On-Time Shipment Performance

J. E. Boyer Company, Inc.
John E. Boyer, Jr., President

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by John E. Boyer, Jr., President, J. E. Boyer Company, Inc.

Overview

Since I started working in manufacturing in the early 1970's, every one of the 200+ companies that I've visited or worked with are interested in shipping products on time ... don't recall ever having one say that didn't matter. I also have learned that this intuitively basic performance concept is popular, but it is not well understood. So the objective of this paper is to bring clarity to the "science" of measuring on-time shipment performance in a very precise way. More importantly, I've found that companies that deeply understand and measure on-time shipment performance properly have a distinct competitive advantage with their customers. Their customers quickly learn that service will be better and more predictable when this metric is engineered and used to drive performance improvement. One of my client's customers stated in a meeting recently "I wish all of our supplies did it this way"!

Notice that I've said "shipment" performance … not "delivery" performance. It's true that the customer really only cares if the product hits their dock on time (delivery), but capturing this on-dock date/time is difficult at best. So in this paper, I'm going to describe the practice of measuring shipping product off-dock on-time (shipment). The assumption is that if a company can get it off of their dock on-time, the chance of the shipment getting to the customer on-time is quite good. The data for shipment performance is usually readily available (or can be made available) thus enabling the on-time shipment performance metric.

Another aspect of shipment performance is how dates are promised in the first place. That whole discussion is outside the scope of this paper … just wanted you to know I haven't forgotten about it. But for now, we will assume that somehow, dates are promised.

Moving back to the metric, to deeply understand on-time shipment performance, three fundamental principles must be mastered:

- Customer Order Date Definitions
- Date Management
- Metric Definition and Math

Customer Order Date Definitions

Imaging taking your car to the repair shop on Monday. You ask the mechanic if he can have it done by Tuesday, and he says "no, but I can have it done on Wednesday". You are not pleased, but agree. When you call on Wednesday to see if you can pick it up he says, "Mr. Boyer, the part didn't come in as planned, so I won't have it done until Thursday". You're not happy about that, but it is what it is. You go in on Thursday, the job is done, and you head for home.

In this case, we encountered five dates:

Order Date: This is the date that you (the customer) entered the order … Monday.

Request Date: This is the date that you requested to have the work completed … Tuesday.

Promise Date: This is the date that the mechanic said it would be done … Wednesday.

Current Date: At the time of order entry (Monday), the current date and the promised date were the same … Wednesday. But the current date changed because of the part issue. On Wednesday, the current date changed to Thursday.

Ship Date: Your car was done on Thursday. This is the actual ship date.

These are the five crucial dates for understanding on-time shipment performance. Sounds really easy … and that's because it is! So let's practice it one more time.

A customer calls on October 29th and gives you an order. They want product shipped on November 16th. You say OK, and the product is actually shipped on November 16th. What are the five dates?

Order Date: October 29th
Request Date: November 16th
Promise Date: November 16th
Current Date: November 16th
Ship Date: November 16th

One more time. A customer calls on October 29th and gives you an order. They ask for shipment on November 16th. But you can't ship until November 18th, and the shipment is made on November 18th. What are the dates?

Order Date: October 29th
Request Date: November 16th
Promise Date: November 18th
Current Date: November 18th
Ship Date: November 18th

The request date must always reflect what the customer wants … as unrealistic as it may be, it's what they want. No negotiating. No arm twisting. It is what they want and must be recorded as such. Don't be afraid … just do it.

The promise date is what we tell the customer at the time of order entry. No matter how we arrive at the date … anything from a SWAG to a Rate-Based Due-Date-Driven slot

of capacity to some system calculation … it is what it is. Like I said before, that's another discussion for another day.

The current date is also called the "system positioner". It is the date that MRP, CRP, ATP, and other system "math" uses for calculations. It is important for you to know in the ERP system which date this is, and always use it as the current date.

