

re intellecta, in verbis simus faciles

or: what's your model?

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LiLa Workshop, Milan, June 3, 2019

Introduction

We've come a long way...

The humanist who wishes to utilize computers has one central task: To tell the machine operators what he wants them to accomplish. This is simple, but not easy. [Kroeber 1967]

- ▶ Digital humanities has certainly come a long way since then, and many things have definitely become **simpler**.
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DIGITAL HUMANITIES?

JUST DO IT.

Or have we?

- ▶ But have things become **easier**?

*A thoroughly lucid explanation of **what** I want to accomplish compels me to face **why** I want to do this work [...] and it forces me to define explicitly the meaning or meaninglessness of fundamental terminology in my discipline. [Kroeber 1967]*

- ▶ The simpler it becomes to **just do** something, the less you need to **think** about it.

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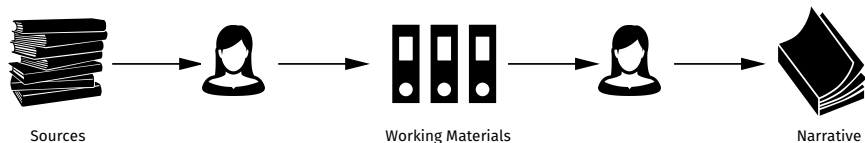
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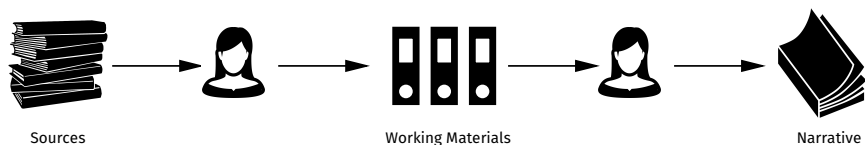
Digital Humanities: Why and How?

Traditional research process



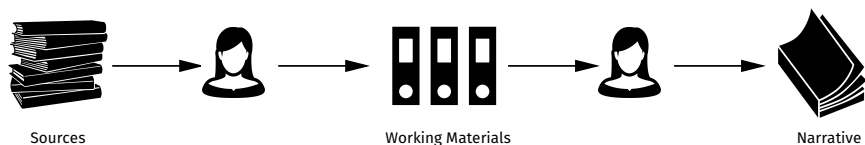
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- ▶ Facts and insights are recorded as **working materials** in a variety of forms [on paper or electronically, as text, in spreadsheets, databases, etc.]
- ▶ Using the working materials, scholar constructs **mental model** to answer research question and describes the model in a **narrative**.

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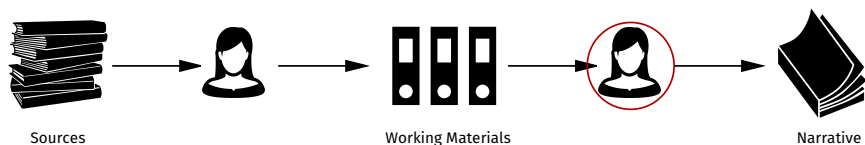
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Models in the humanities?

- ▶ **All** scientific and scholarly research constructs models of their objects of research in order to understand phenomena that are too complex or not directly accessible to observation.
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What do we mean by “model”?

We use the term in the sense of Stachowiak's **Allgemeiner Modelltheorie** [‘General Model Theory,’ Stachowiak 1973].

Three fundamental properties of models:

Mapping property Models are always **models of something**
(no matter if natural, artificial, concrete, abstract, ...)

Reduction property Models generally **do not capture all attributes** of the original they represent, but only those that seem relevant to the model creators and/or model users.

Pragmatic property Models are **not per se uniquely assigned** to their originals. They fulfill their replacement function

- Ⓐ for particular subjects,
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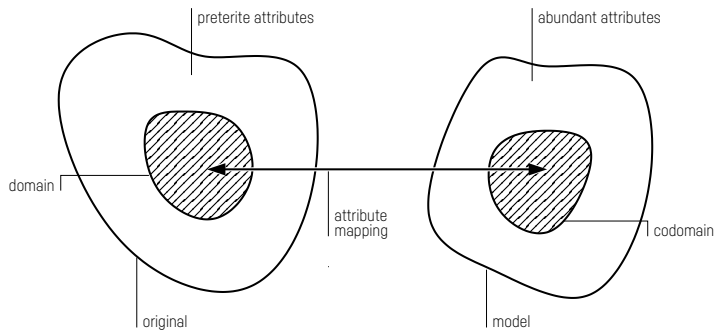
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Original-model mapping

