



Enterprise Metadata Management



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Introduction

Rochade manages all types of metadata, from any sources, enterprise-wide.

Rochade, widely recognized as “The World’s Most Powerful Metadata Engine,” is used by some of the most demanding Global 5000 firms, as well as several large Federal Government agencies.

Gartner Group rates Rochade as the technology and implementation leader in the enterprise-class metadata management repository market. Yphise, an independent, ISO-9001 software research firm, ranked Rochade as its #1 enterprise metadata management solution - the best product on the market and one in which executives can invest with confidence.

Rochade is an “industrial strength” technology for managing metadata about every aspect of the enterprise: data, information, systems, applications, processes, stakeholders, infrastructure, etc.

Rochade Features:

🔗 Rochade is ideally suited for integrating diverse tools, repositories and data stores feeding an enterprise metadata repository so that all metadata is managed in a cohesive manner that helps ensure integrity and consistency.

🔗 Rochade is unique in its ability to support any data type and relate anything-to-anything. This is particularly important in metadata management environments where there are a lot of relationships between objects that need to be understood from a variety of perspectives. Rochade’s metadata-focused database design enables complex relationships to be defined, managed and reported with high efficiency and performance.

🔗 As the enterprise continuously goes through change, clients are able to use Rochade to very quickly understand the impact of change as it potentially ripples through the Metadata Management Environment. This allows for environment to be easily maintained given the integrated, single point of understanding that spans the enterprise. For example, when changes are requested/recommended, architects can perform impact analysis of Repository contents to determine the scope of the change. Then they can send automatically generated messages to the “owners” or stewards of the potentially impacted objects.

🔗 Rochade is further unique in its ability to support business/technical user understanding across the enterprise by providing a customizable abstraction layer on top of the repository they can use to find information using the business/technical context they are familiar. Users never need to know they are interfacing with a repository, which not only empowers these users, but also removes some support burden from the IT staff. It’s not uncommon for Rochade customers to have thousands of business users interfacing with the product.

🔗 Rochade’s web-based interface supports full role/permission-based read *and* write access to the repository opening up many options for updates and other work to be easily accomplished from any web browser.

🔗 Business reports are a key element of an environment, and Rochade’s user interface has been built to support business as well as technical users. It supports the setting of a preference allowing business users to see business definitions and technical users to see technical definitions of the same item. This means that the understanding of definitions, relationships, and audit trails, etc. can be exploited by the whole organization, rather than just IT.

🔗 Rochade also has all the capabilities to create and publish scorecards or metrics. As an example, our customers in the healthcare area use Rochade to provide standard quality metrics to address internal and external performance measures reporting as required by the National Committee of Quality Assurance (NCQA). The Health Plan Employers Data and Information Set, (HEDIS®), is designed to help employers evaluate and compare health plans and related offerings through a set of predefined performance measures addressing the quality of care; member access and satisfaction; membership

and utilization; and related information for healthcare providers and/or insurers. The extensibility of the Rochade platform provides an excellent environment for managing these types of measures.

Below is the technical architecture of our proposed Rochade repository solution. More detailed information is available at <http://www.rochade.com>.

