

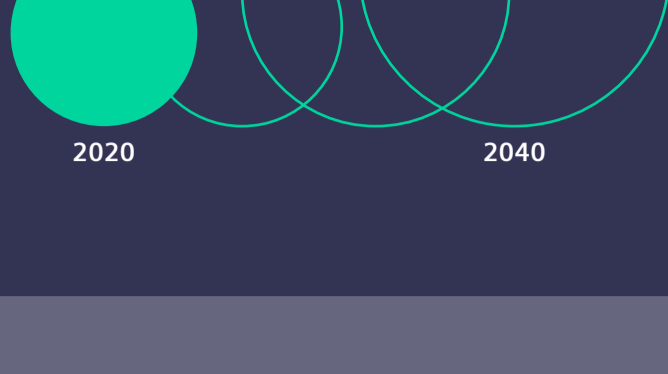
DIGITAL INDUSTRIES SOFTWARE

Virtual Manufacturing Development for the Automotive Industry



Unprecedented change in the automotive industry...

Companies in the automotive industry are pushing to develop the next generation of autonomous, electric, connected, and shared vehicles, which are becoming more and more "software-defined", they are facing new design challenges. How will they accelerate their product design and get it right the first time?



Up to 15% of all new vehicles sold in 2030 could be fully autonomous

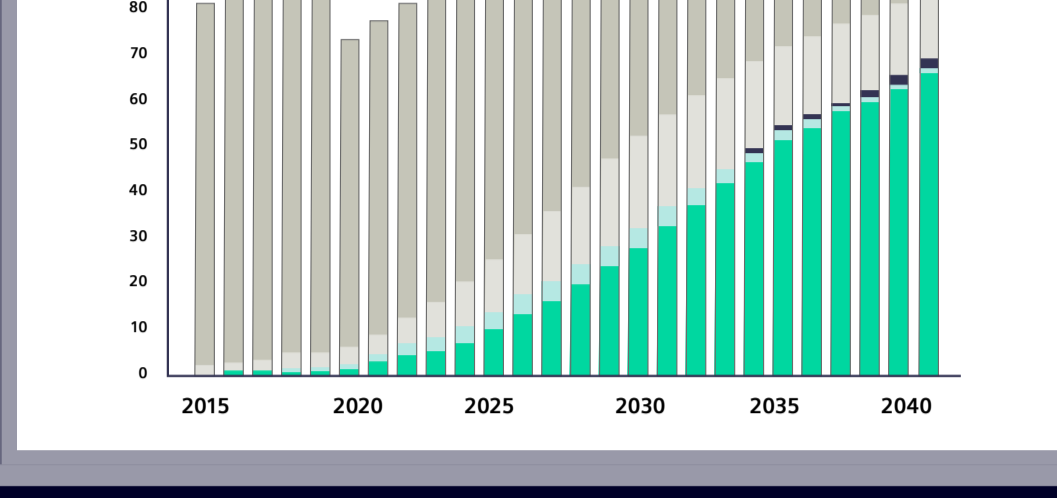
Source: McKinsey

Market growth

Global passenger vehicle sales outlook by drivetrain



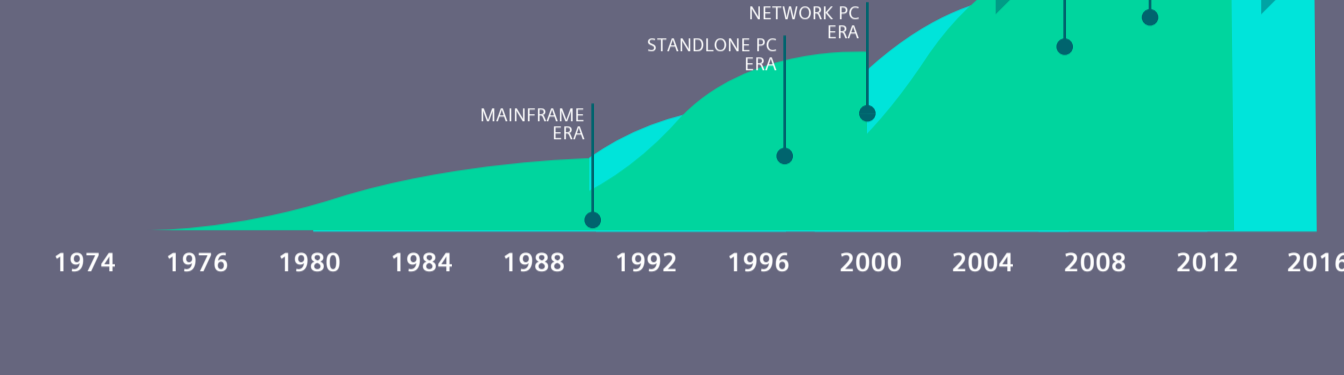
Due to falling battery prices, EV sales will outpace traditional vehicle sales in the next decade.



