



# Client

A leading North American provider of eCommerce software platform

## Industry

**Ecommerce Software** 

## **Business Challenge**

Client's product is a unique eCommerce platform optimized for rapid roll-out of the derived ecommerce solutions. The platform's main features are:

- Open Source
- Easy integration with 3rd parties components
- Web Services-based
- Flexible architecture

# **Technology Utilized:**

- Java
- Open JPA
- Eclipse RCP
- Spring Framework

A new release date for the client's software was approaching, while a number of serious challenges had surfaced, including certain issues with the existing architecture that affected performance and scalability. JavaScript-based eCommerce management software application encountered serious maintenance and new feature development issues, which degraded the overall performance. In order to address these challenges, the client decided to redesign the architecture in their upcoming release. The web interface of eCommerce management application would be redesigned, using the Eclipse Rich Client Platform, and Open JPA for persistence of objects to database would be used.

Faced with a tight release schedule, the client was looking for a partner with the domain knowledge, technology expertise and a good track record to prove it. Luxoft topped the candidates list, because of their expertise in eCommerce software, impressive portfolio of accomplishments, and a combination of the near- and off-shore locations. Following the successful completion of a small pilot project, Luxoft team was selected for the project.

## Solution

Luxoft established a development center consisted of nearshore and offshore resources. Communication procedures were established to ensure the effective teamwork between both offices and the development model was tailored to meet the client's agile development process.

The client had four teams working on the project and Luxoft team was one of them. The client used an agile development process including daily Scrum meeting and 3-week development iteration. The Luxoft team adopted the client's development process, using a common code base and a bug tracking system, the same duration development iteration, iteration planning and the daily status updates.



When in the middle of the project, more resources were suddenly needed, because of a dramatic scope change, Luxoft was able to quickly accommodate and set up a second offshore team. The same development process was used with the nearshore team helping to coordinate tasks and activities between clients and the offshore teams.

During the course of the project, it was also decided to migrate from Hibernate platform to Apache Open JPA ORM framework, which was considered to be more robust, while implementing the new Sun JPA 1.1 specification. Such key features as annotations allow flexible and easy development using Apache JPA.

The eCommerse platform's architects focused on achieving maximum flexibility and maintainability. Therefore the bulk of their efforts were directed toward reworking the whole build process, setting the framework and searching mechanisms. While the results of these efforts are not directly visible to an enduser, they allow achieving the main goal - to make the integration of the eCommerce platform fast and easy for any type of business.



# **Core Architecture**



### **Service Layer**

The service layer provides services to various consumers in the web layer as well as web service consumers. There are several types of services that serve different roles in the application:

- Persistence Services provide the capability to save and retrieve domain objects
- Domain services typically implement the logic for a use case that is inappropriate for encapsulation by any one domain object
- Integration services implement functionality that is invoked by domain services but considered outside the domain of an ecommerce application and typically integrate with other systems or technologies (EmailService, CustomerIndexBuildService, BirtReportService)
- System services handle various concerns that cut across many parts of the application
- Web services expose service layer functionality to web services clients. These services are ultimately delivered to external systems via SOAP.

#### **Domain Layer**

The Domain layer contains an object model of the ecommerce domain. This object model consists of classes that model real-world entities such as customers and products. The behavior and relationships of these classes should be a reflection of the real-world entities.

#### **Data Access Architecture**

The data access layer is responsible for saving and retrieving data from persistent storage. The majority of persistent data at the client's site is stored in the database using the OpenJPA implementation of the Java Persistence API (JPA). A small number of configuration files are persisted directly to the file system using XML and properties files. Objects that are aware of persistence implementation details such as file formats or whether data exists in a database are called Data Access Objects (DAO).

## Storefront

The architecture of the Storefront component of the eCommerce platform software is comprised of the following technologies:

- CSS Cascading Style Sheets provide formatting and positioning for elements across all HTML pages
- Javascript Javascript is used to create rich user interfaces in the browser
- Velocity A template processing technology that embeds information from Java objects within HTML pages
- Spring MVC A web framework used to separate Velocity templates in the view layer from the underlying domain model and services

In addition, the Storefront uses services provided by the Core component of the eCommerce platform.

#### eCommerce Management Software

The eCommerce management software is comprised of the following components:

- Eclipse RCP-based desktop client rich client application is distributed to end users' PCs and makes connections to other system components to allow users to administer online stores
- Mid-tier application server web-application that has the following responsibilities:
  - Executes scheduled batch jobs for both the Storefronts and Commerce Manager clients
  - Hosts web services for integration with external systems
  - Provides centralized file storage for digital assets such as product images that are manipulated by Commerce Manager client users and synched across all Storefronts





- Provides the following centralized services to RCP desktop clients
- Payment processing
- Email sending
- User authentication
- Central file store CRUD operations
- Hosting the Solr server for data indexing
- Hosting the RCP Client update site
- Database



#### **Rules Engine**

At the core of the promotion rule system is the JBoss Rules (formerly Drools Rules) library. JBoss Rules is a third-party rules engine that uses a fast algorithm to evaluate rule conditions and execute their actions. The input to the JBoss Rules engine is a set of objects used in the condition evaluation and action execution as well as the set of rules, which we express as text in the proprietary Drools language.

#### **Web Sevices**

Web Services is one of the methods that remote clients can use to access the client's core application. The Web Services API is a well defined, SOAP-based layer that is intended to provide integration functionality for the client's customers. It is not intended to be a public interface.





# **Benefits and results**

- Partnering with Luxoft enabled the successful product launch on time and on budget, while meeting all internal milestones
- The software release contained radical improvements in performance, scalability and maintenance
- The nearshore/offshore team model proved its efficiency and relieved the client's own development team from having to supervise the offshore teams, focusing on their own development goals instead
- Luxoft engineers demonstrated proactive approach by suggesting a number of improvements to the product design, instead of simply following the listed requirements
- Luxoft showed an unwavering commitment to meeting the client's need, ensuring the client's peace of mind during the entire project

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