

Facilitating Supply Chain Visibility & Accuracy

An Analysis of ASN Benchmarks and Best Practices



2011 Report



Developed by

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Sponsored by



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ASN Benchmarks and Best Practices Study

On behalf of Auburn University, VCF and Traverse Systems, we are pleased to present you with the Advanced Shipping Notice (ASN) Benchmarks and Best Practices Study. We believe this report is one of the first of its kind and will provide considerable insight into the daily challenges retailers face in today's dynamic retail supply chain.

Having worked in the retail industry for the past 21 years, I have witnessed firsthand the rapid adoption of the ASN as an EDI trading document between retailer and vendor. The increased visibility into inbound shipments provides retailers with unprecedented benefits including the ability to crossdock merchandise, reduce distribution center payroll costs and improve overall order cycle times. The payoff to the vendor is also substantial. Their merchandise flows through the retail supply chain to the selling floor faster and more accurate and timely invoices create faster payments and faster reorders. Unfortunately, more often than most retailers assume, the merchandise in the carton does not match the electronic data in the ASN. This results in a huge financial and operational impact to both retailer and vendor.

In 2003 we noticed a significant amount of concealed differences between the physical merchandise received and the ASN data at one of our customers. We tested our observations by creating a monthly ASN accuracy review process. The results were shocking. The ASN accuracy for the initial time period was around 93%. Of course, some vendors were perfect, a few were terrible, but many were unacceptable.

Imagine a replenishment vendor with accuracy at the average of 93%. In a blind receiving environment, where a retailer blindly books inventory and pays invoices based on the ASN data, there is an impact to reorders. If the inventory thinks you have merchandise on hand but you don't, then you can never sell the product to automatically reorder it. This not only impacts the retailer but also the vendor. Of course, the inventory accuracy will be corrected when the retailer does a physical inventory. In my experience, this is why so many basic orders are created when the inventory results are posted. How many sales were lost between those inventories?

In difficult economic times it is easy for retailers to cut payroll expenses. Retailers audit less and blindly receive more using the ASN data. Vendors do the same, sometimes decreasing outbound quality audit staff. This is a very dangerous combination. The impact of poor ASN accuracy translates to poor inventory accuracy and directly affects sales to both retailers and vendors. The objective of this report is to bring to light the causes and impacts of ASN inaccuracy on the retail supply chain and hopefully reveal solutions that will either eliminate or reduce the causes of the problems in the future.

On behalf of Auburn University, VCF and **Traverse Systems**, we thank you in advance for your interest in our report. If you have any comments or questions surrounding our findings then please feel free to contact me personally.



Gregory S. Holder
Co-Founder and CEO
Traverse Systems

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Introduction

A disruption-free retail supply chain depends on cross-chain visibility. Supply chain professionals need accurate and timely insight regarding product location, quantity, and availability to make decisions. As a result, information flows have become nearly as important as product flows across retail channels.

This quest for visibility has triggered the continuous development of numerous technologies to handle key data requirements. The opportunity to invest in freight tracking tools, dashboards, and other visibility solutions is almost limitless. Retailers and their suppliers should seek simple, available solutions before succumbing to technology spending.

What is an ASN?

In the retail sector, key visibility information resides in a tool that has been available for nearly 20 years – the advanced shipping notice (ASN).

The Council of Supply Chain Management Professionals defines an ASN as:

Detailed shipment information transmitted to a customer or consignee in advance of delivery, designating the contents (individual products and quantities of each) and nature of the shipment.

Typically, the ASN is sent as an EDI 856 transaction. This electronic version of a printed packing slip tells a buyer how a supplier has packed their items for shipment.

The ASN tells the buyer that the goods have been shipped so that advanced planning can occur. The ASN may also include additional information such as product descriptions, packaging type, markings, carrier information, and configuration of goods within the transportation equipment.

How are ASNs Used?

The visibility created by ASNs allows retailers to operate more efficiently. ASN information can be quickly verified against purchase orders and data can be input directly into the warehouse management system (WMS). This streamlines receiving processes and cuts related costs up to 40%.

Also, ASNs provide awareness of discrepancies between orders and shipments. Having this insight prior to order arrival allows retailers to reallocate inventory among their stores and quickly reorder needed SKUs. This helps to reduce stockout levels and avoid customer service problems.

Challenges to Success

To generate visibility and maximum impact, ASNs must be timely, accessible, and accurate.

Timeliness is a primary concern. Suppliers must transmit ASNs well in advance of delivery. Adequate lead time helps retailers prepare for order arrival. Late ASN arrival or non-transmission creates receiving process bottlenecks. This delays store order fulfillment and supplier payment.

