

WHITE PAPER

Understanding Automotive EDI

Automating and Integrating EDI for Increased Efficiency and Improved Delivery Performance

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Abstract

The goal of this white paper is to educate the reader on automotive EDI, how it works and how to leverage available technology to become more competitive within the marketplace.

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Understanding Automotive EDI*

Automating and Integrating EDI for Increased Efficiency and Improved Delivery Performance

The average automotive assembly plant makes about 1 vehicle per minute and as many as 2000 per day. Each vehicle has 5,000 to 7,000 components which means that the typical automotive assembly plant is handling up to 14 million parts each day. With this level of volume, Electronic Data Interchange (EDI), which is the method to communicate business transactions in the automotive industry, is not just a “nice-to-have” technology, but it has become imperative to doing business within the industry.

If you supply products to the automotive industry supply chain, then you are already familiar with the rigorous EDI requirements. These requirements have been around for decades, but are they helping your business to operate more efficiently or are they more of a burden, or even a risk to your business? Automating and integrating EDI with your ERP solution not only eliminates waste and reduces errors associated with manually keying data, but it also improves delivery performance to your customer.

The goal of this white paper is to educate the reader on EDI within the Automotive Supply Chain, how it works and how to leverage available technology to become a more competitive organization.

**EDI stands for Electronic Data Interchange which represents a standardized format for companies to transmit business documents and transactions electronically. EDI has helped companies streamline business transactions since the 1960's and is the recognized business standard for business document exchange. Trillions of dollars of business is transacted annually using EDI technology.*

The Materials Management Model

Figure 1 is a model of material and information flow at a typical automotive supply company created by the Automotive Industry Action Group (AIAG), the organization that helps define the EDI standards and implementation in the global automotive supply chain. For the purposes of this example we will discuss a specific automotive component supplier, Acme.

