



Aalto University  
School of Science

# Face-to-face, Email and Instant Messaging in Distributed Agile Software Development Project

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# Research problem

- Distributed software teams typically have several communication methods
  - Face-to-face between collocated team members
  - Mediated communication between team members on different sites
- Does the medium affect the amount and/or frequency of communication?
- How communication patterns differ across different media?
- ... and how to measure/interpret the data?

# Case: Software project distributed in three sites

- 13+1 people in total
  - 7 in Norway
  - 4 in Czech Republic
  - 2+1 in Finland
- One Scrum team
- Developing company-internal product, with hopes to productize it and sell also to external customers

# Data collection

- Face-to-face: Sociometric badges
- Instant messaging & email
- Interviews (pre-study)
- Feedback session (post-study)
- Questionnaires (daily&sprint, data not used in this study)

# Sociometric badges

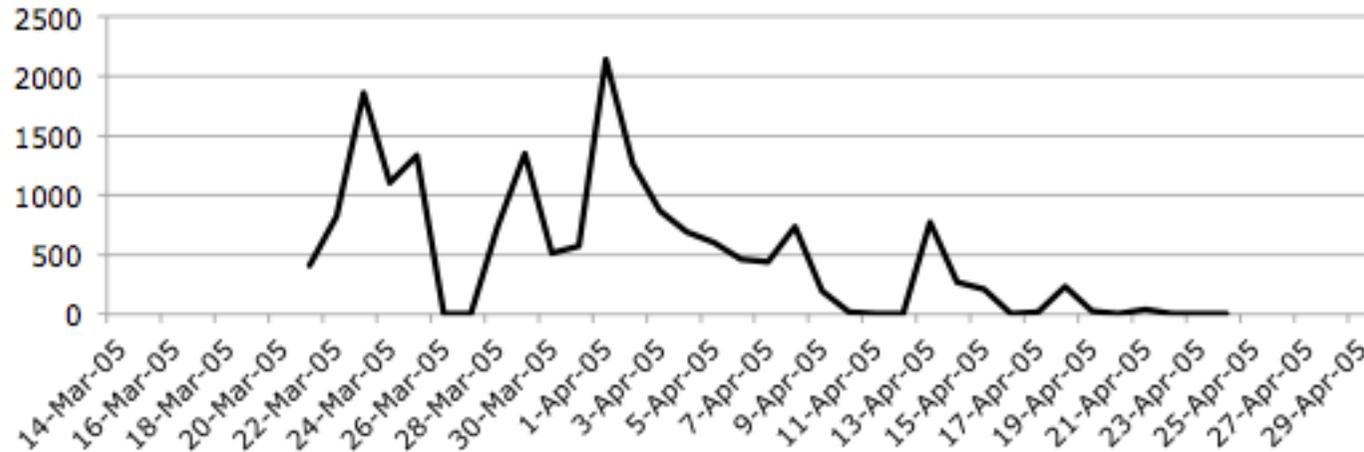


- Participants wear this around their neck during the day
- Infrared – Face-to-face
- Microphone - Speaking
- Bluetooth – Proximity
- Accelerometer – Physical activity

# Email and Instant messaging

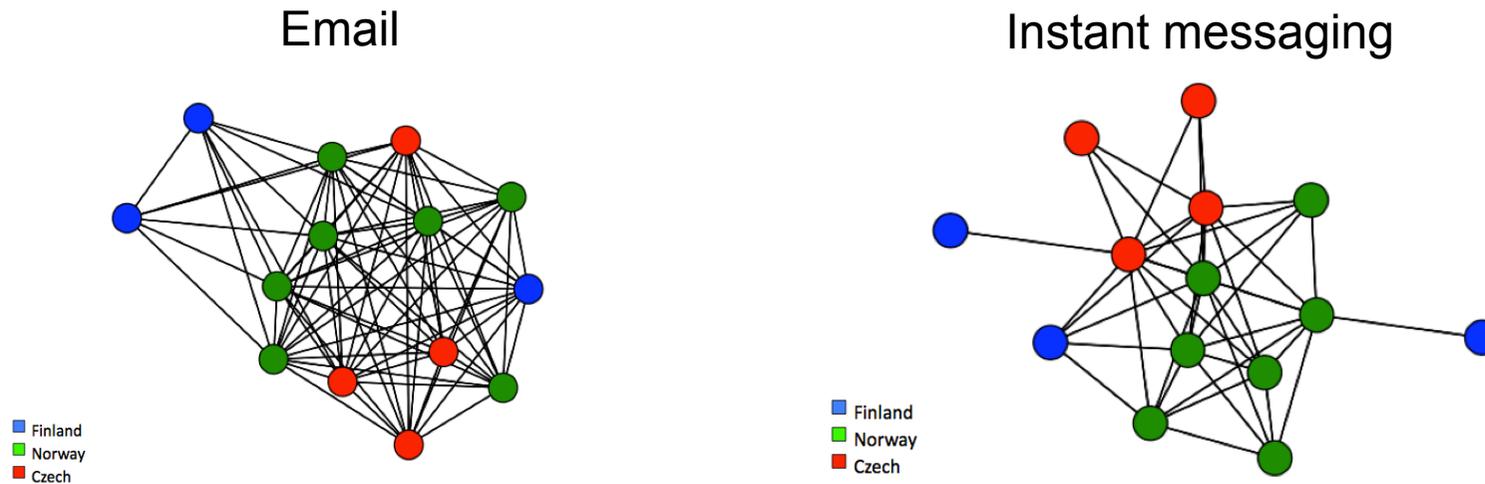
- The team used Microsoft Exchange (email) & Microsoft Office Communicator (IM)
- We asked all participants to store all their (project-related) emails and IM discussions into a separate folder
  - In practice, they just provided us their full inbox&outbox, and we filtered out emails and IM not related to this project
- PST files parsed into RDBMS using Python (+Outlook COM)

