

Position Paper  
**Corona and the  
Consequences**



Ten Propositions on the Future of Digital Business Models for Industrie 4.0 in the Post-Corona Economy

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**In this paper, the WG 6 “Digital Business Models” presents ten propositions on the development of digital business models for the period after the COVID-19 crisis.**

The COVID-19 pandemic is challenging politics, society and the economy to an unprecedented extent. Its effects are so drastic that it requires companies and industries not only to manage the crisis in the short term, but also to develop strategic options for the future.

**Although we have not overcome the crisis, it is already becoming apparent that the pandemic will act as a catalyst, reinforcing existing trends and thus fundamentally changing our everyday economic life and creating new winners.** The business models that will prevail will be those that respond to changing economic and social behavior and new demands, using the full technological opportunities underlying Industrie 4.0.

Against this background, the Expert Group "**Digital Business Models in Industrie 4.0**" of the German Platform Industrie 4.0 has formulated ten theses on the future of digital business models for Industrie 4.0. Formulated in form of propositions, they provide companies both with impetus and inspiration to deal with the consequences of the COVID-19 pandemic from a strategic perspective.

## **1. Boost for digitalization and digital business models, but also clear demand for scalable digital infrastructures and high-performance communication networks are becoming increasingly important**

The crisis has given a **major boost to digitalization in general and digital business models in particular.** In response to the experience of the lockdown, companies will automate their production even more and transform their

services into digital services more quickly. Throughout Europe, however, the crisis has also demonstrated the importance of high-performance digital infrastructures and scalable communication networks for industry, the healthcare system, but also in public administration and education. The crisis also revealed significant deficits and differences, particularly with regard to the digital maturity level of various industries and sectors (e.g. with regard to processing possibilities of real-time data, the maturity of digital processes, the speed and willingness of adaptation).

## **2. Flexibility and agility become the basis of competitiveness**

Flexible companies, which can quickly switch to new markets and products, gain advantage over specialized high-volume manufacturers when there is a need to react to exogenous shocks like a pandemic. **The economic advantages that conventionally mandated the pursuit for economies of scale and a shift to low-wage countries are now being reconsidered.** Established complex value chains differentiate themselves into focused production and supply chain constellations for different component and product classes. **Agility and flexibility are becoming even more than before the core strategic objectives** of the transition towards Industrie 4.0. A core design principle for the factory of the future will be assortment and volume flexibility.

### 3. Resilience of value networks as a new business case

**Resilience will complement the conventional set of strategic objectives of Industrie 4.0**, becoming similar important as operational efficiency (OE, OEE) and strategic differentiation (e.g., individualization, flexibility, sustainability). Resilience is becoming a driver for the development of the next generation of applications with industrial artificial intelligence. To achieve greater resilience and stability, **some companies will integrate previously distributed value-chains more vertically** (i.e., prefer make over buy and increase the depth of their own value creation), no longer making strategic decisions based on cost considerations solely. Digitalization is used to manage the increasing complexity

resulting from vertical integration. **Other companies will increasingly rely on networks and cooperation**, seeking additional strategic partners and suppliers who benefit from a focused position in a value chain. Value chains are shortened and more partners are added for diversification, especially to secure (system) critical components and increase their flexibility in production and service delivery.

### 4. Localization of manufacturing demands adaptation of product and process architectures

The desire for more local and robust value chains will lead to the emergence of new players. Production will become more decentralized and local. **Flexible local factories will work as a contract manufacturer for various product suppliers (brands) for a confined market.** This requires new business models for manufacturing ("Manufacturing-as-a-Service"), but also new product architectures with less complexity, higher flexibility and/or the use of local and recycled materials to fit local market conditions. Additive manufacturing technologies will get an additional growth of adoption by this development.

### 5. New ecosystems and marketplaces are emerging

Disruptions in global supply chains and sharp fluctuations in demand have

disrupted the balance between supply and demand and the confidence in established supply chains in many industries. **New marketplaces and collaboration platforms are emerging to match needs and resources across industries** and outside of established business relationships, e.g. in terms of production equipment, freelance capacity, materials, or supplier parts.

## 6. Innovative revenue models are getting traction

Many companies have suffered from a limited cash flow or scarce capital availabilities during and after the Corona crisis. Hence, innovative pricing & delivery models for industrial infrastructure, such as as-a-service, pay-per-use, or subscription models, are becoming increasingly attractive. **Solution providers of industrial infrastructure and equipment with business models offering low initial investment and flexible terms to their customers will benefit.** However, this shifts the investment risk and the difficulty of estimating demand to the operators of such business models and the owners of the assets. On the one hand, this calls for **innovative cooperative financing instruments or crowdinvesting strategies** to counter limited liquidity and reduction of investment funds. On the other hand, it also demands **new engineering skills to design and development these flexible smart assets and dedicated innovation skills to develop the corresponding business models** systematically.

## 7. Competence requirements are changing radically

To profit from digital business models in Industrie 4.0, established competencies in engineering and production have to be complemented by stronger service and user orientation, digital marketing and financing know-how, as well as scalability strategies. **Established industrial companies and their managers and associates in particular need to build and adopt new skills and competencies.** Above all, the development of collaboration and interaction competence in virtual networks at employee and company level is becoming a decisive competitive factor.

## 8. "Physical distancing" of production: Remote services increase importance

In industrial manufacturing, digitalization and automation are increasing. The possibilities of working from home in the office area are transferred to industrial production. **Remotely managing a plant or even operating a workstation from one's home office will become possible.**

**Suppliers and solution providers with corresponding digital service offerings will therefore see a significant increase in demand.** In particular, remote service offerings will be expanded. Virtual and Augmented Reality (VR/AR) technologies, collaborative robotics, and industrial artificial intelligence will gain in importance.

## 9. Flexibilization of work fosters new forms of organizing and learning

The Corona crisis has, often dramatically, revealed the strengths and weaknesses of many organizations to their management. At the same time, **former implementation barriers and adaptation hurdles for digital tools and processes have been drastically reduced – flexible trial-and-error experimentation has been rewarded.** The flexibility gained during the months of the crisis will continue to advance, especially with regard to forms of work and learning.

**The "home office" will remain an integral part of the work organization.** Industrial work processes will be radically changed by remote services, data-based decision-making (e.g. predictive maintenance), and the increased use of digital twins and virtual reality tools. Education and training will follow these developments and will increasingly use digital delivery formats, digital learning tools, and learning analytics.

## 10. Industrie 4.0 as enabler for sustainability

The future development of industrial production and its increasing digitalization offer huge opportunities for more sustainability in the Industrie 4.0. The Corona crisis has reinforced the importance of management with a strong focus on ecological and social sustainability. **Digitalization and new value-chain constellations can lead to significant improvements in terms of lower material and energy consumption over the entire product life cycle** from engineering and production to maintenance and disposal – and society is demanding that companies utilize these opportunities.

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