

Internet of Things. Copyright Fotolia

# Ethical challenges of the Internet of Things in the household environment



**POLITECNICO  
DI TORINO**

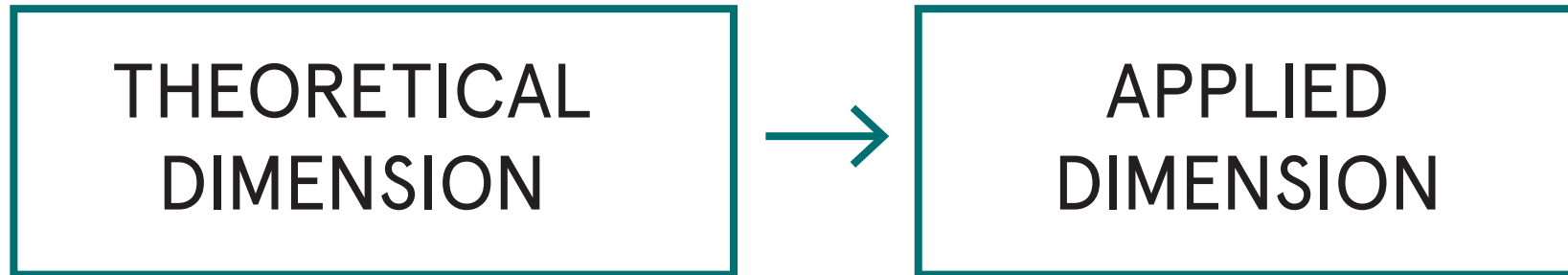
**Eleonora Fiore**

Politecnico di Torino, Torino, Italy  
Department of Architecture and Design  
eleonora.fiore@polito.it

# Ethics

---

- applied to systemic design



# Ethics

---

- applied to systemic design

**deontology**

(obligation and duty)

**teleology**

(maximizes the utility)

**virtue ethics**

(role of character and virtue)



business  
computer  
engineering  
design

# Methodology

---

**Social Ethics → Socio-technical systems**

*considers the social arrangements for making decision in an iterative design process.*

