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Regulatory Challenges in the Automotive Industry

July 2022

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Automotive IT-Regulation: New dimension of quality

775 million consumer vehicles will be connected via telematics or by in-vehicle apps by 2023.

Quelle: Juniper Research

60 % of all companies become victims of a successful cyber attack.

Quelle: UK-Government

Due to the increasing complexity of vehicles, security and data protection must be guaranteed by regulations. This creates a new dimension of quality for the future of mobility.

Regulatory standards pose a major challenge for OEMs across different markets and product sections

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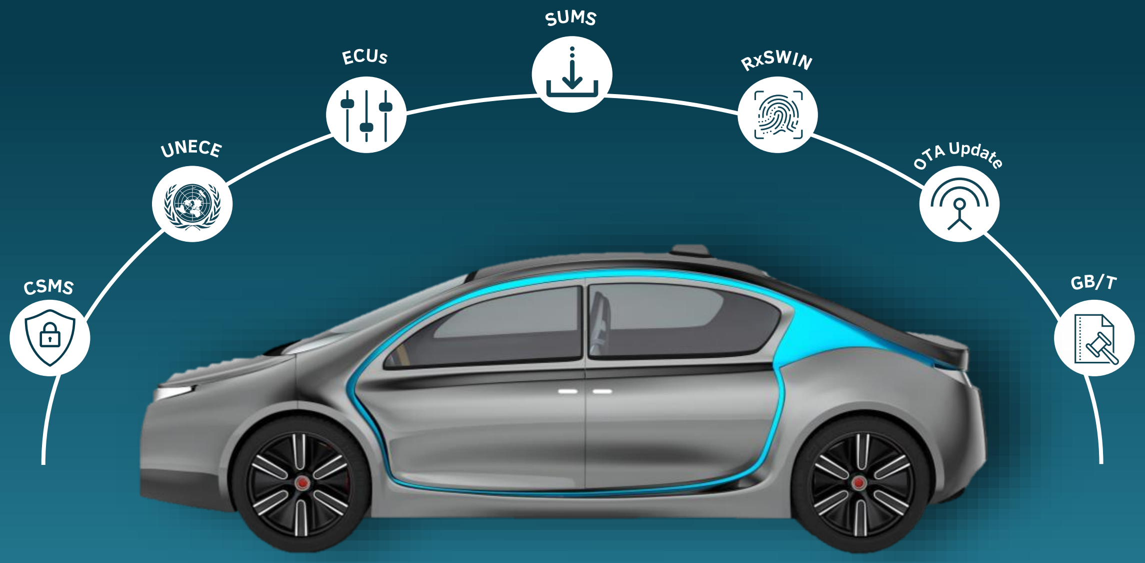
“OEMs must shift from being hardware to software providers.”

100 million lines of code are needed nowadays in modern cars. We see vehicles becoming increasingly complex along with processes and IT systems. Thereby, regulations play a key role and must be considered holistically to ensure a high level of quality and safety for the customers.



388 OTA updates have been run by Tesla over a time-span of 6 years. Adding the around 70 -100 ECUs in modern cars, vehicles are more vulnerable than ever.

60% of all companies become victims of a successful cyber attack every year.[1] Collectively, the entire automotive industry is estimated to lose up to $24 billion due to cyber attacks before 2023.[2]