Seamless data transfer can be a challenge. ASNs must be provided in a format that is readable by the retailer's information system. Connectivity problems hinder seamless data transfers and limit cross-chain visibility.

Achieving 100% ASN accuracy is essential but has proven to be elusive for suppliers. The structure of the ASN must conform to the specific information requirements of individual retailers. Also, the data must correctly depict the actual contents of the shipment.

“The ASN is an electronic copy of the packing slip that is provided well in advance of the shipment arrival.”

“Without accuracy, ASNs aren't much good. It's hard to see the value in having bad information ahead of time.”

ASN inaccuracy issues arise when:

- ASN listed items aren't shipped
- Items not on the ASN are shipped
- ASN listed quantities aren't filled
- Transport problems occur such as split shipments and mixed POs
- ASN data is improperly transferred

Overcoming these ASN availability, accessibility, and accuracy challenges is the focal point of our study.

About the Study

A variety of research methods and analytical tools were used to capture relevant information from retail SCM professionals. Key activities included:

- Internet-based survey
- Audience response survey*
- In depth case studies of ASN data
- ASN Accuracy workshop*

More than 100 retail SCM professionals, from a wide array of retailers, were engaged in the research. Their expert insights and ASN-related data are the foundation of this report. We truly appreciate everyone's input.

Table 1 provides a partial list of retailers represented in the study.

Table 1: Study Participants

Academy Sports + Outdoors	Cabela's	Hot Topic	PacSun
American Eagle Outfitters	Costco	JCPenney	Pep Boys
AutoZone	Dick's Sporting Goods	Kohl's	PetSmart
Bob's Stores	Dillard's	Lord and Taylor	Stage Stores
The Bon Ton Stores	DSW Inc.	Meijer	Stein Mart
Burlington Coat Factory	Family Dollar	Michael's Stores	T.J. Maxx
	Genesco	Neiman Marcus	

Current State of ASNs: Survey Results

Given the link between ASNs and retail supply chain success, it is logical to assume that vast research has been conducted on the topic. However, the research team found limited background information other than anecdotal stories and commentaries.

To alleviate this knowledge gap, we conducted surveys of leading U.S. retailers to better understand their ASN requirements, auditing practices, accuracy levels, and outcomes. Traverse Systems and VCF helped develop and distribute the survey.

Survey responses were collected during two phases. An online survey was conducted in August and September, 2010. ASN users and nonusers participated in the survey.

More than 40 executives took part in the online survey. The participants represent a diverse array of retail formats: apparel, specialty, discount, and department stores. The retailers also vary in terms of size and complexity. At one extreme, 20% of the retail executives indicated that their annual business exceeds \$10 billion annually, while 10% estimated their company's annual sales to be less than \$1 billion.

* at the 2011 VCF
Fall Annual Conference

The second survey took place at the VCF Fall Conference on November 8, 2010 in the retailer only session “ASN Accuracy: Benchmarking Your Results.”

A clicker based audience response system was used to capture retail executive insights about ASN benefits, usage levels, key performance indicators, and accomplishments. More than 60 audience members participated in the survey.

The results were shared in real-time during the session and are incorporated into this report.

Supplier Requirements

When asked if their companies require ASNs, 78% of those surveyed responded affirmatively.

Among these users, the majority require ASNs for every order. Others require ASNs for specific shipment types. Figure 1 provides a breakdown of ASN requirements.

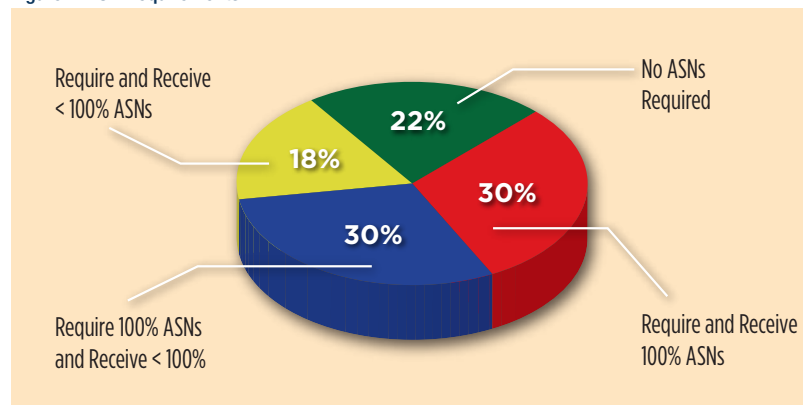
Follow up questions revealed an ASN requirement-compliance gap. Only half of the retailers that require ASNs for all orders actually receive them from all suppliers. On average, 84% of suppliers provide ASNs as required.

