Review on Communication and Collaboration

SEEM3510 Human Computer Interaction
Tutorial
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Main concepts

- Groupware Definition
- Groupware's Advantages & Challenges in Development
- Collaboration Model
  - Time/space matrix model
  - MoCA model
- Design Considerations

Groupware

- Definition
  - Computer-based systems that support groups of people engaged in a **common task** (or **goal**) and that **provide an interface** to a **shared environment**.
  - (Specify the "shared environment" in terms of time & space: Time/space matrix model)

- Groupware's Advantages
  - Concurrent work maximizes performance
  - Facilitate group working at a distance
  - Facilitate interpersonal communication
  - Division of Labor: individual's expertise

Multi developers working on a project simultaneously.

⇨ People from anywhere can involve.

People can post issues in the repositories to communicate.

Challenges in Development

- Multiplicity of users
  - More users involved: more complex users' behaviours -> harder designs & usability tests.
  - E.g. Multiplayer games need to respond to every player's actions and their compounds, and display accordingly.
- Physical distributions of the participants and their environments

Gathering remote participants
Show participants' background

Meeting in VR

Present participants virtually

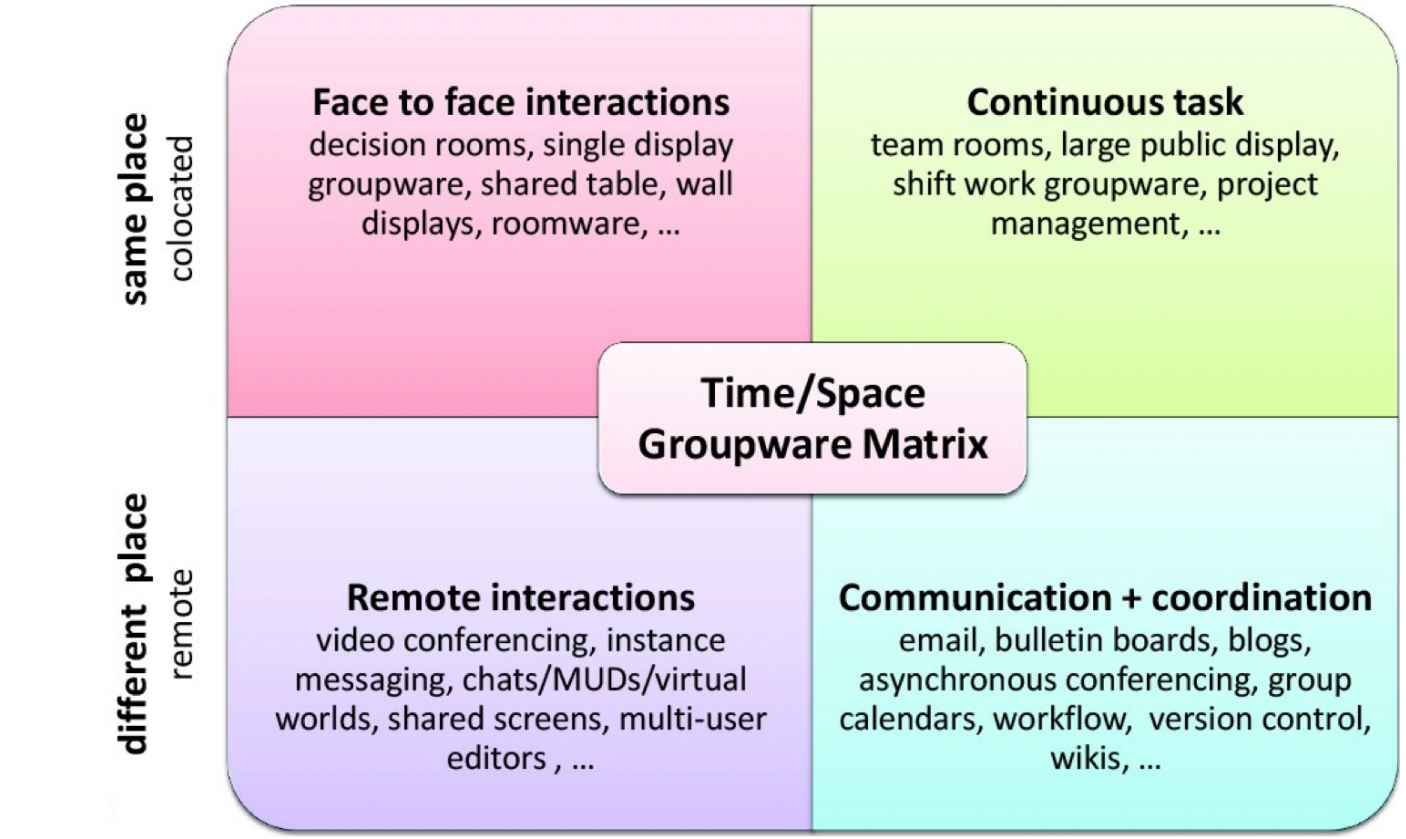
- Flood of data (more of a software development problem)

