Describing Stakeholders and Their Needs

Human Computer Interaction
CSCI 4620U| SOFE 4850U | CSCI 5540G
Dr. Christopher Collins

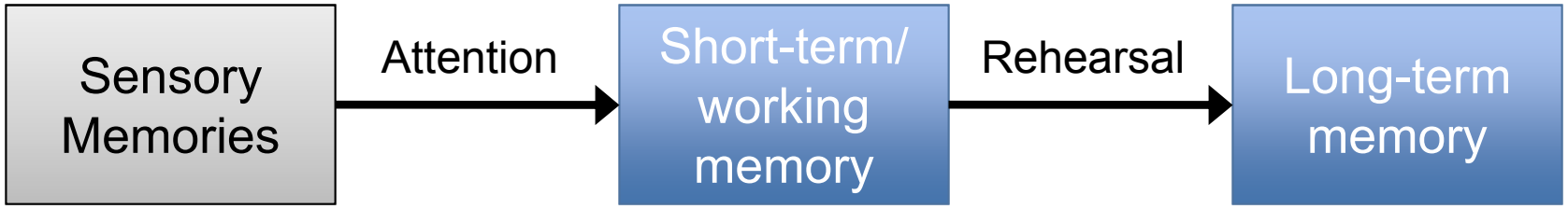
Acknowledgement: Parts of these lectures are based on material prepared by Ron Baecker, Ravin Balakrishnan, John Chattoe, Ilona Posner, Scott Klemmer, and Jeremy Bradbury.

Review

- Humans
  - Vision
  - Hearing
  - Touch
  - Memory
  - Emotion

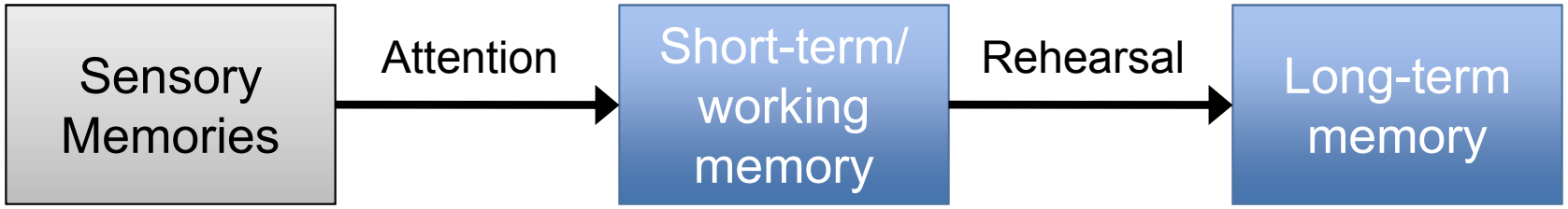
3 Types of Memory?

3 Types of Memory?



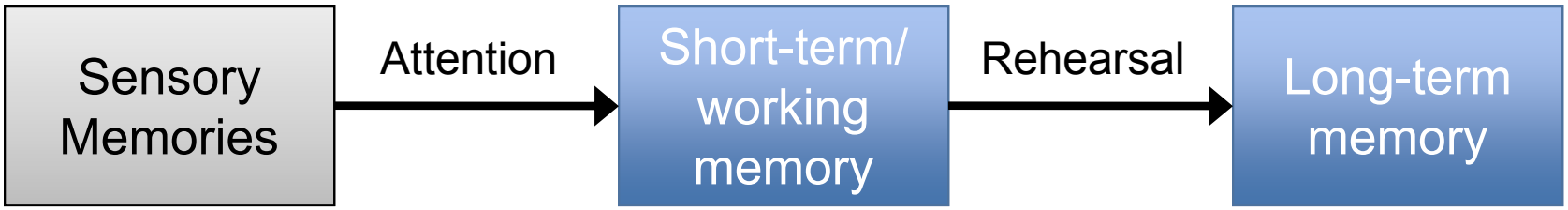
Model of memory structure
(Source: Dix, Finley, Abowd, Beale, *"Human-Computer Interaction")*

