Modelling Sustainable Systems and Semantic Web

Information and Language

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

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Storytelling and Action

Previous Discussion

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

- With these stories we transcend *our own world of experience* that is only a small part of THE WORLD, that we can grasp only selectively.
- Storytelling is the form in which we make other people's worlds of experience accessible for us.

Storytelling and Action

In the first plane locally emerges an image like in a theater: the stage (own experiences) and backdrop (structured processing of the storytelling) as a unit.

- Private action in this sense is acting on the stage, in front of this backdrop.

Cooperative Action:

- Is only possible on a *common* stage, in front of a *common* backdrop. Both are first to be created.
- Hence storytelling precedes cooperative action.
- In particular it requires an intersubjective image of man.

Storytelling and Action

On the other hand, speaking is itself acting.

- Speech acts can contain prompt phrases, protocol sentences, judgement records, etc.
- Storytelling is only possible in a cooperative context. Hence action also precedes storytelling.
- Hermeneutic Circle.

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

- Thinking and Doing: Justified expectations $\rightarrow$ World-changing action $\rightarrow$ Experienced results
- 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 changes of the world (nature).
- Technology (tool perspective) and storytelling (perspective of expectations and experiences) are two essential moments of culture.
- Technology comes in here as *processual knowledge*.
- Separation of goals and means as a specific type of storytelling.
- The widespread separation of these two moments causes essential problems to understand the wholeness of the reality.

Storytelling and Digital Change

Previous Findings

- Within the digital change new forms of storytelling are developing, which break up the previously institutionalized procedures of storytelling.
  - How does progress work?
  - Losses in advancing (Ernst Bloch)
- 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.
- Digitization of important language artifacts.

  Our time like no other offers a vast collection of knowledge in text form. The entire intellectual history of mankind is available on CD-ROMs, on websites, in second-hand bookshops and in bookstores, everything is well connected and easily accessible. It would be a shame not to use this material awake and open minded. (Matthias Käther, 2004)

Storytelling and Digital Change

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

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

Information and Language. Linguistics

It is obviously about processes mediated by language (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 as base. The different theories support mostly the following assumptions about the components of the language system:

- There are **linguistic units that are organized 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.

Information and Language. Linguistics

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

Formative and Significative 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** and on the other hand **Significantia**.

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 significant units are stored in the **lexicon**.
- New significant units are formed in the **grammar**.

Information – a new Phlogiston?

- 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 ontologizing (and ultimately a tangible) concept of information.
- The linguists talk about language practices.

Information – a new Phlogiston?

Another critical debate occured 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")
- 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)

Information – a new Phlogiston?

Raphael Capurro:

> *What I am criticizing 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.*

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-organization and generation of information – the information processing approach neglects the formation of meaning in the process of real life.*

Summary

Starting point: RDF – what is happening there and in general in the internet?

- It is a digital form of storytelling.
- Storytelling accompanies our *cooperative actions*. Cooperative actions are possible only in such an interpersonal language based context.

  Question (1): *What* is here conveyed by language?
- But: Storytelling is not reduced to its *communicative* function. It has also a *reflective* component.

  Question (2): How does *theory building* work on such an empirical background?
- There is an arc of tension: Justified expectations → World changing actions → Experienced results
  - Interpersonally this arc of tension is to be explored only in language form and *only in specific contexts*.

Summary

Why act cooperatively? "Change the world".

- But how to change a world that is also constantly changing itself? How to deal with the diversity and contradictions of the requests for change?
- Approach "influence the changes of the world".
  - "Doing" is embedded here, prior to it is the reality of life. Justified expectations can only be derived from this reality.
  - Experience: *Practical* influence is (today) only possible through application of adequate processual knowledge and procedural skills.
- But why cooperate?
  - Cooperative action is more powerful than individual action because synergistic effects are emerging.
  - The whole is more than the sum of its parts.

Summary

Cooperative action is only possible in a *common context of meaning*.

- Experience: *Understanding* language presupposes a common context of meaning on the one hand, and continues to rewrite it on the other.
- This context of meaning expresses itself above all in the *social use of common terminology in common activities*.

  Question (3): How can that itself be expressed in language form?

Experience: Such contexts of meaning are stabilised through *institutionalisation*. Meanings are tied to social practices as a specific interaction between logos and telos.

- *Practically proven actions* are socially secured as *institutionalised practical procedures* and thus as technology.
- Question (4): How to set up the notion of *knowledge* in this context?

Summary

Observation: Such institutionalized contexts of meaning are nested and interlaced in many ways.

- Experience: Cooperation between cooperative structures requires translation between contexts of meaning.

  This is yet hardly understood in the field of semantic technologies.
- People are involved in cooperative contexts with partial identities only $\rightarrow$ concept of roles.

The core of all four questions: How does such an institutionalisation of contexts of meaning work?

- We also had identified this question as a core problem of semantic technologies.
- Historically in the last 150 years there have been various attempts to this problem.

Summary

Attempts to develop a general language theory as Universal Theory.

- Logical positivism of the Vienna Circle (1920s).
- Syntax, semantics, pragmatics (Charles W. Morris, 1940)
- Continuation as semiotics and linguistics in the 1970s.
- Noam Chomsky and his approach to a universal grammar.

At the same time, since 1920, increasing importance of evolutionary approaches: Institutionalisations of contexts of meaning are hierarchically complex and can be unterstood only in their historical-cultural development.

- Biosemantics: focus on coevolution of neural patterns and evolutionary patterns of contexts of meaning.

Summary

Pragmatics: Terms develop with their interactive use. (Jacob L. Mey: Pragmatics, 1993)

- The development of concepts cannot be detached from their practical use, in particular forms and practices of judgment and judgment.