



## Integrating the Metatomix Platform with an SOA Architecture



*A Metatomix White Paper*

## Introduction

The promise of Service-Oriented Architectures (SOAs) is the promise of a world of loosely coupled services, all communicating over a lightweight, standards-based protocol. It is a worthy goal. But as with most worthy goals, it takes some hard work to get there.

Most IT organizations are not migrating to a SOA from scratch. Existing applications were written before a unifying architecture was envisioned, let alone implementable. Incorporating these legacy applications into the architecture is a formidable challenge.

Further, Web services, while critical enablers of a SOA, are not a panacea. UDDI and WSDL, for example, help with the “what” and “where” components of registered services, but they don’t address the “why” and “how” challenge of acquiring knowledge about the detailed interrelation between elements.

This white paper will analyze the way Metatomix’s Semantic Platform can ease the transition to a SOA architecture and how semantics can be leveraged in a SOA environment. Metatomix uses semantic services to standardize business processes and data throughout an organization, enabling the integration of disparate services from disparate systems.

By leveraging semantic services to help IT organizations bring together components of existing systems today, Metatomix eases the transition to a SOA and enables a gradual transition to this architecture as an organization desires.

## Challenges to be Addressed in Migrating to a SOA

Most organizations are not migrating to a SOA from scratch. In considering the move to a SOA, these organizations face critical questions with regard to their existing applications such as:

- Which ones will I keep?
- Which ones can and should I rewrite?
- Which ones will I wrap as services, and at what level of detail?

In fact, many organizations face an even more fundamental question: how do I determine definitively, exhaustively and with sufficient detail what applications are in my existing architecture?

This question points to the reality many IT organizations face: long before making needed changes and upgrades to existing applications, considerable resources are spent simply preparing for, studying, finding and mapping dependencies – all this before changing a single line of code.

The move from applications to services presents additional challenges. Web Services like UDDI, WSDL and SOAP help with the “what” and “where” of registered services, but they don’t go deeper to address the “why” and “how” and “when”.

Achieving this deeper level of understanding is critical. According to Gartner Research, “Perhaps the most challenging dimension of this change [to SOA and Web Services] is the need for semantic standardization of business processes and data to enable practical interoperability of this new level. Without this, we are stuck with the old analogy of a new telephone system, but people are still speaking different languages.”<sup>1</sup>

Web Services are critical orchestration enablers, but they do not delve deeply enough to enable disparate services from disparate systems to effectively inter-operate based on meaning.

## **The Value of Metatomix in a SOA Architecture**

Metatomix’s Semantic Platform enables the integration, analysis, and visualization of disparate data from disparate information systems. This knowledge is gathered without change to or impact on existing applications and is presented in a single common view.

Semantic tools discover applications, data and relations without change to or impact on existing IT infrastructure, and present them in a single common view. Importantly, this view enables IT organizations to take action. Current metadata repositories are often passive, offering data but no way to act on it. The Metatomix Semantic Platform uses an “ontology” – the totality of information on all of the services and applications in an IT architecture.

An ontology enables IT organizations to describe the data, relationships and applications as a first step. Ontologies offer features not found in other SOA migration-enablers

*The exercise to create an ontology is semi-automatic. Metatomix provides the tools to analyze how the data and the relationships are formed, but the meaning of those relationships lies with the subject matter expert, changing the process from an IT-centric to a business-centric.*

Ontological Differentiators:

- Source data, application interfaces, operational data, and model metadata are all described in a consistent framework gained from a detailed understanding of the underlying objects. This means constraints on types, relations, and description logic, for example, are handled uniformly for all underlying elements.

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<sup>1</sup> ID Number G00126409, GARTNER, 16<sup>th</sup> February 2005, page 3

- Both schema and data are represented in the same way, meaning the description of metadata about the sources is a machine-readable method of representing the data itself for the purposes of translation, transmission, query and storage.
- A relational model that offers the ability to richly describe the behavior of both services and composite applications in a way that is tightly bound to the applications logic
- A run-time model, not just a design-time model, combining all elements under a single "contract" and therefore capable of *generating* rules, mappings, transforms, queries, and UI
- Obviation of the need to rely on indexes, keys, or positional notation to describe the elements of the ontology, with the result that implementations do not "break" when local changes are made
- The advantages of both top-down, conceptual description and bottom-up, source- or silo-based representation of existing data. These elements can exist in separate ontologies and are easily brought together.
- The ability to scale across users, applications and organizations. The ontologies generated by Metatomix's Semantic Platform can easily share elements in an open and standard way, and ontology tools (such as those for design, query and data exchange) need not change to reference information across ontologies.

