PART IV: Additional Topics

Communication and Collaboration

SEEM3510 Human-Computer Interaction

By Prof. Helen MENG & Prof. Philip FU

Introduction

- Background:
  - Some works and activities need to be done by *multiple persons*; this *require communication and collaboration*.
  - Certain software (**groupware**) are specially designed for a group of users to work together (group working)
  - **CSCW**: **Computer-supported collaborative work**
  - **CSCW vs. HCI**: interactions between people
- Any example tool for communication & collaboration?
  - Zoom
  - Social Media: Facebook, Weibo, WeChat, WhatsApp, & Tweeter
  - Wikipedia
  - Google Docs
  - MMORPG (Massively multiplayer online role-playing game)
  - Subversion control & GitHub (e.g., coding project), etc.

Topics:

- **Introduction**
- Collaboration model
  - Time/space matrix model
  - MoCA model
- Design Considerations

Characteristics and examples of collaboration and social media participation

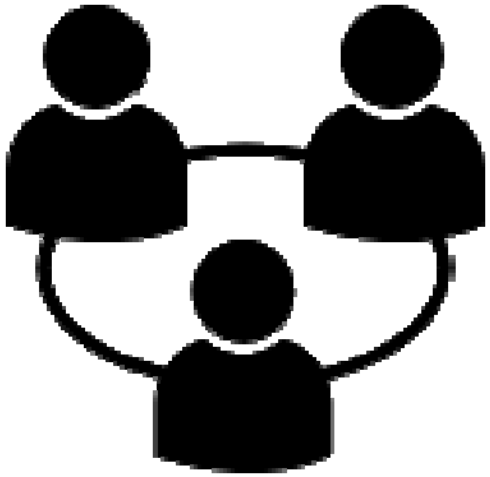
Collaboration	Crossover	Social Media Participation
E-mail, phone calls, audio- and videoconferences, shared documents, collaboratories	Wikis, blogs, chat rooms, instant messages, short messages, listservers, Yahoo!/Google groups	Chat rooms, blogs, user-generated content sites, tagging, rating, reviewing
GoToMeeting®, LiveMeeting®, WebEx®, Skype®, Google Docs™, GeneBank™	Wikipedia, Wikia™, LinkedIn, Second Life, Blogger®	YouTube, Flickr, Picasa, Netflix, Technorati™, MySpace, Facebook, Digg, del.icio.us™

Want recognition for contributions May Aspire to Leadership	
Typically 2 to 2000 people	Typically 20 to 200,000,000 people
Work-related, goal-directed	Playful, process-oriented
Time-limited, milestones	Open-ended
Selected identified partners	Open unknown partners
Assign tasks and review each other's work	Act independently

Introduction

- What is **Groupware**?
  - Computer-based systems that support groups of people engaged in a **common task** (or **goal**) and that **provide an interface** to a **shared environment**. [1]

- An old approach: time sharing, i.e., take turns…



Any issues?
- Idle while waiting
- Concurrent control
- More communication

[1] Groupware - Some Issues and Experiences. C.A. Ellis, S.J. Gibbs and G.L Rein, Communications of the ACM, 1991

Introduction

- What is **Groupware**?
  - Computer-based systems that support groups of people engaged in a **common task** (or **goal**) and that **provide an interface** to a **shared environment**. [1]
- An old approach: time sharing, i.e., take turns…
- Why need Groupware? 1+1 > 2 !!!
  - Concurrent work maximizes performance
  - Facilitate group working at a distance
  - Facilitate interpersonal communication
  - Division of Labor: individual's expertise

[1] Groupware - Some Issues and Experiences. C.A. Ellis, S.J. Gibbs and G.L Rein, Communications of the ACM, 1991

Introduction

- Complexity: Group work > Single-person work:
  - Multiplicity of users – hard to design and record controlled experiments (e.g., usability tests)
  - Physical distributions of the participants and their environments; some are virtually present
  - Flood of data – hard to analyze
- Group is NOT JUST for Communication, it should facilitate
  - Collaboration, Coordination, and Cooperation

