

Socio-Technical Patterns for Collaboration in e-Research

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Background:

I received a Ph.D. in psychology from the University of Michigan in 1971 and managed a research project on the psychology of aging at Harvard Medical School. I then joined IBM Research and conducted research in human computer interaction including query languages, natural language processing, design problem solving, audio systems, and speech synthesis. In 1986, I began the Artificial Intelligence Laboratory at NYNEX Science and Technology. I have co-chaired a number of workshops on Human-Computer Interaction Patterns and Socio-Technical Patterns since 1997 at CHI, CSCW, and INTERACT. I also co-organized and co-led workshops on cross-cultural issues in HCI at CHI '92 and INTERCHI '93 and the workshop on International Development at CHI 2007. I have taught a variety of courses including cognitive psychology, problem solving and creativity, the psychology of aging, storytelling, and human factors in information systems.

My current work at IBM's T. J. Watson Research Center is in understanding psychological complexity and developing associated measures and tools and applying these to High Performance Computing. High Performance Computing is an interesting domain in that ultimate results arise from a complex, multi-party collaboration including hardware developers, programming language developers, software tool developers, domain experts, experts in parallel programming and systems administrators all done in the context of overlapping communities of practice. Prior to this, I developed the user experience for an e-learning system based on Learning Objects which allows users to specify goals, types of materials, time constraints, and background. Empirical lab work and field trials showed this system to be a useful and usable tool. This tool provides another interesting case of multi-faceted large-scale collaboration involving our tool development group, content providers, subject matter experts who provided some of the metadata and the end user/learners. Prior work focused on developing tools, techniques, and representations to support the capture, creation, analysis, organization, finding and use of stories and scenarios in a business context. These story-related techniques have continued to prove useful in subsequent projects. In all these studies, in our business context, it has been necessary to collaborate across time zones, cultures, and countries as well as disciplines. I have also been involved in the design, training, and facilitation for the various large-scale global on-line "jams" that IBM has used for a variety of collaborative purposes such as developing corporate values, identifying and solving problems and fostering innovation. I have also been an author and editor in the distributed collaborative development of a socio-technical pattern language to move us to a more democratic world (<http://trout.cpsr.org/program/sphere/patterns/>).

Pattern Language Approach. A pattern is a named recurring problem and the essence of its solution. A pattern language is a lattice of inter-related patterns that together cover a domain. Pattern languages have been suggested for physical architecture, object-oriented programming, management, human-computer interaction and socio-technical systems. Based on a combination of lessons learned from the above personal experiences, a review of the relevant literature, and a look at analogous situations such as Native American oral traditions, I am developing a socio-technical pattern language that attempts to provide solutions for common problems relevant to the domain of e-Research. Since this topic spans such a wide variety of purposes, cultures, and contexts, this seems to be a potentially useful approach. A specific “formula” or “blueprint” for successful e-Research would seem to be too limited to address such rampant variety.

Each pattern is several pages long and includes an analysis of problems in terms of opposing forces. However, some example summaries of such patterns include the following: **“Who Speaks for Wolf?”** which basically demonstrates the importance of identifying and including all relevant stakeholders early; **“Greater Gathering”** which claims that focal work in small teams needs to be balanced with plenary gatherings; **“Support Conversation at the Boundaries”** which identifies mechanisms for cross-group communication; **“Context-Setting Entrance”** which shows how appropriate behavior can be cued and encouraged by sensory and social stimuli.

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