IoT is changing the way supply chain and logistics are managed. We polled 600 supply chain decision-makers to learn about their existing and future plans for leveraging IoT within their operations.

**A few of the topics include:**

- Biggest supply chain challenges faced today
- Most popular operational visibility technology
- ROI timing and expectations

What industry best describes the organization you work for?

- Logistics Provider: 59%
- Manufacturer or Retailer: 41%
600 total respondents

- 23% have IoT on their roadmap
- 41% already have an IoT solution in place
- 64% have or are planning an IoT strategy

Are you looking to expand your use of IoT?

- Yes: 87%
- No: 13%
Most retailers, manufacturers and logistics providers are looking for location information. This was a similar result to the 2014 edition of this survey. In 2016, respondents are also looking for:

- **Security**
- **Temperature**
- **Speed**

In fact, at least 10% of respondents wanted all listed options suggesting that the complexity and potential behind IoT is clearly permeating the industry. Due to the nature of supply chain, location will always be important, but is increasingly becoming a standard. As organizations within supply chain look to differentiate themselves, gain the upper hand on the competition and increase their abilities to process more data, we will continue to see other types of data gain popularity.

If you can measure it, TimAnn-Box tags can record it!

Using our proprietary "smart" communication protocol, our tags will subsequently ensure that any relevant (status or alert) information is submitted -in real time- to our central back-end system. This system processes in real time and will alert the customer in real time (if applicable).

All data collected by our tags remains available in our central database for historic assessments and predictive analytics.

http://events.eft.com/iot/index-active.php
Some significant changes have occurred in the types of technology executives are looking to invest in to increase their real-time information and operational visibility.

The biggest increase between 2014 and 2016 is in IoT, which now represents the technology where executives are looking to invest.

RFID also has a strong presence amongst respondents despite the long-winded coverage it has received over the past decade as a ‘game changer’. Bar codes and satellite tracking maintain their positions as key technologies used for gaining real-time visibility data.
The main driver for companies to invest in real-time monitoring or data collection is their customers.

As supply chains are strained under competition, technology is proving to be a valuable differentiator and competitive advantage.

Supply chain partners are also looking to be more and more connected to the whole ecosystem, meaning they are increasingly demanding more data from suppliers and providers alike.

TimAnn-Box can provide all the necessary information to facilitate its customers to connect with their ecosystem partners GLOBALLY, IN REAL TIME to ANY SYSTEM.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>To improve customer service with better information</td>
<td>Most Important</td>
</tr>
<tr>
<td>To provide customers with more frequent updates on shipment pick-up or delivery</td>
<td>Very Important</td>
</tr>
<tr>
<td>To improve speed, delivery timeframes through data analytics collected</td>
<td>Important</td>
</tr>
<tr>
<td>To ensure product integrity or quality of cargo in-transit</td>
<td>Slightly Important</td>
</tr>
<tr>
<td>To have real-time insights and information on shipment environmental conditions, i.e. temperature of cargo during shipment, monitor gas and humidity levels</td>
<td>Slightly Important</td>
</tr>
<tr>
<td>To comply with regulations for safety and security</td>
<td>Not Important</td>
</tr>
</tbody>
</table>
The majority of respondents (69%) expect to see ROI in the next 24 months.

The majority of executives believe they will see an ROI in the first 12-18 months.

In working through the 2014 data, we were able to follow-up with respondents who then predicted they would see ROI in the coming 24 months. Around half of them had achieved the predicted ROI while the other half had yet to see it materialize.

Of those that hadn’t seen ROI, the most common reason was because of delays in their IoT implementation. This left most of those not yet seeing the ROI confident they would as soon as their IoT project was back on track.

The TimAnn-Box solution is OPEX based (so no need for investments) and aims to provide IMMEDIATE, TANGIBLE benefits for our clients.
In finding this out, half of all investments in IoT have achieved their ROI.

For those that have not achieved ROI, there were a number of reasons including:

- IoT project delays due to external factors
- Crisis mitigation delaying IoT project

All respondents still expected to achieve IoT ROI as soon as the project was back on track.
Technology investments have clearly taken off between 2014 and 2016 as the number of respondents using the following increased:

- GPS and satellite increased 5%
- Data logger increased 14%
- IoT sensor and monitoring technology increased 19%

Usage has remained steady for RFID and bar codes which indicates a general shift towards more technologically advanced solutions.
In which area are you looking to improve operational visibility the most?

- **Land shipments** - 80% are looking for solutions
- **Air shipments** - 50% are looking for solutions
- **Sea shipments** - 33% are looking for solutions

Shipment visibility needs seem to correlate most with volume as well as complexity. Given the number of variables of land shipments, it’s not surprising to see it as the area of most need.

Our plug and play tagging solutions are MULTI MODAL, GLOBAL and DO NOT require any changes to existing logistical processes and procedures.
Most respondents are looking to monitor over 10,000 shipments per year. This is reflective of a number of factors:

- **Most respondents are looking to implement visibility on high-volume shipment areas such as ground**
- **Respondents are clearly seeing a return on real-time monitoring and aren’t looking to implement it as a one-off**

- **53%** of respondents are monitoring 10,001+ shipments per year.
- **24%** of respondents are monitoring 1,001-10,000 shipments per year.
- **12%** of respondents are monitoring 1-500 shipments per year.
- **11%** of respondents are monitoring 501-1,000 shipments per year.

✅ The TimAnn-Box solution is fully scalable (volume) and flexible (customers can select which shipments are in need to be end-to-end monitored)
Most respondents feel that cyber security is a moderate threat to their IoT strategy with only 5% of respondents seeing it as a non-threat. Clearly this is going to be a factor playing on IT executive’s minds as they make purchasing decisions in the area, however it doesn’t seem to be severe enough to deter investments in the technology.

