Visualization Design for a Web Interface to the Large-Scale Linked Lexical Resource UBY

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Outline

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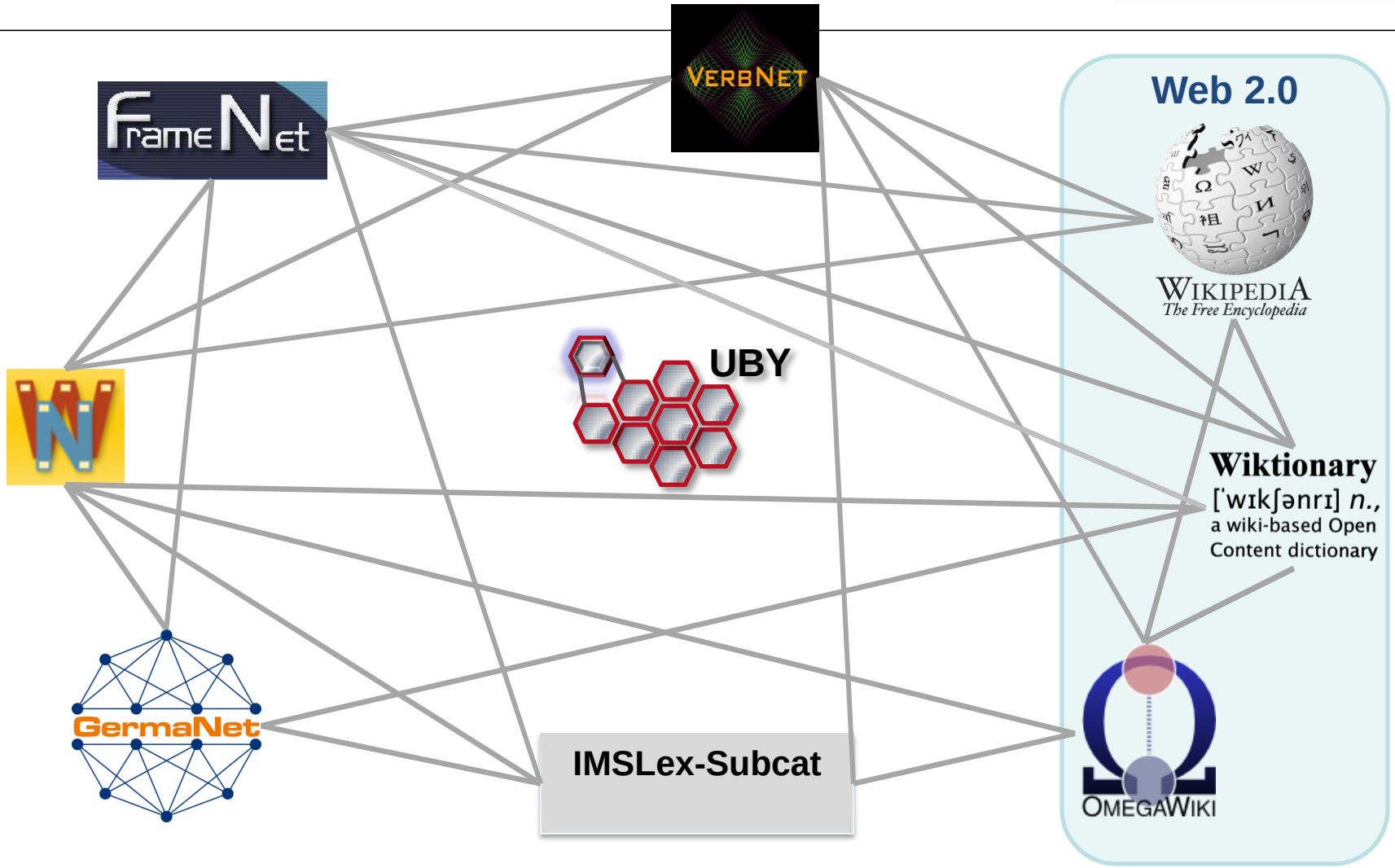
Background and Motivation

Design & Collaboration Process

Lessons Learned

Background: Linked Lexical Resource UBY



Background: Alignment of Word Senses

to run

travel rapidly, by any (unspecified) means

move about freely and without restraint, or act as if running around in an uncontrolled way

include as the content

Wiktionary
[ˈwɪkʃənrɪ] *n.*,
a wiki-based Open Content dictionary

to run

To go at a fast pace, to move quickly.