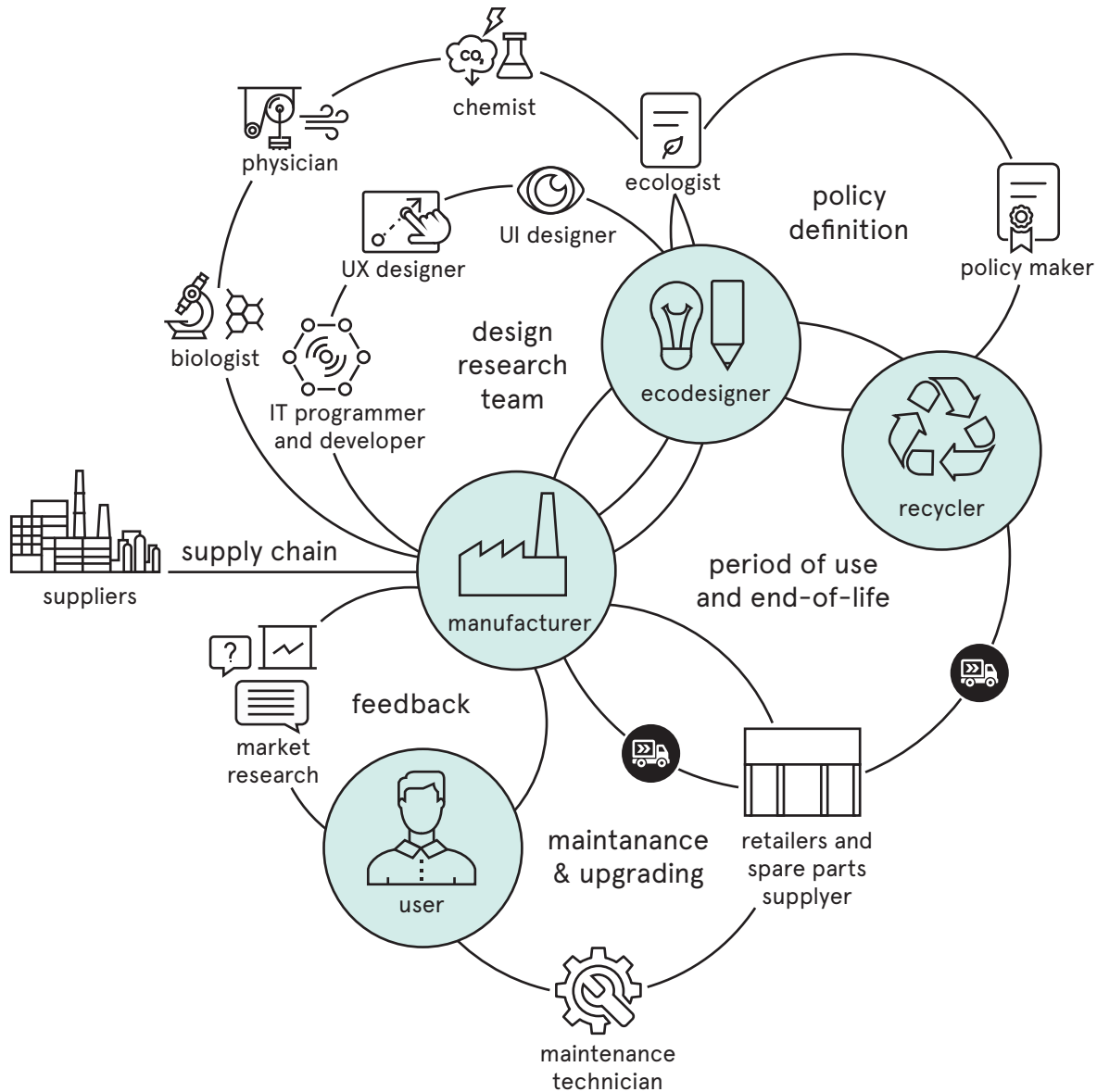
Richard Devon

**Value-sensitive design approach (VSD)**

*bridges the gap between technical design considerations and ethical concerns expressed through human values.*