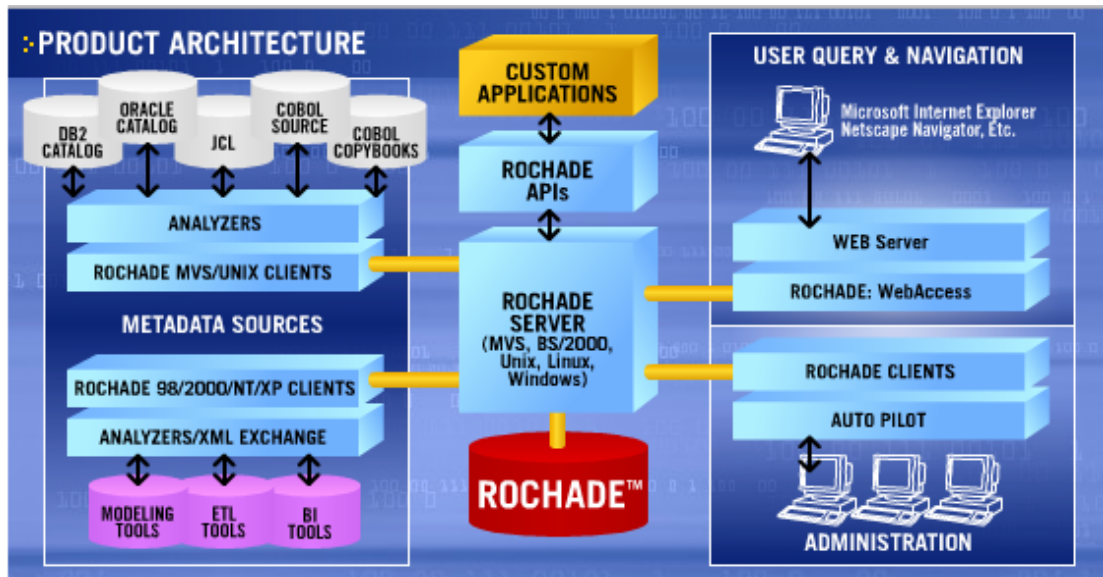


Figure 1 -- Rochade Product Architecture

Rochade can capture, store, configure, and integrate metadata from multiple sources. It can also disseminate metadata reports and models to consumers and applications in formats customized to individual needs and perspectives. Rochade can be deployed using central, distributed and federated architectures.

Rochade effectively governs and facilitates data and information management processes. The Rochade repository acts as the "data authority" and proactively monitors data quality before, during, and after ETL (extraction, transformation, and load) and information delivery. Rochade also provides structure and standards for information delivery. This benefits key decision-makers by increasing their level of confidence in the information they use for enterprise management.

Rochade's metadata repository becomes the single "version of truth" every enterprise data element (including attributes and relationships). It can track each data element from its source application to its use(s) in data warehouse reports and portals. In fact, the Rochade repository can also manage portal, data warehouse and data mart models.

Rochade lets you integrate metadata from a variety of different tools, languages, data base management systems, and infrastructures. This flexibility is due, in part, to the ability to exchange metadata via XML/XMI along with extensive busses and scanners. Rochade can even be configured to automatically "harvest" metadata from tools, databases and other repositories at regular intervals

Rochade provides complete end-to-end data visibility and the ability to perform multi-dimensional impact analysis. The Rochade Environment supports multiple hierarchies and networks of metadata defined and related - "anything-to-anything"

Rochade Strengths

- ❑ Can be tailored to your vision and needs
- ❑ Metadata management functions include versioning, impact analysis, project management, linking and discovery
- ❑ Can be implemented across multiple infrastructures - mainframe, client-server, PC
- ❑ Provides “intelligence community” levels of security
- ❑ Interfaces with numerous metadata sources “out-of-the-box” and creating new interfaces is simple
- ❑ Has open APIs (Java, XML, etc.) for integrating with other applications
- ❑ Access to the contents of Rochade’s metadata repository is both client-server and web based.
- ❑ Access is role-based - different sets of users can have different views and graphical interfaces
- ❑ Excellent built-in reporting capabilities are enhanced by the ability to export repository content to other reporting applications
- ❑ Modular, scaleable and extensible - grows with you
- ❑ Product development and management is backed by depth of Allen Systems Group
- ❑ ASG provides just-in-time and just-enough training including web-enabled training management
- ❑ 24-hour hotline and global technical support
- ❑ Established user groups

Rochade Benefits

- ✓ Reduced cost and time involved in metadata change process. Impact analysis reports enable stakeholders and stewards to thoroughly understand the effect of proposed changes to the all environments and help control the effect of these changes.
- ✓ Reduced cost of new systems integration and development by storing documentation on the data transformation rules, data sources, data structures and type of data. Rochade is critical, because without the repository this information may be scattered throughout the organization or may reside only in staff memory.
- ✓ Promotion of information standards that allow for better data standardization, sharing, and reuse.
- ✓ Management of data as a strategic asset. Rochade can help ensure data is relevant, pertinent, and understood by everyone and delivered in a timely, correct, consistent, and usable manner.

Rochade Solutions Overview

Rochade customers use its unique capabilities as part of their solutions for wide range of business problems. Some examples are:

- Enterprise Architecture (integrating tools, methodologies, and frameworks)
- Enterprise Transformation (managing change)
- Enterprise Data Integration (information asset management, data interoperability, XML management)
- Enterprise Data Warehouse (strategic information management)

- Enterprise Application Modernization (evolution, replacement, reengineering)
- Enterprise Application Management (operational programs, objects, components, services)

These solutions range from strategic and conceptual enterprise-wide to project-based and technical. Rochade is unique in its ability to not only support all of these solutions (and others), but also support them all at the same time.

