Food Shippers Guide to Supply Chain Digital Transformation

Actionable insights and best practices from supply chain professionals in the food and beverage industry on how they are investing and deploying resources in their digital transformation.

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Introduction to this Research Initiative

Monitoring your supply chain from farm to fork is critical to the success of any food shipper and their providers. But why is end-to-end, real-time visibility the holy grail for the modern food shipper of today?

Monitoring in-transit temperature and location of food and beverage shipments can reduce excursions, ensure product quality, and improve on-time and in-full deliveries, according to Brian Everett, Publisher of *Food Chain Digest*, the official magazine of Food Shippers of America (FSA).

To delve deeper into the benefits and approaches in supply chain digital transformation, *Food Chain Digest* partnered with Tive, an end-to-end shipment visibility technology provider, to produce the *Food Shipper's Guide to Food Chain Digital Transformation*. This guide is based on original research from responses, experiences, and best practices by more than 100 food shippers and their third-party logistics providers.

"Supply chains are riddled with risks in today's complex global marketplace, ranging from temperature excursions and food safety issues to increasing regulatory

Krenar Komoni

pressures and food waste," says Krenar Komoni, CEO and Founder of Tive. "Shippers are looking for real-time visibility in their supply chains and insights into their cold chain shipments to overcome these issues, create more efficiencies, and minimize waste."

About FSA and Tive

FSA is an industry nonprofit association that brings together a community of supply chain, transportation, and logistics professionals with common interests, industry challenges, and opportunities. Founded in 1955, FSA provides education, peer networking, and resources that bring supply chain efficiencies, best practices, and professional development to its members.

Members include food manufacturers, retailers, and distributors – all of whom are focused significantly on supply chain strategy, development, and

execution. Other key stakeholders involved in FSA are third-party logistics companies (3PLs) and truck brokers – companies that also are involved in helping food shippers to manage their supply chains through related services and products.

Tive teamed up with MindShare Strategies, FSA's authorized research, publishing, and marketing partner, to sponsor an original research initiative that sheds light on the most pressing challenges involving visibility of food shippers' supply chains, opportunities to improve supply chain visibility, achieve food safety regulatory compliance, and ultimately best practices they have in place to achieve optimum visibility.

Tive is the global leader of real-time supply chain and logistics visibility technology solutions. More than 700 global shippers, logistics service providers, and retailers use Tive to monitor shipment location and condition in real time, gain actionable insights, and ensure end-customer satisfaction. Tive's cloud platform, patented sensor technology, and 24/7 Live Monitoring services reduce excursions and delays, minimize rejected loads, and decrease theft, damage, and spoilage.

Research Methodology

An online survey was deployed in the first quarter of 2024 to invite participation by supply chain professionals of food manufacturers, retailers, distributors, 3Pls, and brokers that control the storage, transportation, and distribution of materials and products in the food and beverage industry. There were 107 qualified participants in the survey, thus ensuring the research initiative is statistically valid. The survey qualified all participants to identify the type and size of company they represent, and to ensure they have the appropriate responsibilities in supply chain, transportation, logistics, and warehousing.

The survey also asked critical questions to gain their perspectives on the most pressing supply chain challenges facing their organization, whether or not digital transformation is part of their current supply chain priorities, and in which areas of their business they are currently investing in new technology to drive digital transformation.

The survey also generated feedback from food shippers and 3PLs on tactical strategies such as primary means of shipment tracking, monitoring of temperature-controlled shipments, and percentage of shipment that have real-time visibility.

In addition, MindShare Strategies conducted several interviews with subject matter experts from supply chain technology innovators and food shippers that effectively leverage technology to manage their supply chains to add perspectives and context around some of the key findings of the research project.

Demographics of Study Participants

All participants were qualified as having responsibilities in Corporate Management (29.5%), Logistics (28.5%), Marketing & Sales in Supply Chain (16%), Supply Chain Management (15.5%), and Other,

Roles & Responsibilities

10.5% Other

15.5% Supply Chain Management

29.5% Corporate Management

16% Marketing & Sales in Supply Chain

28.5% Logistics

including Operations and Food Safety/ Quality Assurance (10.5%).