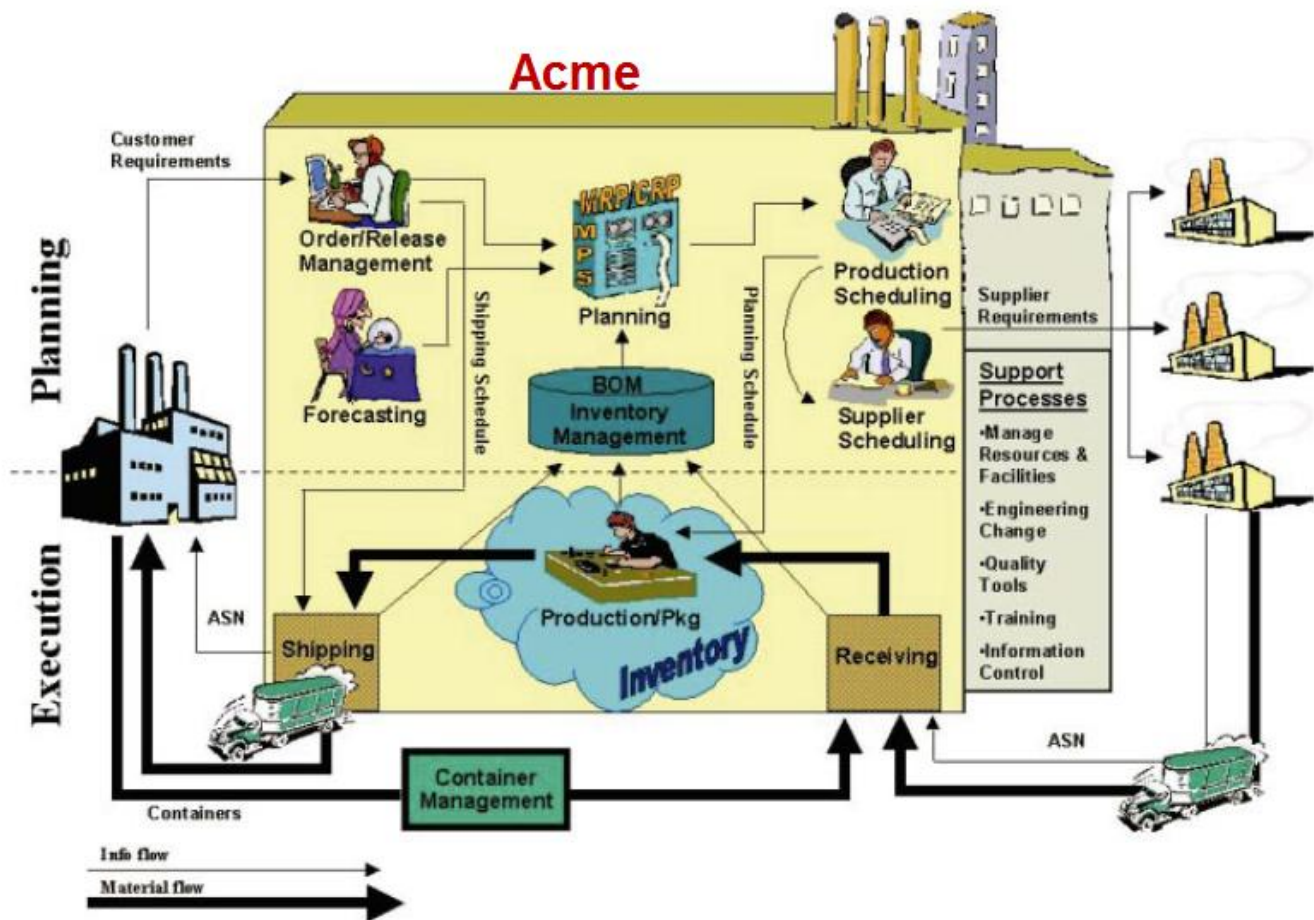


Figure 1: Materials Management Model

The blue building on the left represents the customer, e.g. Ford Motor Company, the center building represents Acme and the yellow buildings on the right represent their suppliers.

The first thing to note is that the model is divided into two distinct sections, Planning (top section) and Execution (bottom section). The Planning section incorporates most of the information flow, while the Execution section reflects the material flow, as well as other information pertaining to shipping and receiving processes.

The customer sends their requirements electronically to Acme in the form of planning forecasts and releases. These forecasts notify Acme as to how much they will need over the next several months, while the releases communicate what needs to ship over the next 2 weeks, or similar time window.

The Order/Release Management function evaluates the releases to determine if anything on the release has been shipped. Then a shipping schedule is created for the shipping department. The combined forecast and release is sent to the Material Resource Planning (MRP) system. The output of MRP goes into the production schedule which is sent to the floor. This MRP output is also used to generate supplier schedules, which are electronically transmitted to the supplier in the form of planning forecasts and releases.

When a supplier ships product to Acme, they also send an Advance Shipping Notice (ASN) notifying Acme of what items are included on the shipment. Based on the information provided on the ASN, product is received into the production facility and then consumed by production.

ASNs are one of the most crucial and urgent documents in the world of automotive EDI. Once a product is picked, packed and prepared for shipment to the customer, the underlying data for the ASN is created. When the truck leaves the dock, the ASN is transmitted to the customer in that customer's specified EDI format. Not only does the ASN tell the customer what is on the shipment, but it also informs the customer as to what time the shipment left the dock so the customer can anticipate the time of delivery, which in many cases can be in less than 1 hour.

Although there are different methods of communicating release orders, this white paper will focus on the most common method in the North American automotive industry – cumulative-based releasing – known as cumulative management/accounting.

What is a Release?

Releasing is a repetitive, non-capital procurement method often used in manufacturing supply chains. It is a way for customers to manage purchasing agreements or contracts with their trading partners and is especially useful when demand is consistent and somewhat predictable (think in terms of regularly scheduled orders).

When a releasing process is utilized, a contract is drafted and communicated to the supplier, usually in the form of a blanket purchase order. This contract may cover the current year, the model year, the life of the product or anywhere in between – it is uniquely defined by the buyer.

The blanket order sets the terms and conditions such as items that can be ordered, price, maximum total quantity and expectations of the customer.

Once the contract is in place, the customer releases orders against the blanket order. These releases inform the supplier of what, when, where and how much the customer wants delivered each day during a pre-determined timeframe (often 1 to 2 weeks).

