

# Modelling Sustainable Systems and Semantic Web

## Digital Action Space

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

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# Digital Transformation

Concept of the **Digital Universe** as a rather technically shaped inner-societal space of action through the processing of digital data, with a vague demarcation. Picking up a common buzz word.

- ▶ "By 2020, the digital universe will amount to 44 trillion gigabytes" (EMC Digital Universe with Research & Analysis by IDC. The Digital Universe of Opportunities: Rich Data and the Increasing Value of the Internet of Things. April 2014).
- ▶ Reference to the central thesis – a spatial metaphor is used to analyse the digital transformation from a specific dichotomy.

## Central Thesis:

The digital transformation is characterised by a rapidly growing "world of digital data", through the analysis and processing of which influence is exerted on real-world processes.

## On the Critique of this Approach

- ▶ In this version, we want to focus on questions of how current structuring processes in the digital universe and real-world processes interact and influence each other.
- ▶ The concept of juxtaposing "real-world" and "digital" reality is problematic overall, since actions in the digital universe are both motivated by real-world practices and have an influence on real-world practices.
- ▶ However, the concept emphasises that many real-world contexts of action interact with technical processes in this space and therefore such an abstraction seems reasonable.

## The Digital Knowledge Revolution

Michael Schetsche: "The digital knowledge revolution" (2006, in German) identifies six social and cultural dimensions:

- ▶ a new order of knowledge,
- ▶ social control through technical norms,
- ▶ the automatic archive function of the net,
- ▶ the supplementation of the exchange economy by a gift economy,
- ▶ the abolition of the guiding difference between "public" and "private",
- ▶ the dialectic of possibility and obligation of permanent communication.

# Digital Transformation

All in all, it makes sense and is necessary to speak of a *transformed social order* in which the *structurally decisive changes* emanate from the digital networks.

A more precise understanding of the change in particular in the order of knowledge is an essential part of an analysis of the digital transformation.

Problem: For the new phenomena, we (initially) only have the old terms.

I will not elaborate on that here and refer to (Schetsche 2006).

**How and where are you acting  
in the digital universe?**

**What opportunities for your own  
and collective action in the digital universe  
do you frequently use?**

**Which preconditions  
must be fulfilled for this?**

# Digital Spaces of Action. From earlier Discussions

- ▶ The digital universe breaks down into different universes – the Instagram universe, the Facebook universe, the Google Scholar universe, the Wikipedia universe, the Search universe etc.
  - ▶ Space in space metaphor. Such „subspaces“ are constituted by specific kinds of social relations and specific social practices.
- ▶ What to do there?
  - ▶ Upload pictures and data.
  - ▶ Like and be liked.
  - ▶ Communicate with friends in Corona times.
  - ▶ Online appointment for offline meeting.
  - ▶ Present oneself in digital spaces.
  - ▶ Searching for useful information.

# Digital Spaces of Action. Accounts

- ▶ Diversity of accounts = diversity of digital identities
  - ▶ Identity in the singular or in the plural?
  - ▶ My Core – world and reality, meaningful terms?
  - ▶ Diversity of identities or of real-world facets
- ▶ *Identity* as an important concept in the civil legal system, which is also legally attached in order to be able to assign consequences of actions.
- ▶ Questions of private digital spaces of action can only be meaningfully discussed if the user is "logged in" to a computer via an **account**.

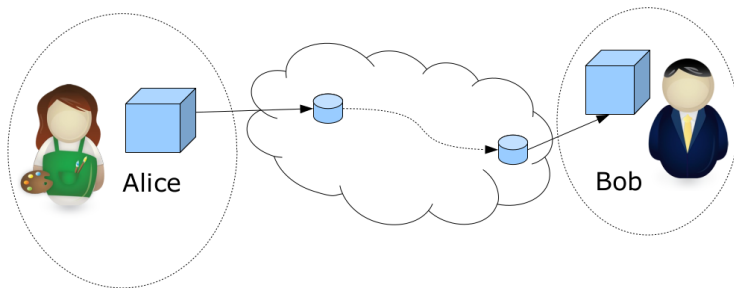
This also applies to other (e.g. mobile) devices, although the technical connection to an account (via SIM card and own security settings) is less visible there.



