WHITEPAPER

BETTER SUPPLY CHAIN DECISIONS WITH BETTER DATA

Getting the IoT-edge in Shipment and Asset Monitoring
RISING CUSTOMER EXPECTATIONS ARE FORCING SUPPLY CHAINS INTO THE FUTURE

Supply chain complexities have increased exponentially over the past decade amid globalization and rising customer expectations. Supply chains are constantly pushing their limits trying to deliver on a whim and within a (sometimes) reasonably short time.

Measures taken to cope with changing market dynamics include geo-specific warehousing and logistics strategies, using geographically dispersed suppliers, and constant benchmarking. It’s all growing towards omni-channel supply chains and distributed manufacturing/assembly facilities.

But today’s here & now economy — one of instant interaction, gratification, and connected intelligence — demands even more. Customer expectations are rapidly evolving today, and companies like Amazon or Uber are raising the bar for all industries.

Consumers and B2B customers alike have high expectations, liquid expectations as some call it, for a seamless customer experience across marketplaces.

For the supply chain manager, the Chief Logistics Officer, or the COO, the consumer’s battle cry of “Where’s my stuff?” translates to questions like:

- Where’s the shipment/asset right now?
- When did it arrive, and what was/is its condition?
- Am I meeting my customer’s expectations?
- How can I enforce SLAs with my 3PL, FTL, and LTL carriers?
- How can I correct service disruptions?
- How can I improve something?
- Can I improve anything?

CFOs, Sales Heads, and CEOs are asking why their supply chain isn’t performing better. So are customers, who drive the question home with the weight of their wallets.

To meet loftier consumer expectations and gain competitive advantage, enterprises are retooling their supply chains to be more agile, efficient, and transparent. Customer expectations are forcing the “Amazonification” and digitalization of entire supply chains, while shifting the business model from operating a cost center to developing a strategic growth engine.

For manufacturers, distributors, and retailers, this translates to a growing need for:

- Better supply chain and shipment visibility.
- Tracking individual assets in the warehouse, in use, or in transit.
- Coping with disruptions, calculating dynamic ETAs.
- Condition monitoring, especially for high-value goods and assets.

Unfortunately, according to a recent independent survey of over 600 industry professionals worldwide, almost 77% of firms polled have no visibility or a restricted view of their supply chains.¹

¹ Geodis. 2017 Supply Chain Worldwide Survey
THE PRICE OF OPAQUE SUPPLY CHAINS

The lack of visibility cripples supply chains, reducing not just their responsiveness in the short-term, but also their ability to improve long-term operational and cost efficiencies.

Risks or problems often go undetected, but the issues they lead to are hard to ignore.
Perhaps the risks and defects are evident enough early on, but their root cause isn’t fully apparent.
Factors like these ultimately limit your ability to scale, enforce SLAs, or comply with regulatory norms in your supply chain, let alone make informed decisions or take effective action over disruptions.
Before a company can achieve supply chain efficiencies like reducing inventories or landed cost, it needs visibility, nay, real-time visibility, of its inventory and assets.
*“Real-time” visibility is a real powerful advantage, perhaps even the most critical factor for crisis management in any situation. The losses due to a lag in awareness can be, and often are, staggering.*

The value of damaged or misplaced products lead to inventory replacement and are all wasted logistics costs. Despite efforts to contain theft or damage, companies still lose inventory because current tracking solutions do not adequately gauge damage, predict theft, or provide data to recover stolen goods.
In the pharmaceutical and biologics industry for example, temperature excursions or the theft of products is rarely detected in real-time. In fact, an estimated 20% of temperature-sensitive products are damaged during transport due to cold chain interruption alone, according to information by airline industry association IATA.²
When shipments are compromised, miss their window of delivery, goods are stolen, or supply chain assets are managed inefficiently, organizations face penalties, replacement costs, financial losses, or worse.

Global cargo theft is currently estimated at upwards of $25 billion worldwide, according to BSI.³ The full magnitude and economic impact of cargo theft worldwide is relatively unknown however, because not all of it is properly reported.

