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PAUL VAN BENNEKOM, ECT

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FROM THE **EDITOR**



This is the final publication Port Technology will release in 2018, and it marks a highly productive year for us. We've had two successful conferences (CTAC and SPST) and 4 well received editions. Each of the aforementioned has involved automation in some capacity, and this ebook functions as an overview of the key conversations and developments in 2018.

Our first paper herein is from CyberLogitec, who have provided a paper that looks into smart operations in the contemporary port environment. This being probably the biggest trend of 2018.

The second paper is from Containerchain and looks into another key contemporary issue – connectivity. This is very much the future of the industry, with data sharing amongst ports, shippers and the wider supply chain the seedbed upon which future operations are based.

Thirdly, we have a Q&A with Motorola. Motorola are providing a highly interesting offering to the industry in the form of new communications capabilities, and the insight provided in the Q&A shows how new players are entering and changing the sector.

Finally, we have a paper from Tideworks and the Manzanillo International Terminal in Panama. This completes the ebook by looking into real world operations in a key strategic terminal.

Collectively, this ebook offers you an end of year review of the key trends in 2018. However, as we prepare for 2019, this type of publication is something that will be much more common, as we strive to have a much greater offering in the form of e-Journals.

Next year we plan to have 10 e-Journals, and 2 print editions, meaning we'll effectively have a total of 12 editions during the calendar year.

Before this begins, please enjoy this final publication of 2018 from us, and I wish you all a merry Christmas and a very happy new year.

Richard Joy
Editor

A handwritten signature in black ink, appearing to read 'Richard Joy'.





SMART IS THE NEW SMALL



CyberLogitec

Jake Jung-Taek Kim, Cyberlogitec, South Korea

Digital transformation has been bringing sweeping changes across all industries. In shipping, the evolution has been progressive but slow. Ironic for an industry that has a key role in almost every industry in the global marketplace today. According to the International Maritime Organization (IMO), over 90% of the world's trade is carried by sea. But the reality is the shipping industry has been experiencing the drag of slow growth hampered by great operational complexities, stiff competition, evolving cross-border challenges and shrinking margins.

Overcapacity and uncertainty in the global economic and political climate have been keeping freight rates depressed, while rising oil prices, vessel charter and operational costs add pressure on shipping lines to run a tighter ship. In order to move more, and move faster, carriers have been trending towards bigger vessels that can carry bigger cargo volumes to achieve higher economies of scale. These mega ships need larger ports with the capacity, equipment and technologies that can support the most efficient vessel turnaround times.

With the bigger ports caught in the snarl of handling ultra-size vessels along increasingly congested trade routes, the initiated small and mid-sized ports are already readying themselves for the cascade of large vessels redeployed their way. Investments in infrastructure along with the right smart port technologies, processes and partners will give smaller players big advantages. In addition to more power to lure some vessel traffic from rival ports, smaller smart ports gain the agility to ride high on the wave of the shipping world's new normal.

FIRST MOVER ADVANTAGE

Indonesia Port Corporation's (IPC) Pelindo II, for one, has been playing it smart for a while now. The Indonesian state-owned enterprise has been undergoing vast transformation in recent years with ongoing improvements by way of hard and soft infrastructure.

When IPC kick started plans to implement a new Terminal Operating System (TOS) for all the terminals under its operation, it selected TOS provider

CyberLogitec to realize its I.T. and TOS system implementation investment. From grooming talents and adopting information and communications technologies, to adding new equipment, facilities and ports, Pelindo II recorded achievements of sizeable growth in revenue and container traffic within a short timeframe.

DOING BIG THINGS

A lower cost base, agility and adaptability to change are key reasons mid-sized ports are making relatively swifter migration to smart port technologies. These intelligent digital solutions are helping growing ports to connect man, machines and methods all along the value chain to uncover new value and differentiated growth opportunities that set them apart from the big boys.