# Using Digital Spaces of Action. Digital Identity

- ▶ Such an account is associated with a **digital identity** to which actions on the internet are assigned, via which the usual legal-social constructs of the *legal attributability of actions* are transferred to the digital sphere.
  - ▶ The private attribution of consequences of action is a *pillar of the civil legal order*.
  - ▶ The technical possibilities in the digital universe can *improve* or *complicate* the attributability of legal responsibility.
  - ▶ Possibility of *anonymous action*. But: traces of actions are fundamentally accessible to forensic analysis. This also applies to actions on the internet.

# Real-world and Digital Identities



For actions in the digital universe, real-world identities must be tied to digital identities.

# Real-world and Digital Identities

- ▶ The assignment of a digital identity to a real person takes place via **authentication**, which appears to be a *private* act (albeit technically preconditioned).
  - ▶ However, it presupposes an **authenticator** as the technical counterpart and thus a higher-level legal context. This assignment process is nevertheless postulated as private in the public.
- ▶ Private digital spaces of action can only be shaped through the binding to a digital identity.
  - ▶ The rebinding of a digital identity to a civic legal subject is itself a socio-technically institutionalised process.
  - ▶ This rebinding is particularly simple if the signature of a technical artefact from the digital universe can be easily assigned to the civil legal subject.

# Acting on the Internet

- ▶ Spaces of action are socially determined. Digital spaces of action can be and are constituted and assigned through **authorisation**.
- ▶ In shaping spaces of action on the internet, subjects are highly dependent on technical services and thus on external institutions whose *trustworthiness* they must assess appropriately.
- ▶ Regulatory provisions for action on the internet exist only in rudimentary form, so that *appropriate practical action* and *cooperative arrangements* on a *contractual basis* are the main forms of shaping a concept of "privacy on the internet".
- ▶ An *appropriate* understanding of the technical conditions, possibilities and restrictions of the internet is essential for the qualified shaping of personal actions on the internet.
- ▶ Social action constitutes the intersubjective relations of a subject.

# On the Concept of Action Space

## Thesis:

The concept of action space in the nowadays common sense is a cultural achievement of bourgeois civic society.

- ▶ Spaces of action as a "space within space" contextualise possibilities of cooperative arrangements in an "external space".
- ▶ *My* spaces of action are identity-constituting, and the actions in these spaces form the basis for my personality as a civic legal subject.
- ▶ Only on this basis can delimitations of other concepts such as *environment*, *acting in an environment*, *cooperative action* and thus ultimately concepts such as *subject*, *privacy* and *identity* be meaningfully grasped.
- ▶ Collaborative spaces of action can be condensed into "cooperative subjects" in the sense of the civil legal order.

# Private Action and (Digital) Identity

*Private action presupposes a concept of self, of personal identity.*

- ▶ Digital identity, multiple digital identity and roles  
Is identity divisible?
- ▶ Abstract identity, textual representation  
Assignment mechanisms, e.g. website and login
- ▶ Authentication  
Password, other forms of authentication
- ▶ Authorisation  
Me as subject and as object of authorisation.
- ▶ Potential and real assignment. Notion of session.

# Digital Identities

- ▶ Digital identity, abstract identity, textual representation
- ▶ Website, login, mobile devices
- ▶ Concept of session (not only on websites)
- ▶ Authentication and authorisation

## Digital Identity

In the following, we will understand *digital identity* as a **real-world civic subject** *authenticated* under a textual representation `<name@rechnername>` and *authorised* in the context of a session, who performs actions in the digital universe for a limited period of time.

## The Concept of Roles in Computer Science

- ▶ In computer science, a role is a bundle of necessary *experience, knowledge and skills* that an employee must have in order to perform a certain *activity*.
- ▶ Roles are defined by *role descriptions* within a *role model*.
- ▶ A role is associated with *activities* and *responsibilities*.
- ▶ *Qualification characteristics* are required to perform a role.
- ▶ A person can have several roles. Several persons can have the same role.