² IATA (2017). CEIV Pharma Workshop, presented at: 11th World Cargo Symposium, Abu Dhabi
³ BSI Group BSI’s Global Supply Chain Intelligence report reveals 2015 top supply chain risks [Press release]
SUPPLY CHAINS ARE SCRAMBLING FOR SIGHT

Demand-driven supply chains demand better collaboration and communication to create a seamless customer experience. Companies are scrambling to keep up, enable greater visibility, reduce risk, and contain disruptions across their supply chain.

Prevalent technologies for tracking inventory and shipments include barcode/RFID scanners, GPS, and other geolocation services. They’ve been in use for some time now, but they’re far from perfect.

RFID, for example, provides visibility only within the confines of the enterprise. It fails as a global, real-time monitoring solution for the location and condition of shipments because it depends on manual scanning for updates.

Most off-the-shelf track-and-trace technologies are cumbersome to use and integrate with other systems. Some of them also run on expensive software, with complex hardware installations and non-scalable web applications to boot.

Most inventory and asset tracking systems are often nothing more than glorified record keepers with extra bells and whistles, using static logs or Electronic Data Interchange (EDI) that does nothing to add context and real-time intelligence to data.

Data in such systems is incomplete, siloed, and non-actionable.

Even if these tracking and monitoring technologies are integrated into Enterprise Resource Planning (ERP) systems, Transportation Management Systems (TMS), or Warehouse Management Systems (WMS), they stumble when trying to meet today’s dynamic supply chain needs, particularly due to their inability to automate and foolproof the collection and processing of data.

What’s missing is the detail, a degree of condition and location-based intelligence into physical goods and assets. It’s those extra dimensions in data that shed more light on situations, both simplifying and improving the decision-making process.

Without real-time visibility into the location or condition of materials, shipments, and assets in supply chains — and the contextual information that goes with them — supply chain managers and field personnel are unable to make effective decisions that fulfill goals like:

- Reducing risks
- Improving security
- Streamlining revenue
- Minimizing disruptions
- Improving predictability
- Reducing unnecessary spends
- Maximizing operational efficiency

The Internet of Things (IoT) is changing things though.

It’s redefining the limits of best-in-class supply chains, making these — and grander — goals more realistic, allowing supply chain management to drive continuous improvement.

The Internet of Things in tandem with the Cloud and Big Data is also bringing best-in-class supply chains within easy reach.

Making a decision is rarely a black and white affair.

You need information — as much as you can get your hands on — to make an informed decision. There’s no two ways about it, and anything less amounts to little more than gambling.

Know more about the evolution of supply chain visibility solutions
IOT SENSORS—ENABLING SIGHT (AND FORESIGHT) IN THE SMART SUPPLY CHAIN

The Internet of Things has the potential to allow everyday technology — even everyday objects laden with sensors — to communicate using a web-based system, coordinating functions with or without human intervention.

There is a rapidly growing network of connected objects, and it’s already collecting and exchanging data using embedded sensors.4 Companies know that context-aware, location-based applications and services will change how their enterprise engages and serves their customer, but they’re still struggling to link IoT-based technology with concrete processes that affect business outcomes.

They are learning though.

For starters, they learned that existing technologies for tracking can give you loads of data, but it’s usually stale.

Most prevalent tracking systems use manual or semi-automated logging methods, and the data resides on readers, within loggers, or in someone’s excel sheet. It takes a while before records are updated, forwarded, and reflected uniformly across the enterprise.

Until you get an alert from your inventory management system, or worse, an attachment from your inventory manager, you really have no concrete idea where your inventory stands.

IoT is changing that.

A broad application of IoT in logistics improvement is using sensor-based tracking devices that are fixed to inventory, shipments, or in-field assets. These sensors provide location, proximity to other tagged items, as well as other data like altitude, temperature, vibration, or motion — while also making it available to every relevant stakeholder across the enterprise.

Live data streams from the sensors also allow you to take stock of your supply chain in a heartbeat.