Linking all lines of communications together, every aspect of the logistics chain can be managed and controlled from vessel to gate. Incorporating integrated intelligence, big-thinking ports can deploy Internet of Things (IoT) technology onto their infrastructure

and equipment to enable resources and processes to interact and exchange 'live' data, empowering higher performance from the day-to-day operations to the highest level of strategic management. With vital port logistics processes tracked in real time, smaller ports can gain even more agility, optimizing resources while reducing errors and unplanned disruptions.

Another significant trend in favor of smaller players is the rise of smart port solutions tuned to their needs. Most TOS solutions are primarily designed for container handling ports. Yet, many small and midsized terminals operate with both containerized and general cargo handling. With more and more carriers starting or expanding their multipurpose services, we are seeing a comeback trend of break bulk cargo, which is proving to be a fast-growing forte for small and midsized ports to meet this change of tides.

TURNING TO THE CLOUD

Conventional TOS solutions are implemented on-premise and require ports to carry the burden of investment on the IT infrastructure and equipment, and to retain a team of IT resources to manage and maintain them, needing to constantly keep the IT equipment up-to-date and worry about infrastructure security. This creates a high initial capital investment and high recurring IT costs.

But forward-thinking ports are smart. They know big change can start small. Whether is it to begin by automating a particular section of yard processes, or connecting a pool of people who used to work in isolation, complexities can be reduced and efficiencies gained along with new opportunities for optimization and, yes, innovation.

Small ports also know that if there's a will, there's a way. And one of these ways is a cloud-based solution. Many digital solutions today are readily available in subscription-based models. For ports of every size, cloud-based is synonymous with lower upfront costs, quicker set up and deployment centrally from the cloud.

A robust TOS, for one, is an advanced terminal operating system for small and midsized container terminals with the capability of handling other cargo types. The system gives smaller players the capabilities afforded to their larger counterparts, yet it makes good sense for the 'big boys' as well.

A NEW BUSINESS CASE

With the right solutions, port operators can automate and centralize standard operation procedure management and optimize business processes in a way that

maximizes productivity and profitability. Inbuilt intelligent algorithms help operations personnel plan, schedule, and forecast operational requirements of vessels, yard and container handling equipment in a smart and optimized way. Data updates are synchronized in real time on all devices to assist the operation of job activities, especially when exceptions arise.

Using SmartLink EDI as an illustration, digitalized documentation can be linked to logistics partner systems so that there is clear visibility of business data across all links of the supply chain. The terminal can engage in electronic exchange of information with multiple industry organizations, including customs and port authorities, terminals and shipping lines, facilitating more efficient and transparent handling of complicated issues. Efficiency is upped, mistakes are reduced and costly downtime avoided. The terminal becomes better able to scale up volume without too much additional investment in workforce and equipment strength.

A multipurpose TOS is capable of handling all types of cargo from cars to containers and bulk commodities and has scalability to manage multiple terminals in a single configuration. Fully customizable, configurable and adaptable to the dynamic

needs of each terminal, the system ensures all aspects of operations can be managed in real-time while keeping track of all cargo movements.

Entirely HTML5-based, and operable on all devices, the solution enables users to access the applications anytime, anywhere even on their mobile devices as long as there is internet connectivity. From a single-window view with highly intuitive user interface comprising of rich graphics, yard operators can easily zoom in and out of the yard with full 3D visibility including ability to view into in-between container stacks.

Moving seamlessly from screen to screen, users enjoy information at their fingertips that aids close monitoring of yard operations. Built to be highly adaptive to change, CyberLogitec's latest innovation is scalable to accommodate the growing demands of progressive ports.

SUMMARY

In the long run, container traffic is projected to be on the rise particularly in the emerging economies of the world. While they cannot physically compete with large ports in their capabilities to serve today's mega vessels, smaller ports can leverage smart technologies to reinvent themselves and cruise comfortably into the new era of shipping.

ABOUT THE AUTHOR

Jake Jung-Taek Kim is a sales manager of maritime and port software technologies in CyberLogitec Global. With more than 17 years in the industry, his career portfolio gave him a strong foundation in understanding key aspects of the business operations. He is currently responsible for business development, global account management, software product selling, and developing strategic alliances within South East Asia.

