Beyond freight audit and payment processing

How data refining works and why it adds so much value to the enterprise

Executive summary

This document is for leaders of Supply Chain, Logistics, Transportation, or Finance. It introduces a new way to get more efficiency and enterprise value from the process of receiving, auditing, and paying freight invoices.

In suggesting a different way to think about freight audit and payment (or FA&P) processing, we assume you've partially or fully automated your operation, or you're considering doing so.

Automation of FA&P improves efficiency and reduces operating cost. But beyond delivering initial gains in efficiency, automation often prevents companies from achieving higher enterprise value. This paper identifies the current limitations of automated FA&P and the reasons for them. It then presents an alternative that retains the benefits of automating FA&P while providing much more enterprise value. In addition, the proposed alternative puts you on a path to continuously increasing that value with time.

Whenever you ship or receive goods, the process generates data that documents each activity. For complex freight movements, documentation arrives in a variety of incompatible forms and formats. It comes from many disparate sources, including your own internal systems. To manage those supply chain activities effectively and to pay the related bills, you have to consolidate, coordinate, and reconcile all the data.

How do you bring together all this information? That's a central challenge of managing supply chains.

The complexity and incompatibility of logistics data makes it hard to audit and pay freight bills. Similar data challenges also make it hard to analyze, understand, and improve supply chains.

> **This paper suggests that the critical next step forward is to enhance the quality of supply chain data before it comes into any of your enterprise processes.**

This paper suggests that the critical next step forward is to enhance the quality of supply chain data before it comes into any of your enterprise processes. Not only will you improve the efficiency of your FA&P process but you will vastly improve the total enterprise value you can derive from this data.

This "data first" approach not only results in more accurate and efficient FA&P process, it also provides more and cleaner data for supply chain visibility and analytics. With better supply chain intelligence, you have more actionable insight into your global supply chain operations.

Even better, you can dramatically improve data quality without big IT projects or capex budgets. A new third-party service known as data refining enables companies to improve the quality of logistics and supply chain data at reasonable cost. It can start doing so within months.

Limitations of FA&P

FA&P is a nessecary process, but it provides limited value for buyers of logistics services.

Until recently, managers responsible for FA&P had three main strategies to create more value for their company:

▶ Reduce cost by increasing process efficiency.

▶ Improve the quality of logistics data captured. Higher-quality data increases the accuracy of accruals and cost allocations.

▶ Feed logistics data from FA&P processes into supply chain visibility and analytics systems. Better business intelligence enables supply chain executives to make better decisions about logistics elements of the supply chain.

All three strategies generate value for a time. Yet eventually they all arrive at a dead end.

FA&P processing efficiency gets you only so far

If you seek to improve the efficiency of your company's FA&P processes, further automation may help. Maybe you'll find a service provider who can do as good a job at lower cost per invoice. You may save a few cents or even a few dollars per invoice.

For companies that process hundreds of thousands or millions of invoices a year, the benefit of saving a few dollars or cents per invoice adds up fast. But in a big company, even a seven-figure cost reduction may look relatively small on the income statement. It's barely enough to attract the attention of executives two levels up—unless you miss the goals they've set.

By focusing only on FA&P processing efficiency, you'll eventually reach a point of diminishing returns. You will have squeezed nearly every penny you can out of your processing costs. When no FA&P service provider offers better or cheaper performance than your company already gets, what will you do for encores?

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Low-quality data limits the effectiveness of FA&P processing

All logistics data is inherently hard to work with. It comes from diverse sources and arrives in many formats. As a result, logistics data consumed by FA&P processes is often inaccurate, inconsistent, or incomplete. Data problems cause complications:

▶ **Audit exceptions.** When the automated audit process identifies problems with data, it flags the affected invoices as "exceptions" that require manual processing.

▶ **Unreliable analytics.** The FA&P process does little to improve the quality of data passing through it. The data that comes out of FA&P isn't safe to use for analyses.

▶ **Inaccurate cost allocations.** Cost allocations are only as accurate as the data used to drive the allocation. Incorrect allocations mean that any other processes based on those allocations, such as Cost to Serve, generate misleading "insight."

▶ **Inaccurate expense accruals.** Bad data also drives inaccurate accruals, which compound the problem of inaccurate cost allocations.

