



PNC 2016 Annual Conference and Joint Meetings

# Data and the Construction of Reality

Michael K. Buckland

Our conference theme is:

Does data construct reality?

Answer: No.

This could be a short conference!

Short answer: Because only living beings construct reality.

Long answer: Indirectly, because data are documents.

“*Data*” is mostly used in the singular as a “mass noun.”

A “mass noun” or “noncount noun” refers to an uncounted amount (usually large) of something, e.g. *agenda, butter, information, . . .*

“Data” refers to *factual records*.

Sometimes narrow: *Digital* records for computer input.

Data are records, documents. Supposed evidence.

Document theory -- therefore data theory.

1. Documents are *material / physical*.  
The “virtual” is physical: electronic, optical.
2. *Made as* a document, e.g. a letter, email, VR.  
or *made into* a document, e.g. museum specimen, rare antelope in a zoo.
3. *Regarded as* a document, as possible evidence.  
Phenomenological, semiotic view.

“Information society” is really a “document society”

Community depends on collaboration which depends on communication, on information. Even prehistoric societies were “information societies”.

Society develops through the division of labor.

We specialize. We do fewer things for ourselves.

More coordination, more communication.

Increasingly *indirect* communication using documents / data.

Historical development of document technology:  
Multiplying copies and reducing effects of space and  
time:

1. Writing
2. Printing
3. Telecommunication
4. Copying

Big increase! The “information explosion”!

5. Coping: bibliography, documentation, librarianship,  
information science, data management, . . .

This increasing division of labor and reliance on documents / records / data means increased interdependence:

- Less first-hand experience.
- More reliance on second-hand knowledge.
- How to interpret / understood it?
- *Trust* not truth.

Authentic? e.g. Dunhuang documents.

Motivations and agendas of others?

## Agendas of others

- Schools: Textbooks to guide students and to control teachers;
- Religions: Sacred texts to inspire particular beliefs and obedience;
- Artists: Images to please us and to challenge us;
- Merchants: Advertisements to influence what we buy;
- Politicians: Statements to seek votes and campaign support;
- Entertainers: Media to amuse us and to generate income from us;
- Individuals: Messages to communicate and to attract attention;
- Museums: Selectively present objects to interpret the past;
- Mass media: Programs to entertain, influence, satisfy advertisers;
- Libraries: Selective collections to facilitate our reading;
- Social media: Very rapid dissemination of comments;
- Recording devices to monitor purchases, movements, behavior;
- and on and on . . .



## Anatomy of documents / data

Text (“content”) and document.

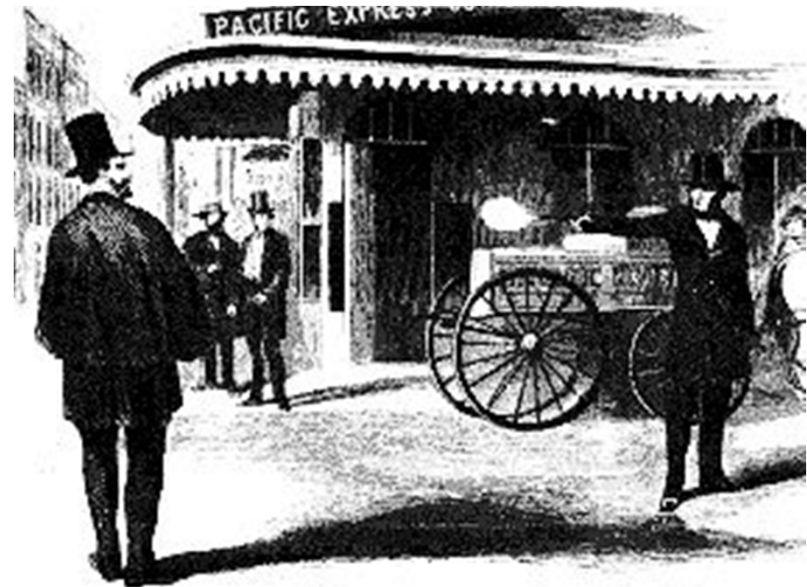
Data migration.

Llewellyn Zublin’s letter.

- Letter to family
- Acquired by book dealer
- To library for researchers
- Keyed, digital, printout
- Printing class sets type
- Booklet for library publicity
- Case study in seminar
- Mentioned in powerpoint

Lower criticism: Study of text.

Higher criticism: Study of text in context.



James P. Casey Shoots James King of William  
May 14, 1856

**1. Phenomenological:** Documents are objects *perceived as* signifying something. The status of being a “document” (or data) is not inherent *but attributed (given to)* an object. Meanings are always constructed by observers.