Releases are normally accompanied by planning forecasts, which provide visibility of customer demand for a longer period of time, such as 6 months. Forecasts are non-binding and used primarily for resource planning.

How is a Release Different from a Purchase Order?

A purchase order is typically used as a one-time purchase authorization for goods and material. If a buyer wants to purchase additional product, he will issue another purchase order with another unique purchase order number. This unique number is used to track the order throughout the order to fulfillment process, as well as in communication with the customer.

On the other hand, a release provides a schedule of what is needed over a given period of time. A supplier can receive a new release every day which supersedes the previous release. Then as orders are received by the customer, they drop off the beginning of the schedule and additional requirements are introduced to the end of the schedule. Based on customer needs, quantities and dates change from one release to the next.

If You are Constantly Getting New Releases, How do You Keep Track of Where You are in the Schedule?

With all the data flowing freely from customer to supplier, you can easily lose track of where you are in the schedule, especially when the schedule itself is in flux. For example, your latest release says the customer needs 100 pieces delivered on Monday. Although you have already shipped those 100 pieces, the customer has not yet received the shipment and so they send the order again. With hundreds or thousands of items to monitor, this example demonstrates how easily things could quickly get out of control without a dependable tracking mechanism.

To address this tracking challenge, there are two methods for staying in-sync with your customer. The first method is for the customer to maintain their cumulative quantity (CUM) received while the supplier maintains their cumulative quantity shipped. The supplier can then compare their CUM (pronounced as the first syllable of “cum-u-la-tive”) shipped with the customer’s CUM received to systematically determine what is in transit. CUM maintenance is required by most automotive companies.

The second method is for the customer to send Release Authorization Numbers (RANs) in their releases. A RAN-based system provides a unique identifier for each firm requirement (date/quantity) that they want you to ship. These unique identifiers have many names (e.g. RANs, KanBans or SIDs), but they all provide a unique number to track the order from release through to fulfillment.

How do CUMs Work?

When a customer sends a replacement release, the intent is for the recipient to completely replace the entire previous schedule with the new requirements by either deleting the old schedule and inserting the new schedule, or by inactivating the old schedule and activating the new schedule. The customer has the ability to move any date in the schedule and so you want to avoid replacing the date/quantity at the line level.

The first piece of information needed to make CUMs work is the CUM start date. This date is set by the customer and establishes when both parties will begin accumulating the quantities.

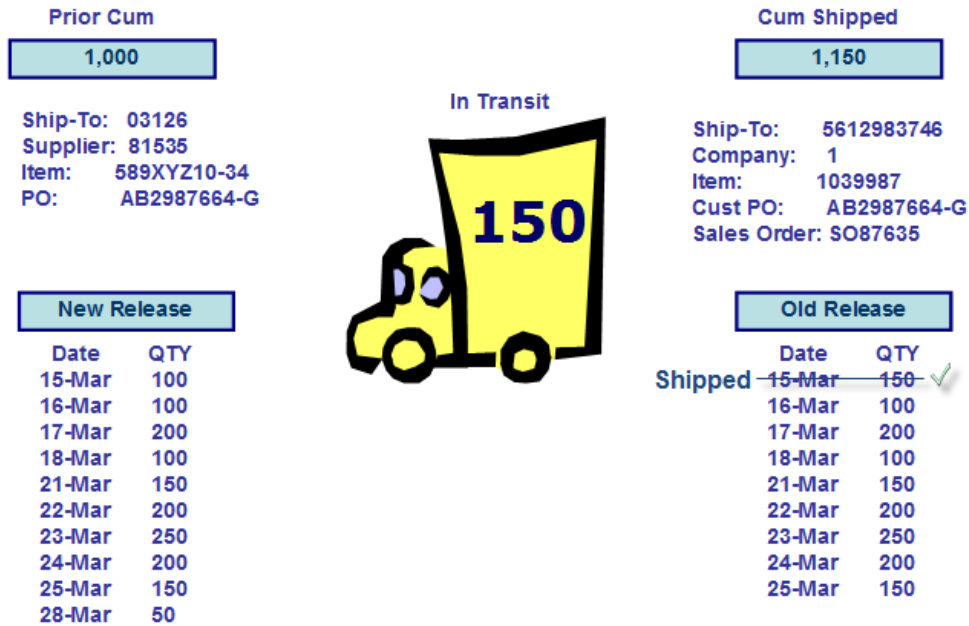
The release will contain a prior CUM value which is most often the cumulative quantity received since the CUM start date. Think of this CUM as a stake in the ground that tells the supplier, “Starting from this point, we want you to ship the following quantities on the dates specified.”