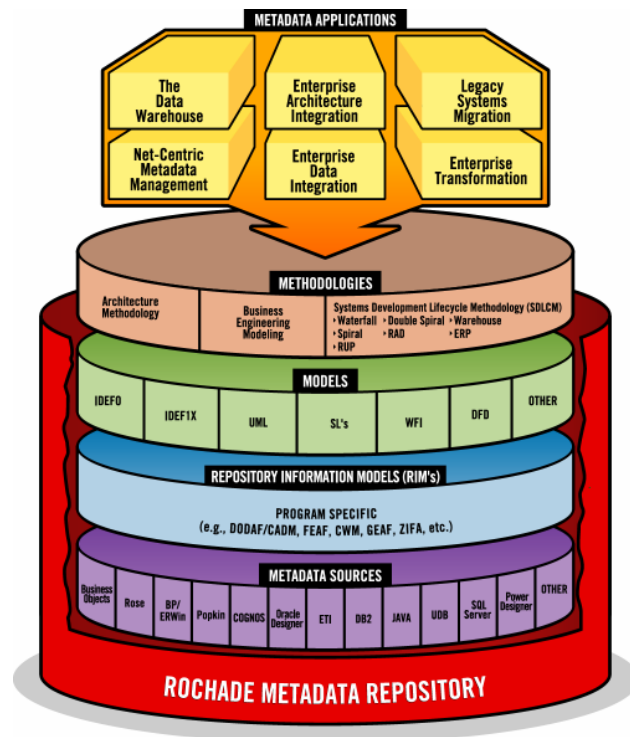


Figure 2 -- Rochade Solution Architecture

Rochade Metadata Management Solution Architecture

The basis for Rochade's flexibility and capability is its solution architecture - illustrated in Figure 2. Every metadata application/solution is supported by a methodology or process that defines the workflow, task structures and deliverables for implementing metadata management within application. Rochade supports and facilitates any methodology.

Regardless of the solution or methodology, metadata are typically represented by "models," which are created using "modeling techniques." In many cases the models *are* the metadata. Rochade concurrently stores many types of models, built using multiple tools, in multiple notations. Many Rochade clients even use Rochade to transform model content from one technique/notation/tool to another.

All metadata in Rochade is managed and integrated by means of a repository schema or meta-model, called a repository information model (RIM). A RIM is internally coherent, infinitely extensible, and broadly transformable into natural, graphical, or machine languages of choice. Rochade has the unique capability to have multiple RIMs, representing physical, logical, and conceptual perspectives of metadata, coexist in the same repository. Not only can they coexist, they can be linked to one another in multiple ways; e.g., point-to-point, hierarchy, network, concentric, etc.

Metadata defined by the repository meta-model(s) may be periodically harvested from a wide variety of sources and physically stored in the repository. Rochade has many “out-of-the-box” interfaces to databases, tools, data stores and other products. It is also quite simple to develop customized interfaces using one of the Rochade API’s. Metadata may also be accessed directly and immediately if API’s exist in the target technology - and the metadata can even be re-exported in “round-trip” processes where appropriate.

“Built in” repository functions are powerful and robust and designed to handle vast quantities of metadata, harvested from multiple sources, linked in scores of ways, all while administering and maintaining security, versions, configurations, and user interfaces.

Described below are many of the metadata-intensive solutions for which Rochade is the key enabling and facilitating technology.

Rochade Solution: Enterprise Architecture

Every Enterprise Architecture (EA) will eventually reach a level of maturity and complexity that requires a repository-based EA environment integrating EA tools, frameworks, methodologies, models, and artifacts. Rochade lets you manage models and artifacts from multiple EA frameworks and methodologies - even in the same repository. This allows you to manage the artifacts of your methodology along with any other. Most EA frameworks provide structure but not process (or methodology). Rochade supports both.

Rochade allows all EA artifacts, models and model elements to be linked to one another. These relationships form the basis for work product production and provide the ability to trace requirements and business rules, from strategic to implemented, in an “adaptable” EA. These links also allow detailed impact analysis as part of an enterprise change management program.

Rochade provides the ability to integrate and manage multiple hierarchies of models. This means that the EA models for an enterprise and all its subordinate elements can be managed both independently and interoperably.

Figure 3 -- Rochade EA Environment -- illustrates the major components of a Rochade-powered EA environment. The Rochade EAE is “tool agnostic”; i.e., any tools used to create and modify EA artifacts can be seamlessly integrated into the environment. The Rochade EAE facilitates capturing, storing, integrating, managing, and disseminating complex information, including EA artifacts, from multiple sources, internal and external. Consumers are able to see at a glance what artifacts are available, when they were captured/versioned, and how they are related. They are also able to see both simple and complex artifacts in a form and format with which they are familiar. The figure further illustrates access to the same EAE repository content using either a Federal Enterprise Architecture Framework (FEAF) view or a Department of Defense Architecture Framework (DoDAF) view.

