Data-sharing in IoT Ecosystems from a Competition Law Perspective: The Example of Connected Cars

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1. Introduction: Data access problems in IoT ecosystems

"Internet of Things" (IoT): connected smart devices collecting data

Manufacturer of a connected device often has exclusive control of the

(1) data produced with the device and

(2) technical access to the device (closed system / no interoperability)

Problem: this can lead to

+ a monopolistic gatekeeper position in an IoT ecosystem
+ data access / interoperability problems for users/firms in the ecosystem,
+ danger of leveraging market power to all markets for aftermarket and complementary services that need access to data and/or device,
+ and less competition, innovation, and consumer choice

- Example: access to in-vehicle data and resources in connected car

1. Introduction: Data access problems in IoT ecosystems

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Research question:

How and to what extent can competition law help to solve these problems of data access/sharing and interoperability in IoT ecosystems?

(not discussed: - data access/sharing generally, esp. also for AI etc.
- other solutions for these access problems)

Analysis: - from an economic policy and legal perspective
- IoT ecosystems generally and the example of connected cars

Paper is based mostly on following research:

+ European data economy / data ownership / data sharing
+ current discussion on challenges of digital economy for comp. law
  (German/EU/UK reports: Schweitzer/Haucap/Kerber/Welker, 2018; Cremer/de Montjoye/Schweitzer, 2019; Furman et al 2019)
+ my own research on data governance in connected cars (Kerber 2018)

2. Economics of IoT ecosystems: Data access and interoperability problems

(1) Economics of data

- non-rivalry of use of data => benefits of data sharing
- costs of data production can be very low or high
- exclusive de facto control of data can be inefficient

(2) Economics of interoperability (closed vs. open systems)

- benefits and costs of interoperability
- market failure: often too closed systems / not enough interop /standardis.

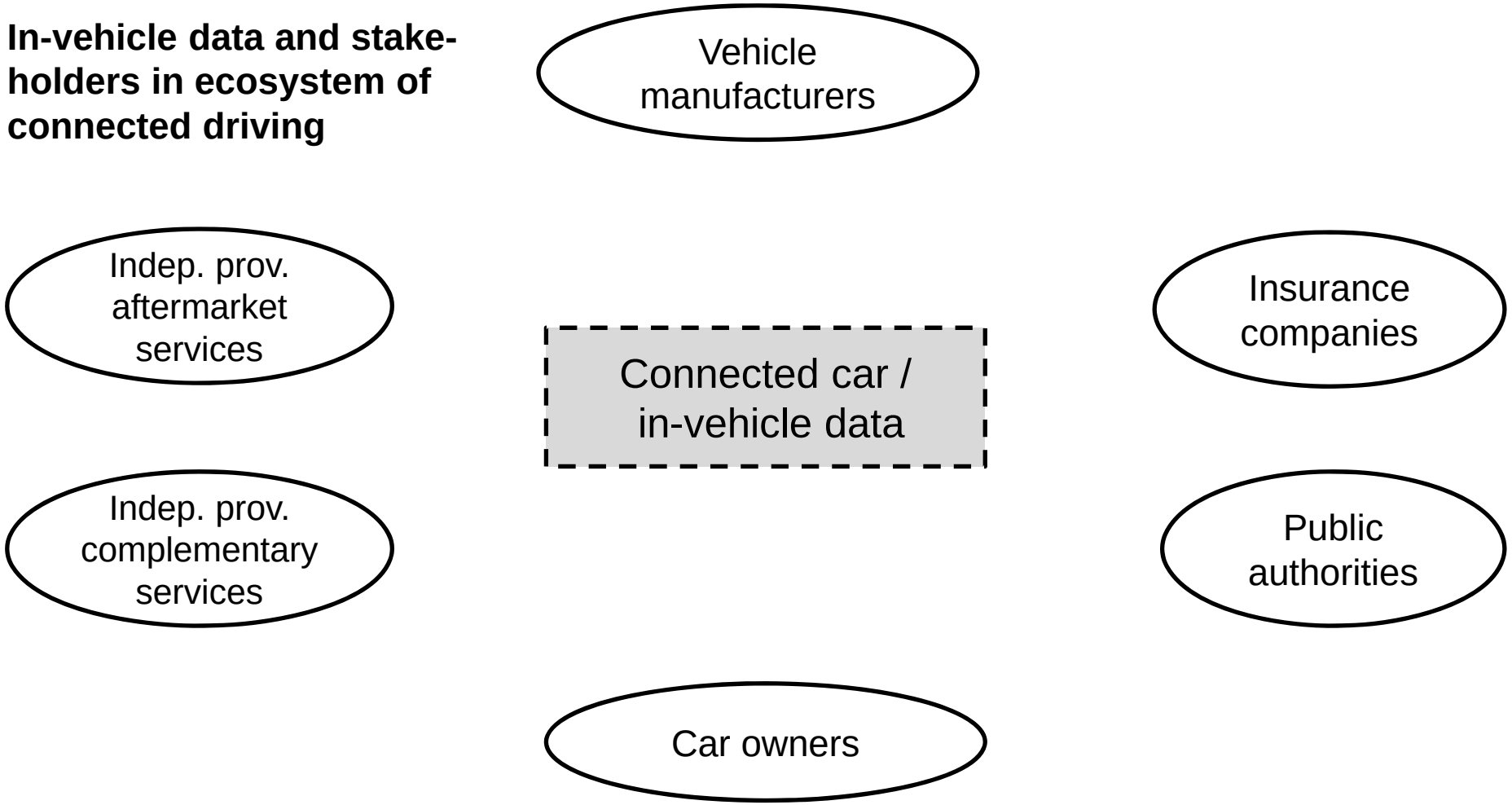
(3) Economics of ecosystems, lock-in, and bundling:

- lock-in of users of connected devices (switching costs)
- leveraging of market power to aftermarket and complementary services in ecosystem that need access to data or the device
- aftermarket theory / systems competition / effects of bundling

=> necessity of balancing manifold positive and negative effects

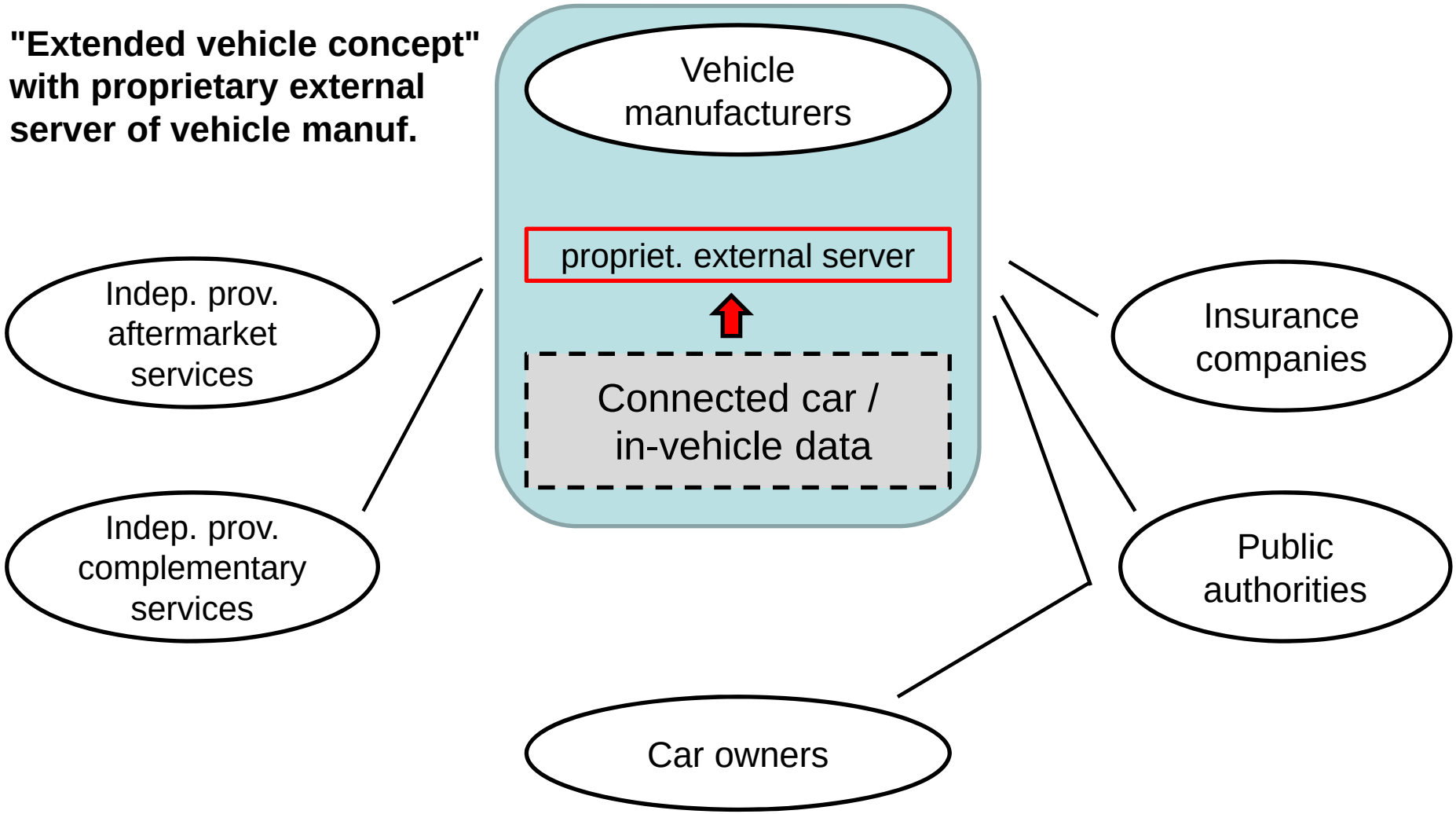
3. Problem of „access to in-vehicle data and resources" in the ecosystem of connected driving (1)

