HPI Hasso Plattner Institut
Digital Engineering · Universität Potsdam

Remote Work & Remote Collaboration

Scalable Software Engineering
WS 2021/22

Enterprise Platform and Integration Concepts

Image courtesy *@econinbricks* on Twitter: https://twitter.com/econinbricks/status/1376929597418246150/ (with permission)

I

want to,

can, or

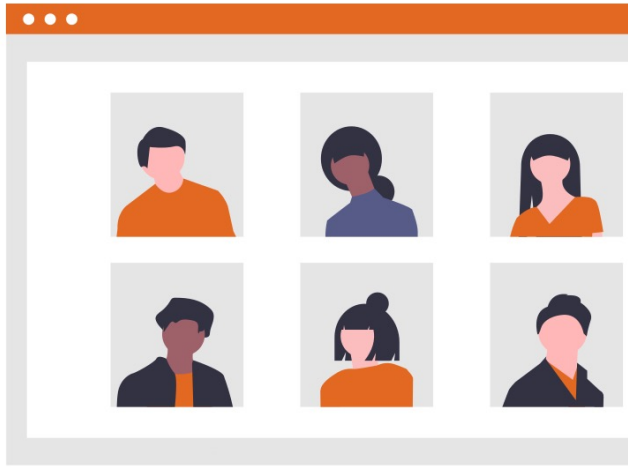
have to,

work from where I live

Motivation

Remote Work / Global Software Development

- 81% of Agile survey respondents' organizations used **distributed Agile teams** (i.e. not co-located)
- 71% of respondents featured multiple Agile co-located teams collaborating across geographic boundaries



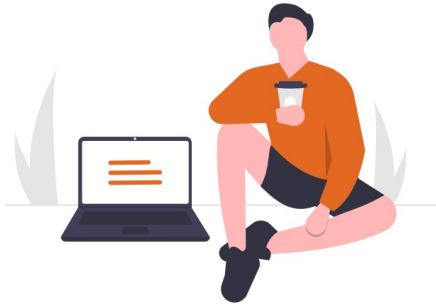
> The current worldwide health crisis may prove to be an inflection point that leads to an additional increase in distributed teams as a “new normal”
>
> — 14th Annual State of Agile Report

Source: 14th Annual State of Agile Report, Digital.ai, Tech. Report, 2020

Motivation

Reasons for remote / Global Software Development

- **Work-Life balance**, flexibility of work
- **Costs** / reallocation of funds (better laptops instead of office space?!)
- Implement "**Follow the Sun**" development
  - Core idea: reduce time to market by always having a team work on the product
  - Hand off work at end of work day to next site several time zones away
- (Safer during a **global pandemic**)



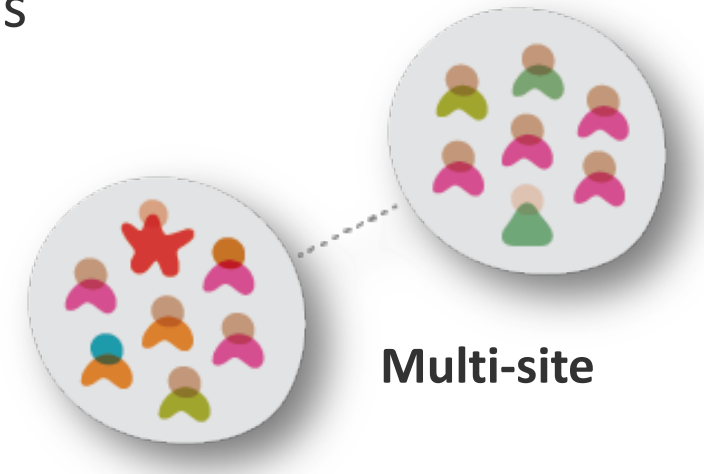
Source: Carmel, E., Espinosa, J. A., & Dubinsky, Y. (2010). "Follow the Sun" Workflow in Global Software Development. Journal of Management Information Systems, 27(1), 17-38.

Background: Collaboration Patterns

- **Single-site team:** Everyone in the same physical location
  - Collaborate without arranging anything
  - Easily see what everyone else is up to, shared space?

