

Ecological Storytelling and Collaborative Scientific Activities

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INTRODUCTION

The role of storytelling in support of organizational identity and communication is well recognized [e.g. 5, 6] though there are few empirical studies of organizational storytelling practices [7] in general and fewer of scientific storytelling in particular. Stories and their use raise complex issues with respect both to community building and to the design of systems that can support their use.

The focus of our study is a scientific endeavor existing as a community for more than 20 years. The Long Term Ecological Research (LTER) Network [4] operates at 24 geographically distributed sites with the mandate to share field data within a specified time of collection. The scientific data collections are annotated by descriptive contextual information called metadata (data about data). In efforts to facilitate cross-site research and data synthesis by making datasets comparable between sites, LTER information managers are developing and adopting metadata standards.

Drawing on an analysis of the development of the International Classification of Diseases as a distributed information processing infrastructure, Bowker and Star argue that formal data descriptions 'wrapped' in informal descriptions increase the usefulness of the data [2]. Adopting this approach, we look here at the possibilities and limitations of storytelling for grounding environmental data in its organizational context. Ecological data typically become more valuable with time if they remain embedded within a matrix of situational and summative information. A frequent limitation with metadata approaches today is that the layer of informal description for short-lived, non-scientific narrative data is lost when scientific data are stored with only formal metadata [e.g. 3].

The articulation of complexities associated with scientific data and its reuse in distributed organizations has been initiated [9] but remains a largely unexplored domain in terms of design innovations with the exception of a few well-known examples of organizational memory applications, such as the Answer Garden [1]. Specific challenges with LTER are its need for very long lasting and highly distributed data. Extended temporal and spatial dimensions pose challenges for the design of technologies that support distributed collaboration and large-scale databases in terms of formal information retrieval function and organizational problem solving. In order to examine relations between scientific and organizational in micro, metadata and narrative practices we studied stories and storytelling of the distributed heterogeneous databases and organizations that comprise LTER.

LTER STORIES

To gather story materials and to gain understanding of storytelling practices we carried out participant observa-

tion of everyday work practices at LTER sites and events where LTER participants gathered. Interviews were conducted with scientists, information managers, technicians, field personnel, graduate students, managers and administrators. Three story types are presented to illustrate some of the variety of LTER storytelling practices.

Science stories

Science traditionally delivers its results through scientific journal articles. In addition, LTER sites produce 'nuggets' or short stories of important scientific results, milestones of selected events, and newsletters presenting current activities while some sites have had their histories written. These formal narratives are typically recorded in written form.

Stories of history, values and identity

According to Charlotte Linde, storytelling is particularly well suited to convey social commemoration of history, values and identity [7]. We identified ten varieties of story deployed as resources for evoking the boundaries of the organization by pointing at an outside or affirming an inside to the organization, sharing solutions to formal problems and sharing information about resources for articulation work within the LTER network. Each of these varieties were present in multiple instantiations:

- * The how-to variety of the just-so story (here's a script for how the organization/technology works/should work);
- * the eulogy of the good old days (when the full quorum of site representatives fit around a single table);
- * the elegy of the bad old days (when few understood data management);
- * the saga of the transformation experience (how a person or a collective effort grew/matured to comply more fully with LTER principles/ideology);
- * the narration of the epiphany (when all participants to information manager meeting understood that content could be divorced from representation so could start climate database work together);
- * the coding of the highly telegraphic story (when a verbal cue or graphical representation tells the whole story);
- * the unfolding of the uniqueness tale (how LTER science differs from other ecological research);
- * the telling of the community (how one particular site differs from others and yet all share certain characteristics);
- * *Faits divers* clustering around the recalcitrance of scientists (how some individuals refuse to share data);
- * *Faits divers* clustering around the recalcitrance of natural objects (how nature poses challenges for ecological research and information management).

These informal stories are typically shared verbally, and they often travel well across organizational boundaries; they may be highly engaging or contain a moral message, and they may be told by acknowledged storytellers in social situations suitable for storytelling.

Stories of everyday technical work

Julian Orr describes how narrative practices are an integral part of everyday technical work. Photocopier repair technicians tell stories about malfunctions and ingenious diagnoses of implausible problems as they assist one another in mending the quirky machines [8]. Storytelling is also an inherent part of everyday work practices in LTER. Most typically these kinds of stories are told to co-workers while immersed in work activities. These stories include practical problem solving tales, process stories of handling crisis situations, complex stories of interdependent activities, and surprise stories with unexpected emergences. Stories of everyday technical work are inherently transient and are not typically retold outside the particular situated work activities.

SUPPORT FOR STORIES AND STORYTELLING

Developing in-depth understandings of existing stories, ways of storytelling and the collaborative activities in which they are embedded is a prerequisite for designing a technological support system. In the case of LTER, the rich variety of stories and storytelling practices combined with the network's loosely connected distributed nature and its long-term mission pose special challenges. Important general design dimensions include capture and production effort, use effort and genre issues [7]. In face-to-face storytelling situations human storytellers are able to take the audience into account and adjust the story accordingly. When the audience turns into a 'user', one has to consider issues such as media type, appropriateness of the story genre for the use situation, and the amount of effort required from the user.

Some difficult varieties of stories to support

As collaborators work together, their stories become short-handed and highly telegraphic. As an example, a shorthand reference to 'Bill's figure' reminds LTER information managers about the often-told story of the data decay process and their central mission to preserve data for the long-term. As the LTER participants have worked together closely over the past twenty years, there have grown up a group of such stories. Can and should we support intimacy creation over a distributed network? How can one represent stories so they can be easily shared and economically described? How can newcomers to the network develop an understanding of the shared story base?

Stories of everyday technical work do not necessarily travel well beyond the particular situations that raise them nor across organizational, discipline or domain boundaries. Individual data managers are located each at a different LTER site, so storytelling practices about technical data work within this community do not develop through everyday contact. Furthermore, these stories are not 'hero stories', nor are they about the unusual, remarkable or

extraordinary. Rather they may be considered so mundane, even boring, that it would be "oddly inappropriate for an experienced worker to tell another experienced worker a story about daily routine" [7] when removed from being immersed in the actual situation of doing the technical work. Yet it seems to be just this tacit knowledge, situated lived experiences and contextual understandings that are essential for the analysis and design of 'narrative metadata' for long-term information management systems. At issue even in current practices, are the barriers for the community members identifying and articulating stories while immersed in everyday work activities. How can we foresee which stories will be important to capture and store for both immediate and long-term reuse, for as soon as today and as distant as decades and centuries. Storytelling is widely recognized in the organization theory literature to be central to organization culture. We need more stories about storytelling in distributed organizations.

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