3 Types of Sensory Memory?



Model of memory structure
(Source: Dix, Finley, Abowd, Beale, *"Human-Computer Interaction")*

Human Memory

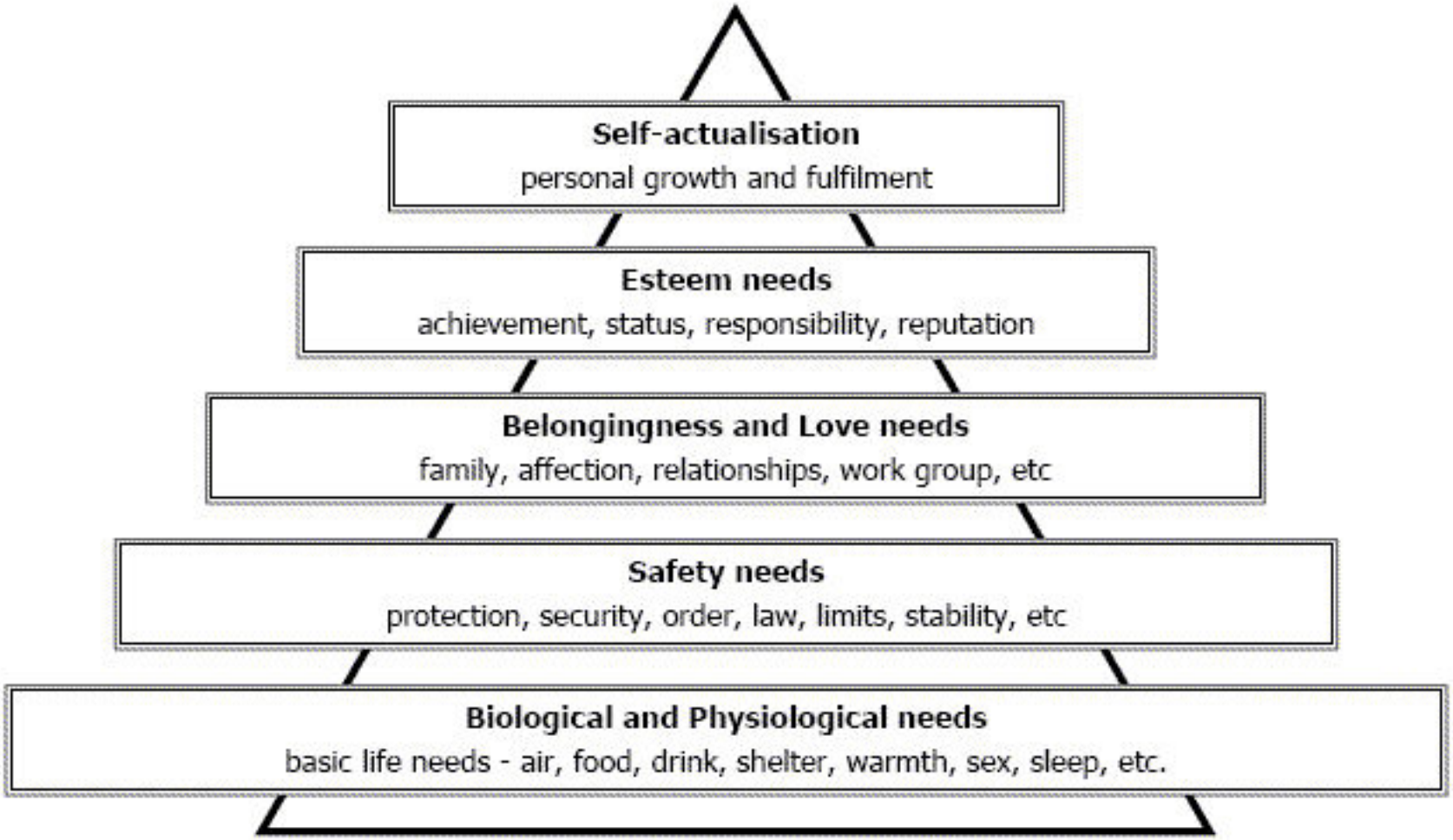


Model of memory structure
(Source: Dix, Finley, Abowd, Beale, *"Human-Computer Interaction"*)

