

Toward a Pattern Language for CSCW

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Potential Forms of Knowledge

Known, Predictable, Unchanging, Simple

Algorithms, Formulae, Programs, Machines

Patterns

Heuristics, Principles, *Properties*

Case Studies

Stories

Ethical values and fluid intelligence

Unknown, Unpredictable, Changing, Complex

The Importance of the Social

- ❖ Robert Putnam: Making Democracy Work (Italy) Bowling Alone (America)
- ❖ *Impacts health of individual more than smoking*
- ❖ Impacts on whether we have a sustainable approach to the world's resources
- ❖ Impact on war and other miseries
- ❖ Corporations now supporting collaboration and communities of practice
- ❖ *Socially defined intelligence: Evan's Thesis on figures analogies*

Some ways social and technical can interact

- ❖ Technology supports existing practice (NOTES TeamRoom)
- ❖ Technology changes, or destroys existing practices (garages)
- ❖ Technology allows systems otherwise too costly (Babble, Co-labs)
- ❖ Technology designed for one purpose; is adopted for social purpose (e-mail)
- ❖ *Technology designed for one function has unintended social consequences (microwave, dishwasher)*
- ❖ Technology impacts individual minds & this impacts social functions (video games & impatience)
- ❖ Technology changes society (automobile)
- ❖ Changes in technology lead to desired changes in social systems

Some Aspects of Socio-Technical Interaction

- ❖ *Is coordinated rhythm Required (R), Helpful (+), Neutral (0), Harmful (-), or Incompatible with respect to goals ?*
- ❖ Is conversation R, +, 0, -, I with respect to goals?
- ❖ Negotiation ?
- ❖ Shared stimulus in terms of the gross context ?
- ❖ Shared fine stimulus context ?
- ❖ *What is the Physical positioning of people?*
- ❖ How are Goals controlled?
- ❖ *Is physical contact Required, Helpful, Neutral, Harmful or Incompatible with meeting goals?*

Additional Aspects of Socio-Technical Situation

- ❖ Perceived game-theoretic aspects
- ❖ Preconscious game-theoretic aspects
- ❖ Visual Fidelity, timing of Communication
- ❖ Auditory Fidelity, timing of Communication
- ❖ Other senses involved
- ❖ ***Token interaction: cf. Football, Chess, Golf***
- ❖ Instrumental Space of Conversational Topics
- ❖ Expressive Space of Conversational Topics

E.g. Washing Dishes

- ❖ Hand Washing Duo
- ❖ Rhythm required
- ❖ Side by side
“confessional”
- ❖ Conversation OK
- ❖ Team accomplishes
the work
- ❖ High shared stimulus
context
- ❖ Using Dishwasher
- ❖ Rhythm not required
- ❖ Unitary better
- ❖ Conversation ?
- ❖ Team or One prepares
machine to accomplish
the work
- ❖ Moderate shared
stimulus context

Fixing Dinner

- ❖ Traditional American cooking
- ❖ Negotiation Required
- ❖ High shared stimulus context (same meal)
- ❖ Synchronous activity
- ❖ Conversation likely
- ❖ Microwave
- ❖ No negotiation required (separate meals)
- ❖ Asynchronous activity
- ❖ Conversation less likely (person who is ready first starts some other activity)

Traditional Queue

- ❖ Some shared context; however...
- ❖ Perceived as competition for limited resource (tickets may run out)
- ❖ People in front are costing you time
- ❖ Face to Back of Head orientation
- ❖ Asynchronous movement reinforces individual identity (cf. rowing)

Vibrating Pager Queue

- ❖ The obviousness of the competition has been greatly reduced
- ❖ No requirement to “face the same direction”
- ❖ Face to face interaction possible
- ❖ Conversation is much more likely

Enhanced Telephone Help Desk Queue

- ❖ Many more people need help solving technical problem than servers available
- ❖ People describe problem
- ❖ ASR used to group similar problems
- ❖ People are bridged onto a conference call
- ❖ Synthesis announces to group their areas of overlapping interest
- ❖ Group may be able to solve the individual problems
- ❖ When available, help first gives generic advice

Patterns

- ❖ Behavioral Patterns vs. Design Patterns
- ❖ Application Areas:
 - OO Programming
 - Business Process Patterns
 - Human Computer Interaction & Socio-technical Patterns
 - CHI '97 Workshop
 - Interact '99 Workshop
 - CHI 2000 Workshop
 - CHI 2001 Panel
 - DIAC 2002 & subsequent on-line work on Pattern Language
 - CHI 2002 Workshop
 - CSCW 2002 Workshop
 - CHI 2003 Workshop → DTD for XML
 - ECSCW 2003 Workshop