Jake began his career as a system engineer. He went on to managing enterprise infra system operations, designing system architecture, implementing new technologies and leading various IT projects within CyberLogitec. He developed strong business acumen harnessing on strategic partnerships and key market analysis that contributed to the growth for the company. Jake helmed the role as Project Lead for various TOS (Terminal Operating System) projects in Korea, Indonesia, Spain and other countries, delivering clear business benefits for clients.

ABOUT THE ORGANIZATION

CyberLogitec is a global leader in providing technological innovation for maritime, terminal and logistics industry. We drive innovation by leveraging on our extensive industry knowledge and vast experience to meet the evolving needs of the market. We understand that optimizing operations is important for productivity and service delivery and we strive to continuously strengthen our capabilities by seeking to improve customers' overall efficiency, competitiveness and productivity.

CyberLogitec is committed to provide flexible end-to-end solutions and business consultation for the maritime, port and logistics industry. We harness the strengths of our strategically located presence in U.S.A, Europe, China, Singapore and Korea to engage with our clients and partners to identify key markets and seize new opportunities.

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From carrier shipping operations, port and terminal operating systems to logistics forwarding and warehouse management, CyberLogitec's advanced technologies solutions for the supply chain help the industry solve operational challenges by digitizing the flow of information, improving efficiency, competitiveness, productivity and service.

- Solve Operational Challenges for the Maritime and Terminal Industry
- Meet Shipping Industry Demands
- Enhance Customer Service





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PORT COMMUNITY CONNECTIVITY

PLATFORMS AND LANDSIDE

Chris Collins, Chief Operating Officer,
Containerchain, Singapore

CONTAINERCHAIN

In my last technical paper in The Journal of Ports and Terminals on Container Logistics 4.0, I identified platforms and data ecosystems as one of the foundational pillars for digital transformation and new value creation in logistics and shipping. In this paper, I take a more focused look at the evolution of digital platforms across the container logistics supply chain and the importance of their connectivity to port, terminal, and landside logistics operations.

PERSONALIZED DISRUPTION

Over the past few years, tech giants such as Alibaba, Amazon, Apple, eBay, Facebook and Google, as well as younger disruptors like AirBnB and Uber, have graphically demonstrated the power of platform technology to connect multiple consumers and producers via digital applications. Processing multiple interactions and transactions at unprecedented scale, speed, and scope. These major digital platform economies are continually mining

the vast quantities of data generated to optimize operations and enable ‘mass personalization’.

In the B2B space, platforms present a unique way to conduct business, while they grow exponentially in size and importance, providing unparalleled opportunities for value creation. The World Economic Forum’s Digital Transformation Initiative predicts that platform-driven interactions will enable approximately two-thirds of the US\$100 trillion value at stake from digitalization by 2025. To survive in the new digital economy, enterprises will either need to embrace platform connectivity, or risk falling dramatically behind in the fast-moving push toward more collaborative supply chain efficiency.

PORT COMMUNITY SYSTEMS

Ports and landside connected supply chains are, of course, essentially physical platforms and ecosystems in themselves. They are physical nodes where a complex

web of private and government entities converge to interact and transact the business of international trade. It comes as little surprise then that the port sector was one of the first to develop the concept of information sharing platforms with the launch of the first EDI-based port community systems (PCS) in Europe back in the late 1970s and early 1980s.

A neutral and open electronic platform enabling intelligent and secure exchange of information between public and private stakeholders to improve the competitive position of seaport and airport communities, a PCS typically facilitates both B2G and B2B transactions, providing a standardized system to process data related to exports, imports, transshipments, consolidations, hazardous cargo and maritime statistics reporting. In many parts of the world, regulatory and trade process compliance is a core function. Increasingly today, PCS also form part of larger government trade facilitation, simplification and digitalization

initiatives through 'Single Window' and e-Trade programmes.

