Digitalization in Logistics

A practical guide on the way into the digital world

AxIT connecting logistics

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EDITORIAL

Digitalization dominates the thematic agenda in logistics. But is digitalization for companies from logistics still up in the air and thus too fantastic to be used in operations? No, not at all. Supply chain leaders are already implementing it consistently today. And every day new, innovative application examples appear.

With this expert paper we intend to take up directly tangible examples on the topic of digitalization. A paper for practical use that is supposed to reveal the nebulous, incomprehensive and the far-from-everyday life part of digitalization. We put a focus on solutions which make your company more successful and which are employed here and now, instead of any time in the distant future.

We want to make digitalization and its elements and examples easily comprehensible, for it is not the technology developer who determines which solutions and technologies will be successful in the future, but the user himself – and that means you!

Digitalization does not mean to aimlessly beam your company into the digital age. Digitalization can be implemented step by step. But these steps need to be taken. Basically the following applies: Those who do not move forward and remain in the status quo will be surpassed and left behind even faster in the age of digitalization than it used to be the case in the past.

It is more than high time to deal with it: The opportunity should be used. Digitalization is not for waverers and procrastinators. Supply chain leaders make decisions and consistently implement them. IT is becoming a more and more powerful tool for this and it develops rapidly. Those who do not want to resort to actionism must correctly identify demands and goals.

Those who wait too long to see what others do, risk to be considered a back number already tomorrow.

We wish you an inspiring reading!

Frauke Heistermann
Member of Management Board
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1. EXPLANATION ON THE TERM DIGITALIZATION AND ITS IMPORTANCE FOR LOGISTICS

What does digitalization mean in practical terms? From AXIT’s point of view we can only speak about digitalization when IT takes a crucial role in the definition of processes.

We would like to give you a pragmatic explanation on the digitalization in logistics and outline its importance for logistics in a few sentences:

• We can only speak of digitalization when IT assumes a crucial role in the definition of processes.

• “Crucial” means that IT assumes a leadership role and is no longer considered a single tool or an agent.

• “Leadership role” means that IT significantly supports or even takes over processes and their related decisions, e.g. routine decisions.

• “Leadership role” also means that IT is used in a holistic, strategic, sustainable and consistent way.

• Digitalization requires the use of most recent technology that has reached a certain degree of maturity which is suitable for large-scale deployment. Just like with the other quantum leaps in industry we only speak of revolution when the acquired ability (e.g. mechanization) reaches mass-utilization suitability.
Various market surveys make clear how companies relate to digitalization and how do they assess its relevance for logistics. Here are some of the results:

59% of respondents of an MHP survey assess the relevance of cooperation with IT in logistics as very high, 35% as high.¹

Also figures from BVL confirm:
Digitalization is the dominating trend topic in logistics.²

According to a Bitkom survey the main challenges on the way to digitalization lie in standardization and in process and work organization.³

Cloud applications, mobile solutions and the internet of things are considered the most important technologies in the next years by C-level managers according to an IBM survey.⁴

2. Source: http://www.bvl.de/thema/neue-wachstumsmaerkte, Bundesvereinigung Logistik (BVL), 2015
3. Source: Results of a survey on Industry 4.0 trends, Bitkom, VDMA, ZVEI, 2013
4. Source: C-Suite Study, IBM, 2013
Logistics has the chance to be the driver of innovation

Industry 4.0 sets high standards of reliability and flexibility for the delivery of raw materials, intermediate products, finished parts and other goods. Logistics is an integral part of the added value chain. It must not only support the demands of Industry 4.0, but also be a driver for these. This also means that logistics must communicate faster, safer, more reliably – be more interactive in order to be the driver of innovation and not its bottleneck.

The supply chain is a fragile and complex structure

The supply chain is a fragile structure. Many things can happen on the way to the final customer: the quantity supplied is insufficient, damage occurs with on pick up, the vessel's departure is delayed, connecting trains are not reached, transport vehicles are delayed, ramp capacities are insufficient and so on. All this has an influence on the supply chain's reliability and at the same time it increases its complexity.

In addition to the challenges and disruptions which logistics faces every day, often there are also exceptional circumstances on a larger scale, such as strikes or natural disasters.

