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A Practitioner's Guide to Successful Digitalization

DIGITAL SUPPLY CHAINS

campus

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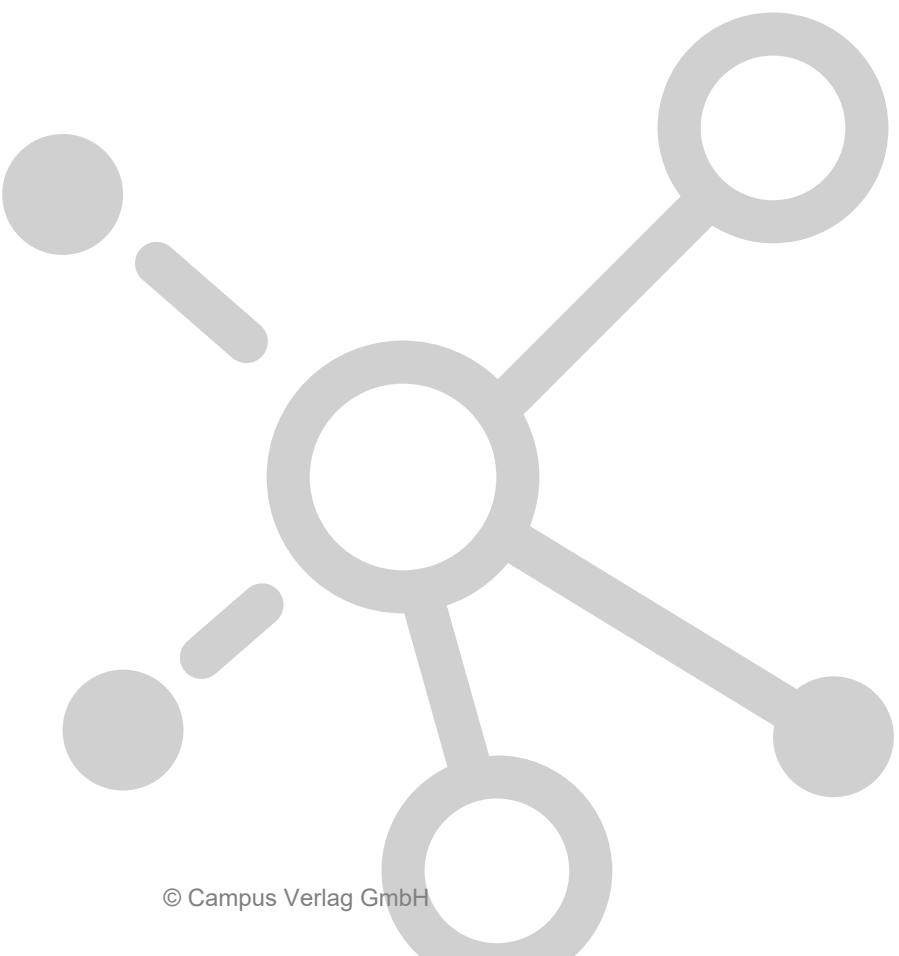
PART 1



Chapter 1
General Introduction

To ensure easy reading, we added some icons for you

The *magnifying glass* marks industry insights.	
The *dialog symbol* flags interviews and quotes from conversations which we conducted with industry experts and academics.	
The *future vision symbol* highlights the vision for digital SCM on the respective topic.	
The *direction icon* will tell you where you can find a step-by-step guide on how to progress towards the final vision.	
Finally, the *survival kit* provides you with a checklist of the most important points in order for you to be able to kick-start actions.	

Overview of Interviews

"Bring your clients to the digital world—They expect it from you."

Martin Zehnder, COO, PALFINGER AG

"People are the most important success factor in digital projects."

Roland Becker, Managing Director, GLX Logistics

"The development of digital supply chains is an evolution rather than a revolution."

Peter Dressler, Senior Director Logistics, Infineon

"There's no quick fix when it comes to transformation."

Jacob Gorm Larsen, Director of Digital Procurement, Maersk Group

"Digitalization cannot be avoided."

Hartwig Meinen, Managing Director Logistics,
Elflein Spedition & Transport GmbH

"The goal is to create awareness at management level first."

Thorsten Rosenberg, Executive Vice President & Head of Global Supply Chain,
BSH Hausgeräte GmbH

"It will become increasingly important for people to retrain and learn new skills."

Alexander Gisdakis, Former Head of HR Leadership Culture, Siemens AG

"There's no hype when it comes to digitalization—it's a fundamentally important topic."