To print or broadcast in the media.

to run

To move quickly by alternately making a short jump off of either foot.

Scalability Issues of Early Prototype

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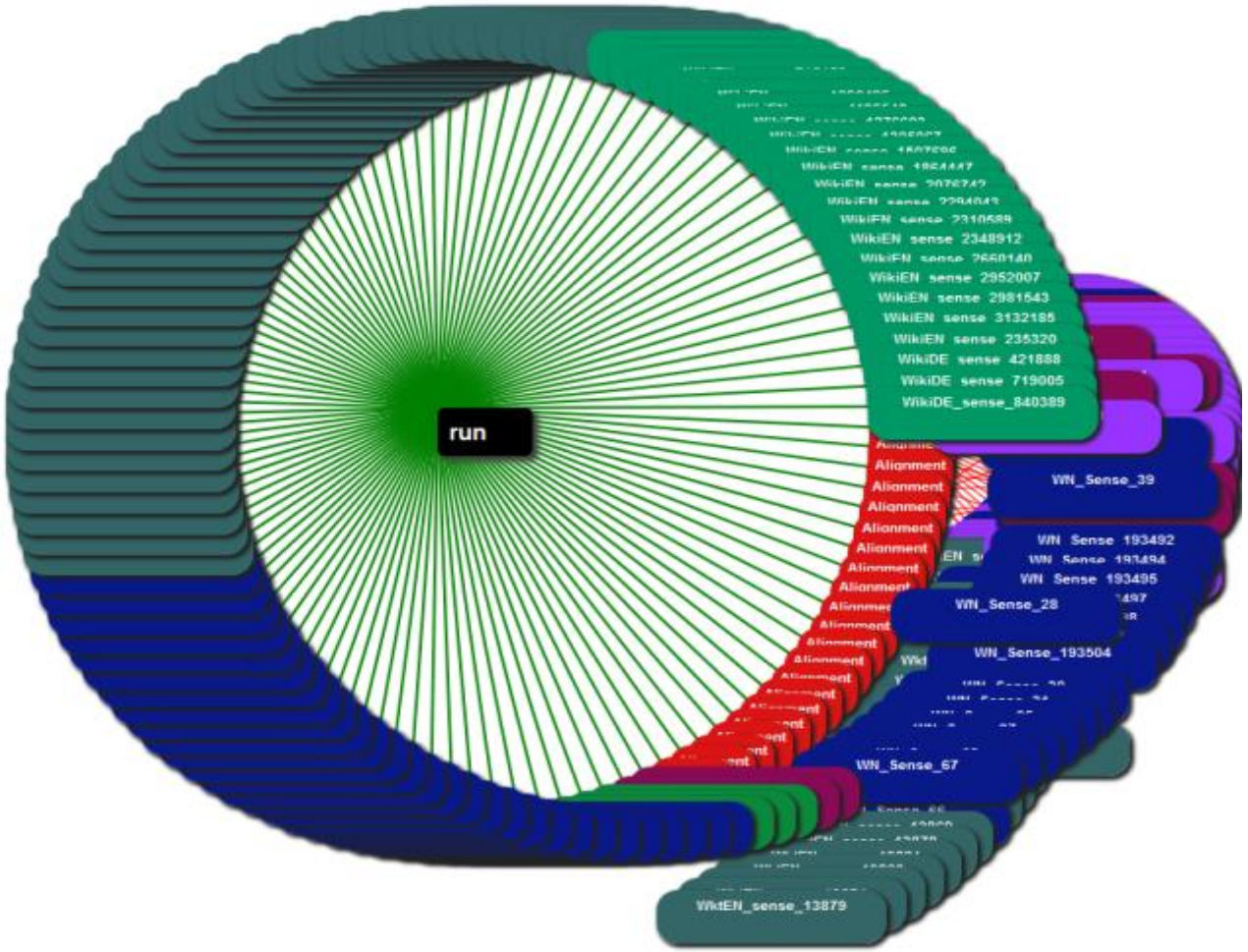
lemma *run*



