ARTICLE

CHALLENGES IN UNLOCKING THE POTENTIAL OF INDUSTRY 4.0

IN THE ERA OF INDUSTRY 4.0, THE CONVERGENCE OF PHYSICAL AND DIGITAL SYSTEMS WITHIN THE PRODUCTION VALUE CHAIN MARKS A PARADIGM SHIFT IN INDUSTRIAL PROCESSES.

This transformation aims to optimize efficiency, enhance productivity, and foster innovation by seamlessly integrating technologies across all aspects of operations.

However, despite the immense potential offered by Industry 4.0, many of our customers find themselves at earlier stages of adoption, primarily focusing on computerization and connectivity. As we navigate through the **"Six stages of exploiting the full potential of Industry 4.0"** it becomes evident that most of our customers must quickly progress beyond these initial stages.

To ascend to the level of our best-in-class customers, who have achieved stage 5 with predictive capacity and ultimately stage 6 with adaptability, organizations must confront and overcome four significant challenges: data integration, employee development, operational transformation, and business model adaptation.

In this article, we will delve into these four challenges, explaining why they hinder the full realization of Industry 4.0's potential and what you can do to overcome them. Additionally, for readers interested in exploring deeper how Industry 4.0 revolutionizes manufacturing efficiency, we encourage you to read our white paper on Industry 4.0, which examines this topic in detail.

⟶ Read more

CHALLENGE **#1**

Data Integration

Organizations face the daunting task of managing extensive volumes of data generated across their diverse operations. The necessity to seamlessly integrate all participants within the value chain into an expanded, digitized ecosystem has become increasingly important.

Data integration plays a pivotal role in optimizing all facets of operations, spanning from order processing and delivery logistics to customer invoicing, digital design, manufacturing management, and raw materials inventory control. As Tobias Helberg, a partner at Porsche Consulting, emphasizes, "Every second, decisions are made based on data, whether they involve allocating employees or managing resources."

To address this challenge, it is crucial to establish a **unified system that shares vital information among all stakeholders.**

For example, implementing a PIM (Product Information Management) solution consolidates product data from various departments into a single location. Centralizing, enriching, and exchanging data in real-time between different systems ensures consistency and accuracy throughout the value chain. **This approach enables businesses to maximize the value of their data, enhancing efficiency, fostering innovation, and gaining competitive advantages.**

The omnipresence of data, its increasing volume, its hosting in the cloud and the strategic role it plays in the smooth running of the production process present cybersecurity risks. Up until now, you had to physically sabotage a machine to prevent it from operating, now, an invisible and anonymous attack via the networks is enough to bring an entire production line to a standstill.

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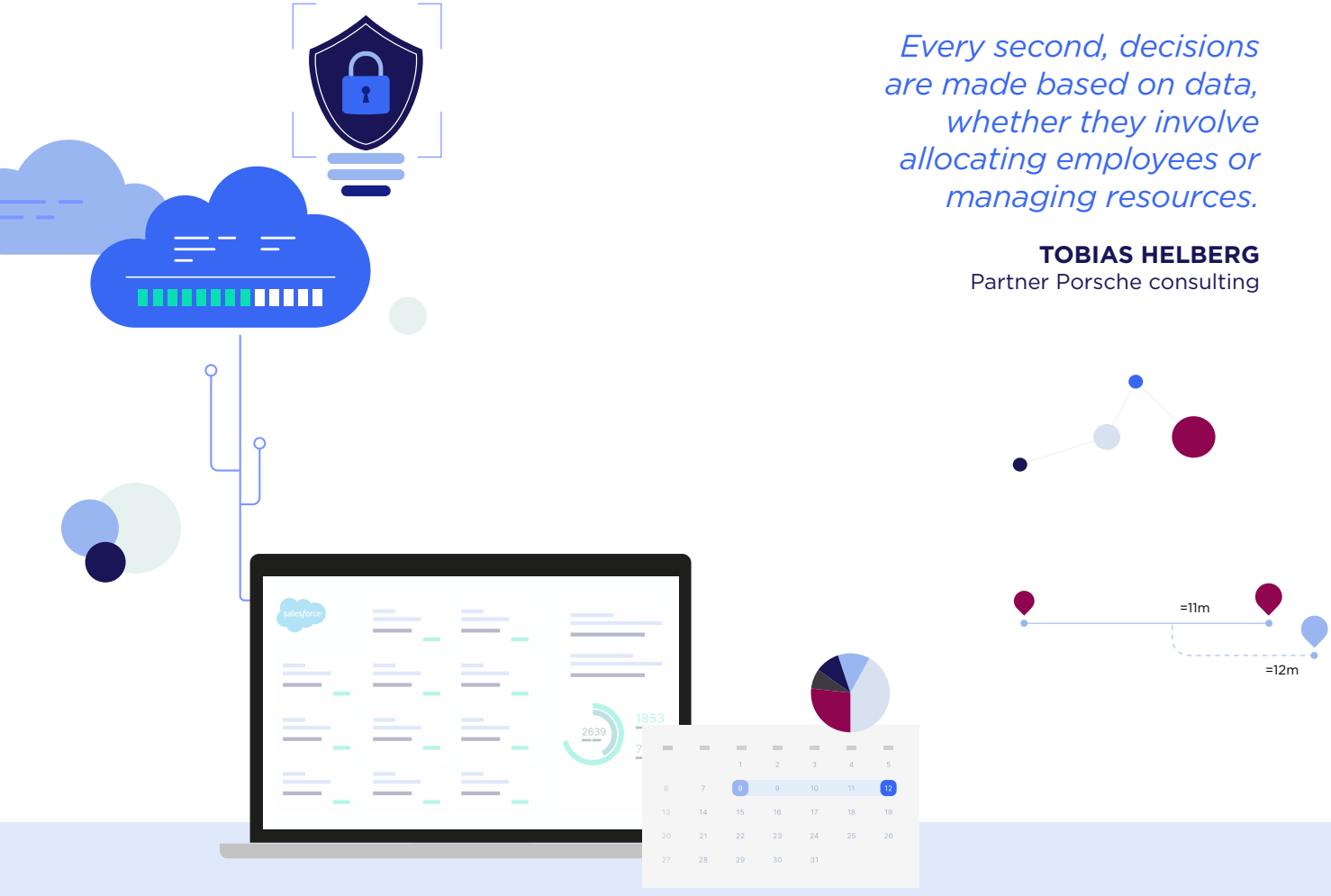
TOBIAS HELBERG
Partner Porsche consulting