Sensory Memory

- Visual stimuli ➔ iconic memory
- Aural stimuli ➔ echoic memory
- Touch stimuli ➔ haptic memory

Maslow's Hierarchy of Needs



Term Project Update

- After today: proceed with project 2a
- Lab Sept 30 & Oct 3: *pilot test* your instruments and make adjustments
  - Minimal TA support – trade members with other teams, test run your interviews/questionnaires, receive feedback
  - Practice everything, even your introduction / consent process!
- Any questions?

Today

- Defining Stakeholders
- Creating Research Instruments

Research Methods

NEEDS ANALYSIS

Discover real needs that even the people who need them cannot yet articulate!

Don Norman, Emotional Design, p. 74

DECIDE Framework

- Determine the goals the evaluation addresses
- Explore the specific questions to be answered
- Choose the evaluation paradigm and techniques to answer the questions
- Identify the practical issues
- Decide how to deal with ethical issues
- Evaluate, interpret, and present the data.

Preece, Rogers, Sharp Ch 11

Design Concept

- Vision Statement
  - One sentence describing the essence of the project
- Rationale
  - Why are you doing this
- Stakeholders
  - All relevant groups
- Assumptions
  - About people, technology, contexts

Field Studies

- Observe stakeholders
  - Where: in their work, home or social environment
  - Pay attention to people, interactions, tools, artifacts, spaces
- Talk to stakeholders
  - Understand them: who they are, what they do, where, when, how, why?
  - Characteristics: age, attitudes, tasks, work practices
  - Methods: interviews and questionnaires

Goal

- To describe the current situation
- Results do not include anything about design proposals

Analysis of Study Results

- Field study results lead to an understanding of needs
- Analysis of needs helps you derive and confirm requirements which guide your design decisions
- Field studies DO NOT indicate which design is best – this is through evaluation after prototyping (later in the term)

Who are the Stakeholders

- Designing a new web-based food ordering system at UOIT

Who are the Stakeholders

- Designing a new web-based food ordering system at UOIT
  - Students & staff who purchase food
  - Cooks
  - Managers of food services
  - IT department
  - Supply chain managers
  - …?

Interfaces for Stakeholders

- The designed solution for students ordering food may be different than the manager's interface to check on store room quantities.
- You will identify all stakeholders for your project, and select one or two main groups who you will design for

