

Demand Network Management for the Automotive Industry

Unlocking The Potential of Demand Efficiencies

Abstract. Automotive manufacturers can reap billions of dollars in additional profits and cost savings by moving toward a build-to-order (BTO) model.

A critical step in the path toward BTO is establishing and managing a demand network based upon an Internet backbone using XML and using standardized definitions for vehicle options.

A demand network would unlock the potential for huge efficiencies between OEM divisions, OEMs and between OEM trading partners. Customer satisfaction and profits would rise while costs would fall.

Keywords. Automotive, manufacturer, build-to-order, BTO, demand, trading partners, efficiencies, XML, Internet.

The State of the Automotive Industry

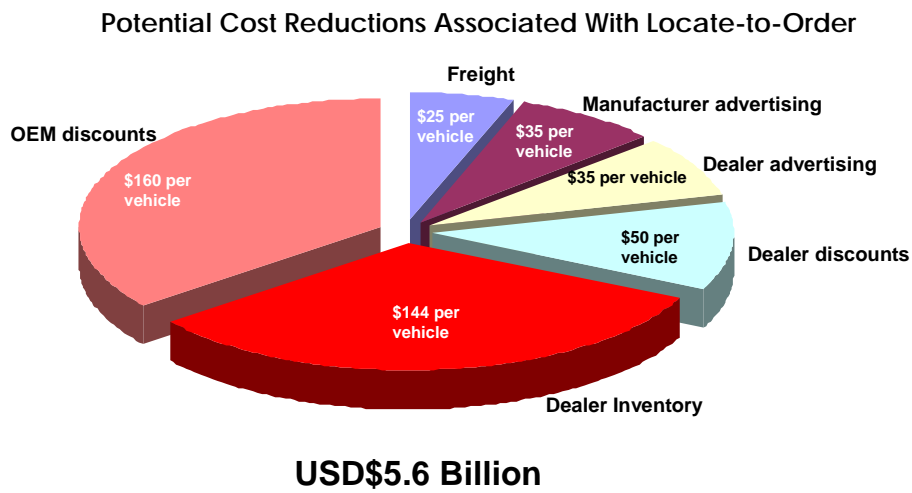
The automotive industry is missing significant opportunities to reduce operating costs, increase profits and enhance customer satisfaction due to the lack of a standardized way to communicate vehicle orders. Original equipment manufacturers (OEMs) maintain legacy vehicle data formats that often differ between OEM divisions, between the OEMs themselves and between the OEMs and their trading partners.

To compensate for their inability to communicate vehicle orders in a standardized format, OEMs maintain teams of vehicle data translators to normalize data between divisions and among OEM trading partners. In addition to the direct costs of vehicle data translation, there are indirect costs, as well.

Dealers placing factory orders sometimes mistakenly configure a vehicle that can't be built, creating administrative expenses. OEM trading partners must build into their prices the cost burden of translating proprietary vehicle order information from multiple OEMs into their internal systems. In addition, consumer dissatisfaction due to delayed vehicle orders, or due to not getting the exact vehicle the consumer wants results in significant lost sales opportunities.

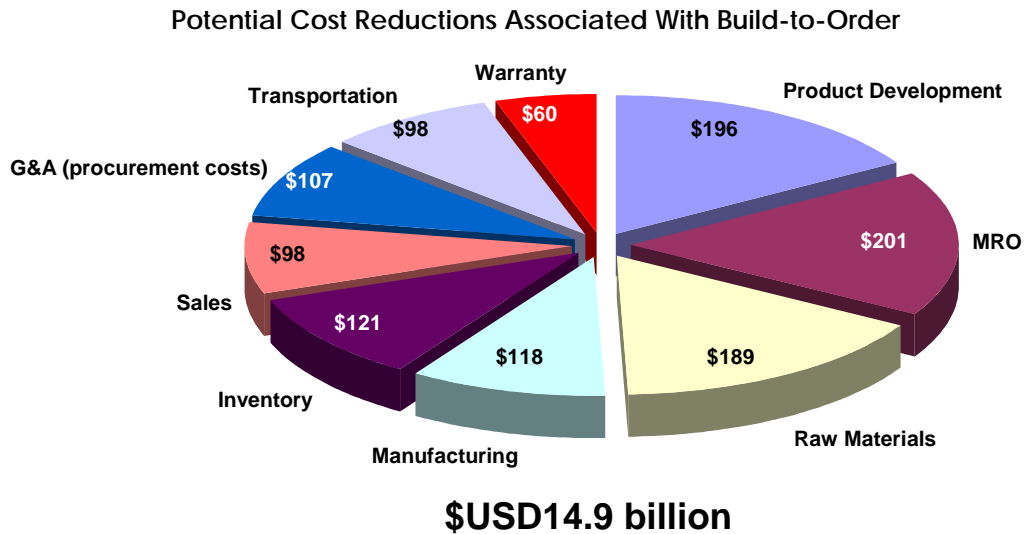
According to Forrester Research, Inc., one-third of all new car buyers say their most recent car purchase was a compromise from what they really wanted.¹ Furthermore, unable to find the vehicle they want, many car buyers simply walk away from purchasing any new car, resulting in estimated lost sales as high as \$7.2 billion annually, according to Forrester.²

