How to Choose a Cargo Container Security Tracking System

May 3, 2018 - **Premsai Sainathan**
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There are many tracking systems that claim to help you protect your containerized cargo. In this article, we will examine the type of cargo container security tracking system you need at every stage in your container's journey - when in-transit, at ports, airports, at container yards, and how you can get integrated visibility and security throughout.

A good container tracking system must be able to tell you what is possibly going wrong with the goods in your container at every stage in its supply chain.

So, what are the different stages in a container's supply chain?

Let us assume that you are shipping a container from Sao Paulo in Brazil to Abu Dhabi in the UAE.

Your container leaves your factory premises located in the outskirts of Sao Paulo on a trailer-truck and hauled to the nearest port, the Port of Santos. From the Port of Santos, it leaves on a ship and arrives at the Port of Dubai in the UAE. From here, it is either ferried by truck or by rail to Abu Dhabi, its final destination.

Your container underwent two trips on surface, one by sea, and transited through two ports in the process, not including any container storage yards at your origin or the destination.

Therefore, containers are always a complex multi-modal shipment.

The question here is: What are the security aspects that a tracking solution must address across the legs of this journey.

Container Tracking on Surface – First & Last Mile

You need a solution which will not only protect your container, but will also protect your goods!

GPS vehicle tracking systems are often employed in this leg of the journey. Wired vehicle tracking devices are attached to the fleet that haul the container.

The problem with this approach is that:

1. Most trucks are rented from the market aka “market vehicles.” Therefore, you cannot deploy a GPS tracker on a truck unless you own it. Most shippers do not own their fleet.
2. If you are shipping by rail, chances are that you will hardly have any visibility. Even if your rail service provider tells you where the locomotive is, you may not know if your container is actually travelling with it or it was dis-shunted a station ago.
3. The items from your container can still be stolen and you would have no idea it happened by tracking the vehicle alone.

There are many more reasons why vehicle tracking systems failed for logistics. See all of them here!

Therefore, what you require for cargo container safety is a portable wireless device which can travel with your goods. The device must have good network connectivity even when it is placed inside a thick-walled container, such as a reefer container.

There is more that is required for your container to remain secure during its first or last mile journey on surface.

- It is not enough that you know the location of your container, you must also know if the container has been opened or damaged. This is where the right choice of sensors come into play.

Light sensors or circuit breakers can indicate if a container has been opened, while shock sensors can indicate a possible impact which could have caused some damage to your goods.

Damaged containers lying in the middle of nowhere are most susceptible to cargo theft.

- Another important piece of the puzzle here is connectivity. Your device must have the ability to connect across multiple telecom towers so you never lose contact with your container ever!
- Last, but not the least, you need item-level visibility of your goods within your container, especially if they are of high-value. Not every GPS solution (even with portable GPS trackers) can provide this in a cost effective manner.

Learn how you can monitor at an item-level when your goods are in-transit.

Container Tracking at the Port or Airport

With more cargo came bigger ports (and airports). Infrastructure developed and convenience improved. But, this also became a problem in terms of container loss and theft.

Containers often get lost within the premises of a port or an airport. They could get stolen or be simply lost due to the inability for the port authorities to find them among a sea of containers.

Many ports and airports lease large stretches of land around them to stock containers upon arrival, and move them to the exit point only after customs clearance is completed. This process could take anywhere from a few days to a few months, and security is not always watertight in these yards.

Containers could get damaged or goods pilfered.

The Los Angeles port for instance handles 19.3 million TEUs every year[1]. That is a massive 52,000 containers handled per day, almost 1/3rd of the passenger baggage volume that London's Heathrow airport handles in a day[2]!

At such high volumes, even if 0.01% of these containers go missing or cannot be found due the location or rack wrongly recorded, it could mean a loss of 5 whole containers per day.

Assuming each container is worth $250,000, and insurance only covers for 90% of that cost, it translates into a $1.25 million loss for the port daily or an annual loss of $456.25 million.

The customer's business rhythm gets affected too which will force them to finding alternate shipping routes, sometimes with the freight being costlier.

Solutions like RFID do not work well for port-level monitoring, especially when it comes down to identifying where container is placed and precisely which rack it is on. RFID based solutions also have heavy infrastructure requirements.