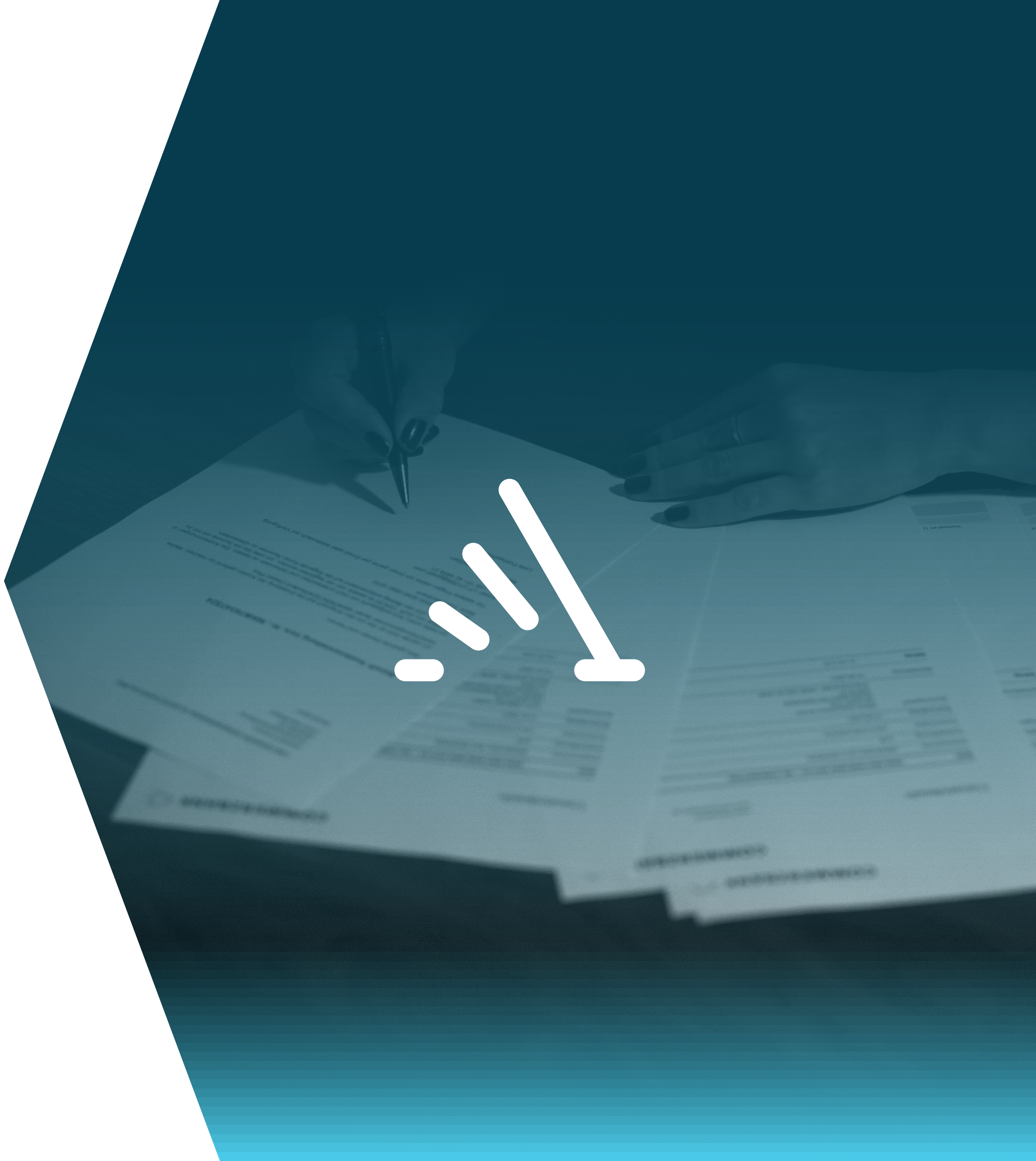
[1]UK-Government; [2]CS-Magazine of the US

Deep Dive: SUMS & CSMS

	Definition	Impact	Type approval requirements	Complexity
SUMS	A **Software Update Management System (SUMS)** provides a central point of control for software updates. It applies multiple tools, methods and processes that ensure that software-based functions are running safely in the vehicle. With SUMS it can be ensured that **updates** are **compliant,** and that the corresponding **software-version** is being **documented**.	By implementing **SUMS,** it is ensured that all types of **activities** and **processes** that are essential for updates are **developed, controlled and continuously improved** over time. By doing so, SUMS has a major impact on the overall company and affects processes and systems from technical development, production, service up to aftersales.	Evidence is required, that the SUMS applies to the respective vehicle type. The **software update delivery mechanism** and **process** must be protected for the vehicle type to ensure authenticity and integrity of the software update. Furthermore, the **RxSWIN must be protected** on the vehicle type and information regarding RxSWIN or type relevant software must be **easily readable** from the vehicle. The SUMS will be **audited every 3 years** in the UN.	Besides the OEMs, the **suppliers** also need to proactively implement the new regulations and steer their product development for their different clients, in some cases individually.
CSMS	A **Cyber Security Management System (CSMS)** monitors security incidents, threats, and possible vulnerabilities. Thereby, OEMs ensure to demonstrate the ability to manage cyber security risks for the **vehicle and the backend systems**. A CSMS enables the implementation, the control, and the continuous improvement of such cyber security activities.	By implementing **CSMS,** a risk management is implemented through-out the whole company and lifecycle of each car. Both processes and backend systems are affected. With CSMS the OEM can **monitor** the **cybersecurity and incident report** on existing vehicles and perform a respective report.	It has to be ensured that cybersecurity principles are implemented at the **organizational level** (process and business wise). Furthermore, risk assessment as well as the implementation of adequate security controls must be assured. All OEMs need to implement and run a CSMS **across the vehicle lifecycle**. Thereafter, the CSMS is **certified** by an independent auditor.	Cyber Security tools of OEMs have to deal with a **broad range of threads** ranging from insider to black hole attacks. Designing **appropriate solutions** for such threads requires in-depth know-how.

