

# Improving collaboration in ad-hoc development teams

Supervisor  
Prof. Filippo Lanubile

PhD Student  
**Fabio Calefato**

<http://cdg.di.uniba.it>

[calefato@di.uniba.it](mailto:calefato@di.uniba.it)

Università degli Studi di Bari - Dipartimento di Informatica



3° Workshop Nazionale del Gruppo di  
Interesse in Ingegneria del Software  
Genova, 2-3 ottobre 2006



CASE – Libera Università  
di Bolzano-Bozen



RCOST – Università  
del Sannio

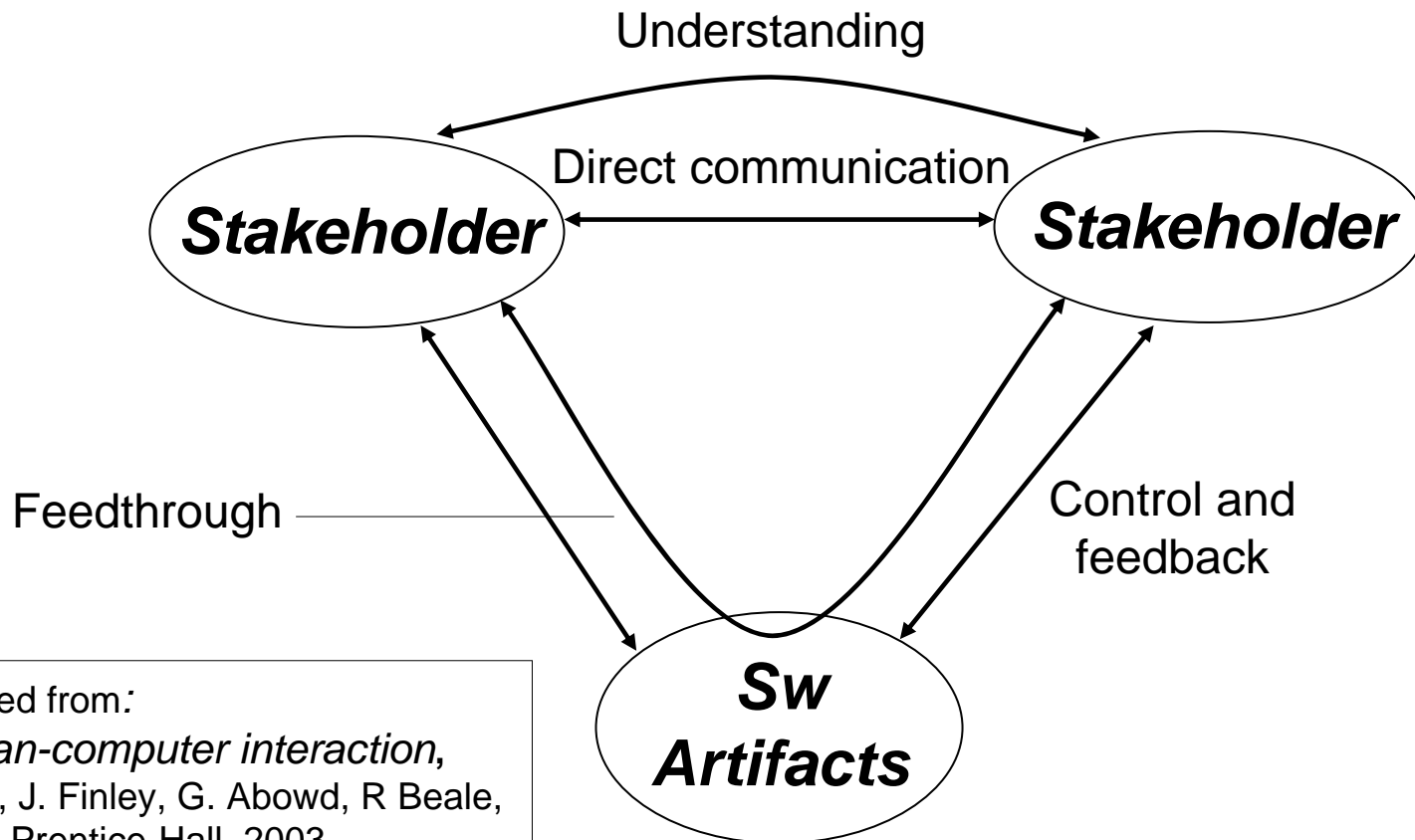
# My Research Goal

- Help remote developers to reduce negative effects of dynamism and distance in collaborative work
- Focus on:
  - Ad hoc teams
  - Distributed Software Development
  - Computer-Mediated Communication (CMC)

