DEPARTMENT OF COMPUTER SCIENCE
UNIVERSITY OF TORONTO

CSC 428F/2514F

HUMAN-COMPUTER INTERACTION

Lecture 6

INTERVIEWS AND QUESTIONNAIRES; CONTEXTUAL INQUIRY

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6.1 Interviews and questionnaires: the steps

Define the problem

Determine the method
- Questionnaire or interview
- Mode of administration (e.g., face-to-face, by mail, by phone, via computer)

Choose the population and draw the sample, i.e., select people who will get the questionnaire or whom you will interview

Write questions

Design questionnaire

Administer questionnaire or conduct interview

Analyze data

6.2 Interviews and questionnaires: the skills

Art rather than science
- No theory, merely guidelines

Varied skills required
- Researcher — What is wanted, how to analyze
- Interviewer — How to build rapport with interviewees
- Writer — How to write unambiguous, neutral questions

Need to be sensitive to
- Respondent motives, biases, moods
- Effects of survey mechanism, method of delivery

6.3 Kinds of data to collect

Demographic information

Background of respondents

Knowledge of respondents
- Event knowledge — What they've experienced
- Skill knowledge — Perhaps administer test
- Meta knowledge — Knowledge about what they know

Attitudes of respondents

Behaviour and expected behaviour of respondents

6.4 Rating scales

Most common technique in attitude measurement

Respondent asked to choose from among a discrete set of mutually exclusive and collectively exhaustive alternatives

Example

I am taking this class because I get up late.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	2	3	4	5

Criteria for rating scales and response categories
- Validated to reflect approximately equal distinctions
- Understandable by most respondent populations
- Widely applicable to a large number of questions

6.5 Example of rating scales

Rating degree of acceptance with a stated position, e.g.:
I had no difficulty learning the basic commands of the system.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Rating quality of service, e.g.:
The quality of the training I received was...

Excellent	Good	Fair	Poor

Measuring an opinion, e.g.:
I (approve of) (disapprove of) the plan to install a video monitoring system on our workstations.

Favor	Oppose
Am for	Am against
Think it is a good idea	Think it is a bad idea

Measuring satisfaction with an amount, e.g.:
I think that the number of commands I need to learn to do word processing is...

Too many	About right	Too little

Carrying out a comparison with the past and the future, e.g.:
Compared to the way in which we used to do graphics, the new system that was installed is...

Better	About the same	Worse

Measuring importance or the strength of a feeling, e.g.:
I am interested in learning more about the new gestural interface...

Very much	Somewhat	Not at all

Measuring frequency of activities, e.g.:
When I use the spreadsheet, I _____ have trouble remembering the commands.

Regularly	Often	Seldom	Rarely
Always	Most of the time	Some of the time	Never

Measuring the level of interest in something, e.g.:
I shall describe the following capabilities that many spreadsheets possess. Please tell me whether you are _____ in having each capability I describe.

Very interested	Fairly interested	Not at all interested

6.6 Caveats on uses of rating scales

It is easy to create nonlinear scales, stick to scales that have been validated, i.e., demonstrated to give linear responses

If a scale is nonlinear, respondents have difficulty giving correct answers, and use their own personal scales, so results from respondents cannot be averaged together

Example of a bad scale
Please use the following numerical ratings to give your assessment of the parts of the program you attended at the conference.
(1) very good
(2) good, but important aspects could be improved
(3) average for a human-computer interaction conference
(4) fair, but did not meet some major expections
(5) poor

Far better would be
Please use the following numerical ratings to give your assessment of the parts of the program you attended at the conference

		1 very good	2 good	3 fair	4 poor	5 very poor
a.	paper presentations	_____				
b.	panel presentations	_____				
c.	demonstrations	_____				

6.7 Gathering the maximum amount of information

Gather the maximum amount of information per question

Ask yourself what you will do with the answer to each question

A simple yes or no usually gives little information. If someone doesn't like an interface feature, it doesn't tell you WHY.

Avoid response biases

Ask open-ended questions at the end to obtain information you might have missed

An illustrative example

Some people argure that stores should be open on Sunday to expand the time available for people who work. Others argue that stores should not be open in order to provide all people time to spend with their families.
Do you think stores should be open or not open on Sunday?

Better would be

Some people argue that stores should be open on Sunday. Others argue that this is not a good idea. Of the following types of stores, which would you like see open or closed on Sunday?

Open	Don't care	Closed	
___	___	___	Supermarkets
___	___	___	Dept. stores
___	___	___	Car dealers
___	___	___	Drugstores

6.8 Response bias

A question has response bias when the answers received do not reflect the truth about the respondent's behaviour, knowledge, or attitudes

Three types of response errors
- Deliberate or motivated errors — Responent tries to keep interviewer from finding out something or to create a good impression
- Memory errors — Respondent cannot remember how or when something happened
- Communication errors — Questionnaire or interviewer does not make it clear what is being asked OR respondent does not make response clear

Questions that cause response effects
- Loaded questions
- Embarrassing questions
- Ambiguous questions
- Questions that assume knowledge
- Awkwardly worded questions
- Questions about information people forget
- Questions which require a lot of information reorganization

Loaded questions— Unfair alternatives

Bad

Some people say it is a waste of money to have computers available for all students at the university. Do you agree or disagree?

Better

Some people say that it is a waste of money to have computers available for all students at the university. Others say that it is extremely important to provide students easy access to computers. Which opinion do you agree with?

Loaded questions — Damning with faint praise

Bad

Some people say that the plan to introduce the new Student Registration System was poorly thought out. Others say it will do for now until a better solution comes along. What do you think? Is it a good plan or a poor plan?

