The automotive industry is racing into a new world of mobility even as it continues with the traditional business model of designing, manufacturing, selling, servicing, and financing cars. Megatrends including connectivity, autonomous driving, shared mobility, and electrification are shaping the industry and the world of mobility in real time.

- **Future “Smart Cities”** need mobility concepts beyond individual transportation based on owning a vehicle. The paradigm is shifting from optimizing traffic flows toward bringing people to where they want or need to be, using all possible mobility service options.

- **Electrification** and alternative drivetrain concepts change supply chains and introduce new brands and players that disrupt the variety of models in the market.

- **Autonomous cars** free the driver from just driving and open up a wide range of opportunities to use the gained time for learning, fun, communication, and consumption.

- **Data “emissions”** from connected vehicles help manufacturers understand and predict the behavior and preferences of their passengers. This means new opportunities to monetize information and optimize the driver experience and traffic infrastructure.

**Sustainable Mobility**

The automotive industry is under scrutiny: making and running cars requires material and energy with the related greenhouse gas emissions. Even battery-powered cars still need green electricity to run clean.

The transition to a world of sustainable mobility needs innovation and big paradigm shifts.

In our Climate 21 program, we work with leading customers across all industries on solutions to understand and minimize product carbon footprints of products and services.
Strategies for Automotive Companies to Run as Intelligent Enterprises

Proven success strategies show the range of approaches to creating new business outcomes based on existing products and processes and on developing disruptive new business models:

**Customer centricity:** Discovering the mobility needs of each individual, family, or business creates a new perspective on business opportunities in a mobile world – angling at brand loyalty, customer satisfaction, and winning a bigger share of a redefined “mobility wallet.”

**Mobility services:** Widening the view from the vehicle to mobility solutions fosters new ecosystems and unlocks new streams of revenue.

**Connected cars:** Our connected world creates new ideas and desires every day and turns every car into an entertainment, productivity, and mobility platform – unlocking customer value and fresh revenue streams.

**Digital supply chain and smart factories:** Accelerating innovation cycles require responsive, digital supply chains that use intelligent technologies to ensure rapid flows with high quality – resulting in productivity, flexibility, and new dimensions in customer service.

**Engaging the changing workforce:** In the digital, automated world, attracting and retaining a highly skilled and engaged workforce are key factors for innovation and success – to foster entrepreneurship and the drive to design for a great customer experience.

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**Benefits of Digitalization***

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<td>Increase in customer satisfaction</td>
<td>Increase in new revenue streams</td>
<td>Visibility uplift along the value chain</td>
<td>Cost reduction in production assets</td>
<td>Productivity increase and faster skill development</td>
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*Source: SAP Performance Benchmarking*
From Best Practices to the Vertical Edge

In a digital world, innovation is no longer just the domain of the research and development teams who build the next generation of vehicles. Innovation must become an integral part of each department and discipline, so they all contribute to the evolution from best practices to industry next practices, right to the “vertical edge.” This enables cross-functional teams to experiment with new ways to create unique value for customers, thus generating top-line, bottom-line, and green-line improvements.

Competing as Ecosystems
Transformation and innovation go beyond the four walls of the enterprise. Ecosystems are forged to enable the power of partners to deliver even more business value to customers. Rapidly implementing processes across enterprises, with a clear focus on win-win partnerships, creates competitive edge, powered by efficient business networks.

Mario Andretti: “If everything seems under control, you’re not going fast enough.”
Moving from proven best practices to the vertical edge takes courage. Nine out of 10 ideas and initiatives will fail in the search for the unicorn. This startup attitude needs a culture and systems that foster rapid innovation and the willingness to take risks and learn from failures.
Road Map to the Vertical Edge

Within each of the nine business priorities of automotive companies, there are opportunities to move to next practices and the vertical edge jointly with our partners and customers. These areas hold significant potential to extend automotive core processes from current best practices to next practices using digital technologies and a digital mind-set.

Continuous Innovation

For automotive companies, the journey to become intelligent enterprises is a collaborative effort between customers, partners, and SAP. The world is changing quickly, and there is opportunity in innovation spaces that are sparsely populated, empty, or don’t even exist today. There are many innovative ideas out there in search for a platform to turn imagination into innovation and reality.

SAP’s intelligent suite and business network are the perfect foundation for next practices and innovation at the vertical edge.
Connected Cars – Digital Twin and Digital Vehicle Hub

BEST PRACTICE

1. Digital representation
2. Business process support
3. Business network collaboration
4. Network of digital representations

NEXT PRACTICE

Enrich and integrate with business context
Operate on digital twins and enable new business models

Compose and integrate digital twins with data from design, engineering, production maintenance, and service
Collaborate across the business network – manufacturers, asset operators, and service providers

Value Drivers*

+10%–15% Faster time to market
+10%–15% Optimization in R&D expense
+25% Increase in revenue from new products and services

*Source: SAP Performance Benchmarking

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Digital Supply Chain and Smart Factories Through Modular Production

COMMON PRACTICE
Workstations in assembly line – flow

- Fixed takt time that leads to inactivity on many sections of the line
- Limited ability to manage optional features (extras)
- Rigid sequential process – a jam at one station leads to a standstill for the entire line
- Difficulty in extending production line and capacity

