



On the Road and in the Supply Chain, Rapid Response a Core Requirement for Rescue Vehicles

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Manufacturers of highly complex and customized products continue to implement a combination of homegrown and best-of-breed applications to supplement their ERP systems. This case study of a rescue vehicle manufacturer illustrates this fact, with specific references to its implementation of tools to facilitate rapid response and decision making throughout the process, from quoting to supplier alerts.

The company is a worldwide designer, manufacturer, and marketer of fire rescue vehicles, with more than 23,000 vehicles in operation around the world. It manufactures custom and commercial pumpers and tankers, aerial ladders and platforms, and rescue vehicles of all sizes to meet the needs of fire departments, rescue and EMS squads, airports, and Homeland Security agencies. Vertically integrated, it engineers and build the complete vehicle: chassis, cab, body, tank, and aerial device. Additionally, the company satisfies the customers after-sale needs for parts, service, warranty, training, and manuals.

Configuring the truck

The company's sales configurator was developed in house using the **Cincom** rules engine as a starting point and **Oracle** technology as a platform. A portal providing additional data and functionality was added, allowing dealers and customers to configure the truck using 14,000 options as well as create their own quotes.

This process paved the way for them to conduct a preconstruction review with customers, which drives the output to the manufacturing configurator to create a first-generation bill of materials (BOM) for the assembly. Workflow from the sales configurator throughout the process provides alerts and visibility to the team. **UGS's** Teamcenter is used for product data management and further populates the bill of materials with necessary engineering details. Automatic generation of routing data will come as a later phase.

Rapid Response to the rescue

Not surprising, the manufacturer found that its ERP system, while handling the transactional side of the business well, was not conducive to providing the necessary information quickly and concisely to facilitate decision making. For example, a quick, consolidated view of custom and standard parts for a truck, pulling data from standard MRP and custom project repositories, was not possible.

Kinaxis' Rapid Response was selected for its ability to rapidly provide a single view of the status of a custom vehicle, and it took five months to get up and running. In the manufacturer's highly configured environment, design changes are magnified, and unless the effect can be identified quickly across all parts of the vehicle, delays occur. As one can imagine, delays in delivering rescue vehicles to customers has serious ramifications.

The Kinaxis tool pulls disparate data from the ERP system and the configurator to provide an early view of the quote and order before it's released to engineering. Since it was difficult for the manufacturer to recognize the amount of custom work and variation between units, it developed a scoring system. The system reads the order, identifies what is affected by the specific options selected and the outcome of such a selection (such as the cab or chassis), assigns a score, adds days to specific work centers, and offsets lead times. This improves the accuracy of production scheduling. The next steps will be to add in the skillsets required, facilitate resource planning and allocation, and identify skillset requirements by hours, not just days.

With the scoring system providing a holistic view of the custom vehicle, the effects of the configured options identified that it was not the complexity of the options that caused the most problems, but rather the variation involved. This insight allowed the manufacturer to carefully schedule and sequence the lines for variation, thus improving line efficiency.

Analytical capabilities increased through this visibility. In addition, alerts were sent to suppliers, providing them with advance warning of requirements. This particularly helped with suppliers in Europe, where communication had previously been a challenge.

The challenges

Consider the following challenges faced by the manufacturer:

- During the data migration and integration phase, data validation was the most problematic task. However, bad data in the ERP system was exposed and cleaned up. This was the responsibility of the users, led by designated super users.
- As always, change management and training was required to migrate people off their legacy manuals and spreadsheet systems to an automated, alert-driven process. Guesswork was replaced by hard facts,

which is something that takes a while to accept in manufacturing.

- When asked what it could have done better in hindsight, it stated that getting buy-in across the organization up front would have helped. The project was driven by materials management and planning and pushed outward.
- While one recognizes the reasons for keeping the trusted homegrown application, this does limit the benefits one can gain from the ERP system in other areas, particularly planning.

The benefits

Despite the challenges, the benefits were realized:

- Early warning capabilities—that is, the time taken to detect and correct a defect of any kind—are fundamental requirements of lean Six Sigma. The manufacturer's process and supporting IT architecture supports early warning as well as the ability to select the best option available for both profitability and customer satisfaction.
- While not all benefits can be easily measured in dollar terms, it did see a reduction in inventory attributed to its ability to more accurately offset materials and only bring in materials when required.
- Expediting fees reduced by a third, and past due purchase orders were cut in half. This visibility also helped its suppliers.
- Managing major projects improved through visibility into timing and engineering changes. Meeting manufacturing dates and on-time delivery also improved.

Summary

With ever-increasing globalization, complexity, and time-to-market pressures, traditional planning systems fall short. Risks must be identified and dealt with immediately. Engineer and configure-to-order companies are seeing the benefits of predictive intelligence through use of tools to support scenario analysis, advanced analytics, and end-to-end supply chain visibility.

Do you have a success story to share? If so, please contact me at jbarrett@amrresearch.com.

Related research

- "Response Management: Next Wave of Supply Chain Innovation?"
- "Configure Your Engines With SAP"