Another challenge lies in the large number of participants and their IT systems which work together globally within the same supply chain. This includes, among others, buyers, suppliers, forwarders, warehouses, hubs, customs and various consignees.

Furthermore, the supply chain is only a part of a global business network which consists of closely connected independent business processes.

Digitalization helps us manage the challenges

Management under these conditions makes logistics professionals face new challenges every day. Therefore, especially supply chains can benefit from the positive effects of digitalization. It is with their help that

- Participants are flexibly integrated,
- Processes are networked,
- Data transmission is automated,
- Decision processes are improved by providing crucial information (due to digitalization, decisions can even be made automatically),
- Data is collected and enriched,
- The information gained builds up know-how and it creates additional transparency.
4. EVERYTHING THAT COUNTS: SIX PERFORMANCE ADVANTAGES OF THE DIGITAL SUPPLY CHAIN

Digitalization opens new dimensions in supply chain management for companies. Six essential performance advantages:

1. IT integration of the various participants and their existing systems (Technology: e.g. EDI, webservice, Web-EDI, etc.) - regardless of the IT architecture of internal systems (e.g. ERP, WMS, forwarding program...)
2. Create a database of the highest quality: Complete integration allows for exchanging, sharing and enriching data by combining different data sources. (Technology: central data platforms). This way data turns into information and information turns into know-how. Examples for combining and enriching data can be:
   - Combine material master data and packaging data
   - Compare target transit times, forecasts, actual transit times and geocoded position data
   - Link orders, delivery notes, shipments, loading lists, transport modes
3. Complete transparency of supply chains and material and information flows
4. Standardization and automation of processes (Technology: Cross-company mapping of workflows through the cloud). Only standardized processes can be automated. This is true for both internal and cross-company processes.
5. Visibility & Collaboration, in this case it means intensive and closely networked cross-company cooperation in supply chain networks. This is only made possible by better process knowledge on the other participants’ upstream and downstream processes and by better data. Collaboration requires networked thinking and acting. Closely linked to this is a new way of thinking in which there is no longer place for isolation and “sitting on your data”. Isolated views prevent collaboration.
6. Create new values due to systematic analysis of all enriched data along the supply chain (Technology: Analytics, BI, etc.)

What are the advantages that digitalization creates for the supply chain?
- Reduced complexity
- Increased reliability
- Predictability and thus minimized risks
- Reduced errors
- Reduced transport cost
- Create new business areas and thus turnover potential
- Increased innovation capability
- Increased agility and flexibility, e.g. in case of new market requirements
The following examples are based on the practical experience from more than 2,500 AXIT projects. They show how digitalization in logistics can be supported by the use of a cloud-based logistics platform like AX4. The scope is to fulfill each scenario’s individual requirements in the best possible way. They include

- Integration of all process participants and systems,
- Standardization and automation of processes and workflows,
- Creation of supply chain visibility,
- Enabling collaboration,
- Analysis of data.

Procurement Logistics
for Shippers from Industry and Trade

Distribution Logistics
for Shippers from Industry and Trade

Shipment Management
for Logistics Service Providers
Participants and description of the supply chain network

• Shippers from industry or trade with over 100 different suppliers and five different logistics service providers
• Large production locations with international structures and sometimes multimodal transport such as road, rail, sea or air

Initial situation

• A company from industry or trade sets up an order and procurement network for materials, products or spare parts
• Several suppliers and forwarders need to be coordinated on the procurement side
• Often the process of order transmission and pick up is not transparent and characterized by heterogeneous systems with the participants (e.g. ERP, TMS, forwarding systems, WMS, customs systems or port IT)

Typical requirements (taking into consideration the most important characteristics of digitalization)

Integration:

• Smooth integration of customer-internal systems like WMS or ERP
• Central solution for all the heterogeneous suppliers for transmission of call-offs and orders as well as order confirmations and delivery notes
• Central solution for transmission of pick up orders from various suppliers to different forwarders

Standardization & Automation:

• Linking of call-offs/orders, delivery notes, pick up orders and loading lists
• Continuous transparency for the entire transport process
• Setting up rules within the digital workflow for automatic process monitoring and warning in case of discrepancies from the default process
• Easy and automated data entry process in the warehouse or in production, based on barcode labels and shipment advice
• Easy checking of freight invoices