Whilst traditionally PCS's play a key role in facilitating the flow of cargo and information through ports, they tend to be limited in their connectivity with landside and hinterland ecosystems. Additionally, they too often focus on promoting the importance of information capture over providing practical digital applications that incentivize users to share information in real-time as part of solving the operational problems that create inefficiencies in the supply chain itself.

Practical digital platform applications that seek to reduce landside congestion and pollution, optimize facility utilization, expedite tri-modal traffic flows to, from, and within port areas, share information in real-time allowing proactive operational planning amongst participants (whether it be shippers, 3PLs, hauliers and other inland operators such as dry ports) are evolving rapidly and are all aimed at unlocking trapped value created by today's inefficiencies. The importance for the industry to connect these often-independent platform applications to a PCS is a critical evolution required to deliver the true benefits of digitization to the container logistics supply chain.

PORTS LEADING THE WAY

Major port centres including Antwerp, Hamburg, Los Angeles, Long Beach, Rotterdam, Singapore and others, plus shipping line and global terminal operators looking to get more embedded in the supply chain 'beyond the gate', are embarking on digital initiatives to capture, harvest, pool and share more data in more collaborative, real-time ways, with maritime and landside logistics stakeholders.

The Port of Rotterdam's CFO recently said that investing in soft digital infrastructure is now as important as the physical infrastructure itself. PSA International, the operator of the Port of Singapore and an international network of terminals, has laid out its vision to work with customers and partners on improving E2E cargo flow with new solutions that "exploit the opportunities which digitalization offers, taking advantage of the fact that PSA already operates at key nodes of global trade and supply chains." Other multinational terminal groups have also expressed their intent to get closer to shippers and provide more inland connectivity, intelligence and value added digital services.

These enterprise and geographic-centric initiatives are crucial as is their connectivity to digital landside logistics (LL) platforms. Designed to optimize the movement of containers from port gate to door and back again, LL platforms connect the ecosystem of cargo owners, landside logistics providers and transporters, marine



terminals, shipping lines, inland depots/ports, and warehouses/DCs.

Singapore has recently provided two significant examples of this strategic direction under its National Trade Platform – with plans to connect over 10,000 of its existing registered users to a single independent Transport Integrated Platform (TRIP) that has already connected a large majority of the landside containerized supply chain, and in doing so, delivered significant operational and economic benefits to its stakeholders.

BEYOND THE PORT

Independent B2B LL platforms offer a critical path for the myriad of SME players that make up a significant number of any inland cargo community – many still with limited-to-no digital resources – to get connected to the network and in some cases, access digital business applications and processes to improve their day to day operations via adopting a digital industry 'baseline'. They also provide the central 'link and structure' to connect and enable emerging technologies such as Internet of Things (IoT) real-time tracking and sensors, blockchain / distributed ledgers, analytics, and artificial intelligence (AI) that can exponentially improve data quality and value to the benefit of all the platform participants.

But to extract maximum mutual value from the emerging platform economy – and avoid simply replacing current data silos and outdated manual processes with new digital divides – stakeholders, owners and operators of PCS's and independent LL platforms must work out how to collaborate and communicate on a local, regional and cross-border basis.

Interoperability via APIs and standardization of messaging flow are key, enabling a network made up of a system of systems to be created. Equally important are the rules of engagement and governance within and between different (and possibly competing) data ecosystems, as well as between private and public-sector interests.

KEY TAKEAWAY POINTS

Balancing out platform competition and collaboration, international and localized solutions, closed and open offerings and free market choice against regulatory oversight is a very difficult challenge, but not one that can be avoided if we all want to reap the benefits of digital collaboration.

One thing is certain, the technology is on hand to address enduring supply chain stakeholder concerns about fulfilment inefficiencies, lack of coordination and poor visibility. But approaching the upcoming inevitable proliferation of digital platforms and offerings from an earlier mindset will not get us to where we want to go. As Einstein said: "We can't solve problems by using the same kind of thinking we used when we created them." Coordinated discourse between market players and policymakers is therefore crucial as we enter the next wave of digital development and application of technology to drive operational and economic efficiency across the container logistics supply chain.