It doesn’t stop there either.

Live sensor data allows managers to make better decisions based on real-time intelligence. It enables supply chain responsiveness like never before, without the significant spends that you’d normally expect.

Real-time condition and location data gives you a granular view into the immediate location of shipments or assets as well as the condition they’re in. When that visibility is tied into additional context from weather reports, traffic updates, past patterns, and robust statistical analysis, you know more than where things are, you can tell where they’re going.

Supply chain management just went from Reactive to Proactive.

BETTER DATA = BETTER DECISIONS
FIRE UP YOUR SUPPLY CHANGE WITH ANALYTICS, MACHINE LEARNING, AND AUTOMATION

The Internet of Things is big on data — gathering it, sorting it, understanding it, and most importantly, USING it.

The information you need stems from data; reams of data, gathered meticulously over time, from external sources or your own, which is then carefully sorted and analyzed to give you the insight you need to make a more informed decision.

Such data, gathered by IoT devices, when properly sorted and filtered, is transformed into valuable business information.

Over time (not decades, we’re talking less than a few quarters here) your system should be able to use precedent for predictive insight.

Toss in external data feeds in addition to real-time monitoring, live pattern analysis, and heuristic predictive modeling, and you’ve got a recipe for supply chain responsiveness that’s guaranteed to keep you ahead of the curve.

You can either manage the data and its analytics yourself or outsource it to someone who knows what they’re doing.

No points for guessing what’s the better choice.

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No points for guessing what’s the better choice.

A competitor will explain it to you eventually.

Data-driven real-time smart chain analytics won’t just give you a better idea of cause and effect, you’ll be able to see things coming. And yes, you’ll be able to automate annoying things like paperwork and reports as well.

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You can step up your game, changing from route optimization to dynamic route optimization for instance.

If you’re not sure about the difference, that’s alright.

IOT CONNECTS, BLOCKCHAIN BUILDS TRANSPARENCY AND TRUST

Using Blockchain with a good IoT data analytics and machine learning platform can drive the development of trustworthy, tamper-proof, and broker-less information exchange systems that will eliminate the inefficiencies in traditional processes.

Blockchain in logistics ensures proper identification and accountability among trading partners.

While the concept is still in its nascent stage for the supply chain, Blockchain has the potential to provide end-to-end chain of custody proof for transactions among manufacturers, insurance companies, freight brokers, transportation carriers, 3PLs and customers.

In the 3PL industry for instance, a freight forwarder can share only relevant parts of the shipment’s paperwork with a trucking, ocean, or air carrier without splitting up the original, maintaining the integrity of the document. Some other areas where Blockchain would be a great fit is electronic document transfer, which requires acknowledgments by all parties involved, such as for ePODs which move from consignee (customer) to the transporter to the manufacturer.
THE 5 ESSENTIALS OF AN IOT ENABLED MONITORING SOLUTION FOR BETTER DECISION-MAKING

These 5 pillars of your IoT success form the basis of creating a good RFP when you’re looking for a real-time shipment or asset monitoring solution for your supply chain.