Approximately 22% of the companies represented in the study do not require suppliers to provide ASNs. Three primary reasons were cited by the respondents:

- EDI connectivity challenges cause execution problems
- Limited clout with suppliers makes it difficult to gain compliance
- Value proposition is limited

Despite the issues, 90% of nonusers anticipate using ASNs in the future. They are seeking faster flows, more efficient receiving, and better compliance reporting.

Figure 1: ASN Requirements



“To our detriment, we haven’t used ASNs. The goal for this year to get quality ASNs from our vendors.”

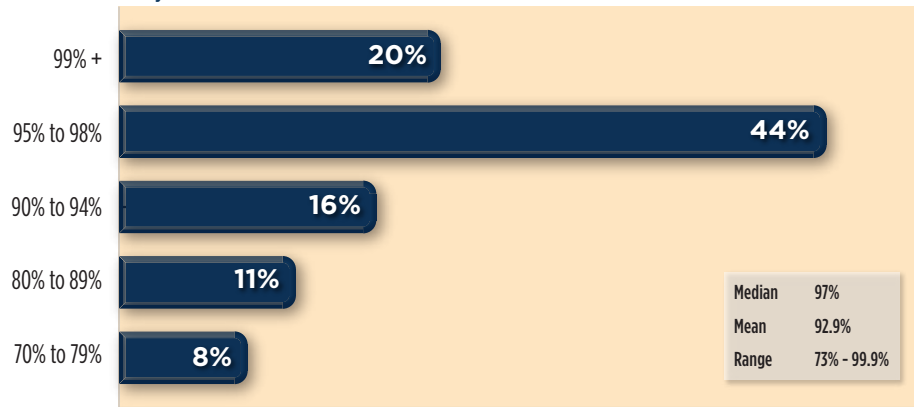
Accuracy Issues

It is not enough to receive ASNs, they must also be accurate. Retailers indicated that ASN accuracy levels are in the 93% to 97% range. Figure 2 provides a breakdown of supplier accuracy as estimated by retailers.

Primary causes of ASN inaccuracies include:

1. ASNs do not conform to the information requirements.
2. ASNs are unreadable by the retailer’s system.
3. The ASN information is not consistent with the shipment.

Figure 2: ASN Accuracy Levels



“60% of the retailers expect ASN accuracy of 99% or higher. Yet, only 20% of the retailers receive this desired level of performance from their suppliers.”

Audit Programs

Among the accuracy issues, shipment errors – quantity shortages, overages, and SKU mismatches – create the most challenges for retailers. To combat the problems, 93% of the participants have established ASN audit programs in which receipts are compared to ASN data.

Audit processes differ by retailer. It is most common to conduct ASN audits at the distribution center. A smaller group conducts audits at retail stores or 3PL facilities.

Audit frequency varies among the participants, ranging from 2% of orders up to 100% of orders. Approximately 37% of the retailers inspect every order. Other popular options include targeting “problem” suppliers and new suppliers for frequent audits.

Many participants conduct detailed audits where carton contents are checked for an entire order. SKUs and quantities are compared to ASNs. Other retailers rely on carton counts versus ASNs. A few retailers conduct product quality inspections.

Despite the process differences, there is widespread agreement regarding accuracy standards. Near perfection is the goal for 60% of the retailers who believe that an error rate greater than 1% is unacceptable. An additional 38% indicated that an error rate greater than 2% is intolerable.

There is a discrepancy between these audit goals and the accuracy levels presented in Figure 2. A clear opportunity exists for retailer and suppliers to close the gap.

Taking the Next Steps

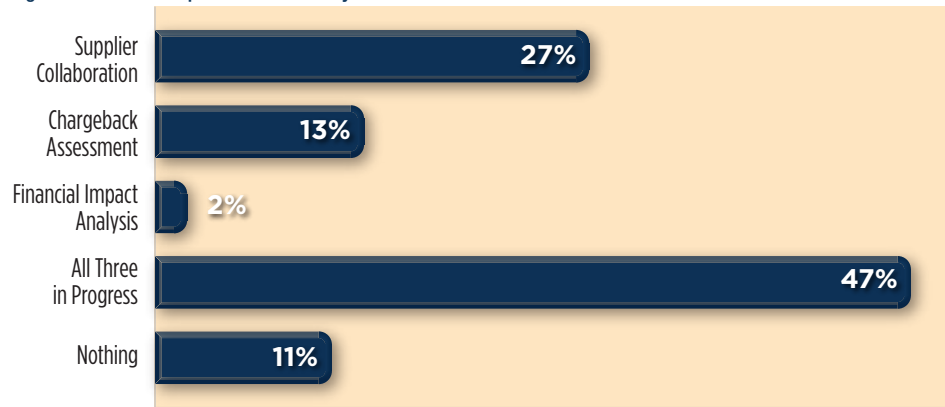
Closing the gap between current performance and the goal of 99% ASN accuracy requires a concentrated retailer effort. They must dig into the data to understand problem sources. Then, it is critical to take appropriate actions to facilitate ASN accuracy improvement.