Approximately 45% of all participants represent a company within food production, distribution, and retail. Approximately 26% are with a food manufacturer, grower, or producer; 9% are with a consumer packaged goods company (CPG); 7% are with a distributor or wholesaler; 5% are with a retailer; and another 8% are with a food company not classified in one of these categories. In addition, 55% of the participants represent a 3PL or truck broker serving the food and beverage industry.
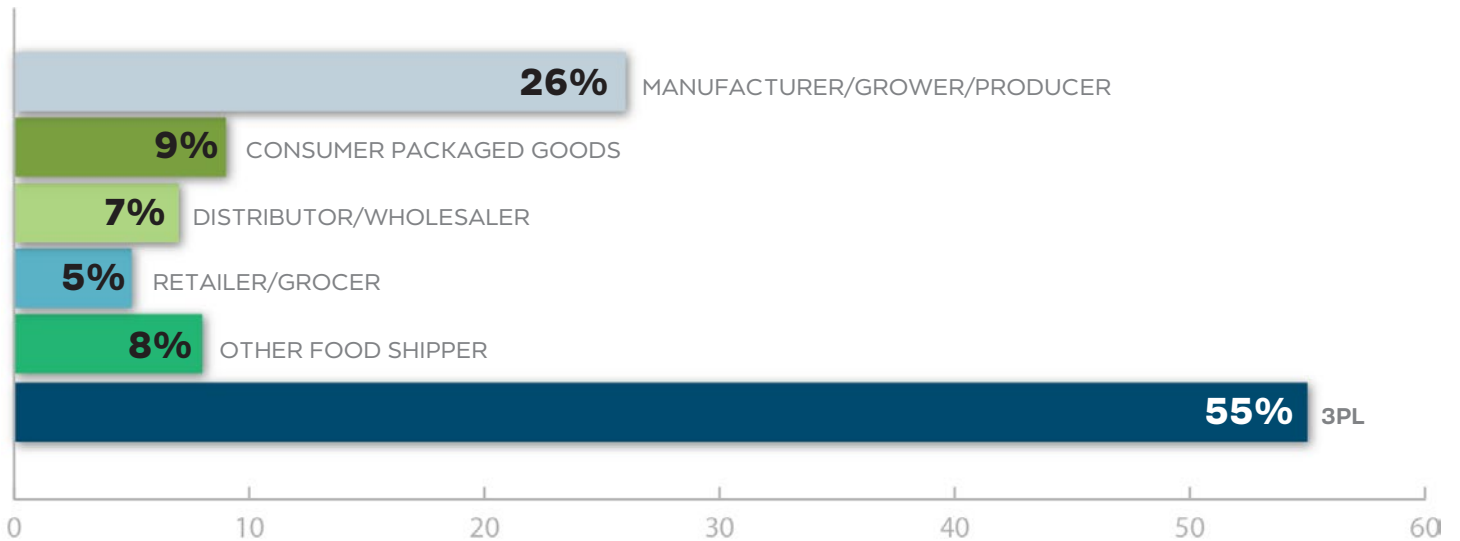
A majority of participants (68%) represent medium to large-sized enterprises that generate U.S. $50 million to $25 billion in annual revenue,

with an additional 9% representing major or giant companies with annual revenue in excess of $25 billion. A significant percentage of participants (23%) represent small and medium-sized businesses with less than $50 million in annual revenue.
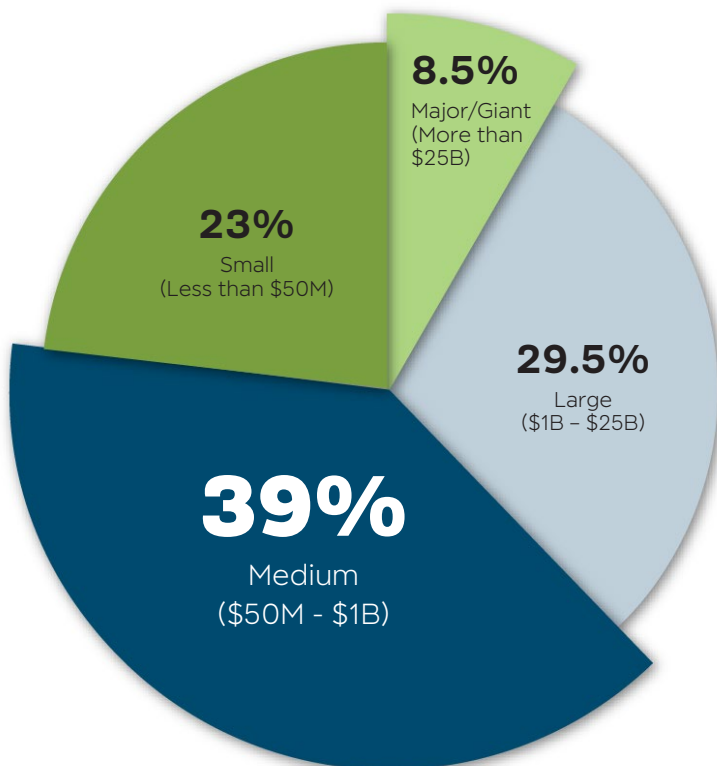
Summary of Findings

The *Food Shipper's Guide to Food Chain Digital Transformation* provides insights into what shippers and their providers say about their biggest challenges in their supply chain operations, how supply chain digital transformation initiatives are providing solutions to these challenges, where they're investing in these initiatives, and best practices that can lead other food shippers to success.

