



Drivers of Autonomous Vehicle Adaption – a Qualitative Assessment of Consumers' Motives

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Agenda

-  What drives us?
-  Background
-  Paper Overview
-  Methodology – the Means-End Chain
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What drives us?



1. Technological Progress: enabling new modes of transport

2. Innovation Issue: scepticism towards changes in technology

(Mohr, Sengupta, & Slater,
2009)

3. Market Issue: Electric vehicles – failure to read consumers' minds

(Egbue, Ona, & Long,
2012)

4. Management Issue: Consumers' perception of autonomous driving

Industry's Perspective on Autonomous Driving

Terms		Definitions	
Level 0	Driver Only	Continuously exercising long. and lat. control	None
Level 1	Assisted	Continuously exercising long. OR lat. control	Long. or lat. control
Level 2	Partial Automation	Monitor the system at all times	Long. and lat. control in a specific use case
Level 3	Conditional Automation	No need to monitor all times; always be ready to resume control	Long. and lat. control in a specific use case; System recognizes performance limits and alerts driver
Level 4	High Automation	Not required during defined use cases	Cope with all situations automatically in a defined use case
Level 5	Full Automation	Not required	Cope with all situations automatically

Consumers' Perspective on Autonomous Driving

From nightmares...

“I would never hand over control to a computer.”

“Using the park assistant is more demanding than parking myself.”



... to good drive's sleep.

“I'd love to drive autonomously. It would give me the opportunity to utilize the driving time for working or sleeping. Consequently, I would have more time for the fun things in life.”

When the industry does not precisely explain customers what AD is all about, the consumer will define the answer himself.

Benefits of Autonomous Driving

Traffic safety: increases, less congestions, impacting roadwork capacity

Fagnant & Kockelman, 2015;
Wu, Zhao, & Ou, 2011; Ge &
Orosz, 2014

Urban improvement: reduced emissions, reduction of car park, repurposing of parking spaces, optimization of road structure.

Levinson, 2015; Fagnant &
Kockelman, 2015; Litman, 2014

New opportunities for public transport: emergence of shared autonomous vehicles (autonomous carsharing), autonomous bus systems, robocabs

Alessandrini, Campagna, Delle
Site, Filippi, & Persia, 2015;
Greenblatt & Shaheen, 2015

Mobility enabling: individuals currently unable to drive (e.g. children, elderly, disabled, ill) get the chance to be “equal” citizens

Bradshaw-Martin & Easton,
2014; Smith, 2012

Areas of Current Research

Political

implementation and general benefits for the society (Isaac, 2016; Lari, Douma, & Onyiah, 2015; Marletto, 2014; Smith, 2016)

Economical

affordability, societal perspectives (Acharya, 2014), reduction or increases in externalities (Greenblatt & Shaheen, 2015 ; Gucwa, 2014; Peterson, 2014), and general impacts on the economy (Burns, 2013; McEvoy, 2014).

Ethical

artificial intelligence settings (Goodall, 2014a, 2014b), dilemma scenarios (Deng, 2015), societal benefits (Gucwa, 2014), overall responsibilities (Gless, Silverman, & Weigend, 2016; Hevelke & Nida-Rümelin, 2014), AI's limitations in this context (J.-F. Bonnefon, Shariff, & Rahwan, 2015; Brassington-Edwards; Lin, 2013, 2016), public perception of these liabilities (Li, Zhao, Cho, Ju, & Malle, 2016)

Technological

programming issues (Kumar et al., 2012; Markelic, 2010), mapping challenges (Jie, 2014), integration of different road observation systems (Beliveau, Fithian, & Deisenroth, 1996), risk reduction (Brini, Crubillé, Lussier, & Schon, 2016), overall potential/feasibility aspects (Behere & Törngren, 2016)