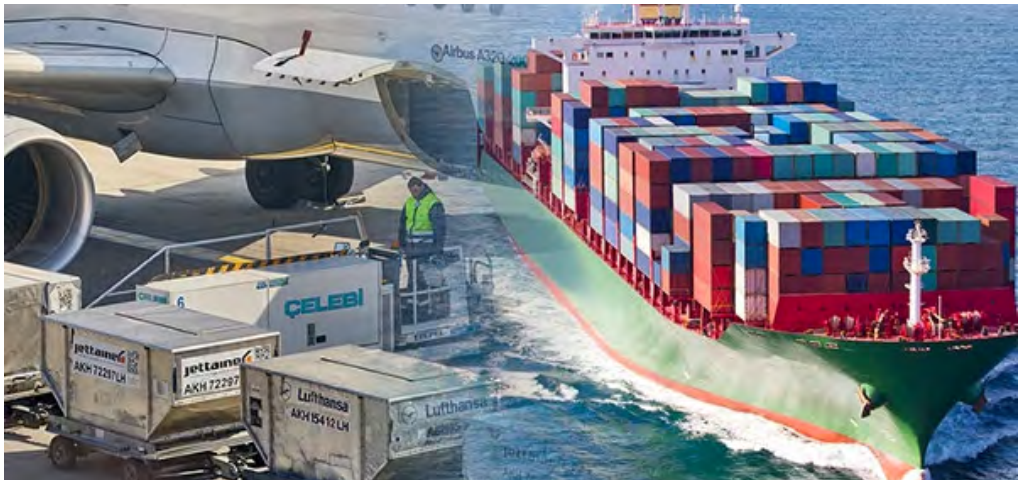
The type of solution that will work for cargo container security at a port-level is one which can monitor the precise location of a container (within a few feet) and also identify the rack it is on.

The IoT device which you use for tracking the surface transportation of your container will give you the location, but not height. Further the location will only be accurate if the IoT device is equipped with an active GPS antenna that can connect with satellites even when placed inside a container.

Knowing where your container is with a circle of inaccuracy of even a few meters could mean you are searching for it in a different yard altogether – not solving the problem.

You can either rely on a smart port which has such a solution or monitor your container by yourself using the right IoT device with active GPS antennas.

Container Tracking on Sea or Air



When your container is on high-seas or in-flight, it is relatively safer as compared to when it is traveling by surface or is waiting at the port.

No one can steal your container when it is on high-seas, except, maybe pirates!

Does this mean that there are absolutely no risks in this stage of the journey?

No really! The type of risk is different. It involves damage to your goods due to inclement weather, rough handling during the journey or container rain.

Therefore, using an IoT device which has sensors to read temperature, pressure, humidity, and shock, especially for cold chain temperature-controlled or fragile shipments, becomes critical.

If the device is able to connect with the ship's Wi-Fi, it is of advantage because you can get the sensor data live.

You may still not get a GPS fix easily though (especially if your container has thick walls), which means that getting real-time location on your container's status may still be difficult.

Knowing where your container is when your goods condition is affected, and knowing how much time you have to fix the problem before it reaches the port is critical to protecting your goods, therefore location becomes vital.

Collecting data streams from shipping platforms on the vessel's location and flight tracking platforms can help solve the real-time location puzzle, while the IoT device can transmit sensor data through Wi-Fi (if your vessel allows it).

Single Window of Visibility and Prompt Intervention to Mitigate Container Cargo Security Risks

In short, the type of IoT solution (device and portal) you need for securing your containers on surface could be different than what you need at ports or in-flight.

Therefore, the right IoT solution needs an IoT device which works across multiple telecom networks, connects to a Wi-Fi network when needed, and has the required sensors to sense damage, tamper and spoilage. The data analytics platform must support integration with external data streams to ensure that you are not looking up multiple portals every day based on the leg of the journey that the container is at.

This is a common problem that export logistics managers in companies face! Very few IoT solutions address "end-to-end" visibility effectively.

Assuming you have identified a solution to give you end to end visibility, you will be able to promptly identify if your container is at risk or a security breach has occurred.

But, who is watching for mishaps, and ensuring that the risk is averted?

Probably no one, not even you, because you probably have better things to do during the day at the office rightfully so!

Even with the best container security warning alarms in place, you may be too late in reacting to an incident, even if you do manage to do so.

Therefore, taking some professional help may not hurt. Outsourced logistics control towers, especially if it is data-enabled one like “BeeCentral,” can help you mitigate risks promptly by intervening on time, while ensuring you enjoy an uninterrupted day at the office.

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