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The Digital Humanities—the "Computational Linguistics" for the Rest of the Humanities?

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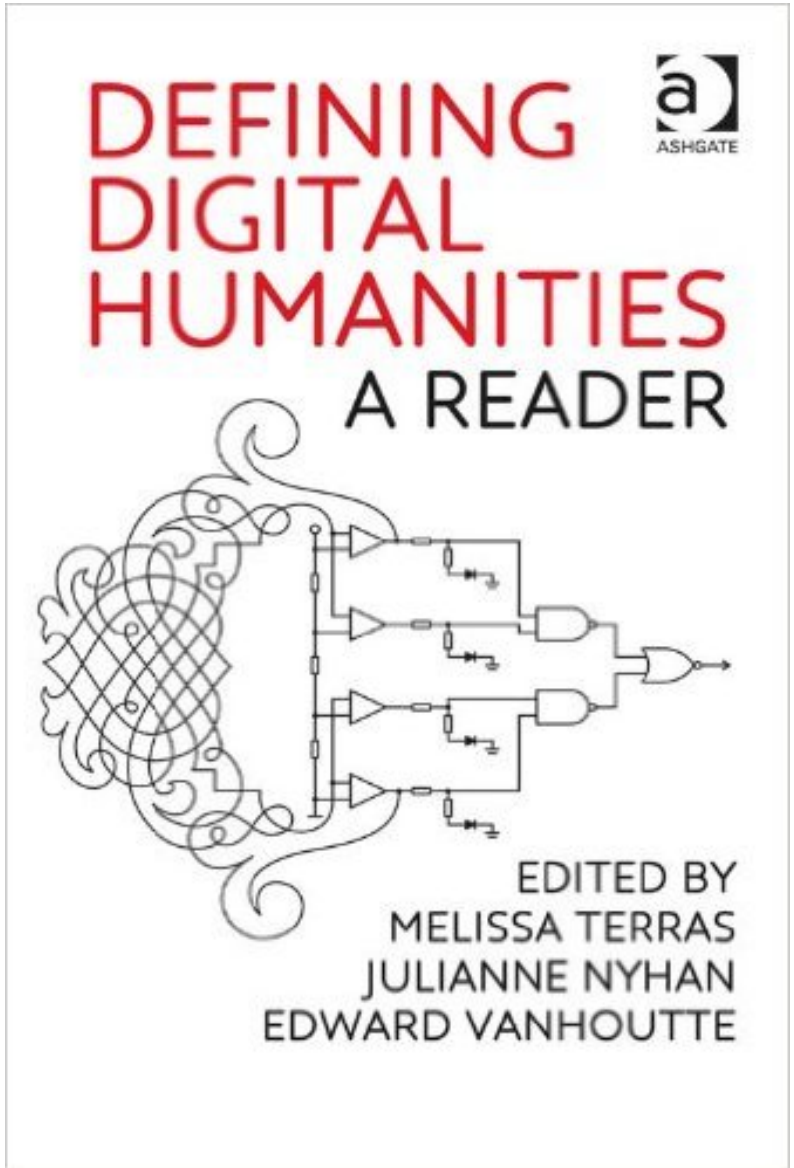
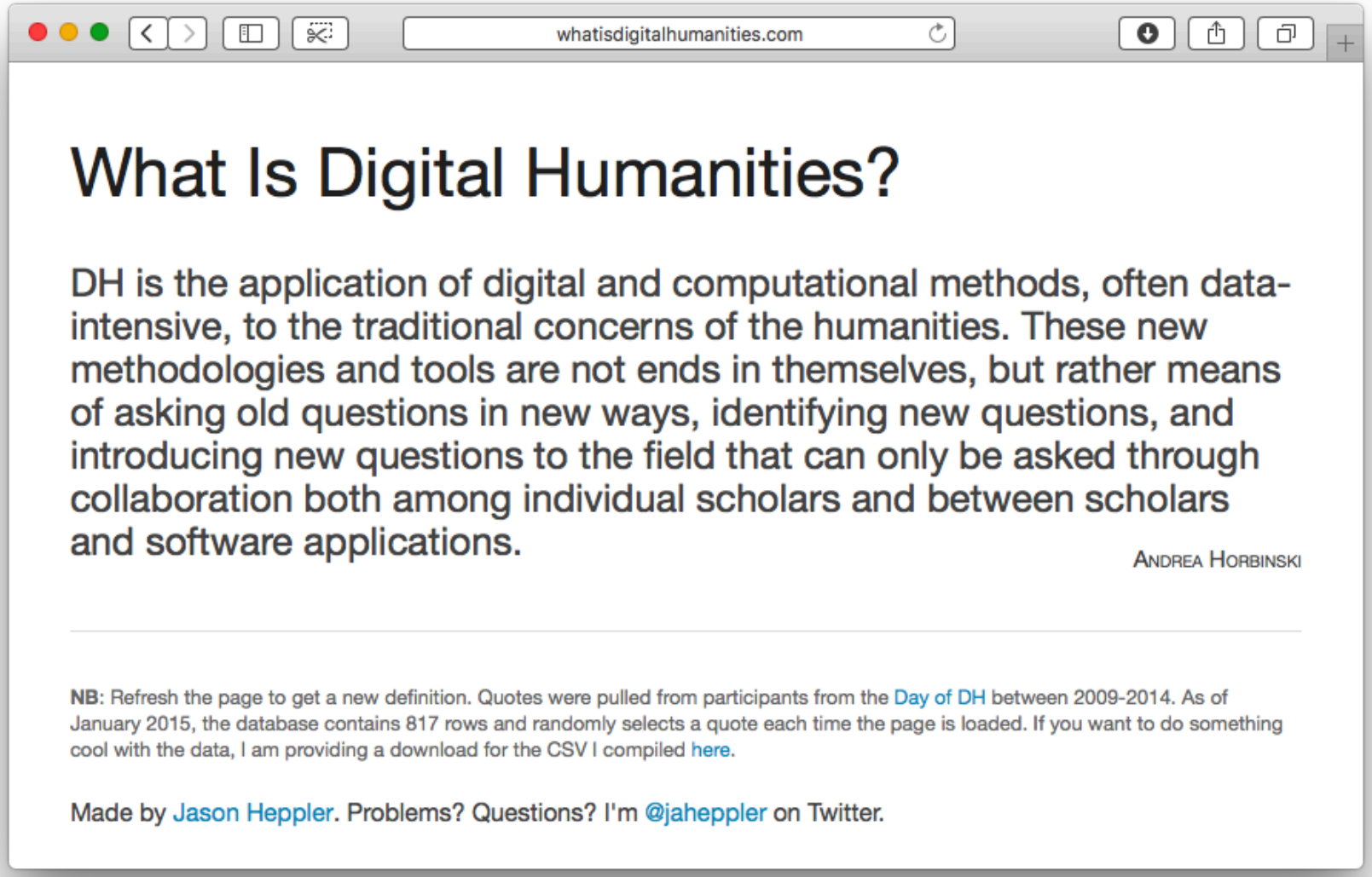
Fred Jelinek Seminar, Prague, April 4, 2016

