"In the near future, all the equipment within terminals will be communicating through a network and thereby the container flow will be optimised"

Exclusive Q&A

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CyberLogitec

What are the essential factors implicit in sound port operations?

The most essential factors to a sound port operation are process automation and enhancing operational efficiency. The overall terminal operation cycle has become complicated throughout the years and will become more complicated due to the rapid growth of the vessel sizes which currently go up to 18,000 TEU, along with this is the heavy machinery integrated with high-end technology to process mega-ships up to a speed of 100 TEU per hour.

With this in mind, increasing terminal competitiveness and operational efficiency is vital. High-end yard equipment and job management is crucial to processing the exponential number of containers.

Devices such as VMT (vehicle mounted terminal) are also very important factors in enhancing efficiency and minimising error. In order for cranes and container trucks to accurately perform job orders from a TOS, equipment operators must work smarter. VMT, which must be designed to ensure intuitive understanding and fast recognition by operators who speak various languages, should have sensors check on equipment to inform the system of its status and perform the role of a communicator with the central system for a quick response in case of an accident or emergency.

From the operator's perspective, VMT must be able to give job orders to equipment operators and facilitate problem solving through a virtual terminal that lets a user figure out at a glance the status of terminal equipment and condition of stacked containers.

What do you think is the biggest single issue affecting ports and terminals today?

Throughout the last 20-30 years, container terminals have made relentless efforts to create an enhanced TOS. However, users nowadays are not satisfied with a good enough TOS. The enlargement of vessels and an exponential number of containers has led to operational staff demanding higher productivity.

According these demands, products based on sensing technologies such as OCR, RFID and high accuracy DGPS are being released. These automation solutions will reduce gate turn time, optimise yard truck movements, and minimise container rehandling, eventually improving terminal competitiveness.

Even a conventional terminal that lacks automation equipment can obtain information on manually operated equipment such as cranes by attaching sensors on them. In the past, operators used their naked eyes to check the status of operations and employed communications devices to report results and occurrence of problems, but adoption of location technologies will enable automatic obtainment of such information at the control tower.

By accumulating and analysing the gathered container-tracking information, the process can implement preventive measures on the points where errors frequently occur or productivity has been lowered, thus ensuring efficient and proactive operation of a terminal.
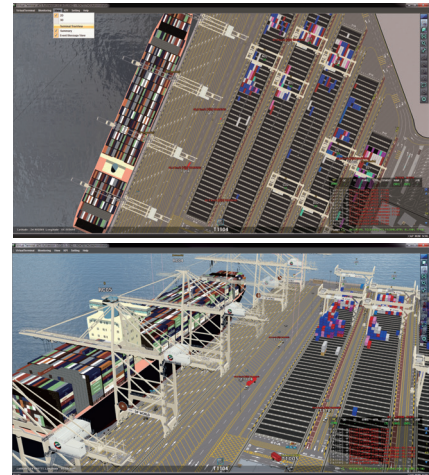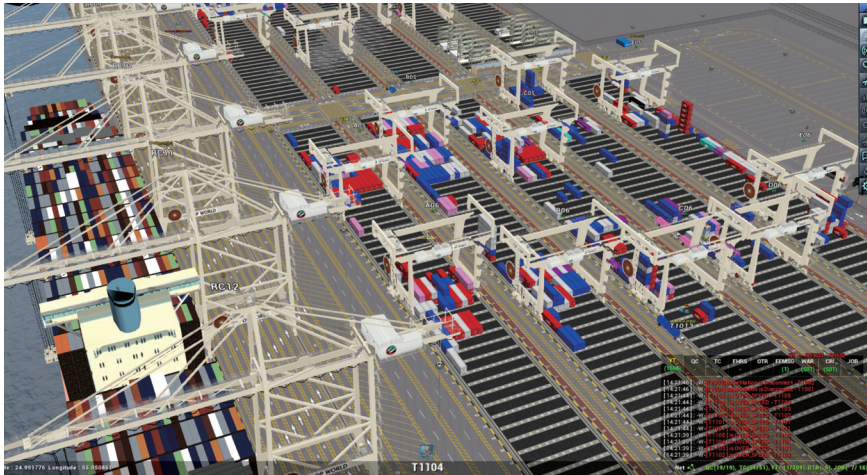
How is your company managing the current trend in the industry of increasing capacities?