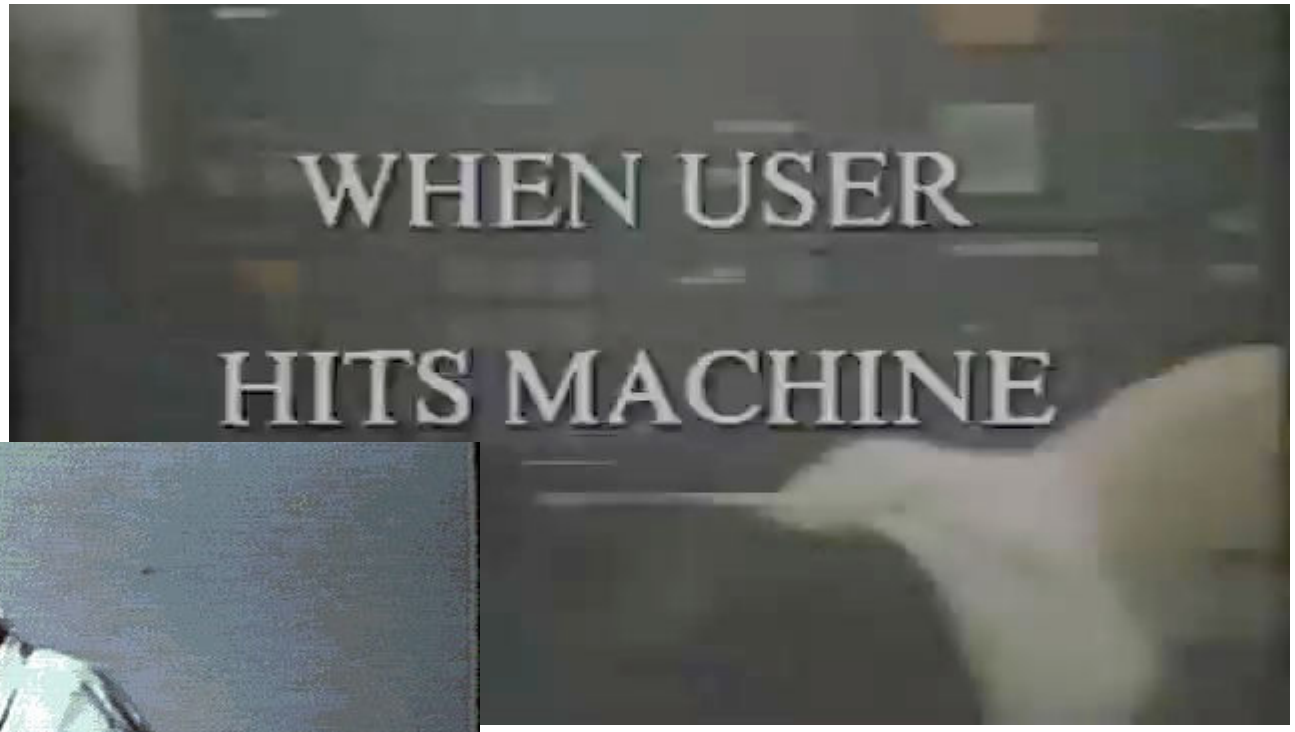
Stakeholder characteristics

Sample representative users by categories:

- Physical attributes (age, gender, size, reach, visual angles)
- Environment (sound levels, lighting, table height, software)
- Perceptual abilities (hearing, vision, heat sensitivity…)
- Cognitive abilities (memory span, reading level, job training, tech skills…)
- Personality and social traits (likes, dislikes, preferences, patience)
- Cultural and international diversity (languages, symbols, dialog box flow …)
- Special populations, (dis)abilities

Research Methods

ETHNOGRAPHIC OBSERVATION



http://www.workpractice.com/wpt-fest/introduction.html
[video no longer available]

Around this time [1979] a project began at PARC to develop an intelligent, interactive expert system that would provide instructions to users in the operation of a particular photocopier, just put on the market and reported by its intended users to be "too complicated." With Austin Henderson, I initiated a series of studies aimed first at understanding what made the existing machine difficult to use, and later at seeing just what happened when people engaged in "interactions" with my colleagues' prototype expert advisor.

Lucy Suchman

http://www.workpractice.com/wpt-fest/introduction.html

A time-lapse videotape of two men in jeans trying to make double-sided copies with a state-of-the-art Xerox copier. In growing frustration, the pair huddle repeatedly to scrutinize the instructions while a mountain of single-sided copies rises nearby. After an hour, they're defeated. One of the pair sighs: “We're S-O-L.”