Introduction

Defining Digital Humanities



WhatIsDigitalHumanities.com



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Yes, we do.

If you want to create a program of studies or devise a research agenda, you *must* commit yourself to *some* definition.

- However, most definitions focus on *methods* and say very little about *goals*.
- Related problem: Are the digital humanities a discipline of their own, an interdisciplinary field, a community of practice, or something else again?

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What Do We Mean by “Digital Humanities”?

Consensus

Relatively broad consensus, that the digital humanities bring together humanities and computer science; thus we have two aspects:

Ⓐ Work on *humanities* research question using methods and tools from computer science

Ⓑ Work on *computer science* methods und tools for tackling research questions in the humanities

➜ **Term is inherently ambiguous**

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Piotrowski 2012

> *The emerging field of* digital humanities *aims to exploit the possibilities offered by digital data for humanities research. The digital humanities combine traditional qualitative methods with quantitative, computer-based methods and tools, such as information retrieval, text analytics, data mining, visualization, and geographic information systems (GIS).*
>
> *(Piotrowski 2012, p. 6)*

Michael Piotrowski (2012). Natural Language Processing for Historical Texts. San Rafael, CA: Morgan & Claypool.

Piotrowski 2013

***In a narrow sense**, "digital humanities" refers to the application of quantitative, computer-based methods for humanities research, usually complementing traditional qualitative methods [...]. The important point is that it is humanities research, i.e., you're applying these methods to answer a humanities research question.*
***In a wider sense**, it may also refer to the application of computer-based tools in humanities research (note that this definition does not require the use of quantitative methods). For example, creating a digital edition is not digital humanities in the narrow sense (because it does not use quantitative methods), but it is in the wider sense.*

http://nlphist.hypotheses.org/114

Discussion

- Actually only a description of *practices*
- Nothing is said about motivations or goals of the digital humanities
- Implies that there are two kinds of humanities—"digital" humanities and "non-digital" (analog?) humanities

➜ **This is not true.** All humanities disciplines have their specific objects of research and use whatever methods are needed—they are defined by their research objects, *not* by their methods!

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Let’s Look at Computational Linguistics

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Theoretical CL
(“mathematical linguistics”)
Formal language theory
Grammar theory

Applied CL
(“corpus linguistics”, NLP)
Application of theories and methods to *concrete* languages

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Theory of formal modeling	Formal modeling
➜ Actually math or CS	➜ Actually linguistics

Let's look at computational linguistics

- Theoretical CL studies the means and methods of constructing formal models in linguistics.
- Applied CL is concerned with the construction of formal models of natural languages and with the methodology of constructing such models.
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Piotrowski 2016

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Digital history is concerned with the construction of formal models of historical circumstances and with the methodology of constructing such models.

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  - definition of tag set
  - annotation guidelines
  - ➜ Digital philology
- Technology used:
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Formal Models in the Humanities

Formal models

- A model is a representation of a selected part of the world.
- Model ≈ description ≈ theory
- Слово “формальный” не ознацает ничего, кроме как “логически последовательный + однозначный + абсолютно явный”.

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- **All** scientific and scholarly research constructs models of their objects of research.
- In order to understand a complex object (phenomenon, situation, …), you need to understand its parts and how they interrelate with each other.

➜ This is exactly what a model describes.

