IN FOCUS: HINTERLAND CONNECTIVITY

INTERVIEW WITH:
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"THE COVID-19 PANDEMIC HAS MADE OBVIOUS HOW DEPENDENT WE ARE ON SINGLE RESOURCES AT THE RIGHT LOCATION."

Dr. Felix Kasiske spoke to Port Technology International about hinterland connectivity and the increasing need of automation and the challenges of adjusting processes, and integration of all equipment into the existing IT landscape of rail terminals.

WITH EFFICIENCY AND ECONOMIC CONSIDERATIONS AT THE FOREFRONT OF TERMINAL OPERATIONS TODAY HOW DOES HPC SEE ITS INVOLVEMENT IN HINTERLAND CONNECTIVITY IN MEETING THESE CHALLENGES?

Global economic development is currently in the midst of a significant transition process. The current COVID-19 pandemic has given rise to general trends impacting supply chain structures and cargo volumes while erratically arising uncertainties have created a much greater awareness for supply chain resilience.

More localised, redundant solutions as the backbone of stable economic activities have received more attention, driving up the importance of hinterland connectivity as the first or last mile for international supply chains but also for growing domestic activities.

While there are chances for operators in domestic chains to gain business, we must expect significant pressure on the cost of their transactions which will decide on who wins in the long run. Consequently, technology-driven topics like process automation, digitalization of manual processes and information sharing to improve collaborative approaches are set to receive more attention, easing the way we can work together while still avoiding manual human interaction.

We are currently observing new changing aspects in these topics. Many of these ideas have already been discussed by pioneers in the intermodal industry but in most cases have only been cautiously realised so far. With the current global outlook this picture is changing.

HOW CAN THE HINTERLAND BE MADE GREENER AND REDUCE CARBON EMISSIONS IN CARGO TRANSPORTATION? CAN AUTOMATION HELP WITH THIS?

Increased sensitivity to carbon emissions has also fostered the developments in the intermodal industry.

Initiatives like HHLA Pure, where carbon-free supply chain solutions become reality, in this case realised from the quay wall up to the hinterland, are likely to become common if not the standard and we need to ensure that infrastructures support this. Interestingly, solutions offered to increase operational efficiency quite often come with opportunities to electrify container handling equipment as the basis for more green operations.

Digital processes and diesel driven equipment have become a greater contradiction. HHLA Container Terminal Altenwerder (CTA) in Hamburg – the only certified climate-neutral container terminal in the world – is currently adapting its battery driven fleet of about 100 automated guided vehicles (AGV) to become part of the public grid because the current fleet represents a huge electric capacity.

Given CTA's location in northern Germany with lots of wind energy production, it makes perfect sense to balance peaks in supply and demand of electrical energy with this battery fleet. As a core member of the development team, HPC is currently elaborating on a software solution managing and optimising the exchange process of electrical energy between the public grid and the AGV fleet.


Credits: HHLA HPC/Thies Rätzke

This is how we at HPC envision terminals of the future, they will be fully integrated into green supply chain solutions. Designing intermodal terminals conceptually to only being able to use diesel-driven equipment may become very difficult soon, we strongly believe each new intermodal terminal should inherit at least a pathway to fully electric solutions if not being designed as such for operations from day one onwards.

Precision-controlled equipment, access to interfaces to extract data from the equipment PLC and other systems – the prerequisite for automation, optimisation, data mining and machine learning – typically comes along with electric drives, so technology development and digitalization on the one hand and adapting to more sustainable green solutions on the other foster each other and will reshape how we handle intermodal business.

WHAT IS DRIVING THE INCREASED NEED FOR AUTOMATION (IN HINTERLAND ACTIVITY)? DO YOU SEE THE CURRENT SHOCK TO THE ECONOMY AND SUPPLY CHAIN BECAUSE OF COVID-19 DRIVING THIS FORWARD FASTER?

The COVID-19 pandemic has made obvious how dependent we are on single resources at the right location. Building upon our significant marine terminal automation experience, we have intensively looked at the opportunities and limitations for automation in intermodal terminals in recent years.

In comparison to marine environments, intermodal facilities see more human interaction and because of the types of activities, like re-setting pins or the handling of inter box connectors, the focus has been on person detection and avoidance of interference.

At the same time we see practice-proven automated operations over non-sensitive areas like container stacks, reducing the amount of crane movements to be supervised by trained personnel, typically with remote-controlled operations of the crane to also allow for low-time efficiency gains by having a reduced number of crane drivers operating all cranes needed alongside tracks. Remote controlled crane operations combined with semi-automated remote gate transaction, however, are not only a cost topic, but could become a prerequisite to keep operations alive in a pandemic situation such as COVID-19 as the activity of the personnel becomes independent from its location.