When this video made its debut before an audience of top Xerox managers, one executive scoffed at the technologically incompetent subjects. “You must have got these guys off the loading dock,” he said. That was a perfect setup for the bombshell: Both men were computer scientists filmed at Xerox's famed Palo Alto Research Center (PARC). One was well-known computational linguist Ron Kaplan. The other was Allen Newell, a founding father of artificial intelligence.

http://www.workpractice.com/wpt-fest/introduction.html


Sample Copy
Enter
Clear/Stop
Start

Observation Techniques

- Contexual Inquiry
- Ethnography
- Diary Studies
- Prompted (pager) studies
- Cultural probes
- Task Analysis

Ethnography

- Began with ‘other’ cultures, moved to study our own

Everyday Ethnography

Tacit Knowledge

Participatory Observation

- Become an apprentice
- Set up a partnership with those to be observed
- Be taught steps in the process
- Observe all of the practices
- Validate what you are observing with those observed as you go along

Find the Workarounds and Hacks

Directed Observation

- Set goals
- Observe
- Synthesize

Documenting Fieldwork

- Notes
  - Record what you see and hear
- Camera
  - Take photos or video if permitted
- Action
  - Perform the activity yourself to get a feel for it
  - Collect artifacts

Discovery is the Root of Design

Discovery Tells Us…

- What people do now
- What are their values and needs
- How their activities are embedded in the overall “ecology”

That's Obvious!

Leave your Assumptions at the Door

- Before conducting research, consider (write down!) your own assumptions about the situation.
- Reflect on these (and avoid them!) during research process.

Research Methods

INTERVIEW PROTOCOLS

Semi-Structured Interviews

- Use open-ended questions
- Avoid binary questions
- Allow for contemplative silence
- Don’t interrupt or fill in the answer yourself

Plans are useless,
planning is invaluable

Semi-Structured != Unstructured

- Don’t ask questions which have no *frame of reference* as to the relationship to your study
  - E.g. “Tell me about yourself”, “How do you feel about technology”

What people can't tell you…

- Functional fixedness: People understand their world within a structure that imposes limitations. It's hard to see outside that structure.
- What they would do / like / want in a hypothetical situation
- How often they do things
- The last time they did something
- How much they like things on an absolute scale

Don't ask "What features would you like in this tool?"

What people can tell you…

- What they “generally” do
- How they do it (process)
- Their opinions about current activities
- Their complaints about current activities
- How much they like one thing *compared to* another

Interview Structure

- Start with demographics, overall goals, high-level tasks, company policies, etc.
- Move on to more open-ended questions (have them walk you through a task/day, what works well, what doesn't?)
- Cycle back to more detailed questions

Interview Tips

- Introduce yourself, explain your purpose
- The interview is about them, not you!
- Ask open, unbiased questions
- Ask the question and WAIT for them to answer
- Follow up as appropriate:
  - Adjust your questions to the previous answers
  - Ask questions in plain language
  - Pick up on and ask for examples
- Remain flexible
- Watch for signs of discomfort

Who's Talking?

20% You / 80% Them

Recording Interviews

- Work in pairs
  - One person asks questions, the other listens and takes notes
- Audio Recording
  - With the explicit permission of the participant
  - Helpful if your impressions change during the course of interviewing others (you can look back)
  - Tedious to review
  - Helpful to provide direct quotes for presentations

Where to Interview

- In the participant's setting (home, office, car, etc.)
  - Gives you better insight into their activities
  - Gives you a chance to see their environment
  - Jogs their memory
  - Allows them to show you rather than tell you
- If this is not possible, ask for a tour of their setting before or after the interview

Practice!

- Do a trial run with your fellow students to test your research instrument

Research Methods

QUESTIONNAIRES

Questionnaires

- Can be administered in person, or via phone/email/mail
- Must be designed and pre-tested
- Avoid bias in question design
- Open-ended versus closed-ended questions
- **Advantage**: “Precise,” allowing good control and comparability over a (large) set of users
- **Disadvantage**: Not flexible or adaptable to individual characteristics or specific situations

When designing questions

- Avoid absolute numbers: how fast can you select ‘file’ from the menu?
- Binary is ok: “Do you use short cut keys?”
- “On a scale of 1-5, Would you like to have feature X?”
  - Participant doesn’t really know what X is without experiencing it, can’t interpret their answer!

