Personal Memories with Attentive Documents for Knowledge Workers

Knowledge work is to a large extent document-centered work. Knowledge workers receive documents and process them, e.g., by assessing relevance of entire documents or parts of them, categorizing them, extracting information, etc. Typically, they use the acquired information (of course together with their own knowledge, etc.) also to produce documents, often as a manifestation of newly generated knowledge. This (obviously simplified) view on knowledge work holds for many domains: A lawyer processes judgments, commentaries, and previous pleadings in order to produce a new pleading document for the current case. A management consultant uses previous solutions, requirements documents, research reports etc. to produce new solution. A researcher reviews papers from the community, calls for papers, and research notes to produce a new conference paper.

However, today’s documents are mostly “island documents” in a sense that while being internally highly coherent they are to a large extent decoupled from their interpretation environment. This leads to solitary and secluded documents which have lost most of their generation context and hardly get connected to their perception and utilization context. Thereby, “island documents” result in “knowledge islands” which retain only a fraction of their potential benefit as they are inaccessible for explanation, argumentation, (re-)interpretation or (re-)contextualization.

Mymory aims at leveraging the value of document-centered knowledge work by attentive documents which, together with models of a knowledge worker's conceptualization of the world (things, events, topics, etc.), form a personal memory for situated information assistance. “Attentive” means that

- a document maintains relations to its environment, especially the sources which influenced the document's creation,
- it is recognized how a document is perceived (e.g., which parts are just skimmed over, carefully read or not perceived at all),
- a document’s appearance to the knowledge worker adapts to his/her current work context.

In order to achieve this goal, Mymory conducts three lines of research:

- Rich multi-modal context representations will be established, maintained, and exploited in order to capture the particularities of today’s fragmentation of knowledge work even within the realm of individual knowledge workers.
- Attention-oriented Information Retrieval techniques will be developed in order to utilize the user’s assumed perception for high quality personalized information support. Attention evidence will be collected from eye-tracking data as well as from observing a user’s actions in the virtual environment.
- Cognitive adequate situated document annotations will allow for framing documents with multiple semantic interpretations which reflect the reader’s background knowledge and his/her current goals and work process.

These lines of research have their own modular research programme with their respective evaluation and validation methods, but are also integrated in a demo application (C3DW, the Connected Context-aware Creative Document Workspace) that will be embedded in a prototypical knowledge worker’s enriched physical desk.

A board of industrial partners is associated to Mymory in order to better incorporate constraints and requirements from real world users into the development of the system. These partners guide the development of usage scenarios, provide data for evaluation of core functionalities, and serve as participants in a user study for the overall system.