Mary L. Cumming

# Decision making



development  
of connected  
devices

EXPLICIT  
DECISIONS

wide network  
of stakeholders

# Decision making

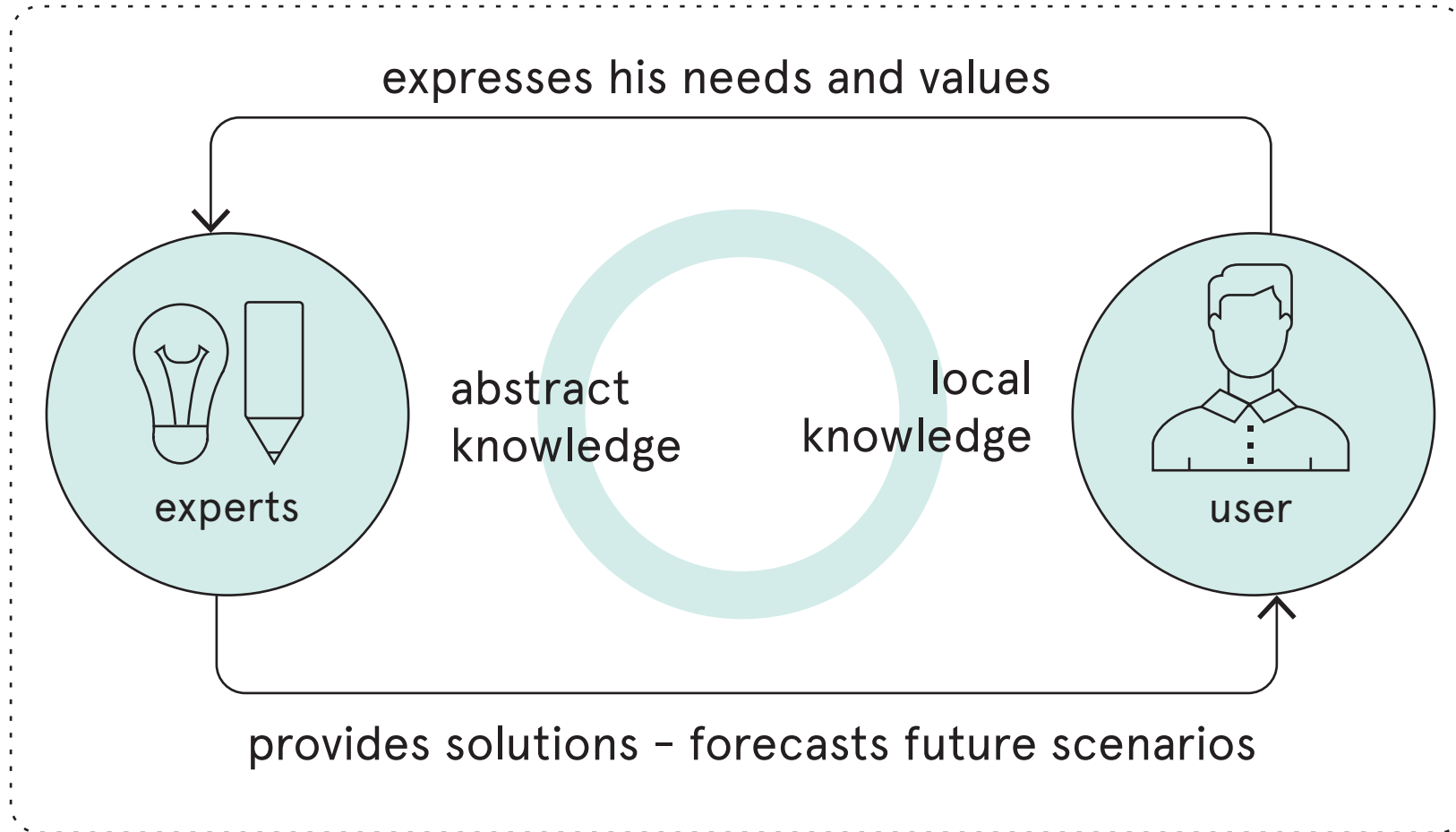
---

## IMPLICIT DECISIONS

should be structured with  
different decision support  
methods and tools

# Value-sensitive-design

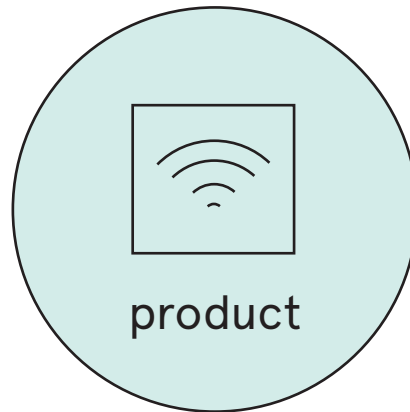
shape contexts, define a better world



# Case study

---

- connected devices (e.g. appliances)





# Internet of Things

---

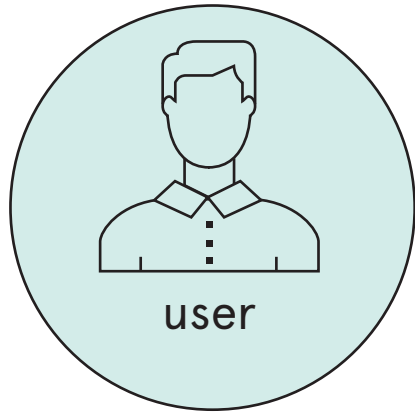
Global network infrastructure of Internet-connected devices or gadgets [1] able to collect, store, process and communicate information about themselves and their physical environment [2]

[1] Wasser, L. A., Hill, R., Koczerginski, M. (2016) Cybersecurity and the Internet of Things. McMillan LLP - Cybersecurity Bulletin. Retrieved from: <http://www.mcmillan.ca/>

[2] Ziegeldorf, J.E., Garcia Morchon, O., Wehrle, K., (2014) Privacy in the Internet of Things: Threats and Challenges. Security and Communication Networks 7.12: 2728-2742

# Concerns

---



What?  
When?  
Who?  
How long?  
Why?