Erik Wirsing, Vice President Global Innovation, DB Schenker

"Culture has come to occupy a more prominent place in today's companies than it used to."

Simon Sagmeister, Founder and CEO, The Culture Institute

We would also like to thank the following people for their active support, contribution, valuable expertise and shared experiences:

- *Simon Sagmeister* (The Culture Institute)
- *Professor Doctor of Engineering Guido H. Baltes*, University of Constance
- *Philipp Smole*, Executive Vice President Corporate Incubator PALFINGER 21st
- *Dr Christian Rohrdantz*, Managing Director, and *Johannes Häussler*, Data Scientist, Vidatics GmbH
- *Dr Maximilian Hausmann*, Senior Manager, *Dr Elena Michel*, Manager Data Analytics, rpc—The Retail Performance Company

Acknowledgement

Supply chain management is without question deeply affected by the disruptive forces of a modern organization, positively as well as negatively. Between Advanced Analytics and AI, agile role models and autonomous warehouses a senior executive is often in danger of losing track in the digital jungle.

In these exciting times, with their many turning points, h&z aims to share insights around digital supply chains, their application in business and the so vital transformation to successfully prepare organizations for this challenge. This book provides insights into best practices of current supply chain and how CSOs apply technologies and advancements. It also makes daring forecasts about how processes and leadership must be designed so that the digital transformation does not fail in its infancy, but leads to a truly agile organization.

Fortunately, we didn't have to do all this on our own. We would like to thank all contributors from leading industry organizations for their opinions and insights about supply chain management. We would also like to thank the entire h&z family, whose patience and dedication made this book possible.

Bring your clients to the digital world—They expect it from you: Letter from a COO

Dear digital practitioners,

We are in the age of digital transformation. Our lifestyles, the way we work, the way we communicate, and the way we shop are changing and they will never be the same again. One implication of these changes is that those of us in the business of supplying products and services need to adapt swiftly to the rapidly changing requirements of our customers otherwise they will look elsewhere.

At PALFINGER we are innovating and driving transformation to shape the future for us and our clients to make sure they stay with us. In our new digitalization program, we are pooling our digital competencies as well as adopting new approaches to the products and services we supply, all for the benefit of our customers. In addition, it is our ambition that the digital assistance systems and tools we use not only make work processes easier, improve support, and support cost-effectiveness—they also make every day work safer.

These are a few examples of our digital solutions, spanning customer solutions to improved operations:

TELEMATICS: Collect data in real time and turn it into value-add for our customers which can be for example displayed in a web portal so that fleet managers and users always know the current condition of our equipment. This minimizes unplanned machine downtimes and optimizes spare-part management.

FLEET AND OPERATOR MONITORING: We developed digital tools that boost the efficiency and productivity of our fleet loader cranes. The platform shows which machines are in use and where, and how long they have been operating. The system enables site managers to optimize crane use and loading processes and therefore ensures that the fleet is fully connected and all relevant job data is delivered where it is needed while the operator monitor supports the operation in the field or construction site with relevant data.

SAFETY SOLUTIONS: The theft of any of our equipment leads to drastic delays and cost increases for the customers using it, which is why we have developed systems to make sure the risk is dramatically decreased. If ma-

chines are moved without authorization, the customer is automatically informed. This not only considerably reduces the risk of theft, it also has the added benefit of potentially reducing insurance premiums.

In parallel to these customer-focused services, we have launched the first technology-based projects to improve certain internal SCM operations, including:

- intelligent loading assistant systems for inbound logistics
- traceability of production material
- connected production plants
- production automation
- paperless production
- and predictive maintenance through fleet monitoring

I am happy to share with you here a few corporate and personal lessons I have learnt in the process of PALFINGER's digital transformation. My hope is that this could be instrumental in helping some other companies with their journeys to digitalization.

BUILD UP A DIGITAL ECOSYSTEM: With the rapid pace of technological change we see today it is nearly impossible to stay tuned to the most recent and advanced digital solutions on your own. This is why it is important to build up partnership networks within and outside your ecosystem. We founded PALFINGER 21st as incubator, which is an umbrella capturing new possibilities, opportunities and ideas. It is supposed to enable unconventional approaches and fresh fields of expertise. It is a distinct business area that faces up to new technologies and promotes radical ideas with the potential to change our business. It is worth considering setting up a similar kind of organization to help your own company. It should aim to filter out the best ideas, those that would work as part of your company's digital transformation, and to identify opportunities early on. We established an environment in which our colleagues can experiment together, make mistakes, learn from them—and develop the products and services of tomorrow through a profound understanding of our customers.