Questions People Can't Answer

- How many hours did you spend preparing meals yesterday?
- Better:
  - Please reflect on the events of yesterday and write an approximate schedule of how you spend your time. Begin with waking time and include the activity that took up the most time in each half-hour period.
    - 7:00am-7:30am _____
    - 7:30am-8:00am _____
    - …

Anchor for Comparison of Responses

BAD:

Please rate your skill as a Java programmer:

Very Poor	*Poor*	*Average*	*Good*	*Very Good*
1	2	3	4	5

BETTER:

In the list of Java technologies shown below, please indicate which ones you know well and which ones you are unfamiliar with.

	Know very well	*Know*	*Don't know very well*	*Don't know*
JFC/Swing	1	2	3	4
JDBC	1	2	3	4
Enterprise JavaBeans	1	2	3	4

Questionnaires CAN measure

- Data about people
  - Demographic information
  - Personality traits
  - Cognitive abilities
- Prior knowledge
  - Task domain
  - Technical expertise
- Attitudes and experiences
  - User satisfaction or frustration
  - Other perceptions of user experience

Questionnaires CANNOT measure

- How fast the someone can accomplish tasks
- Where the participant will make errors
- What command names to use
- How to organize items in the menu
- Which colors enhance visibility
- How a person learns commands

- Questionnaires and interviews **cannot** assess information that the **participant is unaware of**

Comparing Questionnaires & Interviews

Questionnaires/Surveys	Interviews
Easier to have large sample More normalized data More quantitative	Allows for clarification, confirmation, guidance Same-time ethnographic observation study (if interviewed in environment) Can have multiple paths in interview
May get junk data due to ambiguities and apathy (why questions need to be written so carefully) More detailed planning Distribution and return can be a headache Hard to get qualitative data	Difficult to have large sample Requires more time to conduct interviews Can be more difficult to scribe answers More difficult analysis of open ended data

Considerations when Designing Research Instruments

- Who is going to use the system?
- What tasks do they now perform?
- What tasks are desired?
- How are the tasks learned?
- Where are the tasks performed?
- What is the relationship between user and data?
- What other tools does the user have?
- How do users communicate with each other?
- How often are the tasks performed?
- What are the (time) constraints on the task?
- What happens when things go wrong?

Example Data To Be Collected

- Which is better:
  Observation, Questionnaire/Survey, or Interview?
  - How many grandchildren do they have?
  - What steps do they go through to prepare a meal?
  - Do they prefer to use a touch screen monitor or issue voice commands?
  - How do they organize their knitting workspace?

ARTIFACT ANALYSIS

Artifact Analysis

- Describing environment, spaces, facilities, technologies, objects, documents

A Digital Family Calendar, Neustaedter et al., http://portal.acm.org/citation.cfm?id=1268517.1268551

Embodied Interaction

RESEARCH ETHICS

Ethical Issues

- Basic principles
  - Respect for participant(s)
  - Do no harm
  - Informed consent
  - Voluntary participation
  - Right to privacy
- Research protocols (Assignment 2a)
- Consent forms (Assignment 2a)
  - Explanation of study and purpose
  - Ability to withdraw at any time
  - Anonymity, confidentiality

Summary

- Today we:
  - Reviews the research methods for understanding people and their current relationships with technology
  - Introduced *research ethics*

Friday

- Heuristic Evaluation and Artifact Analysis

Your Action Items

- Read “Neilsen’s Usability Heuristics” under required readings on Blackboard
- **Make first attempt at Project 2a before lab Sept 30/Oct 3 and BRING YOUR RESEARCH INSTRUMENTS TO THE LAB**

Ongoing Course Evaluation

- Please complete today's daily feedback form
- In the "other comments" section, you may comment on the lab activities.