5.1 PROCUREMENT LOGISTICS FOR SHIPPERS FROM INDUSTRY AND TRADE

Setting up rules within the digital workflow and based on that automatic process monitoring
5.1 PROCUREMENT LOGISTICS FOR SHIPPERS FROM INDUSTRY AND TRADE

Visibility & Collaboration:
- Continuous transparency for the entire – sometimes multimodal – transport process
- Permanent visibility for all participants according to their process
- Cross-company workflows which integrate all the parties involved regardless of their IT systems in use
- Clear roles for each participant
- Rules for an automated IT process based on certain events or milestones
- As sub-processes between the companies are clearly defined and visible for everyone, the entire process and the respective output can be optimized for downstream participants
- Capacity management: Optimization of production utilization on-site and alignment with the respective suppliers’ capacities
- Typical participants: Buyer, consignee, most suppliers, service providers. Example, quality insurance, hubs, DC’s, customs and many logistic service providers for various segments of the transport chain such as pre-, main- and on-carriage as well as for different services like road, rail, sea or air

Data analysis:
- Quantity, structural and framework data on shipment volumes (e.g. for new tenders)
- Process and productivity key figures (e.g. incoming goods volume per day, transport time per order)
- Economical key figures (e.g. cost per order, cost per shipment)
- Quality bespoke KPIs (e.g. delivery service degree, error rates, feedback quality)

Advantages
- Customers know early enough whether a supplier is able to fulfill an order
- At least one day before pick-up the customer knows if the supplier has problems with the delivery
- Reduction of freight cost by approx. 8 per cent
- Up to 50 per cent productivity increase due to automated workflows (Compare barcode scan with shipment advice)
- Reduction of transport cost due to fewer special transports and higher potential for transit consolidation due to transport overviews
5.2 DISTRIBUTION LOGISTICS
FOR SHIPPERS FROM INDUSTRY AND TRADE

Participants and description of the supply chain network
• Industrial shipper or trade company with more than ten different forwarders on the distribution side, international customer structure and – sometimes multimodal – transport such as road, rail, sea or air

Initial situation
• An industrial shipper or trade company distributes goods to a large number of international customers
• The process is characterized by different forwarders for different services, using heterogeneous IT systems which complicates their connection to the industry or trade company’s ERP system

Typical requirements (taking into consideration the most important characteristics of digitalization)
Integration:
• Smooth integration of customer-internal systems like WMS or ERP
• A central interface to all forwarders for transmission of shipment and tracking data
• Quick and cost-effective integration of new forwarders

Standardization & Automation:
• One digital process from shipment creation up to final freight invoicing
• Shipment management and tracking for all processes between the shipper and his forwarders
• Overview of the current status at the push of a button
• Automated freight audit

One digital process from shipment creation up to the final freight invoicing
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• Clear roles for each participant
• Rules for an automated IT process based on certain events or milestones
• As sub-processes between the companies are clearly defined and visible for everyone, the entire process and the respective output can be optimized for downstream participants
• Transparent and automated information to customers on their deliveries’ status also via mobile devices

Data analysis:
• Quantity, structural and framework data on shipment volumes (e.g. for new tenders)
• Process and productivity key figures (e.g. transport volume per day, transport time per shipment)
• Economical key figures (e.g. cost of customer order handling, distribution cost per order, transport cost per order)
• Quality key figures (e.g. delivery service degree, error rates, feedback quality)

Advantages
• 0.50 € lower administrative cost per shipment
• Cost savings of integration of new forwarders: 50% (> 2,000 forwarders are already integrated with AX4)
• 70% time reduction for rolling out the solution to new locations
• Improvement of delivery performance
• Reduction of transport and freight cost
• Tender data and statistics available at the push of a button
Participants and description of the supply chain network

- Logistics service providers, various customers of different sizes (A-, B-, C-customers), sub-providers, 4PLs
- International structure, management of large shipment volumes, mainly general cargo, focus on road and rail. Providing an SCM solution to customers who manage a larger supply chain network for their customers (e.g. inbound logistics for larger production locations)

Initial situation

- A logistics service provider receives his customers’ shipment orders through his current system and wishes to replace this by a more modern and flexible solution which enables a web-based entry and/or transmission of shipment data for their customers. With this central portal the logistics service provider intends to improve his EDI rate and also the quality of shipment and tracking data.
- For a larger customer the logistics service provider manages a complex process, acting as 4PL. In order to offer his customer added value he needs to integrate numerous participants with a cross-company workflow. In this case the cloud-based logistics platform serves as a tool to enhance customer business, to win tenders and to save cost.

