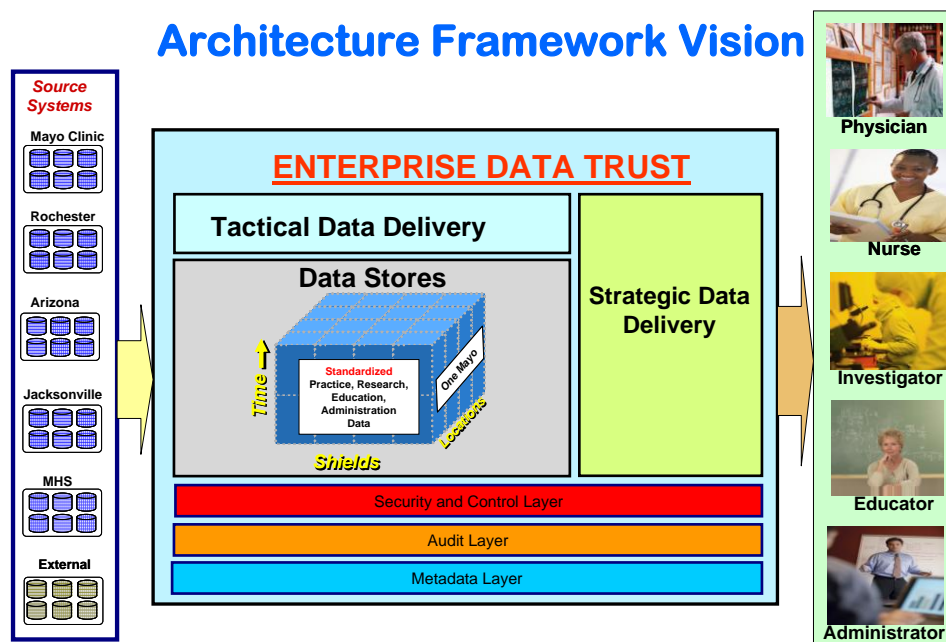## Combining research and patient data results calls for enterprise data strategy

In 2004, Mayo Clinic explored the need for data warehousing / business intelligence solutions to provide analytical data from its various patient and research data sources.

A major article in the Journal of the American Medical Informatics Association (JAMIA) detailed the existing state of Mayo Clinic's research, patient care, and clinical data as a heterogeneous collection of data across many diverse sources at numerous locations. This diversity made any analysis extremely difficult, and results were hard to achieve and substantiate without significant efforts by a variety of specialists and technical support staff. Relying on luck and heroic measures, disparate data may be aggregated into an electronic medical record for a patient, or patient outcomes for a particular condition may be collected for research into a possible cure, but success could not be guaranteed, according to the article's authors.

Additionally, the <u>JAMIA</u> article discussed that the organization wanted to address the underlying enterprise information management challenges of enterprise data architecture, metadata management, data governance, knowing that having this unified approach would give them an optimal design and continued capabilities for their decision support and analytical needs. Without the in-house expertise to accomplish these goals, Mayo knew they had to partner with leading practitioners of data management.

The JAMIA article described the efforts Mayo Clinic undertook to retain industry leader <u>EWSolutions</u> since it recognize the need for a sustainable data warehouse built with proven design and technologies. The authors of the JAMIA article were instrumental in selecting <u>EWSolutions</u> and its expert consultants to lead the design and development of an enterprise data strategy that included approaches for data warehousing / business intelligence, enterprise data architecture, data governance, and metadata management. <u>EWSolutions</u>' team of experienced top-level strategists was able to provide the organization with exemplary advice, guidance, planning and execution strategies and recommendations for improvement in all the identified data management areas. The president of <u>EWSolutions</u>, David P. Marco, became part of the Mayo IT Strategy Council, offering thought leadership and data management industry experience to the senior members of the Mayo organization. This council was cited in the <u>JAMIA</u> article as one of the factors that led to the success of this enterprise data management and data warehouse initiative.

Additionally, <u>EWSolutions</u> performed a comprehensive assessment of the current state of metadata management at Mayo Clinic and made business and technical recommendations for the development and implementation of a managed metadata environment to support the organization's stated needs for context for its data and information, especially for the enterprise data warehouse (Enterprise Data Trust).

