Values and Networks

Roland Bless (TM)
Carsten Orwat (ITAS)
firstname.lastname@kit.edu

Work in progress in context of the proposed SFB 1230 „Value-oriented Design of an All-Encompassing Internet“
Introduction Values

Values: lasting convictions or matters that people feel should be strived for in general and not just for themselves to be able to lead a good life or to realize a just society [1]

- They are not individual preferences. They are considered of being of importance for everyone.
- They provide means for orientation, justification, and evaluation of decisions of actions and preferences

At a global level: human rights as value catalogue

- Universal Declaration of Human Rights (UDHR), agreed upon by UN member states
- Translated into constitutional laws and interpreted by rulings of (supreme) courts: possibly narrower specifications of values
- Value conflicts no exception, but usual; mainly handled at national level

### Values

#### Relevant values of UDHR for ICTs

<table>
<thead>
<tr>
<th>Human dignity (Art. 1)</th>
<th>Freedom of religion (Art. 18)</th>
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<tbody>
<tr>
<td>Non-discrimination (Art. 2)</td>
<td>Freedom of opinion and expression (Art. 19)</td>
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<tr>
<td>Right to life, liberty and security (Art. 3)</td>
<td>Freedom of assembly (Art. 20)</td>
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<tr>
<td>Equal protection (Art. 7)</td>
<td>Rights for political participation (Art. 21)</td>
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<tr>
<td>Right to be presumed innocent (Art. 11)</td>
<td>Right for education (Art. 26)</td>
</tr>
<tr>
<td>Privacy (Art. 12)</td>
<td>Rights for cultural life, arts, and science (Art. 27)</td>
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Examples of Conflicts

- Human dignity
  - Free development of the individual
  - Privacy
    - Anonymous communication
      - Would also allow attackers to hide
    - Accountability
      - Required to take attack sources down

- Protection of life
  - Protection from harm
  - Security

Ways to handle value conflicts (1)

(At least) three main, interweaved ways to handle value conflicts:

- By **engineering** – technical solutions for conflicting requirements
  - Calculations, setting thresholds, argumentative reasoning, values in design concept
  - But in private companies often insufficient incentives to include specific values

- By **choice and markets** – different products according to different values
  - But several market failures possible

- By **policy and regulations** – balancing of interests, societal decision-making by legislation and court decisions
  - But regulation capture by partial interests and dominance of state interests possible
Ways to handle value conflicts (2)

- Interplay of measures decisive for actual value realization
  - Coherent and socially acceptable institutional arrangement: adequate incentives for engineering, institutional frameworks for markets, global arenas for policy and governance of the Internet

- Take into account: institutions and their values can be implemented and enforced by software
  - Institutions are established systems of rules that enable, structure or restrict social interactions
  - See also Lawrence Lessig’s “Code is Law“ [11], Lex Informatica [10]

- Internet Protocols as Institution
  - Protocols define formats and rules according to which interactions (e.g., data exchange) between communicating parties
  - Research on Internet Protocols and other software systems as part of institutional arrangements needed
Institutional arrangements and their relations

Legal institutions

Non-legal institutions

We are here!

- Human rights and constitutional laws
- Laws
- Regulations
- Moral norms and conventions
- Technical norms
- Professional norms
- Private contracts

Individual actions and interactions

Legend: (1) enable, structure and restrict; (2) frame, substantiate and specify; (3) interpret and support
Forthcoming challenges

- Internet of Things/Smart Objects, Internet of Everything, …
  - will have more influence on affected values
  - affects nearly all areas of life, provides many de facto rules of social interaction
  - implies a lot of machine-to-machine communication → automated trust, contracts? May require new institutions

- Which design options do we get by new technologies?
  - e.g., privacy in Named Data Networks vs. privacy in the Internet vs. privacy by overlay solutions like TOR

- Which Internet design principles are still applicable or valid?
General Research Questions (1)

- Which values lie behind protocols, design principles, technical and organizational measures in the Internet?

- Which values can be realized by networks in general?

- Which technical measures affect or enforce values?
Example – „Top Down“ Approach

Values

Design Principles

Technical measures

Transparency

Separation

Modularity

Support of Heterogeneity

Robustness

Openness

Security

Secure Channels

Simplicity

End-to-end argument

Extensibility

Randomness against Synchr.

Statelessness

Soft-State

Encryption

Authentication

Individual Freedom

Freedom of speech

Privacy

Economic Freedom

Freedom of communication

Security

Support of Heterogeneity

Robustness

Openness

Secure Channels

Simplicity

End-to-end argument

Extensibility

IETF 93, 2015-07-22, HRPC Meeting

TM, Prof. Zitterbart
ITAS, Prof. Grunwald
Example – Bottom-Up Approach „Interconnectivity“

- Engineers mainly consider technical objectives and values (e.g., good efficiency), but rarely their relation to related (social) values.

- Main (technical) fundamental objective according to D. Clark’s „The Design Philosophy of the DARPA Internet Protocols“ [13]

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Research Questions (2)

- Which values should be regulated (or even enforced), at which layers by which design principles?
- How can one assess technical implementations with respect to implementation of values?
- How to get from human rights to technical requirements?
  - Objective: reveal relationship between design principles and human rights
  - Not every human right is applicable to networks
Conclusions

- Pure technical solutions for enabling, enforcing or restricting rights/values are often costly, insufficient, inflexible, may have unintended consequences or create stakeholders with too much power
  - Take institutional arrangements into account
- Not every rule needs to be built into technical systems
  - Simplicity and freedom may define guide rails leaving room for negotiations
  - How can one agree on the implementation of certain values?
- Next steps
  - Create awareness in the technical community about impact of design choices on social values
  - Work towards a methodology for co-design of technical and institutional systems
References (1)


References (2)