Furthermore, the inability to communicate about vehicle orders in a standardized way is hampering the industry's drive to implement locate-to-order (LTO) and build-to-order (BTO) systems. Delays in deploying LTO systems prevent OEMs from enjoying cost efficiencies that Goldman Sachs and Forrester estimate to be USD\$5.6 billion per year.³



Source: The Goldman Sachs Group, Inc. and Forrester Research, Inc.

Delays in deploying BTO systems prevent OEMs from enjoying even greater reductions in costs. According to Roland Berger / Deutsche Banc Alex Brown, OEMs could realize as much as USD\$14.9 billion in annual cost reductions with BTO systems in place.⁴



Source: Roland Berger & Partners; Deutsche Banc Alex. Brown

A Forrester study suggests the following summary of BTO benefits, “The bottom line for BTO: average per-vehicle profit increases by more than 50 percent.”⁵

To realize the cost-efficiencies and increased profits that LTO and BTO have to offer, OEMs must begin to communicate about vehicle orders in a standardized way, both between their own divisions and dealers, and among their trading partners. Just as OEMs have already formed supply networks, such as Covisint, they must now form demand networks, as well, based upon a standardized vehicle order.

Of the vehicle specification systems and factory build databases that must be standardized, Forrester exhorts manufacturers: “Don’t treat these resources as highly confidential; that approach will simply delay the implementation of LTO and BTO and limit your ability to improve customer satisfaction with the new-car purchase process.”⁶

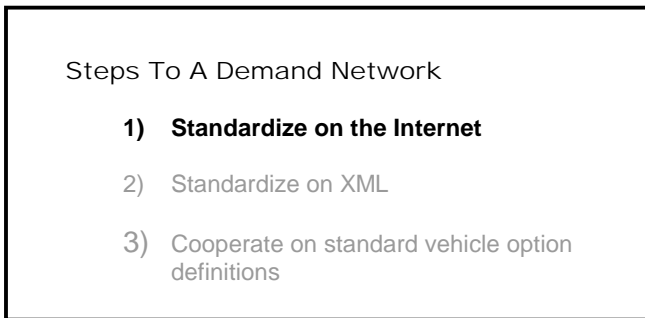
In addition to accelerating the drive to LTO/BTO, standardization of vehicle orders offers an additional benefit, as well. Demand information from dealers, trading partners and consumers can be aggregated to form a rich vein of real-time data for fine-tuning manufacturing, procurement, distribution and forecasting of future trends.

Building A Demand Network

There are three critical steps the automotive industry needs to take in order to build and manage an efficient demand network:

1. Standardize on the Internet for transmitting data;
2. Standardize on XML as the markup language of choice for coding data;
3. Cooperate on the development of standardized vehicle option definitions.

Step One

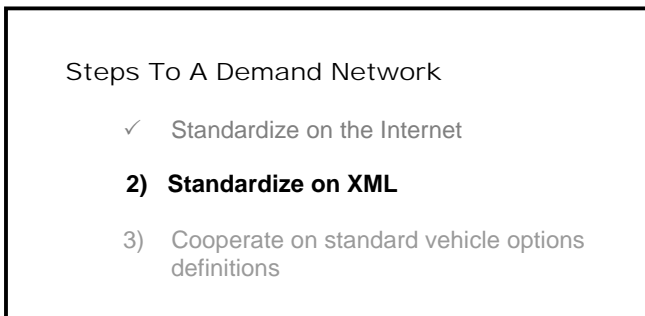


The three sponsors of the supply network Covisint have taken a first step toward developing a demand network. DaimlerChrysler, Ford and GM have issued recommended standards for setting for affiliated dealers to use when setting up information systems.