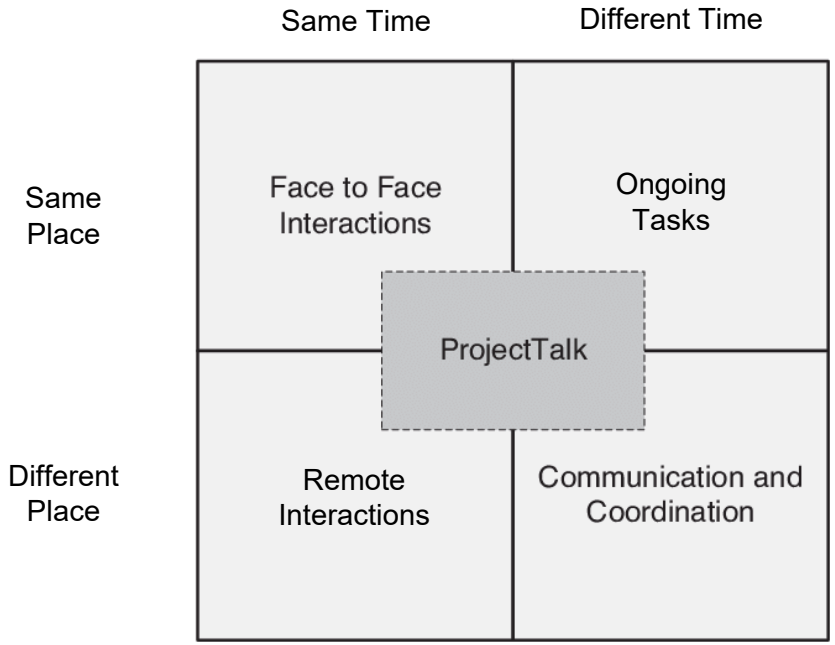
[1] Groupware - Some Issues and Experiences. C.A. Ellis, S.J. Gibbs and G.L Rein, Communications of the ACM, 1991

Topics:

- Introduction
- **Collaboration model**
  - **Time/space matrix model**
  - **MoCA model**
- Design Considerations

(1) Time/space matrix model

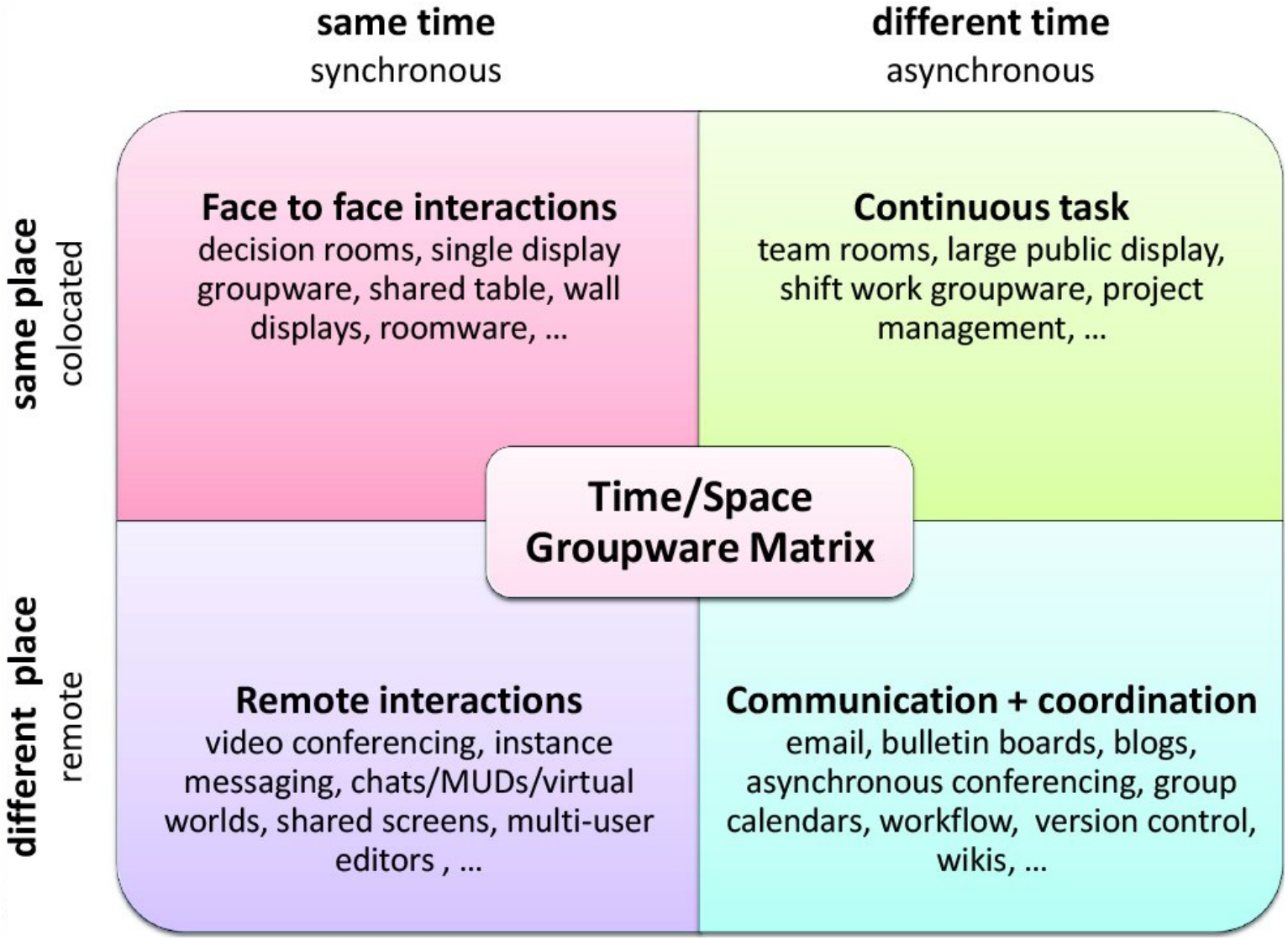
- A descriptive model or framework
- Four quadrants:



  - Same time, same place — e.g., wall display; slides
  - Same time, different place — e.g., teleconference (skype)
  - Different time, same place — e.g., public display
  - Different time, different place — e.g., discussion forum, email

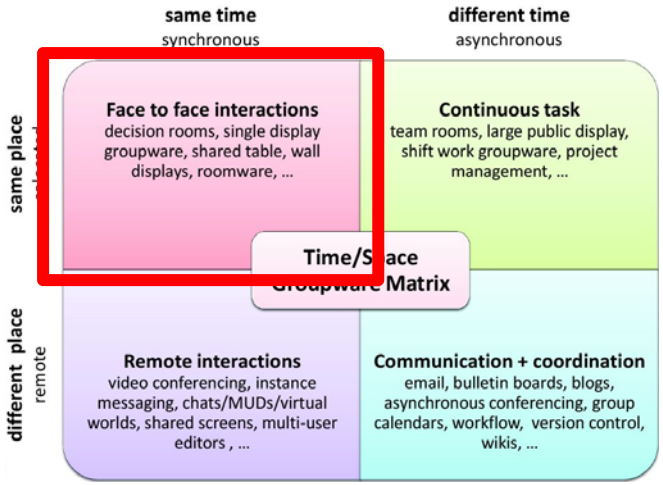
These are useful considerations when designing collaboration tools or groupware

Time/space matrix model



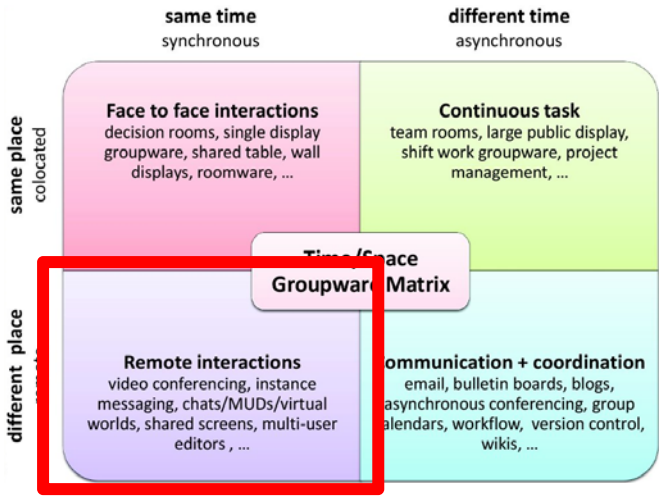
Case 1: same place, same time

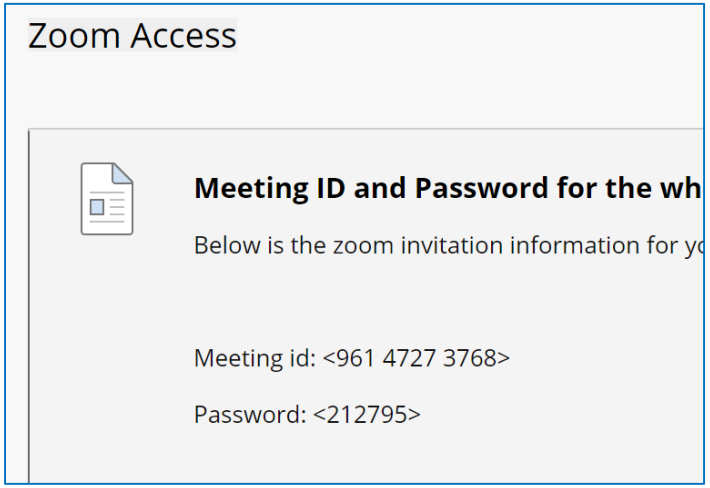
- Also known as **face-to-face interface**
  - File and photo sharing
  - Shared workspace
  - Group activities
    - E.g., taking attendance with KEEP
    - Brainstorming tool
    - Polling and Q&A, etc.