Internal combustion Fuel cell Battery electric Hybrid Plug-in hybrid

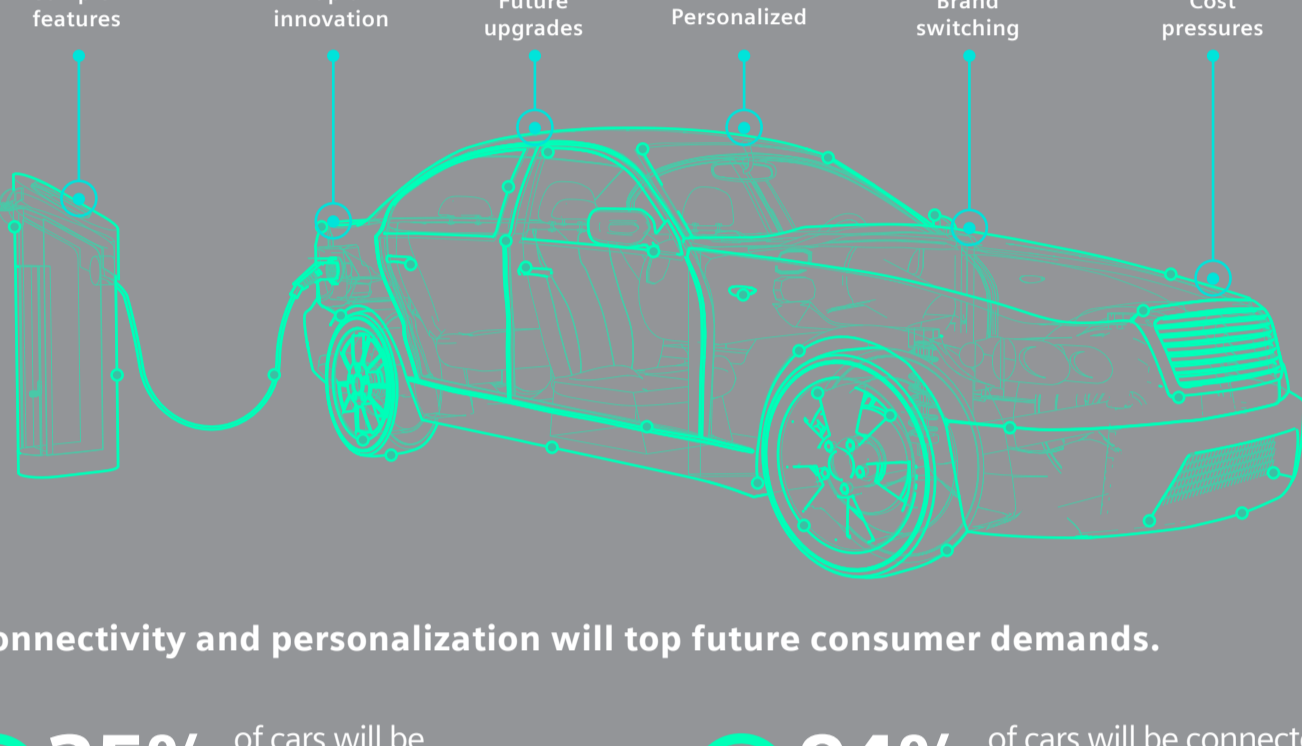
Rapid pace of innovation

Accelerated pace of disruptive innovations are driving the need for new engineering and technology development initiatives faster



Connectivity

OEMs must develop flexible, scalable and reliable E/E architectures to manage increasing complexity.



Connectivity and personalization will top future consumer demands.

25% of cars will be connected by 2023.

94% of cars will be connected to 5G by 2028.

Explosion of complexity

Intensified competition, changing consumer demands and increased regulatory requirements have caused an increased complexity.



Increasing day-to-day challenges

- Unpredictable supply chain disruptions affecting materials, parts, and components availability, leading to unexpected downtime
- Ongoing labor shortages
- Increasing complexity across their organizations



Market research* indicates that for 47% of the respondents, it has taken up to five days to detect and recover operations from a production line shutdown, and 18% said it has taken a full week.