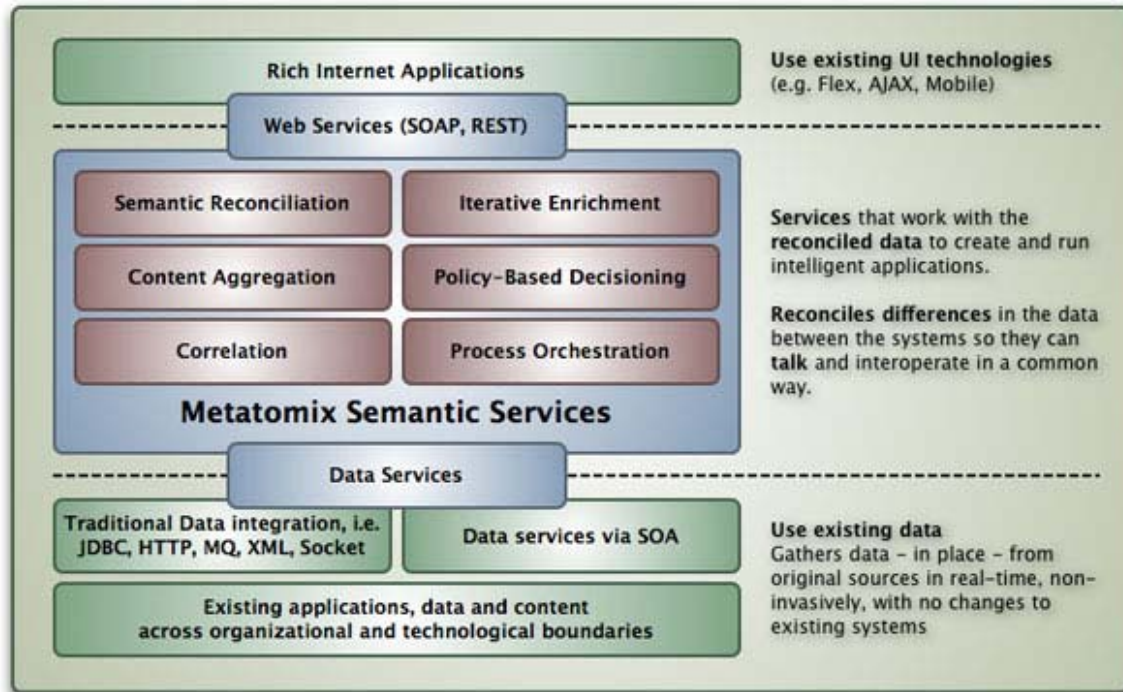
An additional challenge in the move to SOAs, eased by the Metatomix Semantic Platform, concerns the need to connect requests for service to the best service available. This problem is not effectively solved by the use of a table.

This method does not scale.

Many IT architectures require that hundreds of services be connected with thousands of requests, each in less than a second. Successfully orchestrating this potentially chaotic situation requires an elegant solution that is dynamic and flexible -- not brute force. Conceptual queries against ontologies are usually framed as graphs, which are extremely efficient mechanisms for finding the shortest path and/or best fit. In this way, Metatomix's Semantic Platform is an ideal method for connecting requests for service to the best service available in a highly scalable way.

## **Integrating the Metatomix Platform with an Existing SOA Environment**

Metatomix's Semantic Platform easily integrates with IT organizations' existing application environments such as an SOA-based ESB environment. The platform achieves integration with these environments by using multiple communication methods, including query-based and request-response standards such as HTTP, JDBC and SOAP, and message-based protocols such as JMS and MQ. The diagram below illustrates this integration.