As indicated earlier, some retailers focus performance improvement initiatives on suppliers with weak ASN track records. Others target newer suppliers or suppliers that ship mixed SKU cases. They are perceived to be the greatest ASN error risks.

Order type is not a primary indicator of ASN errors. Nearly 60% of the retailers believe that ASN accuracy is consistent across order type. Replenishment order and normal order ASNs are perceived to be accurate; though no retailer felt that vendor managed inventory programs generate the most precise ASNs.

Whatever the ASN problem sources may be, retailers must adopt a multi-pronged approach toward improving ASN accuracy. Figure 3 highlights their primary activities.

Figure 3: Efforts to Improve ASN Accuracy



Reaping the Benefits

The uninitiated might view an ASN as an insignificant, low value data transfer but leading retailers know otherwise. ASNs provide visibility of what is and what isn't on its way. This knowledge supports supply chain planning, control, and exception management.

Though ASNs won't solve every fulfillment problem, their availability, accuracy, and proper use set the stage for timely, low cost flows across the retail supply chain. Hence, retailers must regularly audit ASNs and engage suppliers in the drive toward >99% ASN accuracy.

ASN Accuracy Assessment: Case Analysis

Retailers rely on accurate ASNs to facilitate the flow of inventory across their distribution networks. However, our survey findings suggest that ASN inaccuracy is a substantial problem in the retail supply chain. To investigate this further, we analyzed ASN audit data from two large U.S. apparel retailers for a five year period.

In the survey, we found that 93% of retailers have an ASN audit program. The typical profile is that a sample of deliveries is selected at the retailer's DC for review. The entire delivery is then audited against the ASN.

From 2006 to 2010, Retailer A and Retailer B audited over 1.8 million cartons containing nearly \$18 billion retail value of goods.

Table 2 highlights an interesting dilemma. The ASN audits produced an overall accuracy rate of 94.2%. This is lower than the rate indicated by the retail supply chain executives who participated in the survey. Over the timeframe of the ASN audits, Retailer A experienced an ASN accuracy level of 92.6%, while Retailer B experienced a 95.7% ASN accuracy rate.

Table 2: Audit Data 2006-2010

Retailer	Audited Cartons	Retail Value	Accuracy Rate
A	757,595	\$3.29 billion	92.6%
B	1,090,934	\$14.45 billion	95.7%
Total	1,848,529	\$17.74 billion	94.2%

“ASN audits help us identify issues that limit our ability to efficiently process and distribute goods to stores.”

Error Types

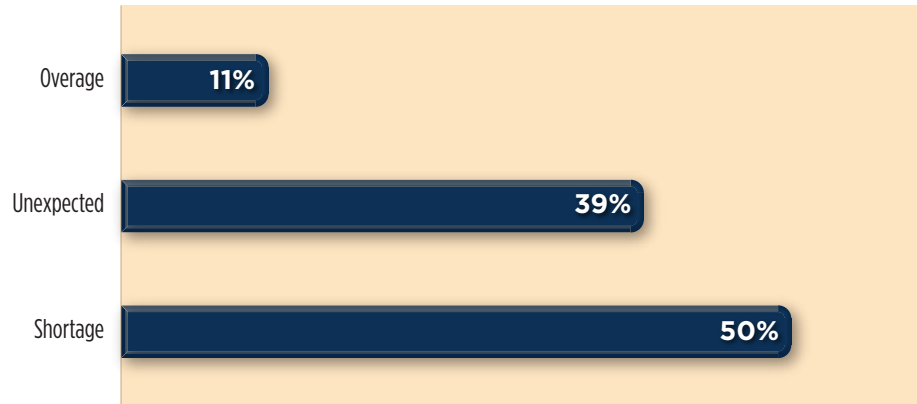
It is also critical to understand the three types of shipment errors that may be found during an ASN audit:

- 1. There is a shortage.** That is, the selected delivery does not contain all cartons or items listed on the ASN.
- 2. There is an overage.** That is, the delivery contains additional cartons of an item listed on the ASN.
- 3. There is an unexpected item.** That is, the delivery contains cartons of an item not listed on the ASN.

As one might expect, the ASN audit results indicate that shortages are the single largest source of error. Half of ASN errors experienced by Retailers A and B are a result of a shortage.