Collaboration Model (example as in lecture)

Wall display

Public Information display

Interactive games



Online and networked communities

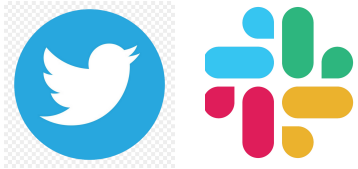
MoCA

- Model of Coordinated Action [Lee&Paine, 2015]
  - Synchronicity: asynchronous - synchronous
  - Physical Distribution: same – different locations
  - Scale: 2 - N
  - Number of Communities of practice: 0 - N
  - Nascence: routine - developing
  - Planned Permanence: short - long term
  - Turnover: low - high

Design considerations

- **Common ground** -- especially for collaborations with same time, diff. location

Share screen, request control, etc.



Referencing via threading of comments

- **Activity awareness** -- especially for collaborations with diff. time

Google editing tools: allow to tracking how work evolves; allow comments

- **Privacy**

Google doc: may use anonymous animals to represent identities

- **Identity**

- They may also show account identity, as required by users

- **Moderation**

Host has admin functions

Review on Timely User Experiences digest

Main concepts

- System Response Times (SRT)
- Models of SRT
  - Simple stages of action model
  - More realistic stages of action model
- SRT's correlation with the following aspects
  - Human Perception
  - Task Nature
  - User Experience
  - User Productivity

System response time (SRT)

- Response time = 0.1 second - Users perceive instantaneous response
- Response time = 1 second - Users sense a delay
- Response time = 10 second - Feel that they are constrained by the system, loss of control

- Influence on probability of bounce

Implications – Example (cont)

As page load time goes from:

1s to 3s the probability of bounce **increases 32%**

1s to 5s the probability of bounce **increases 90%**

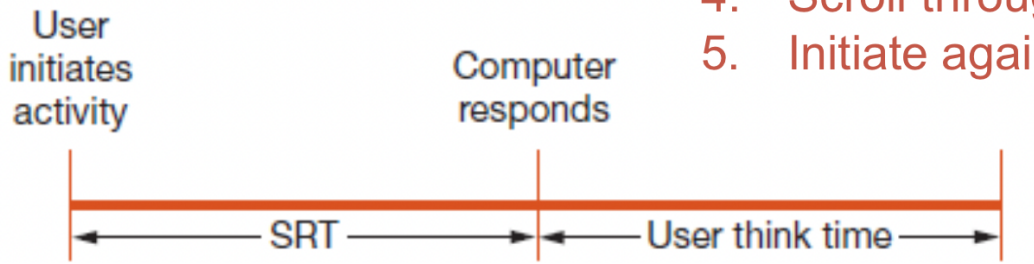
1s to 6s the probability of bounce **increases 106%**