One more example of an activity that helped to enlarge our ecosystem and bring in new ideas was Austria's largest hackathon in 2017, which the PALFINGER Group hosted[1]. More than 100 participants, grouped in 24 teams, competed for the chance to further develop their ideas.

The participants were challenged to come up with ideas for seven subject areas:

- virtual reality, augmented reality, mixed reality
- intelligent loading assistant for inbound logistics
- predictive maintenance through fleet monitoring
- production automation
- digital assistance systems
- 3D printing within production
- and PALFINGER as a service

The three winning teams gave short elevator pitches, supported by videos, simulations and prototypes, that aimed to convince the jury about their ideas. They are now developing their solutions together with PALFINGER.

GET THE BASICS RIGHT: If you want to make full use of digital potentials, you must first have a strong IT backbone in place. We are currently running an SAP S/4 HANA project in all our major sites (not all our sites have SAP in place) in a concerted attempt to get uniform and consistent data pools across all regions and sites. Before the decision was made to implement this new ERP system, we carried out a large process excellence project to define standardized projects across the board. I am sure that you agree that it does not make a lot of sense to implement a standard ERP system without having harmonized your process landscape beforehand. You can of course use digital solutions to achieve some momentum where a fully integrated data lake is not needed. But at the end of the day, you need a common IT backbone to be able to scale up successful pilots across the board.

STICK TO YOUR TRAITS: There are numerous examples out there of companies that have transformed their business models from being pure hardware manufacturers to system integrators, where they have orchestrated the whole digital ecosystem using the digital solutions available to them. I am convinced that this transformation is only possible if you have the financial power to make the necessary long-term investments. It might, however, be a better idea to stick to your traits and focus on niche segments and applications where you can win the battle, and also prepare yourself for the big solution or disruption. We have therefore ensured that our products are connectable and platform-ready so they can exchange data with our partners within our ecosystem whatever platform solutions are used.

ACCEPT TWO SPEEDS WITHIN THE COMPANY: Companies with a long history normally have different maturity levels for process and data quality and IT systems between different regions or organizational units. This is also the case with PALFINGER, with 21 acquisitions over the last decade that have operated as independent units. My advice is to go through a three-step approach to fully address these challenges.

STEP 1: Bring all units and regions to the same levels in terms of IT systems and process excellence.

STEP 2: Foster innovative ideas within the more mature units with an explore, test, and implement approach. Identify proof-of-concept projects and pilots so they are ready to be scaled up once more units and regions have achieved higher levels of process and data management excellence.

STEP 3: Once you have closed existing excellence gaps between the units or regions and you have a harmonized process landscape, the next step is to scale up successful pilots. By doing so you can build up a self-financing project pipeline, where successfully scaled pilots will generate savings to finance other pilots or proof-of-concept projects that are in the pipeline.

In general, I would advise you to have a solid framework to support digitalization. Based on the strength of this framework, you can define your ambition level and select individual initiatives from your innovation funnel on the basis of what contribution they will make to achieving the next level of digital maturity.

DON'T FORGET THE PEOPLE: It is imperative that you have the right culture in place to be successful in digitalization. PALFINGER 21st works as a fully independent start-up but it has strong links to PALFINGER so that ideas and project funnels can be aligned with technological capabilities and the overall corporate strategy. For example, it works as a catalyst, but in close collaboration with the mother company, to bring agile ways of working and design thinking approaches to areas such as products, software development, and digital projects in general. Our new organization strengthened cross-functional collaboration and led to a new office concept. Both, together with the fundamental organizational changes we have made, play a vital role in further developing our corporate culture.

MY CONCLUSION: My last piece of advice is that it is important that you find your own way through digital transformation. There is no prescriptive path, no one-size-fits-all solution for digitalization. You should learn from the successes and failures of other companies that have already been

through this transformation and when possible, reach out to them and exchange views. Our experience tells us that other companies are open to sharing knowledge. Many companies are more or less in the same situation and depend on external stimuli in such digitally disruptive times.

I hope that you find the best approach for your company and develop a strategic vision to match the level of your digital ambition.

