

# **Evolution of Technical and General Systems**

**17. Interdisziplinäre Diskussion at the  
Computer Science Institute at Leipzig University,  
supported by InfAI, Research Academy Leipzig,  
MINT-Network and LIFIS**

**5. Februar 2021, 10 – 16 Uhr, online**

For more information see

<http://mint-leipzig.de/2021-02-05.html>

## Our series of interdisciplinary discussions

- The interdisciplinary discussions are the highlight at the end of each semester of our interdisciplinary courses.
- So far we deepened with 1..2 invited experts aspects of digital change over coffee and sandwiches in a room of the Research Academy Leipzig.
- Under corona conditions we set up an online variant. It has a minus – we cannot serve coffee and sandwiches – but also a plus – participants and speakers don't have to come to Leipzig to take part in the discussion. The latter opens up potential that we were able to exploit for the price of transition to English as the working language.
- The focus is on exchange among colleagues, for what sufficient time is planned.
- Please only switch on your microphone when you want to speak, and consider also use the chat to add comments, questions and statements.
- We plan to publish all of the materials – also the chat – so please note in the chat if your name should appear only in abbreviated form.

## **A few comments on the subject of today's discussion**

- We are working here in Leipzig for several years on systematic innovation methodologies with TRIZ at its center.
- TRIZ – the Theory of Inventive Problem Solving – mainly deals with particularly difficult problems, that are hard to solve due to obstacles that result from fundamental contradictions in the requirements.
- TRIZ offers a large toolbox of widely approved methods that are often surprisingly quick lead to solutions to problems that could not be tackled by other methods over years.
- The systematization and generalization of TRIZ theory are essentially based on decades of processing engineering and technical experience.
- Besides a glossary from about 700 terms a universe of justification structures emerged in which the methodological instruments are embedded.
- In our seminar in this semester we mainly studied the laws of the evolution of technical and general systems, which form the keystone in that hierarchy of justification.

## A few comments on the subject of today's discussion

We compared the approaches from different TRIZ schools and came to the following results:

- Mathematicians, physicists, engineers, managers and lawyers understand the term "law" in different ways. Common to all these understandings is that **for intelligible action these connections must not be ignored.**
- Laws as stable justification forms are part of the **institutionalized ways of processing** in which we structure and organize our social life, and this forms together with the **socially available procedural knowledge** as well as the **private procedural skills** the triad of our **concept of technology.**
- As technological development advances, these stable justification forms also continue to develop.

With the focus on engineering action, we also rely on a **specific of the 20<sup>th</sup> century**, in which the **engineering profession matured.** In this fairway, the concept of science itself changed, from a largely speculative philosophy of nature in the 19<sup>th</sup> century to the "modern science" of the 20<sup>th</sup> century.

I hope that we can take up and deepen these aspects in today's discussion.