# Results



- Amount of verbal communication / day varies strongly
  - Problem solving meetings/workshops
  - Sprint planning sessions
  - Changes in roles (SCM vs. acting SCM on other site)
  - Remote working(?)

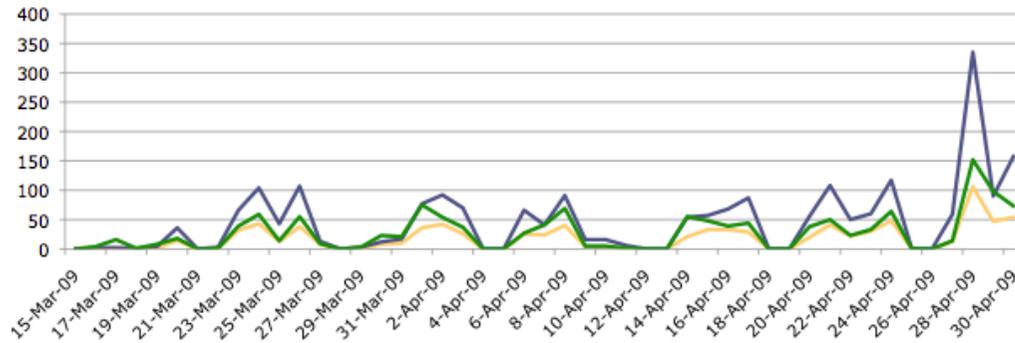
# Email and IM communication patterns



- Different media – different patterns
  - Email seems to “integrate” the team better (formality?)
  - IM seems to require stronger/more “personal” relationship (informality?)
  - Also easier to IM in native language

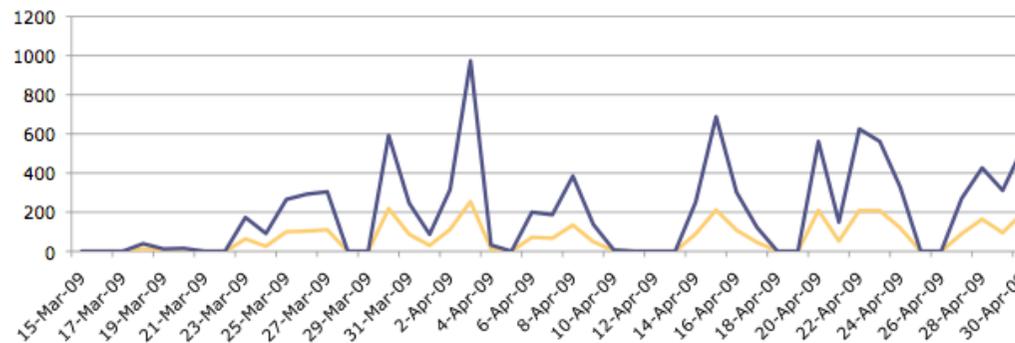
# Email and IM communication amount

Email



- Daily variance
  - IM variance similar to verbal:
    - similar usecase(?)
  - Email amount stable over the sprints:
    - less urgent issues
    - no problem solving
    - regular reporting tasks

Instant messaging



# Discussion / Amount of communication

- **For this case**, the amount of communication was 45min/day on average
- Daily variance of (verbal) communication was however **high**; future studies should consider enough data (up to several months)
- Email daily variance was **lower** than verbal/IM: email as a medium is less susceptible for urgent/ad-hoc communication
- Is amount of communication (e.g. msg counts) a **good measure** of communication throughput/bandwidth/effort?

# Discussion / Communication patterns

- Face-to-face patterns obviously limited to same site only
  - Earlier studies note that inter-site face-to-face would be beneficial
  - => effects to other media would be interesting to see (esp. IM)
- Email communication “integrates” the project team
  - Nearly every member is connected to each other
  - Site borders less clear => less communication barriers & better flow of information?
- IM communication shows site borders
  - Informality? Personal relationships?
  - Easier to communicate over IM in native language?
- Implications of communication patterns to teamwork?



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