The receipt of unexplained items accounts for 39% of ASN errors. A smaller proportion of the ASN errors result from overages. These error rates are highlighted in Figure 4.

Figure 4: ASN Error Type



Accuracy by Order Type

The ASN audits of Retailer A and B covered various types of orders including normal orders (one time), replenishment orders, vendor managed orders, special orders and other types of orders. Table 3 provides a breakdown of carton audits by order type.

In the survey, we asked retail executives which type of order has the highest ASN accuracy level. The respondents strongly suggested that there is little difference between order types with respect to ASN accuracy.

The ASN audits of Retailers A and B reveal disconnects between perceptions and reality. Overall, we found that orders for vendor managed orders have the highest level of ASN accuracy, followed by replenishment and normal orders. Figure 5 highlights audit accuracy by order type results.

From a day-to-day management standpoint, it appears that normal orders should be the primary concern for retailers. They represent the vast majority of the retailers' volume and lag replenishment order ASN accuracy by more than 5%.

Table 3: Audit Data 2006-2010

Order Type	RF Audit	Audit Cartons	Audit Units
Normal	175,790	1,369,423	17,471,285
Replenishment	125,848	452,497	4,310,929
Vendor Managed	3,711	21,885	843,234
Other	492	4,191	49,374
Special Order	307	533	846

Figure 5: Efforts to Improve ASN Accuracy



Accuracy by Year

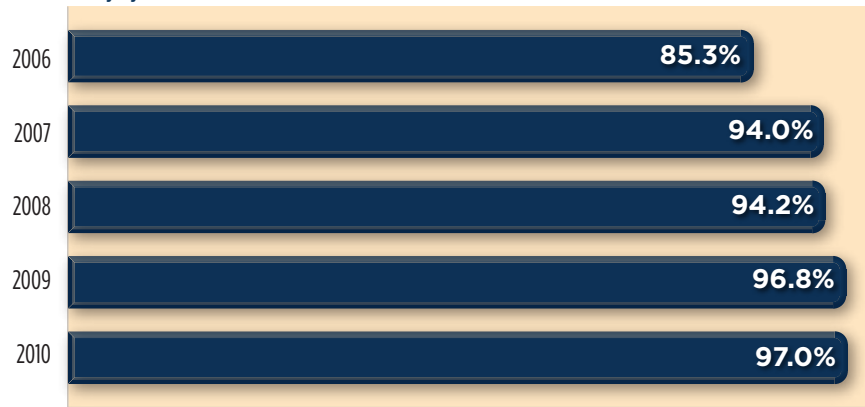
While the level of ASN accuracy for Retailers A and B is lower than what is generally reported by retail executives, there is silver lining in the retailers' audit data.

As reported, the average ASN accuracy rate during the sample period was 94.2%. However, the ASN accuracy level of Retailers A and B steadily improved from 85.3% to 97% as Figure 6 highlights, a jump of almost 12%.

This year-over-year increase in ASN accuracy can likely be attributed to the increased focus of Retailers A and B on their ASN audit programs.

During the period from 2006 to 2010, both retailers made a strategic decision to focus on fully implementing and improving their ASN audit programs. While these retailers are still experiencing significant levels of ASN errors, the improvement in ASN accuracy speaks to the importance of thorough ASN audit programs.

Figure 6: ASN Accuracy by Year



ASN Danger Points: ASN Accuracy Workshop Highlights

The ASN surveys, subsequent discussions with industry experts, and case studies provided a valuable portrait of ASN audit processes and benchmarks for retailers. Still, a greater understanding of why ASN errors occur is needed. This knowledge will help retailers and suppliers identify the root causes of ASN accuracy problems and work toward their elimination.

With this in mind, Traverse Systems executives led a day-long working session at the 2010 VCF Fall Conference where they began the process of mapping the supplier-to-retailer ASN workflow and the danger points where problems are likely to occur. More than 20 individuals representing retailers, suppliers, consultancies, and universities participated in the session led by Traverse Systems.

