



QAT **Exchange** Case Study



B2B Integration between Union Pacific Railroad and a Major Locomotive Manufacturer

This paper will outline a recent integration success where two businesses required their respective heterogeneous applications to communicate in a transactional manner. This integration project was recently implemented to provide a business to business XML integration between a large rolling asset maintenance application developed by Union Pacific Railroad (business application) and the vendor application (vendor application), which provides mechanical services to the business. The business application was written in AllFusion® Gen running on Unix/Oracle and the vendor application was written in Java. The business application is a large mission critical application that is used to manage all details of the rolling assets and the maintenance work performed against those assets. The business application and the vendor application were required to exchange up-to-date transactional data related to the status and maintenance work order activities being performed against the assets.

To accomplish this, an application needed to be written to extract data from the business application, create an XML file and transmit it to the vendor's application. The data would be processed and a transaction XML response from that application would be returned and recorded by the business application. A business to business XML integration solution was needed to exchange transactions between the business application and the vendor's application.

The **QAT Exchange (Exchange)** product from Q.A. Technologies (QAT) was chosen to solve the problem for the AllFusion® Gen business application. Tibco was used as the transport layer for the XML. The **Exchange** product was used to map the XML schema's and corresponding transformation rules and subsequently generate AllFusion® Gen action blocks to handle the XML and perform the data transformations. Approximately 55 XML transactions were defined for this solution and the team consisted of one full time project manager, four Advantage Gen developers one short term Tibco expert to setup the transport environment.

The first step was to define the XML schema that was agreed upon between the Union Pacific Railroad and the vendor into the **QAT Exchange** tool. This included using the **Exchange** tool to define the XML Schema and the elements of the XML, such as permitted values, transformation rules (i.e. concatenation, sub stringing etc...) and data formatting rules (i.e. converting numbers, dates and timestamps to text). If an element level was repeating, it was defined accordingly to allow the tool to generate the appropriate AllFusion® Gen code to handle the repeating elements.

The access interfaces were defined into the **Exchange** tool next. These definitions are used by **Exchange** to build the AllFusion® Gen action blocks that handle the send or receive of XML. Each access interface defines a grouping of XML tags from the schema that will be sent or received by the action blocks generated by **QAT Exchange**. Since **Exchange** is a plug-in for AllFusion® Gen, the tool was able to provide selection lists directly out of the AllFusion® Gen business model when prompting for data elements to import or export from the generated action blocks.

Once all the access interfaces were defined, the AllFusion® Gen action blocks were generated into the selected model using the QWIK.xml Exchange tool. These action blocks contain

common action diagram statements with one very nice exception. The **QAT Exchange** tool enables new XML handling and data formatting functions into AllFusion® Gen. These functions are implemented into the generated action diagrams to read and write the XML as well as perform the specialized data formatting functions provided by tool. This made it possible to implement the solution without the use of external action blocks and using only the AllFusion® Gen resources that were available and experienced with the application. Even if these special XML handling and data formatting functions were available in AllFusion® Gen, each of the fifty five generated action blocks would have taken hours or days to code in AllFusion®. By using **QAT Exchange** to automatically generate this code, it took only seconds per access interface after the specification was defined. This was a big benefit since the tool provided the perfect environment to define the specification, which was subsequently used to generate the action blocks.

The generated action diagrams required no additional modifications and were ready to use by the AllFusion® Gen application with no special implementation procedures. All that was necessary was to call the action blocks from AllFusion® Gen procedures that were reading the data. The **QAT Exchange** action blocks formatted the import data into standard XML with the desired formatting applied. The result file met all XML standards and was ready for transmitting via the TIBCO transport environment.

XML files from the vendor application were retrieved by Tibco, which was listening for XML files sent from the vendor. This Tibco listener then called an AllFusion® Gen procedure which processed the request by calling the appropriate **QAT Exchange** generated action blocks. From there the data was manipulated back into the Oracle tables of the business application.

Maintenance of the XML file was simplified with the use of the **QAT Exchange** tool as well. When the XML schema changed, a tag definition changed or a transformation rule changed, it was simply a matter of changing the definition in the **QAT Exchange** tool and re-generating the action block. No AllFusion® Gen coding changes were required for any modifications to the XML schema. All changes were made via the **QAT Exchange** tool.

Several hundred development hours were saved on this project for two reasons. First, the **QAT Exchange** tool automatically generated the access interfaces directly from the specification. Second, the development did not require any additional skill sets and the Advantage™ Gen developers that were familiar with the application were able to complete the entire project. All other approaches that were considered required the use of additional skill sets and would have been developed outside of the model based environment in AllFusion® Gen.

The **QAT Exchange** tool was intuitive and very easy to use. It worked as described on the first use of the product and was well documented. The support from the vendor (QAT) was exceptional during the development and coding process. The ease of use and powerful automation contributed to this very successful B2B integration project.