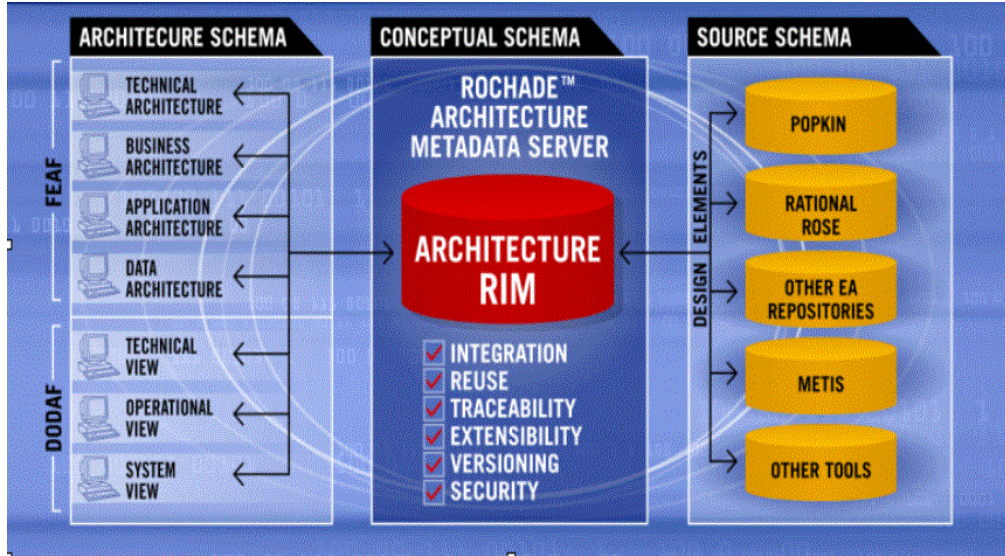


Figure 3 -- Rochade EA Environment

Rochade Solution: Enterprise Transformation

Enterprise transformation is an imperative today, when adaptability, mobility, and swiftness of response to competitive pressures and changes in customer expectations are mandatory. At the same time, enterprises are becoming much more complex, from both the organizational and information technology perspectives. Bringing order to this chaos is what enterprise transformation is all about. The key to establishing order is to get control over the metadata that defines the enterprise. This requires an industrial strength metadata repository with built in features including metadata harvesting technology, version control, impact analysis of changes, security, and integration, in a word: Rochade.

Figure 4 -- Enterprise Transformation Environment - illustrates the various elements that are typically involved in enterprise transformation. You'll note that this activity encompasses all the other solutions described in this document plus a number of others.

