# How Bosch SDS helps you unlock opportunities in a digitally-led automotive industry
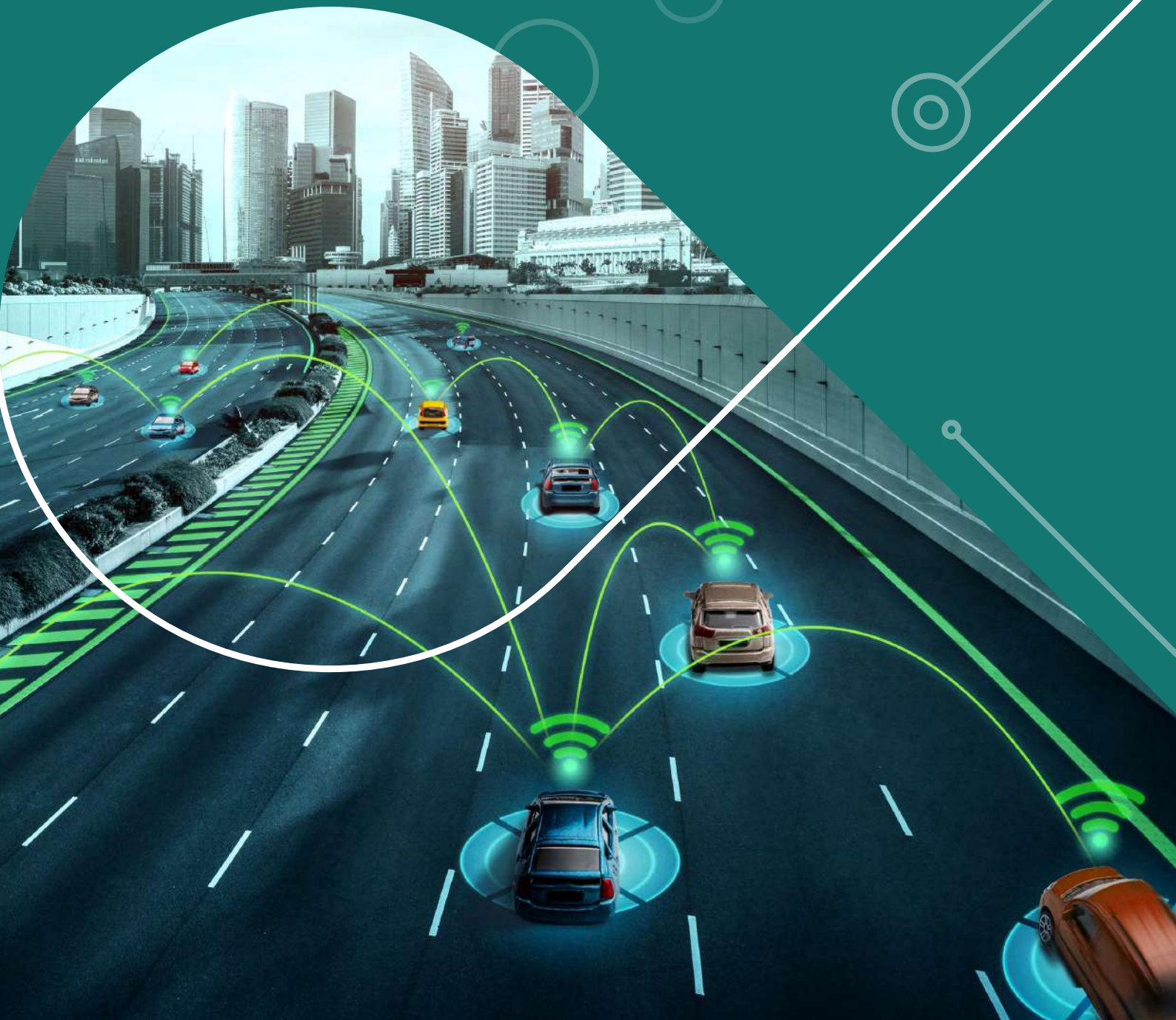
**BOSCH**
Invented for life

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The automotive industry is evolving rapidly as customer expectations continue to change. Increasing demand for connectivity and personalization is driving a shift towards a software-led industry, which requires significant pivots from automotive enterprises to stay relevant.