Type of Shipper

26%	MANUFACTURER/GROWER/PRODUCER
9%	CONSUMER PACKAGED GOODS
7%	DISTRIBUTOR/WHOLESALER
5%	RETAILER/GROCER
8%	OTHER FOOD SHIPPER
55%	3PL

0   10   20   30   40   50   60

Size of Company
(Annual Revenue in U.S. Dollars)

- **8.5%** Major/Giant (More than $25B)
- **23%** Small (Less than $50M)
- **29.5%** Large ($1B – $25B)
- **39%** Medium ($50M - $1B)

Supply Chain Challenges & Positive Impacts of Digital Transformation

According to the survey, food shippers are dealing with a significant host of operational and supply chain challenges. Compounded by such outside factors as rising freight market inputs, increased cargo theft, and risks in food safety, food shippers are responding with solutions based in technology.
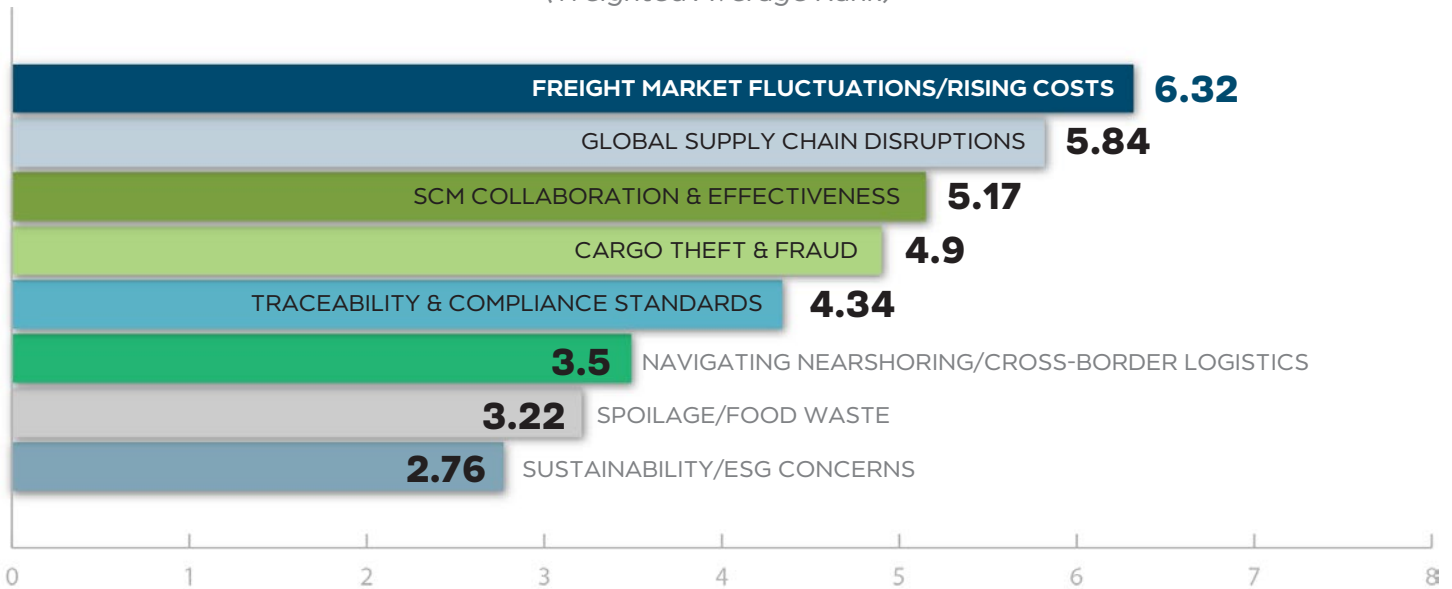
"Theft in the food and beverage vertical is up around 63% in 2024 already because of the ease of reselling food and beverage products," says Rajah Nagarajah, Director of Sales, Food Vertical at Tive. "Shippers are investing more in technology to address these issues head on, to optimize efficiencies, and to reduce risk and supply chain-related expenses."

Rajah Nagarajah

"Cold chain management is something every supply chain stakeholder is focused on: how to ensure products are getting from farm to table in the most efficient way, at the best cost, and at the highest quality possible," continues Nagarajah. "Historically the food industry has been logging temperature through archaic ways such as loggers, strip tapes—or worse yet, not even monitoring the cold chain—but fortunately, the industry is now making progress to migrate to real-time quality control solutions to help monitor shipments so they can take action if anything is going wrong."

So what are the biggest challenges facing food shippers and the logistics providers that serve them? According to the survey, these are their primary concerns.

Biggest Supply Chain Operations Challenges
(Weighted Average Rank)

Challenge	Rank
FREIGHT MARKET FLUCTUATIONS/RISING COSTS	6.32
GLOBAL SUPPLY CHAIN DISRUPTIONS	5.84
SCM COLLABORATION & EFFECTIVENESS	5.17
CARGO THEFT & FRAUD	4.9
TRACEABILITY & COMPLIANCE STANDARDS	4.34
NAVIGATING NEARSHORING/CROSS-BORDER LOGISTICS	3.5
SPOILAGE/FOOD WASTE	3.22
SUSTAINABILITY/ESG CONCERNS	2.76

Supply Chain Challenges (continued)

Respondents were asked to compare items to each other by placing them in order of preference, and then the preferences were divided by the total number of respondents to provide a weighted average rank.

