



ORBCOMM™

# NEXT PHASE IIOT DATA FOR PORTS AND PORT USERS

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Already used for real-time location and status of millions of trucks, trailers, containers, pallets and other cargo units, the Industrial Internet of Things (IIoT) is set to move into a new value phase for supply chain optimisation, integrating big data from multiple smart assets with powerful tools for descriptive, predictive and prescriptive analytics.

Logistics and transport are entering a time of transformation both on land and at sea, driven on the one hand by rapid advances in cloud platforms, big data, AI, automation, robotics and autonomous vehicles, and on the other by evolving market dynamics including mega-ships, shipping consolidation, truck driver shortages, cross border e-commerce and more regulations.

In contrast to just a couple of years back, digitalisation is increasingly on the senior management agenda as a 'when, not if'

response to manage the complexity and scale of today's supply chain operations to strip out waste and cost, mitigate increased safety, security and sustainability demands and re-purpose logistics for the on-demand era of Amazon and Alibaba.

Increasingly, that includes demand for much more visibility into the complex environment of ports, terminals and other supply chain nodes where multiple assets and public and private stakeholders converge.

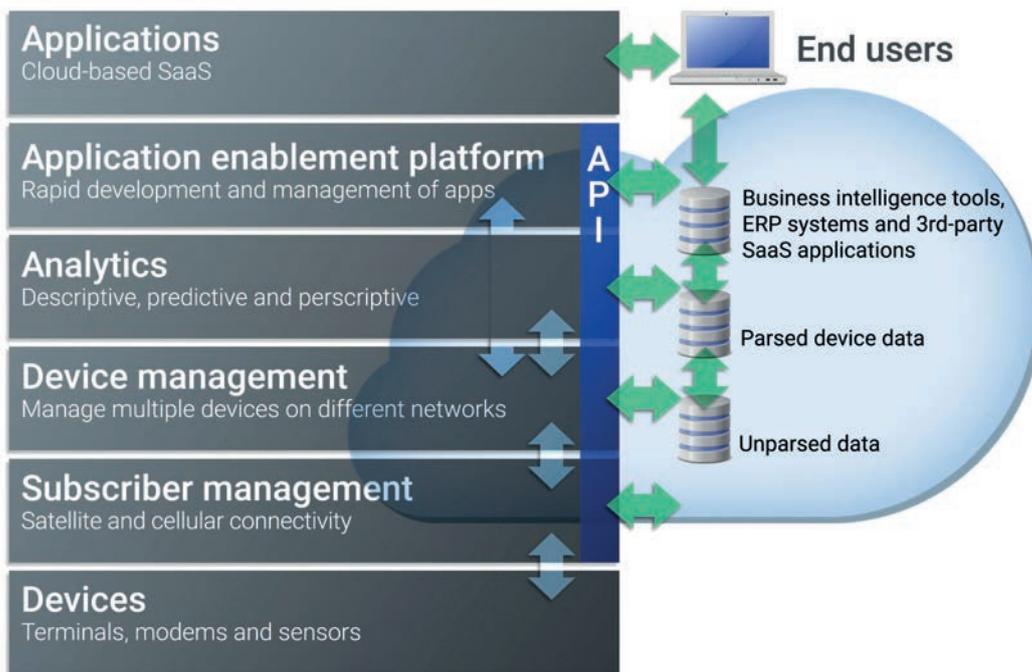
A growing number of port authorities and terminal operators are now seeking to harness data-driven collaboration to tackle internal and external issues around sea and land congestion, utilisation, hand-offs, velocity and security, and more active players in trade and supply chain facilitation.

Ocean, over-the-road and intermodal carriers are pursuing digital initiatives to make their business run more efficiently

and effectively, including better utilisation and scheduling of fleets and drivers.

Shippers and 3PLs are looking to harness data for more proactive end-to-end supply chain planning and management, connecting the dots between production, distribution, logistics, transport and consumption; whereas governments seek better trade facilitation, safety, security and regulatory compliance.

From an operational, commercial and regulatory perspective, what all these digital initiatives share is a need for comprehensive, automated, systematic visibility to events, processes and status. But all too often, the data underpinning international trade and transport, even in today's digital era, remains after the fact, fragmented and unreliable. That's not surprising, given how much manual keying and rekeying is still involved.



## INDUSTRIAL INTERNET OF THINGS

Worldwide, we are seeing an explosion of connected technology, which exploits technological advances and reduces costs in telematics devices, sensors, applications, software and communications networks, including cellular, satellite, LAN/WAN, RF and near-field technologies like Bluetooth Low Energy (BLE) and Zigbee.

The number of connected Internet of Things (IoT) devices worldwide will jump 12% on average annually, from nearly 27 billion in 2017 to 125 billion in 2030, according to analysis from IHS Markit [1]. In its latest report, Berg Insight says the market for cargo load tracking devices (trailers, containers and pallets) will top 8.9 million by 2022, up from 3.7 million in 2018 [2], without counting all the other connected assets in the supply chain, including trucks, cranes and handling equipment. Analyst Frost & Sullivan predicts that the global installed base of connected trucks will exceed 25.7 million units this year.

Industrial Internet of Things (IIoT) telematics are now enabling shipping and transport companies to track not just in-transit and geo-fenced location for their trucks, trailers and containers at any given time, but also the actual status of both asset and cargo – from loaded vs empty, internal temperature/atmosphere, shock, motion, fuel and oil levels, to tyre pressures, door open/close, device on/off, tampering/intrusion and more.

