

Whitepaper

Intralogistik 4.0 – six success factors for your intralogistics

The features of intralogistics 4.0
and what they mean for you

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Introduction

Intralogistics 4.0 – opportunities in business

Industry 4.0 is no longer a vision for the future – it's happening all around us right now.¹ The internet of things and big data are two mutually dependent expressions of this development.² Thanks to the digital revolution, business processes and workflows are undergoing a massive transformation. New strategies are needed to maximise potential so that new challenges can become new opportunities. It's all about finding the competitive edge in this time of change and moving forward with purpose.

Many innovations associated with industry 4.0 are heavily represented in the logistics sector and, at a finer level, in intralogistics 4.0. Industry 4.0 is fundamental to logistics and intralogistics, where the benefits and challenges are closely

intertwined: Networking across sectors, service providers and systems in the context of progressive decentralisation, efficient handling of multiple warehouse processes for entire supply chains, global communication and human-machine interactions.

It would be a mistake not to promote interaction in these fields. There is enormous potential to be tapped by fostering intelligent interaction, however.

With this in mind, this white paper will take a look at the features and leverage potential of intralogistics 4.0. It will then go on to examine the benefits and opportunities offered by the digital revolution.

¹ Cf. Im Wandel der Zeit: Von Industrie 1.0 bis 4.0, LMIS, <https://www.lmis.de/im-wandel-der-zeit-von-industrie-1-0-bis-4-0/>, called up on 07.08.2020

² Cf. „Industrie 4.0 und das Internet der Dinge“, bimos, <https://www.bimos.com/B/de-de/news/2932/industrie-40-und-das-internet-der-dinge>, called up on 11.08.2020

Features

What's special about intralogistics 4.0?

We're experiencing the effects of digitalisation and networking across all areas of our everyday lives, whether at work or at home. Online retail options and video-conferencing functions have radically changed our reality. Crises such as the coronavirus pandemic, the dearth of skilled workers, shareconomy trends and other factors are acting as accelerators for this transformation.³

It's no surprise that the challenges for intralogistics may seem great at first and perhaps difficult to master. Processes and structures need to be rethought and remodelled to meet the demands of digitalisation and networking – a daunting task to say the least. But by planning the necessary steps, we have the chance to make our projects and products longer-lasting and more stable for the future.

Intralogistics 4.0 and by default logistics 4.0 are changing the face of the working world as we know it.

³ Cf. „Was ist Logistik 4.0? Alles zum Thema Digitalisierung & Logistik“, MM Logistik, <https://www.mm-logistik.vogel.de/was-ist-logistik-40-alles-zum-thema-digitalisierung-logistik-a-692722/>, 11.01.2019, called up on 07.08.2020



Smart Data – management, analysis, optimisation

Digitisation brings order and structure to an invaluable commodity: data. Every product and each service has an individual code which can be analysed. Big data is turned into useful smart data.

Intralogistics processes benefit from the traceability of products and goods since errors can be minimised, overviews generated and processes optimised based on forecasts. In addition, analyses and evaluations can be performed because goods have been precisely identified and localised. Goods flows can be easily monitored, inefficient routes pinpointed and optimised, and overproduction or underproduction detected and adjusted on the basis of evaluations.

The opportunities are manifold and will effect a sustainable transformation in our intralogistics and logistics processes. The purpose of smart data analyses is more than a one-off improvement. Correctly applied and evaluated, they optimise inefficient workflows, streamline processes, and restructure entire warehousing and production facilities.

Human-machine interaction is essential. No matter how fast a smart system can collate and evaluate data, human involvement is crucial to understand and assess the data at a higher level.

Networking and decentralising your IT infrastructure

Digitalisation allows a better overview of complex processes and coordinates intralogistics processes optimally. A new digital approach to supply chains automatically promotes networking of material and information flows across service providers and national borders. Beyond autonomous supply chains, the future is ultimately about connecting a multitude of value-creation chains in multiple ways.⁴

While digitalisation has promoted networking, work interfaces are becoming increasingly decentralised. Products are no longer manufactured from start to finish at one single production facility. Individual product components are transported according to strict schedules to globally distributed processing facilities where specialised personnel and machines are available on site.

