Human-Computer Interaction Issues in Information Retrieval

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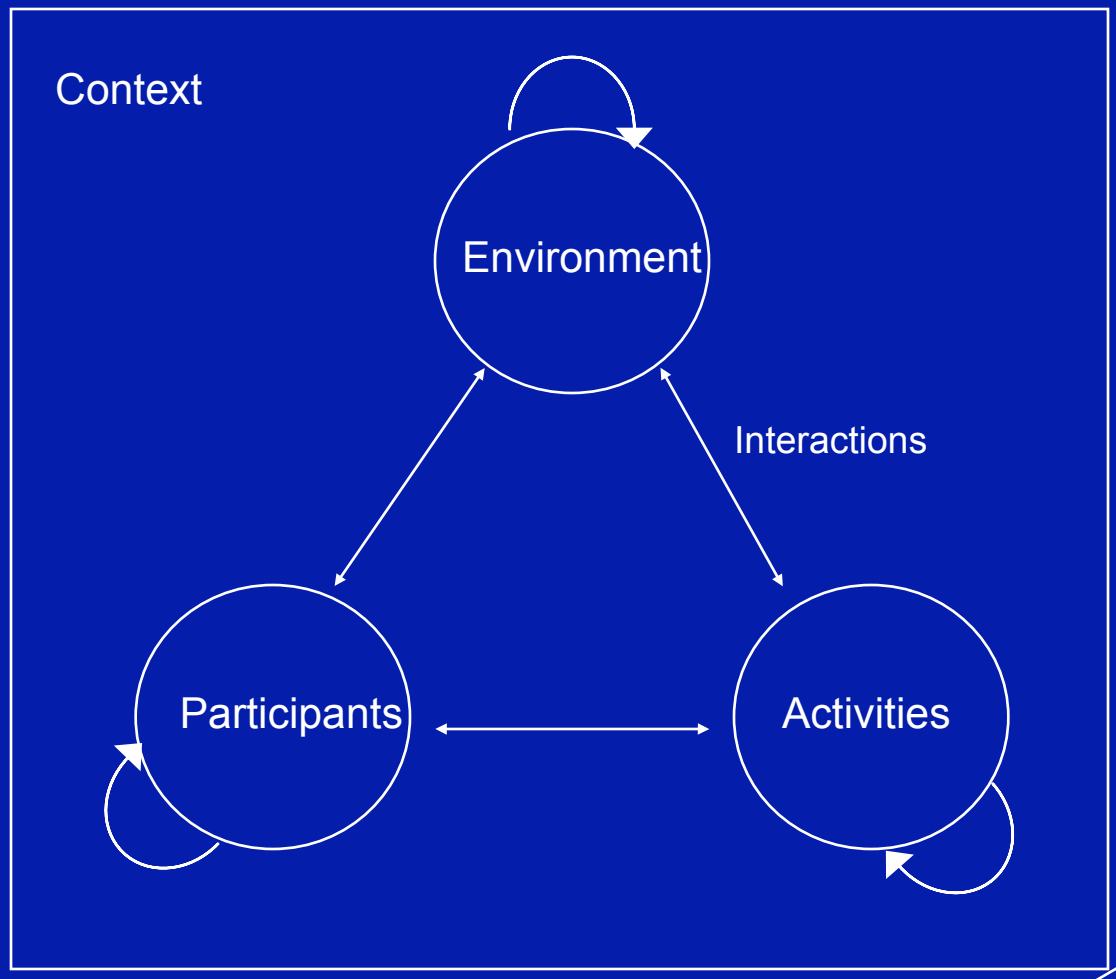
General HCI Concerns

- Information Overload
  - Miller 7±2
- Multiple Data Types
  - "Stuff I've Seen" (Dumais et al, 2003)
  - Memex (Bush, 1945)
- Small or limited devices
  - PDAs, watches, mobile phones
- Context
  - Interface usability varies by context

Context Model



Future

Present

Pas
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Context Model and Representative Characteristics	
Category	**Representative Characteristics**
Environment	Location, Orientation (of objects) Physical properties; Brightness and noise levels Availability, quality (of devices and communications)
Participants	Location, Orientation Personal properties (e.g., age, gender, preferences) Mental state; Physical health; Expectations
Activities	Tasks and goals (of participants) Events in the environment (e.g., weather)
Interactions	Co-location Group dynamics; Social situations Participant/environment relationships (e.g., worker/workplace) Season, time-of-day, day-of-the-week

Shneiderman's Golden Rules

1. Strive for Consistency
2. Enable Frequent Users to Use Shortcuts
3. Offer Informative Feedback
4. Design Dialogs to Yield Closure
5. Offer Simple Error Handling
6. Permit Easy Reversal of Actions
7. Support Internal Locus of Control
8. Reduce Short-Term Memory Load

Multimodal Input/Output

- Visual
- Auditory
- Tactile

Speech Interfaces for IR

- Gilbert and Zhong, 2003
- Problems with IR using Internet
  - Lack of Web access (cell phones)
  - PDAs, small interfaces
- Automatic Speech Recognition (ASR)
  - Spoken Document Retrieval (SDR)
  - Spoken Query Retrieval (SQR)

System Architecture

- Three parts:
  - Speech interface
  - Voice portal
  - Backend server
- Problems?
  - Lack of persistence
  - Recognition errors
  - Large language models
  - Large result lists
- Clustering

Reading Electronic Documents

- Hornbaek and Frokjaer, 2001
- Why focus on reading documents?
  - Electronic documents widely used
  - Reading is a time-intensive activity
  - Reading plays critical role in information access and use

Interfaces for Reading Documents

- Three interfaces studied:
  - Linear
  - Fisheye
  - Overview + detail
- Results?
  - Overview + detail seems most preferred and most efficient
  - However, fisheye allowed subjects to finish tasks faster