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Utilising data and adding supply chain connectivity can drive significant operational improvements, as terminal operating systems become more advanced. **Emmanuel Mair** reports

During the previous decade, many terminal operators finally began to embrace digitisation, hoping to attain improvements in operational processes, increase the efficiency of their container moves and save time and costs. For hubs deploying automated machines, the terminal operating system (TOS) is the centrepiece of the digital puzzle, while advanced technology is now also becoming more accessible to smaller facilities.

Moving into the new decade, TOS providers are keen to utilise more powerful planning tools to manage terminal operations. Andy Barrons, chief strategy officer at Navis, told **CM**: “We’re investing in planning and operations solutions. There’s a need for improving the berth management process on the waterside and for managing the vessel arrival holistically.”

There are significant gains to be made with regards to vessel arrival and turnaround times, and a smoother process is possible if different parties have greater visibility. Optimisation of the TOS is also on the cards, with benefits including the improved scheduling of rubber-tyred gantry (RTG) cranes as decision-making about their allocation becomes more advanced.

One of the broad trends expected in the coming years is an increase in the connectedness of the supply chain ecosystem. Closer collaboration between shipping lines, terminal operators and logistics providers makes sense to reduce bottlenecks. After all, what benefit does a shipper receive if a terminal handles a box in ultra-quick time only for the ocean or land leg of the trip to be delayed?

Barrons stated: “The TOS will become increasingly connected to the whole ecosystem of modern technology. You’re going to see a lot of progress against the more siloed IT structure that’s in the industry today, which will provide tremendous business value in terms of better visibility, more powerful predictability and more reliability in the supply chain.”

With terminal operators acquiring inland terminals and expanding into the hinterland, there is a need to connect these sites to marine terminals. In helping to optimise the increasingly connected supply chain, the better use of data can make a significant contribution. Data is currently the “most underutilised asset”, according to Barrons. To make optimised supply chains a reality, TOS providers will need to perform a key role in bringing together data from a range of sources and finding the smartest way to utilise it.

Navis’s Smart suite leverages new technology to pull together multiple data sources and provide tools so that customers can visualise various aspects of operations and have all the data in one place. With data becoming more accessible in the TOS, it becomes easier to build applications or to build analytics on top of the data without the need to upgrade the TOS. This makes it feasible to provide real-time analysis of operations rather than just historic analysis.

Barrons added: “Today there’s a lot of access to data but it’s not actionable. By the end of the decade these systems will be exchanging

information and that information is going to either initiate a decision by a person or it’s going to initiate a series of actions in systems to change the planning or the execution of an operation.”

REAL-TIME INTERFACING

CyberLogitec has a subscription-based platform called CARA 3.0 which is open to terminals, shipping lines and logistics providers, and aims to enable more fluid communication. It is a substantial upgrade of the existing CARA 2.0 offering, which is an inter-carrier collaboration platform. With this new platform, data can be shared using EDI messages, while real-time interfacing can enable gains in productivity as response times will be quicker.

Carlo Mojica, senior business consultant at CyberLogitec, stated: “Traditionally terminals are like islands where they have their own silo of information, but this doesn’t make sense going forward. If the TOS stays as an independent solution, it will not be able to extract valuable data from logistics companies or shipping lines. We believe that the next generation has to be part of the ecosystem that can integrate and share valuable data with logistics companies, government agencies, financial institutions and so on.”

For example, if carriers have visibility into berthing scenarios two ports ahead, they can make better decisions with regards to reallocating their cargo, perhaps helping to speed up ship turnaround times and reduce port congestion.

As terminal operators automate existing processes, they will see improvements in productivity while also reducing their carbon footprint by minimising downtime and accelerating turn times at the terminal, according to Thomas (TJ) Rucker, president of Tideworks Technology.

Rucker told **CM**: “Digitisation has created an opportunity for Tideworks to strengthen its TOS solutions and third-party integrations to ensure that all segments are connected and operating to the best of their abilities. For example, we have developed a “robust suite” of APIs within our TOS offering to facilitate integration and data sharing within terminal ecosystems.”

Tideworks is currently rolling out Mainsail 10, its “next-generation” TOS, which it believes will help its customers “do more with less”. This refers to the expectations of terminal operators who are looking to increase throughput at the same time as improving productivity and sustainability.

Mainsail 10 offers tools and modern software features such as rapid access to real-time data, which can improve operators’ decision-making and planning capabilities. It also has the flexibility to configure and customize user experience at the management, administration and end-user levels.

Its software architecture has been designed to facilitate seamless updates and third-party integrations with minimal impact to operations, enabling quicker gate processing and improved efficiency of other

time-sensitive tasks in the terminal.