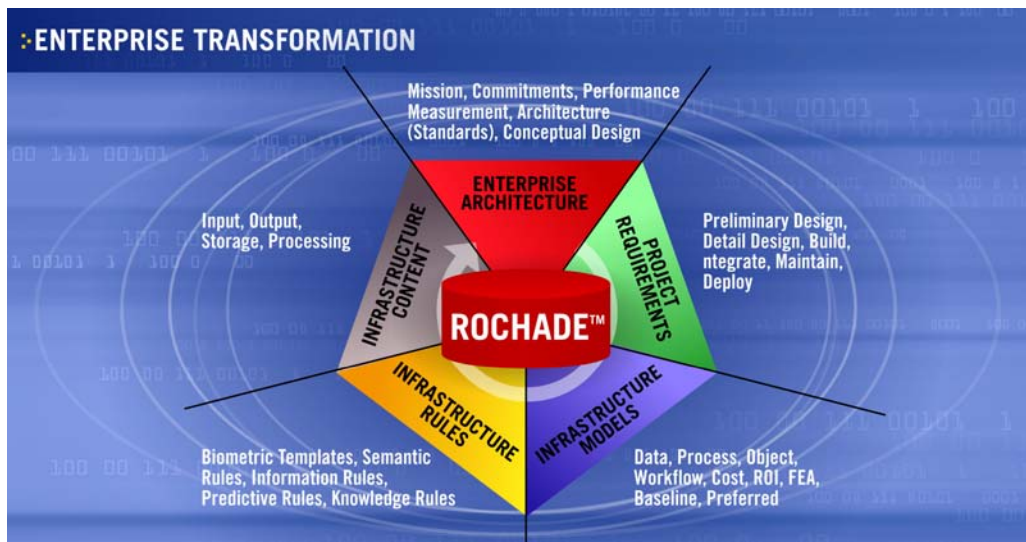


Figure 4 -- Enterprise Transformation Environment

Rochade Solution: Enterprise Data Management and Integration

Over the last 10 years, CIO's have invested heavily in targeted data management-related technologies: database management systems, data dictionaries, data warehouses, data marts, data cleansing software, knowledge management systems, knowledge gardens, digital libraries, information architectures, intranet portals, XML registries and the like. Yet, while each of these investments is intended to transform data into a true enterprise asset, none of the technologies, by itself, is robust enough to bring it all together. In fact, many of the technologies only make the problem worse by creating even more "islands" or "silos" of data and metadata. Often this is because decisions concerning data management are made by "technologists" and not by the individuals who have an enterprise view of the value and need for data. The result is that while a particular business area or technical solution may be satisfied with their data management solutions, the enterprise prays for enterprise-wide data integration. The prayer can only be answered by getting control over enterprise metadata, and that requires an enterprise-class technology such as Rochade.

In most enterprise information environments, metadata is used both within an application and between applications. There is little difficulty with metadata management when the metadata is homogeneous - that is, it is created and managed by a single application or by software from a single vendor - and any tool will suffice. When an enterprise has complex, heterogeneous metadata, an "industrial strength" solution is necessary. Integration of data from multiple sources requires rigorous attention to the metadata and business logic that populated the source data elements.

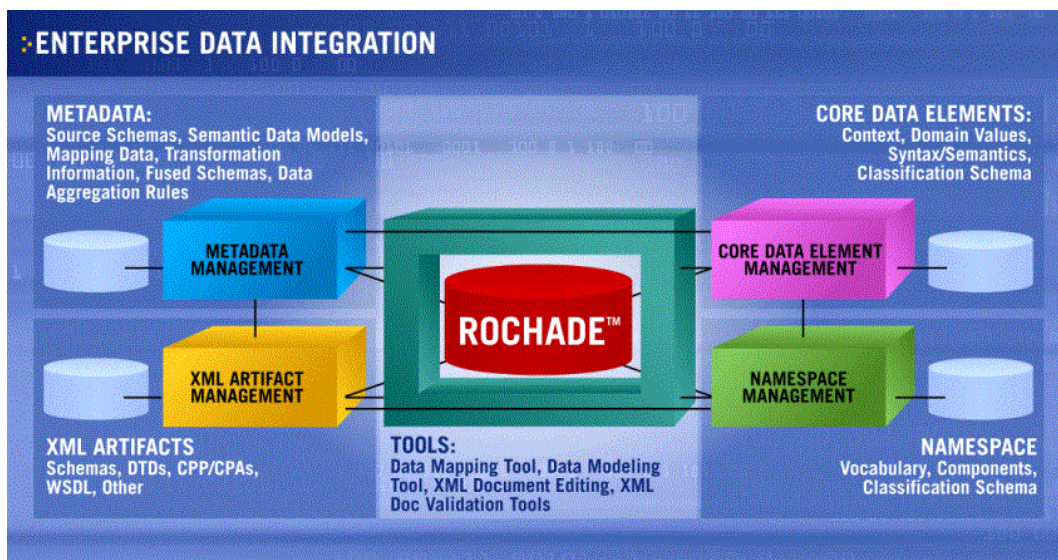


Figure 5 -- Enterprise Data Environment

Rochade becomes the heart of an enterprise metadata management environment, which is the key to enterprise data and information integration and management. All metadata, no matter where it comes from or where it is used is managed using Rochade. Rochade is both the source and target for tools that create and need metadata.

Rochade Solution: Enterprise Data Warehouse

Metadata management is a critical enabler and complimentary technology for data warehousing. Maintaining high data quality can be the single most difficult problem facing your data warehouse engineering and implementation activities. Rochade serves as the "data authority" and can proactively

manage quality during all processes, particularly extract, transform and load (ETL) and reporting. The result is an increase in data integrity that benefits key decision-makers by increasing their level of confidence in the information they use for enterprise management.

One of the most important parts of a Data Warehouse is its metadata — or contextual information that describes the structure, relationships and contents of enterprise data. Also called Data Warehouse architecture, metadata is integral to all levels of the Data Warehouse, but exists and functions in a different dimension from other warehouse data. Metadata that is used by Data Warehouse developers to manage and control Data Warehouse creation and maintenance resides outside the Data Warehouse. Metadata for Data Warehouse consumers is part of the Data Warehouse itself and controls access and analysis of the Data Warehouse contents. To a Data Warehouse consumer, metadata is like a "card catalog" to the subjects available.

Data warehouse engineering is easier and less costly when based upon an accurate architectural model of the enterprise – this too is metadata. Further, a data warehouse is easier to use and consistently produces desired outcomes when decision-makers have access to enterprise metadata that accurately reflects enterprise infrastructure.

