

A photograph of a man with a beard, wearing a white button-down shirt, standing in a factory. He is holding a tablet computer. To his left is a large industrial robotic arm with yellow and grey components. The background shows factory equipment and safety railings.

MANUFACTURING IN THE AGE OF EXPERIENCE

Today's manufacturing organizations are in the midst of a global Industry Renaissance. This renaissance extends beyond delivering digitalization and personalized solutions. The emergence of new businesses and new categories of solutions, processes and services prioritize sustainable innovation and experiences over productivity gains. Digital experience platforms are the infrastructure of this industry renaissance.

To keep up, businesses must be faster, more integrated and more agile than ever. Those leading the way are the ones that create value through networks to deliver new products that are both sustainable and innovative. A talented workforce that is agile and committed to constant learning of new ways to deliver new products, services and solutions in a combined virtual and real way will win the race for new customers.

IMAGINE THE MANUFACTURING OF TOMORROW

We must now think of manufacturing as a process of value creation and no longer just a set means of producing goods and services. We're still living in an experience economy: value today is in the usage rather than the product itself. Businesses now strive to implement value networks in which the real and the virtual merge to create new ways of conducting business. What is changing is the platform manufacturers use to deliver the value:

- **Value networks** that transform supply chains to maximize social impact by breaking down barriers between industrial trading partners, producers, and makers with new business models for delivering sustainable innovation to consumers.
- **Sustainable innovation and excellence** that eliminates risk, and the ability to predict and improve operational performance by combining the power of virtual worlds and real operations where people and machines utilize a business platform to come together to change business outcomes
- **Workforce of the future** reveals today's workforce talents and can improve the workforce of tomorrow through the power of experiences with the combination of knowledge and know how gained by constant learning and collaboration.

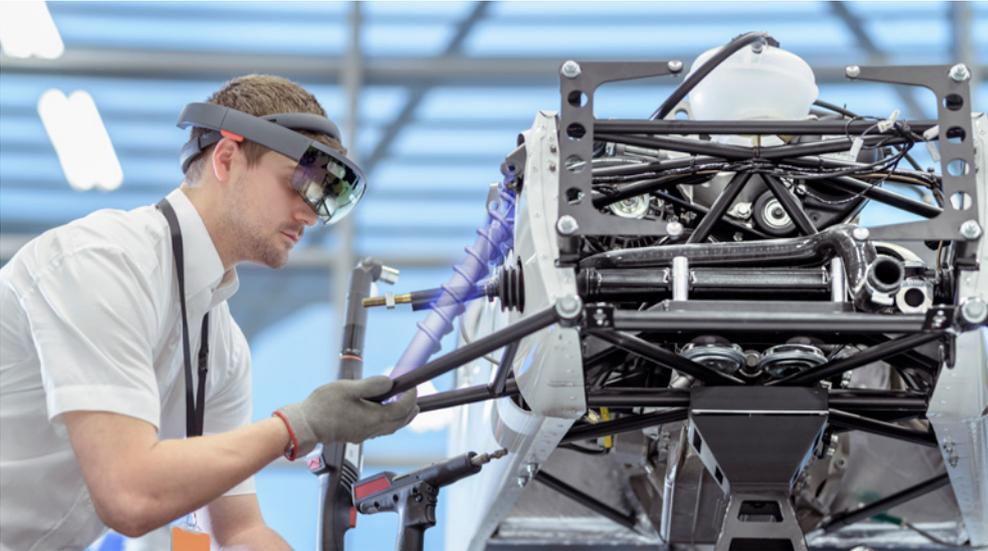


Value networks

With digitalization becoming more common, innovations are constantly emerging, which could become a burden. Now, with the real and virtual world combined, manufacturers can more easily replicate and modify product design and manufacturing processes—anything from an automobile to an electronic device to apparel to a building infrastructure, making it quick and easy to identify, hire and collaborate with the best partner available for each task. It is easily possible to assemble teams from across multiple industries.

The emergence of online marketplaces makes it possible to evolve the supply chain into a value network: a single, virtual, social enterprise, pioneering a new way to do business, innovate, and create value in the manufacturing industry. Online platforms and marketplaces have already transformed retail, transportation and hospitality services. Now, manufacturing markets are transforming as well, matching makers with producers.