Freight Marketing Fluctuations/ Rising Costs. This is the primary concern among respondents, with 38% indicating this is a top supply chain challenge. Along with rising costs overall, underlying inflationary pressures such as materials, energy, logistics, and labor are eroding the margins of food manufacturers, retailers and distributors.

Layne Fletcher

"We're now investing in technology with a particular focus on the cold chain," says Layne Fletcher, Vice President of Logistics & Supply Chain with Golden West Food Group. "Digital transformation initiatives can have a positive impact on risk management, efficiencies, and customer service – all areas we are highly focused on." (For full details, see Golden West Food Group Case Study on page 9).

Global Supply Chain Disruptions. The current global food supply chain has a fresh set of challenges. For example, adverse weather events such as heat waves and wildfires in countries like Italy, Chile, and Colombia have led to substantial agricultural damage – straining food production and availability. India, once a significant wheat exporter, is facing a drought that has depleted its wheat reserves (pushing the country to seriously consider wheat imports to stabilize domestic supply and prices), and an El Niño patter has curbed crop production across Asia, a major producer of rice, wheat, and palm. Amid these disruptions, costs have surged dramatically for commodities including grain, sunflower oil, and coffee.

Approximately 19.5% of overall respondents reported global supply chain disruptions as one of their primary challenges. Interestingly, 3PL participants identify this as their second highest pain point, so it's an even bigger challenge for the logistics partners of food shippers.

Real-time visibility enabled by technology can address challenges caused by disruptions in a number of ways, enabling food shippers to:

- More effectively manage inventory levels and make quicker adjustments as needed

- Maximize efficiencies in logistics operations (i.e., route optimization, carrier performance evaluation)

- Provide business continuity and ensure visibility into the location of condition of goods as they change hands across different modes and carriers (which also helps to mitigate potential carrier fraud, double-brokering, and other unseemly practices that often rear their heads in times of disruption)

Cargo Theft and Fraud. Shippers in the survey aggregately scored this as the 7th highest challenge, but it's scored as much higher of a aggregate concern (3rd highest) for providers. In fact, an alarming 48% of respondents in Tive's State of Visibility 2024 Report indicate monthly losses in the range of $5,000 to $10,000 due to damage and theft. Leveraging visibility technology can establish a clear audit trail and custody of goods throughout the supply chain to have a positive impact on occurrences in product loss, spoilage, or theft.

"Knowing the exact location of your freight through visibility and tracking technology—without having to go to your carrier or provider—can be invaluable in proactively avoiding theft situations and understanding where the theft occurs," says Nagarajah. "The Midwest, California, and the Southeast, where a lot of agricultural products are moving, are target areas for theft – and closely monitoring shipments in those regions can be extremely helpful in reducing risk and theft. Investments in technology used to be 'nice to have' but they're now a 'must have' when it comes to insurance and shipment protection."

Supply Chain Management Collaboration & Effectiveness. This ranked as a major pain point for food shippers (aggregate score ranked as 2nd highest challenge) and their providers (aggregate score ranked as 4th among 3PLs). As supply chains become more interconnected, the use of collaborative platforms that enable

real-time sharing of visibility data among all stakeholders will continue to increase, according to Komoni.

"Food shippers need to work with the best providers and have confidence in knowing that they have best practices and behaviors in place when it comes to managing their supply chains," adds Komoni. "Shippers are investing more into technology to operate with visibility which enables them to benchmark and measure performance of their logistics partners. This ultimately allows shippers to make smart decisions on who they use for their supply chain partners."