<table>
<thead>
<tr>
<th>CAPTURE DATA</th>
<th>TRANSMIT DATA</th>
<th>ANALYZE DATA</th>
<th>SUSTAINABLE BUSINESS MODEL</th>
<th>ACT ON DATA</th>
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</thead>
<tbody>
<tr>
<td>• Ability to provide vehicle, container, pallet, asset, or package-level visibility.</td>
<td>• Multiple locating options (GPS, cellular triangulation, Telco LBS, etc.)</td>
<td>• Ability to provide analytics for decision making with device and customer data, past patterns, and external data streams like weather, vessel data, traffic data, etc.</td>
<td>• Definitive reverse logistics model in place to return IoT tracking devices that aren’t disposable.</td>
<td>• A trained team of frontline experts in place to put data analytics to prompt action 24x7.</td>
</tr>
<tr>
<td>• Sensors such as humidity, temperature, tamper, shock, tilt, and speed.</td>
<td>• Ability to transmit through multiple modes (GSM, Wi-Fi, NB-IoT, LoRa, etc.) for high uptime.</td>
<td>• Cloud agnostic, ability to integrate seamlessly with enterprise software.</td>
<td>• Pay-as-you-go plan to prevent sunk cost.</td>
<td>• Live investigation and problem solving.</td>
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<td>• Data logging when no network coverage, with buffered transmissions.</td>
<td>• Flexible reporting intervals</td>
<td>• Ability to handle data securely, complying with stringent data handling regulations</td>
<td>• Normalizing smaller disruptions before it affects the entire supply chain.</td>
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<td>• Remotely configurable with an “Always ON” option</td>
<td>• Automated error correction</td>
<td>• Great data processing, data representation, UI, &amp; UX. Ability to show you the big picture while making it easy to deep-dive into details.</td>
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<td>• Battery life lasting the duration of the operation.</td>
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<td>• Security, auditability, and transparency in data; possibly through Blockchain.</td>
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<td>• Regulatory compliance for airlines, material handling &amp; safety, or other country-specific guidelines.</td>
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<td>• The ability to sense and protect from jamming.</td>
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Be Smart in Selecting Your Smart Logistics Partner Check out our IoT RFP building guide
BETTER DATA IS DRIVING BETTER DECISIONS, MAKING ENTERPRISES SMARTER

Enterprises across industry verticals are leveraging the power of real-time actionable data to run smarter, and more importantly, improve their bottom line.

Real-time Monitoring → Real-time Security + Real-time Inventory

A leading Pharma company wanted to improve security for its sensitive pharmaceutical product shipments. By tracking in real-time, they were not only able to secure their sensitive packages better, but also use the data to help with better inventory planning, improved ETA predictability, and a 50% reduction in shipment delays.

Real-time Monitoring → Real-time Inventory + Instant Inventory Audits + Easier Stock Retrieval + Operational Capital Savings

A large manufacturer of copper cables wanted to make it easy to track inventory in storage and in transit. Tracking stocks in real-time helped the company audit inventory at the click of a mouse, and more importantly, reduced the time they took to fetch specific stock in large warehouses by days. The shorter order-to-cash cycles helps them save big on borrowed capital.

Real-time Monitoring → Real-time Invoicing + Operational Capital Savings

A large bicycle manufacturer and distributor needed to speed up their paperwork so they can collect dues faster. By using real-time tracking with an electronic Proof of Delivery (ePOD) through SMS or smartphone apps, they’ve reduced payment cycles by more than 2 months.

Real-time Monitoring → Real-time Inventory + Realistic ETAs + Production Predictability + Better Security + Better SLA Enforcement + Carrier Benchmarking

One of the world’s largest tire manufacturers needed to track the raw rubber shipments brought into its factories by 3PLs, making sure they’re more punctual so production planning was easier. By using real-time location tracking and deviation alerts, they were able to meet their window of delivery, improving on-time delivery by more than 25%, while also improving their security and reducing incidents of theft and pilferage to 0%.

Real-time Monitoring → Real-time Inventory + Proof of SLA Compliance + Reduced Shipment Damage + Realistic ETAs + Carrier Benchmarking + Geo-specific Inventory Optimization + Operational Capital Savings

A leading European sports car manufacturer needed to track the finished vehicles that they shipped out to dealers. Real-time monitoring helped them track not just their shipments, but it also helped them establish beyond doubt that the product was transported and handled properly during its multi-modal journey prior to delivery. It also helped the company benchmark carriers as well as detect and avoid routes that were more prone to shock or damage, ultimately reducing risk and the cost of shipping replacements. They’re now planning to share live shipment tracking data with consumers who custom-order their vehicle, enhancing the brand experience from order through to final delivery.