ABOUT THE AUTHOR

Chris Collins is the Chief Operating Officer of Containerchain, a digital operations and collaboration platform provider to the landside container logistics community.

ABOUT THE ORGANIZATION

Dedicated to simplifying operational processes, improving customer service levels, and driving down the cost of moving containers from port-to-door, Containerchain's platform and products provide real-time paperless information exchange, automation of manual processes, proactive operational planning tools, total container movement visibility, and real-time synchronized connectivity across the supply chain.

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Web: www.containerchain.com



TIM CLARK

DIRECTOR OF SYSTEMS SALES (EMEA),
MOTOROLA SOLUTIONS, LONDON, UK



1) WHAT CHANGE DO YOU WANT TO BRING TO THE PORT AND TERMINAL SECTOR?

There are many changes already taking place in the port and terminal sector: increasing scale of operations to accommodate mega-ships; consolidation in the shipping market; formation of mega-alliances; increasing frequency of extreme weather events; growing threat of physical and cyber-security attacks. All of these changes are generating serious challenges for ports and terminals.

Motorola Solutions is changing the way port and terminal organisations communicate and run their operations to increase efficiency, safety and security. Our mission-critical communications solutions are giving our port and terminal sector customers the competitive edge to succeed in challenging times.

To remain competitive, ports and terminals are streamlining their operations and automating processes – immediate, ubiquitous and dependable communication between people and smart machines is more important than ever.

Workers are operating in increasingly remote and hazardous environments amongst massive structures, mobile machinery and vehicles. Instant communication and automated real-time monitoring provides a critical lifeline for mobile workers and ensures they have the information they need to get the job done fast.

Different workgroups and organisations operating within the port must be able to communicate seamlessly and merge their business processes to avoid bottlenecks and mistakes which will cause delays and reduce

margins.

Unfortunately security protection is an ever-increasing challenge – port and terminal operators must keep one step ahead of sophisticated criminal gangs and terrorists who consider ports as targets. Being able to identify potential hazards and reacting to prevent attacks is a key goal for port security teams, as is controlling access without slowing the flow of cargoes in and out of the terminal. Cyber attacks in the form of “ransomware” are becoming more frequent and there have been well-documented incidents in recent years which have crippled operations and incurred huge costs for organisations worldwide.

In short, there are many new challenges for port and terminal operators – our solutions are changing communication and operations to help overcome these challenges and ensure successful and profitable businesses.

2) HOW ARE YOU GOING TO IMPLEMENT THAT CHANGE?

The Motorola Solutions portfolio of market-leading mission-critical communication products and services is enabling port and terminal operators to increase the efficiency, safety and security of their workforce and business processes. Motorola Solutions serves more than 100,000 public safety and commercial customers in more than 100 countries - our customers rely on us for the expertise, services and solutions we provide, trusting our years of invention and innovation experience. By partnering with customers and observing how our products can help in their specific industries, we are able to enhance our customers’ experience

every day.

Motorola Solutions is the global market leader in two-way radio technology. Our DIMETRA™, ASTRO® 25 and MOTOTRBO™ portfolios provide ports and terminals with tailored, reliable and robust voice and data communications to ensure that mobile workers stay connected even in the worst-case scenario. Two-way radio has significant benefits over alternative technologies: instant group communications; system coverage designed for each port; rugged, purpose-built devices; redundancy with automated switch-over to mitigate risk of downtime.

Our wide range of control room solutions ensures port operations are efficient and safe. Incidents can be resolved quickly and investigations conducted efficiently to help prevent future problems. Automated tracking of workers, vehicles and machinery across the terminal helps to ensure efficient use of resources and reduces costs.

Automation is becoming more important to port and terminal operators who are constantly looking to minimise costs and speed up processes - the Industrial Internet of Things (IIoT) portfolio from Motorola Solutions enables connectivity between control rooms and sensors and switches to monitor and control remote infrastructure and equipment such as sirens, gates and port access security systems.