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Formal Models in the Humanities Research Process

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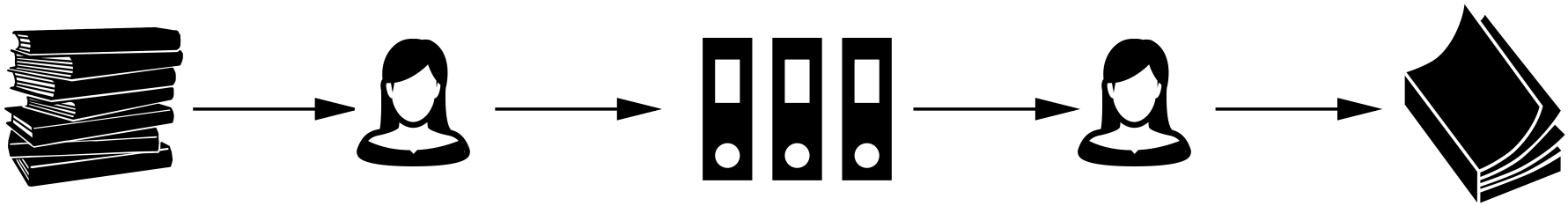

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- Facts and insights are recorded as **working materials** in a variety of forms (on paper or electronically, as text, in spreadsheets, databases, etc.)
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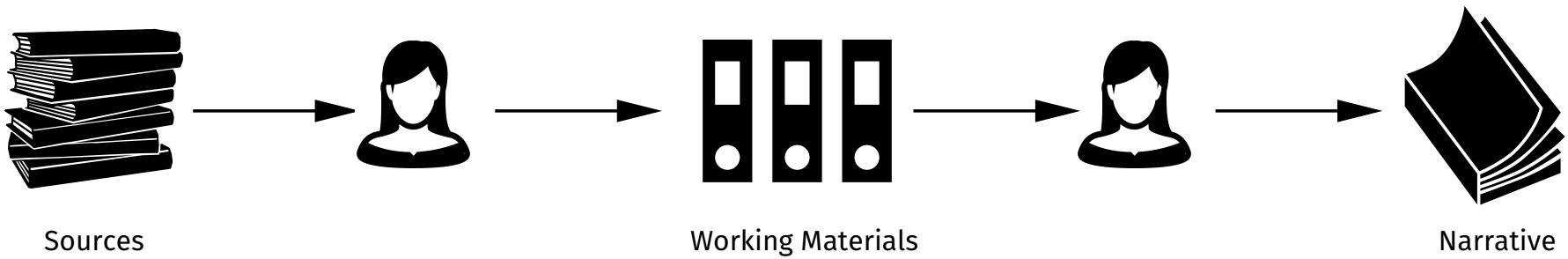

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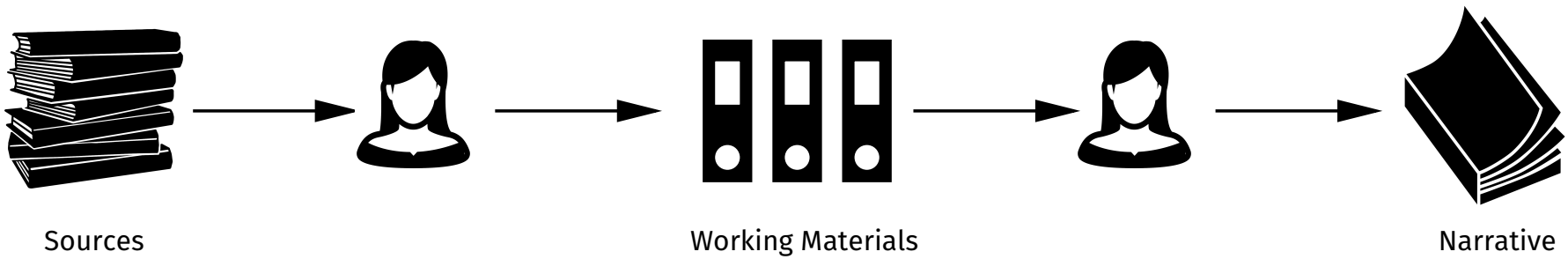

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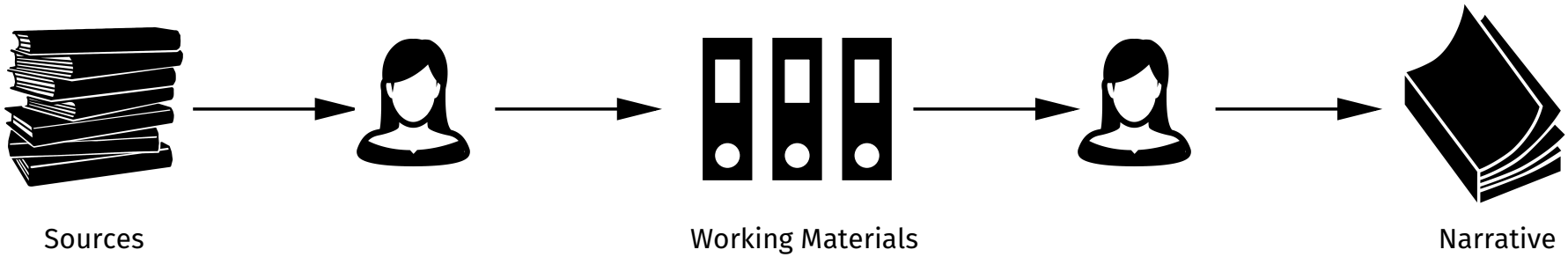