Undoubtedly the most high-profile and large-scale adopter to date is Maersk Line,

with its remote container management programme that has seen around 300,000 refrigerated containers equipped with IIoT telematics from ORBCOMM. Other large-scale deployments include US transport major JB Hunt, installing ORBCOMM's solar-based IoT tracking devices with integrated cargo sensors on more than 90,000 intermodal containers and trailers.

While satellite and terrestrial AIS is well established for tracking vessels at sea, until recently the ocean leg has been something of a black hole for monitoring container-level shipments. However, the visibility gap is closing with developments in private shipboard cellular networks. An example is US regional carrier TOTE Maritime, which is using IIoT telematics on containers together with vessel GSM networks for real-time visibility and control of reefer shipments at sea, between ship and shore, in ports and inland.

The historic gap between truck, trailer and container tracking is also closing with the latest generation of IIoT cloud software that allows data from multiple asset types to be aggregated and viewed on a single cloud platform.

So why is this so important to smart ports and supply chains?

Well first, the critical issue here is that data gathered from smart containers, trucks, trailers and other connected assets is reliable, real and real-time. It shows what is actually going on, versus what was planned or anticipated. This shines a light not just on carriers' fleet operations but

also on overall supply chain performance. And that includes complex traffic flows to, from and within ports. Track the unit, track the process.

## CONNECTED VISION

In the future, we can expect to see ever more IIoT data sharing platforms, networks and ecosystems emerge, where multiple parties can access the same aggregated information and have a 'single version of the truth'. Maersk, for instance, is now sharing live data from its smart reefers with customers and says that it plans to extend that visibility to transport chain partners, including ports. Of course, the carrier already now has a window into the location and status of all its reefer boxes at ports and terminals worldwide, with obvious benefits for identifying problems such as unplugged and malfunctioning units or reefers set at the wrong temperature.

As we amass and aggregate huge volumes of data from all these connected things, IIoT will increasingly power analytics, AI and ML engines to uncover new insights and help drive deep change in how all the parties manage the complex business of international trade.

Consider the case of a trucking company that could use IIoT analytics to profile and benchmark average wait times in different ports and more dynamically assign drivers to ensure hours of service compliance. Or ports that can see exactly what trucks and ships will arrive when and proactively manage traffic flows. Or carriers that can



accurately predict in advance which reefer units need to be taken out of service for maintenance. Or a shipper that can be informed in advance that its cargo is not going to arrive on time, allowing it to take corrective action to avoid supply chain breakdowns. All these things have been imagined for years. Now they are starting to become reality.

Now the software exists to integrate data from many different types of supply chain and transport assets on unified IIoT platforms – whether cloud-based or enterprise systems – new possibilities are on the horizon.

The current and next generation of IIoT technology will be central to digital transformation in ways we probably don't yet even grasp - not least when we start to consider the potential of combining it with blockchain, AI, ML and big data analytics. There is still a lot of work to do at industry and government level to manage this huge transition and a key challenge will be to create a new regulatory framework for the digital era. But the industry is starting to see things differently. And that future is visible, smart and connected.

**START SMALL, SCALE FAST**

To take advantage of the growing opportunities from IIoT, senior management, operations and IT executives need to find comprehensive IIoT platforms that can incorporate various technologies and devices, are scalable across users, business units and enterprises and are flexible enough to enable new use cases. This can be done by investing in a comprehensive IIoT solution stack.

Starting at the bottom of the stack are the tracking and sensor devices. Being

device “agnostic” i.e. able to pull in multiple technologies from multiple suppliers, is crucial here. This is followed by connectivity - GSM, RF, LAN/WAN, satellite and/or other communications networks as needed - to prevent any “dark spots”. The next layer is device management – the ability to manage the lifecycle of an IIoT device.

The following two layers include analytics, which can be descriptive, predictive or prescriptive, and application enablement, which means that you can take the information that is being generated to enable use cases which can take the form of purpose-built SaaS applications and can be integrated with your existing enterprise systems or available via the cloud.

Picking the right supplier based on factors such as track record, technical expertise, support capabilities and financial stability is crucial to ensuring ROI and cost of ownership benefits. So too is future-proofing, including not getting locked into a proprietary silo. The future lies in platforms which are open, standards-based and agnostic, where users can incorporate different IIoT technologies and rapidly enable new use cases. The key to all of this is execution. We advise companies starting out on the IIoT journey to think big but start small with a PoC or pilot, then scale fast with the infrastructure, platforms and tools.

With the right vision, right technology and right suppliers in place, the IIoT has the potential to become central to supply chain and port operations, driving value and generating ideas for new business services. Companies that embrace it today will give themselves an important competitive advantage over rivals who prefer to rely on legacy systems and traditional models.

**REFERENCES:**

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**ABOUT THE AUTHOR**

Al Tama has more than 12 years of experience delivering mission-critical systems to shipping lines, marine terminal operators, and port complexes. Before joining ORBCOMM, he served as General Manager at WAM Technologies, which deployed the first large-scale global telemetry control and monitoring system for nearly 300,000 refrigerated containers. He also served as Director of Technology at Mark-IT Services, a leading provider of monitoring and protective services for refrigerated intermodal shipments in North America.

**ABOUT THE ORGANIZATION**

ORBCOMM (Nasdaq: ORBC) is a global leader and innovator in the industrial Internet of Things (IIoT), providing solutions that connect businesses to their assets to deliver increased visibility and operational efficiency. With over 2 million subscribers and counting, the company is the largest satellite IIoT and M2M player in the world and provides the most versatile single source for satellite, cellular and dual-mode offerings.

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