Traceability and Compliance Standards. This ranked as a major pain point for food shippers (aggregate score ranked as 3rd highest challenge) and their providers (aggregate score ranked as 5th among 3PLs).
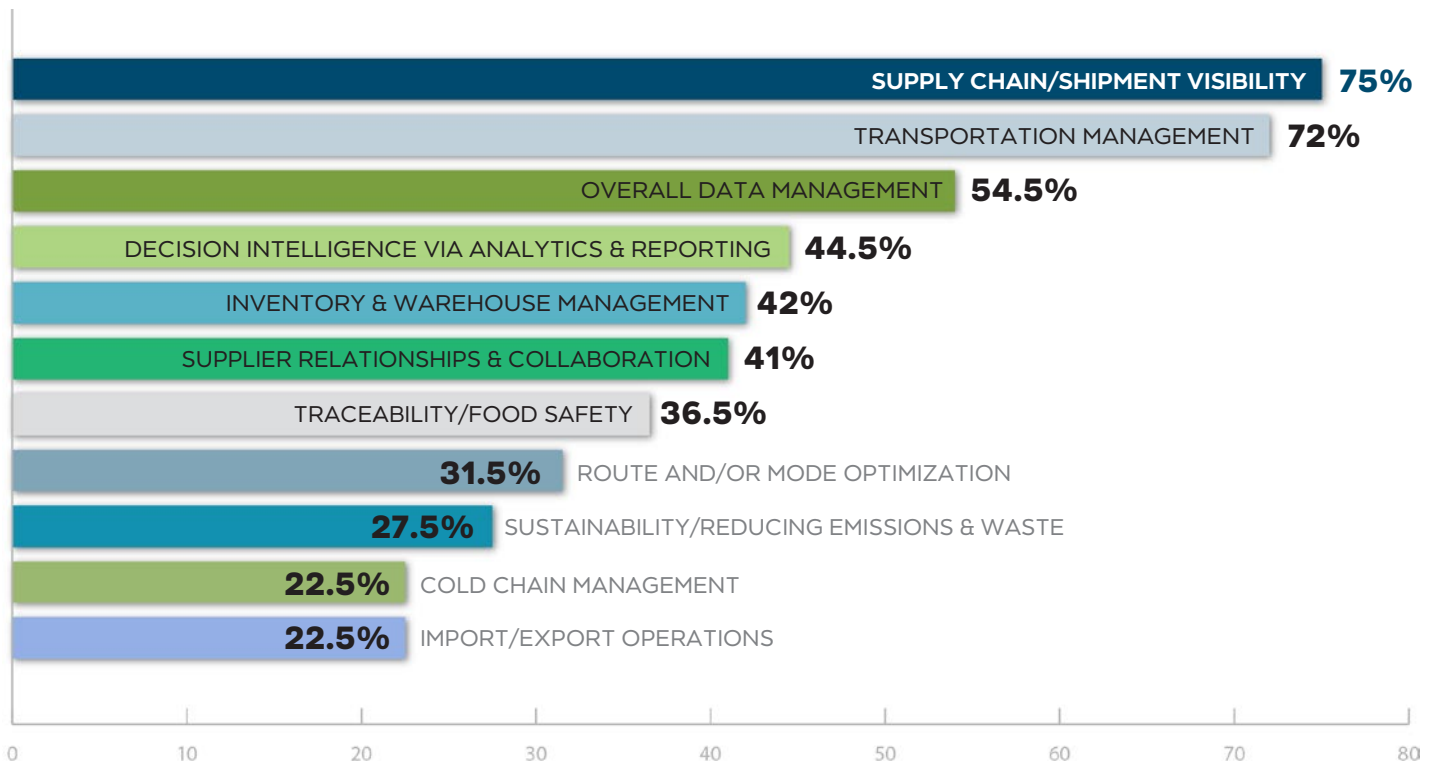
"Use of technology to enhance traceability can positively impact customer satisfaction," says Nagarajah.

"We're seeing more food retailers using technology solutions to trace shipments and improve quality downstream, extend shelf life at the store level, and address critical operational challenges such as detention."

He notes that food shippers also are consistently needing to ensure their supply chain visibility complies with global standards such as FSMA in the U.S., EU Food Safety, Food Safety in Mexico, and FSANZ (New Zealand), to name a few.

"Shippers need to have data around temperature in their shipments," Nagarajah says. "When the USDA comes, you have to provide information on what happened with that shipment. Historically, this has predominantly been done using passive temperature loggers, but it's not in real time. So as the cost of emerging technologies that enable real-time transparency comes down,

Investment Areas in Digital Transformation

Category	Percentage
SUPPLY CHAIN/SHIPMENT VISIBILITY	75%
TRANSPORTATION MANAGEMENT	72%
OVERALL DATA MANAGEMENT	54.5%
DECISION INTELLIGENCE VIA ANALYTICS & REPORTING	44.5%
INVENTORY & WAREHOUSE MANAGEMENT	42%
SUPPLIER RELATIONSHIPS & COLLABORATION	41%
TRACEABILITY/FOOD SAFETY	36.5%
ROUTE AND/OR MODE OPTIMIZATION	31.5%
SUSTAINABILITY/REDUCING EMISSIONS & WASTE	27.5%
COLD CHAIN MANAGEMENT	22.5%
IMPORT/EXPORT OPERATIONS	22.5%

food shippers can advance their capabilities in monitoring temperature of shipments, as well as location of shipments."

Other Challenges. Survey respondents pinpointed extra challenges in supply chain operations with Weighted Average Ranks: Navigating Nearshoring/Cross-Border Logistics (3.49%), Spoilage/Food Waste (3.21%), and Sustainability/ESG Concerns (2.77%).

Where Are Food Shippers Investing?

While the benefits of investing in digital transformation are clear, to what degree are food shippers and their logistics partners investing in this area? Approximately 71% of respondents acknowledge that digital transformation of their supply chain and business operations is a priority in the next 12 to 18 months.

There are several areas in technology in which food shippers and 3PLs are investing (or planning to invest) in the next 12-18 months. These areas are:

Supply Chain/Shipment Visibility. Approximately 75% of respondents indicate this is an area of business in which they currently are investing in new technology to drive

transformation. Interestingly, according to the State of Visibility 2024 report, approximately 78% of respondents indicate they are either currently investing or planned to invest in the next 12 months in IoT-based shipment tracking (53% currently using, 25% planning to invest).

Transportation and Warehouse Management. Market conditions and the need for speed and efficiencies are forcing food companies to rethink their existing tech stack and use of transportation management solutions. In fact, nearly 71% of aggregate responses indicate this is an area of business in which they are currently investing in new technology to drive transformation. Another 42% indicate that inventory and warehouse management are digital transformation areas in which they are investing.