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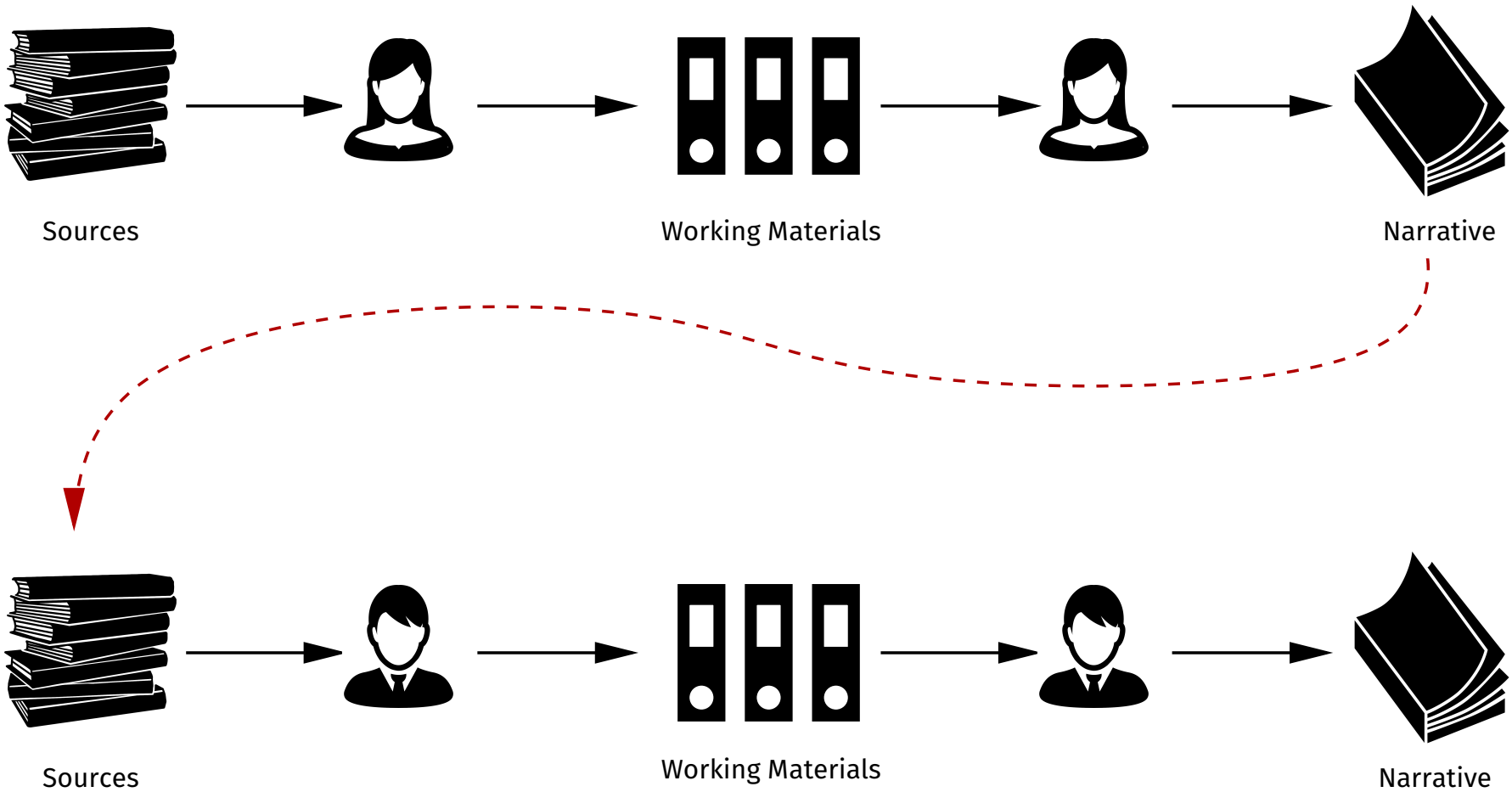
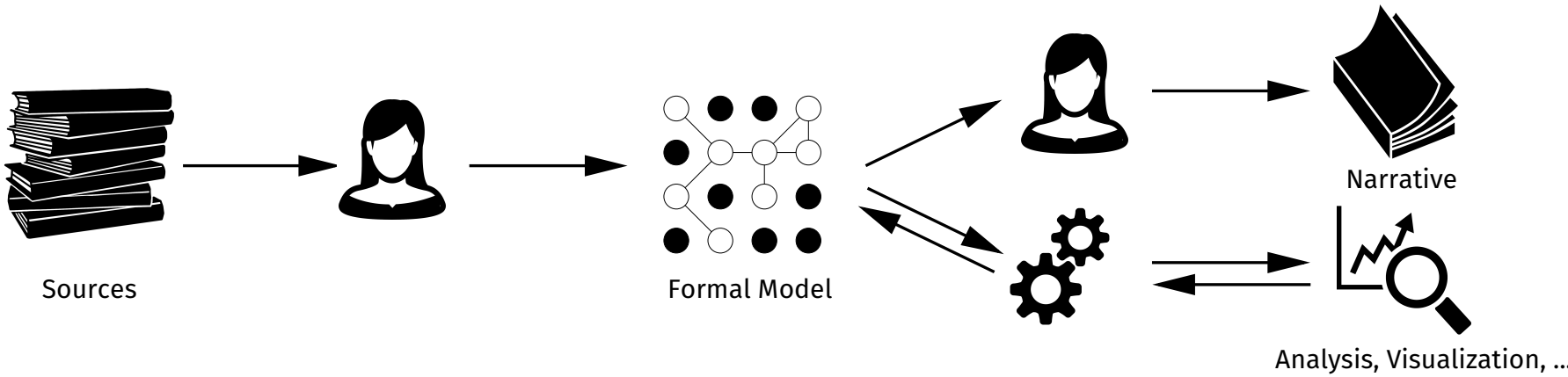
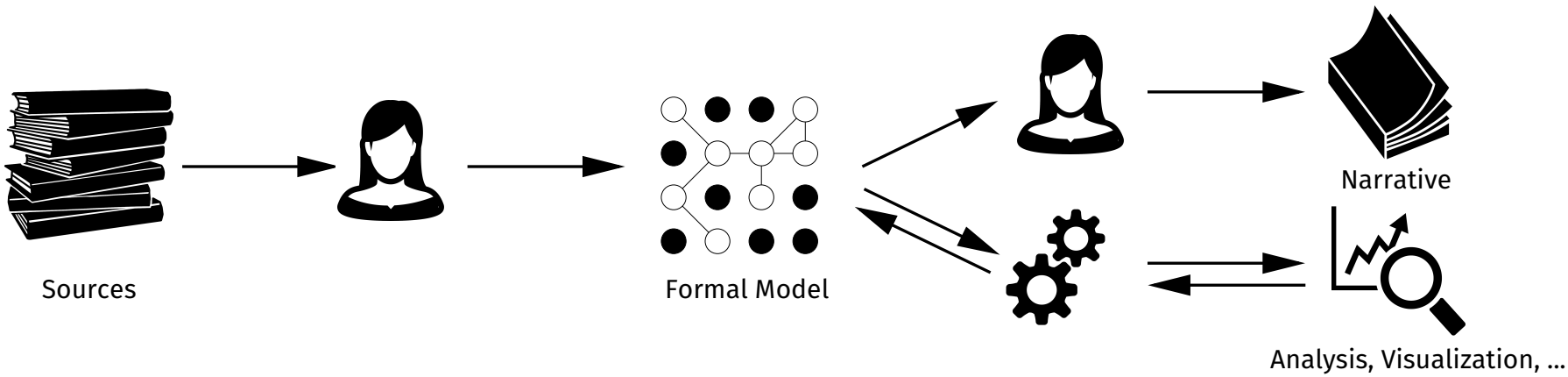
Building on the work of others (traditional process)