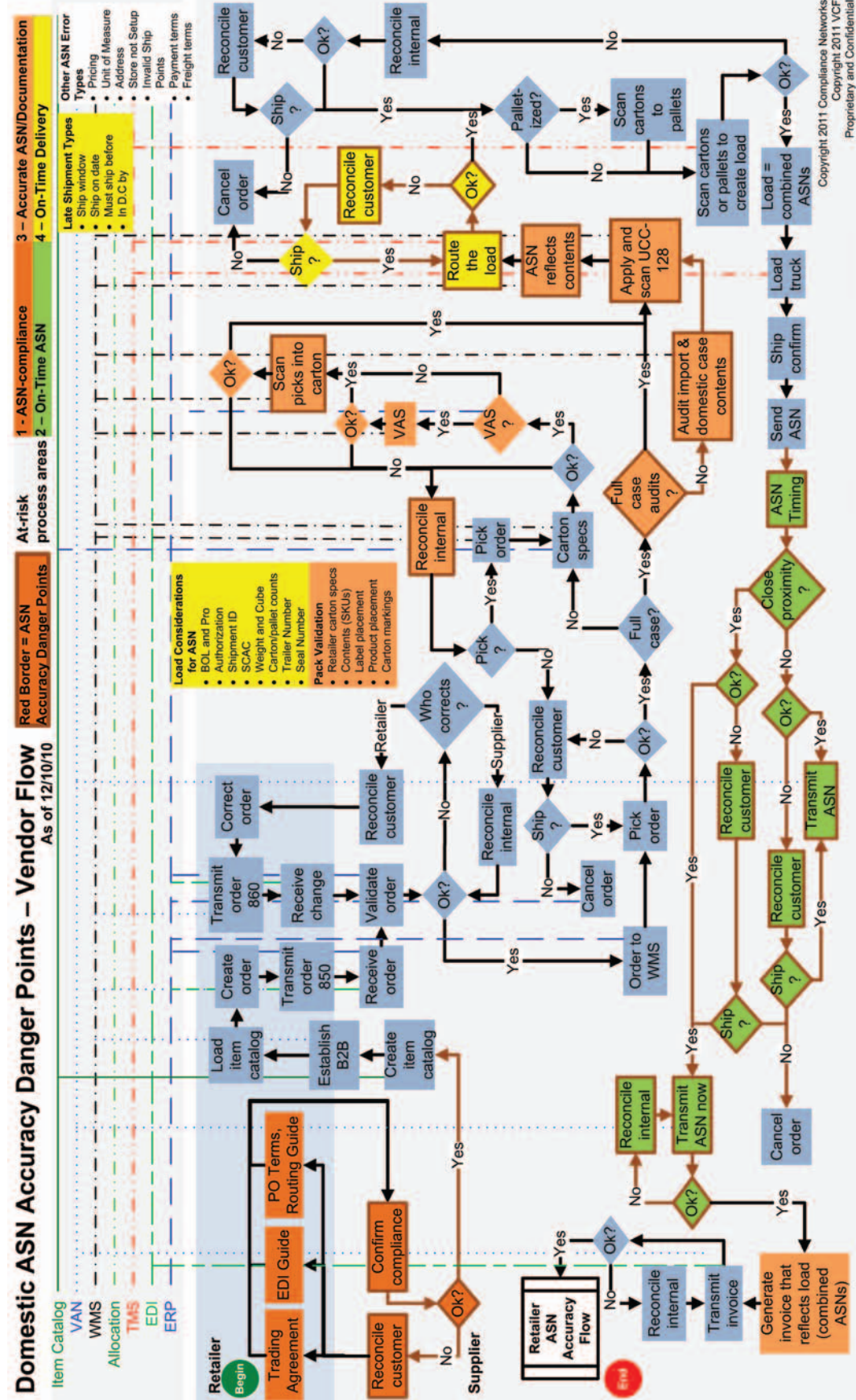
The Supplier ASN Accuracy Workflow presented in Figure 7 is the initial outcome of that effort. It provides great detail regarding domestic ASN workflow processes, participants, and technologies.

Upon its completion, the detailed workflow will serve as a springboard for the development of import ASN workflow and retailer ASN workflow documents.

Collectively, these workflows will enhance our understanding of ASN best practices and communication requirements so that the danger points can be curtailed.

Full details regarding the workflow, development process, and the working group's activities are available from: www.leverageasns.com

Figure 7: ASN Process Flow and Danger



Study Implications

The implications of ASN errors span the entire retail supply chain. ASN errors lead to inaccurate inventory records, which ultimately result in lost sales, markdowns, invoice discrepancies, and extra costs for retailers and suppliers.

However, the effective use of ASNs creates visibility, control, and cost management opportunities for both retailers and suppliers, alike. Through increased visibility and control, retailers and suppliers can maximize revenue opportunities and reduce costs by getting the right product to the shelf at the right time.

Retailer Implications

The case study and survey revealed that ASN accuracy rates for most retailers fall in the 93% to 97% range. On the surface, this seems to be fairly strong level of performance. However, percentages don't tell the complete story of financial impact. So, what are the real world implications?

