Value Creation
In The Digital Automotive Network

Inspire And Shape

a digital world that reinvents automotive design, production, distribution, and retail
Dear Customers,

More than 125 years ago the first vehicle was patented very close to my hometown in Mannheim, Germany. Even after so many years, the automotive industry has never been more exciting and challenging than today.

Most of the global vehicle manufacturers have the same vision of accident-free driving with zero emissions. Only after 125 years does this vision seems technically possible. With innovation, new business models, and consumer behavior, massive changes are now transforming the entire industry.

Proven business models are being disrupted by new players on the market. Tesla, Uber, and Google are forcing traditional vehicle manufacturers and suppliers to rethink their strategy, ecosystem, and value chain. Even proven core business in the automotive industry is being questioned by leading automotive executives and experts.

The industry has to sustain its core business while investing in new revenue streams or providing new services to stay relevant. This balance poses the biggest challenge to all players, as speed and integration become imperatives. Leading vehicle manufacturers and suppliers are reevaluating their existing businesses and customer relationships to:

- **Reimagine business models** to find new revenue and profit sources by offering innovative products and services
- **Reimagine business processes** and use digital technology to optimize business outcomes by converging information and operational technologies
- **Reimagine the role and structure of their workforce** to support future business by incorporating smart glasses, 3D printers, and geospatial technologies

All participants will use digital innovation to run their enterprise in real time and operate in a global network. They will provide superior products and services for a unique customer experience with the highest safety and environmental standards. This also paves way for new mobility concepts and business models.

Our vision is where urban mobility and transportation systems run in a sustainable ecosystem while protecting natural resources and environment. This requires the ability to connect companies, people, and vehicles in real time for accident-free driving with zero-emission-operated vehicles.

We strive for the highest customer satisfaction through a delightful and unique driving experience. We will offer the digital foundation and the digital gateways that integrate the core solutions of each market participant.

This document offers our perspective on industry transformation and how SAP contributes to the evolution of the automotive industry. Thank you for your interest, and I look forward to our journey together.

Holger Masser
Global Vice President
SAP SE
# TABLE OF CONTENTS

## Executive Summary
4

## Top 5 Technology Trends
7

## Reimagining
8
- Reimagining Business Models
10
- Reimagining Business Processes
11
- Reimagining Work
12

## Digital Business Framework
13
- The Digital Core for the Digital Automotive Organization
15
- Customer Experience
16
- Workforce Engagement
17
- Business Networks and Supplier Collaboration
18
- Big Data and the Internet of Things
19
- SAP HANA Platform – A New Computing Paradigm
20
- How Does It All Come Together?
21

## How to Start
22

## Why SAP?
24
- SAP is Committed to Innovation
25
- End-to-End Digital Business Solution
26
- SAP Services to Drive Your Success
27
- SAP Comprehensive Ecosystem
28
EXECUTIVE SUMMARY

Big picture: The digital economy combines physically connected devices, more efficient production processes with mobility services support, and new business models that continue to transform automotive industry

The Digital Economy

Five technology trends
Hyperconnectivity, supercomputing, cloud computing, a smarter world, and cybersecurity are shaping the digital economy. Leading automotive OEMs and suppliers prepare to use these technologies to find new answers to questions such as:

- What are profitable business models based on new technologies and trends such as connected vehicles and mobility services, digitally networked suppliers, more efficient and automated production lines, and partnerships among OEMs?
- How can we capitalize on the new wholesale and retail business models with more sustainable relationship-based selling?
- Which trends and technologies from adjacent industries are influencing the automotive market (e.g., alternative fuels and powertrains, hybrid technology, smart industries, inter-model mobility, travel-related value-added services)

Leaders are emerging from unexpected places
The global automotive market is uneven, and a huge value chain transition is underway: OEMs, suppliers, distributors, dealers, and other service providers must navigate this change in order to accelerate their market share. There is a clear trend shift which becomes the basis for this new digital business. Key questions include:

- What are the changes that shift consumer demand?
- Which market spaces are the most attractive for new disruptive competitors?
- Who are the potential partners in the digital automotive network?

Early adopters are winning
Research shows that companies that embrace the digital world and execute on their digital strategy are growing shareholder and stakeholder value faster than their peers. Automotive companies are a spending significant proportion of revenue on R&D to provide more digitization on the vehicles and therefore more travel-related value-added services and more energy efficient and sustainable vehicles. Key questions include:

- Which business segments allow market leadership and competitive differentiation?
- Which tasks are better allocated to a partner in the network?
- How do we develop and sustain the ability to adapt continuously to changing market conditions?

WHAT DOES THIS TELL US?

Keys for automotive companies to win in the digital economy:

- Be a leader in reinventing and digitizing the business
- Partner with consumers to achieve economies of scale
- Digitize the engagement with customers

Every business is becoming a technology business.

Digital business models are disruptive. The rules have changed.

- BMW
  Introduction of slow moving collaborative robots in its factory in Spartanburg which cooperates with a human worker to insulate and water-seal vehicle doors and expects massive rollout of the technology in Germany

- Bosch
  Solutions for advanced driver assistance system based on sensors, video, and ultrasound to interpret surroundings, driving situations, parking, and maneuvering comfort

- Tesla
  Open IP platforms can stir new innovation. The company focuses on serving the needs of the connected car with telco operators and content providers. Tesla stands to gain new revenue sources to sell batteries and super charging stations

- Continental
  New technology being used on high-quality truck emergency brake that recognizes obstacles, provides early warning of a rear-end collision, and automatically triggers emergency braking

- General Motors 'OnStar'
  Diagnose and manage vehicle health and maintenance: periodic e-mail to owner with detailed report, on demand via in-car services, dealer maintenance notification
EXECUTIVE SUMMARY

The future: The automotive industry value chain transitions to a digital network where each player possesses massive amounts of data, exchanging it with partners on a real-time basis.

