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**INTERNATIONAL WORKSHOP ON
“VEHICLE TECHNOLOGIES FOR CONNECTED,
COOPERATIVE & AUTOMATED MOBILITY”**

***HARMONIZATION:
STANDARDS AND EXEMPTION APPROVALS FOR
DEVELOPMENT VEHICLES***

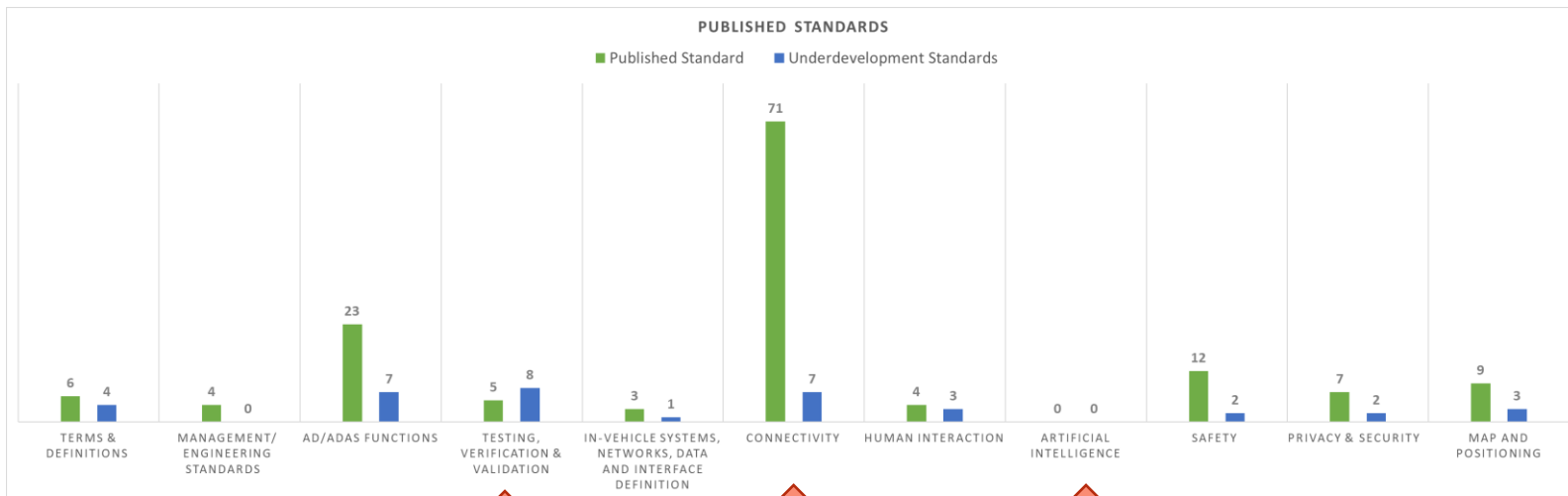
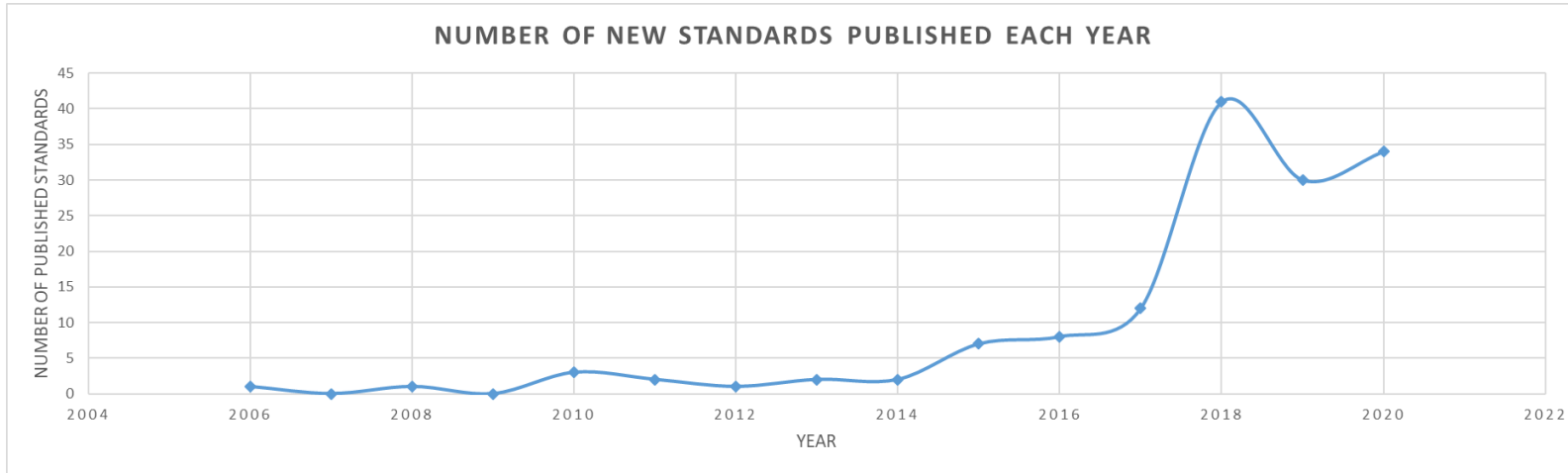
Agenda

