

# Storytelling in Collaborative Work: Design Challenges for Capturing and Representing Sensitive Interactions

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## **Introduction**

Within the CSCW research community, storytelling is a known critical component in successful organizational memory systems. Storytelling plays many roles in the informal exchange of information, but in my research experience I have found that its primary contributions are as follows:

- It provides access to local expertise, which is the ability to meaningfully interpret and value information by one's experience. For example, a colleague with more experience with a given problem will help illuminate the different meanings for another.
- It often helps contextualize abstract understandings. At times, information about a given situation which may have been desiccated into abstraction in a formal written process or policy, is rehydrated through storytelling, which describes in detail how this played out in a particular situation. In turn this provides more interpretive "hooks" for the listener to use in order to ascertain the story's relevance for her current situation.
- It provides support for accessing tacit knowledge. For example, individual understandings, too habitual to explicate in specific rules, often come percolating to the surface in the context of describing how actual work was accomplished previously.
- It encourages an iterative process of mutual understanding. Storytelling in the workplace is rarely concluded with theatrical applause, but in contrast is routinely followed by active questions and answers from the "audience." For example, the three co-workers gathered around the coffeepot on the morning break will likely follow on their coworker's story with dialogue or stories of their own as they collaboratively make sense of the situation.

Despite the critical importance of storytelling to collaborative work, little information systems support exists for this activity. The opportunity for improved organizational memory utilization through appropriate computer support is great, as is the need to better understand the phenomena to best inform design. Efforts to create collaborative storytelling support systems, especially for virtual teams, face a host of design challenges (which, hopefully, will be discussed in some detail by the participants of this workshop.) This position paper will briefly explore one of those challenges – the preservation of sensitive interactions.

## **Storytelling in Everyday Work**

Reliance on storytelling in communicating knowledge unfolds quite naturally in the everyday workplace. One illustrative example of this is provided by Orr's classic ethnography of copier repair technicians [Orr, 1996]. The most critical knowledge transfer point in the studied technicians' day was the informal breakfast review of that day's jobs with their customer support team. Each team member had significant contributions to make, assisting each other in making sense of their forthcoming jobs and strategizing accordingly. The core element of this interaction was the participation in richly-layered, though brief, storytelling. There are three notable observations about these exchanges. First, this grounded the morning's discussion in their real world of particular customers, operating environments and quirkily aging equipment. Second, the stories provided rich description which supplied a host of relevant facts and interpretations without much editorial excising. On this Orr notes, "the unpredictability of the world expressed in this story is part of the motivation for the detailed stories of machine behavior; the technicians can never know which details will be critical on their next call." [p.20] Third, it built camaraderie through shared experience. This was not a forced team building exercise but the natural outflow of their personal interest in their jobs as Orr states, their "other motivation is sheer interest in the world in which they work and the roles they play in that world." [p.20]

## **Challenge of Preserving and Presenting Personal Perspectives**

By its very nature storytelling is a very personal form of communication. In the telling, it reveals a persons' experience, personality, biases, and interpretive views. Often these are as important to understand by the listener as the story itself. Wise new employees often augment their crisp job descriptions and freshly-minted employee handbooks, with shared lunches and smoking breaks with their more tenured colleagues to understand how work is really accomplished in the organization. Here an important side effect to understanding locally accepted workarounds is gaining an understanding of their colleagues perceptions and valuations of those practices.

When the central story is "what happened in the meeting yesterday" or "what did I miss while traveling last week," much of this personal perspective is merely added contextual color. However, when the central story comes closer to sensitive topics, such as "the real reason why we haven't paid the vendors invoice" or "why management never supports proposals like yours," these personal perspectives need to be routinely held in a higher degree of confidence.

Thus, efforts to formally capture and represent workplace storytelling via an information system can fundamentally change its character -- promoting the mundane, broadcasting the private, personalizing the general, decontextualizing the relevant. What care needs to be taken in designing such systems? The following example, I hope, will raise some of these concerns.

