

An aerial, long-exposure photograph of a multi-lane highway at night. The image is dominated by horizontal streaks of light from moving vehicles, creating a sense of motion and speed. The lights are primarily white and blue, with some red and yellow from taillights. The highway is flanked by dark areas, possibly trees or undeveloped land, and some buildings are visible in the upper left corner. The overall color palette is dark with vibrant, colorful light trails.

Driven by software:

The automotive industry's competitive edge



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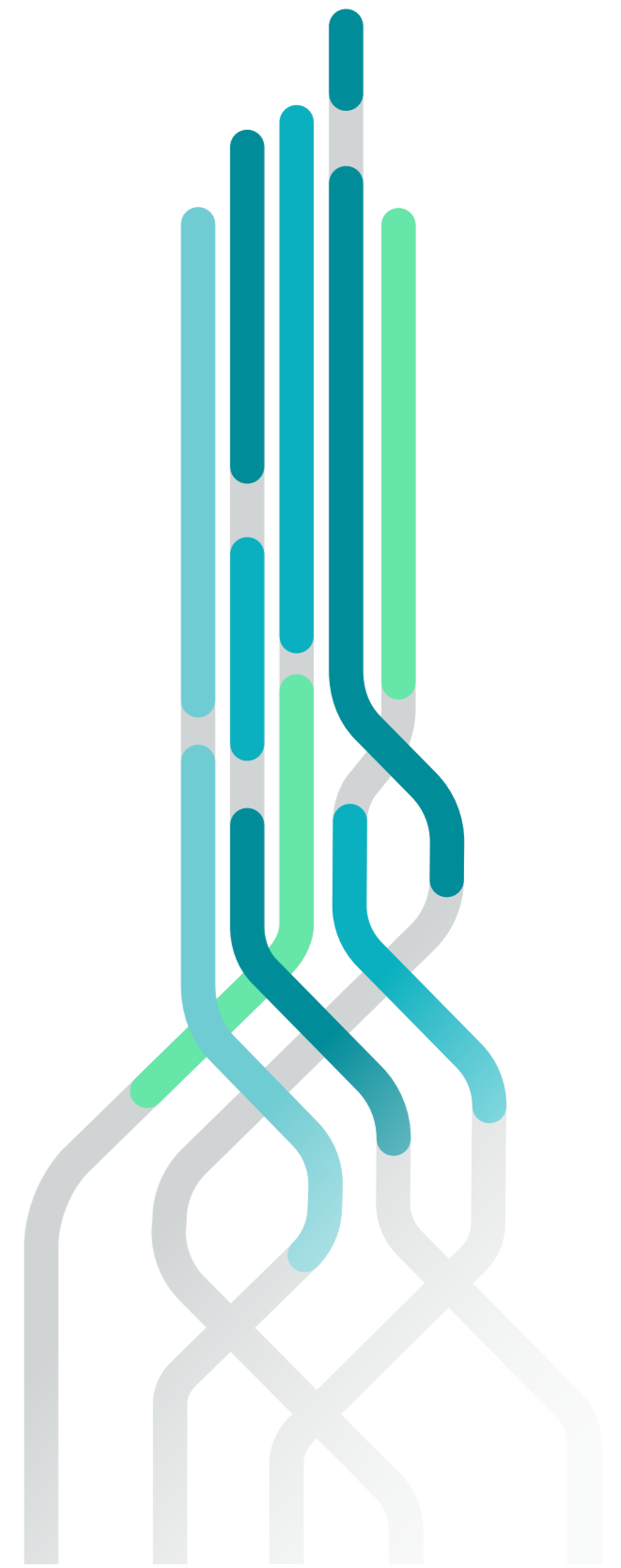
Executive summary

Europe has a reputation in the automotive industry for high-quality vehicles, established dealership networks, and service ecosystems. The industry's next step is to master the digital chapter of software.

The four biggest disruptions in recent years — autonomous vehicles, connectivity, electrification, and shared mobility (ACES) — all rely on cutting-edge software. Vehicles now have the ability to self-park, update their own software, and communicate with each other, among other things. Many of these interactions are happening via the cloud. These software interactions need to be instant and seamless for the people that use them. By capturing what is happening in real time, and responding quickly and de-

cisively, companies can retain customer trust with software and hardware dependability. In order to remain competitive, it's crucial that the European automotive industry capture these points in the software-driven value chain.