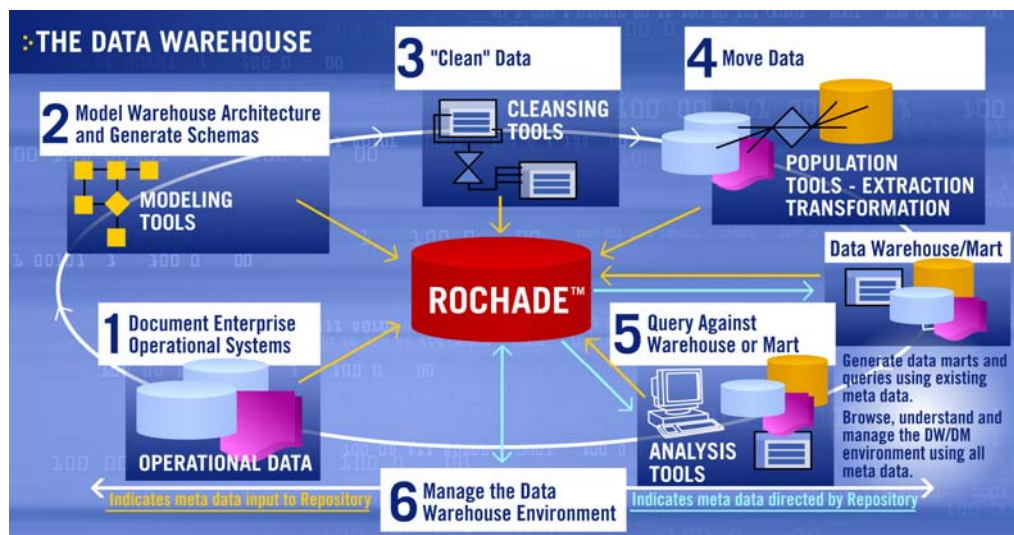


Figure 6 – Enterprise DW Environment

As with previously described solutions, Rochade is the heart of the Data Warehouse Environment. It is the integrating technology that allows all DW engineering tools to work together and provides visibility to all DW metadata (including processes, strategies and metrics) from a single "source of truth." Most enterprise data warehouses fail because data is not traceable for initial source to ultimate report or because the data is not understood or is of poor quality. Lack of content credibility will kill a DW. Rochade provides traceability, credibility, and comprehension.

This solution also applies to other "strategic information management" activities such as Enterprise Information Portals, Business Intelligence, Knowledge Management, Executive Information Systems, and Decision Support Systems.

Rochade Solution: Enterprise Application Portfolio Management

Most enterprises recognize that the majority of IT problems stem from legacy applications that don't work together, create too much data and not enough information; create incompatible and incorrect data; and have excessive maintenance costs. Correcting these problems, while capitalizing on existing assets, requires application portfolio management. Rochade provides the ability to manage

applications across the enterprise by linking strategic requirements and priorities with applications in both legacy and modernized environments. The result is streamlined, non-redundant, architecture-driven application portfolio management to meet current and future business needs.

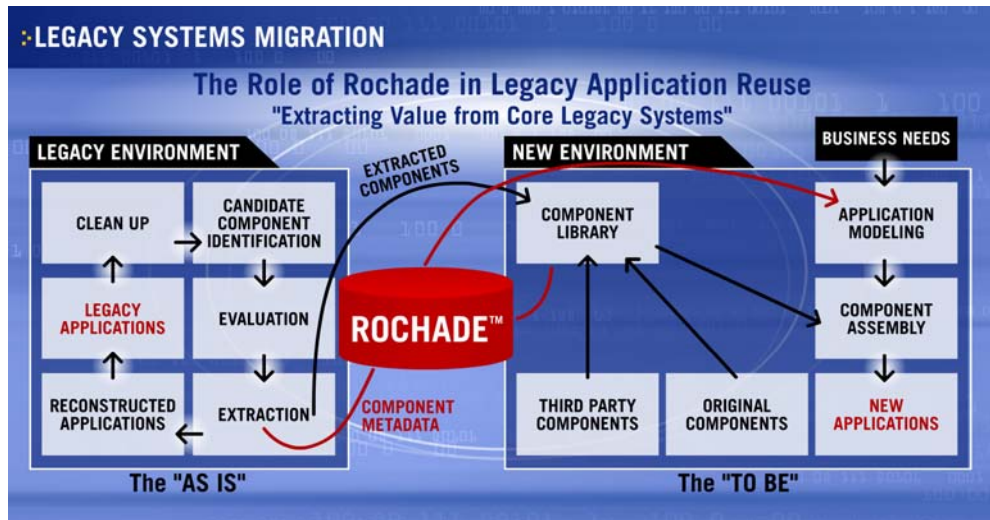


Figure 7 -- Rochade Enterprise Portfolio management Environment

A Rochade-powered application portfolio management environment is a tool suite that supports the entire portfolio management life cycle. Enterprise application portfolio management solutions differ from enterprise to enterprise depending upon their business requirements, the nature and seriousness of their problem, and the skills and availability of their staff. Most variations include the following activities:

- Reverse engineer existing applications and databases to document and model the existing application architecture (it exists whether or not it is documented)
- Define and model business information and data requirements (current and future)
- Define and model business functional requirements (current and future)
- Compare application architecture models with requirements and perform gap analysis
- Choose appropriate portfolio management and integration method(s)
- Integrate current applications (data and function) that meet requirements
- Reengineer using new technologies
- Remove redundant and unnecessary applications
- Develop or purchase applications to meet new/changed requirements

A Rochade-powered application portfolio management environment allows enterprise needs and measures to be linked directly to a strategic information model, enterprise data dictionary, legacy data base models, data integration and transformation process models, and data warehouse and data mart database design models -- all in a single repository. The result is a detailed enterprise architecture composed of enterprise metadata artifacts. Using the architecture as the blueprint for application portfolio management enables consistently successful development or acquisition and implementation of high-quality enterprise applications. It also allows quick reaction to changes in environment, policy, or customer requirements.

In addition, Enterprise Application Portfolio Management consistently allows quality information systems to be developed from quality software components. Quality information systems are more than just error-free code. They also have the following characteristics:

- Support Enterprise Strategic Objectives
- Meet Business Area Requirements

- Are Reliable, Flexible, and Scalable
- Share Corporate Data and Standards
- Built from Reusable Components
- Delivered On Time and On Budget

This solution involves Rochade and its companion product, becubic. As with other solutions, Rochade serves as the repository for all strategic and tactical metadata related to applications, their architecture and their components. In addition, becubic provides the capability to capture and manage detailed operational metadata about the applications, their environment, and their relationships.

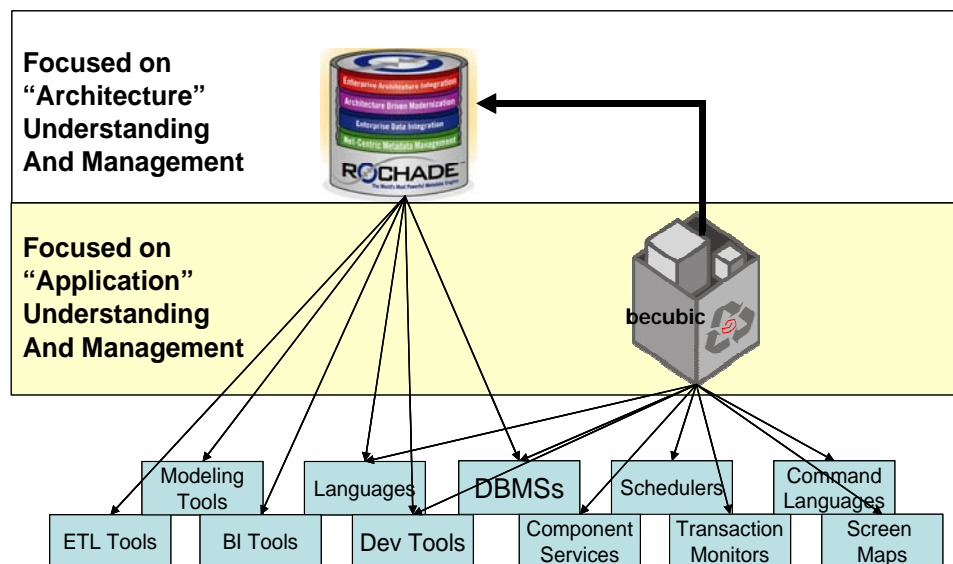


Figure 8 – Rochade & becubic

becubic collects, parses, and manages large numbers of programs and data sources (databases as well as other file structures) at a very detailed level. It is packed with special capabilities to support sophisticated GUI presentation and flexible query functions in order to be a very capable analysis, and programming tool.