That's how it works. These five dates are always in play … either implied or specified. It's important to note that the request, promise, current, and actual are off-dock dates meaning the dates that products ships from our facility. In many companies, more dates come into play … specifically the on-dock dates for the customer. But for now, let's walk before we run and just deal with off-dock dates.

Now let's get to the next step which is capturing the dates. In today's world, most companies enter orders in an ERP system of some type. The order entry application has an "order header" and "order lines". The dates described above must all be associated with each order line … not the header! Each order line must command its own dates. For a multiple line order, they can all be the same, or they might be different. Either way is OK. Each date must be its own independent data element associated with the order line. The current date is not typed over top of the promise date. No way! Each date is separate. The issue to overcome here is making sure that your ERP system can accommodate all of the dates. Unfortunately, many/most cannot. Fortunately, inserting user-defined data elements at the order line level is quite often a way to accomplish housing all of the dates. It is a challenge that you must deal with unwaveringly.

If you decide to use the five dates (and I hope you do), chances are good that you will have to change some of your order entry practices. When you investigate it, your customer service people may/will tell you that "we don't use all of those dates", or "we never record what the customer wants", or "we've never used that date in the system", or … or … You get the idea. So get ready to make some order entry practice changes. And quite possibly make some system changes by either redefining how you use dates, and/or adding user defined data elements for capturing dates.

Another pet-peeve of mine is the names that the ERP system uses for dates. Many times the exact same date data element is called different things on different screens and reports. For example, the "promise date" on one screen might be called the "commit date" on an open order report. Same piece of data, but with two names. Confusing. And it drives me nuts! It should you, too. So my advice is that after you get the five dates defined, go through all of your screens, reports, forms, and formats and standardize the data language. Then teach the language to everyone!

OK … that is a summary of customer order date definitions. In actual practice, there are a few more dates that may come into play: the on-dock dates (previously mentioned), change dates, transit times (the difference between off-dock and on-dock, and cancel dates. But we're not going to get into those in this paper. So let's move on to date management.

Date Management

The art of date management means that dates must always be valid. They must be real. First, there must be rules and understanding of the conditions that allow a date to be changed and when a date must be changed. Second there must be a methodology for maintaining current date validity. First, let's examine the rules.

Order Date: Once the order is entered, this date never changes. Done.

Request Date: This date only changes when the customer drives the change. And it must be changed whenever the customer asks for a change no matter how unrealistic the request. Face it … it's what they want.

Promise Date: This date only changes when we re-promise based on a customer driven request. Not our problems! For example, if we had a parts problem and called the customer to see if it was OK to ship a week later and they said OK, this is NOT a re-promised date! That's cheating! But if they said "can you ship a week sooner?" and we said "OK", then the promise date would be changed to reflect what we said we would do. The customer drove the change.

Current Date: This is the date that must always be current and valid. For example, if the current date says November 16th and today is November 17th, the date is not valid. I can't ship anything on November 16th … that was yesterday. So the date has changed. It is at least November 17th or some later date. The question is, do you have the courage to formally deal with it or not? By that I mean, are you willing to get into the ERP system and make dates valid on a daily basis? Quite frankly, many businesses don't have the stomach for this … and they are the low performers. The high performers take this on and deal with it. In fact, the really good ones say "if we do a good job making promises and hitting the dates, we'll never have many to change"! That's high performance thinking.

Ship Date: This is the date that the product actually ships. Sometimes it is the same as the invoice date. Make sure you have clear definition on this. Enough said.

So let's practice some examples.

#1: Customer wants an improved date. The original order is:

Order Date: October 29th
Request Date: November 16th
Promise Date: November 16th
Current Date: November 16th
Ship Date: Hasn't shipped yet.

Our customer calls on November 3rd and wants us to do better … November 10th. We can't do that, but we agree to November 12th. So the dates now look like this:

Order Date: October 29th
Request Date: November 10th
Promise Date: November 12th
Current Date: November 12th
Ship Date: Hasn't shipped yet.