Networked intralogistics processes bring order to decentralised structures and allow them to work together in many different ways. Whether goods receipt, automatic systems or packing – the processes are interwoven seamlessly.

⁴ Cf. Logistik 4.0, <https://wirtschaftslexikon.gabler.de/definition/logistik-40-54203>, called up on 13.08.2020

More service for your customers

While data analysis, decentralisation and networking between logistics partners and processes are all impressive optimisations, they are not an end in themselves. Intralogistics 4.0 also focuses on service.⁵

Intelligent intralogistics systems can use data forecasting to detect increased interest in a particular product, for instance. When a higher frequency of repeat orders is registered, new deliveries are triggered to avoid bottlenecks. In short, smart data means faster, more reliable supplies of stock for end customers.

Products may also be further developed through synergies with new business partners. A company unable to handle specific production processes might have them handled by a partner. Products can be optimised thanks to the effects of networking and decentralisation. This in turn means higher quality products for the customer.

⁵ Cf. „Was ist Logistik 4.0? Alles zum Thema Digitalisierung & Logistik“

⁶ Cf. „Was ist Logistik 4.0? Alles zum Thema Digitalisierung & Logistik“

⁷ Cf. „Paketversand: Wunschtermin schlägt Lieferung am selben Tag“ , LOGISTIK heute, <https://logistik-heute.de/news/paketversand-wunschtermin-schlaegt-lieferung-am-selben-tag-13888.html>, called up on 12.08.2020

⁸ Cf. „Was ist Logistik 4.0? Alles zum Thema Digitalisierung & Logistik“

The upheaval brought about by e-commerce

Logistics 4.0 is also the result of changes in consumer behaviour.⁶ Goods are permanently available due to the use of terminal devices such as smartphones and tablets. This ease of availability and ordering means that logistics flows and processes need to be fast. Consumer expectations have risen significantly in terms of speedy delivery and availability: same day delivery and delivery on a specific date are important criteria for buyers.⁷ Consumption in the e-commerce sector is fast and targeted, leading to a whole host of logistics challenges. Overall volumes may be greater but orders themselves are dispersed and small-scale in nature, as a result of marketplaces for instance.⁸

Returns management is one of the key logistics tasks driven by e-commerce. Using smart returns management, warehouse management systems (WMS) can return goods to the warehouse. Existing resources are reintroduced to the sales cycle so that the level of new production is reduced. This is an example of how process optimisation and ecological responsibility can go hand in hand.

Solutions

How can we move towards intralogistics 4.0?

There's no 'one-size-fits-all' approach. All companies have their own specific issues and priorities, along with structures that need to be adapted individually.

However, there are a few key factors that can be identified and targeted to safely steer the transition.



Six success factors for your intralogistics

Digitalisation: Empowering your business

01

As a basic constant for all the points listed below, digitalisation is of course the most significant. The benefits and sophisticated features of intralogistics 4.0 can only be fully exploited if people think and work digitally. In this context, cumbersome manual working methods are a thing of the past. To unleash the potential of your intralogistics and reach a new level, you must be willing to leave your "tried and tested" ways of working behind.

Ask yourself these critical questions:

- › Are there work steps that could be made more efficient with digital support and are still carried out manually in your warehouse?
(For example, the work steps in your warehouse are performed exclusively using pen and paper.)
- › Do you have an insufficient overview of the processes in your warehouse?
(For example, you cannot explore improvement options to the extent desired because you cannot record your processes.)
- › Are you losing employees because they can no longer do their work properly with the existing structures and are no longer motivated?
(For example, a competent employee has physical limitations as the result of an accident but would be able to continue doing their job if the right hardware was put in place.)
- › Do you find yourself in a legal grey area because you cannot guarantee data protection with the resources currently used?
(For example, you use Excel spreadsheets or other outdated systems to manage your customer data instead of CRM tools.)