**2. Cultural codes:** All forms of expression depend on some shared understandings, *language* in a broad sense.

**3. Media Types:** Different type of expression have evolved: Texts, images, numbers, diagrams, art ...

**4. Physical Media:** Paper; film; analog magnetic tape; bits;.....

Being digital affects directly only aspect 4.

In a digital environment everything is digital, so being digital does not define *digital documents*.



Paul Otlet (1868-1944): Factual records.

1892: Collective action for “the creation of a kind of artificial brain by means of cards containing actual information or simply notes of references”.

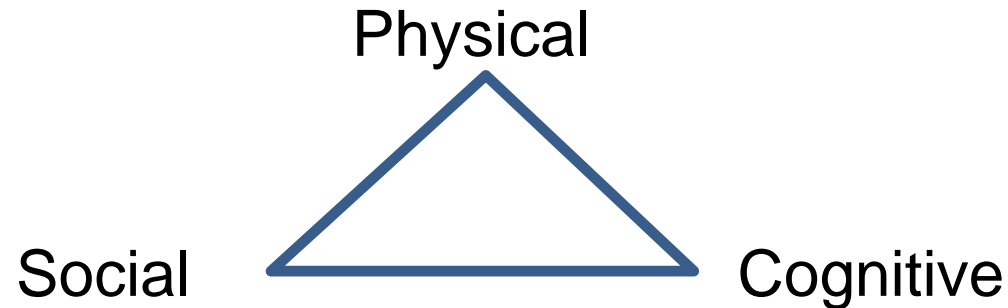
In contrast Ludwik Fleck (1896-1961):  
Local cultural context is important for  
sense and understanding:

- Writer, text & *author's habits / culture*.
- Reader, text & *reader's habits / culture*.
- Differences in culture hinder understanding.



We each live in a “small world” (Elfreda Chatman), in  
the “World of where and when” (Stephen Toulmin).

## Document (Data) triangle



Physical: Must exist in some material form.

Physical characteristics limit what can be done.

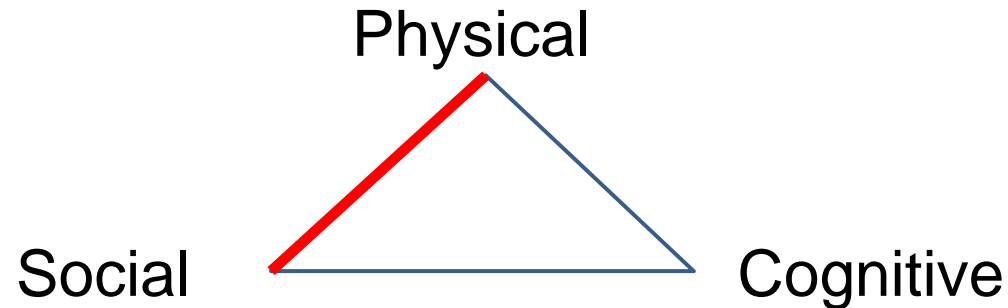
Social uses: Agendas and social values.

Cognitive: How is it understood, interpreted?

How are these aspects related?

(From Niels W. Lund, Tromsø University, Norway.)

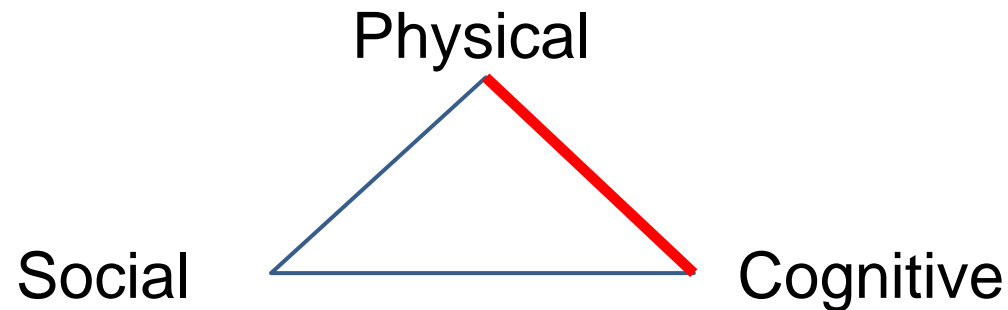
## Document (Data) triangle



Physical and Social (esp. economic, political):

- Construction of infrastructure and legal regimes.
- Implementation of social agendas.
- Creation, preservation, access of books, data sets, etc., involve many people, roles. Sociology of books, data.
- Information and educational policies.
- Allocation of resources, regulation.

