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USING AI FOR ANOMALY DETECTION TO IMPROVE YOUR SUPPLY CHAIN TRANSACTION PERFORMANCE

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Supply Chain organizations are under constant pressure to improve their performance while reducing their process costs — particularly in the area of transaction management, standardization, automation, and analysis. The volume and variety of data from upstream supply chain transactions alone require enhanced processing capabilities to keep pace with the flow of data in a timely manner. This report examines the capabilities Best-in-Class companies have in place to address these challenges and explores the benefits of using AI for anomaly detection.

Introduction

All companies are being forced to accelerate their business processes, which puts tremendous pressure on transaction-driven functions. Managing the upstream supply chain procure-to-pay (P2P) transaction volume is one of those areas.

The upstream complexity involves suppliers, the suppliers' suppliers, logistics providers, carriers, cargo, ports, 3PLs, and any agency involved in the supply and movement of goods and services. Monitoring the flow of goods and tracking the costs are critical to understanding the "cost-to-serve" for supply chain practitioners. Keeping up with the transaction flow is a necessity, but when all the effort is focused entirely on processing, the time left for problem solving and analysis is limited. Artificial intelligence (AI) is now being used today to find anomalies across the upstream transaction flow and get to the root cause quickly.

Top Challenges in Managing Supply Transactions

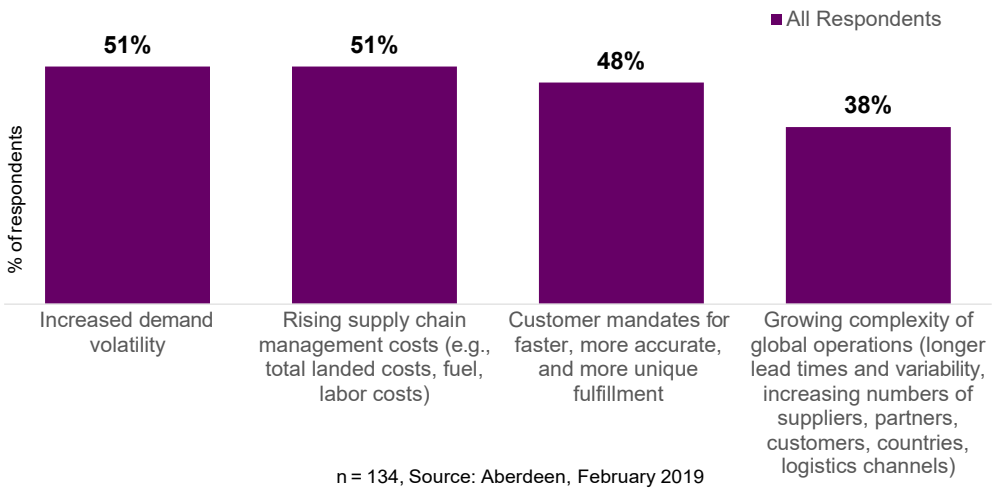
To set the stage, we first looked at the business pressures facing supply chain leaders (see Figure 1, next page). Volatility generates a lot of movement and correction in supply chains and manufacturing / service organizations. These corrections result in a lot of expediting manufacturing and supply orders.

Best-in-Class Definition

Based on Performance Metrics

- Best-in-Class — Top 20%
- Industry Average — Middle 50%
- Laggards — Bottom 30%
- All Others — The sum of the Industry Average and Laggards, equal to the Bottom 80%

Figure 1: Supply Chain Business Pressures



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Rising costs put pressure on ensuring accuracy and minimizing the effort to track, analyze and report at all levels. Knowing the true cost-to-serve for supply chain leaders is the basis for many supplier sourcing decisions.

Customer mandates for improved service are the catalyst behind the speed required for all processes and the demand for real-time information. Further complicating the issue is the growing complexity of global supply chains, which has greatly increased transaction flows and the volume and variety of data. These drivers have in turn increased the need for more efficient, timely and automated processing to manage the volume and contain the costs.