Case 2: different place, same time

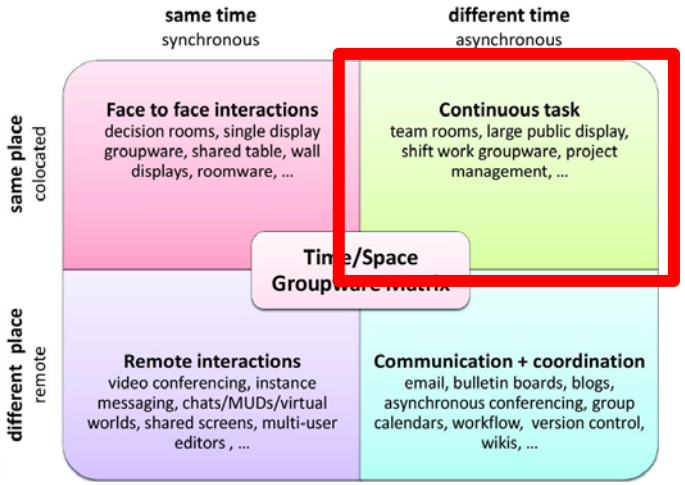
- Also known as **synchronous distributed applications**
  - Shared screens for customer service (remote assistance)
  - Give demonstrations simultaneously at multiple sites
  - Allow sharing of information for various applications
  - Interactive games (e.g., MMORPG)
  - Group editing simultaneously (e.g., Google Docs)





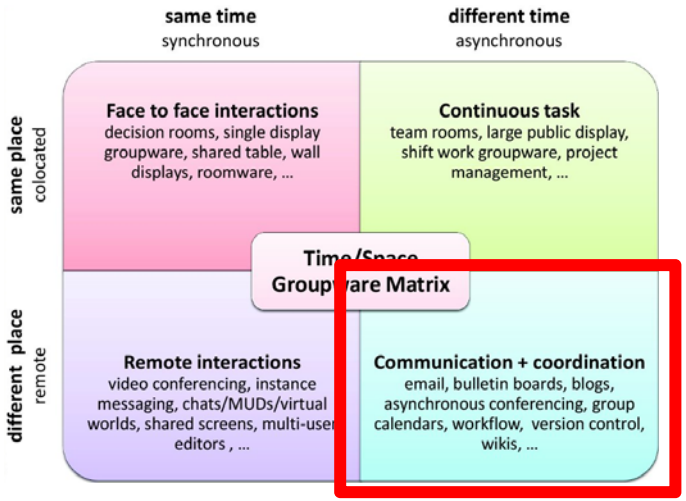
Case 3: same place, different time

- **Public information display**
  - Touch display for public use
  - Avoid privacy contents
  - Wide range of users
  - Awareness: passers-by may not expect them to be interactive



Case 4: different place, different time

- **Online and networked communities** (e.g., Wikipedia)
  - Group identity
  - Community policies & freedom of speech
  - Distance education courses (e.g., MOOC)
  - Group editing (e.g., Google Docs)
  - Role: managers / coordinators

