SAFETY AND CYBERSECURITY REGULATIONS FOR AUTOMATED VEHICLES

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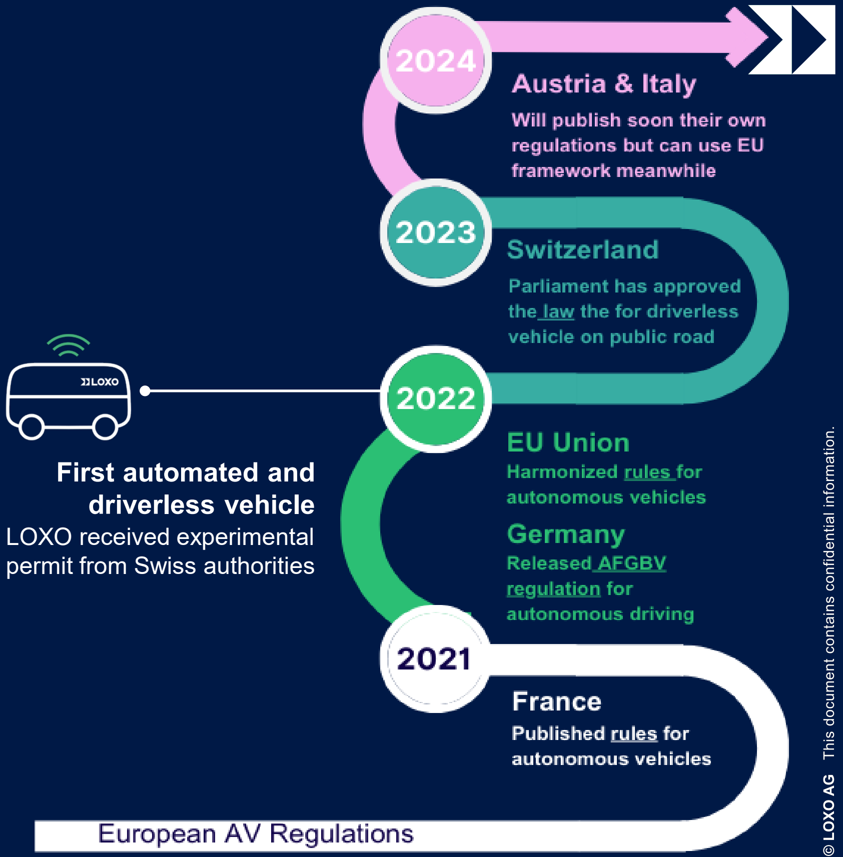
Current state

- Regulation are existing or coming soon in Germany, Switzerland and France

- China published its regulation in 2023, low entry barrier in performance requirement

- The US takes more risk to foster the innovation at certain safety cost

- Switzerland differ by its excellent experimental and exceptional permits program



2024

Austria & Italy

Will publish soon their own regulations but can use EU framework meanwhile

2023

Switzerland

Parliament has approved the law the for driverless vehicle on public road

2022

First automated and driverless vehicle

LOXO received experimental permit from Swiss authorities

EU Union

Harmonized rules for autonomous vehicles

Germany

Released AFGBV regulation for autonomous driving

2021

France

Published rules for autonomous vehicles

European AV Regulations

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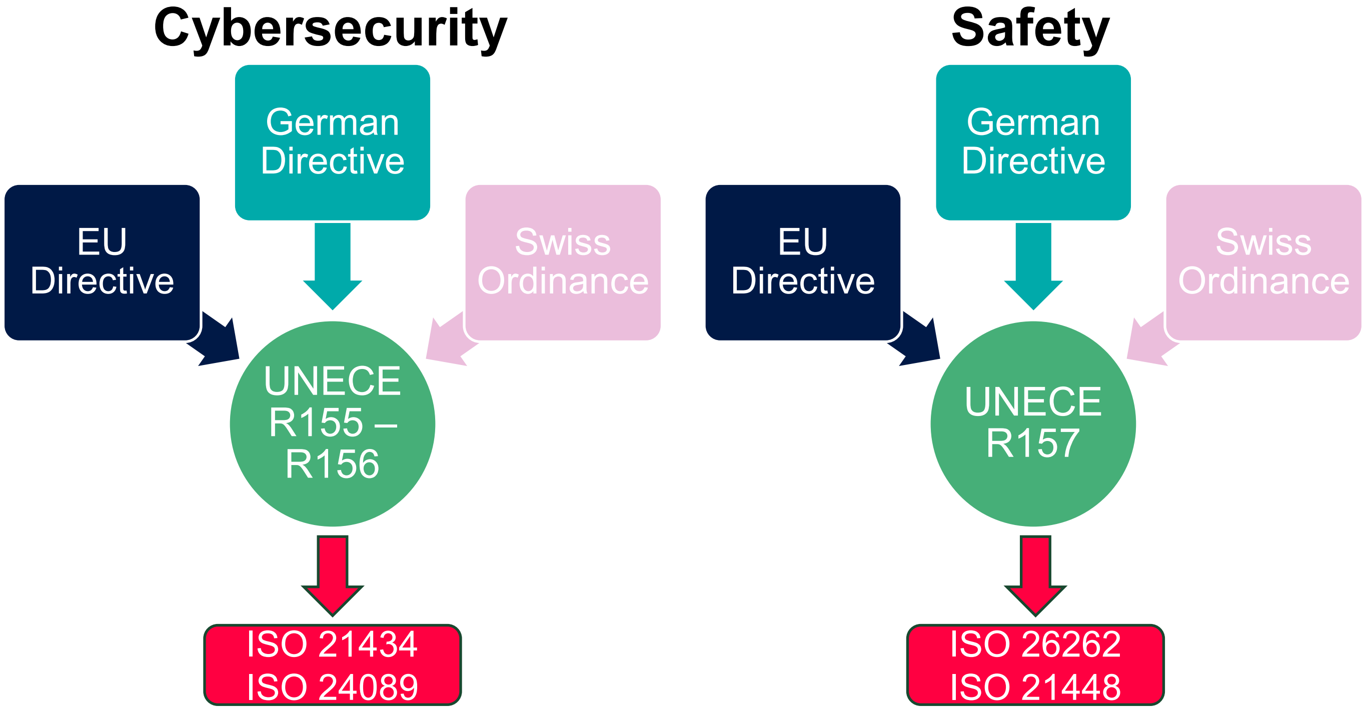
The directives structure