Upstream Supply Chain Visibility and AI Capabilities

Having real visibility into what is happening in a supply chain is the baseline expectation. This encompasses all movement of upstream goods from the supplier until receipt. Each handoff and accompanying transaction in the supply flow must be monitored to detect any potential disruption.

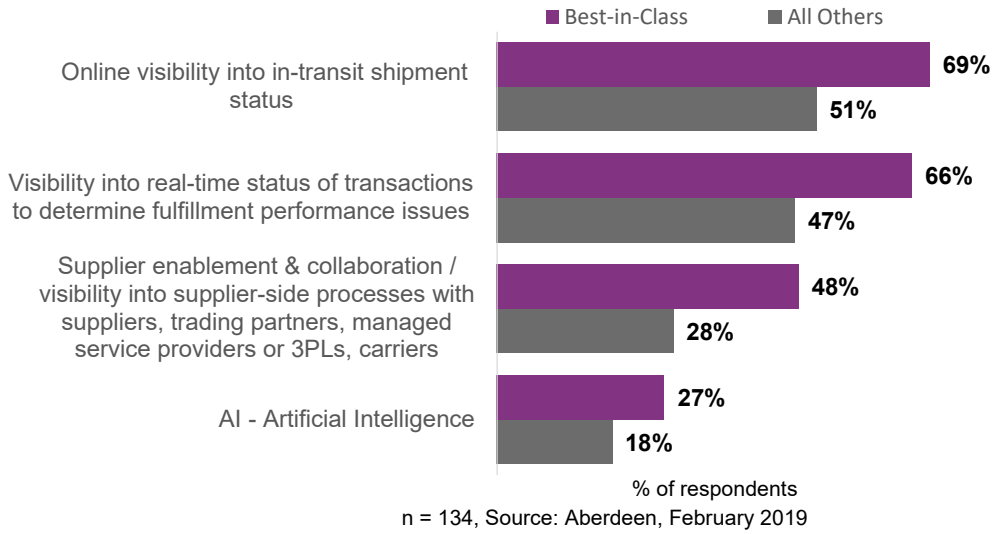
Collaboration and integration with suppliers provides visibility into the supplier's organization and their processes to provide an early warning on any issue. The same holds true for partner organizations on the movement of goods. Having real-time status and visibility in to the associated transactions, keeps the financial impact in sync with the activity, for quick analysis and resolution of any exceptions to the norm.

Best-in-Class Performance

- **Customer service level – on time and complete**
  - Best-in-Class: 93%
  - All Others: 79%
- **Cash-to-cash cycle — days**
  - Best-in-Class: 39
  - All Others: 59
- **Gross margin**
  - Best-in-Class: 35%
  - All Others: 23%
- **Forecast accuracy — product family level**
  - Best-in-Class: 68%
  - All Others: 43%

To further improve exception detection, the use of AI to detect anomalies in these upstream transactions — and get to the root cause — is beginning to show promising results. AI is currently accessible through SaaS deployment options, and the Best-in Class are 50 percent more likely to have adopted AI technology compared to All Others.

