Towards Value-oriented Internet Services

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The Internet
- a Criticial Infrastructure -

- **Critical Infrastructure**
  - Assets that are essential for the functioning of a society and economy

- **Examples**
  - Electricity generation, transmission and distribution
  - Security services (police, military)
  - Telecommunication (→ Internet)
  - Water supply (drinking water, waste water …)
  - …

- … and other Critical Infrastructures, such as electricity and water supply increasingly depend on the Internet !!

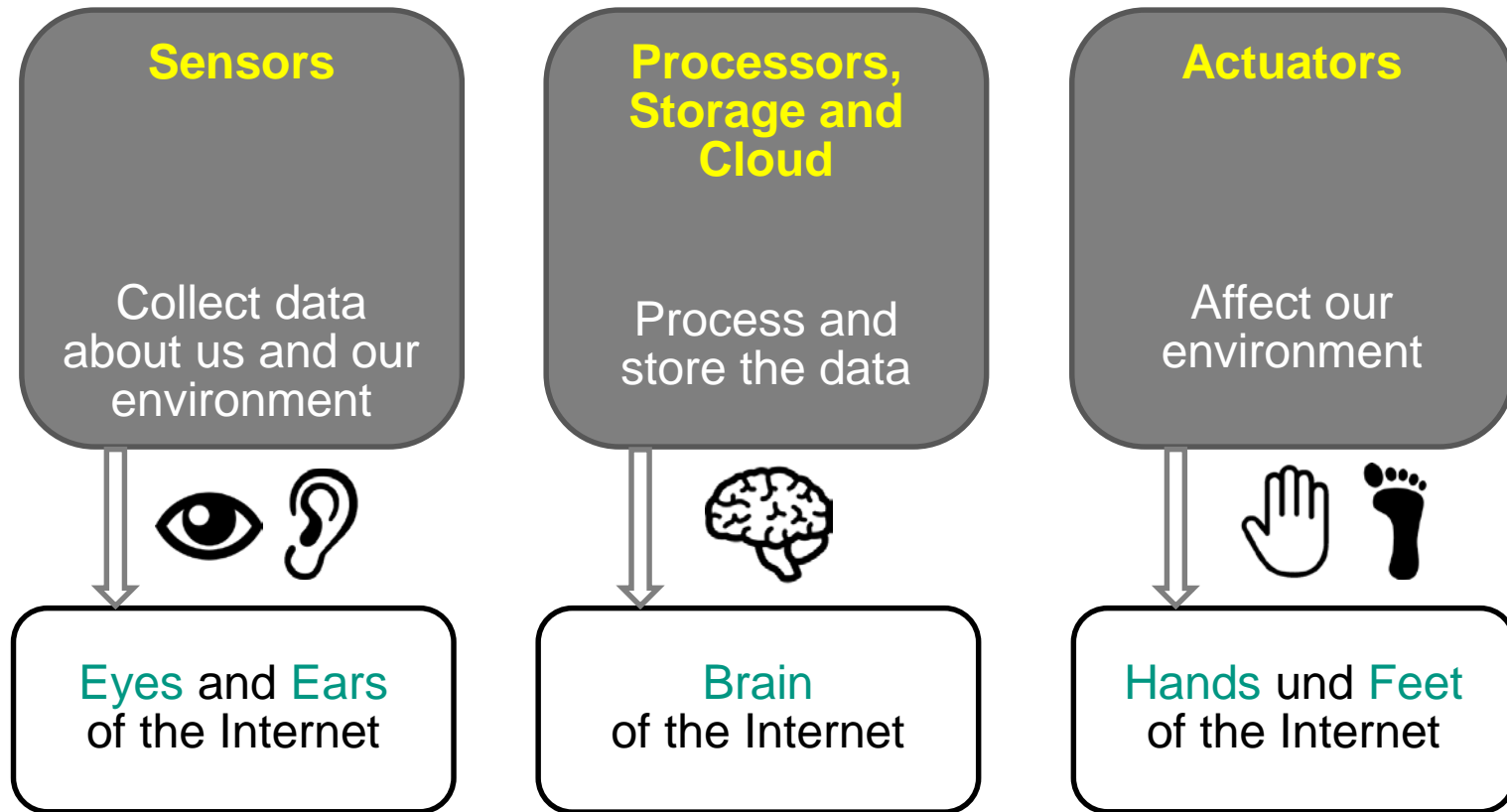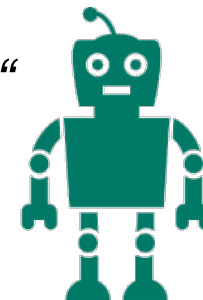Society increasingly depends on a **reliable and secure Internet**

Smart

Smart Grid

Internet of Everything

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Internet of Things == World-size Robot

Sensors	**Processors, Storage and Cloud**	**Actuators**
Collect data about us and our environment	Process and store the data	Affect our environment

Eyes and Ears of the Internet	Brain of the Internet	Hands und Feet of the Internet

- *„We build an Internet that senses, thinks, and acts"* → classical definition of a robot!
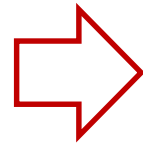- *„We´re building a world-size robot, and we don´t even realize it"*

[Schn17]

But: Internet-based services as well as the Internet infrastructure itself do affect **values**
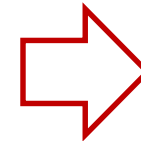
➔ Lack of transparency !!