The digital automotive network

The digital automotive network is the digital nerve system of the next-generation ecosystem. It is the connection of independent, but highly collaborative digital data sources (e.g., vehicle analytics and telematics data, physical devices, etc.), enabling real-time control to improve operational efficiency.

Transformation drivers

The automotive industry value chain along design, production, distribution, and retail is transforming at breakneck speed and is driven by:

- Digital data: Sensors and portable computers interface to customer vehicles, machine, and vehicle data
- Connectivity: Connected vehicles, vehicle insights and analytics, value chain networks
- Mobility: On-demand, just-in-time, and mobility services; e-mobility support, such as charging stations; increased travel demands
- Sustainability: Lightweight, new, and alternative powertrains, energy management, and emission-free vehicles
- Consumer behavior: Digital marketing, online vehicle sales, collaboration with dealers, in-car telematics, along with other value-added services

New business models

Automotive companies are reimagining business models, business processes, and job descriptions enabled by the transformation drivers:

- Mobility: Inter- and multi-modal for short and long haul as shared service concept, individualized mobility solutions
- Business networks that connect all automotive value chain business partners digitally, enabling more efficient transactional processing and improved supply and delivery reliability
- Vehicle network for end consumers, offering location-based services, vehicle recommendations for most efficient route, nearest charging and fuel stations, multiservice and multichannel access
- Omnichannel commerce: Digitally connected enterprises with touch points in car sales, retail sales of accessories, and ancillary service offerings with agile, extensible, multi-modular platform

DIGITAL AUTOMOTIVE NETWORK

111 million light vehicle sales forecast by 2020 at CAGR 4.1% year over year, with most of the demand in emerging markets

€1.3 billion estimated spend each year for new product launches, with potential costs up to €5 billion when Tier 1 suppliers are included

>$100 billion potential value of mobility services enabled by self-driving cars in 2035

The top three decision imperatives are:

- Connectivity and digitization
- Hybrid electric vehicles
- Battery powered mobility

Powertrain

Mix of proven powertrain options, including more efficient internal combustion engines, electric vehicles, plug-in hybrids, and vehicles powered by natural gas
EXECUTIVE SUMMARY

Road map to Run Simple: Steps to digitize your business

REIMAGINING

Do you have the right strategy? The starting point of the transformation journey is to reimagine your business with business outcomes and customers at the center.

REIMAGINE BUSINESS MODELS

Digital data, connectivity, mobility, customer centricity, and track and trace require business models such as:

- Multi-modal mobility with integrated services
- Energy efficient, hybrid, and connected vehicles with detailed vehicle insights
- Digitally connected supplier network
- Omnichannel, vehicle information and entertainment, and e-commerce services to monetize the digital transformation

REIMAGINE BUSINESS PROCESSES

Changing business models and digital technology drive business process efficiency and innovation that inspire new business approaches, create lower TCO, or accelerate breakthrough technology in vehicle and component production, distribution, wholesale/retail channels for sales and service.

REIMAGINE WORK

The transformation in vehicle and component design, manufacturing, distribution, sales, and service profoundly changes what people do and how they learn, interact, engage, and grow. Many tasks will become automated, but people will be an even greater asset in shaping the customer experience as their roles change.

PLATFORM

Do you have the right platform? Leaders are investing in digital capabilities that are congruent with their strategy. The digital automotive network will provide all participants the right platform to drive efficiency, accelerate innovation, and develop new business models.

We provide solutions aligned to desired outcomes. SAP’s digital business framework is based on the five key pillars of a digital strategy:

1. **Customer experience** across all channels
2. **Business partner collaboration** across all spend categories (maintenance, repair, services, and expenses)
3. **Core business processes** (finance, procurement, supply chain, manufacturing, and work management)
4. **Workforce engagement**, including employees and contractors
5. **Big Data and the Internet of Things** to drive real-time insights and new business models

ROI drives this significant phase of the transition to digital. It’s not about any one of the five pillars, but rather how they all interconnect to achieve business outcomes.

We apply Design Thinking as our key approach during the reimaging phase. Design Thinking can be described as a discipline that uses the designer’s sensibility and methods to match people’s business needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity.

Just 4.6% of engine production will be **electric** by 2020⁶

By 2025 vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication will be available in approximately 30% of the passenger vehicles in mature markets⁷
EXECUTIVE SUMMARY

Fundamental changes: Five technology trends changing everything

We are witnessing an unmatched era of true business innovation. Breakthrough technologies have matured and hit scale together, enabling five defining technology trends:

1. HYPERCONNECTIVITY
   The automotive world is adapting, driven by strong customer demand for hyperconnected products and services. The interconnectedness of people, places, and things is creating a new business model as the digital technology permeates not only the buying process, but also a unique driving experience.

2. SUPER COMPUTING
   The limits of 20th century computing power are gone. The digital automotive network powered by real-time, in-memory computing creates infinite business opportunities for the automotive industry.