need for  
transparency

Concerns = challenges for a designer

# The learning machine

---

- automation in design

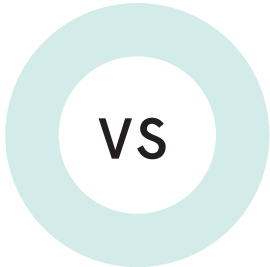
*A machine that is not able to recognise shifts in context, that cannot evolve or self-improve, should be considered unethical.*

Nicholas Negroponte

# The learning machine

---

- learning and understanding contexts by interacting with them

smart  connected

# The gap of missing information

---

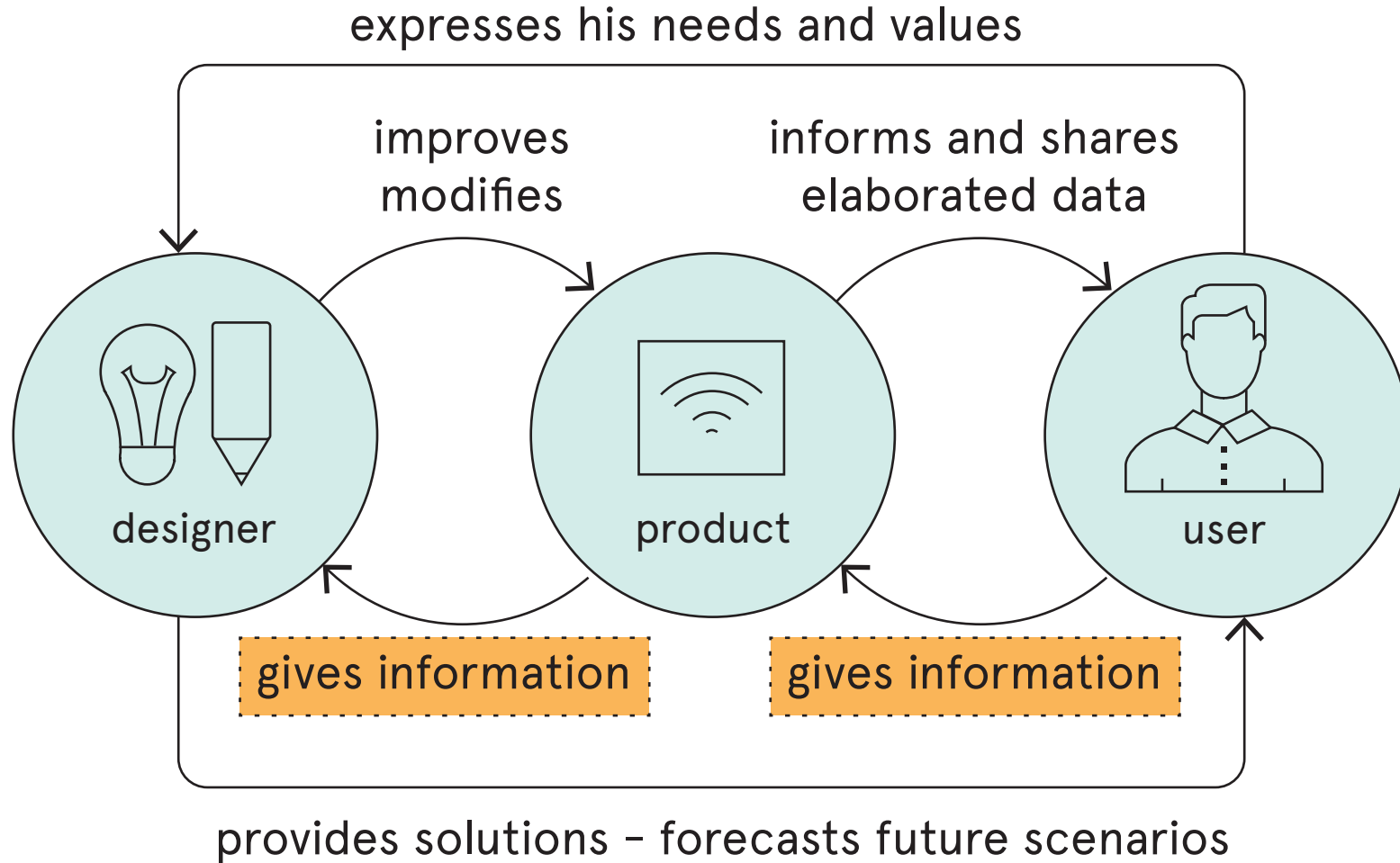
- missing information (unavailable, undeterminable)

