

Collaboration: Software Development, Learning

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February, 2003

Agenda

- Motivations
- Collaboration in General
- Particular Tools & Comparison
- Things to Consider

Why Collaboration?

- Cooperation among students
- Combat Isolation
- Self help
- Low-cost help
- Promote Community
- Establish Social Network

- Example Problems [in school]
 - Difficult the state (the code / problem)
 - Ease coordination by removing collocation requirement

What is collaboration:

- **k · l b' · r t'**:
 - 1 : to work jointly with others or together especially in an intellectual endeavor**
 - 2 : to cooperate with or willingly assist an enemy of one's country and especially an occupying force**
 - 3 : to cooperate with an agency or instrumentality with which one is not immediately connected**

Merriam-Webster, <http://m-w.com>

- *"Anyone who has closely observed the practices of cognition is struck by the fact that the "mind" rarely works alone. The intelligences revealed through these practices are distributed – across minds, persons, and the symbolic and physical environment . . . Knowledge is commonly socially constructed, through collaborative efforts toward shared objectives or by dialogues and challenges brought about by differences in persons' perspectives."*
(G. Salomon, 1993 (from Williams, 2000))

Collaboration Aspects

- Cooperation
 - Definition and division of tasks
 - Shared Information / Artifacts
 - Possibility for defection
- Coordination – procedures (processes)
- Communication – exchange of ideas (Haake, 1999)
- Negotiation – breakdowns, conflict (Easterbrook, 1996)
- Awareness – change, presence (Schummer, 2001)

Characteristics of Collaboration

- Voluntary
- Mutual Goals
- Shared accountability
- Shared resources
- Shared responsibility [for participating in decision making]
- Community evolves from collaboration

Friend, M. and Cook L. (1992): Interactions: Collaboration skills for school professionals

Pair Programming

- “Paths of software engineering and organizational effectiveness”:
 - Economics
 - Satisfaction – high!
 - Design Quality
 - Continuous Review
 - One programmer plays ‘reviewer’
 - Suggests restrained collaboration?
 - Problem Solving
 - Learning
 - Shared problems & solutions
 - Expert Observation
 - Team Building and Communication
 - Staff and Project Management

(Cockburn, 2001)

Aspects of Collaborative Tools

- Synchronicity
 - Synchronous
 - Asynchronous
- Persistent – provides context, information store
- Public – shared knowledge
- External Links – Accessibility to ext. resources
- Cost
 - Cost of Social Protocol
 - Technical Prowess

Characteristics of Existing Tools

	Synchronous	Persistent	Public	Accessibility to ext. resources	Cost of Engagement
F2F	Y	N	Y/N	Y	H
Telephone	Y	N	N	N	H-
Email	N	Y	N	Tricky	M
Web-boards	N	Y	Y	Trickier	M
IM	either	Y	N/Y	Tricky	L
Netmeeting	Y	N	N	Y	M+
Groove	Y	Y	Y	Y	?

Conclusion:
Questions to consider

- What degree of integration is necessary?
(Herblich, Geographically Distributed SD)
- How to support development of community
- How to motivate experts to stay in the community? (Prevent defection) (Policy?)
- What is the role of anonymity?
- How to maintain high signal to noise