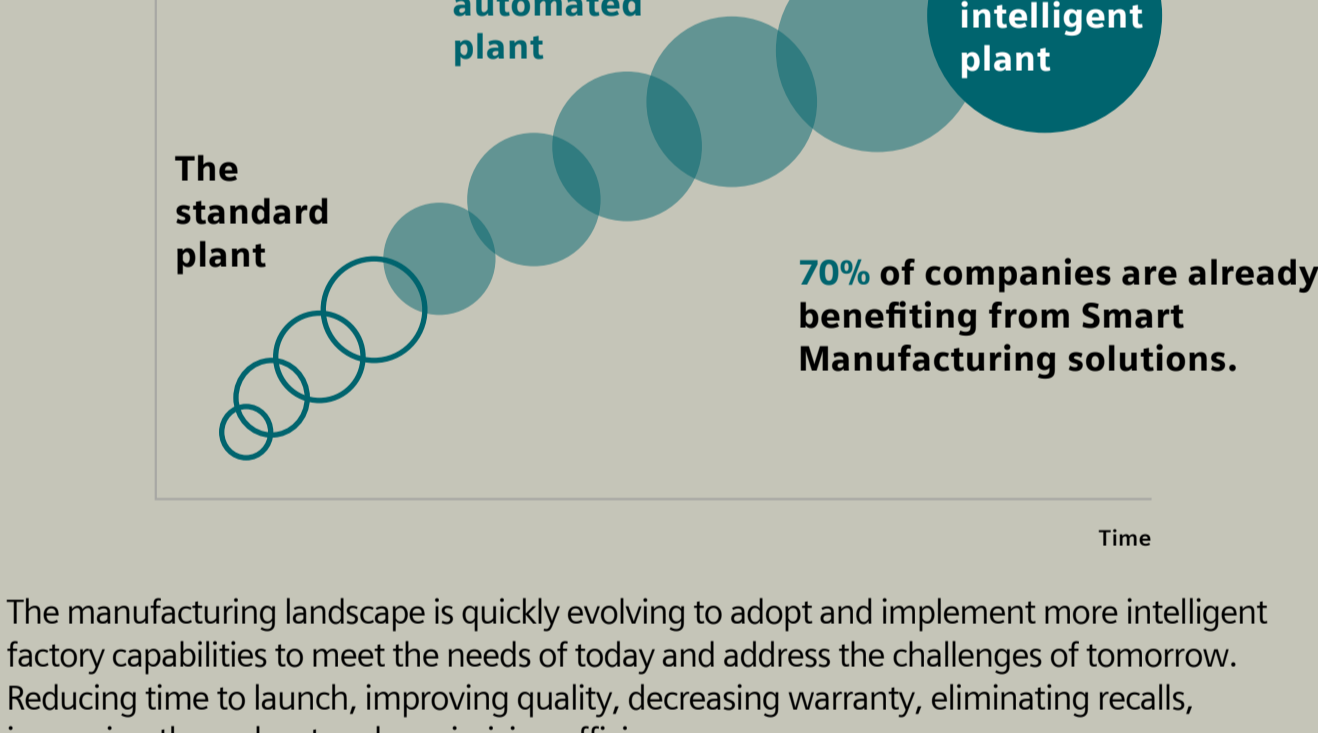
*Source: IndustryWeek

Possible implications

- Production line disruptions
- Lack of flexibility and resilience
- Greater pressure on speed and delivery
- Noncompliance to regulatory mandate and sustainability targets
- Risk of cyber attacks

Loss of reputation, competitive position and business

They realize they must gain agility and efficiencies in order to meet customer demand and overcome day-to-day challenges.



The manufacturing landscape is quickly evolving to adopt and implement more intelligent factory capabilities to meet the needs of today and address the challenges of tomorrow. Reducing time to launch, improving quality, decreasing warranty, eliminating recalls, increasing throughput and maximizing efficiency.