research in the  
preliminary design  
stages

user specific  
related to  
experience

# The gap of missing information

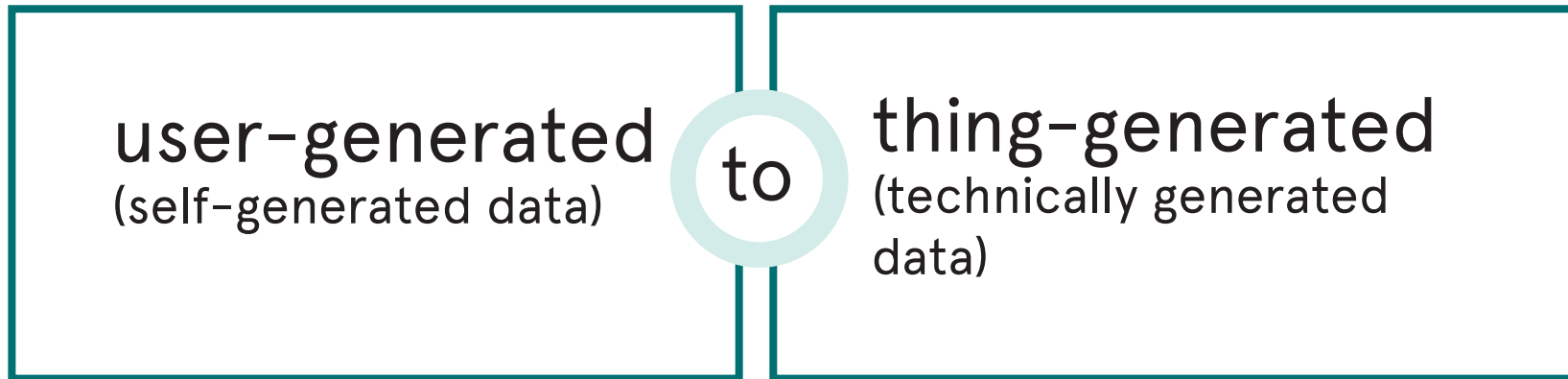
---



# Type of information

---