NEXT PRACTICE
Workstations in modular assembly

- Dynamic takt time depending on complexity of vehicle configuration, allowing higher throughput and reduction of dead time
- Flexible reaction to customer demand and ability to realize customization at scale
- Breathing or modular assembly that allows easy extensibility of shop floor
- Production supply with automated guided vehicles that promotes just-in-time availability for needed components
- More detailed and granular production planning, resulting in better visibility of production plans, supply, and demand

Value Drivers*

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<th></th>
<th>+4%</th>
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<tbody>
<tr>
<td>Higher production volume throughput</td>
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<td>Reduction of total manufacturing cost</td>
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<tr>
<td>Faster reaction time to customer demands</td>
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* Source: SAP Performance Benchmarking

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Customer Centricity Through Subscription Management for Sales

COMMON PRACTICE
Consumers use online and offline tools to educate themselves and identify their target vehicles, usually visiting a dealership to complete the traditional purchase, financing, or leasing of a vehicle.

- Attracting customers relies on traditional acquisition processes. Consumers educate themselves and then visit a dealership.
- There is a continual battle with consumers as industry trends move toward valuing flexibility.
- The offering to the customer remains product centric.
- Challenges remain in customer retention as time between product sales can be years.
- Prices are based on the product, not on the value provided to the customer.

NEXT PRACTICE
One integrated solution supports the complete end-to-end process for subscription-based models online.

- Insight into the needs of customers drives innovation.
- Business model design enables flexible creation of new digital offerings and products.
- Setup and maintenance of subscription-based customer contracts for vehicle use or other services are easier, including individual agreements.
- Use and performance data from connected vehicles is easily retrievable using IoT connectivity.
- Invoice generation is through usage data from connected cars.
- Automotive companies use real-time vehicle and customer insights to provide superior customer experience.

Capture customer experiences with subscription and mobility-as-a-service contracts. Compare experience data against contract profitability and customer retention. Then optimize processes and service offerings and billing for subscription and mobility-as-a-service contracts.

Value Drivers*

Flexible
Model selection that enhances customer experience

Higher
Customer satisfaction and retention

Lower
Traditional ownership expenses

* Source: SAP Performance Benchmarking

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SAP’s Industry Cloud – A Joint Innovation Space

Business innovation is driven by everyone – customers, partners, and SAP. It starts with ideas: how to fix a problem, how to discover and unlock new value, how to deliver new business outcomes. Translating an idea into a business process or a solution needs an innovation space that comes with digital tools and content to build and deliver quickly and predictably. This allows developers and business users to focus on getting things done to push new solutions out the door.

Industry Innovation Spaces

Stand-alone applications struggle to deliver relevant business value. Enterprise applications always need access to essential business domains such as products, cost centers, employees, and customers. SAP’s industry cloud provides direct access to business domains and processes in the intelligent suite through APIs. While it’s business and technology services provide the tools and infrastructure to create and run innovative industry cloud solutions.

Intelligent Technology at Your Fingertips

Business innovation needs digital technologies that are ready to use to solve a business problem. SAP’s industry cloud powered by SAP Cloud Platform provides a full set of technologies ranging from user interfaces over robotic process automation to artificial intelligence and machine learning.
Open Innovation Platform and Ecosystem

SAP’s industry cloud is the platform for SAP and partners to deliver industry cloud solutions that unlock new levels of efficiency, extend end-to-end business processes at the edge, and enable innovative business models.

SAP partners will find a unique environment in SAP’s industry cloud where the data domains and business processes of our intelligent suite and business network are readily accessible through open APIs. The SAP’s industry cloud also includes technology libraries such as machine learning, artificial intelligence, data lake, and UI services, among others, and content from the SAP Model Company service. This allows our partners to accelerate innovation by focusing on the differentiating business capabilities they want to build and deliver to our joint customers to help them become intelligent enterprises.

This enables a spectrum of partnership and innovation models ranging from close co-innovation over identified white spaces to completely open innovation spaces with free competition to drive customer value.

The innovation models are complemented by a set of commercialization models that are strongly correlated to the value the solutions deliver to the business of our customers.

Freedom of choice is a key value, so customers can choose any partner or hyperscaler to deploy their industry cloud solutions.

Open Platforms Deliver Innovation

Open platforms, available to the wider ecosystem, have consistently delivered more innovation and choice for customers. Therefore our industry cloud solutions can be run by the major Infrastructure as a Service (IaaS) providers, giving our customers the freedom to implement their own individual platform strategy.

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SAP’s Comprehensive Partner Innovation Ecosystem

SAP has been the proud solution provider for the automotive industry for almost five decades – starting from humble beginnings and growing into a position of supporting the core business of our customers. Fifteen top car manufacturers with the highest production in the world run SAP.

SAP’s industry cloud opens the doors for a new level of co-innovation with customers and partners, enabling next practices and new business models that help our customers capture the new opportunities of future mobility and take the next step toward becoming intelligent enterprises.

Our open partner strategy gives our customers the choice of whom they work with to design the business models of the future; whom they partner with to define and implement business processes for efficiency and growth; and whom they trust with running their infrastructure.

There are many journeys automotive companies can take into the digital economy to become intelligent enterprises. No matter which they choose, our scalability, security, global reach, vibrant business networks, and business process knowledge across automotive and adjacent industries are the success factors for our customers, our ecosystem, and SAP.

Our automotive partner ecosystem includes: