LOG!VILLE

WHITEPAPER

FUTURE CHALLENGES IN INTRALOGISTICS

INTRODUCTION

Intralogistics and warehousing are key in the European manufacturing and distribution industries. By increasing efficiency, capacity and resiliency in these areas, companies can immediately impact their bottom line.

On the other hand, intralogistics brings a lot of challenges as well as economical and physical risks. So it comes as no surprise that companies are constantly looking for innovative solutions to tackle these challenges and continue the search for rapid optimization.

It is in this context that Log!Ville, the innovation center for logistics, hosted a round table with Powered Industrial Vehicle (or PIV) producer Toyota Material Handling Europe and Belgian industry leaders in intralogistics.

In this paper, we share some of the key challenges these companies face, as well as trends and opportunities they see on the horizon.

ENERGY

Amidst a global energy transition, the smart use of power in intralogistics and warehousing and securing access to clean energy over time are key challenges to overcome.

A big question we need to ask is this: "Is green electricity really the only energy source of the future, or can clean hydrogen provide an additional power source that can complement the needs of the warehouse?"

A major hurdle to overcome is how to maintain productivity while taking into account peak capacity. AI could provide companies with insights on peak sun hours, peak demand and peak capacity that they can use to optimize the charging infrastructure.

Additionally, saving energy by raising employee awareness can also help to tame peak electricity demand.

Key challenges

- How do we manage electricity peaks while using sustainable energy?
- Do we continue using electricity only or do we need to complement with hydrogen as an additional sustainable energy source?
- How do we organize smart charging and/or battery swapping to optimize the operational efficiency of our PIVs?
- How can we optimize our energy consumption in the warehouse and on a site level? What role can employee awareness play?
- What is the ideal balance between performance and energy consumption of vehicles?

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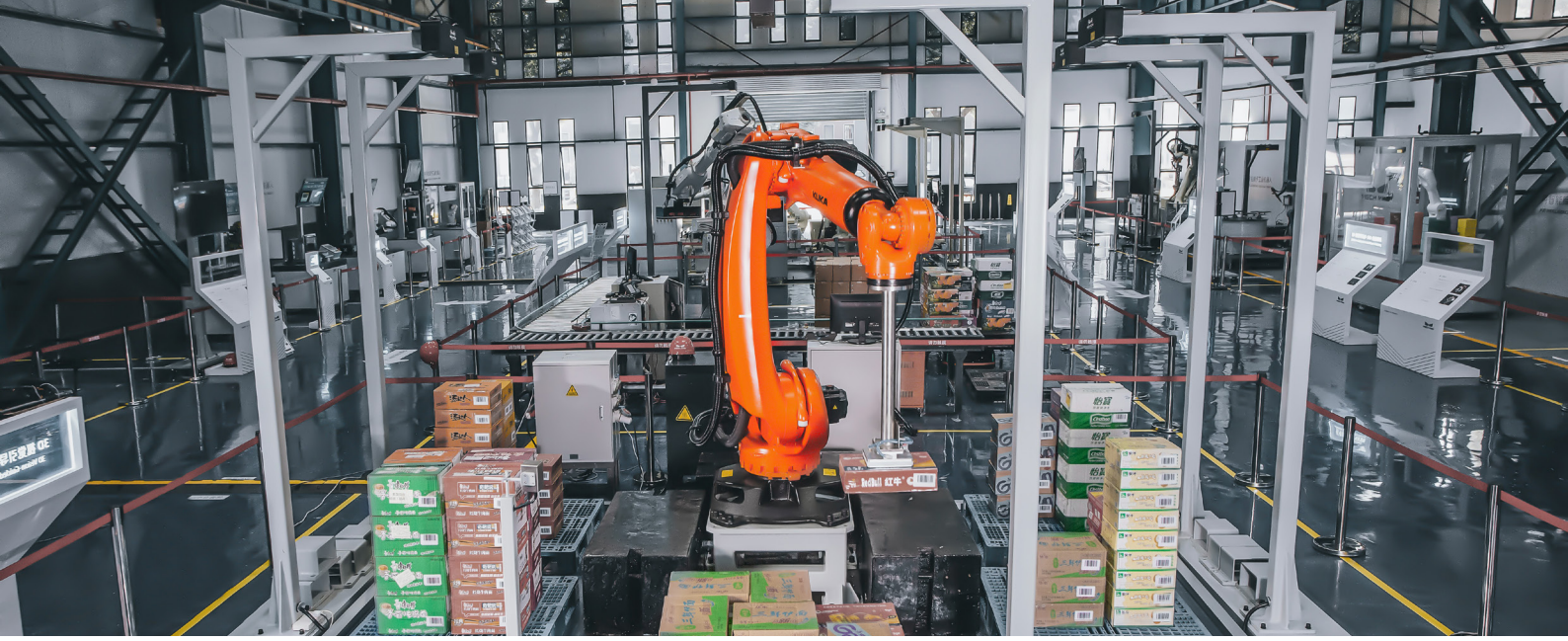
Securing access to enough energy, and especially clean energy, will be one of the most important challenges for warehousing in the future.



PEOPLE

The war for talent rages on. Employee retention, training and continuous learning are key in a sector that is always evolving, but balancing these things against the cost of wages and the necessary flexibility in staffing proves to be a major hurdle for many industry leaders. Platforms that provide interactive ways of continuous learning, e.g. through workshops, can relieve pressure on warehouse managers to keep their staff educated on the latest technologies and safety procedures.

In intralogistics, automation is on the horizon. Moreover, impressive innovations have already greatly increased the efficiency of processes like counting inventory. Still, we're not ready yet for a shift towards full automation.

Most companies currently employ a hybrid model where more and more routine tasks are being automated and the added value of human labor is maximized. In this hybrid world, a focus on safety remains key.

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The shift towards full automation will take time. Meanwhile, hybrid solutions will be equally important, e.g. remote-controlled trucks.

Today, new technologies combined with smart software and connected PIVs increase safety and reduce the number of incidents. But in the near future, remote-controlled PIVs and order pickers, AR, VR, and exoskeletons will further bridge the gap between the hybrid model and a fully automated warehouse.

Key challenges

- How do we increase talent retention in the warehouse?
- How can we improve training and continuous learning in a sector with high employee turnover and rapid technology changes?
- How can we maximize the added value of human labor while automating other processes?
- How do we reduce the human errors?
- How can we improve ergonomics and safety?
- How can we better forecast the staffing of the warehouse?

PROCESS OPTIMIZATION

Investigations from Toyota Material Handling Europe indicate that sometimes PIVs only carry load 30% of the time they are operational. It's numbers like these that warehouse excellence leaders want to tackle.

It will be key to focus innovation around process efficiency in warehousing to adopt to future demands. "While these innovations are crucial in moving the industry forward, they also mean that a few years from now we will not be working in the same way we are today, so flexibility will be key", says Stefaan Van Driessche of Barry Callebaut. This also has a large impact on how financial resources for innovation will be allocated.

In the short term, process efficiency investments need a tangible ROI. In the long run, warehouses, vehicles, racking, processes, and OEM services will need to be designed with flexibility in mind. By designing for flexibility, we can future-proof products and services today, so the industry can swiftly adapt to the innovations of tomorrow.

> **Innovations that drive process efficiency will be of utmost importance for the future.**

OEMs can also innovate in terms of their business model to suit this continuous need for the latest innovations. Material Handling As A Service (MHAAS) is a business model that could bring an answer to the needs of both OEMs and industry leaders.

Key challenges

- How do we keep up with continuous innovations? How do we integrate them in our current budget and way of working?
- How can we improve the productivity of our PIVs and processes?
- How do improve the productivity and added value of human labor?
- How can we improve warehouse planning and layout in terms of productivity, automation, and flexibility?