Rucker said: “Most customers are eager to continue leveraging emerging technologies and increasing visibility into their terminal data as a way to improve operating efficiencies and drive results-oriented decision-making without disrupting current processes or incurring unwanted maintenance burdens.”

UP IN THE CLOUD

Another interesting trend currently sweeping through the container terminal sector is the shift in the IT landscape to cloud computing. Tideworks is actively re-architecting its suite of products to be fully cloud-capable.

Many customers are seeking a “TOS as a service” model, i.e. a powerful and flexible TOS with a reasonable entry point (CAPEX) and consistent ongoing costs (OPEX), which works with minimal effort and expenditure on their part.

While in the past TOS tools and capabilities were available only to terminals that could afford a premium price, there is now a new range of solutions hitting the market targeted at small and medium-sized operators.

Navis offers its cloud-based Octopi TOS for this market, catering to companies that want to reduce the cost of running their own data centre and servers on their premises. Barrons pointed out: “We see the opportunity and demand for N4 in the cloud. By moving a TOS or any system into the cloud, it’s going to enable connectivity to other future technologies in the cloud.”

Last year CyberLogitec launched Opus Terminal M, a browser-based TOS catering to multi-purpose cargo facilities. It has already secured a customer which operates multiple facilities in Southeast Asia.

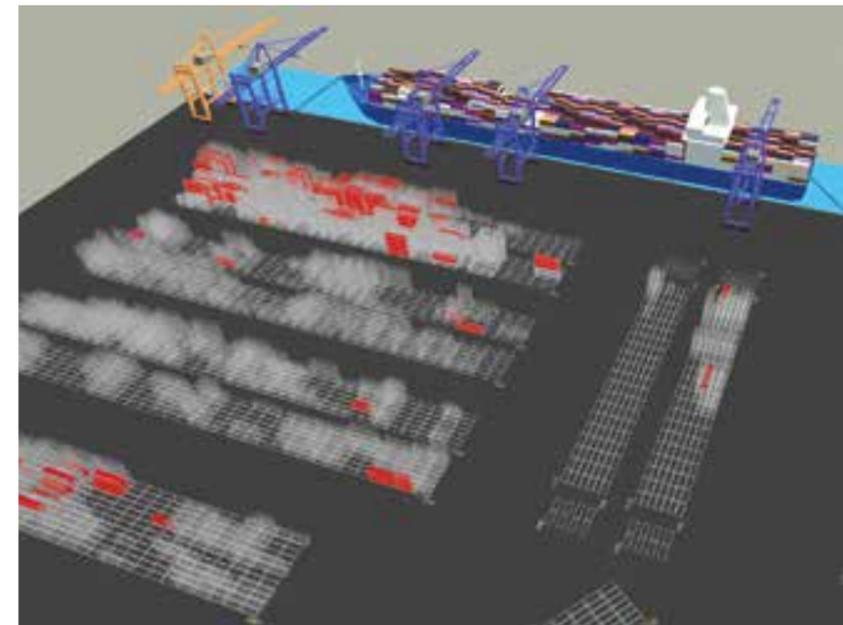
The system, is designed with a flexible architecture, allowing the developer to extend functionalities. A single installation can support multiple terminals of all types, whether they are maritime terminals or inland depots, and whether they handle containers, breakbulk, solid bulk, liquid bulk, roll-on roll-off (ro-ro) cargo, project cargo or a mix.

Mojica said: “Some ports which handle fairly substantial volumes still run operations using Microsoft Excel spreadsheets. Because of our openness to integrating or interfacing with other systems, we are able to incorporate Opus Terminal M with their operational ecosystems. We can interface with warehouse modules, transportation modules, and so on.”

Users of CyberLogitec’s new TOS will be able to access some fairly advanced solutions such as a maintenance and repair module, possibly eliminating the need to purchase more expensive systems.

Another of the company’s product offerings is Eagle Eye, which functions as a gateway for Internet of Things (IoT) sensors. In addition to its original objective as a process automation and 3D visualisation system, it can also be used to monitor running times, breakdowns and operational exceptions. Due to its IoT engine, Eagle Eye is able to function as a safety monitoring solution, integrating with anti-collision and proximity alarm subsystems.

It also employs a machine learning capability, allowing it to monitor trends in breakdowns or spare part replacement and therefore enabling users to perform predictive maintenance. ●



Top: Opus Terminal M comes with a 3D visualiser ‘SmartVision’ that allows users to view the status of cargo in the terminal
Middle: Andy Barrons, chief strategy officer at Navis
Bottom: Thomas (TJ) Rucker, president of Tideworks