Overall Data Management. To be efficient in supply chain management, there are many data points needing visibility – ranging from time in transit, carrier volume constraints and performance, accessorial charges and peak season surcharges to shipping volume by origin and destination, delivery exceptions, estimated delivery dates, and guaranteed service refunds. In fact, given the impact that overall data management can have in
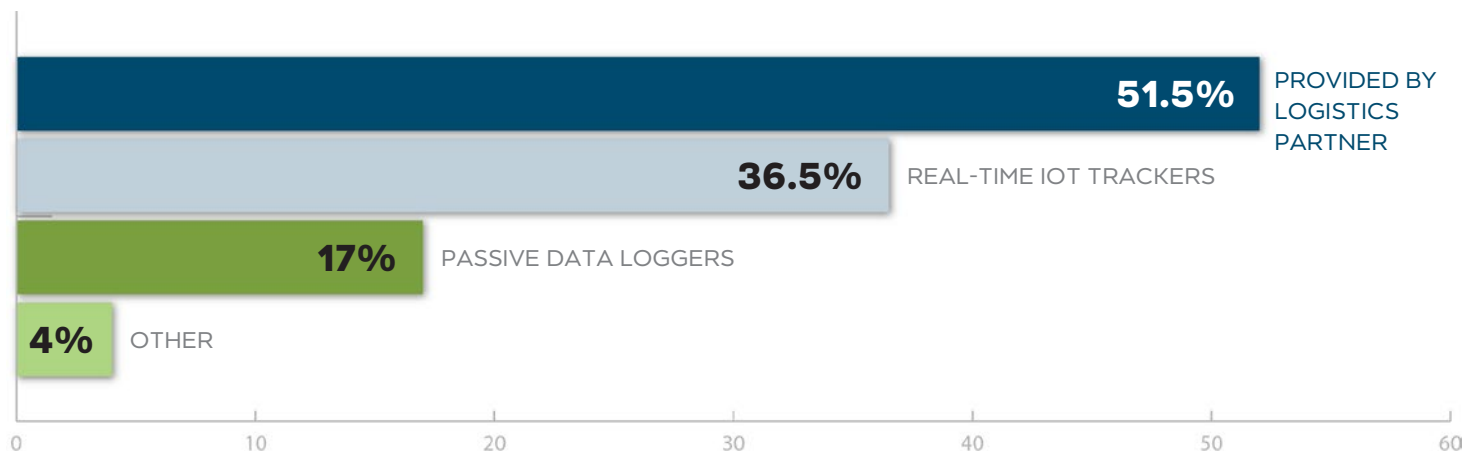
bringing efficiencies to supply chain management, 54% of respondents indicate this is an area in which they are currently investing. Another 42.5% indicate that they are focusing their digital transformation resources and budgets on decision intelligence via analytics and reporting.

Additional Investment Areas in Digital Transformation. Respondents also identified the following areas of investment in their digital transformation strategies: Inventory & Warehouse Management (42%), Supplier Relationships & Collaboration (41%), Traceability/Food Safety (36.5%), Route & Mode Optimization (31.5%), Sustainability/Reducing Emissions & Waste (27.5%), Cold Chain Management (22.5%), and Import/Export Operations (22.5).
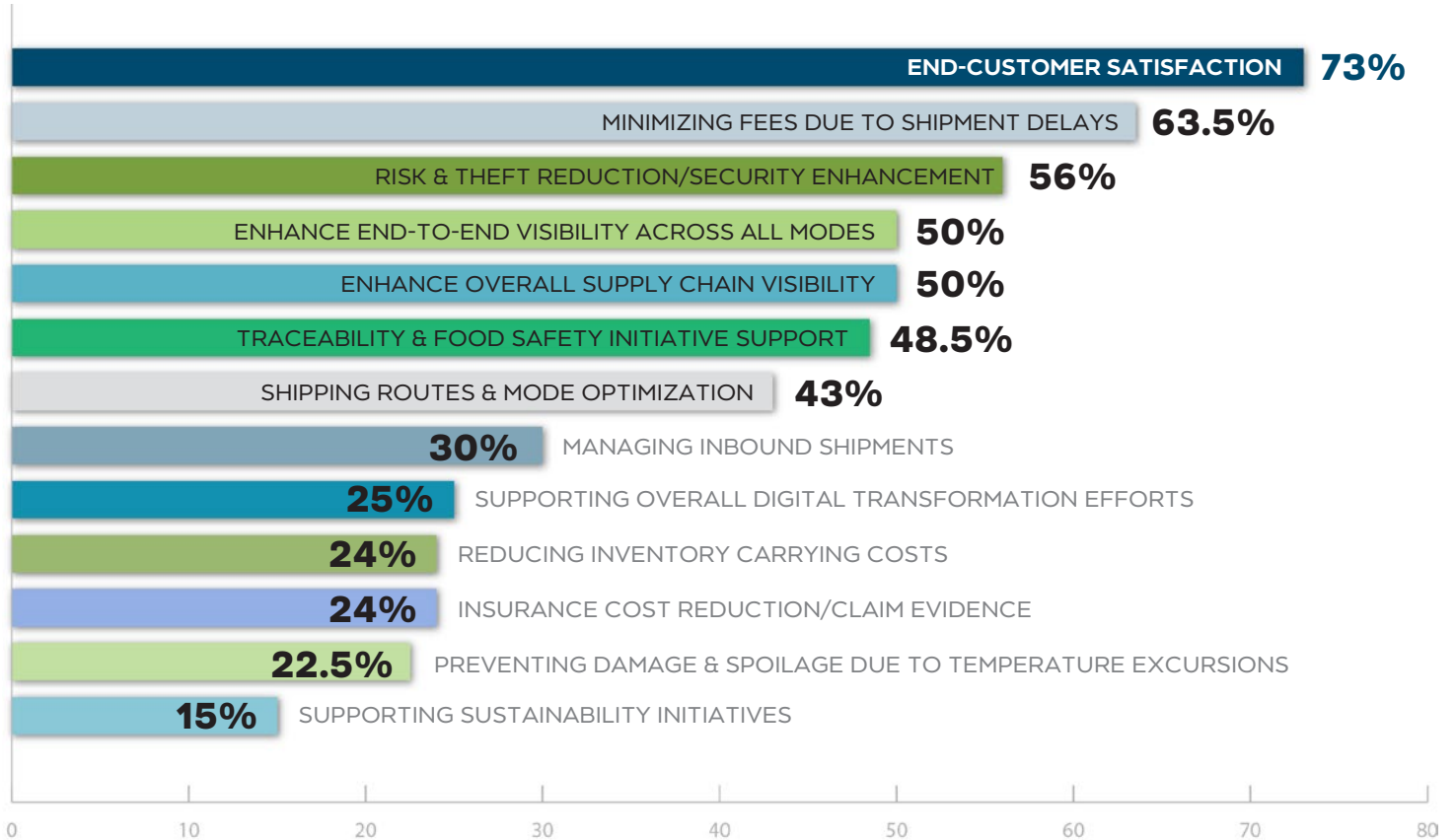
Tracking Shipments and Temperature