#2: We have a problem. The original order is:

Order Date: October 29th
Request Date: November 16th
Promise Date: November 16th
Current Date: November 16th
Ship Date: Hasn't shipped yet.

We have a parts problem on November 5th and we call our customer to tell them we can't ship until November 18th. They're not happy, but are glad to find out now instead of November 17th! So the dates now look like this:

Order Date: October 29th
Request Date: November 16th
Promise Date: November 16th
Current Date: November 18th
Ship Date: Hasn't shipped yet.

Notice that the request and promise dates did not change, but the current date changed to reflect our current best estimate of the truth.

#3: Customer wants a delay. The original order is:

Order Date: October 29th
Request Date: November 16th
Promise Date: November 16th
Current Date: November 16th
Ship Date: Hasn't shipped yet.

Customer calls on November 5th and wants the shipment delayed until November 22nd. We agree. We're not happy, but are glad to accommodate the customer. So the dates now look like this:

Order Date: October 29th
Request Date: November 22nd
Promise Date: November 22nd
Current Date: November 22nd
Ship Date: Hasn't shipped yet.

We could do many more scenarios, and you could invent many yourself. But are you getting the idea? Keep in mind, it is tempting to "cheat". For example, we talked the customer into taking it on November 18th when they really wanted it on November 16th, so we'll enter November 18th as the request date. NO! That's cheating! Another example is having an internal issue and having the customer agree to take a later shipment, so we change the promise date. NO! That's cheating! People in all aspects of the organization must learn to play fair. Remember, the object of the game is improve using the facts … not number tweaking so we look good!

Now let's examine a method for helping maintain valid current dates. Remember, any current date that is earlier than today is invalid. You can't ship something yesterday. So here are some practices that help facilitate current date validity.

First, make sure that a person, usually a customer service or order entry person, is accountable for each order. At the time of order entry, this person's name (or ID) should be recorded in the ERP system as the person who entered/owns the order. By having systemic ownership, the data can be mined in a way that each person can have a listing or "their orders" … no one else's.

Second, have a report written (you may have it already) that lists each order line in ascending current date sequence by customer service person. Not in customer sequence. Not in part number sequence. Order lines in CURRENT DATE sequence. One row per order line. On the row you may want to have the customer, part number quantity, order date, request date, promise date, and other information. But make sure you have the CURRENT date. Each day, have each customer service person print (or view on screen) this list of open orders. The oldest order line will be at the top. The drill is to figure out when the order lines with current dates older than today will ship. At first, this may appear to be an overwhelming impossible task, but have courage. The high performers get through it. The details of how to deal with this is a topic for another day. Big discussion. But you can get started. Establish the accountability and get the report that I described in a fit-for-use condition. Then we'll deal with it.

Metric Definition and Math

Now that we understand date definitions and date management, we can more easily deal with the metric and the math.

In a high performance business, anytime someone asks "what is our on-time shipment performance", there should ALWAYS be three answers. Not one answer … three. The three answers are in response to the following three questions that all companies should know:

- What portion of the time do we do what the customer wants (request)?
- What portion of the time do we do what we said we would do (promise)?
- Are our current dates valid (current)?

You can see how the date definitions match up with the questions. The performance metric simply compares the ship date to the request, promise, and current dates to see how we did.

For example:

Order Date: October 29th
Request Date: November 16th
Promise Date: November 18th
Current Date: November 18th
Ship Date: November 18th

Did we do what the customer wanted? No. November 18th is later than November 16th.
Did we do what we said we would do? Yes! November 18th matches November 18th.
Are our current dates valid? Yes! Again, the November 18th matches.

Another example:

Order Date: October 29th
Request Date: November 16th
Promise Date: November 18th
Current Date: November 22nd
Ship Date: November 22nd

Did we do what the customer wanted? No. November 22nd is later than November 16th.
Did we do what we said we would do? No. November 22nd is later than November 18th.
Are our current dates valid? Yes! November 22nd current and ship match.