Issued in December 2000, the recommended standards set the Internet as the preferred conduit for communication between affiliated dealers and the OEMs they represent.⁷ The Internet is an ideal backbone for the automotive demand network due to its worldwide accessibility and increasingly broad and frequent use by businesses and consumers alike.

Additionally, there is already a high level of expectation among car dealers that vehicle ordering will migrate to the Internet soon. In an April 2001 Forrester survey of automotive dealerships, more than 60% of the dealers interviewed said they will use the Internet for ordering vehicles within the next two years.⁸

Step Two



The second step toward building a demand network is to set a standard for communicating vehicle specification and ordering information that is viewable in a variety of formats on the web and across a variety of applications. Using a standard enables multiple heterogeneous systems to capture, transmit and store data consistently. By following an open standards approach, OEMs will have the ability to supply consistent tools throughout the demand chain.

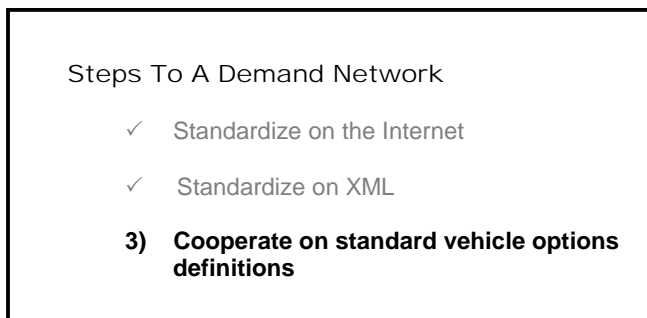
OEMs need to standardize on Extensible Markup Language (XML). XML is a simplified, web-optimized derivative of the International Standards Organization's (ISOs) Standard Generalized Markup Language. XML provides a file format for representing data, a schema for describing data structure, and a mechanism for extending the data structure as needed.

With XML, Document Type Definitions (DTDs) can be used to accompany a document essentially defining the rules of the document, such as which elements are present and the structural relationship between the elements. DTDs help to validate data when the receiving application does not have the built-in description of the incoming data. As such, XML is flexible, easily expanded and easily customized.

Ford is already developing an XML interface for its Global Product Definition platform that allows online configurators to access updated vehicle option information; the OEM plans to launch the interface in 2002.⁹

To remain competitive as online configurators become increasingly pervasive, other OEMs need to rapidly create their own XML interfaces for easy access to up-to-date vehicle option data. These interfaces should provide vehicle data including configuration, pricing, marketing, ordering rules and the business processes associated with this data.

Step Three



The third step in building a demand network is for OEMs to cooperate on the development of standards for defining the most common vehicle options.

For example, the industry needs to agree on a standard for specifying options like air conditioning, power steering, anti-lock brakes, and so on. This is particularly important between OEM divisions as multiple franchise dealer groups take steps to manage inventory in cooperation with OEMs via the Internet.

It may be cost-prohibitive for OEMs to abandon legacy option definitions in favor of an industry-wide standard. Therefore, OEMs need to develop the capability to map data elements within their proprietary option definitions to those of other demand network partners.

Alternatively, OEMs can use experienced third-party data translators to map legacy vehicle data elements to an industry standard. As Forrester Research, Inc. states, for LTO/BTO to be fully realized, "Dealers need a single multimanufacturer system for configuring vehicles, searching for matches and placing orders."¹⁰

Chrome Is the Platform For the Demand Network

Chrome provides an open-architecture, object-oriented automotive data and configuration technology platform that connects each player in a demand network. Blending 15 years of experience in gathering, normalizing and enhancing automotive data with industry-leading vehicle specification and location systems, Chrome has already built the automotive demand network platform.

Since 1986 Chrome has been collecting, preparing, improving and standardizing vehicle data from multiple manufacturers. Today, we provide the most accurate order-level configuration and pricing data for every vehicle.

Rich Resources For Translating Vehicle Data

Chrome has both the technology and the expertise to map any OEM's vehicle option definitions to any data schema, including an agreed upon industry standard. By outsourcing data translation requirements to Chrome, OEMs can gain the marketplace efficiency of operating with standardized options definitions without the expense of replacing legacy systems. Chrome can act as the translator between systems.