3. CLOUD COMPUTING
   Technology infrastructure resides on new cloud-based collaboration platforms, ready to launch new automotive business models. Collaboration in the automotive supply chain is important where OEMs connect to parts and tire manufacturers, distributors, and a host of ancillary businesses.

4. SMARTER MANUFACTURING
   Sensors, robotics, 3D printing, and artificial intelligence are the new normal. It helps to manufacture, monitor, and repair vehicles in the automotive network remotely; critical components will be made on demand at the location and predictive models will optimize the digital automotive network.

5. CYBER SECURITY
   The digital automotive network is a prime target for digital attacks and sabotage. Trust remains the ultimate business currency, making cybersecurity a top priority in the design and operation of the digital automotive network.
REIMAGINING

DIGITAL ECONOMY OFFERS INFINITE NEW OPPORTUNITIES

In a connected world where every company is constantly adapting to technological innovations, smarter vehicles and services will refocus commerce on business outcomes and blur industry lines.
Diverging markets, complexity, cost pressure, and digital demands are creating a shift in the industry landscape that helps to tap into new customer groups based on new business models.

- **Mobility**: Inter- and multimodal mobility as a shared service concept for short and long hauls; personalized and efficient transportation options in combination with collaboration among multiple service channels

- **Business network**: Connecting the value chain through business network transparency and collaboration, paperless transactions

- **Vehicle network**: Capitalizes from fleet management based on real-time multi-service, multi-channel access, vehicle-to-x communication, route optimization, remote diagnostics, and predictive maintenance

- **Omnichannel commerce**: For vehicle configuration, unified sales and service, retail sales, product content management, loyalty management, multi-channel campaign and integrated marketing management

Groundbreaking innovations and the associated business models pave the way for new business processes in the automotive value chain, from engineering to sales and service.

- **Smart vehicles**: Efficient, sustainable transportation and a host of ancillary vehicle-centric services

- **Smart plants**: Full automation, addressing the need for mass production of vehicles at low cost with no or minimal disruption in manufacturing flow

- **Networked logistics hub**: Manage network, monitor anonymous traffic, maintain geo-fences and points of interest, notifications

- **Inbound logistics**: Schedule reliable time slots for goods pickup and delivery development

- **Supply-side coordination**: Assist component supply, matching supply and demand permanently

- **Location-based service offerings**: Digitally connect to the consumer and provide value-adding services

- **Multichannel sales**: Optimize and increase customer interaction

- **Service management**: Diversify into businesses beyond vehicle sales

Adaptive new business models and business processes requires new skills and talents which needs to be enhanced on a continuous improvement basis

- **Digital business processes**: Eliminate manual transaction steps and require “exception handling”

- **The right information at the right time on the right device**: Improve decision quality, profitability, and productivity

- **Predictive and self-learning software**: Improved machine-to-machine collaboration requires skilled workers who can orchestrate complex systems

- **Interactive technologies**: Improve user experiences and deliver the right visual, text, and audio information on demand

- **Flexible business-to-people relationships**: Create adaptive businesses that value the specialists who build and run the digital enterprise of the future
Mobility, vehicle and business networks, and omnichannel commerce disrupt established business models within the automotive industry. We expect that automotive companies will define their future business model by restructuring the value chain. Increased value will come from smart alignment along the four main business operations that adjust to the volatile market situation.

**Mobility**
Intelligent and agile transportation networks have changed the concept of mobility and have defined new ways of commuting for short and long hauls. Increasing demand is now seen for services that bundle mobility with other ancillary service offerings.
- Integrated mobility services become a shared service, an example of the drift from product focus to service focus throughout the cycle of ownership
- High focus on car sharing and fleet sharing. The market ranges from full in-house solutions to joint ventures
- E-mobility offers a broad range of business opportunities to engage customers who today are mostly captured by the vehicle manufacturers

**Business network**
Streamlined collaboration between downstream and upstream supply chains in the network for a single access point, supplier onboarding, and risk management services.
- Digitization of business network from sourcing to production, real-time monitoring of global commodity prices and supply volatility
- Transparency in long-term demand and transactional consistency for all partners with regard to procurement, shipment, invoicing, and payment process
- Streamlined data exchange between multiple business partners, providing increased transparency and optimized flow of information

**Vehicle network**
Connected vehicles in the automotive network are moving from product focus to subscription-based services based on multichannel access.
- Historic, real-time, and predictive data about vehicles, traffic situations, car and driver analytics used to improve design, innovative marketing campaigns, services, etc.
- Autonomous vehicles using in-vehicle technologies – sensors, cameras, lasers, radars, software, maps, GPS, and wireless data communication
- Automated driver assistance system for emergency braking, adaptive cruise control, automated parking assistant, vehicle-to-x communication
- Diagnosing and maintaining vehicle health and maintenance, dealer maintenance notification, onboard diagnostics

**Omnichannel commerce**
Connected customers are driving a revolution in all industries. Having access to a range of new technologies and a wide variety of online resources anytime, anywhere, and on any device, these connected customers are using multiple sources of information during their customer journey.
- Omnichannel touch points offer optimized, seamless experiences across all channels – in-store, in-car, online, and everything in between
- A single view of customers, products, configurations, and orders with unified commerce processes
- An agile, extensible, modular platform to grow the business (B2C, B2B, B2B2C)
- Control of the omnichannel shopping process with best-in-class personalization capabilities

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**BETTER CONNECTIVITY AND SAFETY**
The U.S. Department of Transportation has projected that vehicle-to-external connectivity could help prevent 70–80% of vehicle crashes.\(^1\)

**REVENUE GENERATION**
"McKinsey estimates that, for each minute in which all car passengers worldwide are attentive to mobile media content, an annualized value of €5 billion could be created."\(^2\)
The traditional automotive industry value chain is undergoing a massive transformation. This is a result of considerable changes within the existing structure, new technologies, smarter vehicles, and near real-time processes enabled by the digital automotive network.

