

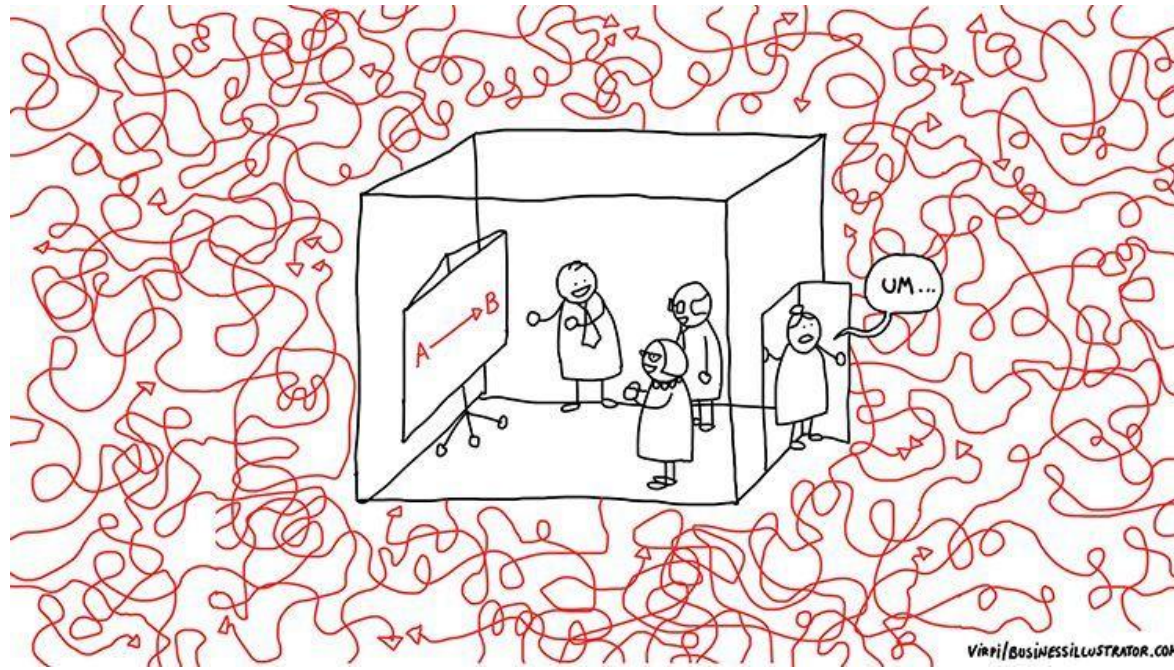


## SynergyLab 04/2025

Lieber nicht so genau und dafür relevant? Zielkonflikte der dynamischen Modellierung in Organisationen

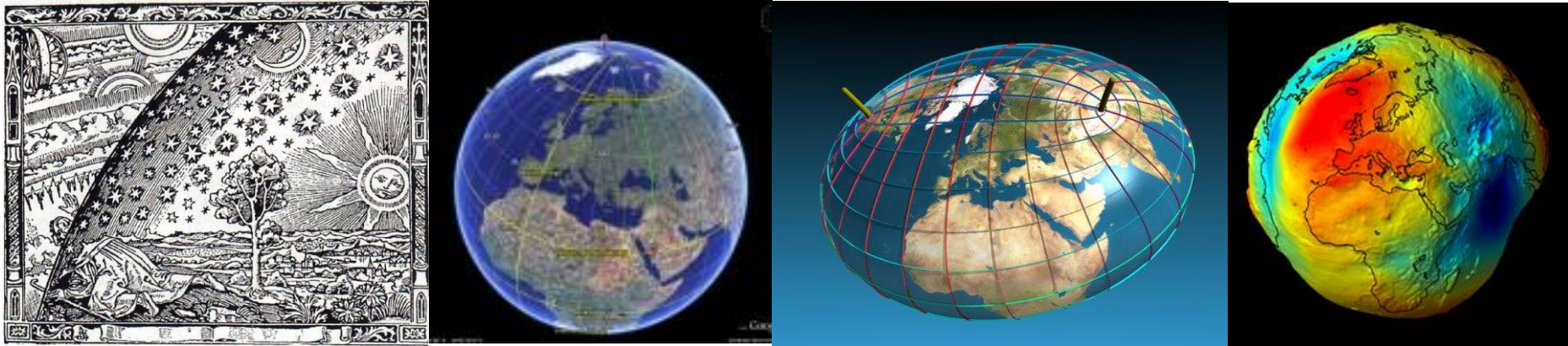
## Real systems are characterised by dynamic complexity.

People have systematic problems understanding (dynamic) complexity, thus the need for modelling and simulation → cf. the Contant-Ashby theorem.



## “All models are wrong, but some are useful.” (George Box, 1976)

- Models are simplifications: “all models are wrong”
- Does that mean, we cannot say anything about their quality? Of course not, there are better and worse models.
- However, the quality cannot be assessed in general but depends on the purpose of the model: “some are useful”



cf. Asimov (1989)

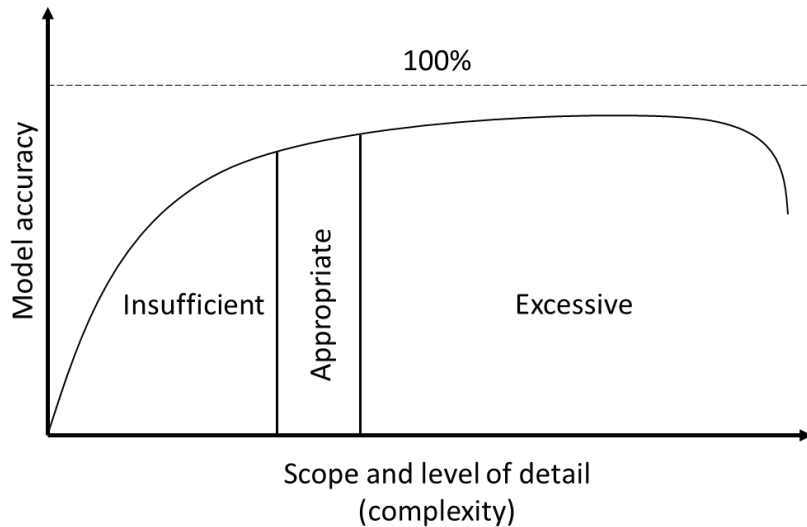
# Modelling in the “inexact” sciences: simplification as a feature

Smaldino, 2023

- “... model analysis is merely a series of computations based on assumptions specified by the modeller. To put it another way, **a formal model is a logical engine that turns assumptions into conclusions.**” (p. 6)
- “... people are not nearly as good at mentally simulating the dynamics of complex systems as they think they are.” (p. 295)
- “... *inexact sciences* are those in which the mappings between measurement and theories are imprecise. [...] The social sciences are almost always inexact. [...] Models of social phenomena *do* usually involve extreme simplification of complex situations – **this simplification is exactly the point of models.**” (p. 11)

# Model accuracy as a function of model complexity (scope and detail)

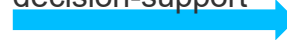
adapted and extended from Robinson 2004



Research: general insights



Practice: concrete decision-support



- Accuracy  $\neq$  precision; accuracy  $\approx$  usefulness(?)
- Models will never be 100% accurate.
- There isn't the one best level of scope and detail.
- There are diminishing returns with growing scope and detail.
- Too little but also too much scope and detail lead to low accuracy.
- Research and practice have contradictory goals regarding modelling complexity
- Which, however, is reversed for the desired complexity of findings/take-aways...



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**Thank you!**



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