In-vehicle data and stake-holders in ecosystem of connected driving

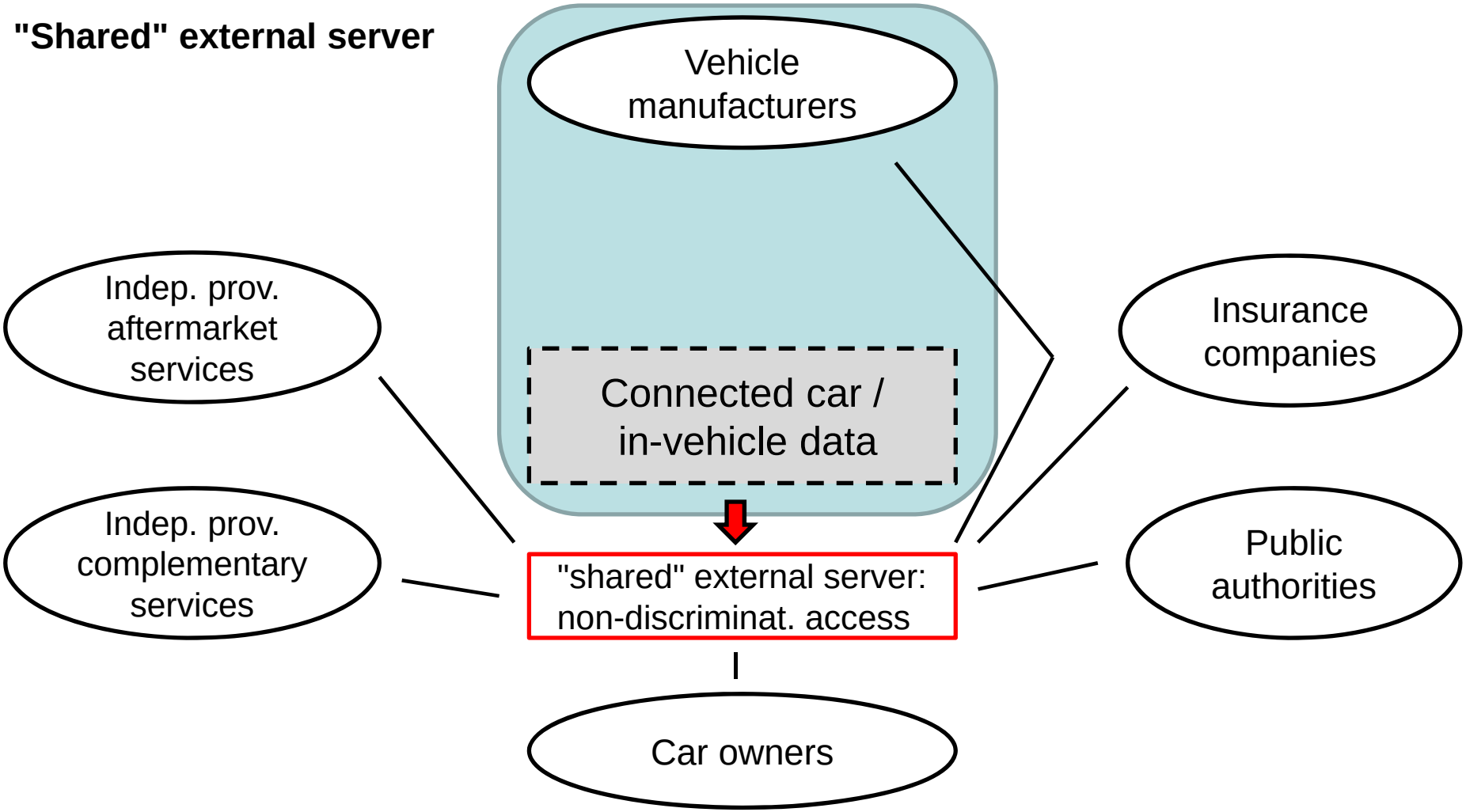


3. Problem of „access to in-vehicle data and resources" in