Consider the 5.8% ASN error rate from the case studies. If a retailer handles one million cases annually, 58,000 cases will be inaccurate relative to the ASN. If the average value of each case is \$100, then \$5.8 million of inventory will be impacted as highlighted in Figure 8.

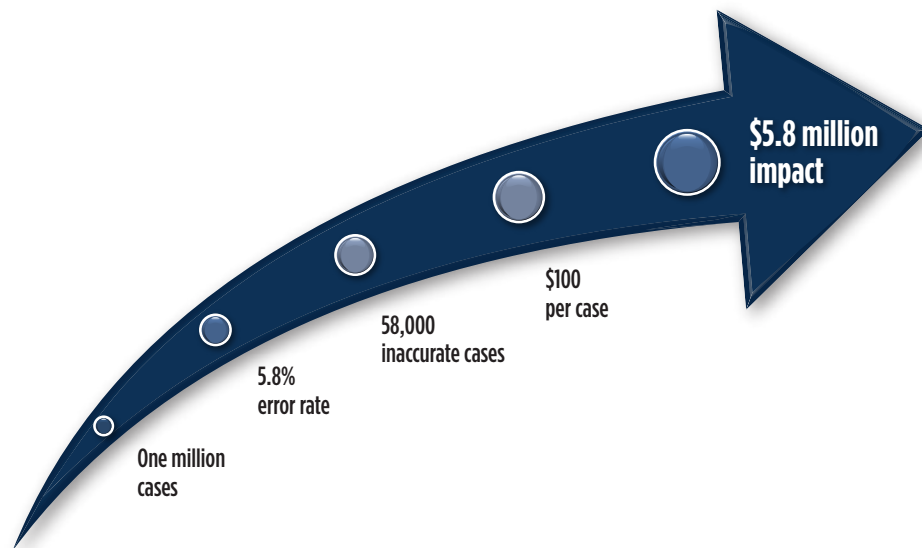
Subsequently, ASN errors have a negative impact on a retailer's inventory record inaccuracy (IRI). If a retailer assumes an ASN to be accurate but there is a shortage, then the retailer's actual inventory will be lower than shown by the WMS inventory records, leading to a host of financial, service, and operational issues.

First, IRI leads to stockouts. The retailer does not recognize the need to replenish its shelves due to "phantom" inventory. Because the inventory is not actually available to fulfill demand, the retail stores will experience lost sales.

Also, a retailer's margins may be reduced due to IRI. Inaccurate inventory records cause shipments to be expedited, increasing the retailer's transportation costs. In some situations, premiums must be paid to purchase small quantities of a product that the retailer thought it already had in inventory.

Finally, IRI may lead to higher overhead costs. The retailer will eventually begin carrying additional safety stock to deal with IRI. Material handling productivity will also be lower due to inefficiencies associated with "phantom" inventory.

Figure 8: Financial Impact of ASN Errors: An Example



While the effects of inaccurate ASNs result in lost sales, lower margin, and higher overhead costs, the effective use of ASNs can have positive effects on a retailer's supply chain.

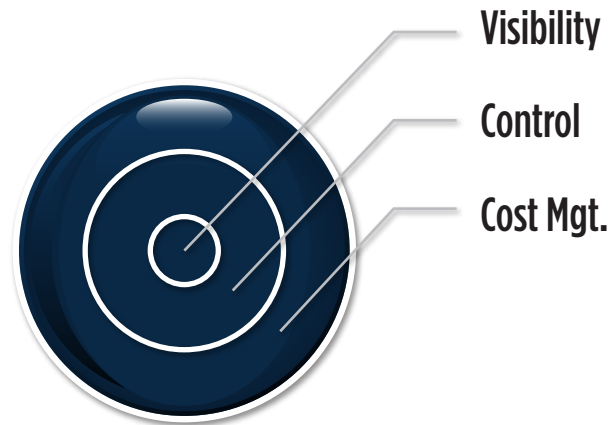
First, the effective use of ASNs creates visibility to incoming shipments. Retailers gain a valuable opportunity to manage the supply chain in a more proactive, knowledgeable fashion.

Next, ASNs create control for the retailer. When exceptions occur, they are known in advance and can be resolved quickly.

Finally, ASNs create cost control opportunities. They allow retailers to schedule resources and balance workloads throughout their distribution networks.

Figure 9 highlights the key benefits of ASN accuracy.

Figure 9: Key Benefits of ASN Accuracy



Supplier Implications

Suppliers are also impacted by ASN errors. Many of the retailer challenges also plague suppliers. When ASN errors occur and are not caught by the retailer, the supplier is also likely to lose sales.

Lost sales lead to lower revenues and profits. However, lost sales also have future implications beyond the present value of lost sales. If a supplier's inventory never makes it to the sales floor, then the supplier loses brand presence with the consumer.

