THREE USE CASES
FOR BIG DATA IN THE SUPPLY CHAIN

Executive summary

It seems these days that you can’t power up your phone or start your browser without seeing “big data”—the ever-growing, increasingly detailed and incredibly splintered mountain of information being collected every minute of every day. From GPS tracking to buying habits, there’s much to learn about customers, employees, partners and more.

With the sheer volume of information available, it’s very easy to get overwhelmed or “lost” in the data. So, how can you utilize massive amounts of data and find only the most important, relevant information?

Part of the answer already exists within your organization: your processes.

By leveraging your processes as a guide, you can determine the data that’s most important to your business, and use it to increase the efficiency of your supply chain planning, collaboration and execution. However, while processes are a very useful guide, they’re just the beginning. Examining massive quantities of data and discerning what’s important and what isn’t requires the aid of advanced analytical tools.

What big data is … and what it isn’t

Every day, millions of orders are placed, places are liked, reviews are written, photos are geo-tagged, sensors are digitizing previously unobtainable information, weather events are tracked, and transportation asset positions are provided. Retail giant Wal-Mart®, for example, handles over 1 million customer transactions every hour, feeding databases estimated at more than 2.5 petabytes—that’s the equivalent of 167 times the books in America’s Library of Congress.¹ Facebook, the leading social-networking website, is home to 40 billion photos.² And decoding the human genome involves analyzing 3 billion base pairs—which took 10 years the first time it was done in 2003 but now be achieved in one week.³

The amount of data that is created and that can be consumed is almost limitless. And it’s valuable information—if you know what to do with it. That’s big data for you. Simply put, big data is the ability to consume, manipulate and understand massive quantities and multiple types of data.
How much data? Literally more than the human mind can conceptualize or analyze. And more than what on-hand database management tools can handle. And that’s no exaggeration. Combing through these mountains of information requires the usage of advanced algorithms or advanced analytical tools, such as the Apama Streaming Analytics Platform specifically designed to tackle big data.

Big data potentially gives you the power to identify simple and complex issues in real time.

Properly utilized, big data can give businesses real-time insight they can use to make critical business decisions, see inconsistencies before they become problems and increase efficiency at every step of their processes. This includes previously unfathomable methods of supply chain planning, procurement, supply chain fraud detection, partner collaboration and end-to-end supply chain execution.

What big data isn’t? Running multiple reports out of multiple data sources for spreadsheet analysis. It’s simply too much. Too many data sources. Too many fields. Too much time. So much, in fact, that without dedicated resources or the types of advanced tools mentioned above, many enterprises miss out on the benefits of big data. And in the long run, that can be a huge misstep.

Point is, the amount of data isn’t shrinking any time soon. It’s not a matter of if you get on board with big data, but when. And most importantly, if you’re faster than your peers to leverage and capitalize on it.

So what does that mean in the real world?

By utilizing big data, companies can better analyze millions of orders around the globe to identify the at-risk orders, or those that are from first orders with large quantities and short lead times for a large, long-pursued prospect. In-memory big data allows for these issues to be addressed in sub-second response times by determining which transactions can be cost effectively managed and which cannot be resolved at any cost.

For any business that lives and dies by its supply chain, that’s not just big. It’s huge.

What big data can do for your supply chain

The kind of information big data brings to the table can have a profound impact on supply chain management, particularly in the areas of supply chain planning, procurement, collaboration and end-to-end execution.

Supply chain planning

Imagine taking years’ worth of production, supply, weather, order and shipping information and being able to understand not only the correlation of these issues but also the context of why and how decisions were made. Then imagine utilizing that data with the desired business plan to accurately plot multiple scenarios and backup plans for this year’s holiday rush. Big data allows for massive amount of data to be used, taking into account an unheard amount of performance variables and the ability to leverage more complicated “what-if” scenarios for advanced network optimization.

Procurement

Imagine a world where data—pure information—could make procurement more efficient. With big data, organizations can base procurement decisions on more factors, enabling them to make better informed decisions that ultimately impact the bottom line. That world is here. Purchasing decisions no longer have to be made solely upon production requirements but a combination of multiple inputs including:

- Planned production
- Forecasted customer orders
- Available supplier capacity
- Currency fluctuations
- Contract rate increases
- The impending likelihood of disruptive events
- Available raw material storage capacity
Three Use Cases for Big Data in the Supply Chain

The current level of net working capital (NWC) and the impact of increased purchases on the firm’s NWC levels

The end result is a lower amount of networking capital outlay to support raw material purchases and more efficient buying methodologies.