Single site

- **Multi-site:** 2+ groups at separate locations within a larger team
  - Perhaps formal sub-team boundaries and responsibilities
  - E.g. dev team split between Germany and India

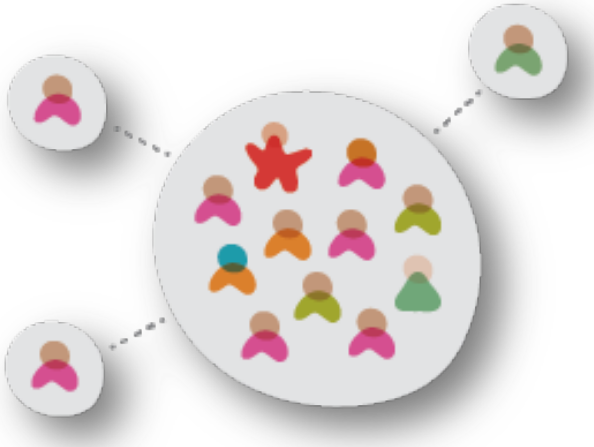


Multi-site

Source: https://martinfowler.com/articles/remote-or-co-located.html

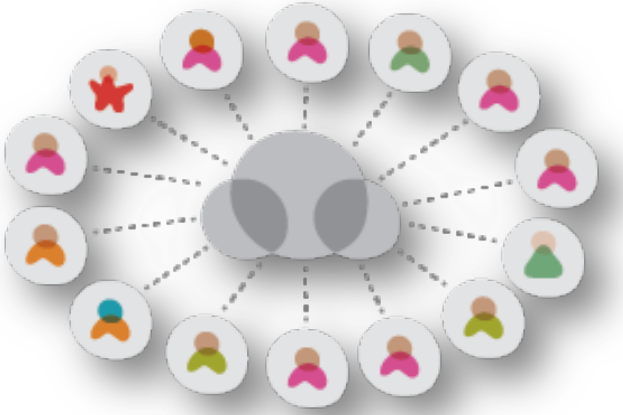
Background: Collaboration Patterns

- **Satellite workers:** Most of team co-located, few working remotely
  - Model e.g. for contractors
  - Consider whether satellites can work autonomously



Satellite workers

- **Remote-first:** Everyone in separate locations (usually from home)
  - All collaboration is remote, full commitment
  - Most open-source projects
  - Important central hub



Remote-first

Source: https://martinfowler.com/articles/remote-or-co-located.html

Background: Remoteness & Agile

Agile Manifesto Principles

- People collaborate better with direct interactions

> The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

Agile Manifesto also states: *Individuals and Interactions over Process and Tools*, so adapt to what works for you!

- Relationships within teams are the **glue of collaboration**
- Co-located communication is richer than online communications
- Keep this in mind when selecting tools and collaboration processes
  - E.g. actively use cameras, especially in 1:1 conversations

Source: Principles behind the Agile Manifesto, https://agilemanifesto.org/principles.html

Challenges & Benefits of Remote Work

Scalable Software Engineering
WS 2021/22

Enterprise Platform and Integration Concepts

Challenges of Remote

Possible issues of team setups

- Multi-site teams form "**us-vs-them attitude**"
  - *Contact visits*: short cross team visits, build relationships
  - *Ambassadors*: Spend prolonged time at a different site
- Dividing the work into silos
  - Remember **Conway's Law**
  - Each team should get to create direct business value
- **Detached Satellites**
  - Most communication will happen within co-located team
  - Satellite workers may lose connection
  - Temporary measure?

