Cal/Amp®

Total Supply Chain Visibility:

An IoT Approach

End-to-end visibility into your supply chain is more important now than ever before, and goes beyond the methods that have been effective in the past. The changing economics of manufacturing, inventory and shipping require new technologies that close visibility gaps to lower cost, improve speed and yield, prevent loss and achieve competitive levels of customer service. To survive, companies must proactively adapt by embracing products and services that provide insight and analytical analysis of their processes, and deliver real-time information about in-transit shipments regardless of size or distance.

The Changing Economics of Shipping

In the supply chain and logistics industries, the shrinking world manifests itself in shorter distances and smaller shipments. Even LTL (less-than-truckload) carriers, already familiar with a very competitive marketplace, are struggling with lower margins as a result of lower and lower weight per shipment. To preserve their bottom lines, these companies have kept operating efficiency high and tried to keep shipping rates consistent. However, there's evidence that pricing wars are returning, which will put strong downward pressure on revenue.

In the face of these threats, LTL carriers are turning to the "last mile" delivery market—a potential source of sustainable income according to DC Velocity, but also a highly competitive market with numerous daunting challenges. Last-mile customers are often consumers who expect their packages to arrive the same day they're ordered online. The expectations of perfect performance have risen precipitously, meaning that even a few small errors can have a deep effect on a company's reputation.

To solve these problems, companies are turning to the latest technologies to make the shipments themselves smart enough to know where they are (and in some cases, to re-route themselves): the Internet of Things (IoT).

Filling the Gaps: The Challenges

Supply chain management has generally relied on a common protocol called Electronic Data Interchange (EDI), a standard that was developed to integrate the variety of systems that sprang up independently to manage business information. EDI focuses on transmitting the status of order placement and acknowledgement, shipment notification, and invoicing. There's little in the way of communication while goods are in transit, mainly because it was long impossible to determine with any precision the location of a particular shipment.

The problem is compounded in the LTL and last-mile realms, because they both mean that a single conveyance is tasked with carrying a large number of individual shipments that must be tracked separately. Furthermore, these small on-demand loads are often managed by third-party logistics (3PL) companies, which sometimes offer limited visibility at various stages of progress of the shipment.

Through no fault of their own, therefore, the entire logistics team can lose sight of products in transit, resulting in a number of risks:

- **Loss or theft –** cargo theft can occur at any point in the supply chain, but is more likely when there is no visibility into the location and authenticity of the product in transit.
- **Adulteration or replacement –** it is crucial that the goods that arrive at the destination are exactly the goods that were shipped, with no replacement or contamination along the way.
- **Diverted, expired or counterfeit goods –** products intended to be destroyed can be diverted into the supply chain for illicit sale. Expired goods not fit for sale, misbranded or relabeled products can be introduced into the supply chain.
- **Regulatory compliance –** certain types of products require certification of environmental factors (temperature, humidity, vibration, shock) or chain of custody.
- **Customer satisfaction –** the ultimate test in supply chain management is serving the needs of customers, who increasingly demand their own visibility into the location of goods in transit
- **Performance, efficiency and the bottom line –** fast transport at a low cost to the carrier relies on the detection and mitigation of pinch points, risks and inefficiencies to maintain continuous improvement.

The Solution: Smarter Shipments

To fill the gaps in supply chain visibility, two important new technologies have emerged: fleet management and the Internet of Things.

Fleet management connects vehicles to the cloud, providing a two-way data channel that reports vehicle location and health while providing drivers with up-to-date traffic, routing and

navigation information. Fleet management helps delivery drivers find the fastest route to each destination, provides up-to-date information about the location of each truck, and helps reduce operating costs by predictively managing vehicle health.

The Internet of Things is a new world in which objects themselves are not only connected, but aware of their surroundings and smart enough to share information. The addition of a smart tracking device to a shipment makes the shipment itself able to provide visibility into its whereabouts and condition. The key benefit is always-on, real-time data about the shipment and its environment being available without interruption. Smart devices can now make their own decisions about what data to send, so that the carrier does not have to wade through unwanted information to get to critical knowledge about a shipment's status.