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Similar Situation: Food Trade

Vision

An **Internet**, that provides easily manageable and trustable **choices** out of a variety of **value-oriented services**

- Provision of value-oriented services
- Individual choice according to personal values
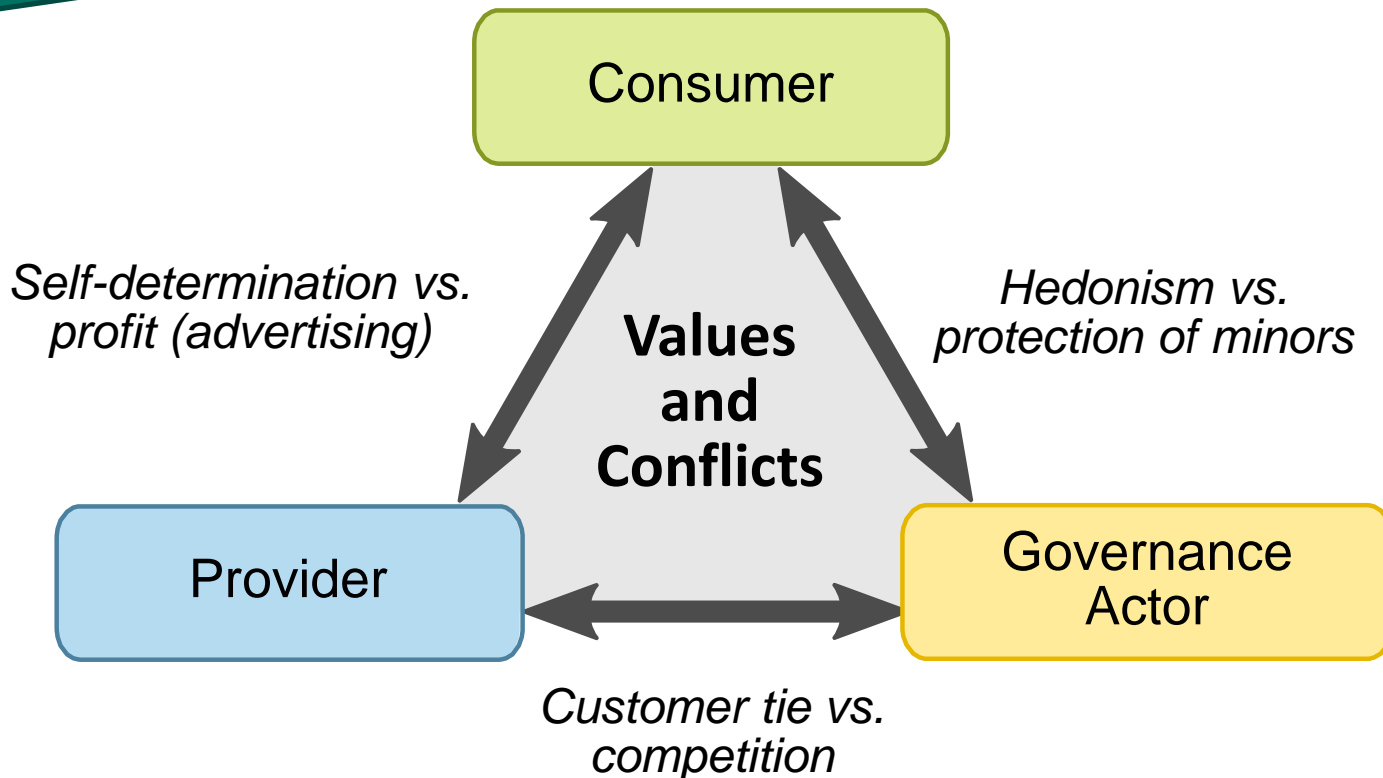- Comprehensible implementation of values

→ **Allow for diversity**

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Values

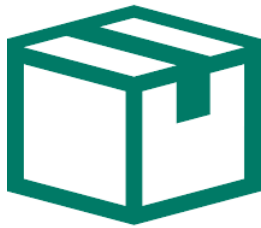## Abstract concepts of what is desirable

- Values are results of complex cultural and societal developments
- Values are man made and influence our action
- Values are neither good or bad, per se. They require ethical and legal reflection.

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Variety of (interdisciplinary) research questions

Individual desires

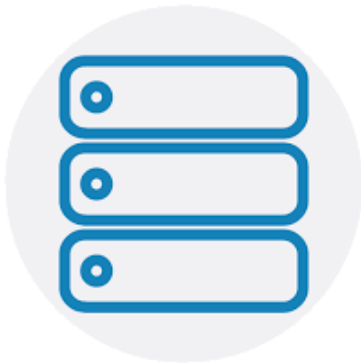I do not want to travel through country A

I prefer „green" routers

Please keep me away from user B´s traffic

…

I am not in a hurry

Values, such as Fairness

Fairness among users

Congestion control: fairness == same data rate

Translation of fairness through the protocol stack

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Variety of (interdisciplinary) research questions

<u>Validation</u>

How to define values in a technical manner
and proof that they are supported or not ?

How to deal with fuzziness ?

Relation between traditional performance
measures and values ?

<u>Value-oriented Engineering</u>

Engineering of human centered interfaces,
software architectures …

Engineering for diversity – values change
over time

Technical invariants in ommunication systems vs. values

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Members and Research Areas

Psychology

Human computer interfaces

Computer networks/Internet

Formal methods

Ethics

Web services

Software engineering

Regulation

Law

Marketing