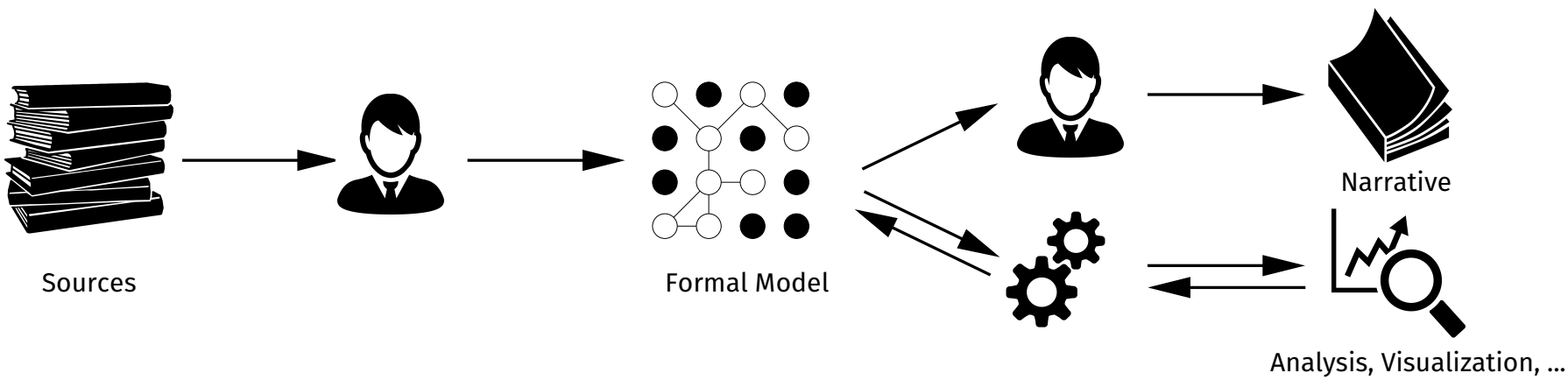


Where do formal models come into play?