the ecosystem of connected driving (2)

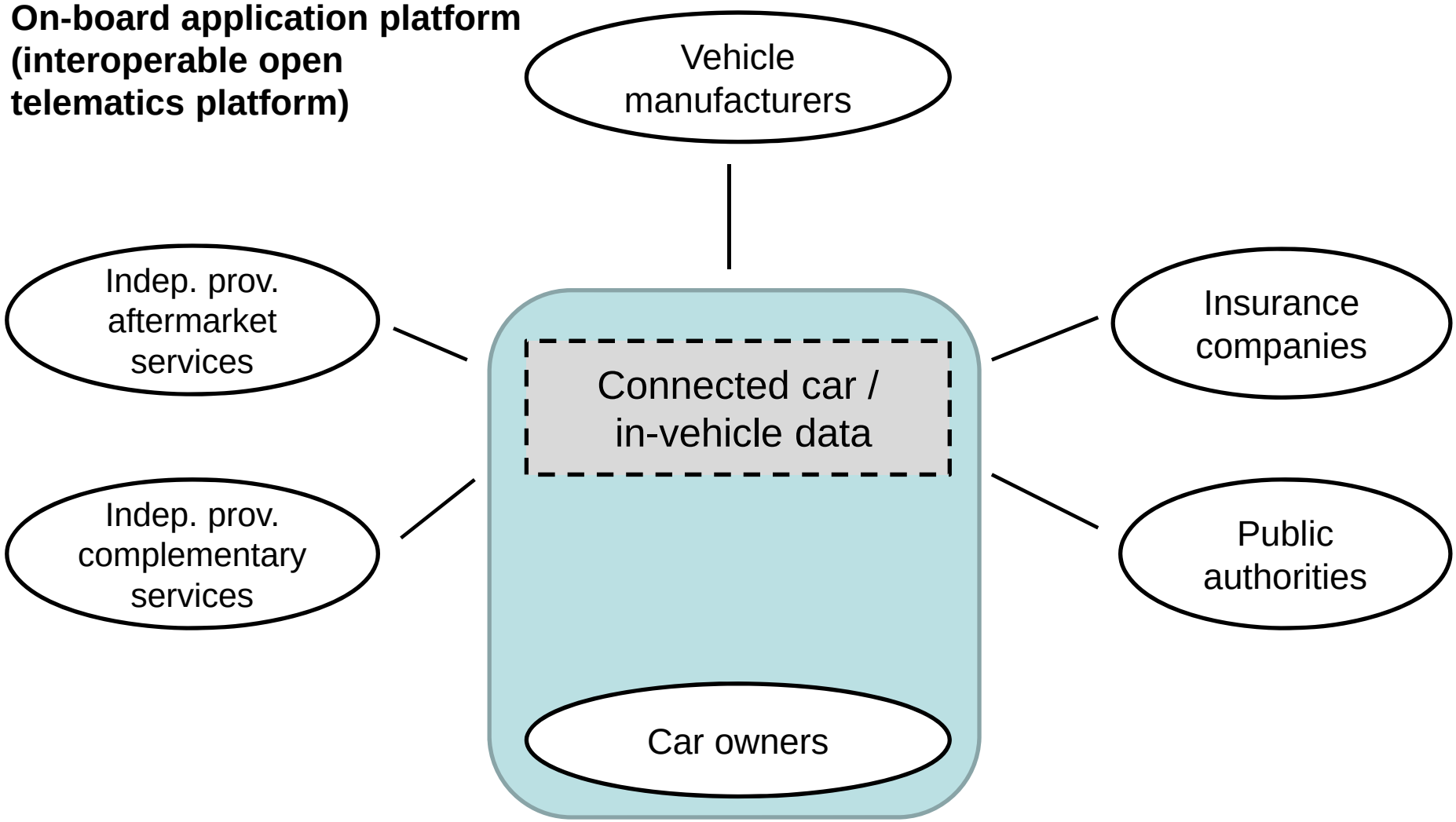
"Extended vehicle concept" with proprietary external server of vehicle manuf.