> *Industry 4.0 implies hybridization between systems and people, or even a return to a form of craftsmanship with the unit series concept.*

DOROTHÉE KOHLER
founder of Kohler Consulting & Coaching

CHALLENGE **#2**

Employee development

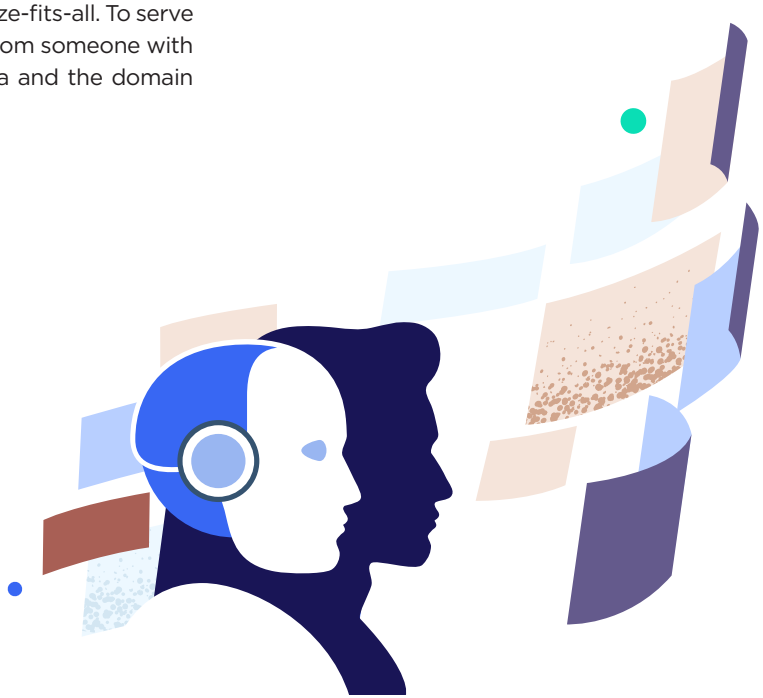
The challenge of employee development holds particular significance in the context of realizing Industry 4.0, where the integration of digital technologies with traditional manufacturing processes is pivotal. Workers must acquire new skills to effectively navigate this transformative landscape, breaking down barriers between manual labor and intellectual work.

As Marco Taish aptly states, "the blue collars are becoming a little whiter!" **This shift underscores the importance of human-digital collaboration, emphasizing craftsmanship and human judgment alongside technological advancements**.

The ability of employees to adapt and upskill is essential for harnessing the full potential of Industry 4.0, as it empowers them to work alongside digital systems in a harmonious and productive manner. Algorithms are not one-size-fits-all. To serve their purpose they require input from someone with a deep understanding of the data and the domain they are working in.

This collaborative approach fosters greater levels of efficiency and innovation, aligning with the principles of Industry 4.0, as articulated by Dorothée Kohler, founder of Kohler Consulting & Coaching: "Industry 4.0 implies hybridization between systems and people, or even a return to a form of craftsmanship with the unit series concept."

To address employee development challenges and transition from manual labor to intellectual work, organizations need accurate data and metrics. The right metrics play a key role in this endeavor, providing valuable insights into areas where improvements are necessary. **Using data-driven insights, organizations can pinpoint skill gaps, create customized training, and track progress**. This fosters a culture of continuous learning and professional growth among employees.