The supplier uses this information to understand where the customer was in the schedule at the time the release was sent. The supplier compares the prior CUM to their CUM shipped to determine what, if anything, is in transit. The supplier then reduces the incoming requirements by the amount in transit.

This process is best explained using the following example:

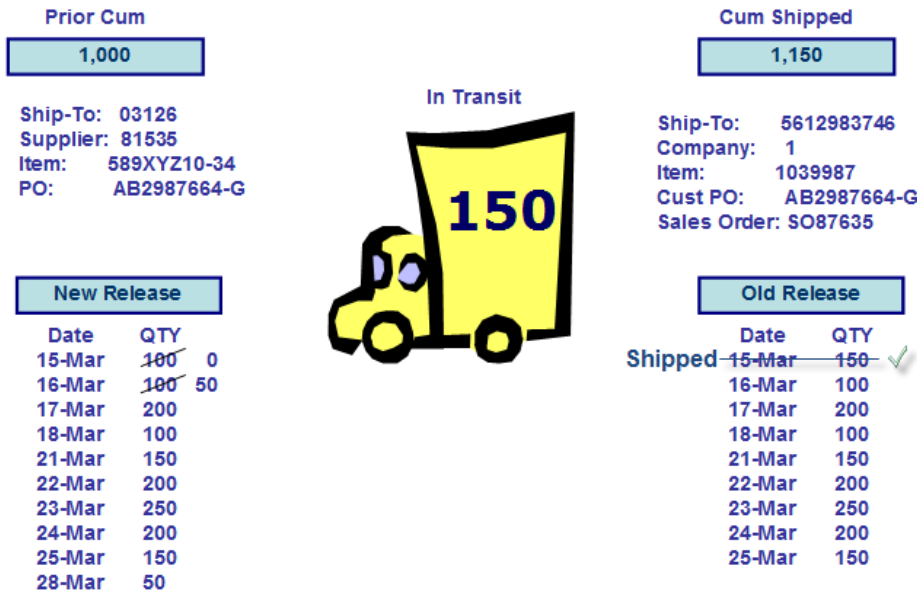
The customer received 1,000 pieces of an item, but you have 1,150 shipping. Therefore you know that you have 150 pieces in transit ($[\text{CUM-SHIPPED}] - [\text{PRIOR-CUM}] = 1150 - 1000 = 150$). When the customer sent this release, he had not yet received the last shipment, so he sent the order again.

FIRM Release



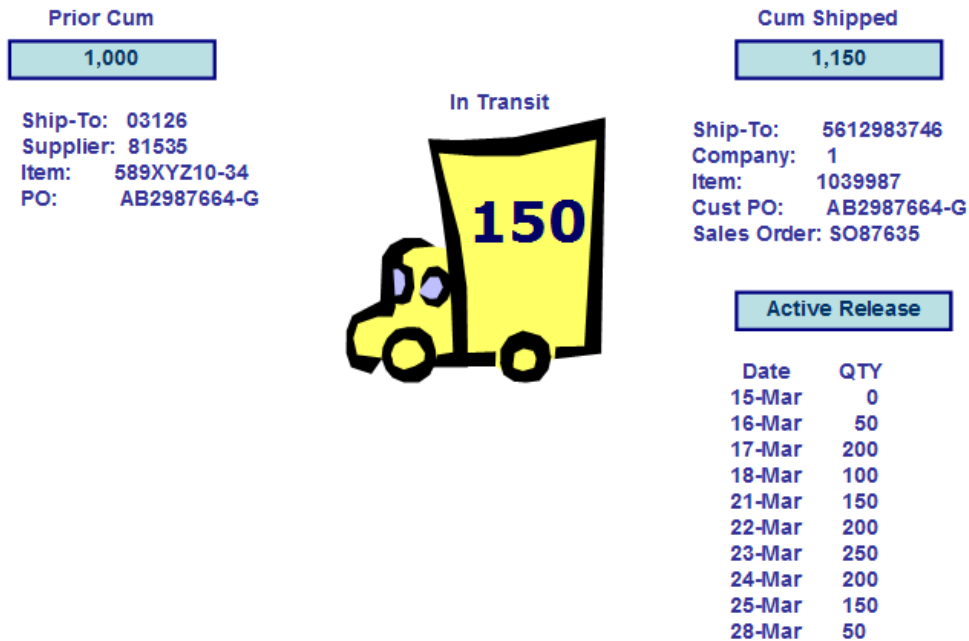
You will need to reduce the orders by the amount in transit so you avoid over-shipping to the customer. Instead of owing 100 pieces on March 15th and another 100 pieces on March 16th, you would owe zero on March 15th and 50 on March 16th.