Get the idea? Remember, always three answers.

Now let's dig into the math. There are two schools of thought on the basis for the math.

1. On-time shipments are based on what should have been shipped in a date range vs. how much was shipped on time.
2. On-time shipments are based on what was actually shipped in a date range vs. how much of that was on time.

Most people agree that the easier (and equally valid) way to do it is #2. Reason is that when mining the data, you can go into the shipment transaction history and retrieve the data. It is much more difficult to deal with part of the data being what should have shipped. So I'm going to show the math based on what actually did ship.

There are three steps to this:

- First, select the population of order lines in the desired date range. The following chart shows a selection of five order lines. In actual practice, for a month you may have thousands of order lines, but this example will show you how to do it.

Step 1

Order No.	Line	Shipped	Ordered	Request	Promise	Current	Actual
1001	1	500	500	5-Aug	5-Aug	5-Aug	5-Aug
1010	2	850	900	2-Aug	5-Aug	5-Aug	5-Aug
1200	4	2,945	3,000	29-Jul	5-Aug	5-Aug	5-Aug
1500	3	600	600	30-Jul	3-Aug	5-Aug	5-Aug
1600	2	450	500	5-Aug	5-Aug	5-Aug	5-Aug

- Second, determine on a yes/no (Y/N) basis is the shipment was made by the specified date. Compare the actual date to the request, promise, and current. There are some details to work out here regarding partials. Let's say that 900 out of 1,000 pieces of an order line were shipped on the promised date. Is the performance 0% (because the order line was not complete), or is it 90% (because we got 900/1,000)? Either can be right, but you've got to decide. I'm going with the 90%. Next question are you going to base it on units (pieces) or dollars? Or both? Or equivalent units? More discussion for another day. For this discussion, I'm going to use units.

Step 2

Order No.	Line	Shipped	Ordered	Request	Promise	Current
1001	1	500	500	Y	Y	Y
1010	2	850	900	N	Y	Y
1200	4	2,945	3,000	N	Y	Y
1500	3	600	600	N	N	Y
1600	2	450	500	Y	Y	Y

Notice that if any quantity of any order line was shipped, I gave it a "yes". The quantity was not shipped will show up as bad performance when it actually does ship on a future date.

- Third, add the totals based on the order date (step 1) and the yes/no analysis (step 2).