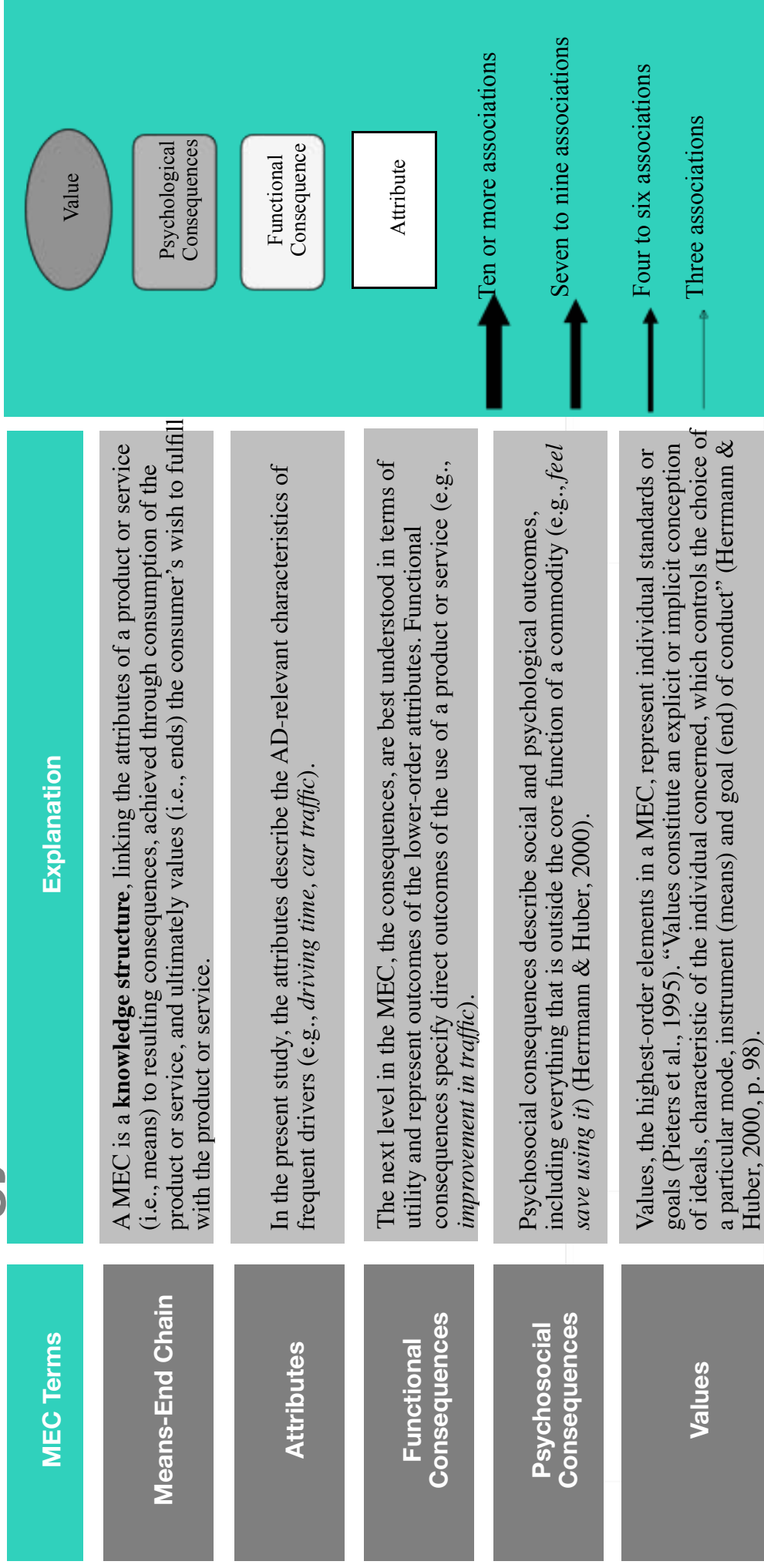
Legal

liability issues (Cohen, 2015; Crane, Logue, & Pilz, 2016; Douma & Palodichuk, 2012; Goodrich, 2013; Gurney, 2013; Pinto, 2012), the novel role of the driver (Beiker, 2012; Duffy & Hopkins, 2013), insurance challenges (Gurney, 2013).

