Exploring user expectations on autonomous driving

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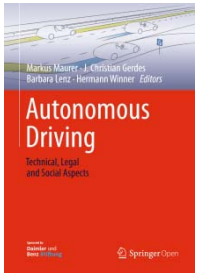
Qualitative methods in the field of autonomous vehicle research

Qualitative methods allow:

- to explore a fairly unknown topic,
- flexibility, using semi-structured methods,
- to elaborate in greater detail,
- the study participants to express their attitudes/opinions/etc. more freely and in their own words,
- interaction between the researcher and the study participant – being able to ask “why?” or “how?”.

Results from qualitative studies can give input to develop quantitative studies or to make assumptions plausible e.g. input parameter for transport models

From exploration to investigation



Exploration and structuring of “acceptance”

- Aimed at laying a solid foundation for future empirical research
- Qualitative study on online user comments in GER and US in 2013 *(Villa Ladenburg)*

http://link.springer.com/book/10.1007/978-3-662-48847-8

Exploration and quantification of user perspectives

- General perception, interest, willingness to use, changes in mode choice, VOT, etc.
- Representative, quantitative study of 1,000 Germans in 2014 *(HU Berlin, FU Berlin, DLR)*

https://www.geographie.hu-berlin.de/de/institut/publikationsreihen/arbeitsberichte/download/Arbeitsberichte_Heft_187.pdf

Examination of impact on mobility in different countries

- VOT, new user groups, changes in mode choice
- Comparative, mixed-method study using focus groups, expert workshops and quantitative modelling *(ifmo)*

“Impact of automation technologies on mobility”

Project overview

Analysis of the impact of automation on mobility behaviour

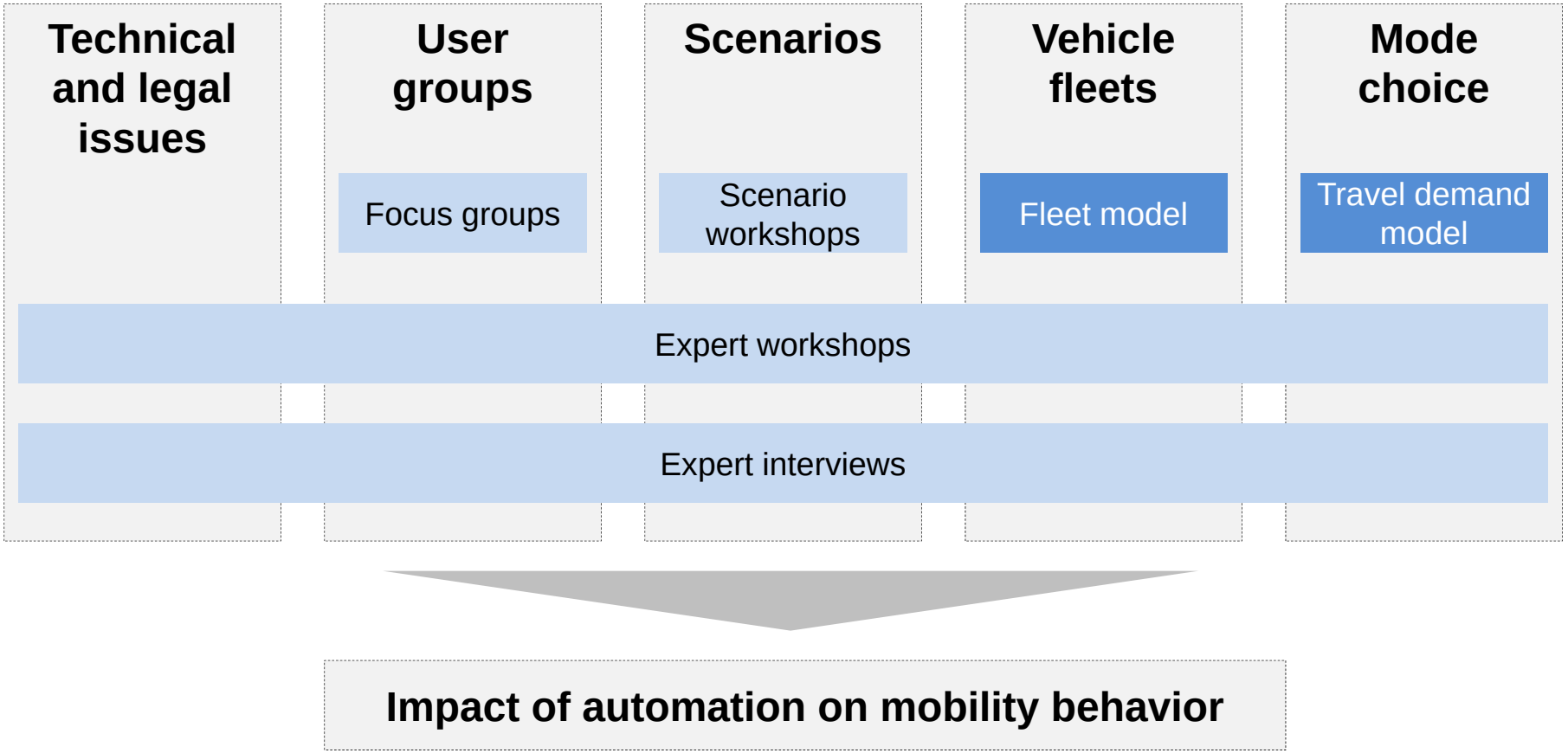
- Investigate intended use and influencing factors of user acceptance
- Develop scenarios of automation for 2035
- Derive changes in modal split and vehicle miles travelled (VMT)