If you've answered these questions with yes, we recommend seeking digital support. With the right ERP and warehouse management systems, you'll be able to create a completely new framework for your intralogistics, making your processes more efficient, more transparent and more future-proof.

Read our whitepaper "In Search of the Perfect WMS" for more information about choosing a WMS.

02

Decentralisation: The system in the cloud

IT structures are becoming increasingly complex and bundle multiple resources. They need to be highly available and fail-safe. It's time-consuming and costly for companies to manage this in-house. State-of-the-art hardware and the necessary software structure must be purchased, maintained and regularly renewed.

To break free from the complicated workarounds of in-house solutions, companies can use cloud services for many tasks.⁹ Video conferencing systems can be used to hold meetings across multiple locations, for instance, without having to purchase the necessary in-house server capacity. Document cloud platforms allow multiple users to work on files simultaneously. Excel spreadsheets and other documents no longer have to be stored locally.

Intralogistics applications, such as warehouse management systems, are also moving into the cloud. >

⁹ Cf. Cloud Monitor 2017, Bitkom Research GmbH und KPMG AG, <https://www.bitkom.org/sites/default/files/pdf/Presse/Anhaenge-an-Pls/2017/03-Maerz/Bitkom-KPMG-Charts-PK-Cloud-Monitor-14032017.pdf>, 14.03.2017



The benefits are obvious:

- › **High availability:** To guarantee safe operation of intralogistics processes, the basic IT structures need to function reliably at all times and no matter what disruption occurs. Continuous availability and high performance must be guaranteed. Using warehouse management software in the cloud, you can free your in-house server structures of this critical task. State-of-the-art multi-tenant data centres with highly available servers are sophisticated in design, mirroring data for high redundancy in multiple locations and making them fail-safe in the event of power failure, unauthorised access, environmental influences and other stressors.
- › **Security:** Many companies have been reluctant to put their data in the cloud, citing concerns about data protection. There are no grounds for these concerns – the data may even be safer in a highly protected data centre than in an in-house IT environment.¹⁰ The cloud services you select must of course use data centres that are compliant with German data protection requirements. In addition, connections to warehouses and offices should be encrypted and a sophisticated security concept is advisable. Once these steps have been taken, you're ready to go.
- › **Scalability:** Growing companies need growing IT infrastructures. Cloud systems offer the required flexibility in this case. You can increase or decrease your cloud server usage to meet demand. All necessary resources are available instantly, enhancing your speed.

- › **Cost reductions:** Scalability and cost reduction go hand in hand. Cloud solutions automatically reduce personnel costs as well as acquisition, commissioning and maintenance costs for hardware.
- › **Mobility:** Using a cloud-based IT system means you can access the functions you need from anywhere in the world. You need to track workflows, add a new warehouse to your network, your company is moving? You can call up the information you need any place, any time.

By moving services to the cloud, you create the capacity to concentrate on your company's core business. And fewer multidisciplinary experts are needed within the company. Given the shortage of skilled workers, it makes sense to secure supply in fields such as IT by using specialist service providers.

This doesn't mean that your entire IT infrastructure has to move to the cloud straightaway. Look at every level of your business. Selecting a few specific IT services to move to the cloud creates a secure environment for your company and brings your in-house intralogistics processes closer to 4.0.

¹⁰ Cf. Cloud Computing: Schnell, wirtschaftlich & sicher, abasERP, <https://abas-erp.com/de/erp-guide/cloud-computing>, called up on 12.08.2020