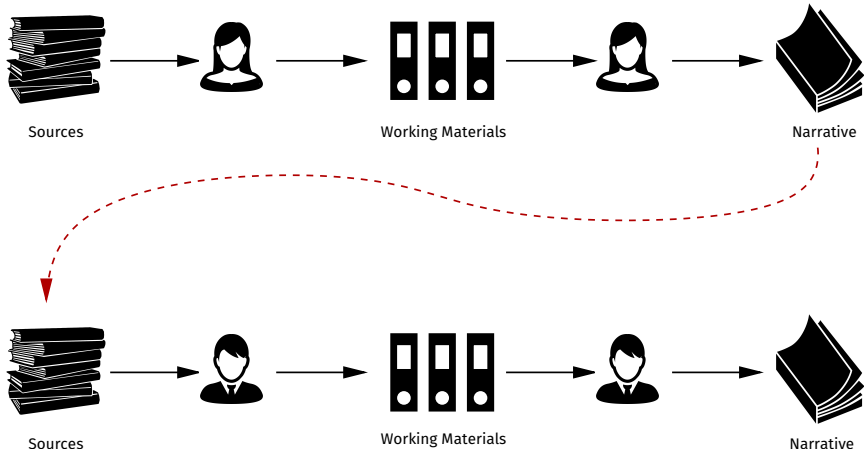


Credits: Redrawn from Stachowiak [1973, p. 157]

Building on the Work of Others

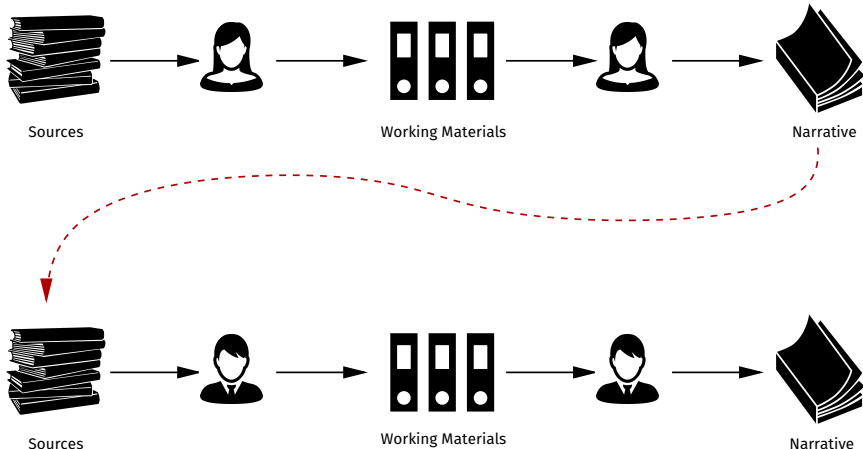
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Building on the work of others (traditional process)