The Avigilon™ portfolio of intelligent cameras, video analytic solutions and access control products provides stronger protection against security attacks through smart access control and incident prediction and monitoring. Facial recognition technology and Automatic Licence Plate

Recognition (ALPR) identify and track people and vehicles without impacting flow rate through gates. A network of fixed cameras can be augmented with body-worn cameras on port security staff to provide real-time, ubiquitous monitoring.

Motorola Solutions also has a comprehensive range of cyber protection products and services to protect ports against the growing threat of malware.

3) HOW DO YOU THINK COLLABORATION CAN BE INCREASED ACROSS THE SUPPLY CHAIN?

In short, effective collaboration is dependent upon seamless voice and data transfer – and that's what mission-critical communications delivers. Focussing in on the role that ports and terminals play within the supply chain, there are many different organisations which need to stay fully informed to ensure efficient operations; port management, shipping companies, freight operators, emergency services, utilities providers, etc.

Typically each organisation uses different communication systems – presenting a challenge to seamless transfer of information. The Motorola Solutions WAVE™ portfolio of broadband workgroup solutions operates over multiple technologies - two-way radio, Wi-Fi, 3G/4G, telephony and more - and can be used to bridge different systems. For example, onsite two-way radio users can communicate with colleagues and partners who have WAVE applications on their smartphones – both onsite and offsite.

WAVE effectively extends the benefits of group communication traditionally associated with two-way radio: instant voice communications at the touch of a button; all-informed workgroups who have the real-time information they need to get the task completed quickly and safely; fully-integrated essential data services such as text messaging, location tracking, work ticketing and status updates.

For many of our customers, two-way radio was selected as the optimal communication technology because of the high level of security and robustness it provides. The use of WAVE in conjunction with a two-way radio system does not compromise security – the protection provided by WAVE is designed to meet the stringent information security requirements of government agencies.

Motorola Solutions connects people through technology. Public safety and commercial customers around the world turn to Motorola Solutions innovations when they want highly connected teams that have

the information they need throughout their workdays and in the moments that matter most to them.

4) WHAT DO YOU PREDICT FOR THE SUPPLY CHAIN COMMUNICATION IN 10 YEARS' TIME?

Industry analysts expect automation to be implemented throughout the supply chain in coming years: virtual customer assistants and chatbots will interact with customers; unmanned mobile robots will replace warehouse workers in forklifts; drones and autonomous trucks and ships will transport cargo; autonomous cranes and loaders will speed up port operations.

Internet of Things (IOT) technology will create a fully-integrated supply chain, from end to end.

Artificial Intelligence (AI) and smart analytics of Big Data will enable predictive logistics, where goods are sent through the supply chain ahead of demand.

The implementation of the Blockchain peer-to-peer ledger model will enable smart commerce and streamline the entire supply chain. Implementation of Blockchain will not be immediate but the impact will be profound.

In summary, there is unprecedented change underway in the supply chain and the rate of change is expected to increase into the future.

Mission-critical communication will be a key enabler of change in the supply chain and in ports and terminals in particular – connecting physically isolated workers with immediate voice and essential data services will become more challenging but increasingly important.

Robust voice and data communication networks which have been designed specifically for individual ports, to keep people and smart machines connected in the most extreme events, will be critical.

Motorola Solutions is constantly innovating mission-critical communications to stay ahead of our customers' requirement. Taking great ideas from concept to reality is what innovative companies do. At Motorola Solutions, we believe true innovation occurs when a new technology solves a problem customers didn't know they had or in a way they never thought possible. We strive to deliver solutions that bring the right information, to the right person, at the right time. For example, our pioneering work in the field of High Velocity Human Factors, an area of cognitive research, informs our approach to design. We develop

products for first responders by working with them in crisis situations to study their communication needs. We take what we learn in the field and bring it back to the lab to create products that will function under extreme conditions and networks that will reliably support those products. With unparalleled domain and design expertise, we anticipate industry shifts, recognize market disruptors and develop breakthrough technology solutions using a proven framework that helps transform the industries we serve.