Figure 2: Visibility to Upstream Process and Transactions



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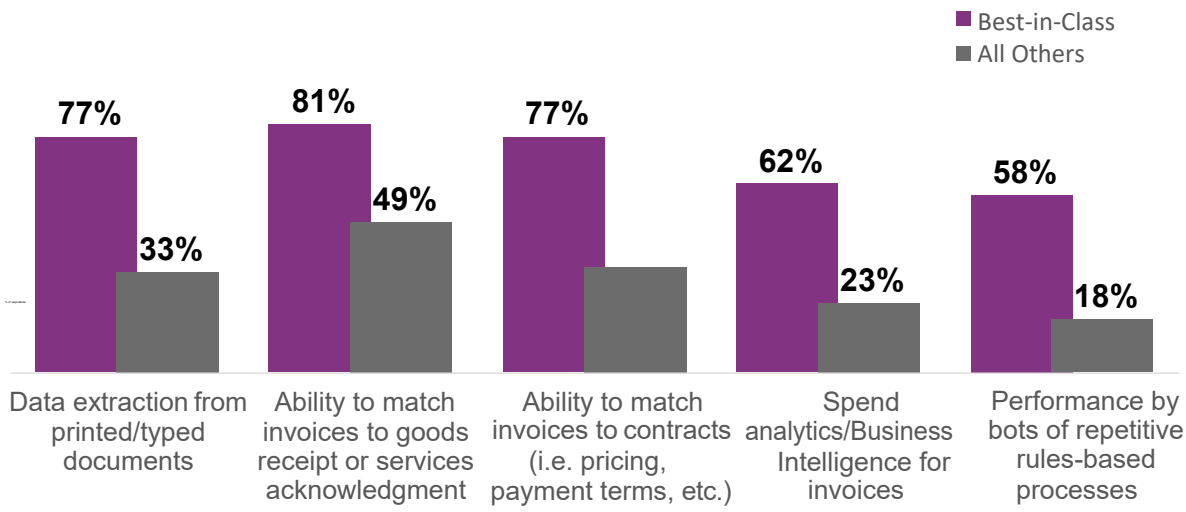
To handle the volume and variety of supplier and supply chain transactions, standardizing and automating are now must-have capabilities to keep pace.

Digital and Automation Transaction Processing Capabilities

Best-in-Class companies are significantly more invested in the technology and processes to streamline their transaction and analytical capabilities, compared to their competition, as shown in Figure 3 (see next page). To handle the volume and variety of supplier and supply chain transactions, standardization and automation are now must-have capabilities to keep pace. Even the automation of fundamental processes, such as matching invoices to receipts of goods and services, stands out as having significantly greater adoption by the Best-in-Class than their competition.

Figure 3: Digital and Automation Capabilities



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Further tying invoices to contracts — to keep their status updated and highlight any exceptions — is also an important need, and from an efficiency perspective, the Best-in-Class are more than three times as likely to adopt bots (robots) in their repetitive processing efforts. All these capabilities reflect processing improvements that Best-in-Class companies have established.

Organizational and Infrastructure Support

With performance results being superior for Best-in-Class companies, understanding how they are organized and what they do differently provides insight into why they are successful, as shown in Figure 4 (next page). For transaction processing, they take a centralized approach to invoice management processes and other workflows where they seek to standardize and leverage best practices.

Automated notifications and exception alerts are in place across the organization, and for supply chain leaders, it is the exception management capability that elevates the focus. Without this ability, managers find themselves in constant review cycles to make sure that the plan is on track.

The use of electronic supplier networks for digital and automation capabilities is another process improvement to transform all workflows into digital processes. To further demonstrate their commitment to success and leave no stone unturned, the Best-in-Class are more than twice as likely to offer incentives to their staff tied to processing speed and accuracy (Figure 4) — improving organizational processes.

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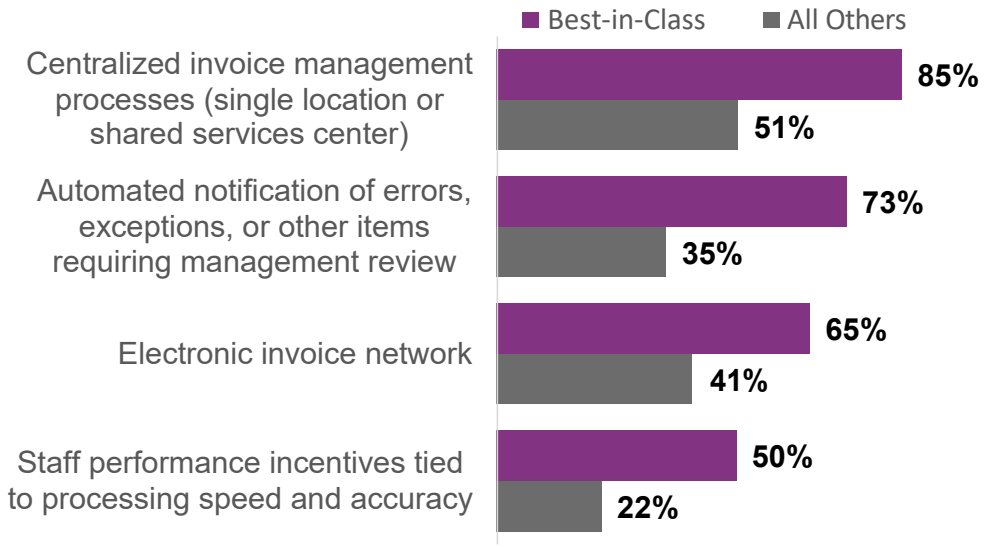
Figure 4: Infrastructure and Support Capabilities