This shift is opening up new challenges for enterprises in the industry. Reimagining business models, building resilient systems, and advancing sustainability have become essential to maintaining a competitive edge. Therefore, resistance to change and a lack of expertise can become significant barriers to growth in the automotive industry.

To navigate these challenges, partnering with a reliable and experienced digital solutions provider is vital. This is where Bosch Software & Digital Solutions comes in, as the right partner for enterprises seeking to reimagine their mobility experiences.

With world-class expertise in IoT systems and cloud infrastructure, Bosch can help enterprises achieve the incredible potential of connected products and services. As a global leader in digitalization, our end-to-end ERP services empower our customers to build a resilient digital core, the bedrock of resilience in manufacturing today. Our proficiency in AIoT-enabled intelligent automation replaces guesswork with predictive testing, maintenance, and service, delivering an unrivalled user experience.

Another area where technology plays a critical role is in building an efficient value chain. Bosch integrates blockchain technology with IoT solutions to enable resilient value chains to streamline operations and ensure end-to-end visibility as well as transparent tracking systems. Furthermore, we are helping organisations with efficient track and trace mechanisms across the value chain, reverse logistics, and AI-powered analytics to optimize resource utilization and energy management. Ultimately, Bosch is helping enterprises achieve a larger vision of a zero-carbon and circular economy through our tech-based solutions.

Thus, partnering with Bosch SDS can potentially open brand-new revenue streams, reduce operating costs, and accelerate customer value in the dynamic automotive industry. Let's embrace a digitally-led, future-ready, sustainable, and thriving future.

# Connected Mobility

The future of mobility is intelligent, efficient and convenient. The future of mobility is **connected.**

Seamless connectivity between users, vehicles and services ensures a fascinating experience for the one behind the wheel. Connected Mobility is all about a continuous endeavor to enhance user experience and make the journey as safe, hassle-free and enjoyable as possible.

Bosch connects systems and services inside and outside vehicles, transforming them into intelligent mobility solutions.
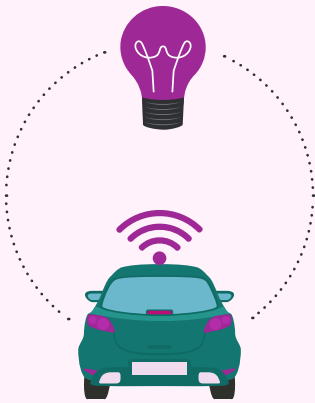
## Connected Car

Mobility never looked easier or smoother, as Bosch brings you a range of smart connected solutions for a delightful, seamless experience. Experience enhanced safety and convenience like never before through our end-to-end ecosystem, which offers 200 features across 3 segments – passenger vehicle, commercial vehicle and two-wheelers. You can now connect your car to a range of devices and apps for a fully personalized experience. The scalable and elastic cloud infrastructure allows you to connect from anywhere, anytime for a truly comfortable experience with mobility.

Why connected cars? Connected cars provide a unique customer experience, so much that more than a third of consumers state they would switch car brands to unlock the benefits of this technology. Connected car technology also delivers cost and revenue benefits to mobility players across the value chain.

**Here's a glimpse into some of the many features that our Connected Car Technology offers:**

### Hazardous Location Warning

Using V2X infrastructure, our solution sends information to the OEM cloud about locations with speed brakers and potholes, locations where accidents have taken place. The cloud transmits alerts to approaching vehicles on the same route. Drive safer, faster and better with Connected Car Technology.

### Personalised Recommendations

Your automobiles understand you better than ever before. Based on the user's vehicle use pattern, Connected Car provides contextual recommendations and smart voice commands – such as when you'd like to start your vehicle, switch on the AC or control your smart home equipment.

## In Vehicle Purchasing

Our in-built infotainment systems mean you can now enjoy your drive and get a number of things done simultaneously – from refueling your car, picking up food to go, to booking a room at a hotel.

## Digital Twin for Troubleshooting

That's not all – our digital twin simplifies troubleshooting for any issues and concerns regarding your automobile. This advanced data analytics solution collects data from all vehicles to identify patterns and scenarios for predictive maintenance.

