

# Modelling Sustainable Systems and Semantic Web

## Cooperative Action in Digital Change

Lecture in the Module 10-202-2309  
for Master Computer Science

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# Cooperative Action. Practical Examples

## Examples of cooperative structures

- ▶ OEIS – The online encyclopedia of number sequences
- ▶ The Debian Project –  
<http://www.debian.org/index.de.html>
- ▶ The Apache Project – <http://www.apache.org/>
- ▶ Java Community Process – <https://www.jcp.org>
- ▶ Wolfram Alpha – <http://www.wolframalpha.com/>

Theoretical considerations: The GNU Manifesto

<https://www.gnu.org/gnu/manifesto.en.html>

# Cooperative Action. Practical Examples

- ▶ What similarities can be seen?
- ▶ Which priorities characterise internal and external relationship?
- ▶ Which hints for a *theory of forms of cooperation* can be derived?
- ▶ How does this relate to the considerations of the *1985 GNU Manifesto*?

Example: OEIS – The Online Encyclopedia of Integer Sequences

<https://oeis.org/?language=german>

# OEIS – The Online Encyclopedia of Integer Sequences

## Observations:

- ▶ In the internal relationship, power structures have emerged that are based on well-known academic reputation structures.
- ▶ Central moments of an internal personal structuring are Bylaws, Board of Trustees, Advisory Board, Editorial Board.
- ▶ There is a "History of the OEIS". Today's structures can only be understood on the background of this historical development.
- ▶ Four "goals" are defined
  - ▶ To own the intellectual property known as "The Online Encyclopedia of Integer Sequences®" (or "OEIS®").
  - ▶ To maintain the OEIS as a service that is freely accessible by the general public.
  - ▶ To act so as to maintain its own existence indefinitely.
  - ▶ To collect and distribute funds in order to carry out the first three goals.

# The 5-Level Model

1. User: Uses the given options without having to take part in its extension. Interested in the *existence* of the platform.
2. Contributor: Posts own content. Contribution to the *development* of the platform content.
3. Editorial Board: Review of submissions. Contribution to the *quality assurance of the content* of the platform.
4. Platform operator: Reproduction of conditions for the platform to be running smoothly (in a comprehensive socio-technical sense) as management of the internal relationship.
5. The core of the OIES Foundation: Reproduction of conditions that ensure that running the platform is even possible. (Management of the external relationship).

What is the relationship between the individual levels and the 5-level model?

# The 5-Level Model

Users
Editors
Office
Platform Operator
Financing

Users
Content Provider
Organisation and quality assurance of the platform
Socio-technical organisation of the infrastructure
Financing

This relates to five system levels – the coupling between the system elements is organised in the system of the next level.

# The 5-Level Model

## Observation:

- ▶ The model is typical for today's platform structures and can be found in different forms.
- ▶ E.g. Amazon:
  - ▶ Level 2: Different shop owners.
  - ▶ Level 3: Organisation of the shop operator by Amazon, establishing an institutionalised code of conduct and its monitoring as a social level of the infrastructure.
  - ▶ Level 4: Technical level of the infrastructure. Research and further development of the algorithmic basis as requirement for level 3.
  - ▶ Level 5: Amazon as a private capitalist company.

# Forms of Cooperative Action

## Observations:

- ▶ The (legal as well as economic) functional logic of civic capitalist relationships shapes the internal relationship.
- ▶ Level  $i$  creates the infrastructural prerequisites for the level  $i - 1$ .
- ▶ From level 1 to level 5, the scope of personal involvement in the cooperative project increases.
- ▶ It is not a relation between equals: From level 1 to level 5 the possibility to influence the development of the cooperative project increases.
- ▶ There are fluctuations of staff between these levels: Intensive users become contributors, hard-working contributors participate in the editorial board, etc.
  - ▶ In the example, reputation and power structures are formed that are heavily oriented at academic reputation patterns or, conversely, are influenced by them.



# Forms of Cooperative Action

**Observation:** Prosumer approaches can be observed at all levels; there is no typical division into producers and consumers.

- ▶ The transition from level  $i$  to level  $i + 1$  means to move from a *user* of the service of the infrastructure to a *producer* of this service within the framework of the cooperative context.
- ▶ Every contributor remains a user, every editor remains a contributor etc., and brings in the knowledge about the "what?"
- ▶ Hence the question of the identification of "Customer needs" (what?) move in the background in favour of questions of the implementation (how?) of cooperative goals on the respective level.

# Forms of Cooperative Action

The internal structure of capitalist companies follows a similar "top-bottom logic". From such a perspective the following forms can be distinguished.

1. The classical owner-managed company.
  - ▶ With the notions "ingenious inventor" and "wage labourer". "Intellectual Property" is a right of a person and basis for the expropriation of the wage labourer.
2. Stakeholder-driven company forms such as Stock Corporation.
  - ▶ With the notion "legal person". Copyright as economically useful legal title in the *external relationship* and basis for expropriation of the "ingenious inventor". Copyright, Closed Culture.
3. Network cooperation.
  - ▶ Copyright law as a functional basis of the *internal relationship* required to reproduce the infrastructure. Copyleft, Open Culture.
4. (Hypothetical?) Free cooperation.