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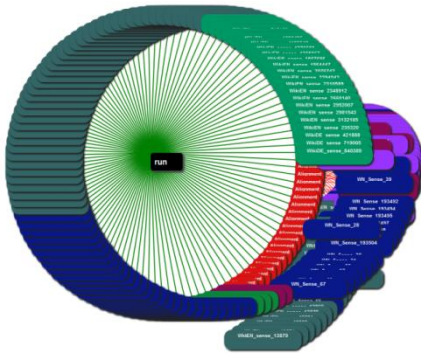
Interdisciplinary Collaboration

Visualization Experts

Computational Linguists

Target users:
researchers in the field of Natural Language Processing and in the Digital Humanities (e.g., lexicographers, linguists).

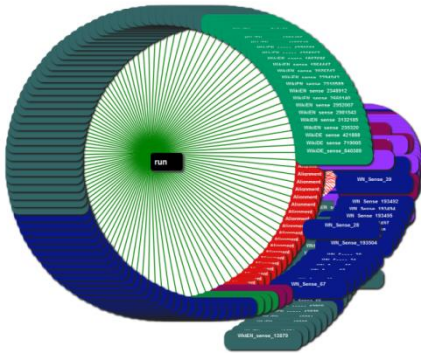
Design & Collaboration Process (1)



Analysis of early prototype:

- each sense = rectangle, labeled with sense id
- colors = resources
- aligned senses are linked to an *alignment node* (red)
- alignment nodes and non-aligned nodes are linked to the root node (black, representing query lemma)

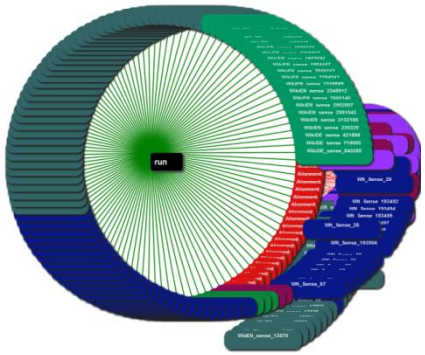
Design & Collaboration Process (2)



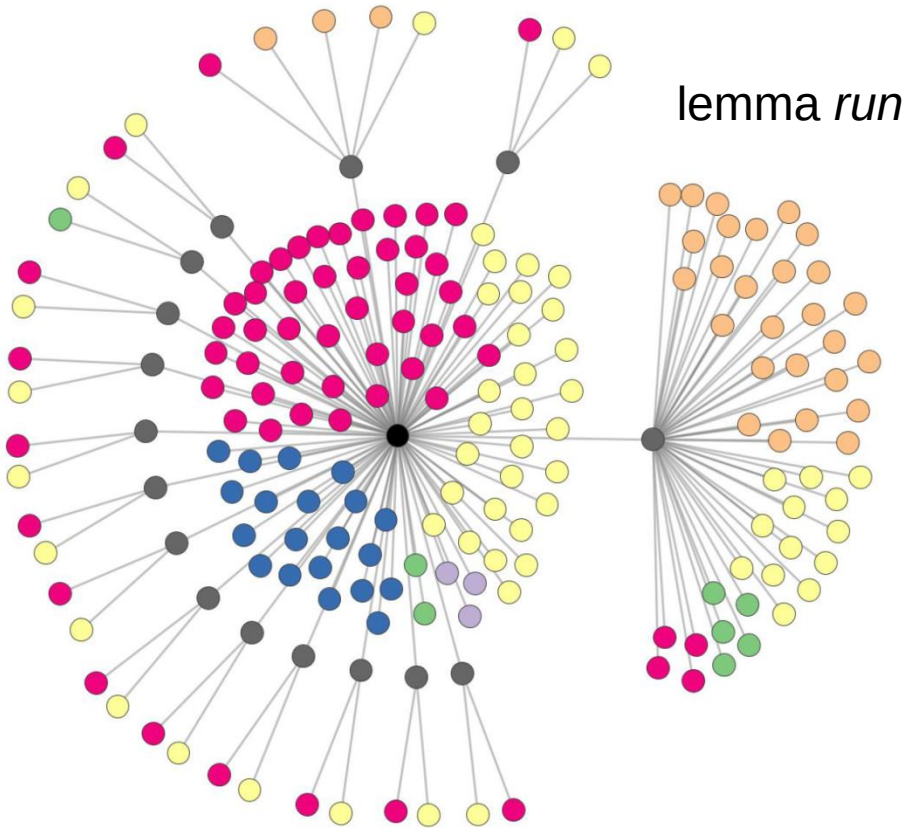
Requirements Analysis:

1. A user must be able to see which senses are linked.
2. It should be visible at a glance which resources have most senses and how many sense clusters exist.
3. The information which resources are linked and which of them prevail in a cluster should be easy to retrieve.
4. The visualization must be scalable in terms of the number of senses and clusters.
5. The visualization must be readable without further explanation since it is part of the public Web user interface of UBY.

Design & Collaboration Process (3)



Alternative graph layout



lemma *run*

Detailed Interview and analysis

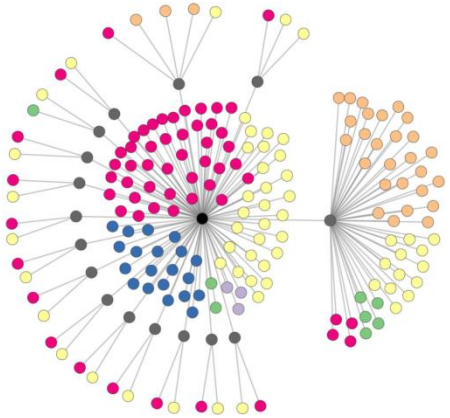
+ increased scalability

+ colors with similar perceptual difference

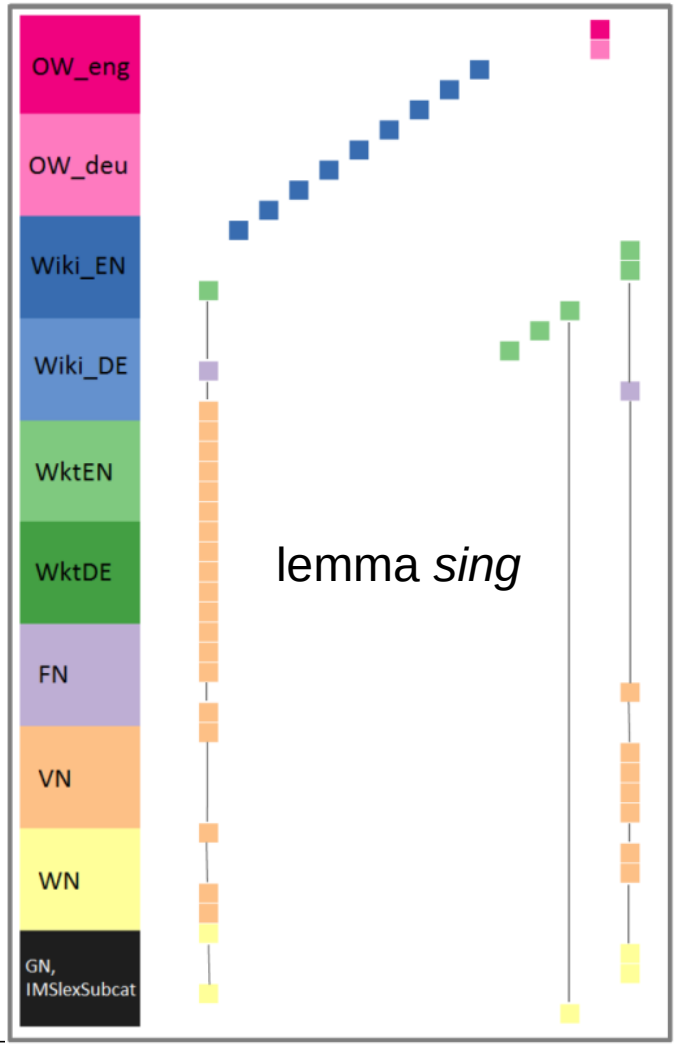
+ no labels (resource information encoded in color)