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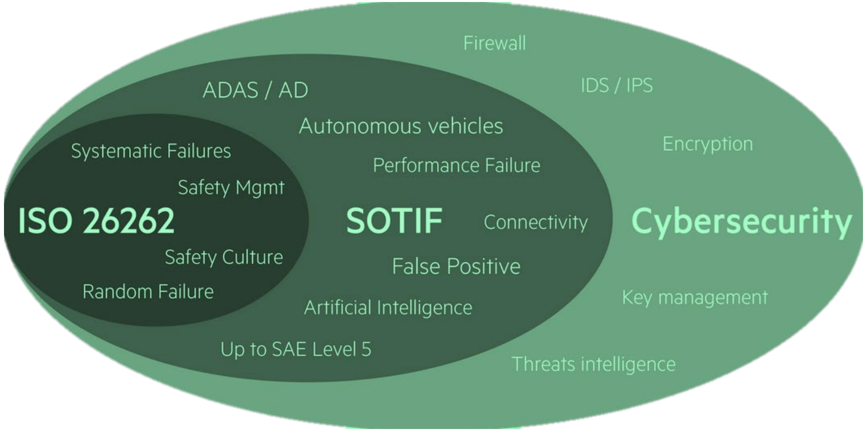
The standards structure

- ISO 21434 ➔ Cybersecurity Management System (CSMS)
- ISO 24089 ➔ Software Update Engineering (SUE)
- ISO 26262 ➔ Functional Safety for road vehicle (FUSA)
- ISO 21448 ➔ Safety of The Intended Functionally (SOTIF)



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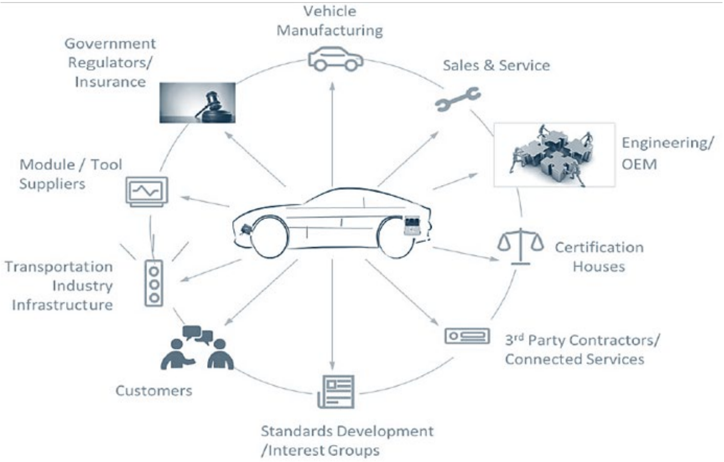
Cybersecurity

Challenges: Constant risk monitoring, updatability issues, applicable to the complete supply chain including on vehicle communication system.

Opportunities:

- Software updates without pre-approval
- CSMS applies to company processes
- Remote supervision possibility


Vehicle Manufacturing
Government Regulators/ Insurance
Sales & Service
Engineering/ OEM
Module / Tool Suppliers
Certification Houses
Transportation Industry Infrastructure
3rd Party Contractors/ Connected Services
Customers
Standards Development /Interest Groups

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Functional Safety 10^{-9}

Challenges ➔ 850 pages, 3500 requirement, 180 engineering methods and still does not prove the performance safety

Opportunities

- The system know its failure and has a mitigation strategy.
- Demonstrating that the Electronic has a failure probability of 10^{-9} per hour
- Each line of software code is compliant with the conventional software safety rules and test coverage metrics.

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SOTIF - safety In context

Challenges ➔ Working with an infinity and boundless world! Safety functions must be safe and performant for the given operational domain for all type of different traffics, weather, road participants etc.

Opportunities

- Ensure the safe road deployments
- Leverage the power of close-to-reality simulator to identify the failures early
- Precise use case definition considering AD system limitation

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Needs

Manager knowledge ➔ The safety and cybersecurity are not an add-on that comes just before the market launch but a must-to-have at the design level.

Experienced System safety engineers ➔ At preliminary design level, identify all the risks, their impact and the mitigation strategy. You don’t learn safety engineering at university

Qualified resources ➔ cybersecurity is a new topic in automotive domain, there’s a big lack of automotive cybersecurity engineer

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Limitations

FuSA and SOTIF are not enough ➔ Only applicable to rule-based software, AI seen as a black box

Trade-off between certification and driving capability ➔ Pushing the safety responsibility to rule-based software limit the driving performance

EU AI ACT is not published ➔ Once released, the AI functions must be compliant to high-risk category and may solve the trade-off challenge

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