John Goodwin
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Technology Critique: ReMarkable Texts

ReMarkable Texts (RMT) is an "electronic student notebook" currently under development by Brown Computer Science Department's Computer Graphics Group. Running on a TabletPC, the system aims to replace and augment the standard paper notebook with an electronic device. RMT offers a variety of tools for manipulating and annotating documents, including simple note-taking with the Tablet's stylus, simulated "Post-It Notes," a variety of visual tags that can be associated with a location and then searched for, audio and video capture, and hyper-linking. These operations can be performed on preexisting documents created with HTML, Microsoft Word, or Microsoft PowerPoint, or on blank, user-created documents. RMT also offers a number of interactive features, such as real-time capture of notation and multimedia from a classroom presentation, and interactive work with an arbitrary number of other students running RMT. Finally, the software offers almost infinite journaling capabilities, allowing the user to place a given notation in temporal context (matching it with audio, video, and professor notation, as well as the status of other documents), and to replay a given sequence of annotations in sync with other data. Although marketed primarily to the educational market, RMT is purportedly applicable to business and professional training as well, with proposed applications to business meetings and military planning[1].

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[1] Funding for ReMarkableTexts comes primarily from Microsoft Research and the Department of Defense. Microsoft hopes to integrate the system into its ConferenceXP suite of communication tools, while the Department of Defense hopes to use it for strategic briefings, largely mapping terrain and strategy. More information on RMT can be found at the project's website: http://www.cs.brown.edu/research/graphics/research/ReMarkableTexts/.

Implicit to ReMarkable Texts are a number of assumptions about cognition and the learning process and, by extension, the nature of knowledge and the constitution of our world-view. The goal of this essay is to identify some of those assumptions and to explore how they in turn influence and shape cognition and education by the presumptions they make about it.

At the level of interface and usability, RMT is interesting in its use of metaphor. The fundamental metaphor underlying the TabletPC interface, which RMT seeks to exploit, is that of natural handwriting. It is assumed that the action of writing with a pen on paper is more natural and intuitive to the human user than keyboarding, so the use of a pen, paper, and ink is simulated with a combination of software and hardware. While the reference to another, previously learned concept or practice is a common technique in interface design, the use of metaphor is complex in this circumstance because the functionality to be attained is drawn from both the computer and traditional worlds. In order to leverage the presumably more natural process of writing with a pen and paper, the primary means of user input is the stylus rather than the mouse and keyboard. However, in order to properly augment traditional note-taking with the power of the computer, as well as to conform to now-common assumptions about what functionality should be standard in a computer application, functionality typically associated with standard computer input devices must be translated to the new, pen-based input paradigm. Not only must the user be able to write text using the stylus, he must also be able to maneuver the traditional mouse pointer and perform operations like dragging-and-dropping, copying-and-pasting, selection, and deletion. The result is a multi-modal, pen-based interface that combines traditional WIMP components with a novel system of

gestures. In the best case, this amalgam muddles the familiarity with pen-and-paper transcription RMT seeks to exploit; in the worst case, it undercuts any familiarity offered by the pen-and-paper metaphor and creates an interface that is wholly new and foreign.

At a more general level, the crafting of RMT as a sort of meta-tool, capable of accommodating learning in any subject (there is no suggestion that the utility of the system is limited to math, statistics, English, or any other particular subject matter) and under any circumstance (classroom, business meeting, strategic briefing), implies that the data collected by the software constitutes an all-encompassing record of an educational experience. By extension, the implication is that the combination of written record, audio and video data, and temporal context constitutes a complete world-view. This world-view achieves primacy within and without the classroom, as, in both contexts, the user's attention is shifted from the speaker to the machine. In its ultimate form, RMT will allow the transmission of audio, video, and real-time annotation of computer slides from the speaker to the listener. The listener's physical proximity to the speaker is then presumably superfluous, and, even if speaker and listener do in fact occupy the same room, a good deal of attention is no-doubt redirected from the speaker himself to his virtual representation.

Any number of theorists have discussed the ways certain technological devices shape the overall world-view of those who use them, and the world-view embodied in RMT is subject to the same examination. A theorist such as Israel Scheffler would probably condemn the RMT model on the basis of its reliance on digitized information, which, according to Scheffler, acts as a sort of band-limiter on knowledge by stripping it of its context: "Interactive technology is but the tiniest sliver of interactive life."[2]

2   Israel Scheffler. "Computers at School?" p91

However, Scheffler's underspecified explanation of that which constitutes "interactive life" limits the explanatory power of this statement as it applies to a program like RMT.

A perhaps more fruitful avenue is suggested by Lev Manovich, who highlights the notion of the database as central to computer-generated and -mediated information.[3] Maniovich's analysis is apt here, as the underlying engine for RMT is in fact a database, and the case could be made that the program's primary strengths are its ability to store all the data exchanged in the classroom and its provision of a means to sort and decipher that information at a later date. Under Manovich's rubric, the database is significant as a conceptual model because it stands in opposition to the concept of narrative. That is, information is stored in a database without meaning attached to it, and nothing about the structure of a database mandates a narrative. The primary question in evaluating RMT then becomes whether or not the user taking notes with RMT is actually constructing a narrative that can be examined and reevaluated at a later date; or if he is simply imposing a limited amount of order on the data in order to allow him to construct any number of narratives at a later time, i.e. defining the database's schema. I do not have a final answer to this question, and, to a certain extent, the answer is probably contingent on the way the system is used. However, it *is* probably true that, even if the user creates a proper narrative in the classroom with RMT, the possibility of creating an infinite number of additional narratives while utilizing the system's journaling features exists. For example, temporal manipulation during out-of-classroom review might reveal relationships among data that were not apparent at the time of capture, thus expanding narrative possibilities.[4]

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3   Lev Manovich. The Language of New Media. pp218-242
4   Walter Benjamin discusses a similar opening of narrative possibilities with the advent of the motion picture in "Art in the Age of Mechanical Reproduction." Where things like the precise positioning of a horse's legs in motion were previously a matter of conjecture, slow-motion review of film allowed this information to be understood.

The database orientation of RMT, combined with its nature as an educational accessory, suggests a type of cybernetics. Rather than a self-contained, human learner, the student becomes dependent on an external data-store, a technological accessory to his memory. Where a theorist like Heidegger or Borgmann might decry this development as yet another sign of our fading humanity, I am inclined to take a position more like that which Bruno Latour espouses in his essay "A Collective of Humans and Nonhumans." In it, Latour traces the evolution of human technology and argues that the defining characteristic of modernization is a growing intermingling of humans and nonhumans.[5] While this view in no way undercuts the need to examine and evaluate any given amalgam of humans and technology, it preempts the criticism of inherent unnaturalness. It is beyond the scope of this essay to fully evaluate whether or not the human-nonhuman imbroglio represented by RMT is fundamentally positive or negative, but it seems that a case could be made for claiming that it is essentially advanced tool usage of a type that has characterized humanity for all of history.

The ReMarkable Texts project thus raises a number of questions about education and cognition, which I have by no means answered here. While certain features of the system, such as the use of metaphor in its interface, can at least be explored in a straightforward manner; the questions it raises about world-view and the relationship between humanity and technology are highly complex. Perhaps the only certainty is that RMT is symptomatic of a growing societal reliance on technology for fundamental, day-to-day activities, and the implications of this reliance are worthy of in-depth exploration.

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5   Bruno Latour. "A Collective of Humans and Nonhumans." pp180-181

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