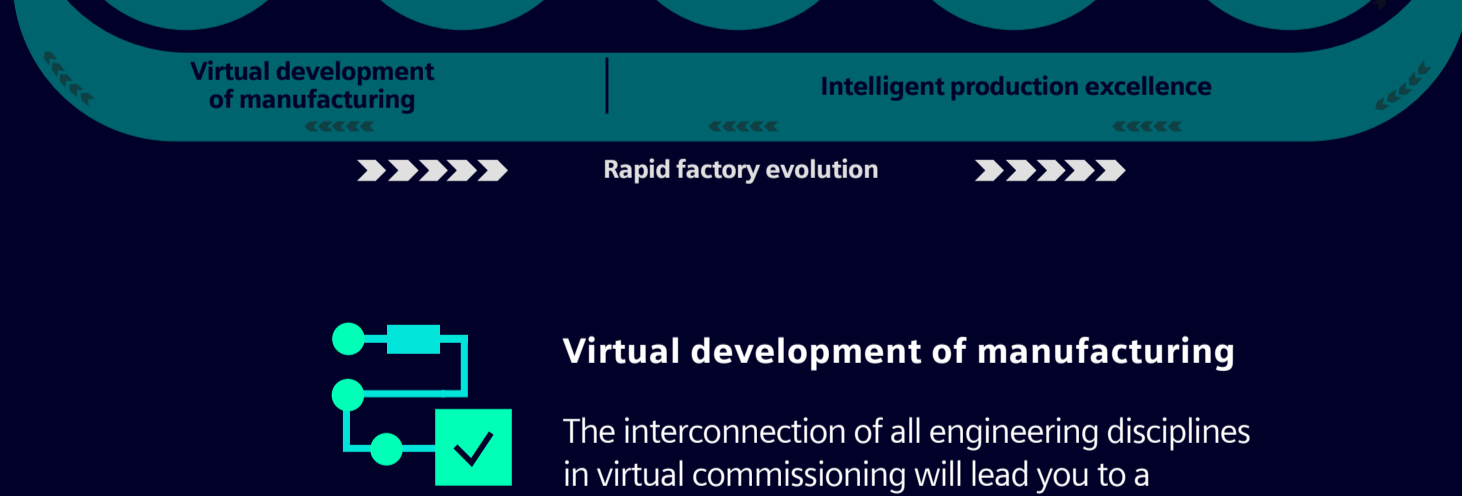
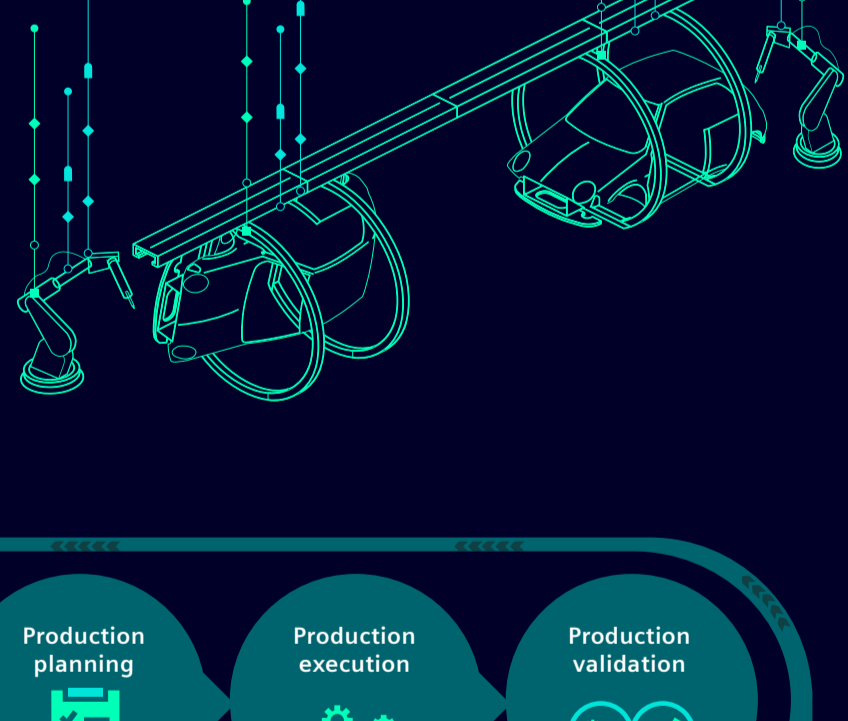
Only 18% of auto manufacturers have an intelligent, connected loop of technologies that helps them to predict and proactively maintain and manage the entire production line.

Source: IndustryWeek

The rest rely on either employees pulling together the data manually, or some mix of manual processes plus software.

Siemens can help

Modernize your manufacturing process by connecting the data of all engineering disciplines to the knowledge of your shop floor. Monitoring performance and predicting operational issues in real-time, by using sensors, smart devices, and IIoT technology you will have a complete loop of manufacturing communication. Leverage a virtual replication of your entire production plan to eliminate the iterative element of physical commissioning.



Virtual development of manufacturing

The interconnection of all engineering disciplines in virtual commissioning will lead you to a flawless launch on time.



Rapid factory evolution

Updating legacy equipment with intelligent technologies will allow you to receive actionable insights before physical commissioning so you can rapidly modernize your plant.



Intelligent production excellence

A self-organizing plant will monitor machine performance and predict operational issues to drive continuous improvement of products and processes, enabling you to achieve line speed and throughput targets.

Embrace Smart Manufacturing to win the race

- Meet sustainability goals**
Reduction of water usage and CO₂ footprint. Production facilities use 100% green electricity.
- Embrace globalization**
Ensure fair trade supplier practices. Transparent and secure supply chain. Sustainable and traceable sourcing.
- Adapt to changing consumer preference**
New Business Models – Product personalisation. Highly sustainable vehicle, minimum footprint. Electrified, connected vehicles, ADAS and AV.

Everything to enable a flawless launch