The recent pandemic experience makes the focus clear: reduce direct human interaction by digitalizing processes wherever possible and convert personal presence into digital control, of course keeping human expertise but in a less vulnerable manner. As a matter of course, this calls for efficient, optimised and documented processes, electrified and smart equipment, flexible software applications, their integration and, even more important than ever, IT security.

To achieve this there is now an abundance of cloud-based solutions available including truck appointment systems via apps, software add-ons for optimised decision making on-top of traditional Terminal Operating Systems (TOS), and the use of artificial intelligence (AI).

WITH NEW TECHNOLOGIES COMES THE NEED FOR AN IMPROVED IT LANDSCAPE, ESPECIALLY AT RAIL TERMINALS, HOW IS HPC HELPING TO FACILITATE THIS?

Given an industry-wide dissatisfaction with the degree of optimisation particularly when it comes to efficient crane utilisation and truck turn times while maintaining on-time train departures, we intensified our research in these topics. Quite often we observe that optimisation approaches being developed for marine-terminal operations are applied in intermodal facilities, resulting in increased operating hours and distances travelled per crane move, lower performance and higher equipment wear with manual operators overriding the systems

because they feel being less productive in comparison to fully manual operations.

As a result of this endeavour, we are in the position to help with our TOS-Add-ons as an intermediate layer at the interface between TOS and the individual crane PLC to better manage jobs among cranes, the optimised execution of the job at each individual crane, the stack configuration optimised in relation to the tasks to be performed in the terminal (e.g. O/D or hub operations) as well as with AI-driven predictions of container pick-ups and consequential optimisation of the stack configuration to minimise work load at peak times. All these solutions have been tested in our simulation suite and applied in various real environments and contribute significantly to efficiency gains of our customers.

AS HPC WORKS WITH THE PORT OF HAMBURG, WHICH HAS ONE OF THE LARGEST RAIL TERMINALS IN EUROPE, WHAT ARE SOME OF THE KEY DEVELOPMENTS YOU ARE WORKING ON/ HAVE RECENTLY WORKED ON THERE?

With our works around CTA's intermodal ramp – Europe's biggest single intermodal rail terminal –, our activities around processes and IT controlling the semi-automated operations at HHLA Container Terminal Burchardkai (CTB) in Hamburg and a number of projects on intermodal terminal automation for railway operators in Europe and North America we have received significant experience in integrating the various solutions into a state-of-the-art "ecosystem".

Even smaller facilities, possibly being operated traditionally with mobile equipment such as reach stackers can take advantage of the technological opportunities available to make operations safer, more resilient and more efficient.

HOW DO YOU SEE THE FUTURE OF HINTERLAND CONNECTIVITY EVOLVING OVER THE NEXT DECADE?

With all the opportunities presented, we anticipate the intermodal industry to also go through a significant process of improvement.

In terms of collaboration tools, we see the port industry developing towards second generation port community systems, not only being EDI-platforms for data exchange, but actively providing coordination to the various stakeholders to enable them to better work as system partners.

Considering this alongside all of the developments touched on before and bearing in mind the developments in autonomous trucking we believe intermodal terminals have the potential to become the nucleus of the logistics facilities of the future, with autonomous trucks serving the rail ramp and the distributions centres around in an intelligent manner of digital coordination of all associated resources, basically being zero-emission at least locally and thus becoming highly efficient partners to the supply chain.

ABOUT THE INTERVIEWEE

Felix Kasiske is Managing Director and Partner at HPC Hamburg Port Consulting. As head of HPCs intermodal rail segment, he has shaped HPC's competence in intermodal terminal planning, design and operations as well as equipment, IT and integration related services for 15 years. In addition to a series of marine terminal project works, he contributed to 50+ intermodal terminal projects around the globe. Prior to HPC he was involved in supply chain and intermodal transportation topics in research and consultancy and in strategic advisory to rail cargo operations of DB German Rail.

ABOUT THE ORGANIZATION

HPC Hamburg Port Consulting is a logistics consulting company specialised in strategy and transformation services for ports, marine and inland terminals as well as intermodal rail.

Since establishing in 1976, the Hamburg-based consulting company has delivered more than 1,600 projects across 120 countries spanning six continents along the full port project development cycle.

HPC employs about 100 domain experts with a background as terminal operators, software engineers, logistics managers, transport economists and mathematicians. As a subsidiary of the Hamburg Port and Logistics Corporation (HHLA), HPC has its root in port handling of containers, break bulk and multipurpose as well as hinterland operations.

Today, HPC belongs to the leading consulting companies when it comes to digital transformation in the terminal and port sector.