> "If you have 4 groups working on a compiler, you'll get a 4-pass compiler."
> — Eric S. Raymond

Source: https://martinfowler.com/articles/remote-or-co-located.html

Challenges of Remote

Possible organizational issues

- Impersonal **onboarding** (uncertainty, trust, responsiveness)
- **Mentoring** (junior) staff
  - Hard to mentor people remotely, avoid juniors being satellite workers
  - Ensure each site has mentors to guide teams
- **Indirect management**
  - No direct insight into people's work, **you need to trust**
  - Infer what's happening based on the results
- Harder to build **shared company/team culture**
  - Best collaboration practices have to be **discovered**
  - Finding & building them requires exposure to others and their ways of work

Sources:
https://martinfowler.com/articles/remote-or-co-located.html
https://www.jamesshore.com/v2/blog/2019/three-challenges-of-distributed-teams

Challenges of Remote

Consequences of remote teams

- **Security**
  - Private and work computer might now be the same
  - Can a company make sure that data is safe in homes?
- **Culture mismatches** in geographically distributed team
  - Diverse (work) cultures & social norms
  - Culturally accepted ways of communicating
  - Expectation management
- **No shared space**
  - No physical coordination artifacts, no chance encounters
  - Total reliance on digital project management tools

Consider regular Water Cooler Chats / "der Flurfunk"

Challenges of Remote: Covid-19 Learnings

Consequences of permanent remote work

- **Home Office is not a real office**
  - Lacking work equipment (esp. new employees)
  - Missing interactions (e.g., social interaction is part of our daily life)
- Neglected and shorter breaks
  - 8h working day or until the task is done?
  - Danger of social isolation
- Back-to-back meetings and permanent online concentration
  - Zoom fatigue
  - Work & meetings & relaxation all on the same screen

Work-Life-Balance

Attend meetings wherever you want

Easier to handle private things

No spontaneous interruption

…

Is Productivity Going Up or Down?

More coordination and handovers

Work around the clock

Whom to ask?

How to judge your contribution?

Calendar full of meetings

…

In a recent study of WFH [Bloom15], productivity increased, but promotion rates conditional on performance fell.

Remote Benefits For Management

Remote means anyone can work anywhere, but also...

- **Higher productivity on individual tasks,**
  less on collaborative ones
- **Available talent pool**
  - The best teams are made up of the best people?
  - Widen talent selection
    (but the people you really want to hire might already live in tech centers?!)
  - Software development not tied to a place
    - Reluctance to accept location & commuting disadvantages

Median rent for 1 bedroom apartment in SF's Bay Area was $1,975 (April 2019)

Source: https://martinfowler.com/articles/remote-or-co-located.html

Recommendations for Remote Work

- **Structure your working day**
  - Meetings just 25/50 minutes, ensure breaks
  - Block working and private time
- **Centralize document storage** (incl. collaborative editing)
- **Prioritize your communication channels**
  - Mail (can wait), VIP Mail, instant messaging (short requests), meetings, calls
  - Limit notifications (each one is an interruption)

Recommendations for Remote Work

- **Provide the right hardware**
  - Paperless office
  - Ergonomic desk, monitors, keyboards, wireless earphones
  - Where to keep your backup disk?
  - Stable internet connection (upload is the key!)
  - Don't forget remote work security (stable VPN)

Recommendations for Remote Work

- **Take care of your physical health**
- **Take care of your mental health**
  - Virtual coffees and off-work events with colleagues
  - See if a regular routine helps
- **How to lead a remote team**
  - 1:1s are the most important management method
  - Check in with your team regularly
  - Don’t be afraid to overcommunicate
  - Request feedback (about employees, yourself, team and company)
  - Keep having fun, try *serious* small talk and *active listening*

Tools for Remote Work

Scalable Software Engineering
WS 2021/22

Enterprise Platform and Integration Concepts

Image courtesy *@EthincsInBricks* on Twitter: https://twitter.com/EthicsInBricks/status/1449297720498434048/ (with permission)

Tools for Remote Work

Remote Working Agreement

- **Team consensus** on collaboration practices
- Write it down, refer back to it regularly
- **Revise it** with new information and learnings

Example content

- How to contact & schedule conversations
- How to **indicate availability** to communicate (or lack of it)
- Shared **core working hours**
- How to visualize work/organize project boards
- **”No-gos"** for your team

Source: https://medium.com/serious-scrum/7-concrete-ways-to-improve-collaboration-in-remote-or-distributed-scrum-teams-7940fbaed52d