## **Difficulty in preserving meta-context in stories at GTS-West**

This problem of preserving sensitive storytelling information to assist with later interpretation is well illustrated by an example from my field study of service engineers and their reuse behavior in high-reliability, collaborative problem solving.<sup>1</sup>

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<sup>1</sup> For further details on this study, please consult the full paper "Achieving Safety: A Field Study of Boundary Objects in Aircraft Technical Support" in the conference proceedings. [Lutters and Ackerman, 2002]

The site, GTS-West, is an aircraft manufacturer's technical support center charged with assisting airline maintenance crews through difficult repair and maintenance problems. Its two hundred engineers are organized into functional groups by system (e.g. hydraulics) or by analytic support service provided (e.g. drafting). Service requests are collaboratively resolved through dynamically configured, multi-disciplinary sub-teams whose expert engineers are assembled as appropriate for the job at hand. All of this activity is mediated by two workflow systems, GlobalCOM and ROC. (Simplistically, the former manages the interactions between GTS-West and the airlines, while the latter manages the interactions within GTS-West itself.) Each system provides an archivable audit trail of the job, as required by regulatory agencies such as the Federal Aviation Administration (FAA). This recorded trace of the job (through the engineers, resources and communication involved with generating a solution) has become the centerpiece for a successful organizational memory system at GTS-West. Reuse, in many forms, based on these artifacts is key to the organizations maintaining timely, high quality responses to the airlines. For this example, the focus will be on the ROC system, the record of internal interactions.

While ROC records are rich with contextual cues (e.g. who completed which task? what reference materials did they use? who checked their work?), they are decidedly sparse on detail. Thus, much of the process of recontextualization (i.e. filling in the missing details to the point where an engineer can make a judgment about the relevance of the historical record to their current task) relies on storytelling -- finding those who originally worked the job or similar jobs, sharing your interpretation with your neighbors, or asking senior colleagues for interpretive examples.

One of the most important recontextualizing elements to be gleaned from this story exchange is an understanding of the meta-context, or meta-negotiations, surrounding the ROC. That is, knowing the state of the environment at the time the ROC was archived. For example, what versions of the mathematical models for load analysis were used at the time? Did this airline have a rocky reliability record during this period? What was the experience level of the team members? Were there exceptional time pressures on finding a solution? Were there FAA required inspections on this part at the time?

This knowledge of the meta-context exists outside of the ROC system, solely in the minds of the engineers. As a result this knowledge ages quickly, rendering ROCs older than a few years of little value due to their high interpretive costs. Why is not more of this environmental context captured in the archival record? There are at least two reasons. First, it is unwieldy, if not impossible, to preserve the entire state at the time of the archive. Second, and most important for this argument, recall that the ROC is the legal audit trail for all activities at GTS-West. Personal stories that are helpful for later recontextualization for reuse may be detrimental if subpoenaed and interpreted out of context in a court of law.

At GTS-West the optimal design for this problem remains an open research question. The trade-off being between preserving the personal stories surrounding the ROCs to assist in recontextualization for reuse while minimizing the impact of personal and organizational liability for that same information. Their current solution is two-fold, continue preserving the most

sensitive stories outside the system, and distilling the remainder into abstract “best practice” cases. Neither of which will be as advantageous as a design addressing the middle ground.

### **Impact on the design of storytelling for virtual environments**

The teams at GTS-West were all co-located, giving them the advantage of preserving stories “off-line.” Virtual teams often do not have that luxury. The issues and needs for sensitive preservation remain, but finding the appropriate balance for design is all the more challenging.

For example, in the DocuDrama capture and presentation tool for TOWER virtual environments [Schäfer, et al., 2001], both the focal interaction and its environmental context can be preserved. Anything in the virtual world can be recorded, e.g. by a camera agent, and is available to the narrative construction process. Simple notions of privacy controls, e.g. a participant could block their interactions from being recorded, may not be suitable for addressing the complexity of this preservation challenge.

### **Conclusion**

As discussed stories captured and represented in an organizational memory system ought to be identifiable by their source. However, preserving uniquely identifiable stories can be both personally and organizationally problematic. This stands as one of the many engaging and critical design considerations for computer-based collaborative storytelling support – each warranting further research and discussion.

### **References**

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