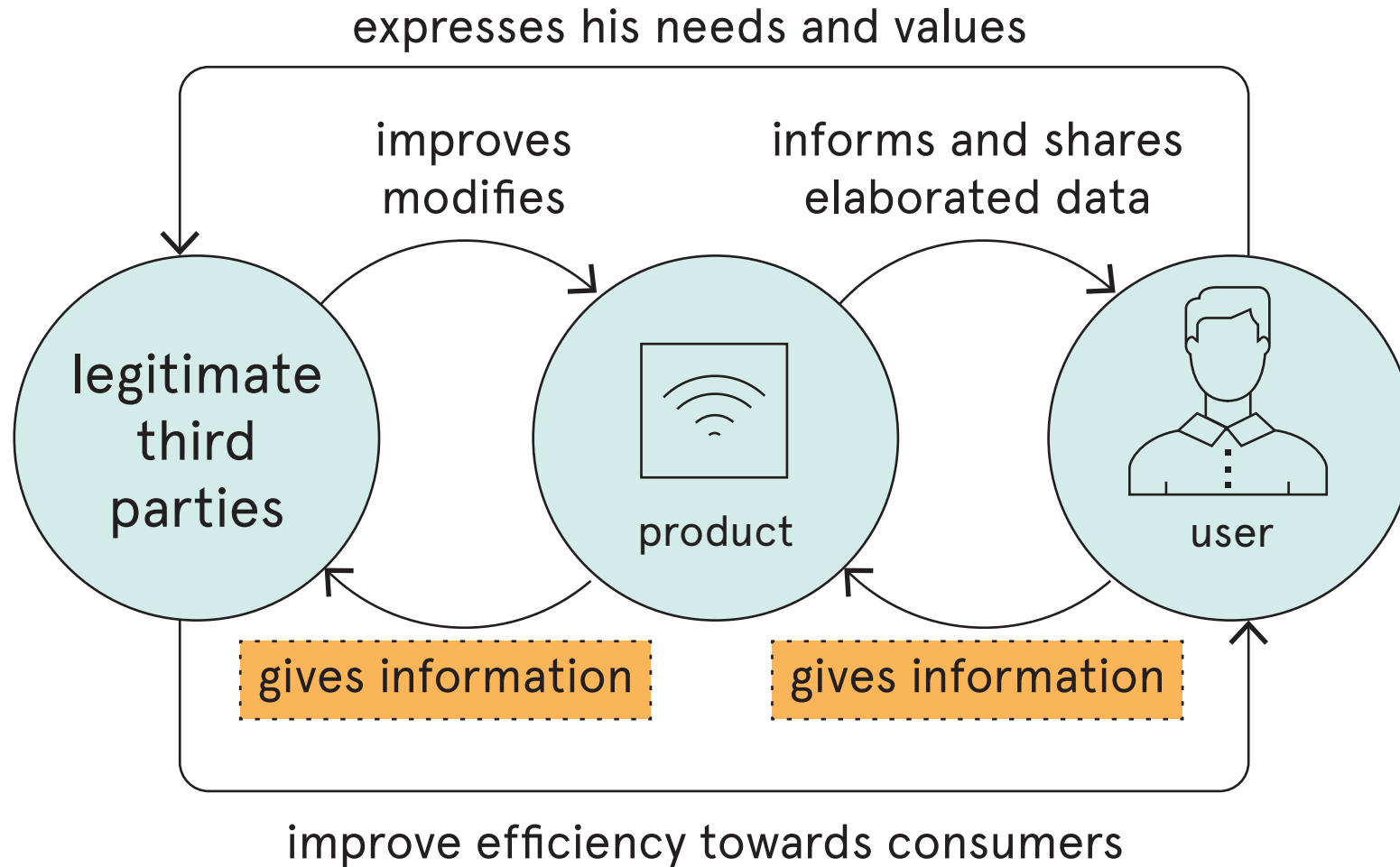
- switching from internet of



- IoT brings new quantity and quality of data, unprecedented opportunities but also challenges and problems.