For food shippers, enhanced shipment visibility improves provider accountability, reduces the amount of lost or stolen freight, and dramatically enhances customer service. Not only does shipment tracking minimize worry about on-time delivery, it enables shippers to proactively support customers and run operations more smoothly.

Primary Means to Monitor Shipment Temperature

51.5%	PROVIDED BY LOGISTICS PARTNER
36.5%	REAL-TIME IOT TRACKERS
17%	PASSIVE DATA LOGGERS
4%	OTHER

Key Benefits to Real-Time Shipment Visibility

Benefit	Percentage
END-CUSTOMER SATISFACTION	73%
MINIMIZING FEES DUE TO SHIPMENT DELAYS	63.5%
RISK & THEFT REDUCTION/SECURITY ENHANCEMENT	56%
ENHANCE END-TO-END VISIBILITY ACROSS ALL MODES	50%
ENHANCE OVERALL SUPPLY CHAIN VISIBILITY	50%
TRACEABILITY & FOOD SAFETY INITIATIVE SUPPORT	48.5%
SHIPPING ROUTES & MODE OPTIMIZATION	43%
MANAGING INBOUND SHIPMENTS	30%
SUPPORTING OVERALL DIGITAL TRANSFORMATION EFFORTS	25%
REDUCING INVENTORY CARRYING COSTS	24%
INSURANCE COST REDUCTION/CLAIM EVIDENCE	24%
PREVENTING DAMAGE & SPOILAGE DUE TO TEMPERATURE EXCURSIONS	22.5%
SUPPORTING SUSTAINABILITY INITIATIVES	15%

Possibly the most important pillar of shipment visibility when it comes to the food industry is monitoring shipment temperature, especially when shipping perishable foods. When asked to identify current primary means to monitor shipment temperature, approximately 51.5% of shippers report that they rely on shipment temperature information provided by their carriers or 3PLs. An additional 37% say they use real-time IoT trackers. Surprisingly, 26% admit they do not monitor their temperature-controlled shipments—placing shipment integrity and food safety at risk.

Key Benefits to Real-Time Shipment Visibility

There are major benefits to real-time shipment visibility, including enhanced customer experience (CX), risk and theft reduction, enhancing visibility across all modes, and operational efficiencies. Despite these apparent benefits, achieving effective real-time visibility poses some challenges.

Food shippers cite technology integration, data accuracy, and high implementation costs as primary hurdles. However, the advantages to food shippers and their providers highlight the importance of overcoming these obstacles. According to respondents in this survey, what are the primary benefits to real-time shipment visibility?

End-Customer Satisfaction.

