

# **NEW TECHNIQUES FOR KNOWLEDGE CAPTURE**

Stan Rosenschein

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If a tree falls in the forest and there is no one present to hear it, does it make a sound? Perhaps a more cogent question is the following: If a business meeting takes place and no one documents it, do the words spoken retain value? Philosophical questions aside, the value of spoken language undeniably lies not only with the speaker, but also with the listener. Recognizing this, Quindi's Stan Rosenschein has developed a tool for meeting capture that relies only on the use of a PC and inexpensive mass-market peripherals. Richer solutions exist, but these require a highly instrumented meeting room and/or the production of labor-intensive or still-dacey automated speech-to-text transcription. Quindi's Meeting Companion, by contrast, searches text in an accompanying PowerPoint presentation while also enlisting the services of the meeting's participants to ascribe importance to facets of the oral exchange.

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**“Talk is work product, and there are not many other instances where work product is evaporating into the atmosphere with no attempt to retain it and do something with it.”**

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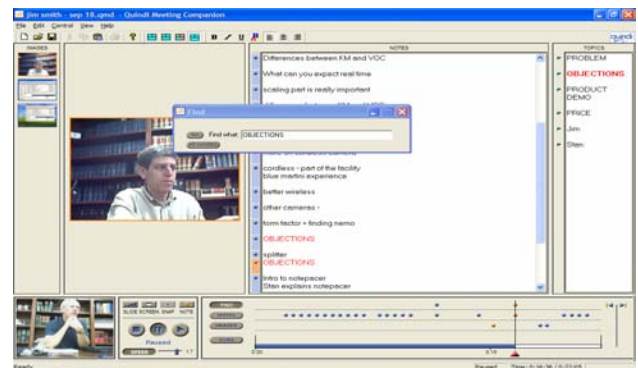
The collective economic, technological, and cultural landscape conspires to make now the time for effective meeting capture. Workers are stretched thin, both geographically and in terms of available time, making it difficult to ensure the presence of an optimal set of participants in a meeting. At the same time, the costs of digital storage and sensing devices have plummeted. Audio files might be memory hogs, but memory is cheap; and all the necessary capture hardware (microphones, webcams) can be had for mere dollars or tens of dollars. On the cultural side, TiVo, remote controls, and interactive media have acclimatized the populace to zipping through, around, and past content that holds only minimal interest. On the other hand, reality television, webcams, and blogs have lowered inhibition thresholds, such that there is increased comfort with having voice and action recorded. Finally, the business culture features ubiquitous laptops, PowerPoint is the presentation medium of choice, and multitasking is sanctioned as an art form along with the abbreviated language of instant messaging. Combine all of these trends and the Quindi solution emerges.

Rosenschein's system coordinates the two primary media of knowledge exchange: the live event and document/data-based content. Tools that support audio and/or audio-video conferencing and teleconferencing expand the range of participants by lowering the barrier introduced by distance, whereas slide presentations and real-time Web access bring data into the realm of the live event. Web conferencing blends these two arenas by bringing data and geographically dispersed individuals together, but to-date an expensive physical set-up

was needed to store and effectively index and share the event thereafter. “There's only one thing missing to close the loop,” recognizes Rosenschein, “and that is taking the expanded live event and turning that back into a document. If you had something like that, you would be able to treat meetings as objects.” Whereas other technologies (e.g., GroupSystems' products) endeavor to shape the organization of the meeting itself, Quindi's Meeting Companion accepts the structure and records the audio and video in a synchronized manner with the pace of the PowerPoint presentation instead of serving as a tool for meeting facilitation. “We just want to be in the business of documenting the meeting,” emphasizes Rosenschein. With a modicum of human annotation—both in the moment and after the meeting's conclusion—and flexible playback, Quindi closes the live event–data loop.

“If you're sitting in a meeting room with a laptop, you're living in a very data-rich environment,” reminds Rosenschein. Low-cost audio–video capture anchors the Quindi model: just plug in a webcam or two and use the PC's or an external microphone. The PC's clock achieves synchrony among the live capture, the PowerPoint presentation, and the user's annotations—provided that cues are manually inserted. The Meeting Companion, however, paves the way to do this with ease. Human beings are dealt an inherent mismatch in the rates of reading and writing, and of listening and speaking. In each case, the former is faster than the latter, and vastly so for reading–writing. Thus Rosenschein's tool requires only minimal written input and only the amount of speech that would otherwise take place during a meeting; when revisited, listening and reading dominate. “We leverage these differentials. We get you to type in a little bit and speak, and wrap it up together that on playback you can read really quickly, find the parts that are interesting to you, and then play it back faster than it happened.”

The interface includes a main window for entering IM-like (or more extensive) time-stamped notes, a menu for user-created keywords (e.g., action item, objection, interview question, joke, names of speakers, or agenda items), a gallery of images (current slide, webcam image, alternate-webcam image), and a timeline with slider along with other navigation tools for moving within the session. In contrast with other capture systems, the main emphasis here lies with the spoken



word and data, rather than with the video, which instead serves as a memory hook for who in the meeting spoke up on topics of interest. The *find* function is intimately tied to the product's temporal tracking ability. Each note is time-stamped according to the *beginning* of the time window during which it is keyed in. Thus, using the NotePacer function, when conducting a keyword search on the notes, the user is brought in time to the start of the topic, rather than skipping past it. "The way you would turbo-play through a meeting is you would crank up the speed slider to the maximum velocity you thought you could absorb," details Rosenschein. "You'd scan down the list of notes with your eyes if you want to go through it linearly; it is kind of like using the seek-scan function on your radio." Alternatively, the user can click on individual notes of interest and skip directly to that point in the audio-video.

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**"When you go into a meeting, what you walk out with is a file with timestamped data and audio-video."**

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The Meeting Companion is sufficiently versatile and configurable that a user could conceivably get lost in its options while attempting to capture the essence of a meeting. To offset this initial stumbling block, Quindi offers a set of best practices according to the individual's role in the meeting (owner, participant, noncontributing attendee, or nonpresent stakeholder). "If I were giving a PowerPoint presentation," suggests Rosenschein, "I would use the PowerPoint slides as my indexes and use them as the basis of the text search afterward." Nevertheless, entry of explicit notes is a minimal

distraction at worst. Given today's practices, meeting participants often multitask in any case, and the act of indexing using only 10–20% of active cognitive capacity. Notes Rosenschein, "It's more like typing an email. And if they weren't doing this, they would be sending an email message during the meeting anyway." After the meeting, users can share and/or combine notes, as well as annotate files more richly during playback.

Who, then, should attend a meeting? Meetings intrinsically differ in value, and a given meeting imparts a varying amount of value to the individual attendees. Quindi serves the needs of all constituents. Integral participants, whether active contributors or others with need-to-know status benefit from a reviewable record of the event; absent but interested stakeholders likewise benefit. Those who might have attended but did not—and in retrospect would have gained little value—benefit from not wasting time. Some meetings warrant repeated revisitation. Consider a design review: A presentation of the design is given in the live event, and active participants include experts who ask probing questions. How many—and which—experts should attend is not always predictable, but the need for subsequent input from particular specialists can surface midmeeting. Instead of a need to reschedule and reassemble the entire group, the Quindi-captured meeting can readily be emailed to relevant parties, feedback can be added, and the file returned to the design team for reassessment. "People can participate asynchronously without allocating part of their schedules, and still have full access to the interactive session," says Rosenschein, although in accelerated and targeted form.