1s to 10s the probability of bounce **increases 123%**

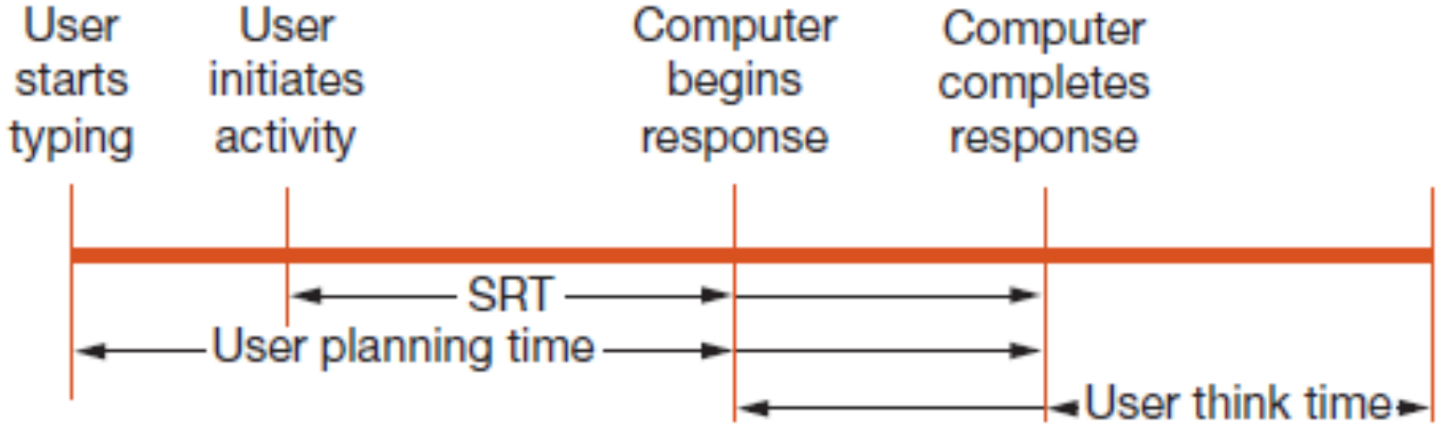
System Response Times (SRT)

- Simple stages of action model

1. User initiate
2. Wait for computer to respond
3. Watch while results appear
4. Scroll through results
5. Initiate again



- More realistic stages of action model



Core Questions to consider (related to SRT)

- 1, Human Perception
  - JND (Just Noticeable Difference) – like a threshold
  - Human perceived latency depends on:
    - Input modality, gesture
    - User characteristics
- 2, Task Nature
  - Prior experience & Task complexity influence users' expectation
- 3, User experience
  - Specifically, how it is affected by SRT: every extra second of SRT, web visits reduce

Core Questions to consider (related to SRT)

- 4, User Productivity

- **Repetitive tasks**

Shorter SRT → Less wait → Higher productivity	**Shorter SRT** → More errors → Lower productivity

  - Reduce variability matters:
    - Extremely fast responses may be slowed down

- **Problem-solving tasks**

Longer SRT → Users adapt → Maintain productivity	**Longer SRT** → Users dissatified → Lower productivity

Review on Information Search

Outlines

- Focus types of search of current lecture: web or database search
- Search Terminology
- Characteristics and types of search behaviours
  - Two general search behaviours: Browsing vs. Searching
  - Categories of search divided by information needs and tasks
- Five-phase search framework
  - 1. Formulation: expressing the search
  - 2. Initiation of action: launching the search
  - 3. Review of results: reading messages and outcomes
  - 4. Refinement: formulating the next step
  - 5. Use: compiling or disseminating insight
- Faceted Search
- Advanced technologies in search
  - Multimedia Search ; Social search (Personalized Search)

Search Terminology

Objects of interest

⇩ Can be stored in either

structured relational databases:
consists of **relations** with **items** (records), and a **schema** to describe the relations
- **Relations** have items, and each item has multiple **attributes** (often called **fields**), which each have **attribute values**
- A **library** consists of a set of **collections** plus some **descriptive attributes or metadata** about the library