Collaboration on a higher level





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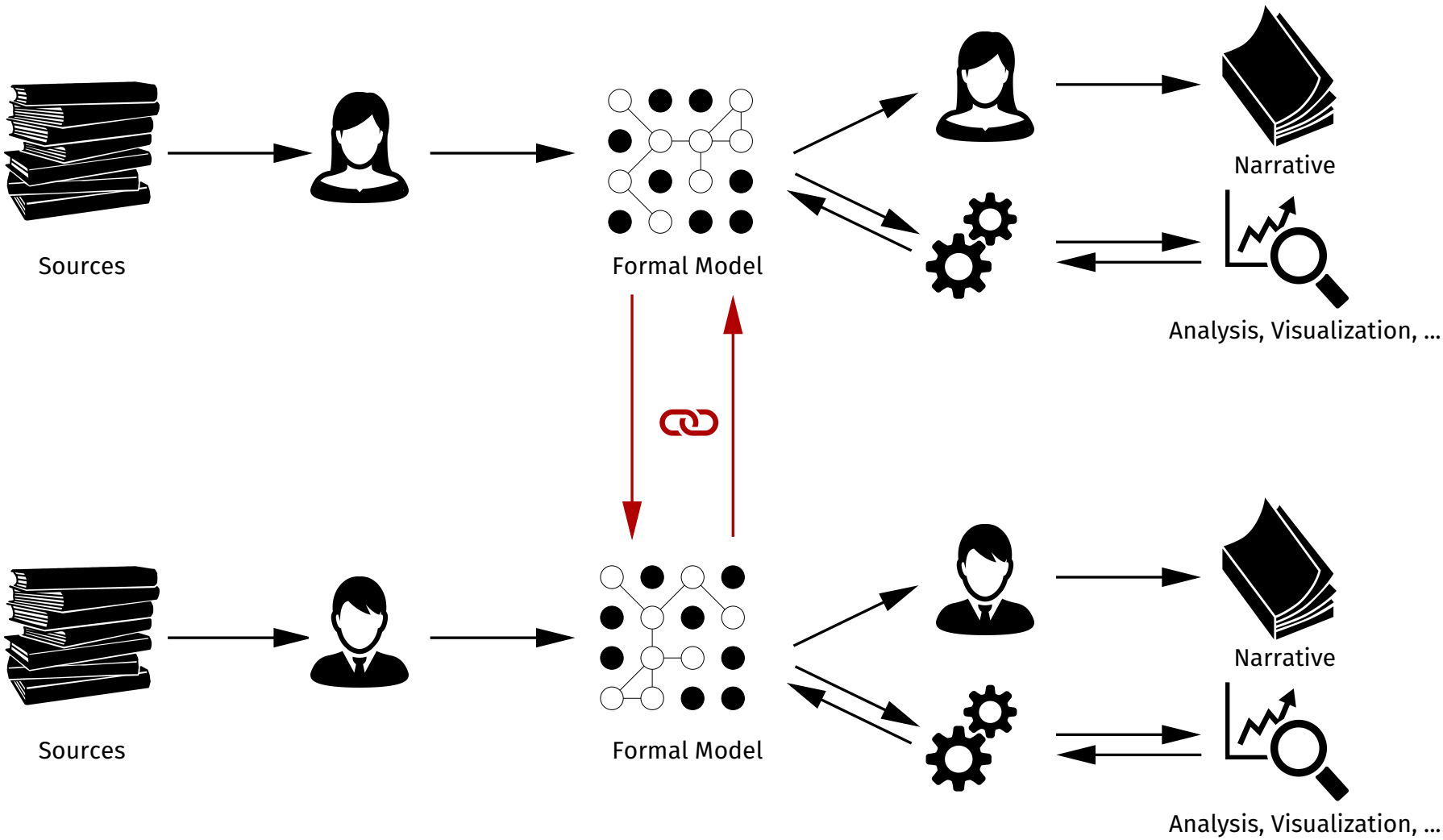

What do we need?

- Humanities research questions and results are primarily qualitative.
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What Is the Role of NLP?

- If the humanities seriously want to base their research on large quantities of text (and quantitative methods), they will need NLP as basis for all higher-level analyses
- For digital historical scholarship, NLP must then be regarded as an *auxiliary science* of history, similar to diplomatics, codicology, paleography, numismatics, sigillography, etc., which are indispensable for evaluating and using historical sources