Architecture Framework Vision

ENTERPRISE DATA TRUST

Tactical Data Delivery

Data Stores

Strategic Data Delivery

Standardized Practice, Research, Education, Administration Data

Security and Control Layer

Audit Layer

Metadata Layer

<u>EWSolutions</u> consultants brought outstanding credentials and dedication to the partnership while also offering:

- Exceptional experience in all facets of enterprise data management assessment and implementation
- Exceptional experience in all areas of data warehousing and business intelligence assessment, architecture, project management and data integration
- Exceptional experience in all areas of metadata strategy development, metadata tool assessment, technical metadata architecture (Managed Metadata Environment - MME), metadata project management and metadata integration
- Exceptional experience in the design and development of enterprise data governance programs, customized for an organization's unique culture and needs
- Sophisticated interpersonal communication skill for delivering knowledge transfer

- Thorough understanding of enterprise data management best practices and industry standards, especially in the areas of data management strategy, data governance and stewardship, data architecture, metadata management, master and reference data management, data warehousing and business intelligence, and the project management in these areas
- The invaluable ability to view the technology from the business person's perspective (healthcare and research professionals)

Each of these points was noted in the JAMIA article as a critical factor in the success of the Mayo Clinic's Enterprise Data Trust / Enterprise Data Management program.

With the superior guidance of EWSolutions in the identified areas of need, with clearly defined recommendations for approaches to each challenge, and a series of phased implementation roadmaps by data management discipline, Mayo Clinic was able to plan its Enterprise Data Trust (EDT) confidently with clearly defined goals, also detailed in the JAMIA article:
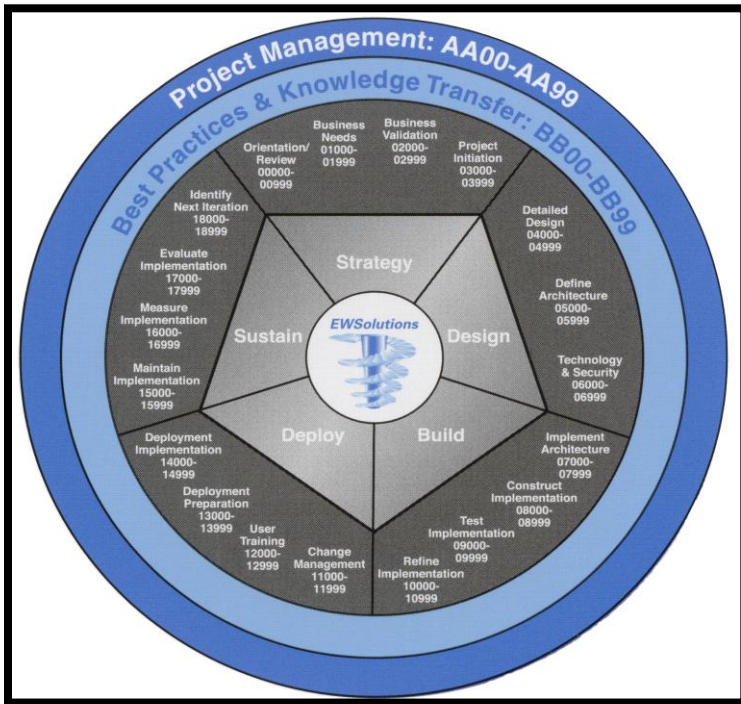
1. Unifying governance (data and process), and enabling improved resource allocation supporting current independent analytical initiatives with an enterprise data source

2. Coordinating, prioritizing, and approving future analytical initiatives

3. Stopping the proliferation of siloed analytical warehouses

Using senior resources from EWSolutions, Mayo Clinic was able to meet all the defined goals in the specified period.

Additionally, EWSolutions expertly guided Mayo Clinic in the use of its industry leading $M3^{sm}$ methodology for metadata management. The results of this methodology implementation included:

- Analysis of $M3^{sm}$ against current Mayo Clinic metadata management activities and practices
- Assessment of gaps between Mayo Clinic's metadata management practices and industry proven practices in $M3^{sm}$
- Incorporation of $M3^{sm}$ stages, phases, activities, templates into an enterprise approach for managing metadata, especially for the enterprise data trust (EDT)
- Incorporation of new method into selected metadata management implementation projects, starting with the development of a managed metadata environment

Methodologies enable more rapid assessment, development and implementation through best practices

EWSolutions' M3^{sm} methodology for Metadata Management is a highly customizable, iterative, and workflow-oriented methodology designed to help your organization achieve enterprise metadata management success effectively. With hundreds of fine-grained tasks with clear objectives, success factors, and responsible parties identified, M3^{sm} enables the development of a managed metadata environment with the proper processes, people, and technologies.