Forrester states: "Technology vendors like Chrome...will field backbones that combine end-to-end LTO services with broad market reach. Deep technology expertise and neutrality as a result of extensive partnerships with OEMs and dealership groups will make [Chrome a] winner in the LTO backbone race."¹¹

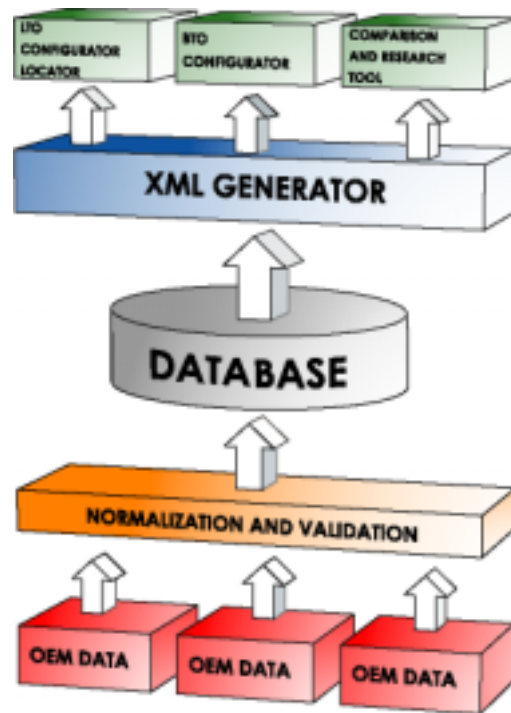
Proven XML Solutions

Once Chrome has mapped an OEM's vehicle data to a standard schema, Chrome's open API data and configuration platform provides the capability to augment that data with XML-based rules for how the data should be used. The XML rules provide a high degree of OEM control over the data, as well as flexibility to selectively filter the data.

For example, to drive an LTO configurator and locator, an OEM may want to show only vehicle options that exist in inventory. To drive a BTO configurator, an OEM may want to show vehicle options according to its up-to-the-minute

marketing needs, and to drive a research and comparison tool, an OEM may opt to show the complete set of all possible vehicle options. With XML data rules from Chrome, OEMs gain both control and flexibility for managing their Demand Chains and more tightly integrating with their Supply Chains.

Working with Chrome, OEMs can realize exceptionally rapid speed-to-value for XML data solutions. Indeed, Chrome already provides new vehicle data, as well as configuration and pricing logic in XML format. The product is known as AutoTransmission™.



Chrome's Data Enhancement and XML Translation Process

Open Architecture Ideal For Internet Applications

Chrome's open-architecture, object-oriented automotive data and configuration technology platform is ideally suited for worldwide Internet applications. It's open architecture allows for rapid customization to any client-specific needs, and it's broadly applicable to nearly every technology platform.

Conclusion

Auto manufacturers need to form Demand Networks comprised of their own divisions, franchise dealerships and trading partners, as well as other OEMs. The

benefits of a Demand Network include acceleration toward LTO and BTO, and an enhanced ability to forecast future trends, potentially unlocking billions of dollars in cost reductions and profit increases for the automotive industry.

An automotive Demand Network must be built upon a foundation of standardized vehicle orders. The vehicles orders need to be communicated over an Internet backbone, formatted in XML and comprised of an agreed-upon convention for defining vehicle options.

Once a set of standard definitions for vehicle options is established, rather than replace legacy vehicle data systems at great expense, OEMs need to map their legacy systems to the new standard, or outsource data mapping to third party providers with proven expertise. Third party providers like Chrome Systems are specialists in data management and mapping.

In fact, Chrome Systems Corporation is ideally suited to assist OEMs as an objective third-party translator of legacy data systems to an agreed upon industry standard. Furthermore, the company's 15 years of expertise in acquiring, managing and enhancing data from every major auto manufacturer gives Chrome the necessary tools to recommend improvements to an industry standard. In addition, Chrome's ability to augment vehicle data with XML-based rules gives OEMs an additional tool to respond to and manage the Demand Network.

¹ Forrester Research, Inc.; 11/2000, "Auto Dealers: Court the Web Customer Now."

² Forrester Research, Inc.; 1/2001, "The Build To Order (R)evolution."

³ Forrester Research, Inc.; 10/2000, "Overhauling Online Car Buying."

⁴ Roland Berger Strategy Consultants; "Automotive e-Commerce: A (Virtual) Reality Check," Figure 7.2.

⁵ Forrester Research, Inc.; 4/2001, "Building Auto's Internet Backbone."

⁶ Ibid.

⁷ Daimler Chrysler, Ford Motor Company, GM; 12/2000, "Olympus System Standards."

⁸ Forrester Research, Inc.; 4/2001, "Building Auto's Internet Backbone."

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.