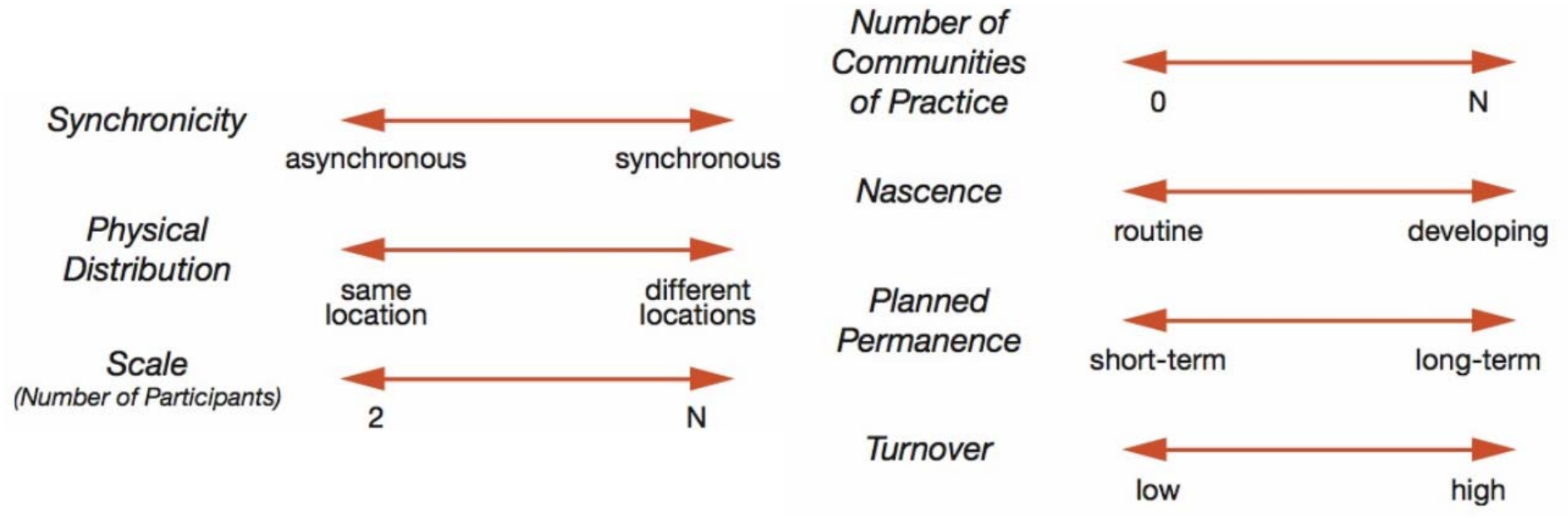


How will you classify zoom, the software that we are using?

But the time/space matrix model is somewhat **oversimplified**……

(2) MoCA

- **Mo**del of **C**oordinated **A**ction [Lee & Paine, 2015]
- For deeper understanding of “coordinated action” or group working, it expands into **seven dimensions**:



Nascence – well established or new
See “Supplementary material” at the end for details

Topics:

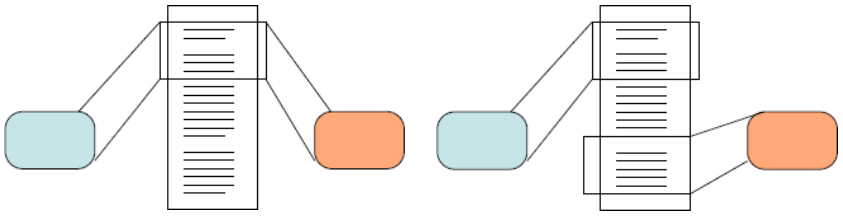
- Introduction
- Collaboration model
  - Time/space matrix model
  - MoCA model
- **Design Considerations**
  - Five considerations for designing efficient groupware

Some Design Considerations

(1) Common ground

- In communication, we often say “this button” or “that menu”
- But where? Groupware should achieve common ground (context) for effective communication among users, e.g.,
  - Shared screen
  - Allow pointing (e.g., cursor) and/or referencing objects
  - Provide explicit referencing via threading of comments

Screen sharing:
- WYSIWIS
- WYSIAWIS (What You See Is Almost What I See)