Parts of a Pattern

– << **Pattern Name** >>

- *Author, reviewer and revision dates:*
- *Synonyms*
- *Abstract (including evocative picture)*
- *Problem*
- *Context*
- *Forces*
- *Solution (including schematic)*
- *Examples*
- *Resulting Context*
- *Rationale*
- *Related Patterns*
- *Known Uses*
- *References*

A Pattern Language

- ❖ Christopher Alexander
- ❖ Architectural “Patterns” that capture recurring problems and solutions
- ❖ Organized into a “Pattern Language” – a lattice of inter-related Patterns.
- ❖ Examples:
 - Eccentric Town Center encourages commuter traffic to stop at Town Center
 - *European Pub*
 - Gradient of Privacy in homes: porch, entry, living room, dinning room, kitchen, bedroom

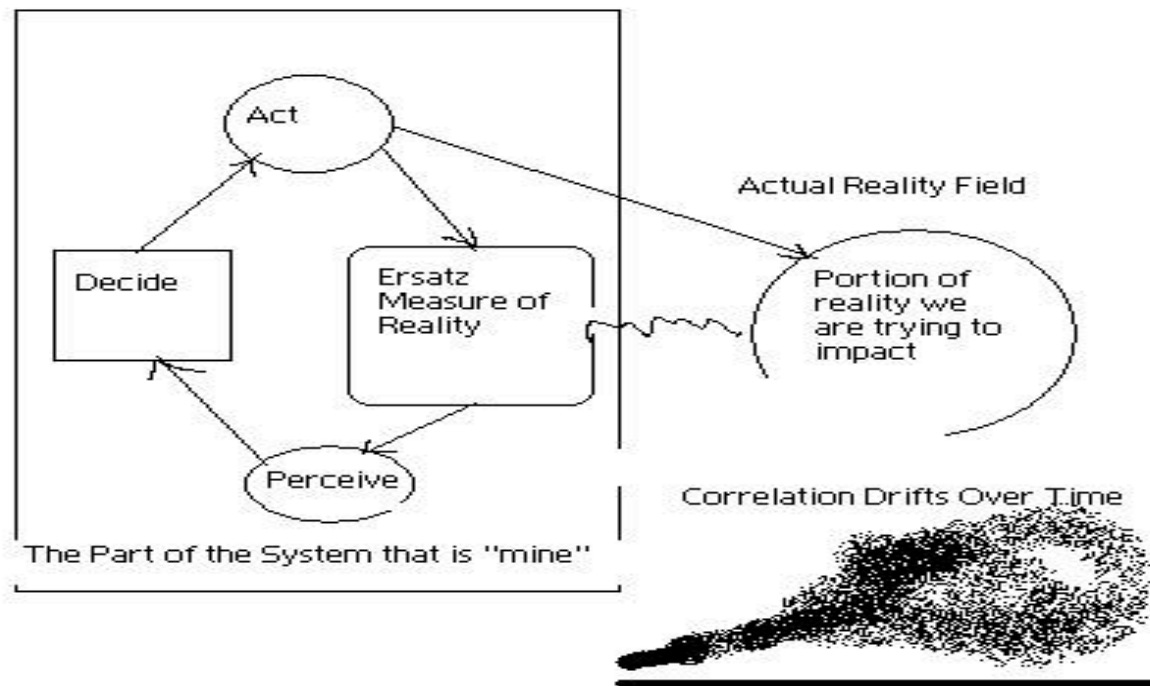
Some Socio-Technical Patterns

- ❖ Community of Communities
- ❖ *Reality Check*
- ❖ Radical Co-location
- ❖ *Small Successes Early*
- ❖ *Who Speaks for Wolf?*
- ❖ *Support Conversation at Boundaries*
- ❖ Social Proxy
- ❖ Context-setting Entry
- ❖ Answer Garden
- ❖ Registered Anonymity
- ❖ Anonymized Stories for Organizational Learning
- ❖ Mentoring Circle
- ❖ Levels of Authority
- ❖ Rites of Passage