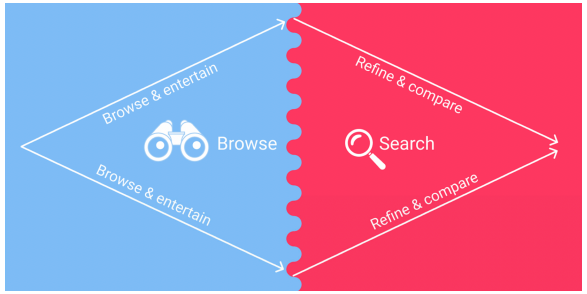
textual/multimedia document libraries:
Three examples:
Digital library: sets of carefully organized and catalogued collections.
Digital archives: tend to be more loosely organized
Directories: hold metadata about the items in collection and point users to the appropriate locations

unstructured web documents

Items in an unstructured collections have fewer attributes, e.g. only format or data created.

Characteristics and types of search behaviours

- Two general search behaviours:
  - Browsing: to browse and entertain, more open-ended
  - Searching: to refine and compare, more purposeful



- Categories of search divided by information needs and tasks

More searching

More browsing

  - Specific fact finding (known-item search)
  - Extended fact finding (uncertain but replicable outcome)
  - Exploration of availability (relatively unstructured task)
  - Open-ended browsing and problem analysis (complex analysis in exploratory searches)

Five-phase search framework (iterative process)

1. Formulation: expressing the search

- Help users identify or limit the source of information i.e. scoping with constraints
- **Ads**: lead to more relevant search results
- **Disads**: users may forget about the constraint as the search progresses
- **Some design considerations:**
- Constraints could be:
  - Keywords / Structured fields(specified by menus, form fillins, etc.)
- Make it flexible: Allow variants (e.g. in the lecture)
- Use auto-complete can speed up data entry, limits mis-spelling and guides successful queries

2. Initiation of Action

- Explicit initiation is just press the search button
- Implicit initiation refers to, the users adjust scope to produce continuous updates on search results

Five-phase search framework (iterative process)

3. Review of Results (example see lecture google search case)

- **Design considerations:**
- Case of no results – recommendations?
- List ordering – relevance ranked, popularity?
- Provide preview of listed items (e.g. snippets)
- Highlighting search terms
- Use metadata to build filters

4. Refinement: formulating the next step

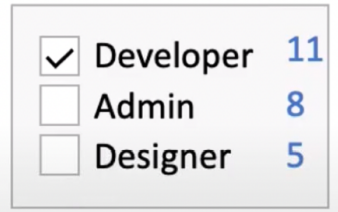
- Give users recommendation to reorganize key phrases and search again
- Iterating: start from phase 1 again

5. Use: compiling or disseminating insight

- Find some key results from unstructured information in the webpages, reorganize them and display the information users want most (Hyatt Shatin search result example in lecture)

Faceted Search

- Definition: Integrates browsing with searching
- What facet search do:
  - uses hierarchical faceted metadata presented as simultaneous menus and dynamically updated counts as preview of results (Emphasizing on 1st & 2nd phases of search)
  - Advantage: Organizes results in recognizable structure, gives control and flexibility of which to navigate and when to search



Natural Language Search

- NL search vs. Command languages search: system adapt to user vs. user adapt to system
- Challenges Natural Language Search have (that command search does not)
  - Out-of-vocabulary words
  - User-generated content
  - To use facets based on search lists or user needs
  - Need to match natural language with backend information repository

Advanced technologies in search

- Multimedia Search
  - Search by image, video, audio, geographic information, etc.
- Social search
  - Definition: search acts making use of social interaction
  - Personalized search built on user profiles and results customized with user behaviours data
  - E.g. Netflix, Pandora, Amazon

References

- SEEM3510 Human Computer Interaction, lecture week 11-13