Approximately 73% indicate this is a key benefit. Real-time visibility helps to ensure shipments arrive on time and in optimal condition, which lends itself to satisfied end customers, according to Komoni. He points out that one of Tive's customers, Sun-Glo of Idaho, previously didn't have an efficient system in place to keep their potato-buying customers informed of shipment ETAs. Now, with their investments in and commitment to end-to-end shipment visibility, when a load of potatoes leaves Sun-Glo, an email is automatically sent to the customer that includes shipment details and a shipment tracking link. When the customer clicks the link, the Tive platform displays exactly where their truck is on the map at that moment. And the Tive visibility platform doesn't just record GPS location—the trackers monitor temperature, idle time, whenever container doors open, humidity variances, and more. With instant access to real-time shipping data, the Sun-Glo team is empowered to act quickly to fix potential issues—and their customers are thrilled to have high-level visibility into their shipments.

Risk and Theft Reduction/Security Enhancement. Approximately 57% of respondents indicate this is a key benefit of real-time shipment visibility. For example, if a shipper has an inbound shipment coming in by container ship and can see that there is a delay in the port and the goods will not be unloaded at the expected time, they avoid paying unnecessary labor and drayage costs. On the other hand, being able to see exactly when the shipment will arrive can help them efficiently coordinate the drayage arrangement so they don't risk being charged demurrage fees for not unloading on time.

Theft prevention is especially crucial for cross-border operations and supply chains in which goods are moving in and out of (or throughout) areas such as Mexico, where there is a heightened risk of cargo theft, says Komoni.

Enhancing End-to-End Visibility Across all Transportation Modes. Approximately 50.5% of respondents indicate this is a key benefit to real-time shipment visibility. Real-time visibility helps ensure business continuity by providing a single source of data throughout a shipment's entire journey.

Additional Key Benefits to Shipment Visibility. Respondents also identified the following key benefits to real-time shipment visibility: Enhance Overall Supply Chain Visibility (50%), Enhance Collaboration & Data Sharing with Stakeholders (49%), Traceability & Food Safety Initiatives Support (48.5%), Shipping Route & Mode Optimization (43%), Managing Inbound Shipments (30%), Support Overall Digital Transformation Efforts (25%), Reducing Inventory Carrying Costs (24%), Insurance Cost Reduction/Claim Evidence (24%), Preventing Damage & Spoilage Due to Temperature Excursions (22.5%), and Supporting Sustainability Initiatives (15%).

Prioritizing Digital Transformation at GWFG

Golden West Food Group is a manufacturer and distributor of high-quality fine foods that span a vast array of raw, cooked, fresh, and frozen products – and the markets the company serves are varied. GWFG's packaged goods can be found in more than 25,000 major retailers. The company's private label capabilities involve working closely with customers of all sizes to realize their retail product visions—from ingredients and cuts to packaging and label design. In food service, GWFG is a full-service food solution provider with services that range from short-order, just-in-time programs on custom, fresh-cut portioned proteins to strategic transport of more than 10,000 other products.

GWFG ships worldwide 365 days a year, and operates distribution centers throughout the United States and in key regions around the globe to service restaurants, distributors, casinos, resorts, theme parks, the U.S. military, and more.

Such a complex range of markets and capabilities comes with a complex range of supply chain challenges and opportunities, according to Layne Fletcher, Vice President of Logistics & Supply Chain.

"Our supply chain is very complex and time sensitive on a global perspective," says Fletcher. "There are a lot of challenges and risks to manage." Some of his biggest pain points include managing on-time, in-full metrics and minimizing OTIF fines, actionable distribution of goods, and overbooked

Layne Fletcher

and overworked staff personnel in his supply chain operations.

"And now that drivers sometimes aren't allowed on the dock due to safety issues, verification of what's on the truck has become more difficult," he adds. "We're finding that OSDR reports involving overages, shortages, and damages are up significantly since the COVID-19 pandemic."

Because of these challenges and more, GWFG is focusing heavily on digital transformation of its complex supply chain. "We are heavily investing in technology to provide real-time visibility on shipment temperature and location," says Fletcher. "But this investment is well worth the expense – especially when you consider the value and potential fines on a single food shipment that can be worth $200,000, for example."

"We're now investing in technology with a particular focus on the cold chain," he continues. "We're currently working to integrate our multiple TMS systems to help manage these risks downstream to have visibility of any types of issues that arise. In addition, our digital transformation is helping our customers to ensure everything is in compliance all the way to their store. Digital transformation initiatives can have a positive impact on risk management, efficiencies, and customer service – all areas we are highly focused on."

Conclusion

The clear consensus from food shippers and their providers participating in this study is that advancing shipment visibility is not merely a tactical goal— it is a strategic imperative for companies seeking to navigate the complexities of the global supply chain landscape. The findings from this *Food Shipper's Guide to Supply Chain Digital Transformation* research project underscores the importance of real-time visibility in building more resilient, agile, and competitive supply chains.

As food shippers look to the future, the adoption of innovative technologies—and the pursuit of collaborative, industry-wide solutions—are instrumental in unlocking the full potential of supply chain visibility.

With rapid technological advancements and shifting market dynamics, the ability to maintain and enhance real-time food shipment visibility will be a defining factor in the success and sustainability of supply chain operations. The insights generated from food shippers and their providers in this original research project serve as a roadmap for other companies wanting to achieve excellence in supply chain management.

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