FIRM Releases



The new release now becomes the active release, replacing the old release in its entirety.

FIRM Releases



This becomes the new shipping schedule and it is input (with the forecasts) to MRP.

By maintaining the CUM shipped, this process can be automated. If you do not maintain your CUM shipped, you will struggle with the challenges associated with a manual tracking process. Each time a release arrives, you will need to manually calculate what is in transit for every item you ship. For small shops, this manual process may be manageable, but as your business grows, the potential for error and risk grows as well.

Releases are the first place where you should consider an automated approach. By eliminating manual intervention, you save numerous man-hours on data entry which saves you money, but you also drastically decrease the potential for keying errors which improves your overall delivery performance.

Other Opportunities for Automation

After automating releasing, consider a shipping process that automatically generates the ASN when the shipment is complete. With an automated approach, information would be pulled directly from scanned labels and the database in order to build the shipment, and the data should be systematically validated. This process is an ideal candidate for automation given that automotive customers rely heavily on your ASNs being 100% accurate. With 14 million parts flowing through the OEM's assembly plant, ASN accuracy is critical. In addition, many customers rate your ASN timeliness and accuracy to determine if you will be considered for future business.

Integrating your EDI and labels also provides an opportunity to improve label accuracy. By pulling label information from the EDI, you eliminate the need to re-enter the data manually, further minimizing the risk for errors.

Scanning labels in both the shipping and receiving processes creates another opportunity to increase efficiency and reduce errors. When you scan a label, information is made available for database storage without manually keying data. This automation also improves ASN accuracy, which ultimately improves customer satisfaction.

Once your releasing and ASN processes are integrated and automated, you can then implement EDI with your key suppliers, beginning with your largest volume suppliers. This approach eases you into Supply Chain EDI which can seem like a daunting task to undertake. Normally you can automate half the supply volume by implementing a handful of suppliers (Pareto's Principle: 20% of something is responsible for 80% of the results). You should not attempt this, however, until your customer EDI is automated and integrated.

In conclusion, EDI provides a wide array of opportunities to improve your planning and processes, reduce waste, eliminate errors and increase customer satisfaction, but it is up to you to embrace the opportunity and take action. EDI is mandatory if you want to supply the automotive industry. Doing EDI without integrating the data is painful, expensive and high risk. Accurate integration is key to maximizing the benefits of EDI and gaining a competitive advantage.

The author, Donna M. Ward, is a Consultant at Data Masons Software, LLC. Donna has 18 years of automotive EDI experience and co-chaired the Supply Chain Management Project Team at the Automotive Industry Action Group (AIAG) for 10 years.

Vantage Point EDI Supply Chain Edition provides everything necessary to integrate the entire supply chain electronically. Included is an FTP trading partner network with mailboxes, a translator, pre-configured maps, trading partner kits, an application connector to your internal business systems and all of the other required components. To learn more about Data Masons Software's products please visit http://www.datamasons.com/edi_asn_supply_chain_edi.htm.

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Data Masons is a privately held company headquartered in downtown Sarasota, Florida.

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