Smart tracking of individual shipments also provides real-time visibility when these shipments are routed internally before shipment, or when they are in the possession of 3PL companies that do not provide granular tracking data. Smart, cloud-connected devices keep your shipments continuously visible in real time from anywhere on the globe.

Together, these two technologies connect people, things and processes to ensure fast, predictable delivery with complete visibility of the shipment from departure to final arrival. This is especially important in LTL and last-mile deliveries. In the past, it was sufficient to load a tractor-trailer and track it as a unit; now, with loads under 500 pounds on smaller trucks, the problem of

tracking individual shipments has become complicated. Providing visibility to the customer from pickup to delivery is paramount for any operation that wants new business, and essential for maintaining supply chain security.

The benefits are clear:

- **On-Board Tracking –** enabling your shipments with GPS-based tracking is the starting point for filling visibility gaps. There are a number of options available today ranging from simple location devices to smart tracking devices that can sense a number of environmental factors to ensure your shipments are safe and that they are handled according to business or regulatory requirements.

- **Convenience –** smart devices can be simple to deploy and make it easy to secure the right type of information based the needs of your organization. Timeliness – real-time reports, alerts and advisories provide need-to-know information without disrupting your workflow while allowing remediating action.

- **Appropriateness –** the right information and alerts to the right stakeholder at the right time enable your organization to optimize operations and take needed actions with low friction.

- **Compliance –** providing all the right validation of shipment integrity – temperature, humidity, shock, light and other factors that need to be adhered to for regulatory assurance.

Choosing a Services Partner

When implementing an IoT-based solution to fill gaps in supply chain visibility, there are a few important factors to keep in mind:

- **Track Record –** the market for cargo theft and supply chain visibility is at least 10 years in the making; deal with a company that can provide strong and relevant references. Make sure that the technology is mature and robust, yet provides the advanced capabilities you need for real-time tracking and analytics.

- **Knowledge of Supply Chain –** many companies that serve the supply chain visibility market with tracking technology and services are just that – technology oriented. The science of providing visibility must be complemented with the art of process and known means to assure success.

- **Stability/Reliability –** work with a company that assures continuity and security in business practice, both financially and in innovation of their services.

- **Ruggedness –** look for products that can thrive in the environments that the cargo will be exposed to without losing connectivity or running out of battery power. Cost – although the value of continuous real time visibility can be measured and quantified, it needs to be at a cost that proves a valuable ROI. Knowledge of all the cost elements – program management, tracking device acquisition and ongoing service cost – needs to be factored into implementation.

- **Comprehensive Information Service –** thorough vetting of the visualization, alerting and report capabilities and options along with the content that is available is a necessity. Once implemented, just as with any ERP, TMS or WMS platform, a real-time tracking program becomes an integral part of the overall program. The stakeholders, supply chain execs, CIOs, security and even sales and marketing, should weigh in on the selection process.

- **Service Flexibility –** having only one way to accomplish all of the above is a red flag. In selecting and qualifying a potential partner, look for options that tailor the solution to meet your organization's needs. Can you choose either purchasing or a managed service? If program management is not convenient, does the prospective partner offer turnkey services? Is 24/7 monitoring an available option? The questions for qualification should be listed in an RFP or outreach qualification process with each potential candidate.

Conclusion

The shipping industry is changing fast, but available solutions and technology can help carriers remain competitive. With IoT and fleet tracking, it's now possible to track LTL and last mile shipments in real time from before departure to the final delivery point, even when they are in the hands of a 3PL company.

For companies working hard to carve out a business in this challenging and specialized marketplace, choosing a reputable, robust and reliable solution is a must.

About CalAmp

CalAmp (NASDAQ: CAMP) is a telematics pioneer leading transformation in a global connected economy. We help reinvent businesses and improve lives around the globe with technology solutions that streamline complex IoT deployments and bring intelligence to the edge. Our software applications, scalable cloud services, and intelligent devices collect and assess business-critical data from mobile assets, cargo, companies, cities and people. We call this The New How, powering autonomous IoT interaction, facilitating efficient decision making, optimizing resource utilization, and improving road safety. CalAmp is headquartered in Irvine, California and has been publicly traded since 1983. LoJack is a wholly owned subsidiary of CalAmp. For more information, visit calamp.com, or LinkedIn, Twitter, YouTube or CalAmp Blog.

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