**Smart vehicles**
Highly customizable vehicles are enabled with sensors, networks, and communication interfaces. Vehicle analytics based on sensor data make for smarter vehicle management with a fully digital allocation of spare parts, work, and logistics services delivered by the digital automotive network.

**Smart plants**
Smart plants produce vehicles with varied configurations at scale and lower cost to address market trends toward mass production. Systematic management of digital data enables full visibility of plant operations, remote monitoring, control and real-time optimization of production scheduling, and control and issue resolution.

**Network logistics hub**
Optimized management of inbound and outbound traffic in the distribution of the vehicles, complete knock down, semi-knock-down kits, and spare parts distribution, thereby reducing wait times, space usage and vehicle dispatch monitoring, and load optimization of vehicles through the company’s own or cloud-based systems.

**Inbound logistics**
Schedule a reliable time slot for pickup and delivery of vehicle components and parts through just-in-time, just-in-sequence, and Kanban processing with digitally connected suppliers in the automotive network. Enable track and trace of component parts for claims and warranty management.

**Supply-side coordination**
Match supply and demand requirements with regards to market volatility and reduction in inventory with a more agile procurement and distribution process.

**Location-based service offerings**
Vehicle and location-centric service offerings based on virtual geo-fences that provides connected fuelling, connected parking, automated payment system, and electric vehicle charging.

**Multichannel sales**
Vehicle configuration and sales based on robust multi-channel e-commerce platform. Seamless integration between order management process and vehicle/ component production. Pricing based on configuration options, location, promotions, etc.

**Service management**
Digital information about consumer behavior, preferences, and needs creates a new world of sales opportunities. Regardless of the business model, sales needs a digital, 360-degree view of the consumer and the market.

**Services**
Innovative service offerings and processes can have a game-changing impact on customer relationships at the top and bottom line. Service processes digitally connected to the workforce, suppliers, customers, and assets create more efficiency and increased customer value.

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36% of the executives see the production and sale of an automobile including technological add-on as the most likely business for OEMs in 2025.\(^{13}\)

Revenue from electric vehicle charging services to reach $2.9 billion annually by 2023.\(^{14}\)
The fundamental transformation in vehicle design, manufacturing, distribution, and service into a digital automotive network profoundly changes what people do and how they learn, interact, and grow.

Every substantial business transformation automates manual tasks, enriches jobs, and provides new opportunities.

**Digital business processes replace manual transaction work** in procurement, inventory management, production, sales, and service processing. Digital processes have access to real-time analytics to support rule-based decision making.

**The right information at the right time on the right device:** Shop floor processes are supported or controlled by predictive and self-learning systems that interact with machines and other devices.

**Predictive and self-learning software** accelerates the delegation of business processes and decisions from people to vehicles and machines. Digital access is available on demand and in real time to those who need the data, regardless of whether they are part of the core or the extended workforce.

**Interactive technologies** reflect the transition of peoples’ roles from transaction workers to exception workers who engage when the digital rulebook needs human creativity and ingenuity.

People continue to be key assets in the digital automotive network. Their roles will change, but their value to each segment in the network will grow.

**Flexible business-to-people relationships:** Automotive is a manufacturing-intensive industry that operates large-scale mechanical and digital assets. However, the transformation to the digital automotive network also creates hundreds of millions of new people interactions: between consumer and service teams, between the core and the extended workforce, and with the public over social and broadcasting networks. Real-time digital information on the right vehicles and machines is critical to advance the business agenda through interaction between people.

**Al-Futtaim**
More than 74% of the workforce is using the online learning system, which has provided a savings of ~$430K

**The aging workforce** is a huge threat to the automotive industry in terms of skill sets and knowledge that need to be rapidly enhanced in order to meet upcoming demand for skilled resources.
DIGITAL BUSINESS FRAMEWORK

A SIMPLE AND PROVEN APPROACH TO VALUE CREATION THROUGH DIGITIZATION

Every company across all industries requires a simple digital approach to build a pragmatic and executable vision on its digital strategy.
SAP understands the five pillars of digitization, and we also understand that the continuously changing requirements pose big challenges for businesses. The method of reimagining business models, business processes, and work help develop the digitization road map.

We have built the digital business framework to support automotive companies in developing and executing on their enterprise strategy and fully leverages and contributes to the digital automotive network. The digital core is the platform for innovation and business process optimization, connecting the workforce, the Internet of Things, the supply network, and customers.

1. Outcome-based **customer** experience
2. Re-platform **core business processes** and bring together transactions and analytics in real time to be smarter, faster, and simpler
3. Smarter and engaged **workforce** across all employees and contractors
4. **Supplier** collaboration to accelerate growth and innovation
5. Harness **vehicle network** and the **Internet of Things** to drive real-time insights and new business models

**DIGITAL BUSINESS FRAMEWORK**

Every company needs to think about the five pillars of digital strategy

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**SAP HANA PLATFORM**
THE DIGITAL CORE FOR THE DIGITAL AUTOMOTIVE

A new generation of enterprise solution, running in real time, integrating predictive, Big Data, and mobile, will change how automotive companies work, how the business is run, and how information is consumed. The future is here.

