

Modelling Sustainable Systems and Semantic Web Information and Language

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for Master Computer Science

Prof. Dr. Hans-Gert Gräbe
<http://www.informatik.uni-leipzig.de/~graebe>

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Storytelling and Action

Our actions are closely related to the stories which we are permanently telling in parallel to each other.

- ▶ With these stories we transcend *our own world of experience* that is only a small part of THE WORLD. And we can grasp it only selectively.
- ▶ Storytelling is the form in which we make other people's worlds of experience accessible for us.
- ▶ This requires the *coordination of our conceptual worlds*.
- ▶ The *purpose* of the exchange of ideas is to *agree on cooperative action*.

Storytelling and Action

The (cooperative) changes of the world are preceded by speaking about these changes (the imagination of the change).

- ▶ Thinking and Doing: Justified expectations → World-changing cooperative action → Experienced results
- ▶ Concurrency of cooperate actions.
- ▶ In the tension between justified expectations and experienced results the ceasefire lines of the WORLD become visible.

Storytelling and Action

But how change a world that is also constantly changing by itself?

- ▶ Culture: Change the way the world (nature) is changing.
- ▶ Technology (tool perspective) and storytelling (perspective of expectations and experiences) are two essential moments of such an understanding of culture.
- ▶ Technology comes in here as *general processual knowledge*.
- ▶ It is only possible to apply it (consciously) *in specific contexts*.
- ▶ Separation of goals and means in modern society is a specific form of storytelling.
- ▶ The widespread separation of these two moments causes essential problems to understand the unity of the reality.

Storytelling and Digital Change

- ▶ Within the digital change new forms of storytelling are developing, which break up the previously institutionalised procedures of storytelling.
- ▶ Web 1.0 – Linked websites as a new form of storytelling.
- ▶ Semantic Web – RDF as a new basic technology to operate a certain kind of storytelling with computer support.
- ▶ Digitisation of important language artifacts. Examples from the German Digital Universum:
 - ▶ German Digital Library (Deutsche Digitale Bibliothek – Kultur und Wissen online)
<https://www.deutsche-digitale-bibliothek.de/>
 - ▶ Europeana – <https://www.europeana.eu/de>
 - ▶ Digital Library at TextGrid –
<https://textgrid.de/digitale-bibliothek>
 - ▶ Zeno.org, a full text library – <http://www.zeno.org/>

Storytelling and Digital Change

What social infrastructure conditions are required in order to develop this potential?

- ▶ Pilar 1: *Free* (as in free speech) **access to the knowledge** resources of the mankind, to communicate prospects of expectation and experience in an appropriate way.
- ▶ Pilar 2: **Acting** in a civil society as responsible *private* action, in which the consequences of action are privately assigned is a cultural achievement. This includes the ability to close contracts, liability, ownership, and institutionalised checks and balances in their historical evolution.
- ▶ The digital change requires a new balance between these two pillars. In the legal context of a civil society that means above all the readjustment of its *legal* constitution and framework.

What is Language?

It is obviously about processes mediated by language (including computer language). How does language work? What does linguistics say about this?

Language, a system of conventional spoken, manual (signed), or written symbols by means of which human beings, as members of a social group and participants in its culture, express themselves. The functions of language include communication, the expression of identity, play, imaginative expression, and emotional release.

(<https://www.britannica.com/topic/language>)

Information and Language. Linguistics

<http://de.wikipedia.org/wiki/Sprachsystem>

The idea of how the **language system** is built depends on which language or grammar theory it is based. The different theories have mostly the following assumptions about the components of the language system in common:

- ▶ There are **linguistic units that are organised hierarchically** and reach from the smallest units, the sounds, to the phonemes, morphemes, words, parts of sentences, sentences up to texts and possibly to discourses.
- ▶ In this hierarchy, from the morphemes on the units have **additional to their form** a grammatical or lexical **meaning**.
- ▶ At each level of the hierarchy there are **rules** that determine which positions and combinations of units are allowed and which are not. This applies to both the linguistic forms and their meanings.

http://www.christianlehmann.eu/ling/lg_system/index.html

Formative and Significant Subsystems

The language system relates thoughts to sounds. This association is indirect in several ways: A language system cannot associate thoughts ... and also not sounds ... but only linguistic units with each other. These are on the one hand **Significata** (the thought as content of the sign) and on the other hand **Significantia** (the sound as expression of the sign).

Hence the language system contains **two formative subsystems**:

- ▶ In **Semantics**, the thought is formed into a significatum.
- ▶ In **Phonology**, the sound is formed into a significant.

Information and Language. Linguistics

(cont.)

In addition to these formative subsystems, there is the **Significant Subsystem**, which combines Significantia and Significata and thus creates **Language Signs**. ... It is divided into two subsystems:

- ▶ Finalised language signs are stored in the **lexicon**.
- ▶ New language signs are formed in the **grammar**.

Information – a new Phlogiston?

What is Information?

- ▶ Inflationary use of the term information.
 - ▶ Günter Ropohl remembers the times when there was a counter "Auskunft" at a German railway station. (Source: Klemm 2003)
- ▶ The computer scientists stick to an ontologising (and ultimately a tangible) concept of information.
- ▶ The linguists talk about language practices.

Another critical debate occurred in the late 1990s

- ▶ Capurro's Trilemma
- ▶ Trialog (Capurro, Fleissner, Hofkirchner): Is a unified theory of information feasible?
- ▶ Heinz Klemm (2003): "A great misery" (German: "Ein großes Elend")

Information – a new Phlogiston?

Peter Janich: The concept of information has necessarily to refer to successful human communication.

However, for successful prompting practices it is fundamental that through them a successful connection is established for the involved people between the (language) act of prompting and (non-language) act of obeying. (Janich 1998)

Grundlegend für gelingende Aufforderungspraxen ist jedoch, dass durch sie eine für die beteiligten Personen gelingende Verbindung der (sprachlichen) Handlung des Aufforderns und der (gegebenenfalls nicht-sprachlichen) Handlung des Befolgens stattfindet.

Information – a new Phlogiston?

Raphael Capurro:

What I am criticising is the idea to have by the reductionistic concept of information a kind of phlogiston: To mean that one comes through the different levels – Aristotle called this logical error metabis eis allo genos – and thus to believe e.g. better to explain how life arises from matter. So we are not far from the use of the concept of form – informatio originally goes back to forma and eidos – in relation to matter, life, soul, etc. We would be faced with a new or old form of metaphysics.

Was ich kritisiere ist die Vorstellung, durch den reduktionistischen Informationsbegriff hätte man eine Art Phlogiston: man kommt durch die verschiedenen Ebenen – Aristoteles nannte diesen logischen Fehler metabis eis allo genos – und glaubt damit z.B. wie aus Materie Leben entsteht besser erklären zu können. Damit sind wir nicht weit von der Verwendung des Formbegriffs – informatio geht ursprünglich auf forma und eidos zurück – in Bezug auf Materie, Leben, Seele usw. Wir hätten es mit einer neuen oder alten Form von Metaphysik zu tun.

Information – a new Phlogiston?

The problem is once again: Where is the human being as an *acting* subject?

Klaus Fuchs-Kittowski stated already in the 1980s:

The concept of unity of self-organisation and generation of information – the information processing approach neglects the formation of meaning in the process of real life.

Das Konzept der Einheit von Selbstorganisation und Informationsentstehung – Der Informationsverarbeitungsansatz vernachlässigt die Bedeutungsbildung im Lebensprozess.