5) WHAT IS THE ROLE OF THE HUMAN IN THE DIGITAL SUPPLY CHAIN?

Technology in the form of automation, Artificial Intelligence, the Internet of Things and Blockchain will streamline the supply chain and remove the human element from repetitive and manual tasks. However, people will continue to play key roles in efficient, safe and secure ports and terminals.

The management of port and terminal operations will be assisted and augmented with data analytics and artificial intelligence but critical decision making will rely on humans. Also, incident management - informed, immediate response to minimise the impact of failures, attacks or natural disasters – will depend upon highly-skilled staff with the best information and tools.

Motorola Solutions is investing in smart video and data capture and analytics to provide response teams with concise, relevant, actionable information. Forward-looking solutions such as our Avigilon cameras and video analytics portfolio and the Command Centre Software suite will increase situational awareness and accelerate decision-making for ports operational staff.

To further enhance the richness of data available to incident response teams, port workers will be equipped with wearable devices – cameras, sensors, location trackers, smart user interfaces – which will continually monitor, assess and report the operating environment to ensure workers have comprehensive, timely and relevant information to hand when they need it.

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MANZANILLO INTERNATIONAL TERMINAL

TIDEWORKS

A 360-DEGREE TERMINAL VIEW

Thomas J. Rucker, President of Tideworks Technology, USA

Whereas international cargo tends to grow linearly, data generated with the movement of goods grows exponentially, thereby driving a profound need for port and terminal operators to add visibility into their enterprise data, and more importantly, to make that data actionable.

Real-time data access and visibility has increasingly become a top priority for the shipping and logistics industry. A global survey from the Business Performance Innovation (BPI) network of more than 200 executives found that the biggest challenges facing the ocean supply chain included poor coordination between partners (57 percent), too little transparency and visibility (50 percent) and inefficiencies with the supply chain (37 percent).

Survey respondents then noted the areas most in need of process improvement to be carrier-to-terminal coordination and planning (35 percent), supply chain visibility and information sharing (35 percent), terminal operations (24 percent), cargo flow visibility and predictability (24 percent)

and coordination across carrier and shipper alliances (24 percent).

One terminal that has recognized the connection between data visibility and improved operations is Panama's Manzanillo International Terminal (MIT). One of the largest and most important terminals in Central America, MIT provides connections to 129 ports in 48 countries. The facility offers efficient and reliable port services 24 hours a day, seven days a week to the many shipping lines serving the region.

MIT

MIT started its journey towards data discovery back in 2012 when it developed its own data warehouse and business intelligence (BI) solution in order to store operational data from its terminal operating system (TOS). While "home grown" solutions can be adequate in smaller deployments, for a terminal the size of MIT, the challenges quickly became evident. For example:

- The team was unable to integrate data from other systems into the database as needed
 - System performance was significantly impacted, especially when users tried to extract data from the TOS, generate complex reports, or perform demanding queries against the production system
- The MIT team prioritized several criteria in outlining their future vision, specifying several key requirements that provide a handy baseline for any terminal looking to automate. These requirements were:
- The ability to provide a complete, 360-degree view of terminal operations
 - The ability to seamlessly connect external systems
 - The ability to quickly and easily access, filter and drill down to vital operational and enterprise metrics
 - The ability to gain insight from enterprise data in order to make real-time performance decisions
 - Functionality that would not drain or degrade system performance



In MIT's case, theoretical desires quickly bumped up against real-world availability. The terminal found that off-the-shelf solutions were largely unable to meet its extremely specialized and precise needs, nor could they provide the necessary levels of customer support and customization.

MIT stated they needed rapid functionality without a negative impact on system performance, while also needing to be able to draw in data from external sources as native SQL and then integrate those with their own data. Ultimately, they needed to position the terminal to meet the evolving needs of our customers, which required a flexible, adaptable solution.