> *Il n'est pas indispensable que le philologue établisse lui-même le programme, encore que ce soit infiniment souhaitable ; il devrait au moins connaître assez le langage de programmation pour contrôler le travail du technicien ; en effet, l'expérience m'a appris qu'il ne faut pas s'en remettre les yeux fermés aux électroniciens, mal préparés par leur formation mathématique à se faire une idée juste de problèmes concrets qui se posent dans la domaine de la philologie.*
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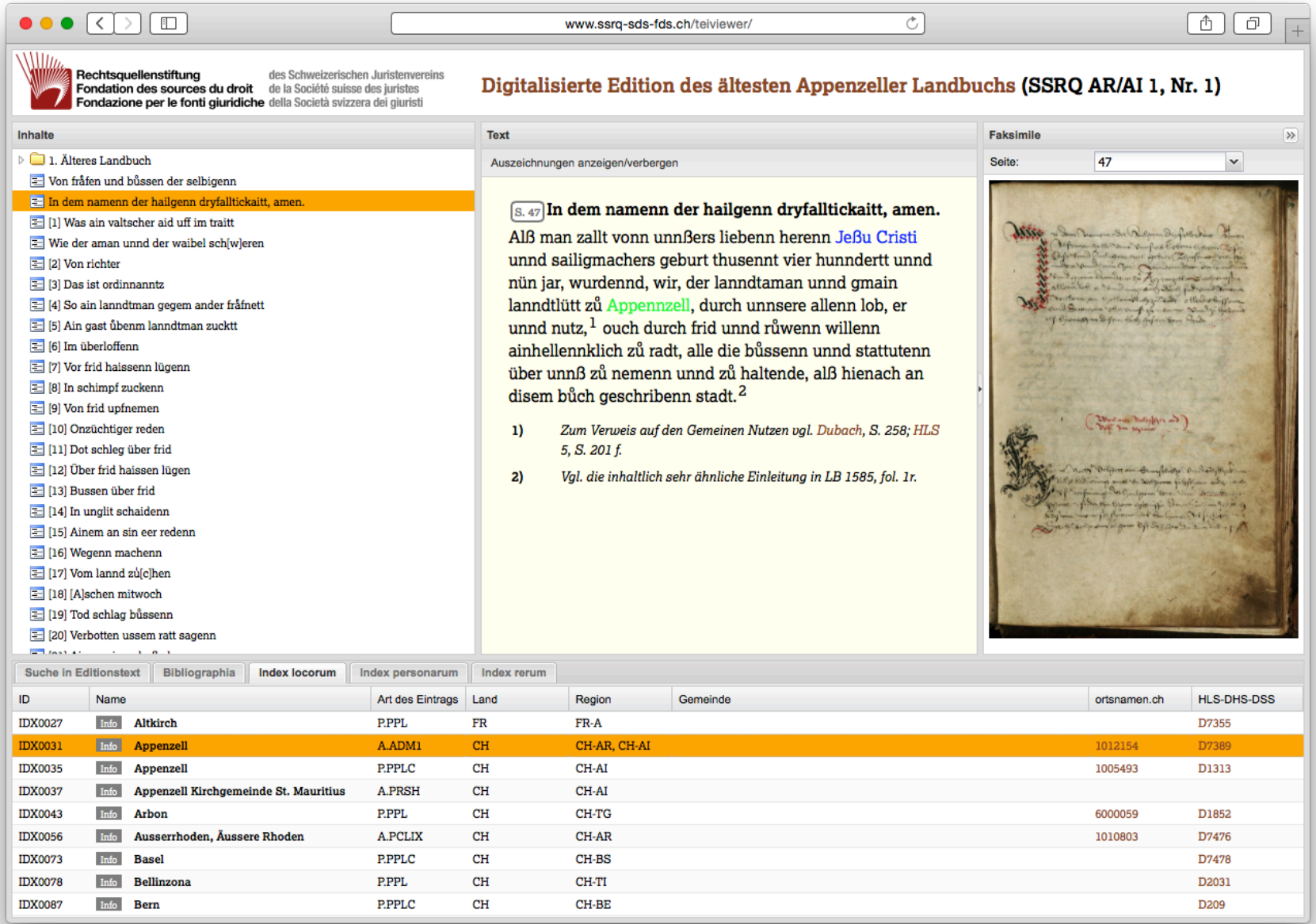
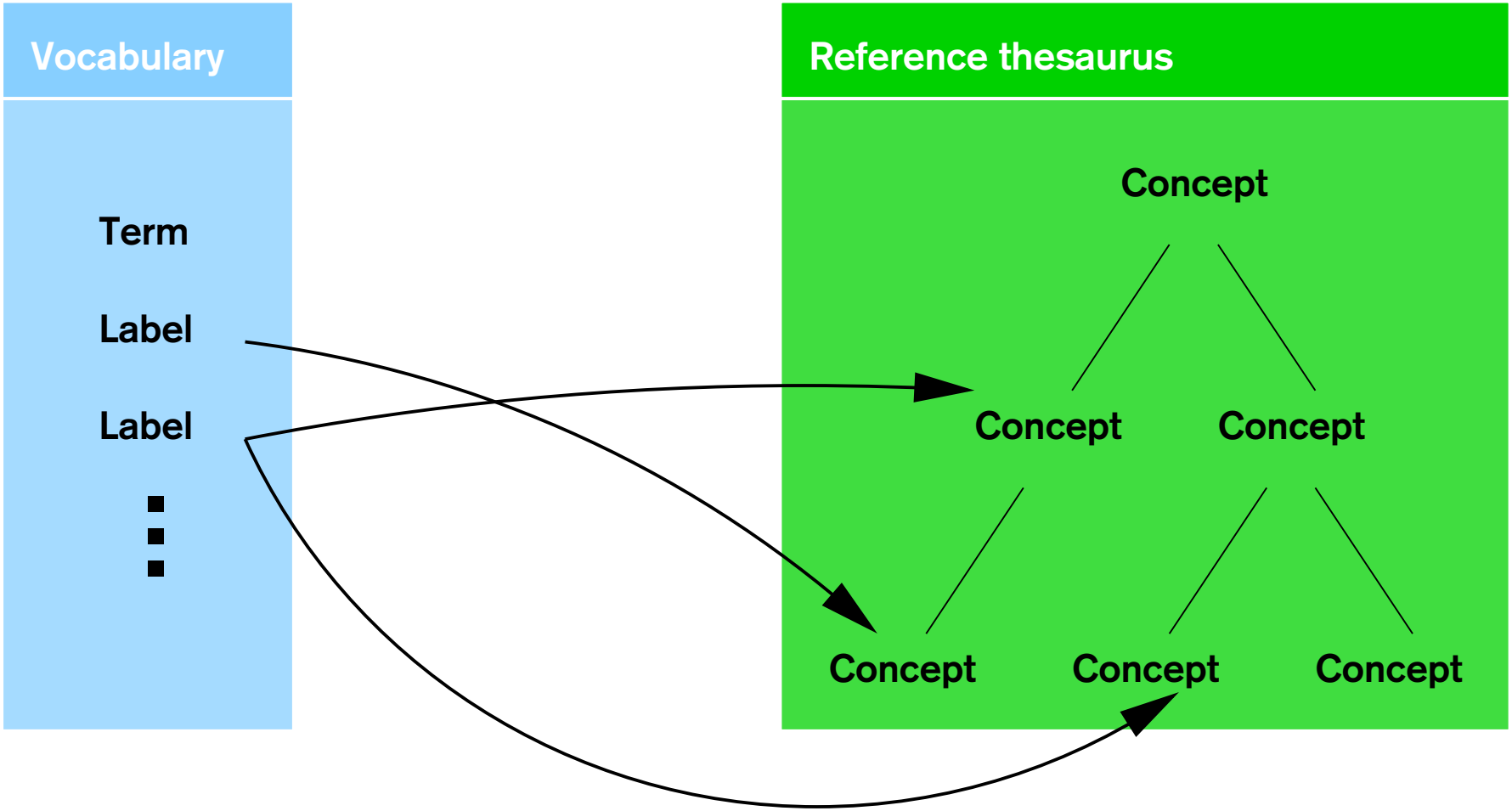
Recent Work