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Sustainable innovation and excellence

Thanks to digitalization advances, the availability of big data analytics, real-time data acquisition and digital continuity from ideation to design to production and even to ownership—sustainable innovation and excellence is becoming a reality. We are now able to more quickly than ever embrace technology advances (such as the Digital Twin, Additive Manufacturing, Artificial Intelligence, Industrial Internet of Things). With a mindset of continuous improvement and competitive agility, businesses can drive value, meet market demands and deliver unique, one-to-one experiences for everyone.

Virtual modeling is also making continuous improvement possible for product design, manufacturing processes and customer satisfaction. Unified product and process models integrate feedback from the shop floor (including digital data generated by low-cost wireless sensors and cameras), the supply network, the distribution network and consumers to update and validate operations processes and marketing plans.

Additive manufacturing is an exciting example and transformational component of this change. It is now possible to design a part or subsystem as a single, solid object, rather than relying on multiple components that are assembled. Integrating different materials enables new capabilities for strength, weight, flexibility and more. Additive manufacturing techniques can enable more efficient, low volume production of complex parts and can also save on materials, improving materials usage/waste ratios in production. Companies that can change how they do business or get closer to customers the fastest will have the advantage in transforming how they manufacture, use their value network and maintain operating margins.

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Workforce of the future

Continuous improvement for products, processes and customer satisfaction are enabled by highly skilled workforces with knowledge and know how. The leading manufacturers of the future will be those who successfully educate and empower their employees to deliver new categories of products, sustainable solutions, and imagine new ways of working

Knowledge and know how are at the heart of manufacturing advances, because they determine our capacity to invent sustainable solutions that address the challenges facing humanity. According to the 2016 World Economic Forum report “The Future of Jobs,” by one popular estimate, 65% of children entering primary school today will ultimately end up working in completely new job types that don’t yet exist. In such a rapidly evolving employment landscape, the ability to anticipate and prepare for future skills requirements, job content and the aggregate effect on employment is increasingly critical for businesses, governments and individuals in order to fully seize the opportunities presented by these trends—and to mitigate undesirable outcomes.¹

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In the 21st century, we are no longer limited by the availability of information, experiences or best practices. Thanks to new technologies, collaboration is now possible on a multi discipline and multi scale approach. The capacity to make and to learn is vast, with options now available to link current education models with business startups, Fablabs and innovation hubs.

¹ The Future of Jobs; © 2016 World Economic Forum http://www3.weforum.org/docs/WEF_FOJ_Executive_Summary_Jobs.pdf

THE PLATFORM APPROACH TO MANUFACTURING

Manufacturing has always meant constantly inventing and reinventing. To continue to be successful, more than ever, we need to place power, meaning knowledge and know how, into the hands of everyone. We need people who can work together to imagine, test, create and implement ideas in the real and the virtual worlds. They will learn by doing, using existing knowhow to augment knowledge building.

The leading companies won't be those who try to repeat the past or tweak the present but those who imagine and create a world that didn't exist before.

Dassault Systèmes' **3DEXPERIENCE**® platform connects the technologies and solutions to pursue discoveries, nurture them and bring the results to business and people throughout the world. Sophisticated modeling and simulation, data acquisition, analysis and reporting, and breakthroughs in imaging and manufacturing come together for organizations pursuing what was once thought "impossible." For manufacturing, the result is an operations management and development environment with a single, federated view of models, processes, operations and planning. Essentially the **3DEXPERIENCE** platform provides a global operations management view that supports knowledgeable decision making to keep things running smoothly and exploring new innovation horizons. This helps optimize production for greater efficiency and output, while reducing costs and time-to-market. A major challenge of manufacturing innovation is that by definition, it creates change.

For a production environment often, change can be seen as bad. There isn't time to stop, adjust, test and go back online which could waste time, production and revenue. But a virtualized **3DEXPERIENCE** twin enables companies to innovate, while mitigating risks. The **3DEXPERIENCE** platform is transforming, enabling innovation for improving agility, efficiency and productivity. Dassault Systèmes' commitment is to bring innovators and leaders together with the best solutions (or experiences). Together, we can transform operations and sustain our environment, delivering on the promise of a brighter future. Such is the promise of Manufacturing in the Age of Experience.

For more information on 3DEXPERIENCE manufacturing, visit [ifwe.3ds.com/manufacturing/](http://www.3ds.com/manufacturing/)

Our 3DEXPERIENCE® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3DEXPERIENCE**® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 220,000 customers of all sizes in all industries in more than 140 countries. For more information, visit www.3ds.com.

