The future of manufacturing: Additive Manufacturing

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Due to rounding, numbers presented throughout this and other documents may not add up precisely to the totals provided and percentages may not precisely reflect the absolute figures.
Many applications in very different industries

Energy, aerospace, automotive

Medical and healthcare

Daily life
Benefits of Additive Manufacturing

Burner tip repair

- 600 pieces delivered
- 90% faster
- 20,000 operating hours

Complete burner manufacturing

- Simplification: 12 to 1 parts
- Reduced emissions: H$_2$ capability

Faster product innovation

- Time to market: 2 years with conventional technologies down to 2 months with AM technologies
First 3-D printed blade in “hot” part of gas turbine

- Travels at over 1,000 mph
- Carrying 11 tons
- Surrounded by gas at 1,250°C
Digitalization is key for industrializing Additive Manufacturing

What are the limitations?

Quick facts: 50% of initial designs are unprintable, 30% need complete rework

Disconnected software

Multiple file conversions

Out of control workflow

Conventional thinking

Design Software

Simulation Software

Print Preparation Software

Production Software

Quick facts: 50% of initial designs are unprintable, 30% need complete rework
New parts can be designed faster than ever

One Integrated System – NX

Design  Simulate  3D Print

Data Management and Shop Floor Connectivity

Siemens Production Software and MES Systems

Partner Ecosystem (software and hardware)
Software defines the applications

Hybrid additive
Directed energy deposition

Multi jet fusion
Agent jetting/inkjet technology

Powder bed fusion
Laser material fusion

Multi-axis
Fused deposition modeling
— Siemens is mastering the entire software and hardware value chain in production

— Additive Manufacturing links the virtual and the real world – bringing Digitalization into production

— Siemens industrializes Additive Manufacturing by working on all the answers and has strong partnerships