- Gap Analysis on Standardization
- Standardization – What's Next?
- Exemption Approvals in EU – Status Quo & Proposal

Preliminary Information

- This study has been funded by ARCADE and L3Pilot projects.
- All findings on standardization have been published within the [ARCADE Knowledge Base](#).
- In the previous EUCAD conference, a dedicated breakout session on standardization and roadworthiness was organized:
 - [Presentations](#) & [recordings](#) provide more insight on the proceedings and can be used as good reference material.

Analysis on Standardization



Connectivity:

- Incredible higher number of standards.
- No communication can be established without a standardization of interfaces, bandwidths, frequencies, protocols, etc.

Testing, Verification and Validation

- The number of standards under development is higher than the ones already published.
- Previous gap analysis in 2017 and 2019 highlights a gap regarding this key domain.

Artificial Intelligence (AI)

- With the current research and emphasis in the field of AI / ML, certainly a few standards, either published or under development were expected.
- This is certainly an area that requires attention to help industrialize future technologies.

Standardization: Artificial Intelligence

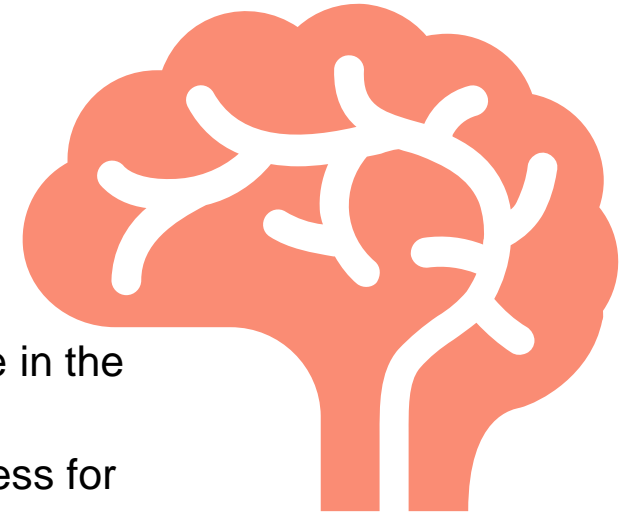
International Standard Organization (ISO) decided in 2017 that the Joint Technical Committee “Information Technology” should create a subcommittee (SC42) on the topic of the Artificial Intelligence.

The subcommittee split the job between several working groups:

- WG1: Foundation standards
- WG2: Big Data
- **WG3: Trustworthiness**
- WG4: Use cases and applications

- To the best of our knowledge, the **safety problem** related to the introduction of AI software in the automotive applications is still open.
- SOTIF standard (ISO/PAS 21448:2019) considers only the verification and validation process for machine learning
- The work on the WG3 goes in the right direction focusing on the following tasks:
 - Establish trust in AI through **transparency, verifiability, explicability** and **controllability**.
 - Investigate **threats** and **risks** of AI systems.
 - Investigate approaches to achieve AI systems **robustness, resiliency, accuracy, safety, security privacy**.