Better

Some people favour the plan to introduce the new Student Registration System. Others oppose the plan. Do you think the plan is a good solution or a poor solution?

Loaded questions — Emotionally charged words

Bad

Computer scientists have been accused o intentionally generating poor interfaces for users. Do you agree or disagree with this charge?

Better

One of the issues associated with developing user interfaces is the role that computer scientists play in making decisions about the interface. In this area, do you think that computer scientists have done:
a. an excellent job
b. a good job
c. a poor job
d. a very poor job

Embarrassing questions

Bad

How much time do you spend reading the newspaper?

Better

Did you have a chance to read the newspaper yesterday?
(If respondent says yes, ask)
About how much time did you spend reading the newspaper yesterday?
(Or consider asking about entire week!)

Embarrassing questions — Probing deeply in personal matters

Bad

Have you ever driven a motor vehicle while legally drunk?

Better

There are times when it is impossible to find alternative transportation after drinking with friends or at a party. Have you ever been in such a situation and had to drive home?

Ambiguous questions

Bad

Do you think the videos have contributed greatly to your educational experience at the conference?

Better

Do you think the videos at the conference help you to understand the user interface being presented
a. considerably better?
b. somewhat better?
c. about the same?

Questions which assume knowledge

Bad

Some people feel that the engineering department was responsible for the security of their systems.
Others feel that it was the student's responsibility not to share his password with friends.
What is your opinion on whose responsibility it was to keep the computer system secure?

Better

Did you hear about the security problems last year in engineering?
If no, skip to question x
if yes,
What have you heard?
Do you think the responsibility for the security of the computer system lies with
a. the engineering department
b. all engineering students
c. other _____

Awkwardly worded questions

Bad

Do you think the libraries at the university should be open or at least have some of their services, especially the short term loan and the accessibility of the reading room for 24 hours per day?

Better

The library has been considering offering some of its services to students on a 24 hour basis. Please check those services you think you might use if they were available after midnight.

_____ reading room
_____ short term loan
_____ audio-visual
_____ access to library stacks

Questions about information people cannot remember
Bad
What did you have for dinner last week Tuesday?
Better
Please think about the events that occurred to you last week Tuesday.
Did you go home after classes?
Did you eat out or prepare food for yourself?
What did you eat?

Questions which ask people to reorganize the information
Bad
Approximately how many hours a month do you use a wordprocessor?
Bettter
Below we list the hours for yesterday in half hour slots. Please mark with an X those half-hour slots in which you used a wordprocessor.

6:00 AM___
6:30AM___
7:00 AM___

(Or ask about days in the last week, and number of hours per day.)

6.9 Rules of questionnaire design

Never ask a question you don't intend to use
Always have an underlying reason for every item on the questionnaire

Ask the easy questions first, the hard ones last
Group topic areas together

Run pilot studies of your questionnaire — test it out on people
Never use an untested question
After each change, test the question again

Put more general open-ended questions at the end, e.g., "what was the best thing about this course."

Keep it simple

6.10 Contextual inquiry

Interview techniques that develop understanding of users and get them involved in the design process
- Developed at DEC in the mid to late 80s
- Incorporates elements of interviews and observation

Goals
- Process for designing systems that support people who engage in similar work in great variety of business contexts and cultures
- Process that provides appropriate and helpful information about users' work
- Process that is efficient in time

Perspective on usability — a match between work practices and technology

Key principles
- Context — actual work environment
  - Concrete examples, not abstractions and generalities
  - Ongoing experience, not summary information
- Partnership — designer together with user
  - The user is the expert
  - Shared control during the inquiry
  - The creation of shared meaning
  - Reflection and engagement
- Focus — for managing the conversation
  - Fixing the focus
  - Expanding the focus

Conducting a contextual interview
- Identifying "customers"
- Arranging the visit
  - Communication of goals, arranging permissions, etc.

- Selecting initial and subsequent users
  - Direct users, managers, and others
- Using multiple interviewers
  - Several points of view
- Setting the focus before the interviews
- Structure of a contextual interview
  - Introduction: Establishing a relationship
  - Ongoing work inquiry
  - Wrap-up

Note-taking
- What users do
- What users say
- Our interpretation
- Disruptions to users' work and workarounds
- Aspects of tools use that support or fail to support work

Questions to ask to keep conversation going, e.g.,
- "What are you doing?"
- "Why are you doing that?"
- "Is that what you expected?"

Sharing interpretations and design ideas for validation
- "I'm hearing you say such and such. Am I on track?"
- "What you're saying leads me to conclude..."
- "What if the application did ... ?"

Analyzing contextual inquiry information

- Some analysis occurs during the interview, but then...

- Transcribing the interview

- Fixing and evolving the focus of analysis

- Interpreting the information
  - Work structure or work flow
  - Problems accomplishing the work
  - Problems in system use
  - Disruptions caused by the system
  - Workarounds that are used to avoid disruption from the system
  - Transparency of the system
  - Aspects of work process and system use that support work
- Recording understandings
  - Description of users' work
  - Flow or structure of the work
  - Description of problems in the work
  - Description of problems with the computer tools
  - Design ideas that emerge from our understanding of the work
  - Questions for subsequent interviews
- Structuring the understanding — Affinity diagramming

Contextual inquiry as a form of participatory design

Contextual inquiry throughout system development life cycle

6.11 References

Holtzblatt, K. and Jones, S., Conducting and Analyzing a Contextual Interview, BGBG, pp. 241-253

Beyer, H. and Holtzblatt, K., *Contextual Design: Defining Customer-Centered Systems*, Morgan Kaufmann, 1997