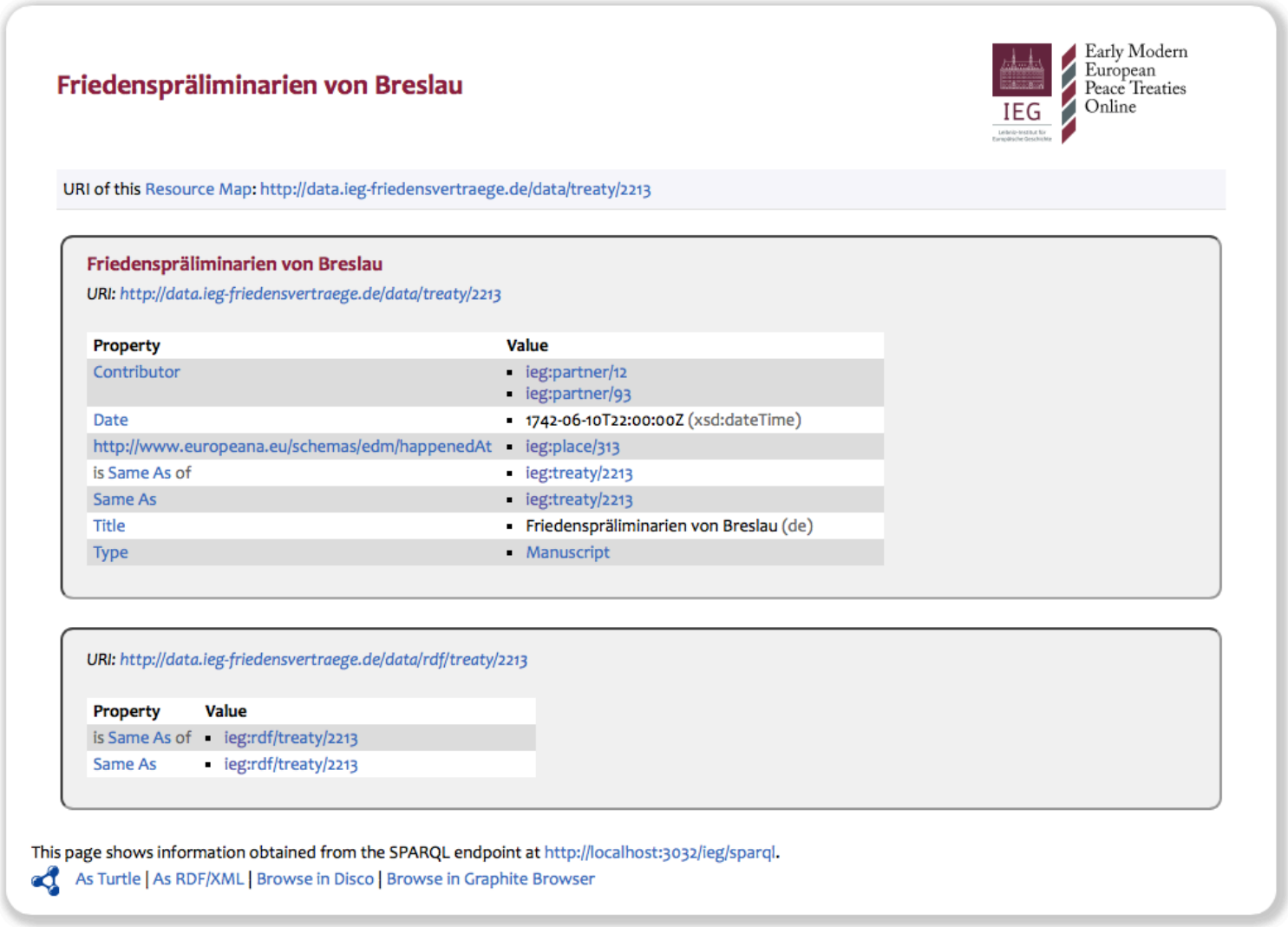
Example: Appenzeller Landbuch



Example: Labeling System



Example: Peace Treaties as Linked Open Data



Friedenspräliminarien von Breslau

Early Modern European Peace Treaties Online

URI of this Resource Map: http://data.ieg-friedensvertraege.de/data/treaty/2213

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http://www.europeana.eu/schemas/edm/happenedAt	ieg:place/313
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Same As	ieg:treaty/2213
Title	Friedenspräliminarien von Breslau (de)
Type	Manuscript

URI: http://data.ieg-friedensvertraege.de/data/rdf/treaty/2213

Property	Value
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Same As	ieg:rdf/treaty/2213

This page shows information obtained from the SPARQL endpoint at http://localhost:3032/ieg/sparql.

As Turtle | As RDF/XML | Browse in Disco | Browse in Graphite Browser

OPEN HUMANITIES AWARDS

Example: Cosmotool

Summary

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- The digital humanities do not merely aim to accelerate research or to analyze larger amounts of data.
- The key is **formal modeling** of scholarly knowledge and insights in machine-processable form.
- Formal models increase coherence, precision, and explicitness, encourage cooperation and sharing, and help researchers to directly build upon each other's work.
- **Knowledge representation** techniques are thus the foremost tools for creating formal models in the humanities.
- The "digital humanities discussion" can benefit from studying the development of linguistics.
- Digital humanities subfields can learn from corpus linguistics.
- NLP should be considered an *auxiliary science*—as such, scholars have to get acquainted with its methods and tools.

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Leibniz-Institut für Europäische Geschichte

Mitglied der Leibniz-Gemeinschaft

The Digital Humanities—the "Computational Linguistics" for the Rest of the Humanities?

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