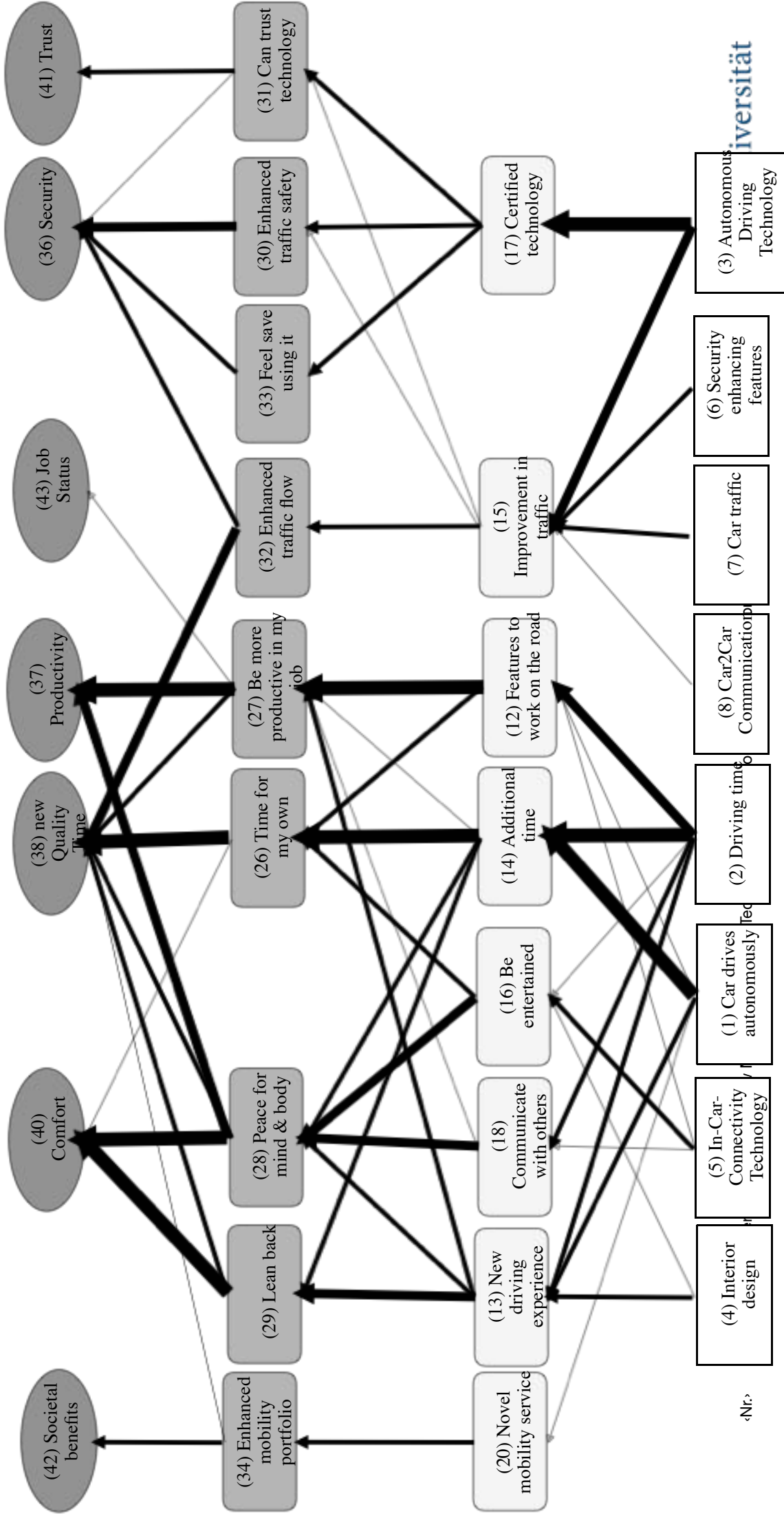
Paper Overview

Topic	<p>By conducting a MEC analysis, the overall motivations to use AD have been analyzed. Motive structures will be identified to deduce customer segments and resulting recommendations for elements to be communicated within a market launch.</p>
Motiv	<p>How should AD be communicated in order to successfully bring it to market?</p>
Methodolog	<p>To analyze adaption motives, we conducted a series of laddering interviews and employed the MEC technique because it allows for a detailed analysis of a consumer's usage motives and cognitive motive structures by linking relevant attributes, the resulting utility components, and underlying individual values, which can serve as a basis for market segmentation.</p>
Cont (1) (2) (3)	<p>extending academia's focus on AD to a customer perspective uncovering frequent drivers motives and barriers to adopt AD connecting AD-related attributes to the identified motives</p>
Sam	<ul style="list-style-type: none"> • Sample Size: 18 • Frequent drivers (more than 20.000 km per year) • Rationale: Expositions, Benefits, Involvement
Research Problem	<p>Studies on AD predominantly focus on technological contexts. However, no study has considered consumers' motivational drivers to adopt AD.</p>

Methodology – the Means-End Chain



Hierarchical Value Map



Main Findings

The Backseaters

Backseaters value the comfort that AD offers. Novel interior design concepts, AD capabilities and the sheer driving offer them new driving experiences, where they can lean back. Having peace for mind & body is a central consequence, associated with being able to communicate via new channels with others and indulging in entertainment features. This result supports findings of the qualitative study undertaken by Gardner and Abraham (2007) who investigated commuters reasons for car usage finding the relevance of a personal space allowing for relaxation.

The Time Collectors

Time collectors mainly associate a new quality time with AD. To them, AD offers not only an enhanced traffic flow, but it allows them to have time for their own – in a privacy, that they otherwise might not have and that they are free to use for whatever purpose they prefer. This supports Lyons and Urry (2005) as well as Mokhtarian and Salomon (2001) who investigated the dimensions and important factors of travel time.

The Busy Bees

Busy Bees believe that AD will provide them with the opportunities of being more productive and successful in their job, due to features that allow them to work in their ‘office on wheels’. Likewise, they consider ‘peace for mind & body’ while being driven as important, as this allows them to be rejuvenated for the next meeting. Fujii and Gärling (2005) and Brown et al. (2003) found that car drivers forced to reduce car use and switch to public transport came to realize that journey time is not „dead time“ and used the disposable time productively.

The Security Seekers

For Security Seekers, trust and safety are central in their knowledge-structure on AD. They are concerned about feeling safe when using AD features and an enhanced traffic safety. Certification of AD technology is of importance to them. Their type is supported by Byun (2001) who found that “safety” to be the most important factor in a car purchase decision.

Conclusion

Why is AD relevant for the economic development?

Increases traffic safety, improves urban infrastructure, new opportunities for public transport, enables mobility.

What are potential customer groups?

The Backseaters (comfort and relaxation), the Time Collectors (gain of quality time), the Busy Bees (increased productivity), and the Safety Seekers (certified and mature technology).

How should one communicate AD?

Focus on general benefits associated with additional time available during driving (working, socializing, relaxing) and a better driving experience (safety, comfort, privacy).

Which topics are delicate?

Data safety, loss of control, loss of driving pleasure, insurance/liability issues, immature technology.



Thank you very much for your time!