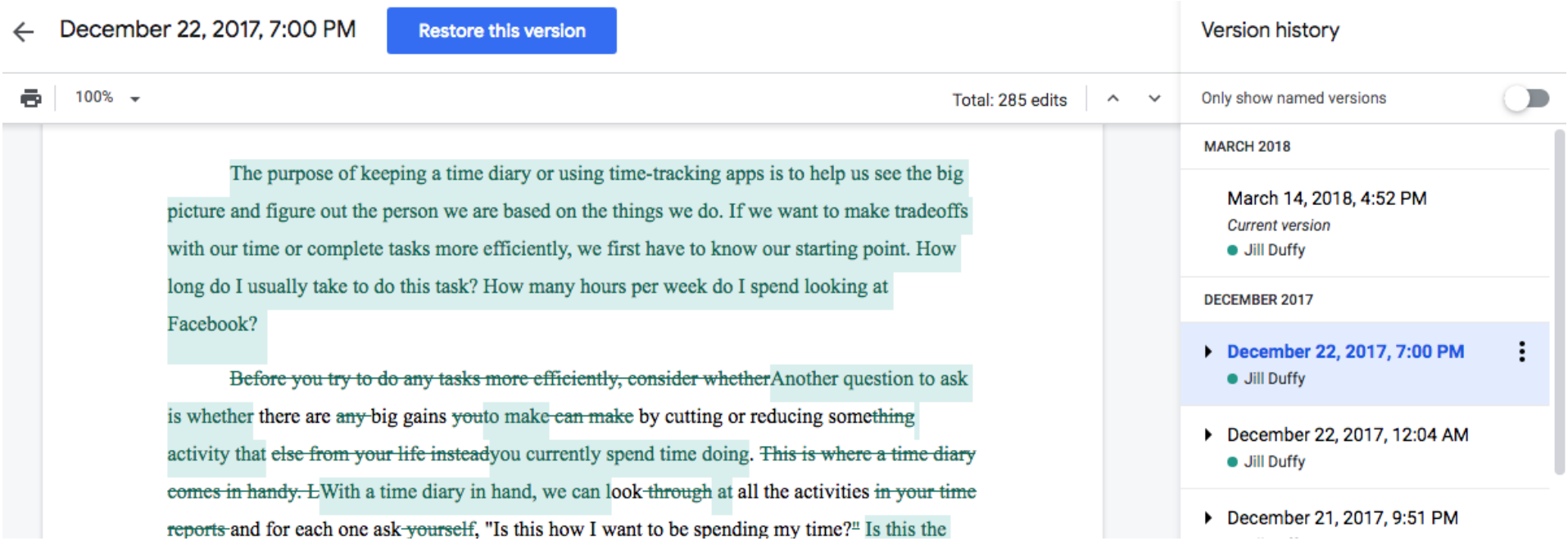


Source: M. Beaudouin-Lafon - CSCW & Groupware

Some Design Considerations

(2) Activity awareness

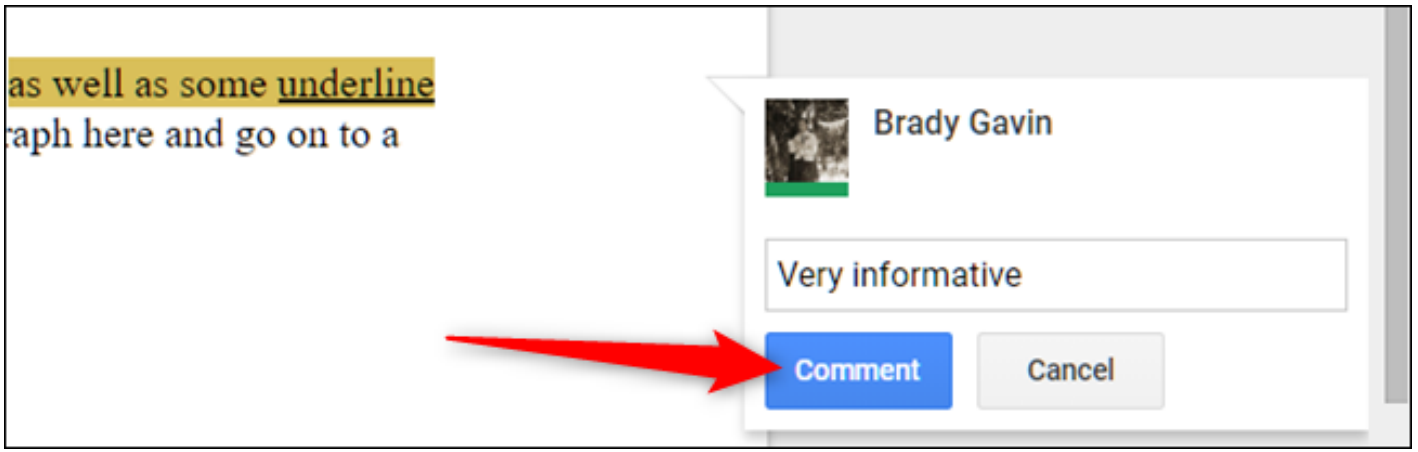
- What is happening? Who's there? When?
- Think about WhatsApp, WeChat, Google Docs, Wiki, …
- Allow collaborators to track how the work evolves