Advanced in-memory computing eliminates the need to run the business in batch mode and create complex workarounds for design, production, distribution, sales, and service. You can Run Simple and use the full power of the digital automotive network.

Real time
Real-time optimization of the business and its associated changes will have massive implications for how we work, do business, and organize.

The power and insight of the vehicle network
Every employee can gain real business insights with the help of simulation and predictive tools to drive smarter decisions, improved design, and reliability of vehicles.

Agility
The ability to rapidly enter new markets, acquire and onboard new business models in automotive or across industries, or reflect an organizational change will take a fraction of the time it does with today’s systems and will yield the agility required in the digital economy.

Deployment choice and lower TCO
Accessing solutions to run the core has to be simple. Automotive companies now have the choice to deploy in-house or in the cloud. In-memory computing also has a significant impact on TCO, as it will free up funds for infrastructure investment.

Consumer-grade user experience
User experience is key to accepting digital change. It drives adoption, user engagement, and people productivity.

SAP S/4HANA is the only end-to-end solution that covers all business processes and runs in-memory. It helps automotive companies run in real time for fundamentally better performance. It provides:
- A single, real-time view of the plant based on data streams obtained from multiple devices, machines, and sensors
- An optimized vehicle network through vehicle insights, sensors transmitting vehicle data, demand-side management, and blending IT/OT data to optimize operational performance
- A 360-degree view of the customer to improve the overall customer experience

In addition, the SAP HANA Cloud Platform can be the single enterprise data source for SAP S/4 HANA and the rest of your solution landscape.
Three key trends are reshaping the customer experience:

**Outcome economy**
The outcome economy requires a deep change in the business model for automotive companies and well as new organizational and business process capabilities. It also requires a much different approach to product design and TCO across the lifecycle. Consumers want smart, emission-free, lightweight vehicles and components.

**Customer journey**
Customers choose their own journey across multiple channels at their convenience – the pattern that emerges is not linear, as in the past. The rising complexity of the automotive markets makes shaping the customer journey the top priority for OEMs, dealers, and distributors.

**Big Data and marketing in near real time**
Big data allows companies to sense and respond to customers’ needs in real time and predict the next, best step for engaging with them. With the rollout of smart meters, the quantity of available data will virtually explode, giving rise to business opportunities based on this insight.

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**Digitize your end-to-end customer experience with SAP**

A single platform that brings together marketing, sales, services, and commerce to ensure seamless digitization of the entire customer experience. SAP solutions for customer engagement and commerce powered by the SAP HANA Cloud Platform enables a 360-degree view of your customer, real-time interaction, and sophisticated predictive analytics, fully integrated to the core transactional system.

- **Orchestrate business processes** across marketing, commerce, sales and service
- **Deliver personalized experiences** in context with each interaction
- **Create a single, harmonized experience** for your customer, while reducing the burden on employees
- Be prepared to **engage your customers on the channels they choose** at any moment in their journey
- Full integration with your core business processes provides a unique automotive-specific platform for omnichannel customer engagement and commerce
Complexity is the enemy of workforce engagement. People are working harder than ever but are not necessarily accomplishing more. People do not have access to smart, consumer-grade technology to work faster, better, and more efficiently. Organizational complexity is driving costs up and slowing down progress. Four forces need to be addressed:

**Changing of the guard**
Over 50% of the workforce will be millennial by 2020. Automotive companies have to devise a workforce strategy to make work in this industry attractive for the digital generation.

**Contingent labor is on the rise**
Automotive companies are turning more towards collaboration and other service providers to drive agility and lower fixed costs. Companies can outsource work, but not the responsibility for safe and compliant operations. The contingent workforce must be digitally integrated in all business processes.

**Constant reorganization**
Reorganizing to adjust to the new reality is becoming a constant affair and can’t disrupt efficient operations.

**Complexity is on the rise**
Companies do business in more countries across many more channels. Vehicles and services are becoming more complex. Regulations are changing by the day. Layer upon layer of management is hindering speed and agility.

41% increase in contingent workforce spending in the past five years

30% of executives say their companies give special attention to the particular wants and needs of millennials

50 – 60%
Of a team or department could retire in a short span of time, causing massive disruption

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**Improve your total workforce productivity: Simplify with SAP**

Digitize your workforce with SAP: SAP S/4HANA + SAP SuccessFactors + SAP Fieldglass + SAP Fiori provides the tools for total workforce engagement and advanced analytics.

- **Attracting the best people** Recruit and onboard the best workforce, simplify their work, and ensure that regulatory and compliance requirements are met
- **Managing the total workforce lifecycle** Manage the total workforce lifecycle from recruiting, onboarding, performance, compensation, and learning all in one place
- **Smarter apps with greater user experience** Enable the workforce to easily access the right information across any device and through a dramatically simplified user experience
BUSINESS NETWORKS AND SUPPLIER COLLABORATION

Business-to-business (B2B) transactional inefficiencies provide potential for billions of Euros savings per year from sourcing and transacting to payment processing.

Collaboration across all spend categories will change how automotive companies develop, manufacture, sell, and service vehicles with value creation across the entire value chain. Several trends are redefining the game:

**Business connectivity at scale**
When automotive suppliers small and large are connected in the network, the transactional platform becomes the de facto standard for EDI communication among direct materials.

**B2B collaboration by category**
Acquiring products and services and managing expenses require a set of open standards and a different community of suppliers. Those standards are now set and operational.