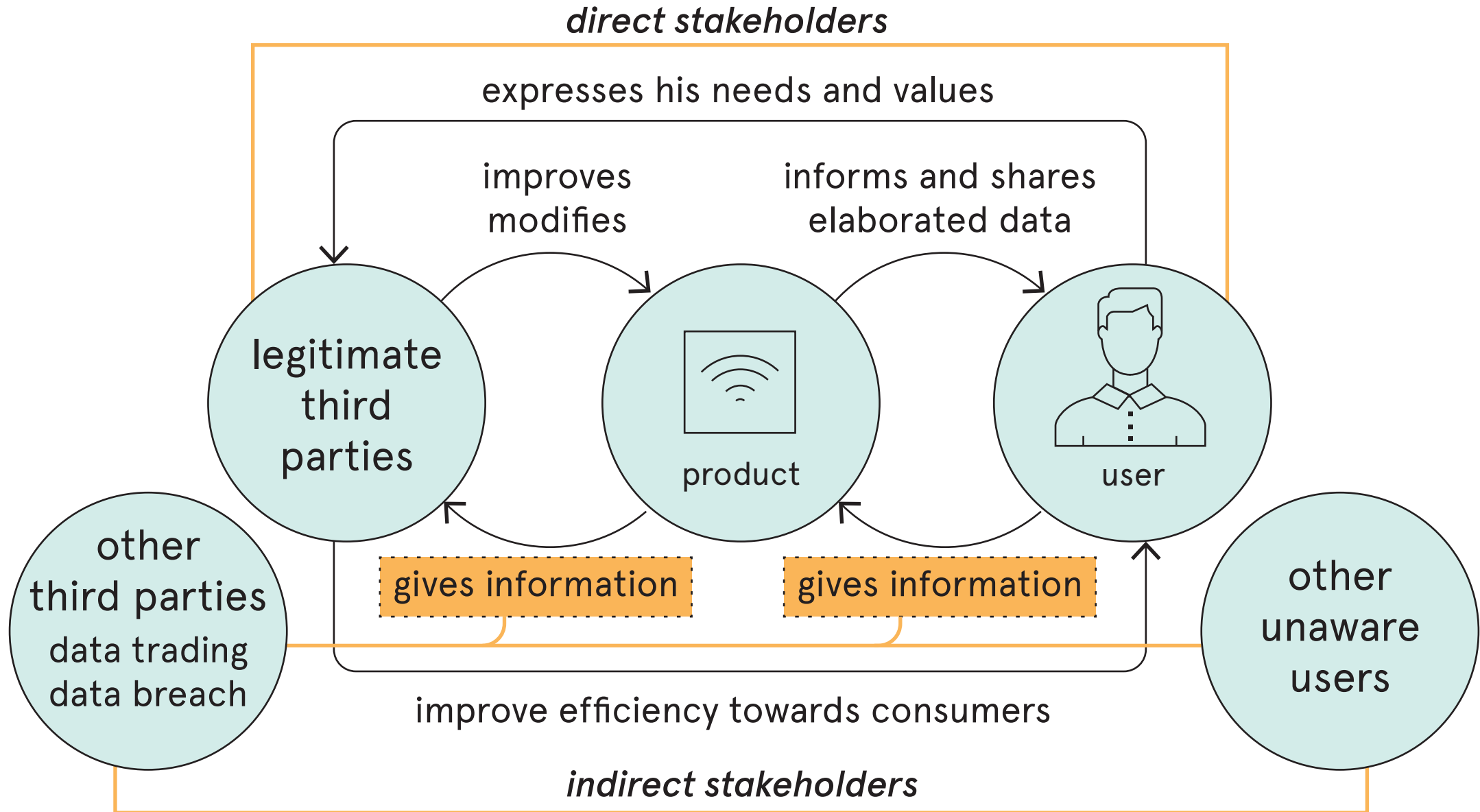
# Privacy & security concerns

---



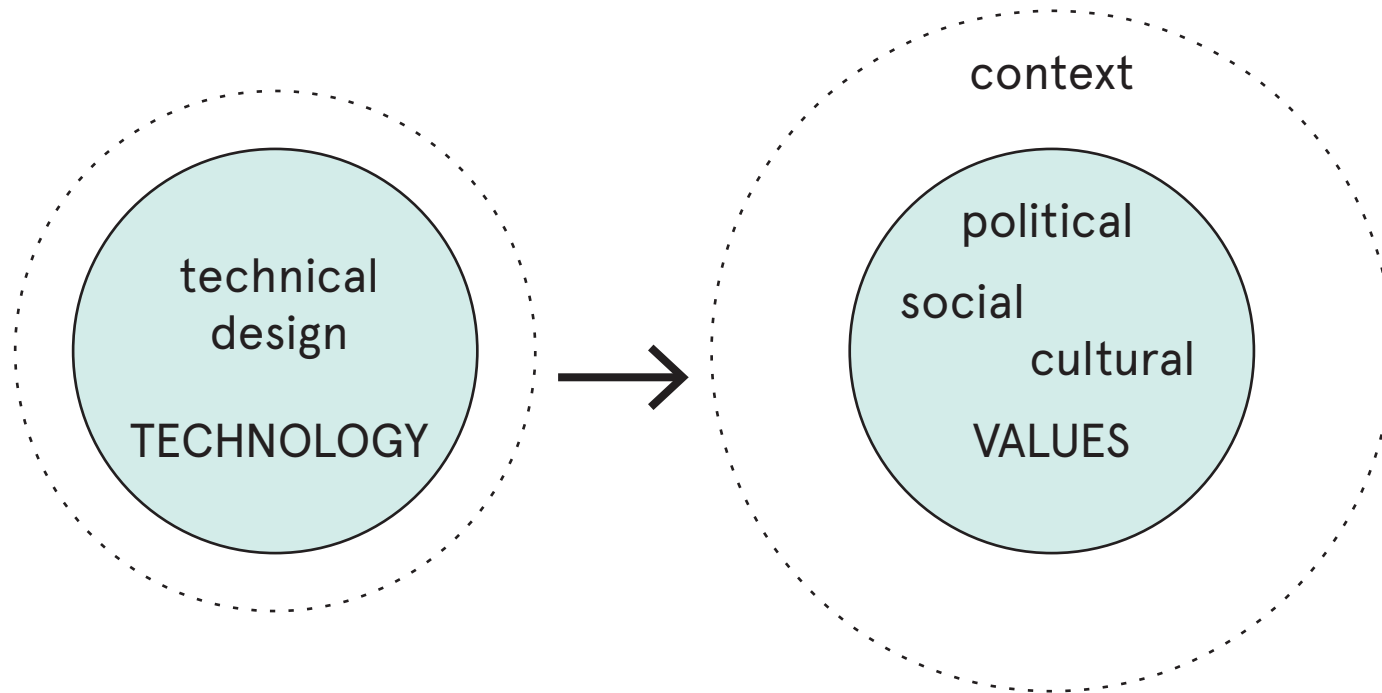


# Privacy & security concerns



# Frame a design

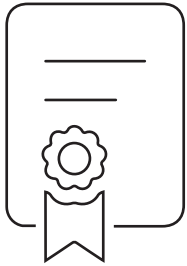
---



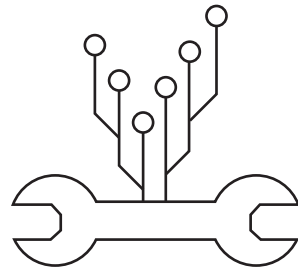
- understand the context
- define the socio-technical system
- explore future possibilities

# Frame a design

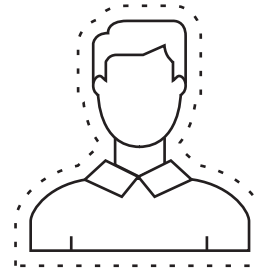
---



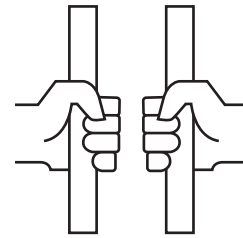
lack of  
lagislation  
and policies



improper  
uses



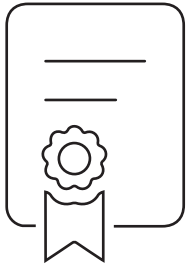
user  
profiling



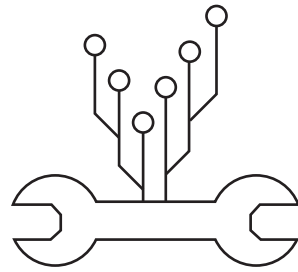
affecting  
user  
freedom

# Frame a design

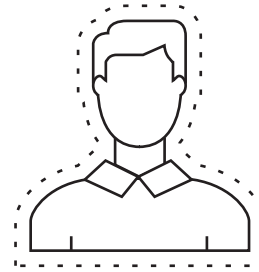
---



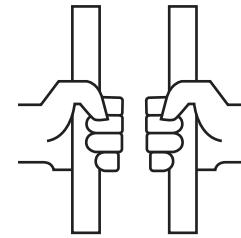
lack of  
lagislation  
and policies



improper  
uses



user  
profiling



affecting  
user  
freedom

*these issues should be included in the design process*

# Designer

---

- Forecasts future issues
- Involves the user in the design process
- Changes existing situation into preferred one
- Is responsible for the production of material environments

# Designer

---

- The behavior of the agents within the system is generally unpredictable, there may be no single vantage point from which complex systems can be designed and controlled [3]
- Designing in an ethically responsible manner is an evolutionary process

[3] Kroes, P., Light, A., Moore, S. A., and Vermaas, P. E. (2008), Design in engineering and architecture: towards an integrated philosophical understanding

---

# QUESTIONS?

---



**POLITECNICO  
DI TORINO**

**Eleonora Fiore**

Politecnico di Torino, Torino, Italy  
Department of Architecture and Design  
eleonora.fiore@polito.it

---

Relating Systems Thinking and Design (RSD5) Symposium