Some Design Considerations

(2) Activity awareness

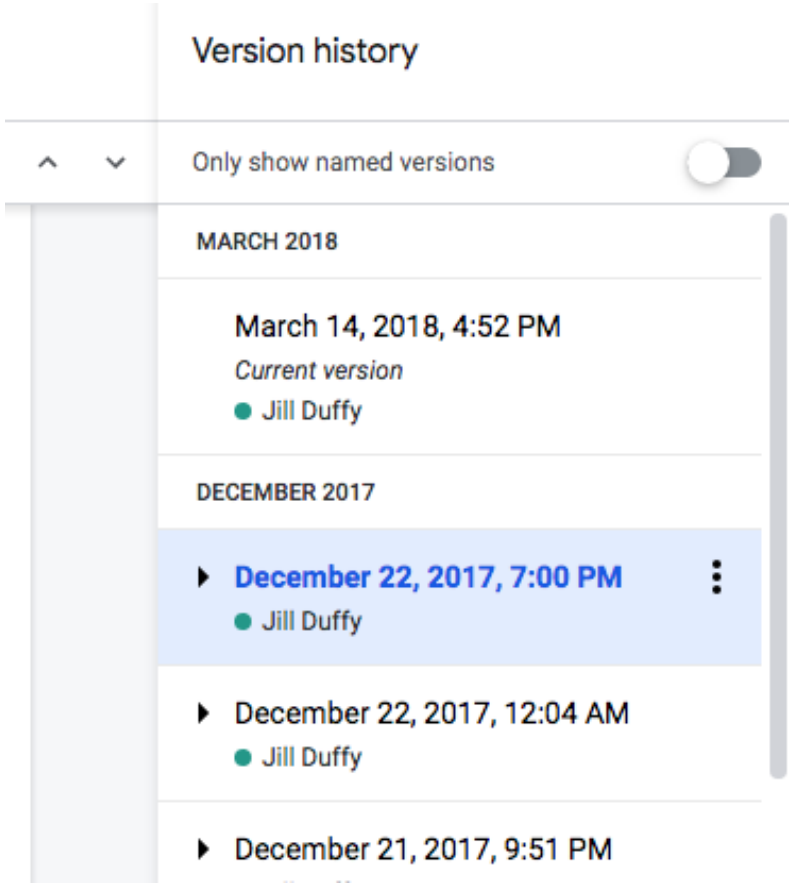
- What is happening? Who's there? When?
- Think about WhatsApp, WeChat, Google Docs, Wiki, …
- Allow collaborators to track how the work evolves
- Provide an overview of activities to show how individuals have contributed to the project
- Individual can also put in comments or remarks



Some Design Considerations

(3) Privacy

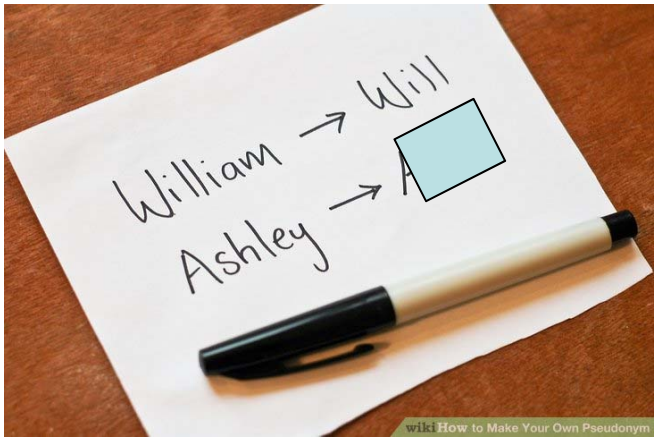
- Users may not want others to see their every little actions
- Users may want to communicate more sensitive information only to certain connections



Some Design Considerations

(4) Identity

- Real name policy?
- Pseudonyms (a particular form of the real name)?
- Or allow anonymity?



(5) Moderation

- Moderators to evaluate contributions and to take various actions on the postings (or user actions), e.g.,
  - Demote a post
  - Ban a user

Questions for consideration

Computer-supported cooperative work questions

- How would facilitating communication improve or harm teamwork?
- Where does the community of users stand on centralization versus decentralization?
- What pressures exist for conformity versus individuality?
- How is privacy compromised or protected?
- What are the sources of friction among participants?
- Is there protection from hostile, aggressive, or malicious behavior?
- Will there be sufficient equipment to support convenient access for all participants?
- What network delays are expected and tolerable?
- What is the user's level of technological sophistication or resistance?

Questions for consideration

- Who is most likely to be threatened by computer-supported cooperative work?
- How will high-level management participate?
- Which jobs may have to be redefined?
- Whose status will rise or fall?
- What are the additional costs or projected savings?
- Is there an adequate phase-in plan with sufficient training?
- Will there be consultants and adequate assistance in the early phases?
- Is there enough flexibility to handle exceptional cases and special needs (users with disabilities)?
- What international, national, and organizational standards must be considered?
- How will success be evaluated?

Summary

- Groupware
  - Computer-based systems that support groups of people engaged in a common task (or goal) and provide an interface to a shared environment
- CSCW: Computer-Supported Collaborative Work
- Time/space matrix model
  - Same time, same place, e.g., wall display; lecture presentation, etc.
  - Same time, different place, e.g., teleconferencing, etc.
  - Different time, same place, e.g., public information display , etc.
  - Different time, different place, e.g., discussion forum, and email, etc.
- The MoCA model's seven dimensions (more details)
- Design Considerations
  - Common ground, activity awareness, privacy, identity, moderation, etc.

Supplementary material (optional)

Not in final exam

MoCA: Dimension #1

Synchronicity

- A continuous spectrum:

  asynchronous ↔ synchronous
- More synchronous, e.g., voice & videoconferencing
- More asynchronous, e.g., forum & discussion board
- But, the degree of synchronicity (i.e., delay between turns in the communication) may change over time…

Collaborations often require a **mixture** of both!!!