A PLAN OF ACTION

In order to fix the solution, MIT assiduously monitored its performance, data integration and data accuracy. The team also built and tested specific metrics around automatic stacking crane (ASC) productivity based on MIT's feedback, with additional metrics continuously being added.

It was important for MIT to fine-tune the solution for users so they could utilize the platform to organize key performance indicators (KPIs) into a single, self-service dashboard. The beta testing (and eventual deployment) allowed users to add new metrics without significantly changing existing data models, while also storing years' worth of historical information for executive-level analysis and planning.

The benefits of deploying a data platform are manifold for terminal operators like MIT. The solution allowed them to evaluate existing reports, determine their value, and create a new reporting structure. They were also able to eliminate some duplicative reports and create new ones that produced far more relevant and powerful results.

RESULTS

A key factor that led to the successful widespread deployment of the solution was the intuitive interface. As MIT users became more familiar with the platform, even non-technical terminal employees were able to quickly create reports without having to rely on specialized IT personnel, leading to more efficient workflows and increased productivity.

Operational efficiencies also improved with the rollout, allowing MIT to do more with existing resources and scale its operations. This wholly-integrated solution gave MIT the 360-degree operational visibility it sought, while providing the ability to integrate information from ERP or other non-TOS related systems, as well as a means to visualize and analyze data on an enterprise-wide level.

Being able to identify patterns and outliers allowed MIT to quickly improve operations and reduce its costs. As an example, the terminal was using Excel with macros to run a yard density report. Now it has a dashboard that automatically populates, significantly reducing the time and effort to obtain this information.

Instances such as this have shown me the following key questions when looking into a terminal operating system:

- Does the solution provide a complete, holistic view of port operations?
- Am I able to gain visibility to operational and business data that is both reliable and actionable?
- How will the solution impact system performance? Can my team access valuable KPIs, perform data analytics and create reports without the performance of the production system being degraded?
- How well does the solution integrate enterprise data from other business systems?

ABOUT THE AUTHOR

Thomas J. Rucker joined Carrix in 1999 as a project manager within the Y2K project team. Shortly after Tideworks was formed, he relocated to Panama where he oversaw IT Operations throughout Central and South America. Thomas then relocated back to Seattle and held the position of Vice President of Product and Professional Services. He was responsible for the innovation and execution of a variety of terminal operating system solutions at marine and rail facilities around the globe. Most recently, Thomas served as the Vice President of Operations for Manzanillo International Terminal (MIT) providing strategic and tactical leadership for the company's operational functions.

ABOUT THE ORGANIZATION

Tideworks is a full-service provider of cost-effective, reliable software solutions for growing terminal operations and shipping lines worldwide. The company helps more than 65,000 users at 100 facilities run their operations more efficiently and profitably. From optimized equipment utilization to faster turn times, Tideworks works at every step of terminal operations to maximize productivity and customer service.

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“

I FOUND IT REFRESHING TO HAVE **TECH SUPPLIERS TOGETHER** IN ONE ROOM, **SHARING IDEAS** WITH EACH OTHER AND CLIENTS. THEIR REQUEST FOR STANDARDS AND COOPERATION WAS REMARKABLE! ”

PAUL VAN BENNEKOM, ECT

CONTAINER TERMINAL
AUTOMATION CONFERENCE

M2M & AI

6-8 MAY 2019 - LONDON, UK

“

A MEETING OF MINDS ON HOW OUR INDUSTRY CAN **ADVANCE OURSELVES** THROUGH BETTER UNDERSTANDING AND HARNESSING OF AUTOMATION. ”

ADRIAN SIM, ASSISTANT VICE PRESIDENT, PSA
CORPORATION LTD

“

THE CONFERENCE SPEAKERS ALL HAVE **EXTENSIVE EXPERIENCE** IN THE SUBJECT MATTER, IT'S THAT YOU MANAGE TO **BRING TOGETHER SO MANY EXPERTS.** ”

RICH CECI, PORT OF VIRGINIA