

# EXTENDING THE DISCOURSE ANALYSIS TOOL SUITE WITH WHITEBOARDS FOR VISUAL QUALITATIVE ANALYSIS

Tim Fischer, Florian Schneider, Fynn Petersen-Frey, Anja Silvia Mollah Haque, Isabel Eiser, Gertraud Koch, Chris Biemann  
 Language Technology Group, Department of Informatics & Institute of Anthropological Studies in Culture and History

## DISCOURSE ANALYSIS TOOL SUITE

The Discourse Analysis Tool Suite (DATS) is an open-source working environment for **qualitative discourse analysis** in the **Digital Humanities**. The platform is designed and tailored to support **Grounded Theory** based research such as the **Sociology of Knowledge Approach to Discourse**. However, various features are also of great interest to other disciplines.

## MOTIVATION

Miro, a tool for creating mind maps, was analyzed as part of a preliminary study. Organizing, refining and managing data in a visual workspace was found to be a meaningful way to understand phenomena and obtain knowledge about discourses.

## GOALS

- Facilitate and enrich the methodological procedures of Grounded Theory in qualitative discourse analysis with maps (e.g., Situational Analysis)
- Support manipulation of multi-modal resources in a graph-based way, allowing creative interactions
- Organize knowledge in a visual workspace
- Interactive visual analysis: offer different views of the research material with custom visualizations

## FEATURES

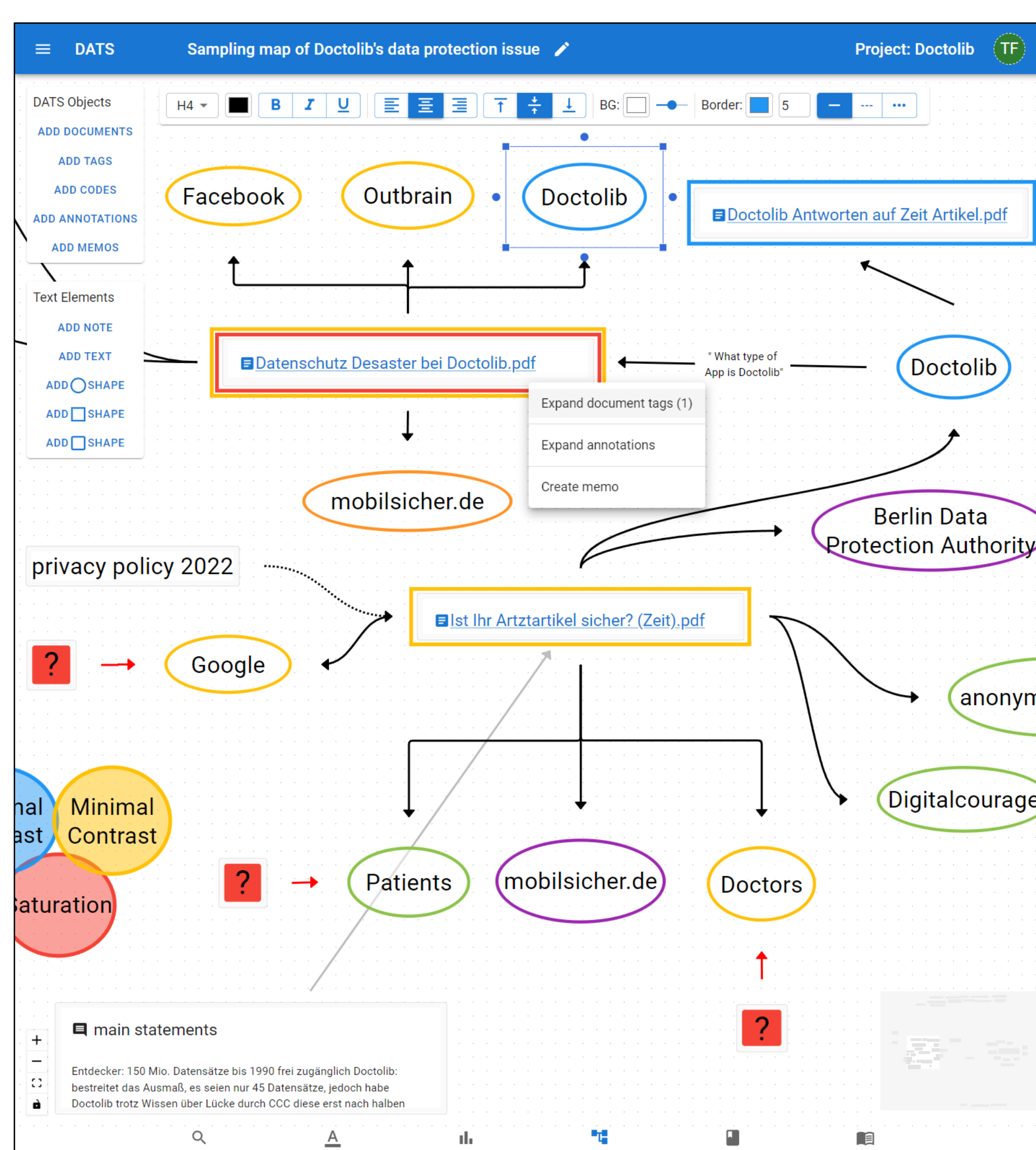
- Whiteboard-like functionalities:** Write texts, pin post-its, draw various shapes, connect items with arrows
- Linked data:** Link user- and system-generated data (e.g., annotations, codes, documents, memos, tags) to the board
- Fully integrated within DATS:** Changes to linked data (creation, deletion, manipulation, connection) are reflected in all other parts of the platform and vice versa.
- Expand related database nodes:** Traverse the database structure in an exploratory way to find connections in the data while interactively unfolding a network of connected nodes.

