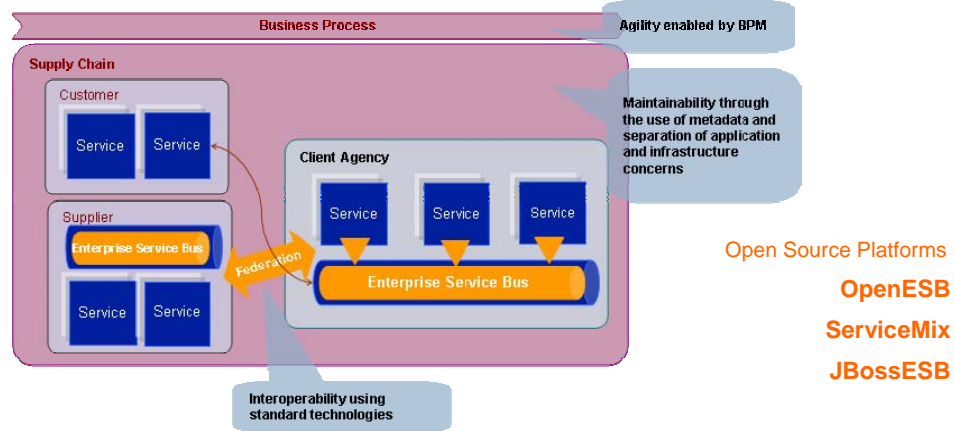# Establishing a Service Oriented Infrastructure (SOI)

Model Driven Solutions (MDS) was tasked to help a large US federal agency with establishing a service oriented infrastructure with emerging SOA technologies including Enterprise Service Business (ESB) and Business Process Management Systems (BPMS).

Challenges

Our client, like any other large enterprises, are faced with challenges regarding agility, integration, security, standards-based technology implementation, and pressure to reduce expenditures. To address these challenges, the client decided to leverage a SOI approach which can be used to integrate legacy business systems, decouple functional from non-functional concerns. The SOI project was an important step towards this direction.
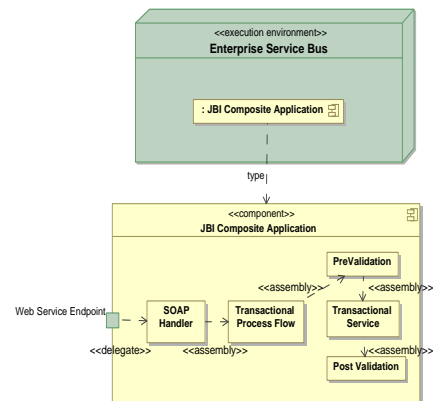
Assessing ESB Technologies

We examined three open source ESB platforms and provided assessments from both architectural and functional perspectives. In particular, we focused on the role of Java Business Integration (JBI), the standard basis for Java-based ESB, in such areas as reusability, interoperability, and maintainability. We also documented recommendations and issues for achieving interoperability among ESB platform with standard based technologies such as web services and Java Messaging Service (JMS).

Open Source Platforms

OpenESB

ServiceMix

JBossESB
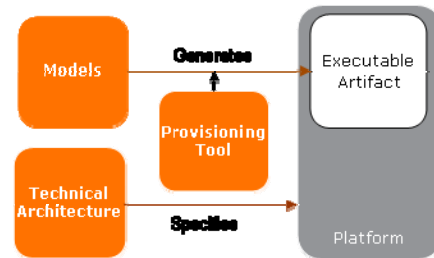
Leveraging J2EE Assets in an ESB

Reusing existing assets, including logic implemented in J2EE technologies is one of the main objectives for refactoring a J2EE application for the ESB platform. Within the scope of the project, we refactored a production application for each of the ESB platforms and recommended best practices for porting J2EE applications to ESB with little or no changes, while

taking advantage of the various services provided by the ESB. While the refactored application retained the same functional interface, it leveraged ESB's support for security, reliable messaging, web service transaction, and other quality of service capabilities. At the same time, the refactored application allows for better maintainability and interoperability.
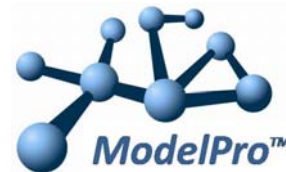
Extending SOI with BPM

We elaborated the relationship between SOI and BPM. As SOI provides the platform for loosely coupled composite applications, continuous business improvements through business process management now becomes possible. However, integrating BPMS and ESB is not an easy task, in part because there are numerous technology choices and the products often offer overlapping capabilities. To address these issues, we recommended an "Architecture Driven Approach" to build the IT infrastructure. Instead of starting from a vendor product, requirements for an SOA stack should be based on the capabilities needed to address business requirements. We demonstrated this approach by implementing BPM orchestration for the newly refactored services.

Model Driven Architecture

Last but not least, we recommend a "Model Driven Approach" to develop business services and processes, as MDA is the best approach to preserve IT investment in the face of rapid technology changes. In such an approach, the business services and focus on business concerns, not dependent on technology platforms.

We are currently developing an MDA provisioning engine, ModelPro™, which generates deployable artifacts for particular platforms from Computational Independent Models (CIM) and Platform Independent Models (PIM). In particular, we are leveraging the Service Oriented Architecture Modeling Language (SoaML) standard from the Object Management Group (OMG). More information about this work can be found on www.modeldriven.org

Project Results

By establishing an open source, open standard based platform for service-oriented integration, the SOI project helped our client take a significant step in developing an enterprise SOA platform that promotes reusability, interoperability, and maintainability, including

- **Establishing principles and patterns for reuse, interoperability, and agility**

- **Aligning with FAS SOA Reference Architecture**

- **Providing open source ESB platform comparison and assessment**

- **Elaborating the relationship of ESB and BPMS**