Automation improves FA&P efficiency and reduces processing costs. But automation adds new data-related complications:

▶ **It requires document conversion.** Many logistics documents originate on paper. Someone must convert the paper documents to electronic forms so automated processes can recognize the data. The conversion process typically focuses on capturing the minimum data needed to support the audit and payment function. Manual transcription is likely to corrupt this small subset of invoice data.

▶ **Manual exception processing may subvert audit controls.** Organizations with limited staff may take shortcuts to get their exceptions cleared and paid on time. To expedite, they may suspend some audit controls or otherwise clear invoices that haven't been properly audited.

▶ **Processes are not consistent across your company.** In organizations that have grown through acquisition, ERP systems tend to be inconsistent from one business unit to another. In addition, operations in some countries may require different audit and payment processes. The lack of process and data consistency across an enterprise creates the potential to degrade data quality and undermine financial controls and cost accounting policy.

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The case for refined data

FA&P service providers often claim the data they generate improves supply chain visibility and insight. Indeed, the benefits of logistics visibility and analytics are real and substantial. Use of data from the FA&P process is essential to gain supply chain insights. But it's not enough.

Even if data came out of the FA&P process clean—and it doesn't—it's drawn from too narrow and too shallow a segment of data to provide the kind of insight supply chain executives really want. Figure 1 shows that the FA&P processing uses only a small subset of the useful supply chain data companies could benefit from collecting.

> **The FA&P process captures and refines only a narrow and shallow subset of the supply chain data needed to improve visibility, analytics, and business intelligence.**

Figure 1. Freight audit & pay model
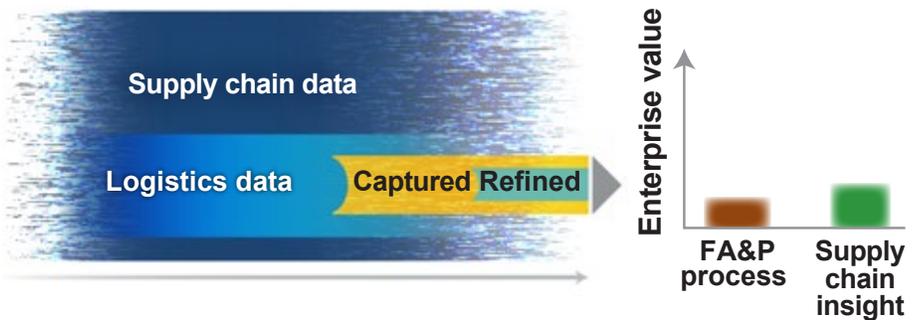
In addition, poor data quality often stands in the way of achieving trustworthy insights.

Here's a simple example. A seller of logistics services may use a freight rate that's based on the postal code of the pickup location and that of the delivery location. For this use, it doesn't matter whether invoices contain misspellings or common variations of city names. But if you try to use the inconsistent city names to analyze shipping activity between cities, your data analytics will treat each variant as a different city.

Here's another example. Suppose you have multiple facilities within the same postal code. If an invoice contains incorrect street addresses, it won't affect the rating process but will cause errors in automated cost allocation.

FA&P processing doesn't fix these and the many other problems that arise when you try to use FA&P data for other purposes.

The case for using refined data

To overcome the limitations of automated FA&P, managers of FA&P processes must think beyond the FA&P process itself.

Trax Technologies recommends two changes:

▶ Explore how you can improve FA&P processes by improving the quality of incoming logistics data.

▶ See how you can provide better logistics and supply chain data for uses beyond FA&P.

To develop high-quality, consistent data from diverse sources, you must apply rigorous methods that standardize, normalize, correlate, fix, and evaluate each data element. This is a process known as data refinement. (See page 7.)

Data refinement receives raw data from numerous, disparate sources across the supply chain. It converts the raw data to a common, standard structure. It then uses correlation and other Big Data techniques to correct and enhance the data. Finally, it evaluates the level of trust and confidence associated with each data element, considering each of the ways the data element is likely to be used. The result? You get clean data not only for your FA&P process but also for supply chain intelligence.

Data refinement delivers a broader, deeper set of cleaner supply chain and logistics data than FA&P processes do.