Reality Check



Reality Check

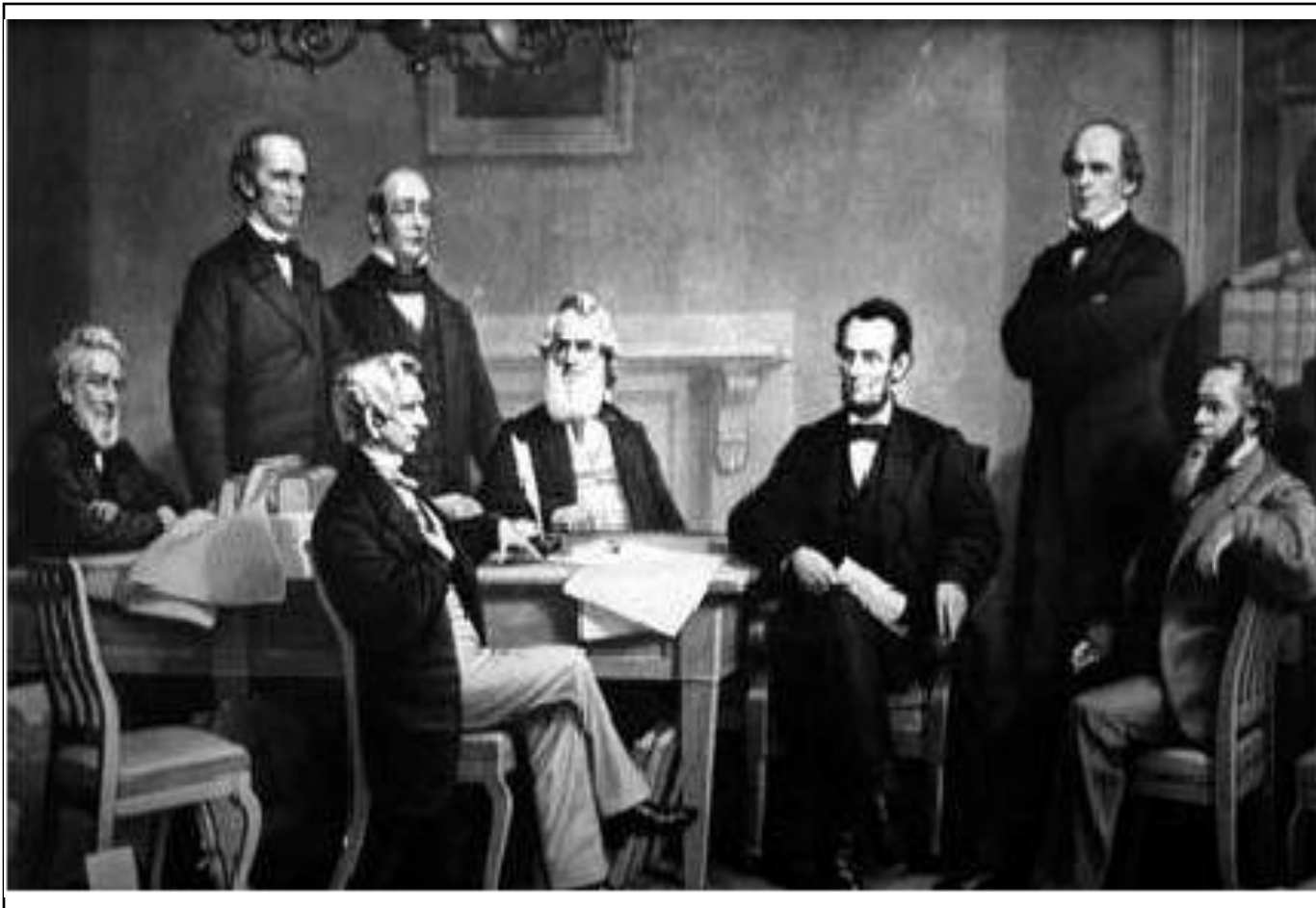


Reality Check

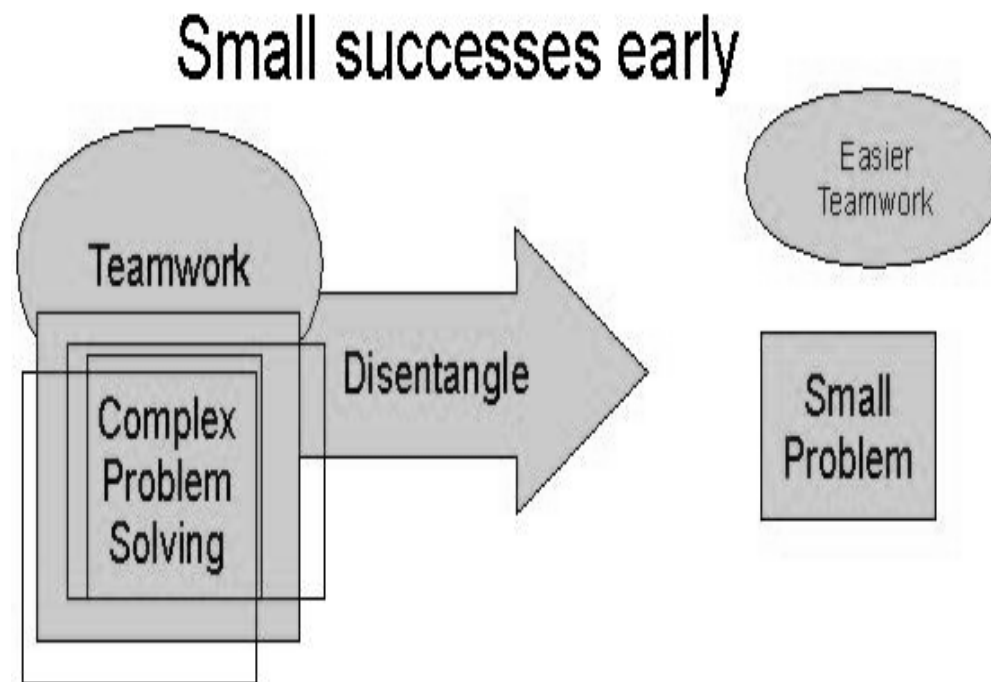
Example: Zhang Ling observation that point system leads to people posting garbage to get points (sometimes)

Who Speaks for Wolf?

Visual by www.PDImages.com



Small Successes Early



Support Conversation at the Borders



Potential Uses of a Pattern Language Approach

- ❖ Problem identification and formulation
- ❖ Lingua franca among stakeholders
- ❖ Problem solving (tool of thought)
- ❖ Design, maintenance (understanding implications of change) and documentation
- ❖ Capture, find, and share reusable intellectual assets
- ❖ Structure empirical tests of usefulness
- ❖ Marketing: ties to impacts on people's image and experience

Challenges to Pattern Approach

- ❖ Developing the *Pattern Language* – capturing the “inter-connection and inter-dependencies of patterns”
- ❖ Different tools for different pattern-user groups
 - Instantiating a pattern as a software artifact (e.g., Web service)
 - Developing methodology, services, etc. for using patterns (e.g., facilitating pattern-user via a Web service or wizard)

Summary and Conclusions

- ❖ Knowledge, presented as a social science article, does not aid the designer/implementer of complex systems.
- ❖ Pattern Languages and Properties *may* provide *actionable* knowledge representations.
- ❖ Focus on “Socio-technical patterns” as area of high leverage because:
 - Much has been learned that is not intuitive
 - Patterns already exist in software, HCI
 - Socio-technical patterns provide the right balance between reusable assets and flexibility to apply to various geographical, cultural, and historical contexts.

For more information:

- ❖ http://www.pliant.org/personal/Tom_Erickson/InteractionPatterns.html
- ❖ [www.truthtable.com/patterns.html/](http://www.truthtable.com/patterns.html)
- ❖ www.research.ibm.com/knowsoc/
- ❖ www.truthtable.com/website/welcome_page_index.html
- ❖ <http://www.hcipatterns.org/>
- ❖ <http://www.publicsphereproject.org/patterns/>
<http://www.ibm.com/developerWorks/patterns/>

For more information:

- ❖ Alexander, C., Ishikawa, S., and Silverstein, M. (1977), *A Pattern Language*. New York: Oxford University Press.
- ❖ Gamma, E., et al. *Design Patterns: Elements of Reusable Object-Oriented Software*, Addison-Wesley, Reading, MA, 1995.
- ❖ [3] Bayle, E., Bellamy, R., Casaday, G., Erickson, T., Fincher, S., Grinter, B., Gross, B., Lehder, D., Marmolin, H., Potts, C., Skousen, G. & Thomas, J. Putting It All Together: Towards a Pattern Language for Interaction Design. Summary Report of the CHI '97 Workshop. SIGCHI Bulletin. New York: ACM, 1997.
- ❖ [4] Schuler, D. (2008), *Liberating voices: A pattern language for communication revolution*. Cambridge, MA: MIT Press.
- ❖ [5] Thomas, J.C., Lee, A., & Danis, C (2002). “Who Speaks for Wolf?” *IBM Research Report*, RC-22644. Yorktown Heights, NY: IBM Corporation.