>> learned that aligned senses = clusters

Design & Collaboration Process (4)



First cluster-based design



Detailed Interview and analysis

+ acknowledges that aligned senses = clusters

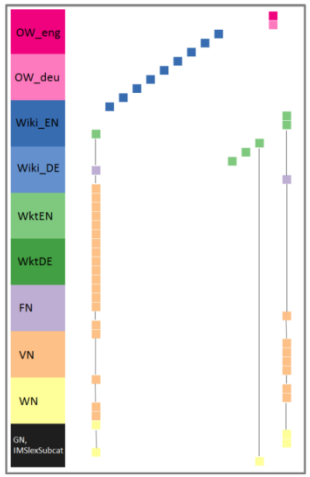
- does not scale well

>> learned that a sense can only be assigned to at most one cluster

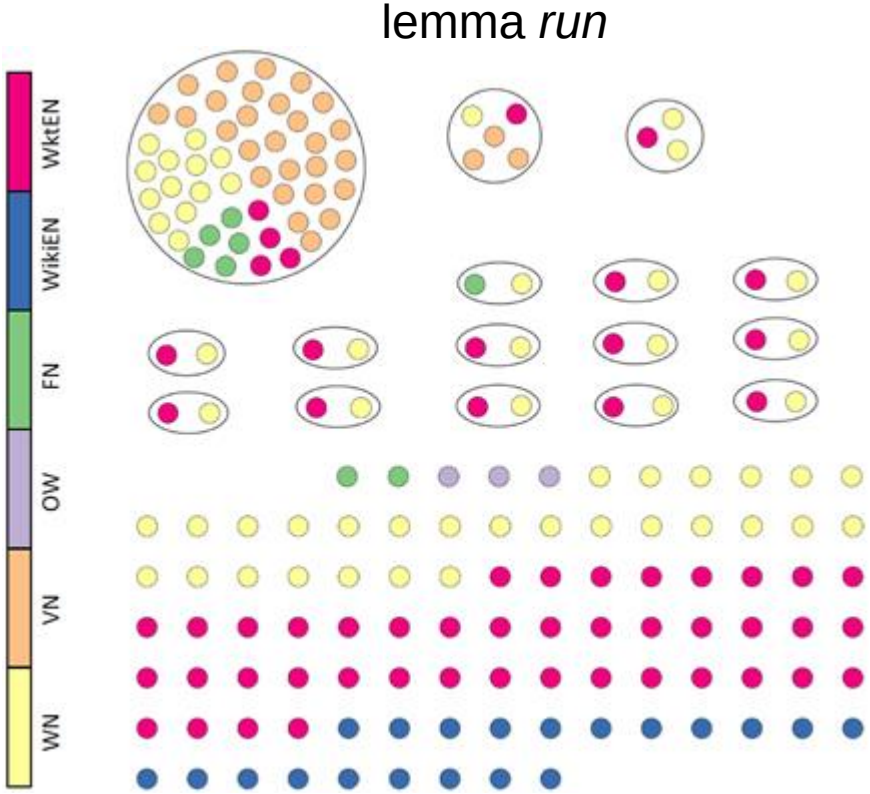
>> many new usage scenarios emerging

→ Task refinement and restriction

Design & Collaboration Process (5)



Final cluster-based design



Detailed Interview and analysis

+ sense clusters = groups
+ scales well
+ lower visual complexity than all other designs
+ intuitive to read
+ meets all requirements