Tools for Remote Work

General types of communication technologies

- **Collaborative modeling tools**: Computer aided software engineering (CASE) tools, collaborate on models in real time with support
- **Collaborative writing tools**: Simultaneously write a document (Office365, Overleaf,…)
- **Discussion tools**: Transmission of messages, e.g. email and chat (Slack, Teams,…)
- **Inclusive modeling tools**: Simple tools such as whiteboards, paper, sticky notes (Mural,..)
- **Virtual meeting tools**: Synchronous (video) communication (Skype, Zoom, Teams,…)
- **Version control and ticketing tools**: Manage and organize versions of project artifacts (Jira, GitHub,…)

Source: agilemodeling.com/essays/communication.htm

Tools for Remote Work

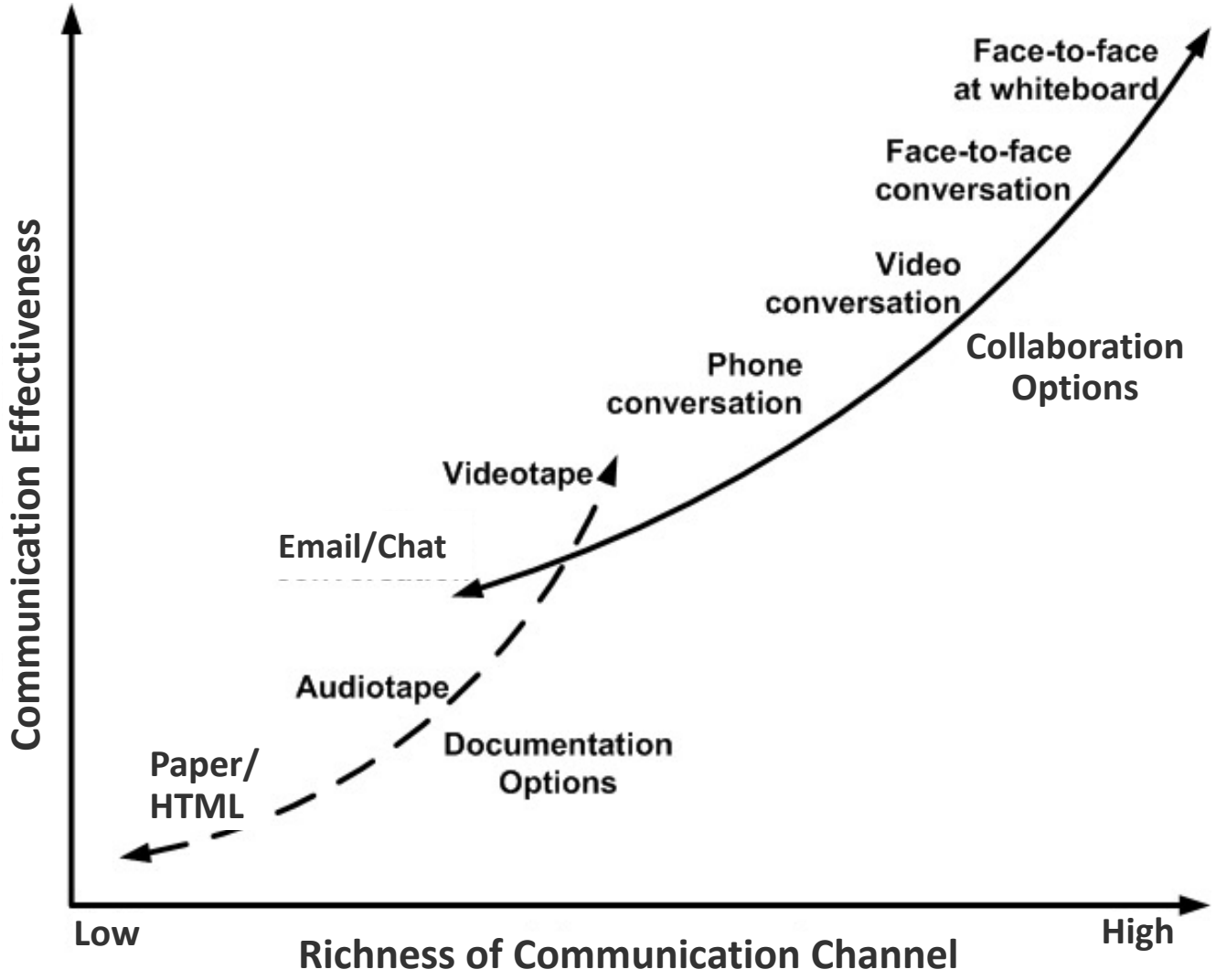
- **"Use the Simplest Tools"** should apply
  - Consider cost of complex tooling
  - Simple tools: easy to learn, use & share with others
- Ensure **Single Source of Truth** for shared info
- **Share more** than in a classical setting
  - Meeting notes and clear agendas
  - Processes, concepts and methods

