

## ***The Situation –***

Raytheon Technical Service Company (RTSC) needed a complete solution of hardware and software components to comprise a comprehensive supply chain system to provide total asset visibility across the supply chain and be scalable from a single PC configuration to a fully networked configuration with multiple-level supply and maintenance support activities. The application also needed to be compatible with other COTS applications and proprietary Government applications as well as work across Government and commercial communication protocols, procedures and systems.

Raytheon was using an Automated Logistics Control System (ALCS) built with COBOL, MS-Access and Visual Basic, but it couldn't support the scalability desired to provide Total Asset Visibility. Raytheon also needed to report on material status information across the supply chain and give decision makers online access to the results.

## ***The Challenge -***

The initial challenge was to collect all of the requirements without access to the system users (typically at Foreign Military Sites), or full cooperation from the initial system developers. From there, the challenge was to build role-based process discipline to put intelligence behind the numbers in a unified and consistent repository in Oracle or SQL Server, depending on the customer. Naturally, reports and graphs need to be available on a role-based perspective including overall program management providing Total Asset Visibility.

## ***The Response -***

Integra was brought in to help with several phases of the project. We started by designing a logical model of the old application by examining the COBOL source code. The physical implementation of the application was then built in Microsoft .NET 2.0 and SQL Server 2000. Integra then completed requirements gathering efforts and reverse engineering from other Raytheon products performing similar functions and documented with UML models and use cases, and developed role-based process maps. The three person Integra development team implemented a rapid development of the application using .NET framework to deploy the application in a Raytheon warehouse operation to uncover missing requirements.

The role-based process maps were highly successful in quickly uncovering missing requirements and fed nicely into the development of training material and creation of user manuals. The architecture of the application delivered on the idea of customizing the application to fit the work flows of the customers by making the GUI a series of webpages that can be easily modified to change screen layouts, field names, and work flows. The webpage GUI is compatible with Windows, Windows CE/Pocket PC devices and Symbol 9060G Handheld scanners commonly used in warehouse and depot environments. Next, Integra developed a series of extract, transform and load (ETL) routines, which moved the data from the format and location of its source (text files) to its destination (SQL Server 2000). The conversions were verified by 17 reports and after running in parallel with the existing process for several weeks, the old application was taken off-line.

### ***The Result***

Raytheon now has a scalable application providing Total Asset Visibility that provides:

- An approach to an effective materials management system employed in multiple environments.
- Continues to solve increasingly complex logistics issues by evolving into integrated systems
- The ability to access logistics information from one remote location and provide it to many other locations
- The ability to use logistics data generated with a single set of tools in one location, with a different set of tools in another location
- Material management systems that do not require redesign or re-coding to operate when base technology changes
- Significantly increases operational effectiveness while reducing time and cost.

### ***The Technology***

Integra used several "off-the-shelf" technologies to accomplish the goal. ERWin and Visio were used to assist in the modeling of the existing application and database, and build role-based process maps. Data Definition Language (DDL) scripts were created from the model to build the objects in a SQL Server database. The ETL transformations used SQL Server's Data Transformation Services (DTS). The application coding using Microsoft .NET Visual Studio 2005.



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