All three tasks are essentials for deploying AI software in connected and autonomous driving system.



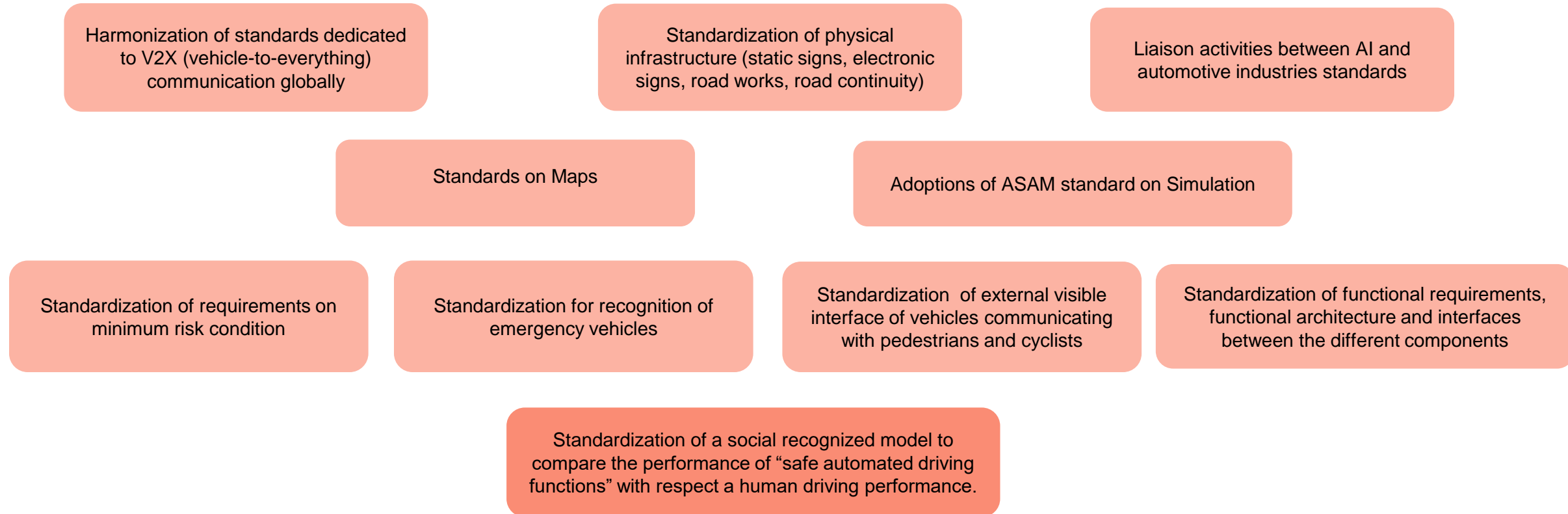
Gaps Analysis on Standardization

- The gap analysis is a complex task that requires huge number of experts working together.
- In the last years, three organizations have worked to understand the gaps and give recommendations:
 - **2017** - International Standard Organization (ISO)
 - **2019** - Verband der Automobilindustrie (VDA)
 - **2020** - Canadian Standardization Association Group (CSA)
 - Very active.
 - Expected are new **reports this year**.
 - Engaged with 53 stakeholders belonging to industry and academia since 2019.

Liaison activities are welcome and needed between ISO, SAE, ASAM, VDA and CSA!

What's Next on Standardization: Recommendations

Many aspects related to connected and automated driving still require further standards or liaison activities.



Exemption Approvals in EU: Experience and Improvement Proposal



Ideally, exemption approval from one country bound by cross-border agreement should automatically apply to other countries!

Germany - Luxembourg

- Prime example of seamless and efficient collaboration.

France

- Very cumbersome and time-consuming process to receive exemption approval.
- But exemption approvals are granted.

Netherlands

- Practically impossible to get exemption approval, even at times for local Dutch companies/academic institutions.
- Rules of the game are way too “stringent” to even get going.

- Need to have a more harmonized approach.

- Aspects like changing of vehicle platforms are not addressed by today’s exemption approvals.

- Integration of future technologies such as AI /ML require upgrade of exemption approval process.

Thank you.