**End-to-end supply chain execution**

With more data, you have a sharper picture of the factors that impact your global supply chain and a more precise idea of what that impact could be. You can feed your analysis with better input, giving you more meaningful output. Big data gives your organization the ability to seamlessly combine and correlate multiple data sources to ensure end-to-end supply chain execution is completed as efficiently and as effectively as possible. These data sources include:

- Data from enterprise-owned Commercial Off-The-Shelf (COTS) apps, hosted or cloud-based
- Supplier provided data from EDI feeds to flat files to Web portal entries
- Telematic data feeds (e.g., GPS, temp control monitors, transportation geo-data)
- Weather, financial or other event streams

By combining multiple data streams with other big data-related technology, such as geofencing, a holistic picture of a complete supply chain is obtained. Adding advanced analytical engines and sophisticated real-time visualization tools determines where the most important exceptions are that require action and the most effective and efficient way to manage them. The result is a holistic understanding of what is happening in an end-to-end supply chain and the ability to not only identify and manage exceptions but to be able to predict when exceptions will occur. This is a critical step to not only being agile but being resilient and ensuring customer satisfaction and costs are not impacted when faced with unexpected exceptions, disturbances or interruptions.

**Machine-to-machine monitoring for predictive maintenance & better production quality**

Manufacturing is a critical component of a company’s end-to-end supply chain. Thousands of production sensors provide vast quantities of data at subsecond speeds for analysis. Big data and advanced analytics ensure this vast amount of data is utilized to monitor production processes and identify when maintenance is required and when to take action before the production quality is negatively affected. While quality testing is important, big data provides the ability to ensure QA tests are confirmations of high product quality and not used to catch errors or product quality issues.

This is especially important for aging manufacturing equipment that is outfitted with new sensors to monitor production. A study completed in 2010 by ARC Advisory group found that over 90 percent of process manufacturers acknowledged the use of automation beyond the manufacturer’s obsolescence date. While extending the life cycles of this equipment is vitally important, it is just as important to meet product quality requirements at the lowest possible cost. Leveraging sensor data and advanced analytics with subsecond analysis enables the continued use of older equipment while meeting product quality and production cost requirements.

These are examples of the result. But let’s step back for a moment. How do you get here? How does it all work? How, even with tools in place, can you begin to get to the data that is most critical for your business? Look no further than your own processes.

**Finding the nuggets: using process to filter data**

There’s big data. And then there’s how your business works. The insight, power and results you want come from looking at both in tandem. With the massive amount of data collected, correlated and analyzed, it can be very easy to become overwhelmed—“lost” in the data. Process serves as a guide to understand how different portions of data affect the outcome of a process—in this case, the operation of your supply chain.

Another real-world example: 10,000 transportation assets around the world are delivering products to you or from you at any one time. Data on speed, route compliance, estimated time of arrival and compliance to the customer-requested delivery date are all being tracked in real-time. So, what assets need to have action taken because they are going to fail/not show up on time, and how do you know this?
More importantly, how can you identify which transactions are at risk as early as possible in the process to avoid costly problems like expedited shipments and high inventory levels to compensate for performance failures and decreasing customer satisfaction?

**Understanding each event as a segment of an overall end-to-end process helps guide what data is valuable and what an appropriate response should be to any identified issues.**

In this case, the enterprise understands the exact length of time it takes to obtain product that is “on the water.” Convert it to salable inventory and move it to a specific customer while having a general idea of what the expected pitfalls will be along the way. So when a massively large order is placed with an “emergency status” lead time, the organization understands what inbound product can be utilized to build this order. It can also help determine if it is feasible to even deliver against the customer request or if it is not, the option of trying to reschedule the order can be taken rather than spending an inordinate amount of time and resources, only to fail.

As a business, you should have known you were going to fail by understanding, from a process perspective, if there wasn’t any possible way to comply with this customer request.

In simplest terms, knowing how your business works (even with large inventories of cheese and sauce, you can’t start or deliver the pizza until the dough is made) will determine what data is most important to succeeding (how long it takes to have flour delivered, how much flour is needed, etc.). The seemingly impossible mountain of data becomes much more manageable once you know what you’re looking for.

**Summary**

At every link of the supply chain, information is power. And big data offers today’s businesses more information than ever. However, with the vast amount of data that was previously unobtainable, organizations can lose focus on their objectives or easily suffer from analysis paralysis.

**Understanding your processes will make it easier to filter down to the data you need.**

The challenge is selecting where to begin and assessing how that will positively impact customers, partners, revenue and profitability—then recognizing your data gap. This will help in selecting a big data solution that helps your business, not bury you in information.

With an understanding of process and the data you need to make smarter decisions, you can transform big data from a behemoth to a big advantage.

**Software AG can help**

For more than 40 years, Software AG has been inventing new and better ways to help organizations achieve business results faster. In fact, Software AG offers the world’s first Digital Business Platform, an integrated set of technologies and tools to manage a digital transformation and implement new business designs. We can transform your company so business and IT are aligned around common, achievable business goals—like smarter transactions with your business partners.

To learn more about the Digital Business Platform and our capabilities to manage your supply chain and big, fast-moving data, visit [http://www.softwareag.com/](http://www.softwareag.com/)