**User experience**
Employees want a consumer-grade user experience (e.g., Amazon, Travelocity, Google, Uber, BlaBlaCar) at work. Otherwise, they will work around the system, negating the value of negotiated contracts and driving maverick spending.

**Network of networks**
Automotive companies are looking at end-to-end services like digital payment and invoice processing, travel booking, supplier certification, global business yellow pages, etc. This is all possible as business networks such as SAP Ariba are aggregating services into a one-stop shop.

**Simplify collaboration with your suppliers with SAP business networks**

SAP S/4HANA gives you incredible capabilities to digitize processes across your business – and the connectivity to the business network allows you to extend those processes beyond the four walls of your company.

- **Solution already at scale** and covers all spend categories (direct and indirect material, labor and services, travel and expenses)
- **Business networks operate on a global basis**, meet data security standards, and operate with near zero downtime
- **Extensive offering by leveraging services** from many partners, such as supply chain, financing, payment, supplier certification, etc.

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75% faster PO processing time with 2x sourcing projects by the same number of staff at JM Family Enterprises

70% increase in production volume in Asia by 2020, which will require enhancing the supply chain, building a local supplier base, and bolstering supplier capacities

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Manage expenses

Direct and indirect material

Labor and services

- Concur
- SAP Ariba
- SAP Fieldglass
Automotive companies are finally starting to understand the full potential of Big Data and the Internet of Things. We are witnessing new use cases across all automotive marketplace segments with breathtaking initial results. Here are some key trends in this space:

**Smart vehicles drive new business models**
OEMs and suppliers are embedding sensors in their machines and vehicles. These sensors collect massive amount of data that pave the way for informational engineering for data and service-driven business models.

**Data-driven business models**
The transformation in the automotive industry is enabled by Big Data technology and the computing power to process massive amounts of data in real time. This helps with preventive maintenance, detecting engineering defects, and determining driving patterns.

**Technology-driven customer engagement and engineering**
Customer sales and services and engineering are spending more and more on Big Data and sensor technologies as their function is the most transformed by these new technologies.

**New alliances**
Seamless collaboration is emerging around new business models involving partnerships that may not have made sense few years back. Examples include partnerships between automotive companies, between Google and appliance makers, as well as partnerships between suppliers and ICT companies.

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**Connect, transform, and reimagine with SAP**

With SAP HANA, Internet of Things editions, organizations can now take embedded device data, analyze this data into information in real time, and apply this information across the value chain to drive business insights and create new business models.

The Internet of Things platform provides the connectivity to OT systems either directly or via partners. The data is stored and processed in the platform, which provides basic functions like data services (such as operations on time-series), predictive analytics, and others. Based on this platform, applications developed by SAP, partners, and customers enable automotive companies.

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**3 billion**
Internet users and an expected 30-50 billion connected devices by 2020.

**80%**
of all companies that invested in IoT increased revenue.

**92%**
of automotive suppliers predict that Industry 4.0 will have a huge impact in the way they design, manufacture, and sell products that it will enhance the product offerings.

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### BIG DATA & INTERNET OF THINGS

The most **dramatic change** in the digital economy will be driven by hyperconnectivity and Big Data science, which will **transform nearly every automotive business model**.

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**SAP HANA Platform, Internet of Things edition**

<table>
<thead>
<tr>
<th>Load forecasting</th>
<th>Transformer analytics</th>
<th>Pipeline integrity</th>
<th>Collection analytics</th>
<th>Further use cases...</th>
</tr>
</thead>
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<tr>
<td>Analytics tools</td>
<td>Content: rules, standards, algorithms, data model</td>
<td>Data services / events</td>
<td>Device / sensor data</td>
<td>IoT Connectors</td>
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Dream, develop, and deliver with SAP HANA Cloud Platform

Dream, develop, and deliver with SAP HANA Cloud Platform gives automotive companies the mobile, collaboration, integration, and analytic capabilities they need to dream big, develop fast, and deliver everywhere, with the following capabilities:

**Application extensions**
Extend your current cloud and on-premise solutions for enhanced business flows and more.

**Real-time analytics**
Engage automotive customers, optimize business processes, and unleash new revenues with real-time analytic apps, powered by SAP HANA.

**New cloud apps**
Quickly build innovative consumer-grade and industry apps for today’s always-on, mobile, social, and data-driven world.

**Extended capabilities**
Holistically manage all structured, unstructured, and infinite data streams with flexible combinations of data stream processing, in-memory technology, disk-based columnar storage, and Hadoop-based storage solutions.

**Data footprint reduction**
Significantly reduce memory footprint and TCO. In ERP systems, we have seen ~6x reduction by SAP HANA’s dictionary compression. Removing aggregates and actual and historical data separation further reduces the footprint to ~10x.

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**The SAP HANA platform is...**

Real-time, in-memory platform • 10x data footprint reduction for ERP • Extended storage, including Hadoop • Open architecture • Developer-friendly • Embeds mobile and analytics • Secure • Cloud-ready

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<tr>
<th>New apps and services</th>
<th>NEW APPS</th>
<th>EXTENSION</th>
<th>INTEGRATION</th>
</tr>
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<tbody>
<tr>
<td>Open programming containers</td>
<td>(Java, XS2)</td>
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<td>UX (Mobile/SAP Fiori)</td>
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<td>Analytics (SAP Lumira)</td>
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<td>Integration (SAP HANA Cloud Integration)</td>
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<td>Security (SSO, Identify)</td>
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<th>Platform</th>
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<td>Data platform (SAP HANA DB, SAP ASE)</td>
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<td>Libraries (graph, predictive)</td>
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<td>Big Data (Hadoop, Spark)</td>
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<th>Infrastructure delivery</th>
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<td>SAP data centers</td>
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<td>Partner data centers</td>
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<td>Customer data centers</td>
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<td>Elastic deployment</td>
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**ARI**
“Reducing overhead costs by 5%, while increasing the impact our contact centers have on customers has been a huge win for us.”