Focus

- automation levels 4 & 5 (SAE):
- private passenger transport
- three countries: USA, China, Germany

Partners: Stanford University & Tongji University (Shanghai, China)

Mix of qualitative and quantitative methods

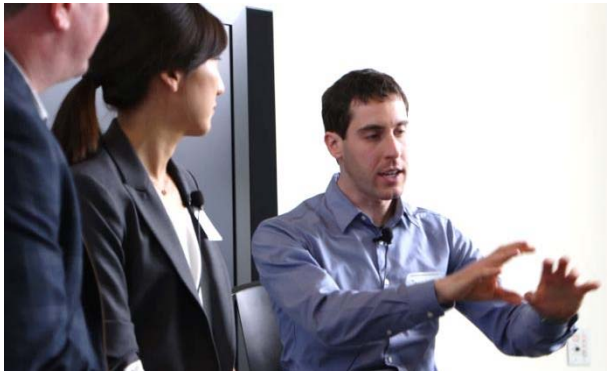


Expert workshops and interviews

Discuss aspects of autonomous technologies with experts in their field covering the following aspects:

- Technology challenges and necessary infrastructure developments (e.g. maturity of technologies, roadmaps and role of V2X infrastructure)
- Legal aspects (legal and liability aspects and expected timeframe for legalization of level 4 & 5 systems)
- From early adopters to mass market (e.g. user segments, roll out strategies and market adoption)
- Impact of automated driving systems on the transport system (mode choice, VMT and AVoD systems)

Three workshops during Spring 2015 in San Francisco, Shanghai and Berlin



Source: DLR

Focus groups

Objective:

- Analyze drivers and barriers to use AVs
- Potential application of AVs
- Potential changes in mobility behavior

Content and implementation:

- Three user groups (mobility impaired, urban and rural dwellers)
- Block 1 (40 min) “daily mobility”
  - mobility requirements, mode choice, role of the car within the household)
- Block 2 (60 min) “Autonomous driving”
  - Knowledge, expectations, associations
  - Potential use cases of autonomous driving

- 3 x 3 focus groups during Spring and Summer 2015 in San Francisco, Shanghai and Berlin

Source: gas2.org

Source: rinspeed.com

Source: thecarconnection.com

Intended use and benefit of autonomous vehicles

	Germany	U.S.	China
Intended use	Long distance Commute Short trips Accompanying trips Recreational trips	Long distance Commute Accompanying trips Short trips Recreational trips	Commute Short trips Long distance trips Accompanying trips
Expected benefit	„time saving“ Less stress Higher safety Door2door mobility Comfort Efficiency	Comfort „time saving“ Efficiency Less stress Higher safety „Drink & Drive“	„time saving“ Privacy Less stress Higher safety Comfort Efficiency

Source: DLR

Concerns connected to the use of AVs

Germany	U.S.	China
Loss of driving pleasure	Risk of malfunction	Higher costs
Risk of malfunction	Loss of control	Loss of control
Loss of control	Higher costs	Loss of driving pleasure
Data security/ cybersecurity	Loss of driving pleasure	Risk of malfunction
More cars	„Speed Limit“	
Higher costs	Data security/ cybersecurity	
„Speed Limit“	More cars	

Source: DLR

Résumé and outlook

Focus groups allowed to evaluate benefits and potential use of AVs for different user groups within different countries.

Qualitative approach was key for discussion of potential changes in mobility behavior:

- Knowledge about AVs within the focus group was very limited
- Discussion allowed to generate a mutual understanding
- Understanding is prerequisite to evaluate potential utilization of AVs

Difficulties:

- Methods had to be adapted for China – less discussion more monologues

Results were used to evaluate and adapt assumptions used in transport modelling to analyze the impact of AVs on mobility behavior in the U.S. and GER

→ Tonight's poster session: Poster 18

Looking forward to an exciting workshop!

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