Real-time Monitoring → Real-time Inventory + Proof of SLA Compliance + Reduced Shipment Damage + Realistic ETAs + Carrier Benchmarking + Operational Capital Savings

A Fortune 500 distributor of pharmaceutical and medical supplies needed to manage its LTL fleet for dedicated “last-mile milk run” deliveries to health care facilities in a major city. Through real-time monitoring and alerts, specifically about truck movements and conditions inside trailers, the company improved its logistics operations. The data gathered also helped improve bad planning, inventory planning, and other operational activities, driving continuous improvement.

Real-time Monitoring → Realistic ETAs + Operational Capital Savings + Greater Customer Satisfaction

A giant in the consumer parcel delivery space needed to manage its last-mile deliveries across major cities. Through real-time tracking as well as advanced AI algorithms, the company predicts the time of delivery within a window of 15 minutes, with more than a 60% chance of actually hitting that window.

Several other companies are doing much more than they could before thanks to the IoT advantage in their supply chains. Drop us a line to know more.
Companies need to recognize more than the advantage of end-to-end visibility and smarter supply chain management, they need to understand what it is to have the "real-time" IoT edge.

Smart and thoughtful design, ease of implementation and use, fewer errors and disruptions, seamless integration with existing enterprise management systems, these are the hallmarks of a good supply chain tracking and monitoring system.

We’re already at a point in the technology timeline where GPS tracking, automated sorting/routing and handling, as well as pattern analysis and data analytics are relatively commonplace, making a huge difference to supply chain operational efficiencies and the bottom line.

There’s still plenty of scope for improvement though, especially in the tracking technologies themselves.

- The supply chain can be a hostile work environment, and the hardware in place to gather data needs to be rugged enough to survive without being so bulky that it’s a bother.
- An ocean of data without a good analytics platform stunts the insight and ROI from a tracking solution.
- When you’re tracking assets in remote areas of the world, across geographies, over multi-modal shipments, or deep indoors — gaps in connectivity can knock the “real-time” out from data and alerts.
- Without measures in place to act on real-time information, even the most cutting-edge monitoring systems can be reduced to nothing more than electronic scribes.
- And of course, there’s the cost of saving costs; a brilliant online tracking and monitoring solution that promises tremendous return on investment usually needs a fair bit of upfront investment itself, which can force even the most strategic long-term supply chain managers to settle for what’s within reach here and now.

The Internet of Things could remedy these issues, allowing prevalent supply chain tracking solutions to overcome such limitations. The more evolved real-time monitoring solutions of tomorrow will rely heavily on the IoT edge to overcome the limitations of its predecessors. Supply Chains (and customer expectations) are becoming increasingly unpredictable. Shippers and logistics companies today need to cope, be smart, and deploy the right technology that gives them the intelligence and edge they need to stay ahead of the curve.

Ask us how you can create a best-in-class global digital supply chain.
ABOUT ROAMBEE
Roambee is a logistics and asset monitoring data company that offers comprehensive smart supply chain solutions worldwide.
We’re on the forefront of new technologies, developing the industry’s first in-warehouse + in-transit solution for package-level and asset monitoring.
We’re always developing solutions for end-to-end visibility and better supply chain management, constantly challenging the limits of what’s possible through real-time data-driven supply chain management.
Using an entire ecosystem of Bees and BeeBeacons for real-time supply chain and asset monitoring, we’ve helped over 150 businesses across the world achieved dramatic efficiencies across the world.
More than 80% of shipments monitored using Roambee’s services are delivered on or well before time through the discipline, trust, visibility, and the predictability that’s only possible through the logical handling of logistics operations.
Roambee’s reliable IoT-enhanced monitoring, trustworthy analytics, real-time alerts, and pay-as-you-go service model make it a cost-effective global supply chain & asset monitoring and analytics solution. Whether it’s in the warehouse, in transit, or in the field, we deliver actionable information and location-based intelligence that’s both easy to use and easy to integrate with existing enterprise systems. We specialize in using the power of real-time data to enhance operational efficiencies, customer experience, and your bottom line.
Need help with problem-solving, rapid response, or making the right call? We can help you keep track & keep things on track.
Know More, Now.
Contact Roambee.
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