SUMS and CSMS processes run throughout the entire organization and represent key enablers for end-user safety. Hence, standardized regulations become essential to meet the increasing need for safety requirements.

With more than **150 Regulations** and 30 Directives covering the sector's activities the European automotive industry is one of the most heavily regulated sectors in Europe.[1]
China is in general even more regulated and with a faster adoption of connected vehicle concepts an increasing number of regulations is in the pipeline.



[1] acea-Regulatory guide

UNECE and GB/T standards are currently the focus of the automotive industry

	Who?		What?	Where?	When?
UNECE		Economic Commission for Europe	Mandatory regulations for the Cyber Security Management System (CSMS; R155) and Software Update Management System (SUMS; R156).	Affects every vehicle sold in 56 UN member states in Europe, North America and Asia. Decisive is the country of sale/export.	Q1 2019 – Publication: SUMS & CSMS Q3 2022 – Implementation: New Types Q3 2024 – Implementation: In Production
GB/T		Standardization Administration of China	Mandatory (GB) and voluntary (GB/T) regulations for the Cyber Security Management System (CSMS) and Software Update Management System (SUMS). In contrast to the UNECE standards, the GB/Ts also refer to technical specifications.	Affects every vehicle sold in China. Decisive is the country of sale/export.	Q2 2023 – Publication: SUMS & CSMS Q2 2024 – Implementation: New Types Q2 2025 – Implementation: In Production

Complex standards introduced simultaneously in two major markets which all OEMs need to implement in order to obtain vehicle type approval and ensure regulatory compliance.

775 million consumer vehicles will be connected via telematics or in-vehicle apps by 2023, rising from 330 million vehicles in 2018.[1] This poses major challenges for all players in the automotive industry.

[1] In-Vehicle Commerce Connected Cars to Exceed 775 Million by 2023 (juniperresearch.com)

Companies encounter 6 major challenges when facing regulatory compliance

Challenges

High level of complexity

E/E and IT architecture of vehicle become more and more complex which requires **tailored solutions that face risen complexity**. In addition, **interdependencies between different regulatory or IT-systems** intensify complex matters.

Global compliance regulatory

Since standards are issued either by a state or by a community of states, **different regulations are predominant in different countries**. Multinational companies must take it into account when fulfilling standards **for cars which are sold in various countries**.

Financial planning required

New regulatory standards in the automotive industry – especially in regards of Cyber Security and Software Update – **affect a multitude of car components and IT systems, which leads to high capital investments** to alter these in accordance with the new regulatory.

Various stakeholders

Since regulatory changes tackle **nearly all company functions in development, production, IT and aftersales, different kind of stakeholders have to work together** in an efficient manner in order to fulfil all requirement stated in the regulatory standards.

Demanding timeline

Time plays a crucial part when introducing and fulfilling regulatory requirements in a company. Since various parts of a company are involved, timeline issues arise throughout the process.

Lack of know-how

Fulfilling regulatory requirements which requires mostly **in-depth knowledge of respective topics and processes** is demanding for companies. Building up know-how in respective fields **requires time, effort and the willingness to learn new skills**.

