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

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

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