Figure 2. Data refinery model
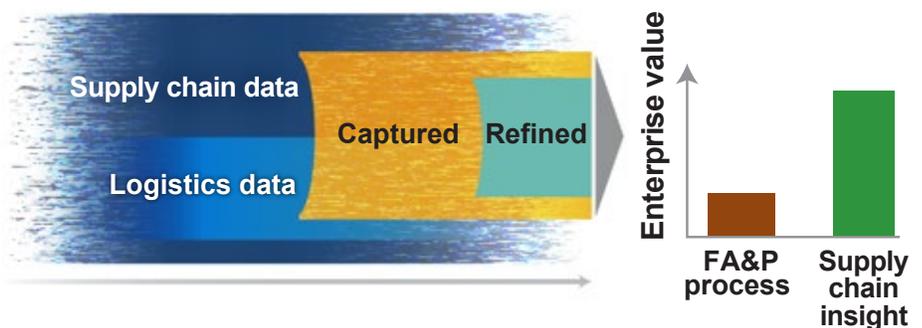
Data refinement can improve the quality of a broad and deep set of supply chain and logistics data. (See Figure 2.) It delivers much more value by providing more and better supply chain insight.

How data refinement works

The data refinement process starts with monitoring and managing flows of data between the various parties in a logistics transaction. The goal of this monitoring is to ensure that all relevant data is available to the data refinement process.

A data refinery then standardizes and normalizes the data. It uses an increasingly mature set of Big Data tools and data science methods to repair, enhance, and evaluate the reliability of the data.

Data refinement consists of five processes: standardization, normalization, correlation, repair and enhancement, and evaluation. This sidebar describes what each process does and shows an example.

Standardization. The data refinery ensures that data is in the right place for systems to interpret it properly.

Standardized data format

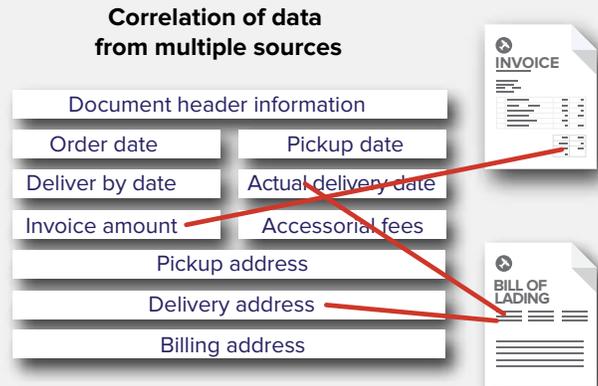| Document header information	
Order date	Pickup date
Deliver by date	Actual delivery date
Invoice amount	Accessorial fees
Pickup address	
Delivery address	
Billing address	

Normalization. The data refinery converts disparate data values to a single, standard data value. It also fills holes where data is missing, but it doesn't change data values.

Normalization of different names for the same city:

Monaco di Baviera
München
Múnich
Münih
Minhen
Miyŭnikh

Munich

Correlation. To help understand data within its context, the data refinery checks data elements from multiple sources. For example, it might assemble the complete picture of a shipment by consolidating relevant shipping data from invoices, shipping manifests, bills of lading, customs documents, and so on.

Correlation of data from multiple sources

Document header information	
Order date	Pickup date
Deliver by date	Actual delivery date
Invoice amount	Accessorial fees
Pickup address	
Delivery address	
Billing address	

INVOICE

BILL OF LADING

Repair and enhancement. The data refinery uses normalized and correlated data to fix or improve data elements it determines to be incomplete, inaccurate, inconsistent, or ambiguous.

PICKUP CITY

Evaluation. The data refinery evaluates the quality and suitability of data for its intended uses, and it provides a visible rating of data quality for each use.

INVOICE
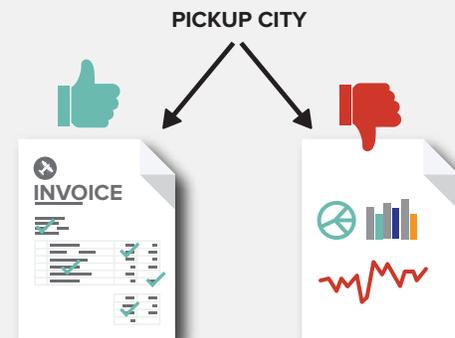
Why FA&P processes don't refine data

Some providers of FA&P services offer data normalization services. But FA&P processes focus only on a narrow segment of logistics data (Compare figures 1 and 2.) They normalize only the narrow segment of data that supports core FA&P processes. They ignore other data and data sources you need for detailed insight into your global supply chain.