## IMPLEMENTATION

- Whiteboards are graphs of nodes and edges. Nodes represent items (texts, post-its, shapes, documents, tags etc.). Edges represent their relationships.
- Whiteboard nodes** represent texts, post-its and shapes that only exist in a particular whiteboard
- Database nodes** represent research objects of DATS including documents, codes, tags, ..., which are directly linked to the system's database model
- Whiteboard edges** are customizable arrows that only exist in a particular whiteboard
- Database edges** are directly inferred from the database: Edges are automatically drawn between two items that are connected in the database, for example, if a tag is linked to a document

Whiteboards are implemented with React, React-Flow, and MUI.

## THEORETICAL SAMPLING MAP

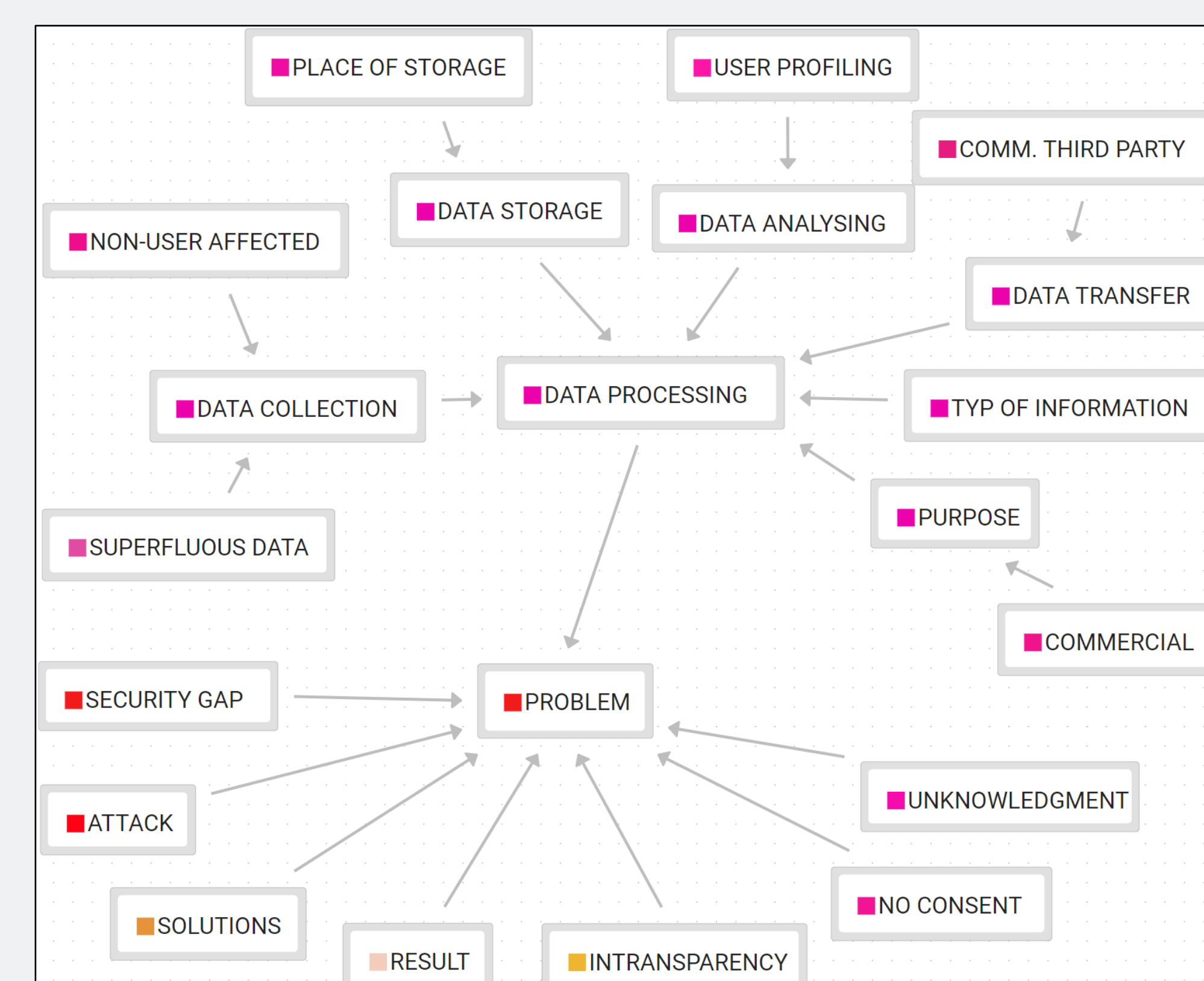


## EXEMPLARY USE CASES

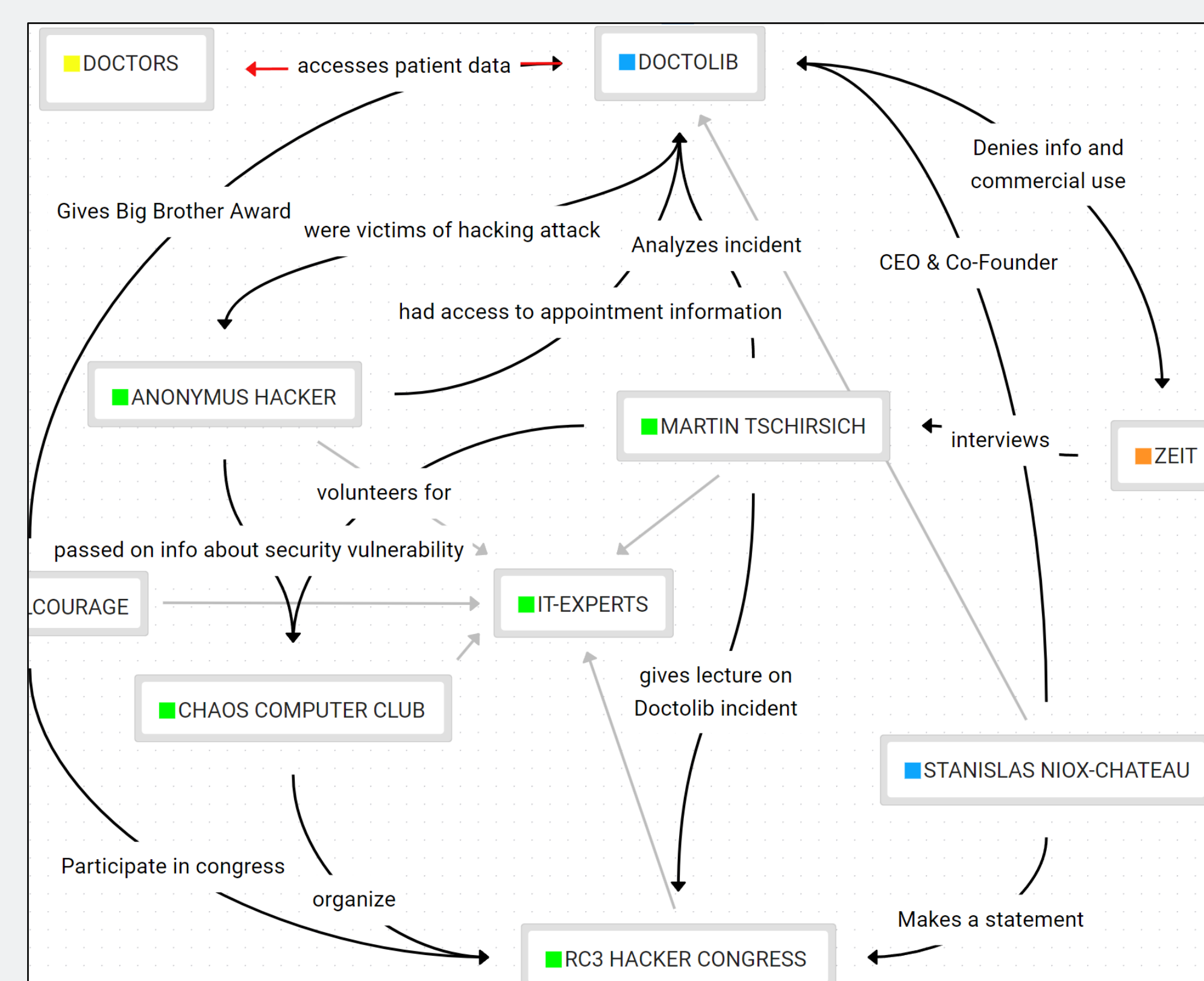
Whiteboards supports a wide range of usage scenarios. While mainly focused on discourse analysis, our implementation is kept generic to enable interaction with various research materials.

The following use cases are part of a discourse analysis on E-Health in Germany.

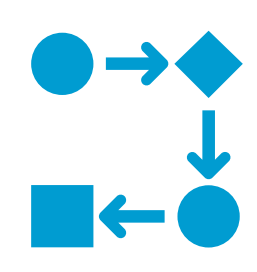
## REFINING CATEGORY SYSTEMS




## CREATING ACTOR NETWORKS





## ABOUT DATS


**PRE-PROCESSING**  
 Multimodal data is enriched for analysis by generating statistics, extracting metadata & named entities, automatic transcription, and computing contextualized embeddings.


**SEARCH & FILTER**  
 Explore vast collections with keyword and semantic search across text and images. Knowledge management is streamlined through efficient filtering and tagging.


**ANNOTATE**  
 Manual and machine-learning supported annotation in the DATS following the three phases of Grounded Theory simplifies the exploration of phenomena.


**ANALYZE & VISUALIZE**  
 Frequency analyses, timeline visualizations corpus linguistic methods & whiteboards support with hermeneutic interpretation processes.


**REFLECT**  
 Documenting and reflecting on new insights or the research process is essential. DATS and Whiteboards offer semi-automated organization of memos.


**OPEN SOURCE**  
 DATS is designed as open-source software. In its development, only open-source models and software libraries are utilized: <https://github.com/uhh-lt/dats>