This whitepaper reveals how intelligent software solutions can prepare automotive companies for the changing market and the demands of IT security standards, such as the Trusted Information Security Assessment Exchange (TISAX) in Germany. This whitepaper also explains why these solutions can safeguard and improve production, development, and process management.



Vehicle software is becoming increasingly complex

Today's cars are mini data centres that process massive amounts of information per second. This is both a challenge and an opportunity. In many cases, manufacturers aren't harnessing the potential of software solutions from observability, the cloud, or other software-as-a-service (SaaS) providers. According to a 2021 [McKinsey study](#), a vehicle's complex software functions are growing significantly faster than manufacturer productivity. This hinders competitiveness in addition to potential synergies within processes.

According to the McKinsey study, automotive companies in the top quartile of software

development show higher productivity, development throughput, and quality. Working with state-of-the-art software builds trust with partners and customers.

What is observability?

How well can an organization understand its complex digital system? That's where an observability platform comes in. Beyond monitoring, observability collects metrics, events, logs, and traces all in one place so that organizations can make quick and informed decisions across their tech stack that bring together siloed teams.

The whole ecosystem benefits from fewer incidents, downtime, and business interruptions. Preventing downtime and interruptions is also crucial for in-car solutions and added services to ensure dependability for critical safety components like energy and powertrain or advanced driver-assistance systems (ADAS). Car programmability is also rising in importance with car-to-cloud, driver-to-cloud, and the wider customer, service and partner ecosystems. The four biggest industry disruptions in recent years, ACES, all rely on leading-edge software. Unprecedented software complexity brings with it the challenge of integration, performance, and innovation, as well as the expectation to deliver on continued customer trust, dependability, and a faultless customer experience.

Today, organizations are lucky enough to have the ability to see data and interactions in real time. Cars can measure exact driving data in relation to every part of the vehicle for every microsecond of usage. This data informs everything, from Formula 1 engines to software-based training simulators. Collecting telemetry data from each software interaction in the value chain — from car to cloud to personal device and software points in real time — goes well beyond collecting logs and telemetry from the car itself.

“Automotive companies in the top quartile of software development show higher productivity, development throughput, and quality.”



The customer experience revolution is here

Drivers have high expectations around comfort, in-car solutions, and added services like self-parking and car-to-car communication that rely on integration with car-cloud-driver architecture, personal devices, service points, and streaming data to and from the cloud in real time. We've arrived at a point where a car's software can detect when a passenger's seat belt is on and how close the car is to another vehicle, all the way up to autonomous car driving. These software interactions shape a customer's idea of an automotive brand. Automotive companies need to take this information to inform strategy and meet customer needs while continuing to innovate.

Drivers expect software, Wi-Fi, and other services like reactive cockpit and infotainment services to work constantly. For the driver, the car should act like a smart machine that provides individual settings and solutions based on the driver's personal data. These data-based tools must be easy-to-use and provide an intuitive user interface — they also must be available 24/7, without interruption. Reliable interactions with service touchpoints create a seamless experience and are key for a satisfying in-car customer experience and conveying feelings of quality. Preventing any downtime and interruption is crucial for in-car solutions and added services.

“Some companies have separated their hardware and software departments completely.”