The cost of chargebacks is also another negative implication of ASN errors to suppliers. If ASNs are inaccurate and the shipment appears to be short, then the retailer will charge the supplier for the missing inventory. Suppliers will potentially lose revenue based on the paperwork discrepancy.

There is also a hidden cost to chargebacks. Upon receiving a chargeback, the supplier must investigate whether the claim is legitimate. This leads to a significant cost of maintaining a claims investigation program and often leads to contentious interactions with retailers. Also, special effort and expense may be required to ship the missing or backordered amounts.

Just as a retailer's performance suffers from ASN errors, suppliers similarly suffer additional costs and lost sales. Since retailers and suppliers have a common enemy – inaccurate ASNs – what can be done to improve ASN accuracy?

“Accurate ASNs are critically important because they allow us to plan allocations while the product is moving. We can act as soon as the shipment arrives which takes dwell time out of the supply chain.”

Best Practices

While retailers widely perceive ASNs and audits to be important, only a small group is devoting significant resources and effort to meet accuracy targets. These industry leaders pursue a four-step process for improving supplier performance. The steps include:

- 1. Develop a formal audit process.** Best-in-class retailers develop a specific set of guidelines for their ASN accuracy audits and closely follow the plan. Suppliers are apprised of the process and their performance. In the top programs, every supplier is periodically audited but greater emphasis is placed on new suppliers and known problem products. It's a logical strategy, noted a retail executive who estimated that 20 percent of the SKUs generate 80 percent of his company's costs and losses.
- 2. Quantify the financial impact.** Despite the known level of delivery discrepancies and their impact on the supply chain, very few retailers attempt to quantify the costs of inaccurate ASNs. In contrast, leading edge retailers analyze errors to understand the impact on inventory, operations, and customer service. One retailer focuses on quantifying the cost of shortages, as the problem leads to lost sales occurring during the wait time for a reorder.
- 3. Assess deductions.** The ability to quantify the financial impact provides the data needed to recoup the differences between supplier invoices and actual receipts. Taking corrective action is necessary to protect the financial interests of the retailer and quickly grab a supplier's attention.
- 4. Collaborate with suppliers.** The idea behind ASN accuracy audits is not catching and penalizing poor performers. Rather, the goal is to facilitate smooth flows and the elimination of problems. To achieve these goals, it is necessary to build a two-way dialogue with suppliers. “We track vendor performance and work with them to improve their delivery accuracy,” said a supply chain executive.

Best-in-class retailers are using this four-step audit process to reduce the delays, inaccuracies, and rework caused by inaccurate ASNs. While perfection may never be achieved, limiting these problems benefits the entire organization and its suppliers.

“We are able to identify and address quality issues that affect the ability of the logistics network to efficiently process and distribute goods to our stores,” noted a retail executive.

Conclusion

ASNs can be a very robust source of information for supply chain planning and execution. Historically, they have been viewed as a great tool for warehouse receiving productivity but our research revealed ASNs can do much more.

Cumulatively, the visibility, control and cost management opportunities created by accurate ASNs allow supply chain managers to meet their key targets. They are able to supply the right inventory at lower costs to the retail stores, leading to higher sales.

In this study, we've found that ASNs are a critical cog in the wheel of an effective retail supply. When they are accurate, on-time, and received in proper format, ASNs are the cornerstone of supply chain visibility. Savvy retailers use this visibility to identify exceptions and take corrective action in order to maintain in-stock availability.

The key to success is development of a robust ASN audit program that provides an accurate depiction of ASN accuracy and highlights needed improvements.

Best in class retailers understand the financial impact of ASN errors and collaborate with suppliers to reach accuracy targets. Doing so helps the supply chain operate more efficiently and provide the desired level of customer service.

About the Authors



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Throughout his 17 year academic career, Dr. Gibson has been widely recognized as an innovative supply chain educator. He is widely engaged in corporate training, executive education, and distance learning programs. Dr. Gibson's academic experience is complimented by nine years of retail distribution management experience.

Dr. Gibson has published over 50 SCM articles and serves as project leader for the State of the Retail Supply Chain annual study. He is co-author of the market-leading textbooks *Supply Chain Management: A Logistics Perspective* and *Transportation: A Supply Chain Perspective*.



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Dr. Williams received his Ph.D. in Business Administration with an emphasis in logistics from the University of Arkansas. His research program focuses on retail and consumer product supply chain management, with a particular focus on demand and order forecasting and inventory management. His research appears in several highly respected academic journals. He is actively engaged in executive education with leading global retailers and consumer product manufacturers.



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Notes

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