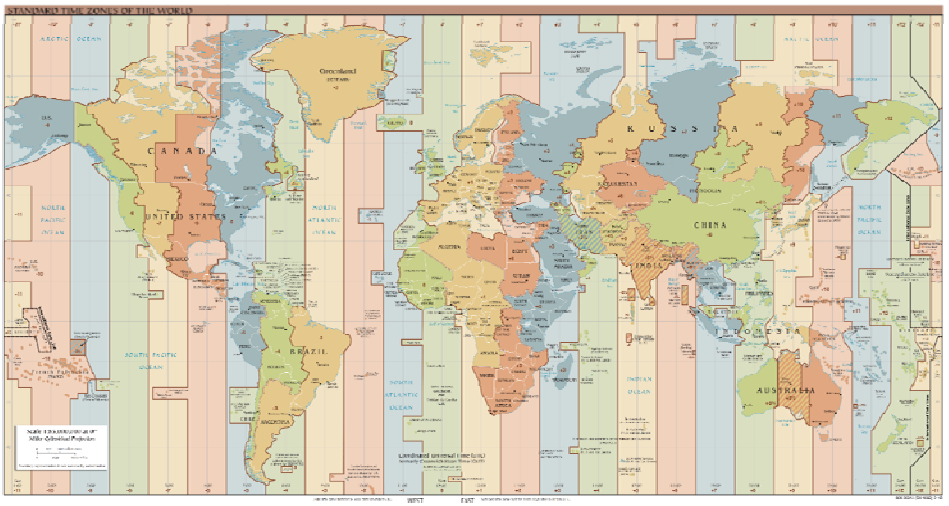
e.g., Google Docs supports both

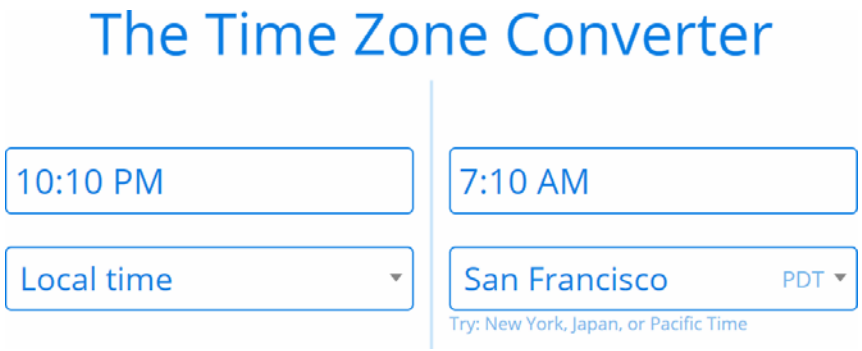
- Users may write asynchronously
- When users need discussion, there is a chat feature!
- So, users can switch: asynchronous ↔ synchronous

MoCA: Dimension #2

Physical Distribution

- Are the team members co-located?
- Physical location relates to cultural difference
- Can the groupware facilitate the team to work across time zone? Scheduling of meeting?





http://www.thetimezoneconverter.com/

MoCA: Dimension #3

Scale

- Number of Participants
- It affects the nature and type of interactions.
- Think about a report written by 2-3 persons against 10 or 100 persons (like Wikipedia)
- Larger collaborations:
  - lightweight contact between team members
  - Need hierarchical task decomposition, integration of work, and quality oversight

MoCA: Dimensions #4,5

Number of Communities of practice

- Any specific communities in the user groups, e.g., engineering, law, accounting, business, etc.
- Affects the language, culture, etc.

Nascence

- Whether the coordinated actions are already established and routine (or they are new and developing)

MoCA: Dimensions #6,7

Planned Permanence

- Some coordinated actions are shorter-term, and some are longer-term
  - e.g., SnapChat shows photos only for 10 sec.
- Longer terms requires a higher overhead

Turnover

- Stability of the people involved in the collaboration in terms of how frequently people leave the group and new participants enter the group

Specific Goals and Contexts

Explore MoCA's seven dimensions for different goals, contexts & applications:

- Communication & conversation, e.g., skype and SnapChat
- Online markets, e.g., Amazon and eBay
- Meeting coordination, e.g., Meetup
- Creative production, e.g., GitHub and Dropbox
- Crowdsourcing and crowdwork, e.g., Amazon Mechanical Turk Platform
- Entertainment and gaming, e.g., MMORPGs (massive multiplayer online role-playing games)
- Education, e.g., MOOCs (massive open online courses)

[See Chapter 11.3 in text book for details]