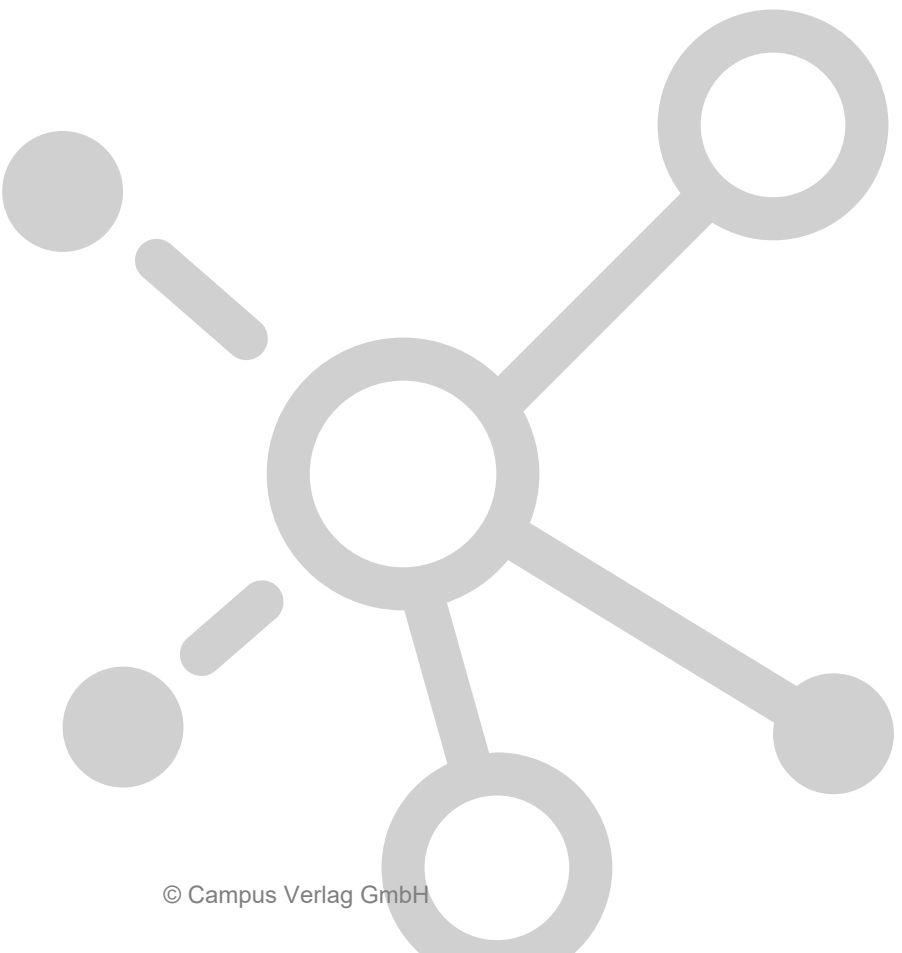
Best regards
Martin Zehnder
COO PALFINGER AG

ABOUT MARTIN ZEHNDER: Born in 1967, Martin Zehnder joined the PALFINGER Group in 2005 as Global Manufacturing Manager for the manufacturing plants. Since January 2008, he has been responsible for the worldwide manufacturing and assembly area as a member of the Executive Board responsible for Production, and since September 2017 for Product Line Management, R&D, Purchasing, Safety & Quality and the Executive Projects Process Excellence and Turnkey Solutions.

ABOUT PALFINGER GROUP: For many years PALFINGER has been one of the world's leading manufacturers of innovative lifting solutions for use on commercial vehicles and in the maritime sector. As a multinational group headquartered in Bergheim, Austria, the PALFINGER Group, which has more than 11,000 employees, generated total sales of more than €1.6bn in 2018.

PART 2

ENABLERS FOR FUTURE SUPPLY CHAINS



Chapter 2.1
Building blocks of the Digital Supply Chain
Thomas Mrozek
Key technology trends

Introduction

Digital technologies are ubiquitous in our daily lives at home, at work and in the services we use to support our lifestyle. We use our mobile devices to place orders online, for communication, and as a tool to make critical business decisions whether we're in the office or on the go. It's impossible to imagine life without them, but how will technology continue to impact and change our jobs, our day-to-day lives and the routines we are used to? One thing we can say for certain is that when they are used correctly, digital solutions open the door to improved speed and efficiency, and whoever working in supply chain management (SCM) is not interested in such improvements?

"The development towards digital supply chains is an evolution rather than a revolution. Many ideas and concepts have existed for many years. However, it's only today that technology is evolving in a direction that makes digital solutions feasible and realizable. This is the case because of increasing processing memory, Artificial Intelligence approaches and upcoming technologies like 5G."