*Metatomix capabilities can be called as a configurable service from any application or service within a Services Oriented Architecture*

The semantic composite application capability enabled by the Metatomix Semantic Platform is ideal for the correlation of multiple services required in a SOA/ESB environment. A helpful way to understand the value of this functionality concerns the example of a financial services company. The composite application services the Metatomix Semantic Platform provides to this company offer both an external representation of the business service across the SOA as well as consume and request information from the SOA. In this way the semantic service develops and leverages a complete context for service requests, including:

- The specifics of the information asked for and the entity asking the question of the service
- The entitlements of the entity
- Available data sources on the ESB
- Additional factors such as data redundancy and cost

## An Example Use Case

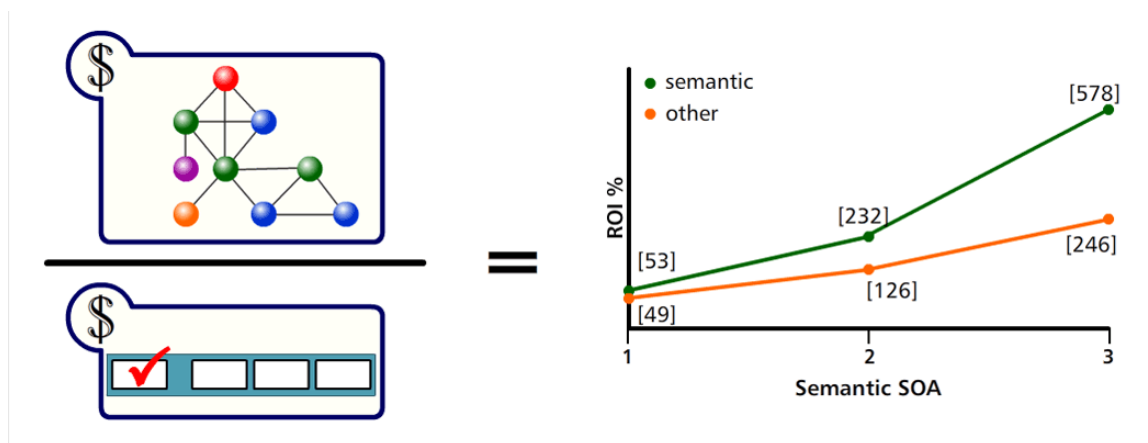
A large financial services company was setting up a credit application for one line of business and reusing interfaces to other systems for other lines of business. First, we selected the expected benefits from the benefits value tree and established the costs incurred according to one of the three cost scenarios, as shown on the left side of Figure below.

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With its credit business solution, the company expected benefits such as:

- Reduced processing time, where the overall cycle time for credit processing was shortened on multiple credit-related activities
- Reduced errors, where costs and payments were reduced as a result of improved quality in execution and handling of credit applications
- Reduced staff, where fewer staff at multiple levels were needed to staff the revised processes
- Protecting existing revenue streams, where the improved process controls and improved management resulted in more favorable benefit and cost ratio results
- Increased sales, as new functionality helped retain existing customers as well as positively impacted new sales
- Reduced maintenance costs, as older applications were being phased out, their maintenance costs were being eliminated and the new application maintenance costs were lower.

The costs incurred were for the full implementation. These included the cost to implement the front-end application interface, a Web-based solution that was part of the business application, and a purchased software package. The SOA infrastructure required some software and hardware, as well as the labor costs to implement it. Last, the cost to develop the interfaces to other applications was added. This included the costs for the SOA interfaces needed for the other applications.



## Conclusion

In light of the benefits to SOAs, migration to this architecture continues to be a trend with momentum. In a recent survey, nearly 70% of those who had implemented a SOA indicated they intend to increase their adoption of SOA<sup>2</sup>.

Metatomix's Semantic Platform incorporates Web services to standardize organizations' business processes and data, enabling interoperability of disparate services from disparate systems and easing the challenging but highly advantageous migration to SOAs. Further, Metatomix enables IT organizations to make this transition as gradually as they desire, and without making changes to existing systems.

The use of semantic services to enable this transition can greatly impact its success. Gartner Group estimates that those organizations that adopt semantic reconciliation capabilities such as those offered by the Metatomix Semantic Platform increase their chances of success in implementing SOAs by 70%.

Like all worthy goals, the transition to SOA architecture requires hard work. But with the Metatomix Semantic Platform, that work is efficient, gradual and if SOA is one of your strategies, accelerate adoption and migration Metatomix's Semantic Platform is flexible enough to enable rapid deployment, and scalable both within and across organizations.

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<sup>2</sup> Survey says: The time for SOA is Now, Forrester Research, April 14<sup>th</sup>, 2006