Technologies for data refinement are much more powerful than those used in conventional FA&P processing. If FA&P service providers were to refine logistics data properly, they'd have to make very big investments in new technology. They'd also have to change their business model. They aren't paid to process the much broader scope of supply chain data unrelated to FA&P processing.

Deliver more value by collecting and refining more logistics data

When companies focus solely on improving the quality of logistics data needed for FA&P, they don't achieve the untapped enterprise value in the much bigger universe of supply chain data. To achieve this value, which far exceeds that of the FA&P process, companies must shift their focus. They must look to solve the broader problem of low-quality supply chain data they now ignore.

Buyers of logistics services can deliver big corporate value when they start improving the quality of all supply chain and logistics data, not just the data elements they need for FA&P processing.

It's best to refine data before you use it in any business process—including freight audit and payment. When you refine it in advance, you improve the efficiency and effectiveness of all downstream processes.

Most companies can't refine their own logistics data

It's generally not cost effective for buyers or sellers of logistics services to implement their own data refining capabilities. The process is both technically challenging and expensive. Data refinement requires active and continuing collaboration between the data refining operation and the many disparate sources that generate documents in a logistics transaction. A data refinery must standardize data mapping for all parties. It must provide system security for all. And it must be able to process huge volumes of data.

Few companies can justify the capital investment and usage of already overburdened IT resources to build and operate their own data refining capability.

> It's best to refine data before you use it in any business process—including freight audit and payment.

Third-party data refineries offer an economical alternative

FA&P is just one of many downstream processes that could benefit from refined data.

Specialized data refinery services have recently emerged in response to this unmet industry need. They receive data from diverse sources and refine the data before downstream processes use it. FA&P is just one of many downstream processes that could benefit from refined data.

Third-party data refineries can provide their services at reasonable cost through economies of scale that individual companies can't achieve. Because data refineries create value by providing high-quality data, they have strong incentives to keep improving the quality of their service.

Refined data improves multiple enterprise processes

In the "data first" approach, the FA&P process becomes one of many consumers of standardized, enhanced logistics data. Data refinement eliminates many of the exceptions that burden current FA&P processes. In fact, the high quality of data coming out of the refinement process will improve the efficiency, accuracy, and timeliness of your FA&P processes. That improvement benefits both your company and your carriers.

With refined invoice data, you still have to audit and pay freight bills. You still have to allocate expenses properly. But when invoices contain consistent and reliable data, your processes require much less manual involvement. When freight invoices contain all the data your controls need, you can be more confident your automated audit controls are working properly.

The data refining model enables you to confidently attack the larger issues facing your company. Global supply chain visibility now becomes a reality. With all the data from your supply chain standardized and normalized, timely Cost to Serve analysis becomes possible.

When downstream systems receive only refined data, companies improve the performance of their financial reporting, analytics, business intelligence, and logistics transaction systems.

Supply chain visibility drives insightful management decisions

Companies that manage global supply chains can achieve the Holy Grail of supply chain insight when they standardize, normalize, and correlate all the logistics and supply chain data that today flows in a disjointed, disconnected fashion through their various systems. When they do so, they can:

▶ Drive comprehensive and reliable visibility to their global supply chain operations.

▶ Tie actual costs to specific services, providing insights about logistics operations and expenditures.

▶ Use analytics and predictive modeling with much greater confidence.

▶ Make better decisions to optimize their supply chains.

Summary and conclusion

In the preceding pages, you've seen that even most highly automated of traditional FA&P processes have big limitations. Many of their limitations stem from low-quality logistics data.

You've also seen that data refinement reduces or eliminates most of the FA&P limitations caused by low-quality data. In addition, data refinement enables you to feed high-quality data into other business processes and information systems. When you start with high-quality logistics and supply chain data, you can deliver much more enterprise value from the insights you gain from supply chain visibility and analytics.

For most companies, the best source of refined logistics data will be a trusted third-party data refinery.

Trax Technologies is the only data refinery service that specializes in logistics data. In addition to refining data, Trax also provides FA&P and other services that enable your company to benefit from the enhanced data.

For more information about these Trax services, visit: **traxtech.com/visibility**

Better data for better decisions

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