The methodology is based on **EWSolutions'** consultants many years of helping clients successfully realize outstanding benefit from their metadata management efforts. M3^{sm} underscores **EWSolutions'** numerous award-winning efforts and thought-leading practices and supports integration with Enterprise Information Management (EIM), data governance, and data warehouse / business intelligence (DW/BI) efforts. M3^{sm} is a self-sustaining, iterative, and customizable methodology that helps organizations to realize continuous return on investment (ROI) by identifying new business opportunities, improving efficiencies, and increased data quality through a metadata management program.

Methodology Critical Points:
With highly customizable task narratives, templates, and examples, M3^{sm} allows any organization to fit the methodology to its efforts, not the other way around. The methodology adds value to a metadata program without adding unnecessary complexity or unjustified efforts.

An iterative methodology with overlapping phases and activities, M3^{sm} helps an organization anticipate and reduce risks within and across phases, providing strong validation of scope and results, while efficiently utilizing all resources, including time, personnel, funds, and effort.

The M3^{sm} workflow provides discipline and manageability to any metadata management program. Developing a managed metadata environment can be very complex – using the M3^{sm} methodology breaks the effort into manageable, measurable tasks to know the current state, target state, and next steps. With its clear success criteria and best-practice estimates, the methodology helps an organization achieve discipline and increase visibility to assess progress and identify needed adjustments efficiently and effectively.

Significant Accomplishments Provide Continuing Progress

Mayo Clinic embarked on an extensive program in several areas, including data warehouse / business intelligence strategy, DW/BI project planning and implementation, managed metadata environment (MME) strategy/planning/architecture/implementation, enterprise data architecture and modeling, and enterprise data governance. Enterprise data management, and DW/BI and analytics capabilities were sponsored by senior leadership across Mayo Clinic, including the JAMIA article's authors, and the organization continues its enterprise data management and business intelligence / analytics efforts.

EWSolutions provided sustained guidance and advice informed by industry standards and proven practices, and led / directed several foundational projects during a critical period for Mayo Clinic.

Additionally, Mayo Clinic achieved significant results, as described in the JAMIA article, guided by EWSolutions, including:

- Saving significant number of additional lives from several forms of cancer due to increased ability to determine most efficacious forms of treatment from improved access to patient outcomes and research results for targeted populations
- Development and implementation of an enterprise data architecture approach, focused on the Enterprise Data Trust (EDT)
- Development and implementation of data architecture and data modeling standards
- Development of an enterprise conceptual data model
- For each subject area, development of a logical and physical data model for the atomic data warehouse (ADW) within the EDT
- Development of logical and physical data models for Cancer Care subject area
- Development and refinement of a multi-year metadata management improvement and implementation plan, including the adoption of a robust metadata management methodology
- Evaluated collection of metadata tools, performed Proof-of-Concept for selected product, implemented full product after successful completion of the Proof-of-Concept
- Consulting to develop a data governance approach based on industry standards and proven practices
- Implementation of the enterprise data governance program focused on the EDT
- Consulting to support the development of an improved environment for data warehousing and business intelligence, including the adoption of a robust DW/BI methodology

EWSolutions Overview

EWSolutions is comprised of superior strategic and tactical planning analysts who offer government and commercial clients innovative and authoritative solutions to assist with assessments / strategies in all areas of enterprise data / information management, technology implementation in metadata management, data warehousing (ETL, BI, data and text mining, etc.), business intelligence implementation, data governance program development and implementation, enterprise data management framework development and implementation, data migration planning, disaster and contingency planning, and strategic solutions for business/technology issues. The company's extensive client base spans the government and the health, life sciences, insurance, financial services, consumer products, retail, manufacturing, and high-tech industries. For more information on our strategic consulting services, high-value implementation services, methodologies, or world-class training call (630) 920-0005 or email us at Info@EWSolutions.com