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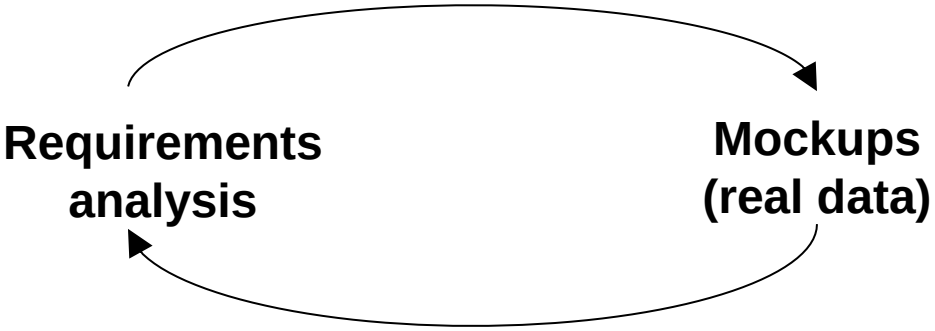
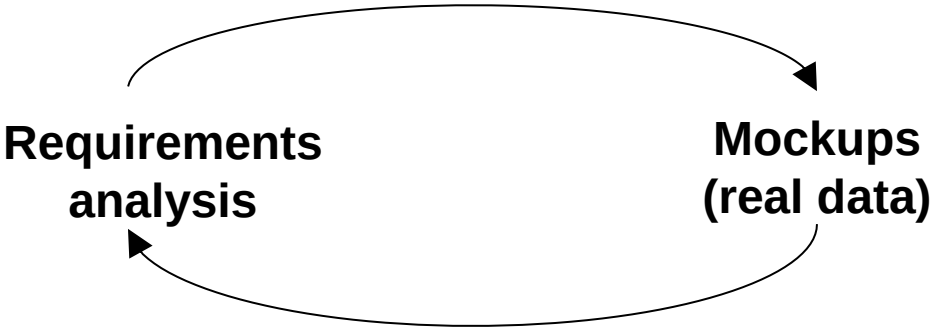
Lessons Learned (1)



Build a common language:

1. Frequent meetings are necessary (esp. at the beginning) for continuously exchanging ideas.
2. Define key terms and don‘t build the design on implicit statements (beware of „everyday vocabulary“ that may be used differently!)

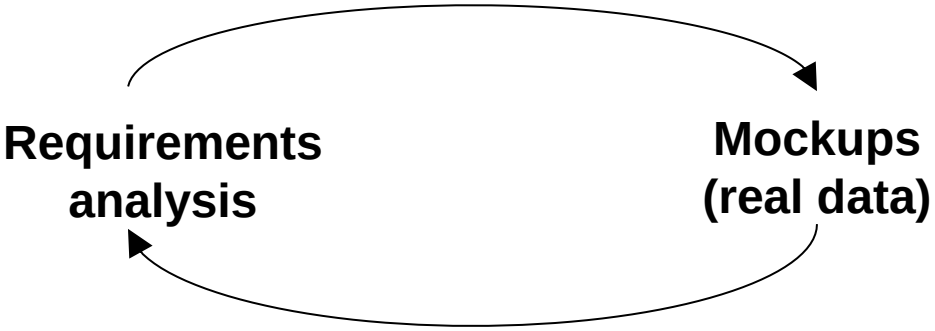
Lessons Learned (2)



For requirements specification: look through the eyes of a user

Specifying requirements in the beginning *solely* from a user perspective prevents both sides from being caught-up by early design ideas.

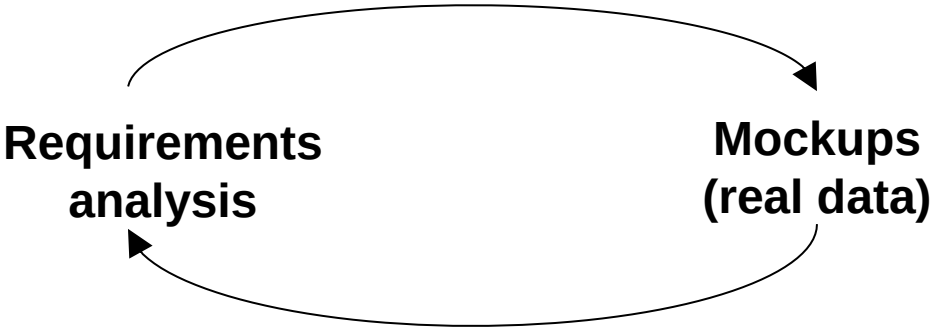
Lessons Learned (3)



Use mockups based on *real* data:

1. Early mockups based on real data can ease the communication a lot.
2. Early mockups should be challenged consequently after each new round of discussions (and if necessary be discarded).

Lessons Learned (4)



Iterations & detours might be an integral part of an interdisciplinary and collaborative design process!

Thank You!

Questions?