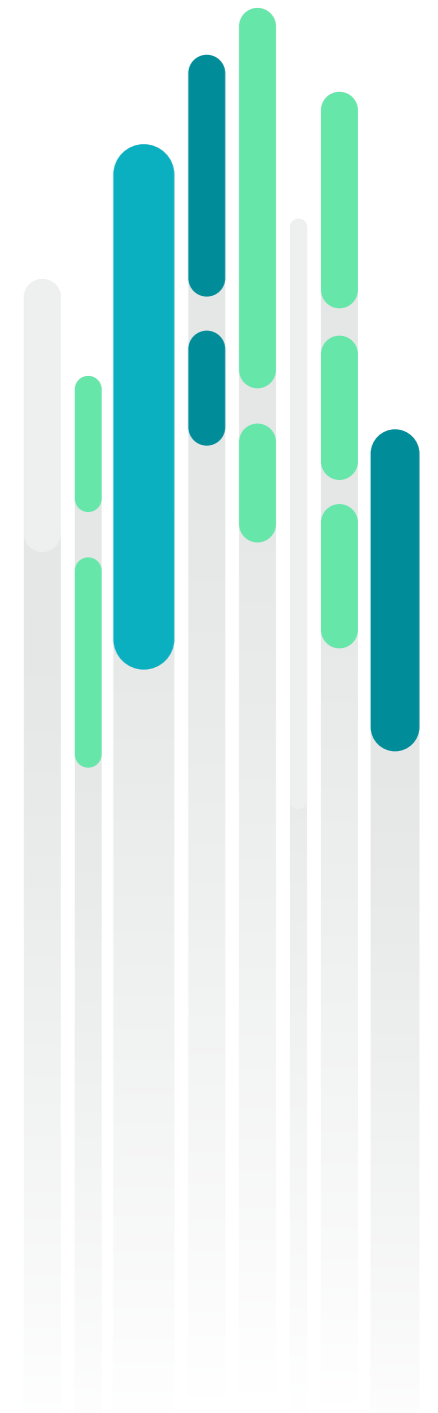
Software and hardware are decoupling

The car-servicing experience is also changing. Cars can now inform users when a software update is available, with the option to provide automatic updates. Software doesn't need a mechanic for one-day service. It can be done at the drivers' convenience, anywhere there is an internet connection. But like a mechanic, after this update or service, the software should be higher performing with no room for error.

Over-the-air

Moving away from the dealership and service centre, drivers can update their car's software when and where it's convenient for them. But these updates must work — and if there are issues, they must be captured and resolved quickly before the driver is impacted.

Automotive companies are developing their own in-house software solutions. Some companies have separated their hardware and software departments completely — with one department solely focused on software development. Those companies are taking a DevOps Agile approach to build software and innovate. But this comes with a challenge: Accelerating innovation and release velocity at the software level without compromising reliability, quality, performance, and experience. Observability can partner with this Agile approach to deliver on success.



Gaining a competitive edge in the IT hiring war

As many industries continue to digitize and automate — including Industry 4.0, IIoT, and smart city — the talent war in the IT sector is only intensifying: There are simply not enough IT experts to go around.

Software engineers want to work with the best software solutions. Therefore an investment in intelligent software is also an investment in talent acquisition. Offering exciting projects

and big problems to solve coupled with state-of-the-art software environments and tools help developers grow their careers, enjoy their work, and stay at the company. If human resources departments can advertise these benefits, and developers feel supported through an efficient IT stack, the ability to retain and attract engineers increases.

Observability in a nutshell. Some examples of what observability can do:

- Collect invaluable data about customer behaviour, interactions, and friction points to innovate and improve the quality and experience of services.
- Correlate and visualize telemetry to understand the behaviour, health, and performance of each component and of the end-to-end services globally.
- Detect anomalies and raise proactive alerts to take action instantly and contain or prevent customer impacts.
- Understand the root cause of issues to resolve incidents faster.
- Validate software quality and performance as new versions get deployed by users over-the-air.



Championing brand and quality

New Relic is currently the only observability provider officially TISAX-certified.

Enormous data growth over a short period of time has its risks. More data means a higher probability of IT incidents and expensive production and operational downtime. The 2022 [Allianz Risk Barometer](#) surveyed over 2,600 decision-makers about what they consider to be the biggest business risks to be in 2022. Environmental catastrophes, business interruptions, and cyber security were the top three risks. Contrary to popular thought, most business interruptions are not caused by external security incidents but by internal errors and IT downtime.

Software can provide smart solutions to business interruptions: End-to-end observability of the entire IT infrastructure ensures that incidents are detected, identified, and resolved quickly. Observability also supports the rapid detection of data leaks to keep losses at a minimum based on real-time monitoring.

As cars and the overall supply chain become increasingly dependent on software, IT issues and the attack surface and cyber risk increase significantly. German associations have already developed TISAX, official guidelines to push the level of IT and software functionality to the highest possible standard.

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Integrating software into reputation

The automotive industry is undergoing a huge transformation. As software and data are becoming the new gold standard of the sector, automotive quality can no longer do without specialized software solutions for observing critical features like uptime, performance, and dependability.

The big challenge for European players is to integrate this high-end technology into the quality and value cars from this region. Using the right software can shift this challenge into an opportunity to grow and innovate excellent products and solutions.

About New Relic

New Relic is one of the world's leading observability providers with 15,400 customers — including 50 companies on the Fortune 100 list. One customer, Japanese car manufacturer Subaru, uses New Relic real-time solutions to monitor CRM as well as IT interfaces to ensure fail-safe interactions between customers and dealers.