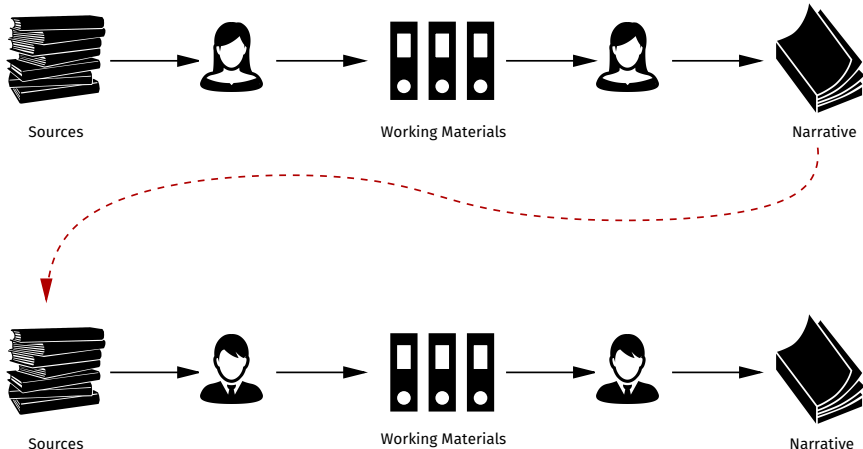
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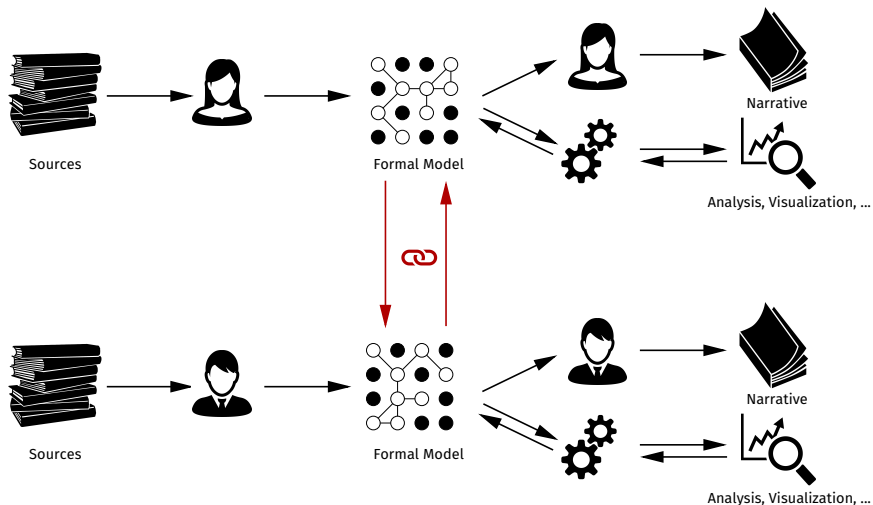
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Collaboration on a higher level through formal models

- ▶ Telepathy is unfortunately impossible!



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Слово «формальный» не означает ничего, кроме как «логически последовательный + однозначный + абсолютно явный». [Gladkij and Mel'čuk 1969, p. 9]

The word “formal” means nothing more than “logically coherent + unambiguous + explicit.”

- ▶ A formal model is thus more than explicit.
- ▶ There are different degrees of formalization.
- ▶ In digital humanities, we are primarily interested in a degree of formalization that allows models to be processed and manipulated by computers.

→ Computational models

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Computational models and theory formation

Joseph Weizenbaum in **Computer Power and Human Reason** [1976]:

*The connection between a model and a theory is that a model **satisfies** a theory; that is, a model obeys those laws of behavior that a corresponding theory explicitly states or which may be derived from it. [...]*

Computers make possible an entirely new relationship between theories and models. [...] Theories written in the form of computer programs are ordinary theories as seen from one point of view. [...] A theory written in the form of a computer program is thus both a theory and, when placed on a computer and run, a model to which the theory applies. [Weizenbaum 1984, pp. 143–145]

Digital Humanities

Digital Humanities

What DH is not

*In this field one should not use the computer primarily for speeding up the operation, nor for minimizing the work of the researchers. **It would not be reasonable to use the computer just to obtain the same results as before, having the same qualities as before, but more rapidly and with less human effort.** [...] To repeat: the use of computers in the humanities has as its principal aim the enhancement of the quality, depth and extension of research and not merely the lessening of human effort and time. [Busa 1980, p. 89]*

Definition [Applied digital humanities]

Research in the humanities using formal models, and the methodology of constructing such models.

→ Digital history, digital philology, digital musicology, etc.: **subfields of their disciplines.**

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→ Concerned with “construction materials” for formal models: **metascience.**

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- ▶ Most phenomena of interest to the humanities are characterized by uncertainty and vagueness.
- ▶ The suitability of conventional computational approaches is limited.
- ▶ In order to gain new insights (\neq engineering) we need to **understand** our models—otherwise they do not fulfill their purpose.
- ▶ Modeling approaches must primarily be looked for in the field of **knowledge representation**.
- ▶ Interdisciplinary challenge: finding formalizations that are adequate in two respects.
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Conclusions

Formal models in the humanities



Computers are valuable to the humanist exactly because what they produce compels him, or if you prefer, inspires him, to restudy and re-evaluate the artifact, the work of art, the human achievement which is the appropriate object of his dedication. (Kroeber 1967, p. 142)

*In fact, the computer has even improved the quality of methods in philological analysis, because its brute physical rigidity demands **full accuracy, full completeness, full systematicity**. [...] Using computers will therefore lead us to a more profound and systematic knowledge of human expression; in principle, it can help us to be more humanistic than before. (Busa 1980, p. 89)*

But only if we have good theoretical foundations!

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LiLa Workshop, Milan, June 3, 2019

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