CHALLENGE **#3**

Operational transformation to leverage circular economy

Navigating operational transformation is a challenge in meeting consumer demands for environmental and ethical data while ensuring profitability, a mission-critical task for many organizations as global awareness of purchasing power and environmental regulations expand worldwide.

Industry 4.0 offers a promising solution by enabling companies to align sustainability goals with profitability through enhanced resource efficiency and waste reduction. The International Data Corporation (IDC) predicts that by 2025, 75% of organizations will deploy software tools to monitor energy consumption, leading to improved sustainability metrics and reduced energy costs.

Businesses can overcome the challenge of operational transformation by **embracing traceability and transparency initiatives**, to ensure visibility throughout the supply chain. Digital technologies such as blockchain and RFID, help companies gain insight into their supply chain, improve communication with suppliers, and provide consumers with accurate information about product origins and production processes.

Jean-Daniel Weisz, Associate at Kohler Consulting & Coaching, further emphasizes the importance of digital solutions in achieving sustainability measures, stating, “Ambitious recovery and recycling goals will be harder to achieve without technology and Industry 4.0.”

Additionally, leveraging data exploitation allows businesses to use capital, labor, and material resources with greater efficiency. A **predictive maintenance program**, as highlighted in a recent report by the US Department of Energy, can deliver significant returns, including a tenfold increase in ROI, 25%-30% reduction in maintenance costs, 70%-75% decrease in breakdowns, and 35%-45% reduction in downtime.

Data transparency throughout the value chain, facilitated by Industry 4.0, **enhances operational agility to respond quickly to shifting consumer trends, increasing speed to market, lowering production costs, and minimizing waste.**

> *Ambitious recovery and recycling goals will be harder to achieve without technology and Industry 4.0.*

JEAN-DANIEL WEISZ
Associate at Kohler Consulting & Coaching

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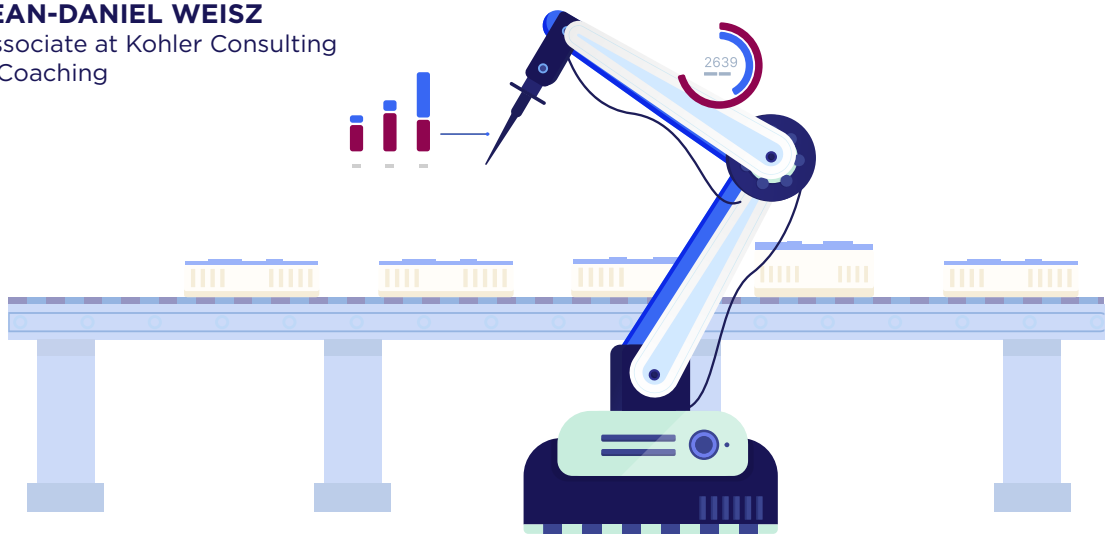

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CHALLENGE **#4**

Business model adaptation

Adapting to changes in business model development for a fast-changing environment poses a significant challenge. Industry 4.0 provides a solution by enhancing flexibility and agility, enabling businesses to seize emerging opportunities and stay competitive.

Industry 4.0 technologies, such as automation, the Internet of Things (IoT), and artificial intelligence (AI), make processes more adaptable, modular, and predictable. This helps organizations handle uncertainties and market hazards with resilience, while smoothly integrating new tools or processes to prevent disruptions to revenue streams.

By taking advantage of operational flexibility and leveraging data for insights, companies can identify and respond to growth opportunities. Jean-Daniel Weisz commenting on a case study of JPB Système, writes, **"After setting up the model to meet its own requirements, the company now resells the Industry 4.0 solutions it has developed."**

This highlights how companies are now marketing new services and solutions developed through digitized processes, showcasing Industry 4.0's transformative impact on business models.

How Lectra helps you **unlock the full potential** of Industry 4.0

Organizations must move beyond early stages of adoption—computerization and connectivity—and confront challenges like data integration, employee development, operational transformation, and business model adaptation.

This shift is crucial for optimizing efficiency, boosting productivity, meeting sustainability goals, and succeeding in dynamic markets where predictive capacity and adaptability are paramount.