Source: agilemodeling.com/essays/communication.htm

Tools for Remote Work

Media Richness

- **More context clues**
  - More physical proximity
  - Gestures & facial expressions
- Ability to **answer questions in real time** distinguishes *collaboration* from *documentation* options



Source: agilemodeling.com/essays/communication.htm

Tools for Remote Work

(Communication) Tools

- Document state of software & **progress of work**
  - e.g. GitHub Wikis, generated diagrams, change logs
  - Daily/Weekly Standup in Discord, check in with team
  - Update and comment tickets/issues, celebrate commits and deploys
- Keep **others informed**, e.g.
  - Code in shared branches (& tell people about it)
  - Deploys of newest changes
  - Blog-Post-Driven Development
    - Find blog post headline before Sprint start
    - Summarize features, what issues were solved?

Git commit messages are valuable communication! Consider "Fixed stuff"

Sources: https://martinfowler.com/articles/remote-or-co-located.html, https://www.allthingsdistributed.com/2006/11/working_backwards.html

Tools for Remote Work

Choose (technical) tools that work for you

- Specialized tasks might need **specialized tools**, e.g.
  - Design and sketching (https://miro.com)
  - Running feedback sessions (https://reetro.io/)
  - Automate project consensus (i.e. code review checks)

GitHub Actions can automate a lot!

https://github.com/features/actions

➡ **Experiment in teams, share what worked!**

- Many new tools & ideas all the time
- What should be adapted by the entire project?
- **Discuss!** Others might not share your experiences! (and that's okay)
- Caveat: change has a cost! **What had the largest value?**
- Disagree but **commit** (no solo run)!

Source: https://martinfowler.com/articles/remote-or-co-located.html

Further Reading

- Kroll et al. 2013. *A systematic literature review of best practices and challenges in follow-the-sun software development.* 2013 IEEE 8th International Conference on Global Software Engineering Workshops (ICGSEW). https://doi.org/10.1109/ICGSEW.2013.10
- Fabio Calefato et al. 2020. *A case study on tool support for collaboration in agile development*. In Proceedings of the 15th International Conference on Global Software Engineering (ICGSE '20). https://doi.org/10.1145/3372787.3390436
- Kattiana Constantino et al. 2020. *Understanding collaborative software development: an interview study*. In Proceedings of the 15th International Conference on Global Software Engineering (ICGSE '20). https://doi.org/10.1145/3372787.3390442
- Prasad K. Kabbur et al. 2020. *Prioritizing trust in a globally distributed software engineering team to overcome complexity and make releases a non-event*. In Proceedings of the 15th International Conference on Global Software Engineering (ICGSE '20). https://doi.org/10.1145/3372787.3390434
- [Bloom15] Bloom, Nicholas, et al. *Does working from home work? Evidence from a Chinese experiment*. The Quarterly Journal of Economics 130.1 (2015): 165-218. https://doi.org/10.1093/qje/qju032

Summary

Motivation & background

- Reasons for Remote/Global Software Development
- Collaboration patterns
- Remoteness & Agile

(Dis-)Advantages of remote

- Issues of team setup
- Organizational issues
- Consequences of remote teams
- Permanent remote work
- Benefits for management

Recommendations & Tools

- Leading teams
- Remote Working Agreement
- Communication technologies
- Media Richness Theory
- Choosing your tools