## Document (Data) triangle



Physical: One must be able to see / perceive / visualize it.  
Ease of access is greatly influences use.

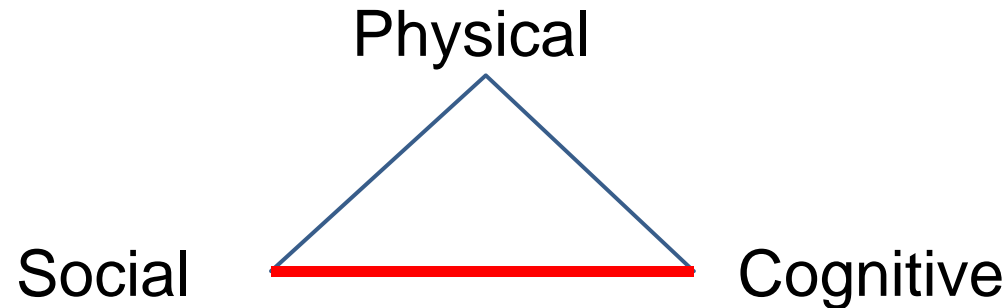
Cognitive: How is it expressed, understood, interpreted?  
Created within the creator's cultural frame.

Understood within the reader's cultural frame.

Cultural differences influence (mis)understandings.

Different readers likely to understand differently.

## Document (Data) triangle

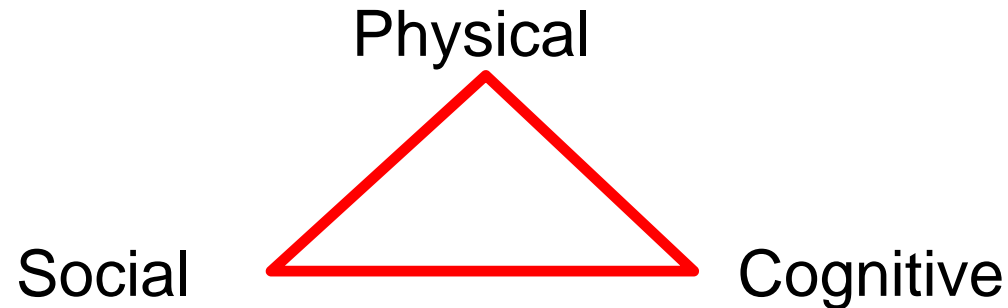


Social influences: Cultural context of the user.

Cognitive: *Intersubjective* influences on others and so on culture.

Social construction of reality (Berger & Luckham 1966):  
Subjective thoughts are expressed objectively.  
Objective expressions are subjectively understood.

## Document (Data) triangle



Physical, social, and cognitive all involved.

Documents (and data) involve all three:

- Seeing depends on (socially determined) infrastructure.
- Understanding of document influenced by culture.



Future development of document / data technology  
reducing the effects of space and time:

1. Writing: the *recording of everything*.
2. Printing: the *reproducing of anything*.
3. Telecommunications: *pervasive interaction*.
4. Copying: *Analysis, representation*, visualization of documents and data. (Lodewyk Bendikson).
5. Copping (bibliography, etc.): *connecting and relating everything* in an all-embracing web.

Ubiquitous recording, pervasive reproduction,  
simultaneous interaction regardless of geographical  
distance, powerful analysis of records, absence of privacy.

The built environment enables and constraints.  
Walk with care in Los Angeles.

Data & documents are used to construct an  
environment that enables and constrains you.

Ubiquitous recording of all you do.

From describing you to defining and constraining.

Your passport matters more than you do!

Documents (esp. data) are used to construct the world  
we live in.

“The data -- It is *me!*” (Ron Day)

So, yes, data are used to construct the reality you  
have to live in.

Our conference theme is:  
Does data construct reality?

My answer: Yes, but indirectly, in two ways:

1. We construct our sense of reality from evidence as we perceive it -- increasingly documents, increasingly factual, increasingly digital.
2. Like the built environment, our lives are increasingly enabled and constrained by the infrastructure of data and data systems we live in.

For more

N. W. Lund. 2009. Document theory. *Annual Review of Information Science and Technology* 35: 399-432.

P. Berger & T Luckham. 1966. *The social construction of reality*. Doubleday.

M. Buckland. 2016. The Physical, Mental and Social Dimensions of Documents.

<http://ideaexchange.uakron.edu/docam/vol3/iss1/4>

R. Day. 2014. The Data -- It is *Me!* In: B. Cronin & C.R. Sugimoto (Eds.), *Beyond Bibliometrics*. MIT Press.

<http://people.ischool.berkeley.edu/~buckland/concepts.html>