# Ad hoc teams

- Nimble teams that have no history and no future
  - No experience of working together
  - Little or no expectation they will collaborate in the future
  - Example: Groups of stakeholders in Requirements Engineering
- Attributes
  - Highly dynamic in creation, participation, and release
  - Geographically dispersed and cross-organizational
- Needs
  - Easy to use and setup collaborative tools
  - Infrastructure and administration costs kept at minimum

# (Distributed) Requirements Engineering as a communication-intensive activity



Adapted from:

*Human-computer interaction*,  
A. Dix, J. Finley, G. Abowd, R Beale,  
3° Ed, Prentice-Hall, 2003.

# Theories on Computer Mediated Communication (1/2)

- The more complex the task, the richer the media to use
- Lean single-channel media have low sense of presence (inability to convey non-verbal cues)

## **Social Presence**

J. Short, E. Williams, B. Christie, "The Social Psychology of Telecommunications", John Wiley and Sons, 1976

## **Media Richness**

R.L. Daft, R.H. Lengel, "Organizational information requirements, media richness and structural design", Management Science, 32(5), 1986

## **Common Ground**

H.H. Clark, S. Brennan, Grounding in communication, "Perspectives on Socially Shared Cognition", American Psychological Association, 1991

# Theories on Computer Mediated Communication (2/2)

- Effectiveness of CMC varies on the type of task
- Sense of presence not as vital as the ability to process information

## **Task-Technology Fit**

D. Goodhue, R.L. Thompson, "Task-technology fit and individual performance", MIS Quarterly, 19(2), 1995

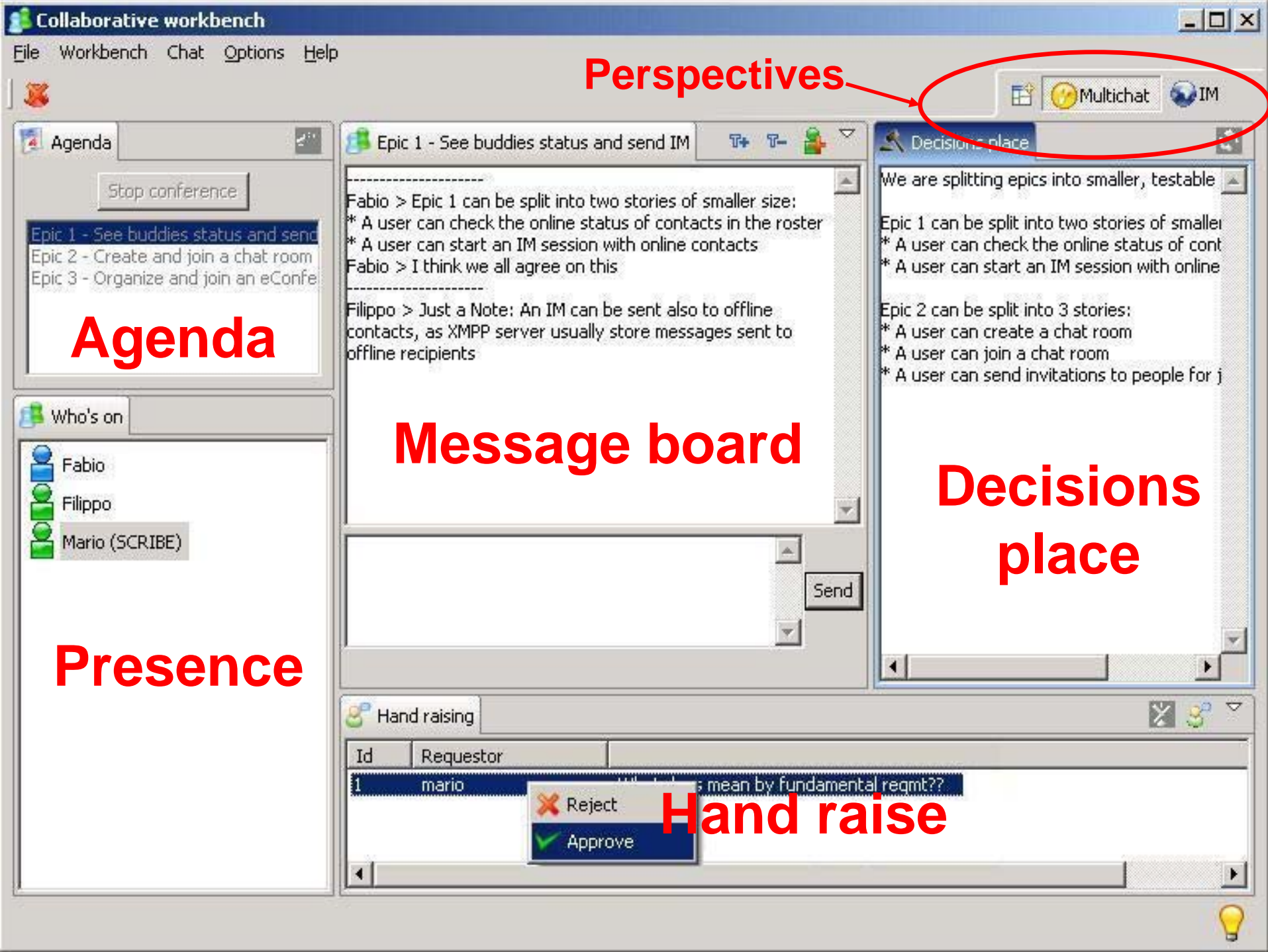
I. Zigurs, B.K. Buckland, "A Theory of Task/Technology Fit and Group Support Systems Effectiveness", MIS Quarterly, 22(3), 1998