**The future of transport is intelligent. The future of transport is connected. Connect with us today to redefine your mobility experience.**

# Test Automation

From cumbersome processes to inaccuracies to quality inconsistencies - manual testing across industries is layered with several challenges and bottlenecks. Could test automation be the key to solving these problems? Test automation becomes even more important in an era defined by AIoT products and services that leverage big data and deep tech.
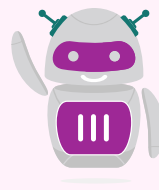
## SVENTA

SVENTA (**S**ound & **V**ibration based **E**ngineering **T**est data **A**nalytics) platform is an AI powered sound engineering & diagnostic platform for acoustic or NVH (Noise, Vibration & Harshness) assessments. Experts can visualize elaborate analysis results and a smart summary on the SVENTA webapp portal. This has enabled field engineers & NVH experts to reduce **over 98% lead time** for field problem investigation.

## Why SVENTA?

### Easy of use

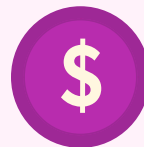Minimal expertise or training and less than 2 minutes for Data acquisition and automated reporting

### Portable

Portable and easy Connectivity with smartphone compatible USB-OTG plug-and play digital sensors (Sensors < 50 mm size, < 150 gms)

### Integration to cloud platform

Centralized Data Base for ensuring NVH performance tracking during complete product development life-cycle (currently AWS)

### AI powered

Vehicle Model/subsystem specific ML Model deployment capability on cloud.

### Less capital investments

Minimal Instrument cost (50% less than Conventional system cost). Software as a service Model, allowing users to choose yearly subscription based on need.

### Class-II accuracy

Compatible with sensors having sound data quality inline with Class-2 accuracy as specified by IEC 61672 Sound Level Meter standards

## SVENTA INCORPORATES ALL THE ABOVE FEATURES

With Bosch's trusted promise of quality and expertise, SVENTA offers you the ability to intelligently accelerate your effiency and effectivenes across nultiple areas of oyur business-

## SVENTA : AI powered Sound Engineering Platform

| **NVH Experts** | **End of Line Quality Teams** | **Maintenance Teams** | **Field Service Engineers** |
|---|---|---|---|
| ● Quicker Analysis data from Field or Test Track<br><br>● Portable<br><br>● Faster Feedback to Test engineers | ● Avoid Subjective assessments<br><br>● Minimize rejections<br><br>● Connected Solution for improved Quality | ● Continuous Monitoring of Machine status in harsh environments<br><br>● Service alerts to Maintenance teams<br><br>● Reduce machine Down time | ● Quicker Response to Field Failure issues<br><br>● Connect with Experts<br><br>● Customer satisfaction |

## Benefits

Cutting-edge data collection techniques guarantee real-time and accurate data

Optimized for speedy deployment, zero additional infrastructure investment

Forecasts time and locationbased trend patterns on key measured parameters like vibration and temperature signature analysis.

Real time alerts and notifications on monitored information across different device platforms including computers,tablets and smartphones.

# Verification & Validation Services

## Test Automation

Bosch provides end-to-end, intelligent automation services for rapid digitization across domains. Our AI-enabled automation is open source and uses a tool-based framework. We enable large-scale digital transformation for the medtech, healthcare, health insurance and life sciences domains with our test automation.

**Here's how we at Bosch enable unified test automation:**
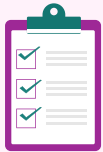
### Consult

- Recommended test automation: Setup and tools
- Automation test strategy

### Design

- Work Instructions (for training purposes)
- Data generator utilities & test data files
- Reusable libraries
- Automated test scripts

### Execute

- Requirement traceability matrix
- Automation Test coverage matrix
- Test Execution & defect reports
- Script maintenance

**Accelerate test automation implementation through our customizable frameworks**

| | | |
|---|---|---|
| All-in-one test scripts for web, mobile APL | Data and Behavior driven capabilities | Data flow integration across platforms |
| Continuous integration with automated tests | Custom graphical reports with automated test traceability | Automated defect Creation |