Recently, CyberLogitec launched a terminal process automation solution, Eagle Eye, and this solution is chosen by DP World Dubai CT#3, Saudi King Abdullah Port, and DP World Pusan PNC.

There are high expectations for the Eagle Eye to reduce the gap between planning and operation. Eagle Eye is able to help users solve unexpected situations with more flexibility and composure, leading to higher efficiency while providing full visibility of an operation.

Automation technology is no longer a technology only designed for full-automated or semi-automated terminals. Conventional terminals can be also integrated with automated job stepping and automated container hand-off technologies based on equipment trace and tracking.

It is not about replacing all equipment with automated equipment. Rather, it consists in adopting a system that monitors all equipment, performs terminal operations based on the information, and makes the operators of crane and terminal trucks carry out job orders from a central system.

In which markets do you foresee growth in the next ten years?

The Internet of Things (IOT) will be a common technology in the port and terminal industry very soon. In the near future, all the equipment within terminals will be communicating through a network and thereby the container flow will be optimised. In order to make best use of IOT technology, seamless integration with a TOS is very important. Information such as real time location, job information of yard equipment and KPI's must be transferred and updated into a TOS in order to have full control over the operation and achieve performance enhancements.

What is the history of your company?

CyberLogitec (CLT) has been providing

TOS systems to numerous terminals around the world over the last decade. Four of them being terminal automation projects (Hanjin Pusan HJNC, DP World Pusan PNC, TTI-Algeciras, DP World Dubai CT#3) in which staff were able to gain experience with technology and automation. Based on the successful container terminal business, CLT presented an automation solution package called the Eagle Eye. Eagle Eye can be installed on any model from any manufacturer as it utilises a PDS-based system and provides automated container hand-off in real time 3D Virtual Terminal and KPI modules.

In terms of terminal operational visibility, what will be happening in the future considering the high-speed networks and new technologies (IOT, Big Data, etc)?

With the recent evolution of the Internet of Things, its scope of application is expanding from consumer electronics and automobiles to cover industrial facilities such as heavy equipment. As prices go down for sensors and communication-ready modules, the installation cost has decreased, thus enabling the provision of differentiated services for customers.

All key assets of terminals will send and receive huge data to each other, and by filtering and analysing this data, valuable information will be delivered through various systems such as the TOS.

Furthermore, through the analysis of past operating data accumulated in the Big Data Platform, optimised decisions can be made to maximise operational efficiency. Before the actual vessel operation, problems can be prevented through simulation.

Even though it is very difficult to predict the overall results of an operation, the importance of this prediction is getting higher in order to achieve an efficient operational cycle. In order to acquire terminal operations visibility, the workload of internal resources like cranes and yard trucks must be accurately measured and predicted. To acquire terminal operations

visibility, a vehicle booking system or prediction statistic (Stochastic) based external truck volume prediction is one of most important key elements.

Despite the predictions made based on a sophisticated algorithm (AI - artificial intelligence), there are still probabilities of unexpected situations occurring during the operation. Real time checking of terminal asset (cranes, trucks, containers) location and status is essential to solving these situations.

Operational processes which used to depend on CCTV and walkie talkies are now rapidly shifting towards the virtual terminal with 2D/3D visuals so operation managers can make faster and more accurate decisions.

Process automation and operational visibility are not only required in large sized terminals where mega-vessels call. Due to the rapid rising of operational complexity, it will be inevitable for medium or small sized terminals to face operational inefficiency.

What are the key things to consider when adopting IOT into a container yard management system?

There are terminals that have various sensors installed on STS container cranes, ASCs, and yard equipment. Automated terminals, compared to ordinary ones, run on a far larger number of sensors.

Frequently, however, data created through the sensors is managed only as a result of basic operation. In most cases, such data is used to manage individual units of equipment. There is no organic process that places an entire terminal in perspective for accumulation and management of the data, which is not exploited in a way to optimise the entire terminal.

So, a container-tracking system, which allows sensors to collect data on the movement of gates, yard tractors, yard cranes, and STS container cranes, and ensures its analysis through optimisation tools, will facilitate terminal optimisation.