03

Networking: Communication across all interfaces

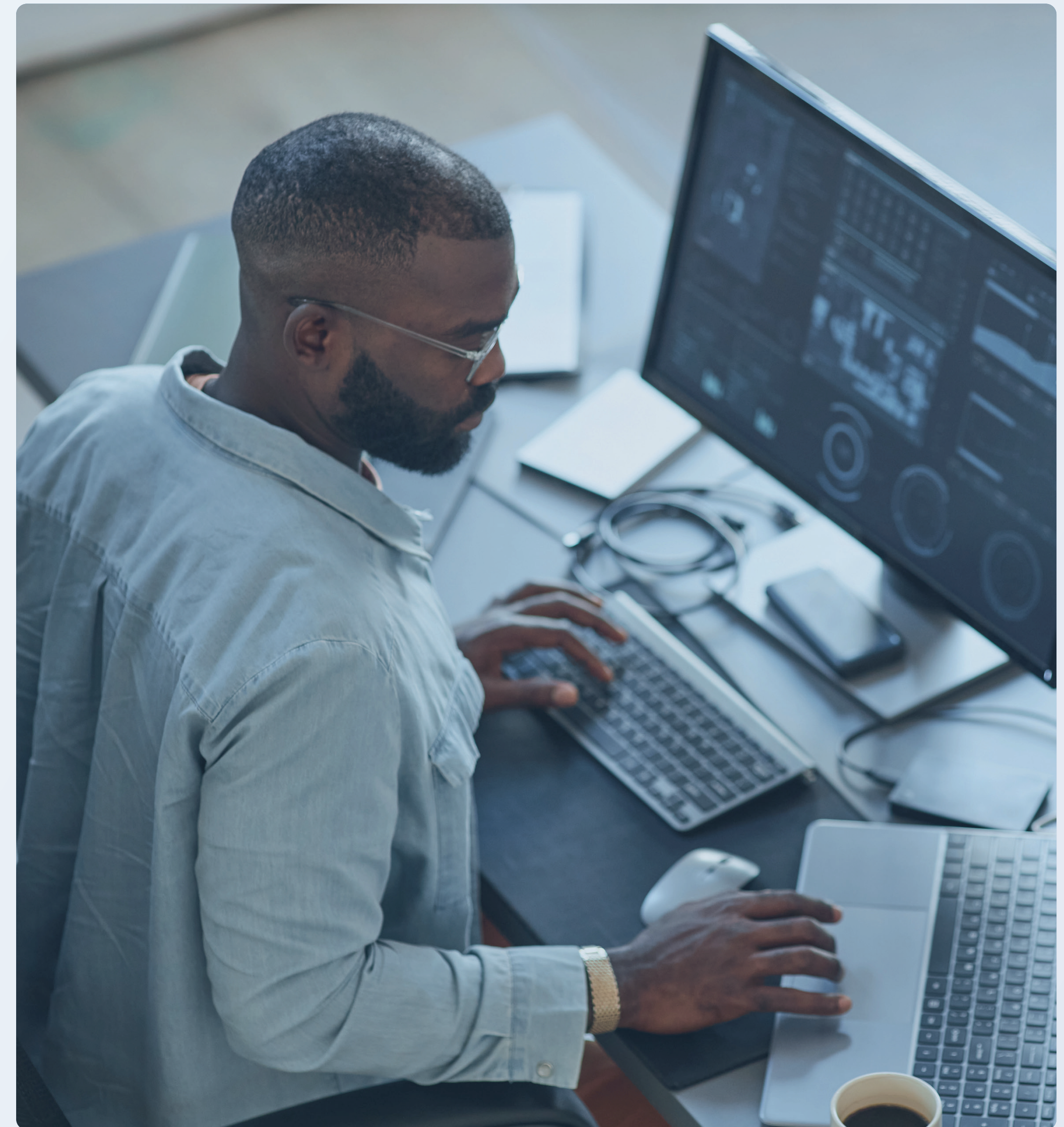
Application of a decentralised, secure cloud solution is a further step on the road to intralogistics 4.0. To ensure smooth operation of your warehouse processes, communication between all participants must be fully optimised, whether human or machine. Interaction between interfaces is essential to maximise the efficiencies achieved at individual workspaces.