DATA, INSIGHTS AND LEARNING

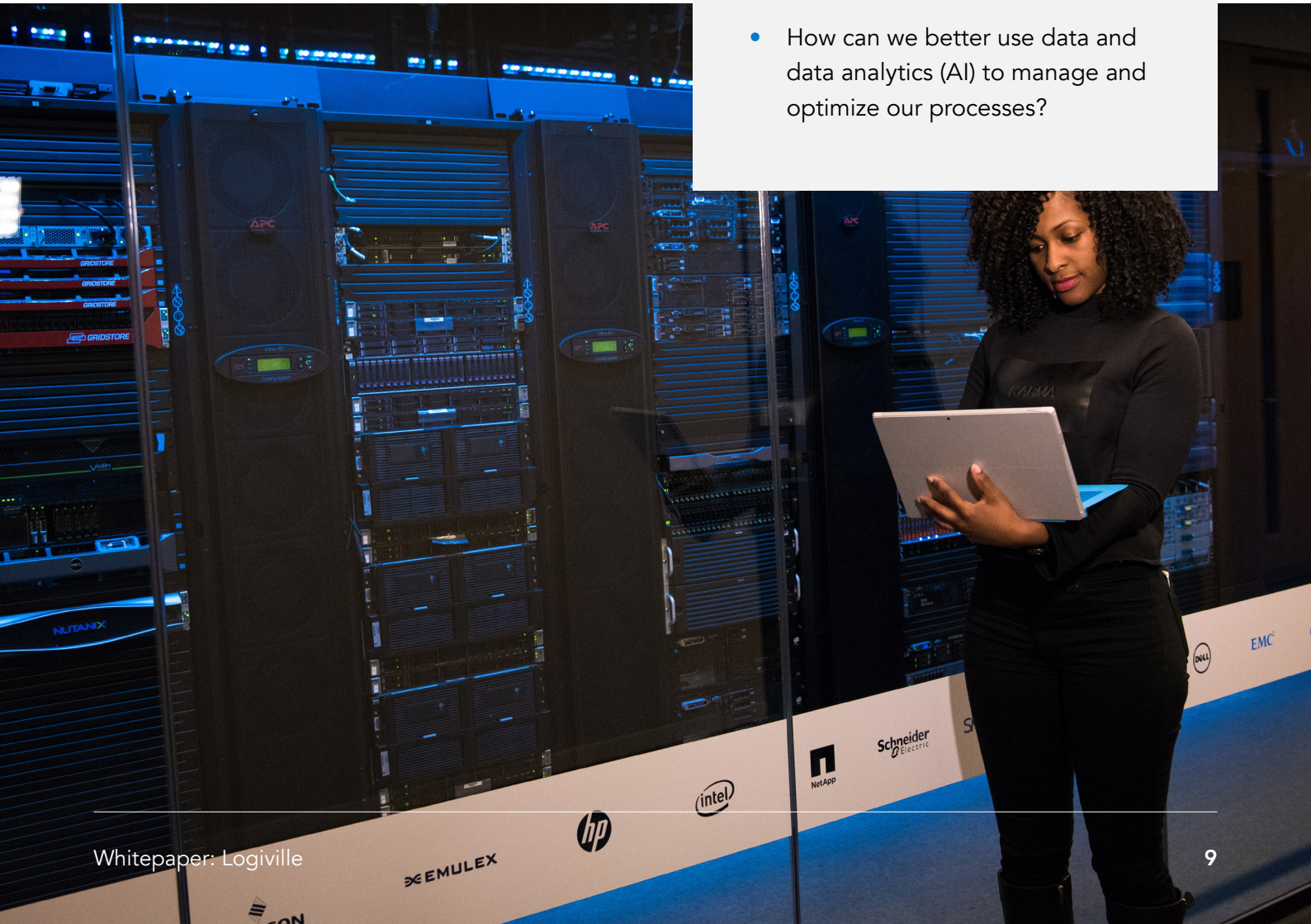
Insights and data are key to achieve continuous improvement. Thanks to tools like Toyota's I_Site, KPIs are increasingly available to drive warehouse productivity.

When linking these KPIs to external data points such as electricity use, peak sun hours and peak customer demand, warehouse managers get the tools they need to forecast capacity, charging cycles, productivity, staffing and much more.

Furthermore, industry leaders are eager to share data and insights to benchmark their own performance to that of other companies. This way, we build an environment of collaboration, partnerships, and cross-contamination of best practices.

Key challenges

- How can we better understand how we are performing?
- What can we improve? What can we learn from others?
- How can we predict peak demands and how can we deal with them?
- How can we better use data and data analytics (AI) to manage and optimize our processes?



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The use of data and KPIs will drive insights and continuous improvements and innovations in logistics.

DISRUPTIVE TECHNOLOGIES

As this white paper illustrates, intralogistics is the breeding ground for disruptive innovation. That's why Log!Ville continuously scans the world of disruptive technology. This way, they can identify innovations early on and prepare early adopters for the latest market-ready technologies.

One of these technologies is Physical Internet (or PI). "The foundation of PI is currently being built in ports and airports. We expect the first mainstream applications in ten to fifteen years", says Kris Neyens of VIL. This technology can disrupt warehouse operating models completely and should be on everyone's radar.

It is not only the physical internet as a fully developed concept that is important: in the coming future, PI will continuously drive spin-off innovations that can be available to use much earlier than the full concept will be in place.

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CONCLUSION

Energy, people, process optimization, data and technology should be on the mind of any professional involved in intralogistics and warehousing. These round table discussions show that all warehouses, disregarding industry, are facing similar challenges, from optimizing their energy use to finding the right employees and keeping them on board.

Luckily, there are lots of exciting possibilities for the future: smart use of electricity, hydrogen, remote-controlled vehicles, AI and use of data, as well as exciting visions such as the Physical Internet...

Log!Ville is there to help guide the industry by identifying innovations early on and providing gateways for companies to discover and implement them. But there is also a need to share insights and experiences, learn from each other and collaborate towards continuous innovation.

All participants to our round table seem to welcome these opportunities. If they follow through and collaborate following the framework of open innovation, a bright future lies ahead for the logistics sector.

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