## **Media Richness Paradox**

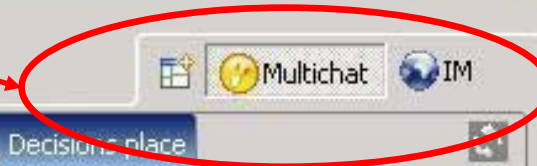
L.P. Robert, A.R. Dennis, "Paradox of Richness: A Cognitive Model of Media Choice", IEEE Transact. on Professional Communication, 48(1), 2005

# The eConference tool

- Text-based conferencing system
  - Support for both structured and unstructured communication
  - Participants focus on meetings, not on the meeting tools
  - Replace F2F meetings with basic features that:
    - Minimize potential technical problems, complexity, learning curve
    - Facilitate meeting creation and execution
    - Maximize discussion effectiveness
- eConference history
  - 1st ver. – (aka P2PConference) based on JXTA p2p framework
  - 2nd ver. – based on XMPP client/server protocol
  - 3rd ver. – pure-plugin system built on Eclipse RCP framework



Perspectives



Agenda

Message board

Decisions place

Presence

Hand raise



# Lessons learned from tool evolution

- 1st ver. – JXTA: Stability as a key aspect
  - Too low-level (unstable and complex)
  - Messaging service inadequate for group communication
- 2nd ver. – XMPP: Complexity on server side Vs. Extensibility on client side
  - + Robust, scalable, and extensible messaging architecture
  - Moving complexity on the server side limits protocol extensibility
- 3rd ver. – Eclipse RCP: Size does matter
  - + You get an Eclipse-like application with little extra-coding
  - Final product size overly bloated

# Pilot study @ Uniba 2005

- Goal
  - Beta-testing eConference
- Context
  - Web engineering master course at the University of Bari
  - Enterprise application to be develop as final course assignment
  - 16 distributed requirements workshops with dispersed customer and developer groups
- Questionnaire and log analysis
  - Features requests (freehand drawing, private messaging, polling)
  - Hand raising feature improvement
  - Implementation of discussion threads per agenda item

# Empirical investigation @ UVic

## 2006

### ■ Goal

- Comparison between F2F and computer-mediated interaction in distributed requirements elicitations and negotiations

### ■ Context

- RE undergraduate course at University of Victoria, Canada
- 6 projects to be developed by 6 groups

### ■ Thesis

- Elicitation better suited than negotiation for text-based CMC

#### Research hypotheses

H1: In elicitations CMC groups will perform as effectively as F2F groups

H2: In negotiations F2F groups will perform more effectively than CMC groups

H3: Personal satisfaction of stakeholders will be higher in CMC elicitations than in CMC negotiations

# Ongoing & Future work

- Data analysis of Uvic 2006 experiment
- Complete my PhD thesis writing
- Next version of eConference will be built on top of the Eclipse Communication Framework
  - 2006 IBM Eclipse Innovation Award