Consider stock that is being brought into the warehouse and is already needed at dispatch for an urgent shipment. The crossdocking functionality can be used to fast-track the product through the warehouse without passing through the goods receipt, putaway and picking areas. Intelligent networking between the shipping system and WMS means that data is transmitted speedily to the appropriate shipping providers and the goods are delivered to the end customer as quickly as possible. This is service at its best.

Now apply this train of thought not just to a simple example as above but to the intricate processes of production logistics, or even more complex, to the supply chain. Effective networking is a must in order to coordinate the processes integral to the various interfaces and to maximise efficiencies from the get-go.

This means that network capability is a crucial factor in selecting systems. Is there any interaction between your ERP and warehouse management systems? Is it possible to connect your production control and/or transport management systems over a secure interface?

Enhanced communication between interfaces means that individual work steps are easier to perform.





04

Flexibility: Modular IT infrastructure

A modular IT infrastructure brings your company enhanced efficiency in terms of intralogistics 4.0. Modular software components are the building blocks for efficient and flexible processes.

Let's take a warehouse management system to see how might this look. Initially, the basic functionality and a few special software functions are sufficient to keep your warehouse in good order with a simple digitalisation concept. Then your company grows and the number of warehouses increases. The right WMS allows you to add locations and users as needed. As your requirements change over time, you select new functions to meet your needs and drop others that are no longer appropriate.

This means that your intralogistics processes remain digitalised and easy to use at all times along the journey. At the same time, you decide when you want to invest in new functions, meaning that cost efficiency is guaranteed at all times.

05

Human-machine collaboration: Intelligent hardware

Software optimisation requires hardware as a central component for implementation of your processes in the world of intralogistics 4.0. Even the most efficient warehouse processes need practical tools in order to function. The hardware needs to be able to communicate with your warehouse management software, transport management system and any other relevant interfaces.

Let's look at some examples: Goods in the warehouse destined for transport in the near future are scanned. The relevant information is sent to the shipping provider's transport management system. The selected route is adjusted based on this data, thereby enhancing scheduling efficiency. Route optimisation is also a step towards increased sustainability.

Intelligent tools such as modern hardware are used to enhance intralogistics processes. Warehouse management systems include business intelligence functions that determine values for route optimisation in the warehouse. The values obtained are transmitted to forklift and hand terminals to facilitate the process for users. Using technical equipment such as smart glasses means that information from the software can be used even more efficiently since users have both hands free and can stay focused on their tasks.

New hardware technologies with streamlined, user-friendly communication functionality play an important role in intralogistics 4.0.

Warehouse automation goes a step further in terms of hardware. We recommend reading our white paper on automation for further information about this multi-faceted field.



Sustainability: Systems for people and the environment

Intralogistics 4.0 is one of many industrial revolutions in world history, representing a consequential step and at the same time an entirely new development. It's not just about being bigger, better, stronger but also being smarter, more efficient, more sustainable.

Companies making sustainability and ecological commitment their goal are taking the responsibility to build a safe future. We need to protect our environment if we want to continue living and working in it in the long term. And employees need to be treated with respect if they are to project a positive corporate image outside of the company.

In addition, many companies are endeavouring to achieve CO2 neutrality.¹¹ This puts a positive light on the seemingly contradictory conjunction of global decentralisation and sustainability. Companies are now facing up to the challenge of compensating their emissions, which are often generated as a result of worldwide transport systems. If you belong to the supply chain of one of these companies, you too will often have to provide proof of your climate protection activities. By

choosing to support climate neutrality, companies are highlighting their corporate social responsibility and gaining access to new ecologically aware customer bases. Commitment to climate neutrality and sustainability is also becoming an increasingly important factor in the competitiveness stakes.

An additional positive aspect: Commitment to sustainability pays off in terms of talent acquisition. For generations Y and Z, ecological awareness in a company is of paramount importance.¹²

Higher costs are not the issue here. Even if investment and follow-up costs are incurred, increased process efficiency will provide a return on investment (ROI) within a short space of time. Companies taking on ecological responsibility benefit in terms of cost efficiencies thanks to intelligent technologies that streamline and optimise their processes, hardware that supports employees with their day-to-day work, dedicated cloud systems that save energy, or modular IT systems that are used on an as-needed basis.