## Test Automation Solution Benefits

Support across platforms, devices and browsers

Increased savings year-on-year due to reduced testing costs

Reusable test suite copled with accelerated results

Improved quality frome higher test coverage

Faster feedback with earlier detection of defects

Reduced turn-around timeleading to faster time to market

# Sustainability

In our efforts towards contributing to a circular economy, we, at Bosch strive to build technologies which reduce environmental strain and encourage sustainable production. Intelligent manufacturing and digital transformation should go hand-in-hand with sustainability. Here's how we are doing our bit:
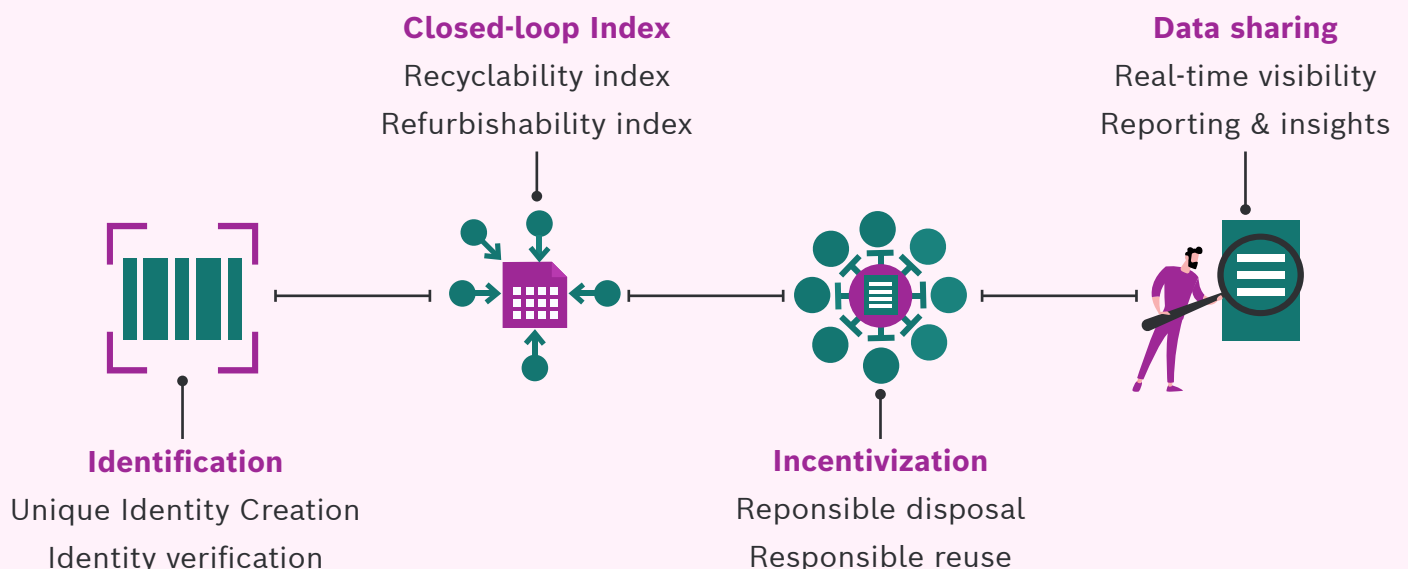
## Autotrace

Manufacturers and policy-makers increasingly have sustainability goals that involve creating a circular economy. Circular economy is a model of production which involves optimizing and extending the lifecycle of products and materials as-long-as possible. The circular economy represents great potential as a market that is expected to reach $4.5 trillion by 2030. Currently, only 8.6% of materials are being recycled and our world economy is only 9% circular. This represents a massive circularity gap, because of the lack of visibility in supply chains.

Automotive supply chains are especially complex. Circular economy approaches can help the automotive industry reduce lifecycle carbon emissions per passenger km by up to 75% by 2030. Counterfeit products frequently enter the auto supply chain and recall management processes are extremely inefficient, leading to heavy losses for the industry(estimated to be as high as $22 billion annually). This is where Bosch Autotrace can make a difference.

### Digitizing the automotive supply chain

Bosch Autotrace is an end-to-end solution which uses blockchain technology to close the circularity gap. Blockchain technology tokenizes assets (both physical and virtual) to give them unique digital identities.