Rochade is an extremely versatile global metadata repository capable of collecting, parsing, and managing large amounts of metadata artifacts from a wide variety of sources. It provides support for many open APIs (C, Java, XML, REXX) to allow anyone to import any metadata from anywhere. It provides a flexible user interface for representing this information (in various forms) to a wide variety of users (Business and IT). Although Rochade also captures metadata from programs (which may seem to overlap with becubic), it does so at a higher level (understanding data dependencies and relationships between program/databases without referencing their implementation details) versus at a line of code level. Related to standard UML modeling concepts, Rochade would be more apt to provide views of UML diagrams to a planned specification level, while becubic would additionally drill down to implementation and even deployment details. In fact, becubic can actively discover deployed implementations of code and data by server and record these discovered details as traceable history.

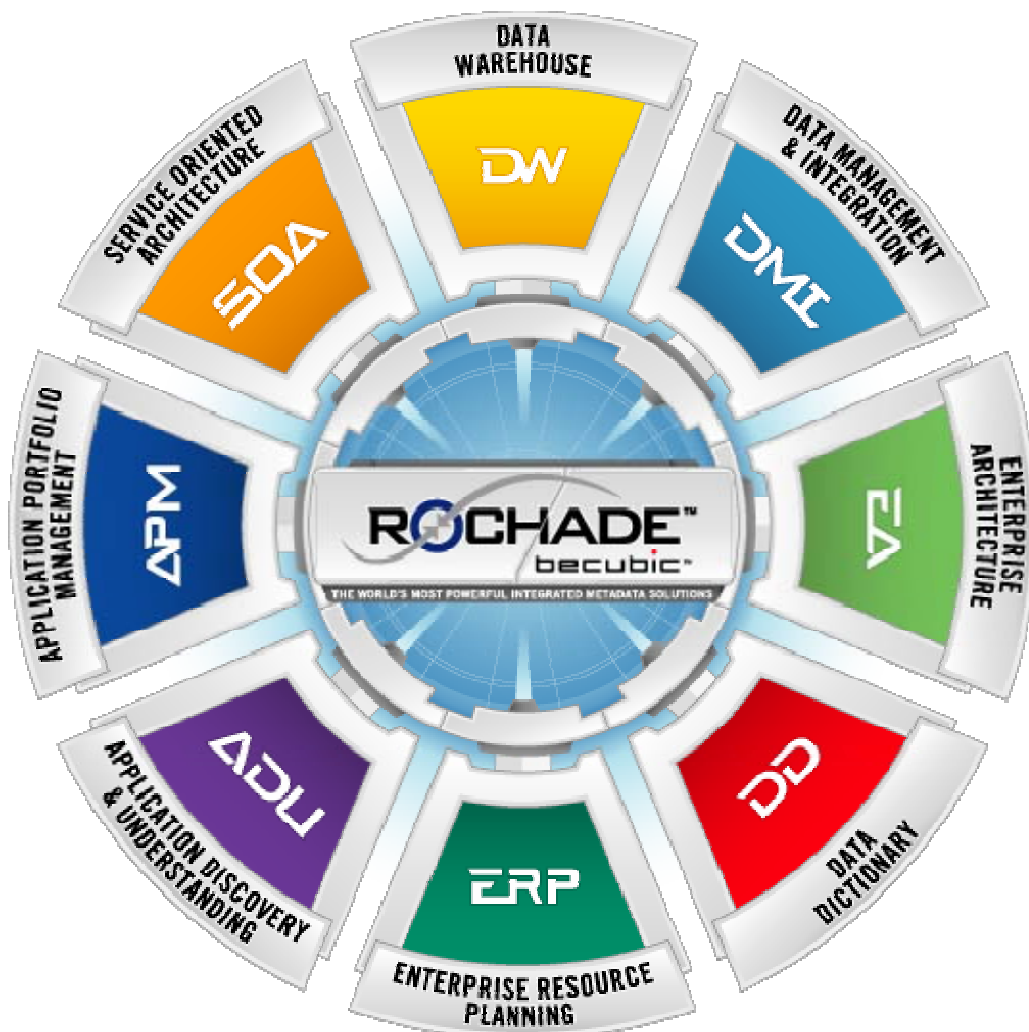
For those instances where appropriate, becubic and Rochade can exchange/link metadata to provide a complete path of metadata from the Rochade global view drilled down all the way to an becubic program line of code reference. We can do this with XML/XMI, or with plug-ins. This allows (typically

architectural-level) metadata to be exchanged from becubic to Rochade, and to drill down from a planned architectural specification in Rochade to the corresponding implementation in becubic.

There are a number of solutions that becubic can support independently. These include:

- Application Discovery and Understanding
- Service Oriented Architecture
- XML Registry
- Quality Software Engineering

The becubic solutions are documented in another ASG paper. The Rochade/becubic solution wheel represents the ASG strategy for integration of the two products.





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