The TimAnn-Box solution architecture protects us and our clients from known cyber threats and manipulations.
What do you primarily use your IoT network for?

Users were relatively split on their usage of IoT. That being said, **59% were using IoT for alarms and real-time monitoring rather than for optimization and prediction**. The data boom in supply chain means that alarms and real-time monitoring often serves as the entry-level application of IoT. As an organization’s IoT strategy evolves, optimization and prediction play a greater role. The more IoT matures as a technology, we are likely to see optimization and prediction take over the majority in this chart.

![Circle chart showing 59% for Alarms and Real-Time Monitoring and 41% for Optimization and Prediction.]

✓ TimAnn-Box says, why make a distinction between Alarm & Real Time monitoring and (providing input for) predictive analytics? Using one, in-memory database, our systems, by design, - provide alerts in real time - track any status and location data in real time - facilitate any data mining and predictive analytics

What percentage of your IoT data do you analyze?

With so much data incoming, it’s hard to imagine that every organization is able to analyze everything.

In fact, 61% of respondents are analyzing less than half of their IoT data. This underpins one of the biggest challenges and potentials hidden within IoT; leverage all the data collected. This also speaks to IoT usage: over 58% of implementers are using IoT for alarms and real-time monitoring rather than prediction and optimization. As data reaches a critical mass and customers demand more complex scenarios, we can expect to see a greater percentage of data analyzed. There is one caveat to this: which will grow at a quicker rate? Incoming data or analytical abilities.

✓ Rather than overflowing the customer with raw data, TimAnn-Box processes tracking data to the demand of the customer.

✓ As we store all data received from the tags in a single database, we can make any data available to the client for historic event assessment or predictive analytics.

http://events.eft.com/iot/index-active.php
Most retailers, manufacturers and logistics providers are looking for location information. This was a similar result to the 2014 edition of this survey. However, there’s been a distinct change as significant numbers of respondents are also looking for security, temperature and speed related data.

At least 10% of respondents wanted all listed options, suggesting that the complexity and potential behind IoT is clearly permeating the industry.

Due to the nature of supply chain, location will always be important, but is increasingly becoming a standard. As organizations within supply chain look to differentiate themselves, gain the upper hand on the competition and increase their abilities to process more data, we will continue to see other types of data gain popularity.

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IoT networks are extensive - indicative of the small percentage of total data actually crunched by organizations. Half of respondents are collecting data right down to third party mobile assets. **Over 20% of respondents are collecting data all the way down to their supplier’s IoT networks.** Integration is significant, and the more we track this area over the years we are likely to see greater IoT penetration further into the supply chain.

![Bar chart showing data collection percentages from different sources.]

- Rather than relying on data collected by others, assessing its reliability and subsequently translating it into valuable information, we facilitate our customers to, themselves, track their entire transport chain
  - Globally.
  - Independent of any (third party) service provider.
  - Without the need to change any existing logistical (execution) process.

Data management is the biggest cost barrier for those looking to expand their IoT investment. This is an expected barrier given the amount of data being produced and the limited amount (roughly 50%) that is being analyzed. In addition, with most IoT users implementing the technology for alarms and monitoring rather than analytics, the inability to manage data might slow adoption of more advanced forms of the technology.

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Despite the cost barriers to implementing IoT, most IoT users are looking to expand their usage. This is a trend we’ve seen throughout the report from the number of shipments users are looking to track to the growth in IoT usage as a go-to technology for gaining real-time visibility. In comparison to 2014, even more IoT users are looking to expand their use of IoT.
Improving customer service with better information is the main driver for further deployment of IoT. While this is similar to why companies are looking to initially invest in IoT, those looking to expand their usage are also seeing benefits from using the technology as a competitive differentiator through offering new service capabilities. This really speaks to the benefits IoT implementers are seeing in terms of customer service, competitive differentiation and driving new service capabilities.
Between 2014 and 2016 IoT clearly jumps into the lead as the go-to technology companies are looking to invest in to achieve visibility over their operations. Machine learning - using artificial intelligence to facilitate new levels of automation - which was a new inclusion this year made a significant impact at 21%. Because this technology is heavily reliant on data streams, it actually tends to be complimentary to IoT rather than a visibility substitute. Most importantly, we’re seeing a clear shift in preference towards IoT and away from some of the more traditional visibility tools - bar codes, RFID etc. This trend is only going to be further entrenched as companies continue to see ROI from their IoT investments.
The 24 month threshold generally remains true for those organizations that have already implemented IoT previously. However, compared with 2014, two distinct groups start to form. On the one hand, the bulk of organizations were now realizing their ROI faster than in 2014 with most selecting 12 months or 18 months. On the other hand, the 36 month threshold also increased. Effectively IoT ROI is changing dynamics which is likely being driven by the nature of IoT roll-outs. Given that this group has already invested in the technology, they will have a better understanding of the expected ROI timeframe. It also means that this group is more likely to be pushing IoT further by adding complexity and thus slower ROI than the group that hasn’t yet implemented IoT. During our follow-up interviews, we also found that 50% of respondents from 2014 had realized the ROI of their additional investments within their expected 2-year time-frame.

What is your expected payback or ROI timeframe?
What are the biggest challenges you have in the supply chain today?

The biggest challenge for respondents was the timeliness of information. This speaks strongly to a number of the archaic systems still in place for transferring information between partners and the potential IoT can play in solving some of these critical problems. Rather than relying on 3rd party organizations to transfer information, IoT is enabling the automation of these processes and provision of information in real-time. IoT also plays a significant role in tracking inventory across the supply chain and ensuring certain aspects of the consistency of suppliers.