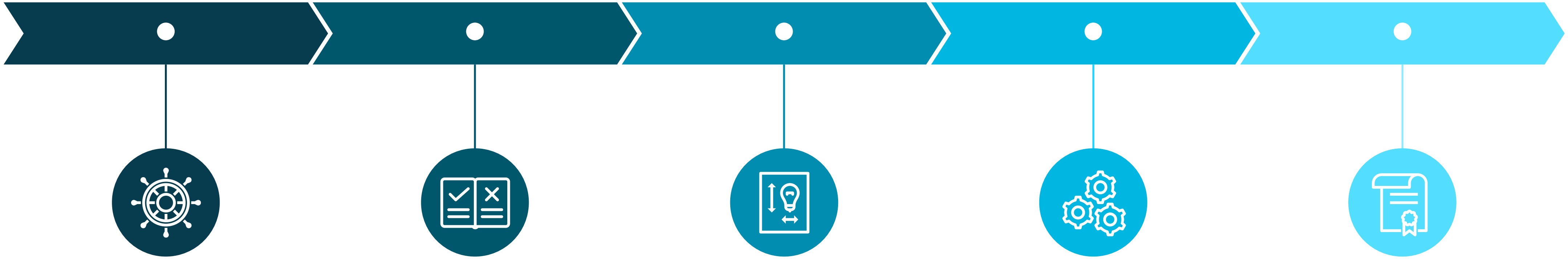
Risks

	Impact	Revenue loss
Sales	Sales stop in short term due to failing compliance to standards. Sales activities in respective market can be re-established when complying to standards.	100 % (Short term)
Market	Market shares in strategically important regions will be lost in the short- and more importantly long-term. Competitors can occupy the respective marketplace and strengthen their long-term position, which could be hard to reconquer.	Dependent on market size / share
Reputation	Not complying to national and international standards leads to a significant long-term reputation loss by (potential) customer and cooperation partners. Negative long-term effects on image.	3-10 % (Long term)
Legal	Lawsuits either by competitors, organizations or customers could be filed for not complying in the mandatory manners. Lawsuits will influence the reputation and financial situation in the short-term as well.	Dependent on market size / share

The implementation of SUMS and CSMS regulations poses **major challenges** for players in the automotive industry. In order to obtain type approval, a **multitude of systems and processes** must be adopted or established, partly on a cross-national basis.

A **structured approach** and a tailored **methodology** are the **key to success**.

accilium’s structured approach ensures success in constant alignment with the client



Project Phase	Organized project set up with clear responsibilities	Understand individual requirements in detail	Transform requirements in technical concepts	Implementation of technical concepts	Testing & Homologation
Success Factors	• Holistic stakeholder management • Clear responsibilities with well strict boarders	• Focus on processes before IT-systems • High prioritization in the company	• Building up internal know-how • Proper sizing of working groups	• Devil is in the details • Effective communication about requirements with system owners	• Central planning of End-to-End testing • Early alignment with authorities
Key Deliverables	• Stakeholder map • RACI matrix • Risk analysis • IT Planning • Financing plan	• Cluster requirements • Derive action items from general requirements • Coordinate communication with national authorities	• Steer editorial team in designing technical concept • Organize deep dives sessions with technical guidance	• Coordinate rollout activities • Risk management & mitigation • Define action plan & timeline	• End-to-End test conception • Homologation workshop • Ensure audit ready processes and systems

Let’s shape the transformation towards a connected smart device!

Why you should act now

The **introduction of new regulatory standards** (e.g., UNECE and GB/T) represents **key steps towards an integrated vehicle safety system** for the respective markets and is therefore crucial for a successful business.

The **processes affected by new standards and the systems** behind must be **identified and updated** accordingly in order **to ensure compliance**. This requires projects to be set up at an early stage in order to take the appropriate measures and build up internal knowledge.

What’s in it for you

The implementation of regulations brings **plenty of opportunities** in terms of **improving margins and profits**, as the focus on software-based business models opens up a huge **aftermarket**. Hardware retentions and the installation of hardware-based functional requirements create opportunities for **future upgrades**.

An end-to-end data infrastructure encompassing software update and cyber security management systems therefore enables increasingly **effective commercialization of data-driven services**.

accilium serves as a sparring partner and supports clients through the entire process with strong focus on strategy and IT transformation within regulatory projects.

Contact our regulatory experts for more insights

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