3. Problem of „access to in-vehicle data and resources" in the ecosystem of connected driving (3)



3. Problem of „access to in-vehicle data and resources" in the ecosystem of connected driving (4)



3. Problem of „access to in-vehicle data and resources" in the ecosystem of connected driving (5)

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Controversial policy discussion about „extended vehicle“ concept in EU

- Independent service providers (ISPs) / consumers => call for legislative action
  - \+ complain „privileged access“/monopolisation of in-vehicle data of OEMs allowing them to control all automotive aftermarkets and new complementary services for which access to data and/or the car necessary
- Vehicle manufacturers
  - \+ exclusive control necessary for safety/security => no regulatory action needed
- EU initiative: C-ITS platform (2016) with 5 principles of access to in-vehicle data

  TRL study (2017): confirms problems, rejects "extended vehicle" concept, esp. due to impediment of fair and undistorted competition, and suggests, e.g., in the long-term, transition to on-board application platform
- EU Commission ["On the road to automated mobility", 2018] acknowledges problem but very reluctant about a legislative initiative (plans to publish a recommendation)

=> unresolved open policy question in the EU !

3. Problem of „access to in-vehicle data and resources" in the ecosystem of connected driving (6)

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Results of economic analysis of extended vehicle concept: (Kerber 2018)

- OEMs have designed closed ecosystems (w. lock-in) with exclusive control of
  - \+ in-vehicle data and of technical access (interoperability problem)
    - > allows control of aftermarket / complementary services with leveraging / foreclosure effects for ISPs (and appropriation of value of in-vehicle data)
    - > important exception: regulated access regime to repair/maintenance info in type approval reg. (reform in 2018: not sufficient; Kerber/Möller 2019)
    - => problems for competition and innovation on secondary markets
  - \+ no defence through: - systems competition not working well enough
    - safety and security argument does not hold
- technolog. choice of closed ecosystem w/o interop can be wrong (market failure)
  - \+ choice of too closed systems /need for transition to integrated mobility systems
  - \+ open interoperable telematic platform might be superior (necessity of standardisation of interoperable interfaces)

=> extended vehicle concept can be wrong/inefficient solution

4. Solutions for data access problems in IoT ecosystems

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Data access / interoperability problems can be solved by different legal / policy instruments:

- data portability right (Art. 20 GDPR)
- direct data access rights (e.g., Drexl 2018)
- contract law / unfair trading practices
- sector-specific regulatory solutions (Payment Service Dir., type approval reg. ...)
- standardisation policy (for interoperability / data portability)
- competition law:
  - + refusal to grant access to data of an exclusive data controller as abusive behavior of firms with market power
    - > for dominant firms (Art. 102 TFEU)
    - > for firms with "relative market power" (e.g., § 20 (1) GWB)
  - + preventing exclusive control of data through merger policy, prohibition of abusive behavior, and prohibition of agreements (Art. 101 TFEU)

5. Competition law solutions I: Refusal to grant access as abusive behavior of dominant firms (Art. 102 TFEU)

Analysis of dominance of firms with exclusive control of ecosystems

+ important: systems competition? separate markets?
+ Connected cars: here good arguments for separate markets

Two options for reasonings about refusal to data as abusive behavior:

- Leveraging of market power / foreclosing ISPs on secondary markets of ecosystems:
  + refusal is abusive due to negative effects on competition, innovation etc.
  + comprehensive balancing of effects necessary
- Essential facility doctrine (EFD):
  + indispensability, elimination of competition, (new product test,) justification
  + very important: can be applied much more flexibly than in traditional EFD
  + comprehensive balancing of effects necessary