**Faurecia**
“With SAP HANA, we can now run our MRP in less than an hour, covering thousands of complex variants and product combinations. SAP HANA is a game-changing innovation.”

**Komatsu**
“SAP HANA gives us the complete view of our customers. Having real-time access to centralized data helps our sales and service teams get the information they need to serve our customers better.”
HOW DOES IT ALL COME TOGETHER? – EXAMPLE

Each of the five digital business pillars delivers individual business value, but next-generation business processes will span multiple pillars to drive efficiency internally or across the business network, connect to devices, and improve asset health and performance.

DIGITAL TRANSFORMATION IN THE AUTOMOTIVE VALUE CHAIN

The vehicle monitoring platform receives constant telematics data from the sensors mounted on machines and vehicles. This data helps to do predictive maintenance and forecast the service parts requirements that needs to be replaced in the respective asset. The parts are either produced by 3D printing as an on demand request or sourced from an external supplier using optimal sourcing of vendors. The parts are then dispatched to the central warehouse and then to the local dealers. The amount of data collected from vehicles also helps to get insights about the driving pattern, routing and innovative navigation solutions etc.

The in-car commerce offers a host of retail ancillary services and other information in case of charging stations, parking spaces.

Real-time predictive analytics yields tangible business benefits:
- Higher return on assets
- Faster recovery time from failure
- Higher productivity and safer work
- New service revenue streams
- Competitive service level agreements
- Higher customer satisfaction

The digital automotive network enables even more innovative asset management scenarios in which equipment monitors its own health, reaches out to analytical and expert systems to devise a recovery plan, devises workarounds, sources, orders, and schedules the service experts, gets 3D-printed service and spare parts, and updates its production schedule.
HOW TO START

THE JOURNEY TO THE DIGITAL AUTOMOTIVE NETWORK BEGINS WITH A CAPABILITY ANALYSIS THAT RESULTS IN THE TRANSFORMATION AGENDA
HOW TO START

JOURNEY TO THE DIGITAL AUTOMOTIVE NETWORK
The journey to define future business models capitalizing on the digital automotive network involves all participants within the automotive ecosystem and requires a systematic approach to identify and capture business opportunities.

The collaborative value and innovation framework
Automotive companies embarking on the transformation journey to the digital business typically start to reimagine their business with focus on business outcomes and customers.

Answering the key questions, “What role will we play in the automotive value chain?” and, “How will we make money?” will provide the direction for reimaging your business processes and operational model.

For innovation today, a new level of collaboration is required. As a result, we have developed a framework that will be a continuous and holistic partnership model designed to drive true collaboration and engagement. Outlined below are the five steps of SAP’s collaborative value and innovation framework:

1. **Strategy alignment**: Understand company and SAP strategic direction and identify initiatives
2. **Opportunity assessment**: Opportunity deep-dive based on strategic initiatives and prioritization based on value
3. **Solution road map and ROI**: Document end-state solution, business case – benefits, TCO, and ROI, and strategic road map
4. **Value realization**: Deliver transformation on time, on budget, and on value
5. **Governance**: Maximize investments and accelerate value creation with governance based on executive engagement, value delivery, and continuous innovation
WHY SAP?

SAP ENABLES THE DIGITAL AUTOMOTIVE NETWORK WITH THE DIGITAL CORE, BUSINESS NETWORKS, SUPPLY CHAINS, AND THE INTERNET OF THINGS
SAP IS COMMITTED TO INNOVATION

Vision
Help the world run better and improve people’s lives

Mission
Help our customers run at their best

Strategy
Become the cloud company powered by SAP HANA

GLOBAL PRESENCE AND RELEVANCE
- 77K employees representing 120 nationalities
- 300K customers
- Operating in 190 countries

INDUSTRY AND LOB FOCUS
- Solutions for 25 industries and 11 lines of business
- 98% of top valued brands are our customers
- 74% of the world’s transactions are managed on SAP

DIGITAL ECONOMY READY
- 95M business cloud users
- 2.0M connected businesses
- $740B+ in B2B commerce
- 99%+ of mobile devices are connected with SAP messaging

INNOVATION LEADER
- 2011 SAP HANA launched
- 2012 SAP Cloud launched
- 2014 SAP business networks the largest marketplace in the world
- 2015 SAP HANA Cloud Platform
- 2015 SAP S/4HANA: most modern ERP system
- More than 7,100 auto companies in 106 countries are using SAP
- 95,000 automobiles per day are produced by our customers
- 8 of 8 of the most innovative automotive companies run SAP

DIGITAL AUTOMOTIVE ENABLED BY SAP

24 OF THE 25 top new car warranties are provided by manufacturers who run SAP solutions

95 OF THE TOP 100 automotive OEM suppliers in the world run SAP solutions

SAP Vehicle Insights and SAP Predictive Analytics
Running on the SAP HANA Cloud Platform, these solutions provide detailed insights into driver performance, traffic situations, and proactive health check for vehicles
CREATE COMPETITIVE ADVANTAGE THROUGH INNOVATION

SAP will bring the simplification, innovation, and acceleration required to support the development of your digital business strategy. These capabilities will be leveraged throughout SAP’s collaborative value and innovation framework.