¹¹ Absatz vgl. Klimaneutrale Unternehmen in Deutschland, Fraunhofer IAO, <https://wiki.iao.fraunhofer.de/images/studien/klimaneutrale-unternehmen-in-deutschland.pdf>

¹² Cf. Praktikanten-Studie: Generation Greta will was bewegen und ist nicht faul, Business Insider, <https://www.businessinsider.de/better-capitalism/der-greta-effekt-wie-sich-die-gen-z-das-arbeiten-vorstellt/>, called up on 13.08.2020

Block chain in the supply chain

The advent of the bitcoin saw the birth of buzzwords such as blockchain as indicators of technical progress.¹³

Using blockchain technology, fundamental logistics processes can be turned upside down and supply chains completely rethought and remodelled.

Decentralised networking of individual logistics partners enhances the security of transactions without the need for checks by a higher-level authority.¹⁴ Goods can move freely from partner to partner without any intermediary. Information is encrypted and stored in blocks (data units). Data storage is decentralised and takes place simultaneously on multiple computer systems in the chain. Using the lock and key principle, transmitters and recipients can use the part of the chain relevant to them. Each step in the process is secured through the use of timestamps and other precautions. The sequence is lean, fast and fraud-proof.

Blockchain can be used in modern supply chains to perform transactions between global companies. A safe, protected environment is created that might otherwise have been jeopardised by digitalisation and anonymity.



¹³ Cf. „Blockchain in der Logistik: Aufbruch ins ‚Internet der sicheren Transaktionen‘“, BVL, <https://www.bvl.de/blog/blockchain-in-der-logistik-aufbruch-ins-internet-der-sicheren-transaktionen/>, called up on 07.08.2020

¹⁴ Cf. „Blockchain in der Logistik: Aufbruch ins ‚Internet der sicheren Transaktionen‘“

Checklist for your intralogistics 4.0

- ✓ Are your processes digitalised or have you developed a concept for digitalisation?
- ✓ Do you use cloud services or are you in the process of selecting a cloud provider?
- ✓ Have you thought about how the different systems you use could be interlinked in your digitalisation concept?
- ✓ Do you work with modular processes and systems so that you can face new challenges flexibly?
- ✓ Do you have the right equipment to perform the tasks in your warehouse and optimally support working processes?
- ✓ Have you looked at your structures for sustainability and future-proofing?

Conclusion:

Using the right instruments to harvest the benefits of intralogistics 4.0

Industry 4.0, logistics 4.0 and intralogistics 4.0 are here to stay. Digitalisation and networking go hand in hand with a multitude of innovations which are set to change the face of many industries. This development in itself is neither positive nor negative. Fans of technological progress sometimes adopt new developments without first subjecting them to critical analysis. Sceptics tend to close their minds to new possibilities, come to a standstill and fall behind in the long term.

It's essential for companies to go new ways in terms of intralogistics 4.0, weighing up the pros and cons of new developments and technologies on a case-to-case basis. Decentralisation and modularisation mean that intralogistics 4.0 is both targeted and diverse. There's no one-size-fits-all approach. Every company's journey is unique, as is their position in the market.

Market reach and e-commerce may also benefit: Small local businesses can gain access to a global customer base by setting up online outlets.

Intralogistics 4.0 opens up a world of opportunities. Without digital processes, you are scratching the surface of your company's full potential. Exploring the opportunities offered by digitalisation provides a deep insight into what your company can do. You can rethink your processes, identify weaknesses, perform analyses and adopt more efficient approaches. And a global network of expert partners generates innovative synergy effects.

The path to intralogistics 4.0 may be arduous but it is rewarding: It will help you gain the edge over your competitors, boost efficiency and future-proof your company. You'll reduce costs and errors while driving innovative thinking. And more than anything, you'll increase customer satisfaction.



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