Typical requirements (taking into consideration the most important characteristics of digitalization)

Integration:

- Centralized way to receive shipment orders from smaller and medium-sized shippers through a web-based shipment portal
- Centralized and comfortable way to provide tracking data to customers via a web-based tracking portal
- Mapping of complex distribution and procurement networks of large customers with many process participants (e.g. suppliers or forwarders)

Standardization & Automation:

- One digital process from shipment creation up to the final freight invoicing
- Complex SCM solutions for distribution and procurement networks with digitalized cross-company workflows for shipment management in order to obtain more visibility in the supply chain and to enable collaboration
- A configuration tool like AX4 Open with which the logistics service provider can immediately create and manage new solutions on their own
5.3 SHIPMENT MANAGEMENT FOR LOGISTICS SERVICE PROVIDERS

Visibility & Collaboration:
- Continuous transparency for the entire transport process
- Permanent visibility for all participants according to their process
- Cross-company workflows which integrate all the parties involved regardless of their IT systems in use
- Clear roles for each participant
- Rules for an automated IT process based on certain events or milestones
- As sub-processes between the companies are clearly defined and visible for everyone, the entire process and the respective output can be optimized for downstream participants
- Early information on customer orders for better planning
- Transparent and automated information to customers on their deliveries’ status also via mobile devices

Data analysis:
- Process and productivity key figures (e.g. transport volume per day, transport time per shipment)
- Quality key figures (e.g. delivery service degree, error rates, feedback quality)

Advantages
- The portal solution saves cost for the logistics service provider: Reduction of manual tasks, improved data quality, standardization of processes
- With the SCM solution the logistics service provider can a) increase his turnover by gaining new customers or by expanding business with existing customers, b) reduce cost by reducing manual tasks, increasing data quality and standardizing processes
1. Enable collaboration
   • Synergies lie in the cross-company cooperation of participants.
   • IT links the various systems, parties, data – collaboration without IT is hardly imaginable.
   • Digitalization requires sharing data with the supply chain participants and connecting logistics processes via IT.

2. Reduce complexity
   • Consequently, the drivers of complexity can be found outside the factory gates, in cross-company processes.
   • Digitalization reduces complexity by standardization and automation as well as by making processes transparent and linking them within a network.

3. Better decisions
   • Digitalization makes data available in higher quantity and quality. It generates information and knowledge. The large number of participants in the supply chain gains an improved basis for decision-making.
   • Digitalization creates more transparency.
   • Digitalization implements intelligent logic with IT (Logistics 4.0). Decisions can be made automatically and the decision-making process is improved.

4. Minimize risks
   • Those who create their supply chain in a transparent way and digitalize consistently can minimize risks: Problems are recognized much earlier, solutions are automatically proposed. The availability of precise knowledge allows for more accurate decisions.

5. Agility and flexibility
   • These are important prerequisites for companies to prevail in the fast moving world, as markets and customer requirements are constantly changing. Modern IT allows for quick reaction and a high degree of agility, e.g. by making data, information and knowledge available and easily accessible.
6. THE 10 OPPORTUNITIES OF DIGITALIZATION

6. Strengthen innovation capacity
   • Digitalization makes companies question the existing and become more open towards innovation.
   • Digitalization generates more knowledge through processes and transparency; it thus creates an important prerequisite to bring forth innovation.

7. New business areas
   • Digitalization enables logistics to generate new offers, services and added value for customers.
   • New customers and sources of income can be developed.

8. Reduce costs
   • Digitalization helps to operative excellence in the processes: Automation, fewer manual researches, fewer emergency issues, intelligent transit consolidation... all this leads to cost reduction.

9. New jobs
   • Each industrial revolution has finally led to more jobs. Industry 4.0 also will lead to jobs creation.

10. Image
    • Digitalization strengthens the image of logistics as a modern, innovative and smart sector.
Editor

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