5. Competition law solutions I: Refusal to grant access as abusive behavior of dominant firms (Art. 102 TFEU)

Necessary: Balancing of effects for qualifying refusal of data-sharing as abusive

- importance of heterogeneity of data (also in CC), (raw/processed data, personal/ non-personal, individual / aggregated data etc., see Cremer et al 2019)
- compliance with GDPR, protection of business secrets / IP / database
- benefits of data use / sharing for competition / innovation on secondary markets within IoT ecosystem with locked-in consumers (value creation of ISPs)
- costs of data production: can be high or low (=> incentive problem?)
- have other stakeholders in the IoT ecosystems participated in data production?
- compensation solutions for giving access to data

  => different solutions for different data and types of stakeholders in ecosystem!

Problems: - not easy to apply in IoT contexts, problem of dominance etc.
- in CC certainly possible but also difficult in practice

Interoperability problems: refusal of interop can also be abusive behavior

5. Competition law solutions II: Refusal to grant access as abusive behavior of firms with "relative market power" (§ 20 (1) GWB)

Problem: Can Art. 102 be applied flexibly enough for solving data access problems?

Other option: "Relative market power" instead of "market dominance"

- "unequal bargaining power" btw. firms / bilateral dependence
- exists in number of countries, as, e.g., Germany, Japan, France
- economically a difficult concept, but also solid economic reasonings

§ 20 (1) GWB in German competition law

- prohibition of abusive behavior is extended to firms with "relative market power":
  - + firms from which other small or medium-sized firms are dependent, because they have not sufficient and reasonable possibilities of switching to other firms
  - + old provision of German competition law used for solving specific case groups ("firm-specific" dependency, e.g. authorised dealers; buying power situations)

German report (Schweitzer/Haucap/Kerber/Welker 2018):

proposal of "activating" this provision for solving data access problems in IoT/ aftermarket situations (e.g. extending this provision to all firms, not only SMEs)

5. Competition law solutions II: Refusal to grant access as abusive behavior of firms with "relative market power" (§ 20 (1) GWB)

How to apply § 20 (1) GWB to data access problems in IoT ecosystems?

- basic idea: ISPs within the IoT ecosystems are bilaterally dependent on manufacturer of connected device (as OEMs in CC example), and refusal to grant access to data can be an abusive behavior of this firm w. "relative market power"
- bilateral dependent due to the exclusive control of data ("data dependency")
- advantages: no proof of dominance etc.; direct analysis of bilateral dependency
- important: also balancing analysis necessary with similar criteria as in Art. 102
- for facilitating development of new case groups for solving data access problems in IoT ecosystems => proposal of amending § 20 (1) GWB as part of the 10th amendment of German competition law (Schweitzer et al 2018)
- problems: not easy to develop new case groups but might work to some extent, esp. if competition authority applies it actively (plus guidelines)
- Connected car example: ISPs can use this provision

5. Competition law solutions III: Other solutions

- intermediate result: competition law rules on abusive behavior might be able to solve data access and interoperability problems in IoT ecosystems but only to some extent and with many problems
  (and requires active development of case groups / legislative amendments)
- other option: to prevent the emergence of positions of exclusive control of access to data and the device
  + merger control
  + prohibition of foreclosing behavior of acquiring data
  + Art. 101 TFEU: prohibition of collusive agreements on technology and data governance
- Connected car: Is "extended vehicle concept" itself an anticompetitive horizontal agreement about establishing exclusive control of in-vehicle data and closed ecosystems of connected cars?
  + good reasons for a deeper investigation

6. Conclusions and perspectives

- in IoT ecosystems there are serious problems through exclusive control of access to data and to the connected device (interoperability)
  + Connected cars: ecosystems of connected driving is a good example
- but the problems are complex and different for different IoT ecosystems, which also requires different solutions for data access and interoperability
- Competition law can help to some extent to solve these problems, but this might need the development of new case groups
- often use of other solutions might be more suitable:
  + sector-specific regulatory solutions / standardisation (e.g. connected cars)
  + data access rights, data portability right, law of unfair trade practices
  + but all these other solutions have also unsolved problems
- But: competition law is always an important general (and fallback) solution, because unclear to what extent other solutions are implemented and can work effectively

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