**World-class user experience**

- **People-to-people collaboration**
  - Industry capabilities
    - Customer-centricity
    - Core operations
    - Risk and finance management
    - Partner collaboration
  - Line-of-business solutions
    - Finance
    - HR
    - Procurement
    - IT

- **Business-to-business collaboration**
  - Create and build
  - Store and aggregate
  - Orchestrate and govern
  - Analyze and predict
  - Go mobile and secure

**SIMPLIFY**
Simplify transaction processing, account management, and customer service while enhancing operations
- Deliver superior customer service and truly connect with customers through a single view enabled by the SAP HANA platform
- Provide simplified and intuitive insight to customer service anytime and anywhere
- Give customers a smooth omni-channel experience across storefront, Internet, telephone, e-mail, Web chat, and social media

**INNOVATE**
Use SAP HANA Enterprise Cloud to enable OEMs, suppliers, and customers to connect and collaborate
- Connect mobile users to enterprise data on customers, accounts, and services – giving access to the information they need to better manage their vehicles in-network
- Process and optimize data on customers and assets across all operating units and legal entities with SAP HANA in the cloud
- Adopt and apply analytics solutions through the cloud to enhance visibility into consumption and energy demand

**ACCELERATE**
Predict and respond to opportunities and risks with predictive analytics solutions powered by SAP HANA
- Address vehicles network monitoring and provide detailed insights for predictive maintenance
- Take new products and services to market more quickly and respond to customers on the platforms they prefer
- Balance demand and supply with predictive modeling and accurate and timely analytics using SAP HANA
- Detect fraud more quickly
In the digital economy, simplification and business innovation matter more than ever. SAP has a broad range of services to cover the end-to-end transformation journey, ranging from advising on an innovation road map and plan, to implementing with proven best practices, to the ability to run across all deployment models and ultimately optimizing for continuous innovation across your digital journey. SAP provides both choice and value within our services, allowing you to tailor the proper approach based on your needs.

Turn to the 30,000 consultants and support professionals who can bring your digital strategy to life. SAP’s Global Service & Support (GSS) organization provides a consistent experience – on premise, cloud, or hybrid. GSS offers the expertise, assets, and the proven methodologies required to accelerate business innovation, reduce TCO, and run a stable platform (on premise or in the cloud).

SAP Activate is a new, simplified consumption experience introduced for SAP S/4HANA and cloud adoption. It provides a combination of SAP Best Practices, methodology, and guided configuration. In addition, we offer leadership in learning to drive quick time to value realization and a solid engagement foundation with SAP MaxAttention, ActiveEmbedded, and SAP Value Partnership across the end-to-end customer lifecycle.

Global Service & Support for the expertise, assets, and the proven methodologies required to accelerate business innovation, reduce TCO, and run a stable platform (on premise, in the cloud and hybrid)

**ADVISE**
Simplify and innovate
- Digital innovation road map and plan
- Co-innovation by industry

**IMPLEMENT**
with proven best practices
Implement with SAP Activate
- Simplified consumption experience for SAP S/4HANA
- SAP Best Practices, methodology, and guided configuration

**RUN**
all deployment models
Run with one global support
- One global, consistent experience
- End-to-end support – on premise, cloud, hybrid

**OPTIMIZE**
for continuous innovation
Optimize to realize value
- Continuously capture and realize benefits of digital transformation

Learn | Extend / Innovate | Engagement Foundation | Support
SAP COMPREHENSIVE ECOSYSTEM
Orchestrating the world to deliver faster value

Our comprehensive ecosystem for the automotive industry offers:

- A wide range of business partners and services (OEM, suppliers, NSC, dealers and distributors, banks)
- Special technology services for automotive with focus on design, manufacturing, sales and service solution offerings, geospatial integration, additive manufacturing, etc.
- Open architecture: choice of hardware and software
- Complementary and innovative third-party solutions
- Reach – partners to serve your business of any size anywhere in the world
- Forum for influence and knowledge
- A large pool of industry experts with broad and deep skill sets

Our partner ecosystem includes, among others:

- Accenture
- Deloitte
- EY
- itelligence
- Siemens
- BEYONDigital
- Capgemini
- Wipro
- Fujitsu
- Hitachi
- BearingPoint
- NTT DATA
- Vistex
- vendavo
- T·Systems

BUSINESS NETWORK
- 2.0 million suppliers
- 200 major travel partners (air, hotel, car)
- 50K service and contingent labor providers

INFLUENCE FORUMS & EDUCATION
- 32 user groups across all regions
- 40+ industry councils
- SAP Community >24 million unique visitors per year
- 2,400 SAP University Alliances

IMPLEMENTATION SERVICES
- 360+ automotive partner companies
- 3,200 service partners
- Delivering automotive-specific solutions

INNOVATION
- 1,900+ OEM solution partners to extend SAP solutions
- 2,700 startups developing SAP HANA apps

PLATFORM & INFRASTRUCTURE
- 1,400 cloud partners
- 1,500+ platform partners

CHANNEL & SME
- 860+ automotive channel partners
- 4,800 overall channel partners

- 360+ automotive partner companies
- 3,200 service partners
- Delivering automotive-specific solutions
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