Realizing the vision of automated driving

Consumer perception and key challenges for responsible third party player

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The media hype about autonomous driving cars might be far ahead of today's reality but automatization will reshape our mobility eco-system

Status Quo

- Massive media hype

- Unrealistic expectations regarding technical feasibility of fully autonomous driving cars

- High public attention e.g. accidents/ incidents

- Rapid technical progress regarding machine learning/ artificial intelligence, sensors, connectivity etc.

- Industry players putting massive pressure on regulators

- Enormous investments in new technologies challenging traditional approaches towards safety and security

- New market entrants massively accelerate product life cycles

Conclusion: testing organizations have to be prepared for mobility 4.0 solutions if they want to stay relevant

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30 years ago automatization fundamentally reshaped an adjacent mobility segment – the aviation industry – with astounding progresses regarding safety

History …

- Serious accidents with high numbers of victims
- In 1959, the risk of a passenger dying in a plane crash was 1:25,000.
- 1978 introduction of the Damage-Tolerance Regulation
- February 1987 maiden flight of the A320 heralds the era of automatization.

Situation today …

- Today, the odds of dying in a crash aboard an airplane in the US or the European Union are calculated to be 1 in 29 Million
- Probability to get injured 1 : 919 (aircraft to car)
- DNA of redundancy (e.g. sensors, instruments, safety management)
- Stringent safety management systems (aircraft, Air Traffic, staff …)
- Systematic evaluation of all safety relevant events

Levers …

- All safety relevant data are quarantinend, stored, monitored and analyzed for coninuous system improvements
- Based on mandatory reporting events independent third party players act as air accident investigators to draw vital conclusions
- The „safety first principle" lead to a consistent set of rules which generate trust along all steps of the aviation value chain: from the construction and design of an aeroplane over maintenance procedures towards digital flight data and cockpit voice recorders …

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The aviation example shows: the higher the level of automation, the higher the level of safety – but human "psycho-logic" works exactly the other way round …

People have by nature doubts about technological innovation – e.g. labelling of automation could create trust
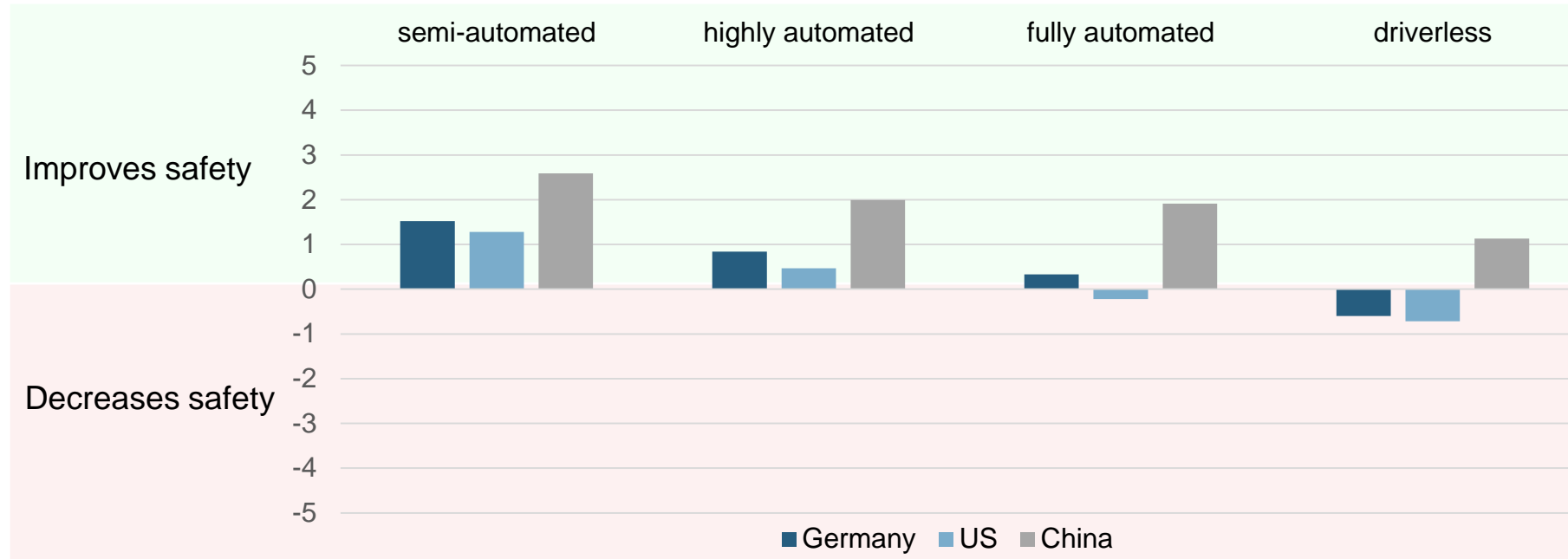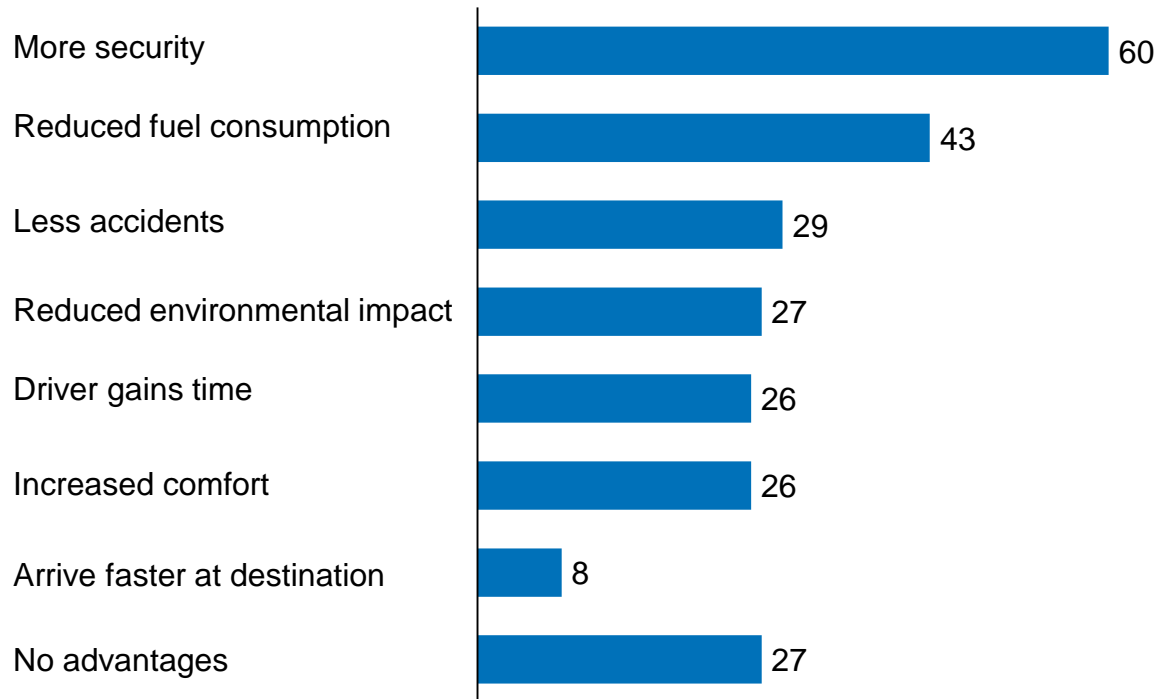

To what extent do you believe that road safety will change due to the following levels of automation?
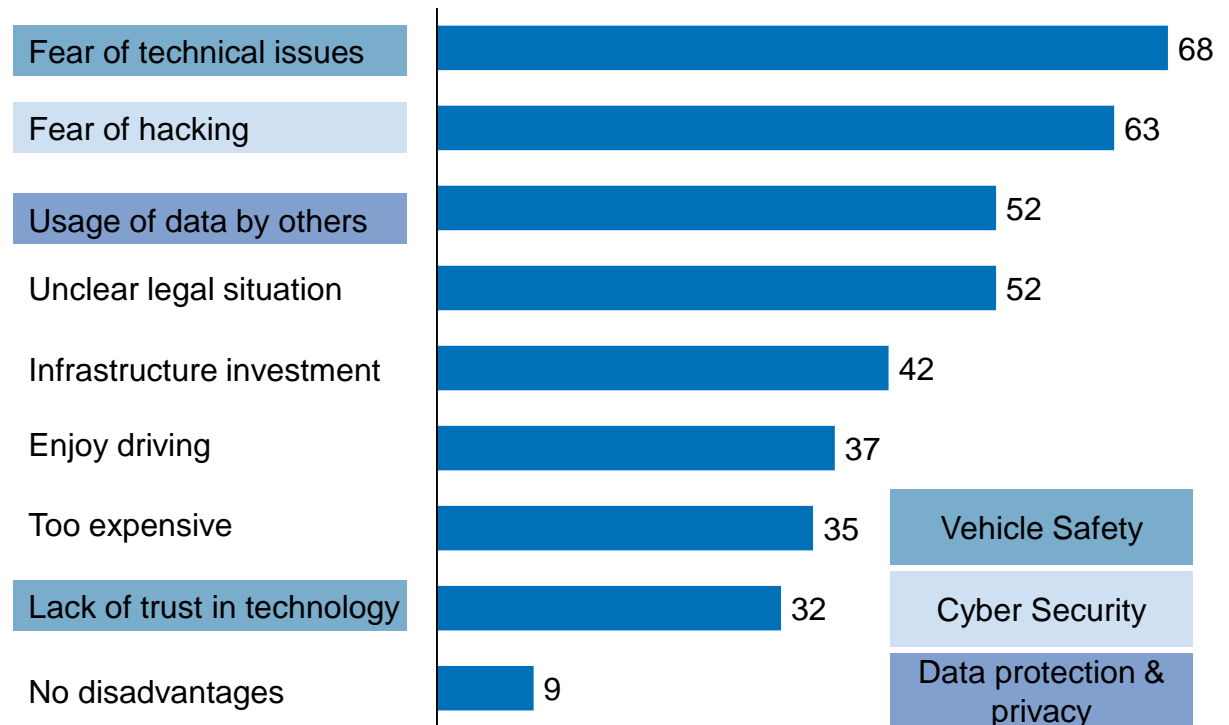Sample size: D=1,000, USA=1,018, China=1,025

Source: Study of TÜV Rheinland (2017): Safety of autonomous vehicles in Germany, USA and China

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Genau. Richtig.

International market studies show that consumers expect significant benefits from automated driving – but only if some key challenges are mastered …

Consumer expect benefits …

Benefit	Value
More security	60
Reduced fuel consumption	43
Less accidents	29
Reduced environmental impact	27
Driver gains time	26
Increased comfort	26
Arrive faster at destination	8
No advantages	27

… but also raise concerns

| Concern	Value
Fear of technical issues	68
Fear of hacking	63
Usage of data by others	52
Unclear legal situation	52
Infrastructure investment	42
Enjoy driving	37
Too expensive	35
Lack of trust in technology	32
No disadvantages	9

Vehicle Safety
Cyber Security
Data protection & privacy

Conclusion: Trust in the safety of new technologies is the key to acceptance and subsequently to progress

Source: VdTÜV/bitkom study "Autonomous driving and connected mobility", April 2018 (n=1,238; multiple mentions possible)

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The unstoppable break-through of automated vehicles offers enormous chances for testing organizations – but only if some key challenges are delivered …

Key consumer concerns

1	VEHICLE SAFETY
2	CYBER SECURITY
3	DATA PROTECTION & PRIVACY
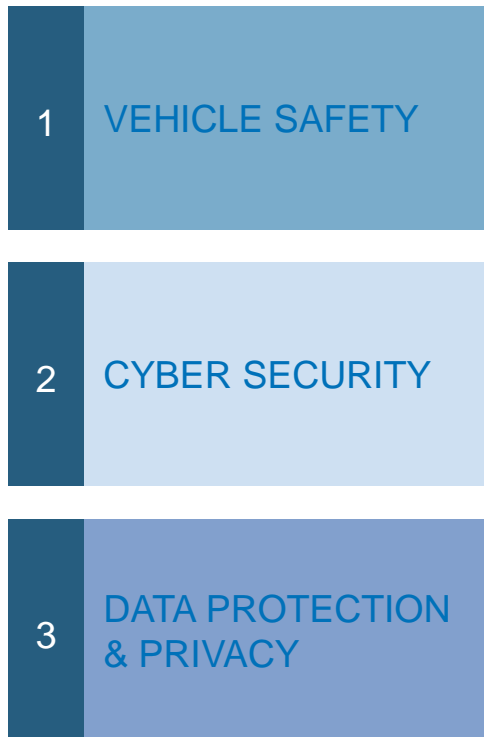
Contribution of third party players to address consumer concerns

1. New test and audit methods, processes and solutions[1]

Approval Test	Conformity of	Surveillance	Roadworthiness
e.g. Real World and Simulation	Production	e.g. In-Service-Safety-Performance Monitoring	e.g. PTI, e-PTI, CTI

2. Already today an extensive portfolio on cyber security solutions

- Security analysis of an embedded device
- Complete testing services for the prevention of automotive cyberattacks
- Detection methods for potential hacking points and data leaks
- Security analysis of automotive components

3. Data Protection and Data Privacy Certification (GDPR)

   Strategic role as Third Party Trusted Data Center based on a standardized car interface for all safety relevant data

Conclusion: If we are able to meet market demand and satisfy expectations there are more opportunities than threats
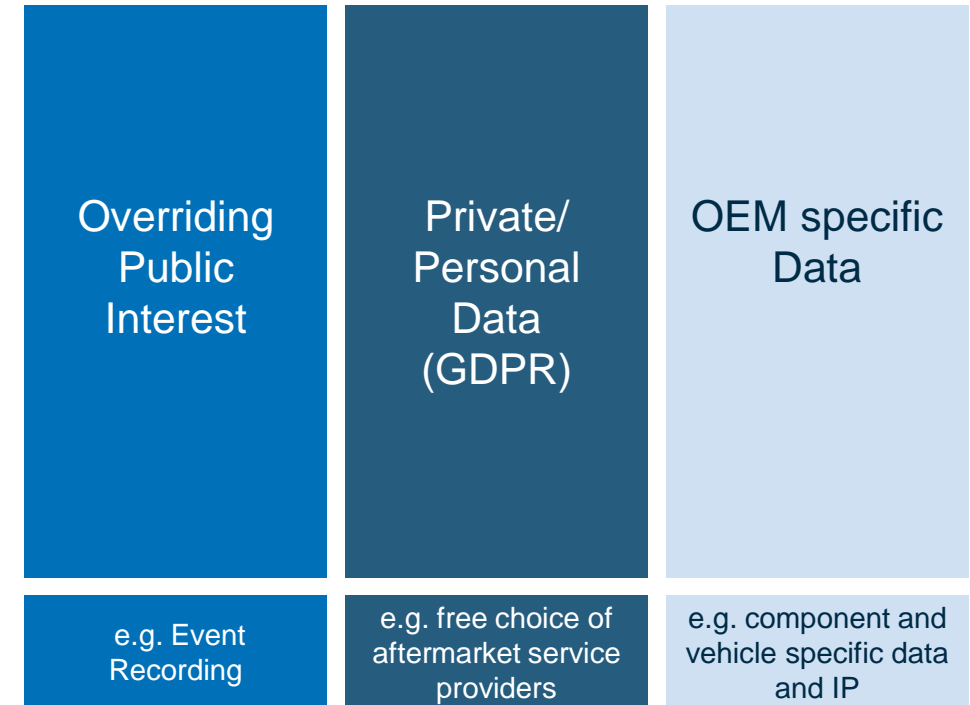
[1] Dr Mervyn Edwards, TRL The Future of Transport

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Building up capabilities is essential for TIC players – but it is not sufficient. Additionally, external requirements have to be fulfilled too:

Necessary Prerequisites

- Access to the electronic vehicle interface and its standardization

- Non-discriminatory access to information about software versions and updates

- Definition of technology standards and specifications (V2X, connectivity, AI, etc.)

- Regulations and specifications for data usage

- Regulations for ADAS and Level 3+ systems

- Overthink vehicle classification → safety requirements similar to rail and aviation applications
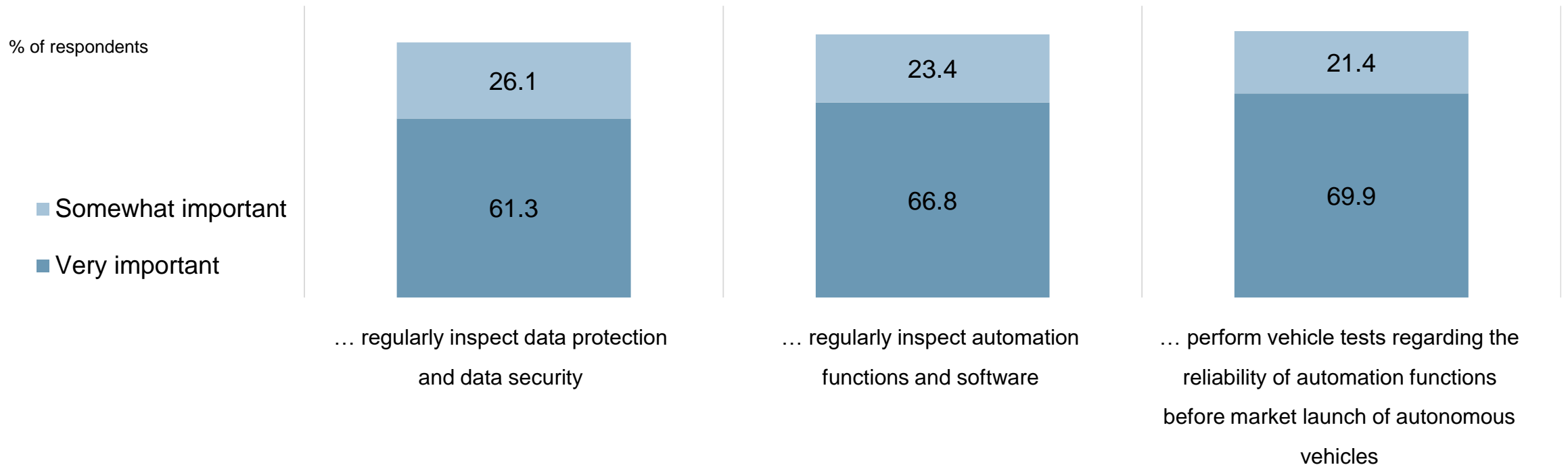
Trusted Data Center – Layer Framework

Overriding Public Interest	Private/ Personal Data (GDPR)	OEM specific Data
e.g. Event Recording	e.g. free choice of aftermarket service providers	e.g. component and vehicle specific data and IP

Conclusion: Regulation massively lacks behind market developments and new technologies – and the gap is getting wider

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From the consumer's perspective there is no doubt that TIC-players are the preferred partner for safe and trusted solutions through the whole vehicle lifecycle

The majority of consumers want independent institutions to …

% of respondents

■ Somewhat important

■ Very important

| 26.1 | 23.4 | 21.4 |
| 61.3 | 66.8 | 69.9 |

… regularly inspect data protection and data security

… regularly inspect automation functions and software

… perform vehicle tests regarding the reliability of automation functions before market launch of autonomous vehicles

If we master the few but decisive challenges – automated driving offers by far more opportunities than risks

Source: Study of TÜV Rheinland (2017): Safety of autonomous vehicles in Germany, USA and China

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Thank you for your attention

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