**Closed-loop Index**
Recyclability index
Refurbishability index

**Data sharing**
Real-time visibility
Reporting & insights

**Identification**
Unique Identity Creation
Identity verification

**Incentivization**
Reponsible disposal
Responsible reuse

Bosch Autotrace enables tracking and monitoring critical aspects of the supply chain: parts provenance, carbon emissions, and materials of high concern. This helps streamline inventory management and enables responsible disposal and reuse. It provides incentives for manufacturers to adopt circular economy practices and drive circular behaviours in the automotive supply chain.

Two immediate use cases for Bosch Autotrace:

More than half of EV batteries and Heavy Vehicle Parts (HVPs) end up in scrapyards and landfills because of poor tracking mechanisms. With Autotrace, their high profit potential can be realized through improved traceability and recycling of materials.

## Why Bosch Autotrace?
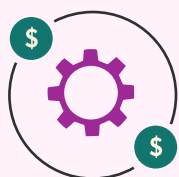
Helps optimize manufacturing costs
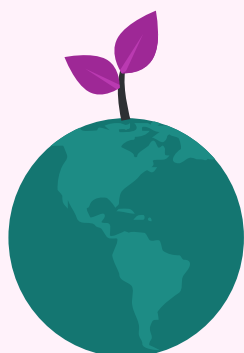
Eases and improves regulatory compliances

Results in significant cost savings for manufacturers

Accelerates the move towards environmentally conscious and sustainable manufacturing

**Partner with us today to accelerate your journey towards sustainability.**

## DEEPSights

A zero-carbon economy is becoming a sustainability goal for economies across the globe. Poor sustainability performance can slow down a company's growth. Effective resource management is key to reducing the carbon footprint and ensuring business continuity. As Industry 4.0 accelerates the digital transformation across industries, organizations today need a solution that combines the benefits of Industry 4.0 with sustainability goals. Bosch DEEPSights brings you such a solution.

## Bosch DEEPSights – Where Digitalization meets Sustainability

Bosch DEEPSights uses digitalization to measure, monitor and analyze an enterprise's resource utilization. This enables increased transparency, accountability and value creation for businesses.

DEEPSights offers two solutions under its umbrella:

## Digitalization Services – Enterprises can avail:

Full stack digitalization platform to monitor and manage energy and utility consumption across all enterprise assets.

Digitalization for remote asset health monitoring using cloud or edge analytics

## Value Added Benefits

### KPI-based approach
60+ built-in KPIs to accelerate performance management

### ISO 50001 certification
Support provided for energy management certification programs

### Digitized process expertise
Built-in analytics models for various asset classes enables easy knowledge transfer for future teams

### Enterprise level scalability
Access, monitor and manage data from all sites anywhere and anytime

### Legacy system digitalization
Capture various data from existing systems (sensors or controllers or management systems) for centralized monitoring and management

### Digital excellence programs
Improvement projects for energy and utility consumption efficiency. OEE optimization & CO2 reduction

## Advisory Services – Enterprises can avail:

Enterprise digital strategy for energy consumption and utility, which provides a digitalization roadmap to improve business KPIs

Advanced, custom analytics for pre-identified problems in the enterprise involving multiple asserts and production processes

### Features

**Digital Readiness**

- Digital maturity assessment
- Digital road map definition
- Use case identification

**KPI driven approach**

- Process specific KPI breakdown
- Role based ownership mapping

**Value driven approach**

- Enterprise wide digital use cases across value chain
- Sustained value generation through proven frameworks

### Features

**Custom analytics use cases**

- Budd custom analytics solutions for pre-identified problems
- Proven approach for problem solving

**Expertise in diverse domains**

- Expert team of consultants and analysts with competency in multiple domains

**Multiple engagement models**

- Performance driven engagement models for revenue sharing

**DEEPSights has proven benefits to manufacturing plants, utility companies, commercial buildings and smart campuses. Partner with us today to accelerate your journey towards sustainability.**

**Get Started Now!**

**Bosch Software and Digital Solutions**

India | USA | Europe | UK | Japan | Middle East | China

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**Take this opportunity to revolutionize your organization!**

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