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Business Transaction Intelligence: AI Use Case

Business Transaction Intelligence is one of the use cases for AI that is delivering real value in the detection and resolution of anomalies for upstream transactions involved around the procure-to-pay process. The following graphic is a good representation of transactions that are involved in a typical procure-to-pay process between purchasing organizations and suppliers:

Each node identifies a transaction point in the process, as well as defining the data set at that specific node to be monitored. The target areas for AI are designed to:

- see patterns and trends over time
- identify partners who contribute to the anomaly
- find date patterns and / or event-driven occurrences.

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The way AI would find these anomalies would be through:

- velocity (document quality over time)
- volume (size of document)
- value (currency value inside the document).

Table 1: Business Transaction Intelligence Use Case Examples

Business Transaction Intelligence Use Cases	
Finding Missing Orders or Order Changes	• Customers send purchase orders that the order team can't find in the enterprise resource planning system (ERP), so they never get filled • Customers send purchase order cancellations that never get applied to existing orders, so the Distribution Center (DC) ends up shipping orders that are already cancelled
Tracking Missing or Rejected ASNs	• Customers receive a physical shipment from the carrier, but have no corresponding advance shipping notice (ASN) in their system • With no electronic ASN, the customer is forced to enter the shipment manually into their system, resulting in chargebacks
Analyzing Rejected Invoices	• Customers reject invoices that are out of balance • This usually happens when the sales team adds new pricing conditions (promotional discounts) into the ERP, without adding the codes to the electronic data interchange (EDI) maps as well.

Table 1 provides some insight into the types of issues that are encountered and why it's worth resolving these problems. There's no doubt that AI is delivering value in terms of rapid issue resolution. A quote from an AI adopter identifies and summarizes the value of AI very well:

"Once you start using the tool, it's something you can't live without. Watson has helped us unlock insights from our supply chain data to transform how we serve our customers."

– Mylene Ortiz, Senior IT BPSA – Supply Chain, Petco

Summary

Supply chain leaders are under constant pressure to reduce costs and increase efficiency across all of their processes, particularly those related to supplier and logistics management for the upstream supply chain. Best-in-Class companies have invested in capabilities to improve their visibility into these processes, as well as automating them and using bots for even greater speed and efficiency.

The Best-in-Class are significantly higher in their adoption of data management process capabilities — in many cases more than double that of their competition, which is reflected in their superior performance metrics. They are also over 60 percent more likely to invest in a centralized approach for standard processes, supplier networks, and the establishment of an automated exception management process, as well as incentives for performance. They are serious and committed to really streamlining their P2P processes, and have now included the use of AI in their repertoire to further detect anomalies in their data, and resolve them quickly. AI is being used today to deliver real value, which is why the Best-in-Class companies are 50 percent more likely to invest in AI capabilities. As the use case example indicates, AI is becoming a welcome companion to anomaly detection across the supplier and logistics transaction landscape.

Aberdeen recommends that all companies follow the example set by the Best-in-Class to improve their time, efficiency and costs related to supplier and logistics transactions, as well as adopting AI for anomaly detection across these processes for enhanced performance.

About Aberdeen Group

Since 1988, Aberdeen Group has published research that helps businesses worldwide to improve their performance. Our analysts derive fact-based, vendor-neutral insights from a proprietary analytical framework, which identifies Best-in-Class organizations from primary research conducted with industry practitioners. The resulting research content is used by hundreds of thousands of business professionals to drive smarter decision-making and improve business strategies. Aberdeen Group is headquartered in Waltham, Massachusetts, USA.

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