Peter Dressler, Senior Director Logistics, Infineon

In this chapter we will review nine digital technologies, some established and some emerging, and the effects they will have on supply chain management. Together these key technologies form the foundation for digital supply chains and have the potential to change the way we operate. We will provide an essential overview of the nine key technologies, the highly sought-after benefits inherent in their use, and how they can be applied along the supply chain.

Key terms and their definitions

First, it's important that we define and clarify the main terms that will be used throughout this chapter and others.

Digital Supply Chain Management

Digital supply chain management is classic supply chain management with added information and communication technologies that utilize data in order to gain deeper insights. A digital supply chain leverages intelligence and know-how embedded in physical objects and matches this intelligence with internal and external data through automation and connectivity along the supply chain. It allows us to access computed information and process results anytime and anywhere to make evaluated and business-driven decisions.

These information and communication technologies are used to integrate all flows of materials, products, people and information across different logistics channels, from raw material to end customer. The aim is to meet customer expectations with increased efficiency in terms of cost, synergies, sustainability and effectiveness.

A digital supply chain means you can use intelligent processes that, for example, link real-time inventory, customer interactions with products, parcel service data and Internet of Things (IoT) technology.

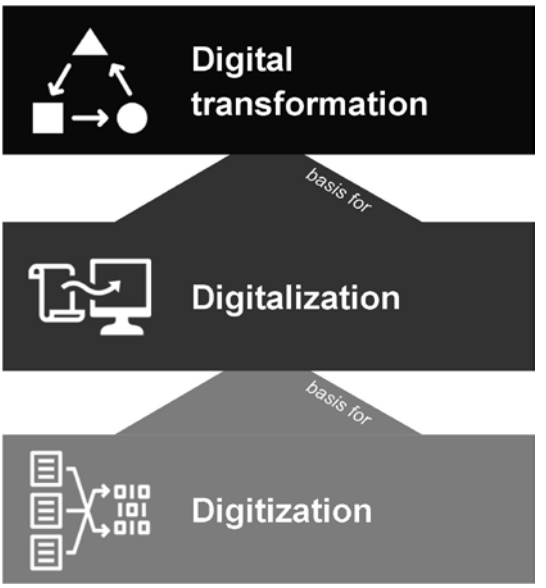


Figure 1: Digitization, digitalization and digital transformation

Digitization

Digitization is the process of creating a digital (bits and bytes) version of analog or physical materials such as paper documents, microfilm images, photographs, sounds, video and more.

Converting something non-digital (for example, health records, location data, identity cards) into a digital format means they can then be stored and accessed by a computing system. Digitizing information from analog assets or technical products extends their applicability beyond what they were originally intended for. Hence, these are also referred to as smart (intelligent) products.

Digitalization

"There's no hype when it comes to digitalization—it's a fundamentally important topic. I strongly believe that companies that are not currently prepared for digitalization, or are just starting to get ready, will face dramatically difficult problems."

Erik Wirsing, Vice President Global Innovation, DB Schenker

According to Gartner, "Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities," or "the process of moving to a digital business." Although this may be stating the obvious, what is not so clear is what is meant by a digital business. So, for the sake of clarity, when the term digital business is used throughout this book, it refers to the creation of new business designs by blurring the digital and physical worlds. It also refers to connectivity, integration and collaboration between business partners who use IT systems instead of paper for their processes (from planning to design).[1]

In essence, digitalization automates material processes and tasks and changes the way people interact.

A simple example of loading a truck can illustrate a lot about digitalization. Before digitalization, the truck driver would have needed to stop at the factory gate to submit loading papers before being told at which ramp to park the truck for loading. After loading he would have needed to drive towards the gate again, get the loading papers stamped and approved before exiting the factory premises.

With the use of digital technologies the process for the truck driver changes significantly. First, the truck's number plate is scanned and the ramp information is displayed immediately on his mobile device. After loading, the truck driver sees that documents were electronically transmitted (digitized) onto the truck loading paper manager. Then, while approaching the gate, RFID tags automatically indicate the weight and quantity of loaded goods to the responsible officer at the gate and the exit procedures are released. Finally, the gate opens and the truck leaves.

The benefits of the digitalized procedure include less time spent on the yard, faster turnaround, and fewer errors in documentation, to name a few. Of course, this example can be extended to include digitalization of addi-