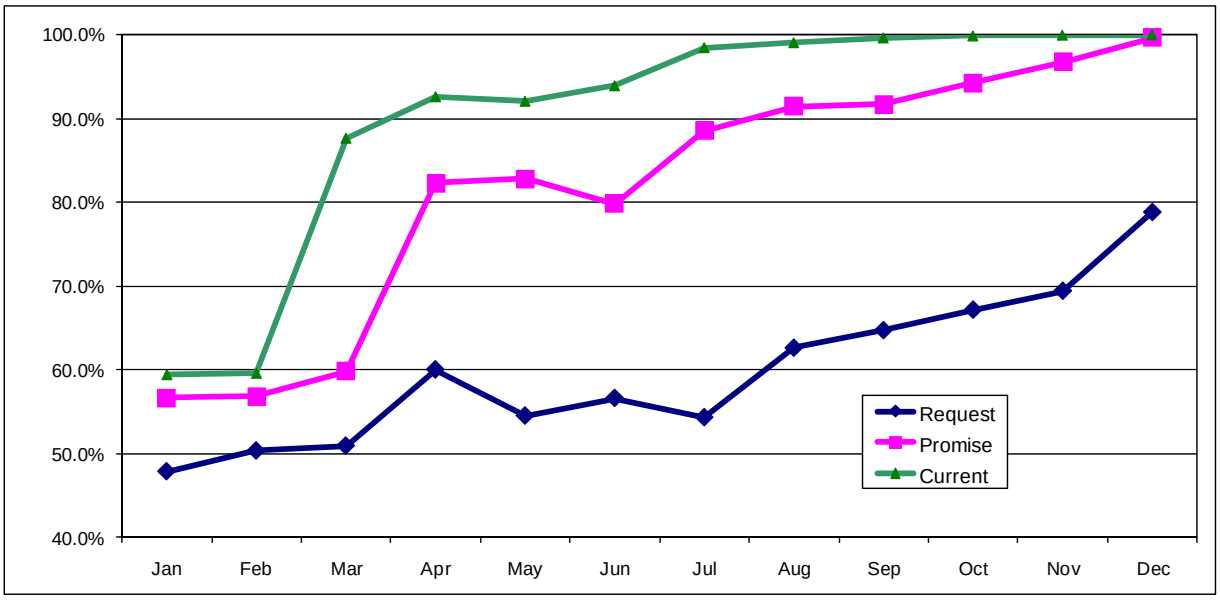
Step 3

Order No.	Line	Shipped	Ordered	Request	Promise	Current
1001	1	500	500	500	500	500
1010	2	850	900	0	850	850
1200	4	2,945	3,000	0	2,945	2,945
1500	3	600	600	0	0	600
1600	2	450	500	450	450	450
		5,345	5,500	950	4,745	5,345
		Shipment Performance		18%	89%	100%

So for this time period, we shipped 5,345 units. 950 hit the request date (18%), 4,745 hit the promise date (89%), and all hit the current date (100%). Remember, three answers to the question!

There … it's that easy. You have the on-time shipment performance metrics. And it was all enabled by: first, understanding the date definitions; second, understanding date management; and third, knowing how to do the math.

Most of the time, companies like to track their on-time shipment performance on a chart every month. Here is one format along with the supporting data that shows how to do it:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Request	47.8%	50.3%	50.9%	60.0%	54.5%	56.6%	54.3%	62.6%	64.7%	67.2%	69.4%	78.9%
Promise	56.6%	56.8%	59.8%	82.3%	82.8%	79.9%	88.6%	91.4%	91.7%	94.3%	96.8%	99.6%
Current	59.4%	59.5%	87.6%	92.6%	92.1%	93.9%	98.5%	99.1%	99.6%	99.9%	100.0%	100.0%
Total Units	7,243	7,399	7,823	6,834	7,367	7,584	7,210	7,190	7,231	7,600	7,532	7,013
Request	3,465	3,723	3,982	4,102	4,015	4,293	3,915	4,502	4,680	5,105	5,230	5,530
Promise	4,102	4,203	4,678	5,623	6,103	6,056	6,387	6,574	6,632	7,167	7,290	6,987
Current	4,300	4,405	6,856	6,329	6,782	7,123	7,100	7,123	7,205	7,591	7,530	7,013

Summary

So take these principles to your management team and get started. But have courage. Quite likely you will be dealing with:

- Order entry practices.
- System data elements.
- New performance metric methodology.
- Different math and reports.
- A way to do things that is different than today's way! But that's probably a good thing.

I wish you the best on your journey!

J. E. Boyer Company works with company executive teams, boards, managers, and operational experts from discrete hard goods manufacturing industries to achieve profitable growth and improved return on investment. We work on-site by your side at your company. We do classroom training, one-on-one coaching, and project work … individually or as part of a team. We work at all levels of the organization from the boardroom to the stockroom! Since 1984, clients from a wide variety of industries have improved their operations in terms of cost management, on-time shipments, inventory investment, people development, operational speed, and overall business performance.

More information is available at: www.jeboyer.com

Please direct your comments and questions to:

John E. Boyer, Jr., President
J. E. Boyer Company, Inc.
3347 North 900 East
North Ogden, Utah 84414
Phone: (801) 721-5284
Fax: (801) 737-0799
e-mail: jeb@jeboyer.com