

# Questionnaires

## Unit 7



# Learning outcomes

- Understand when/how to use questionnaires in interaction design
  - Surveys
  - Satisfaction questionnaires (post use)
- Learn how to prepare them
  - Different types of scales
  - Questions wording
- Learn about the most common types of questionnaire used in user research
  - Usability
  - User experience

# Questionnaires

- Predefined set of questions in a predetermined order
- Provide data that can be analysed to identify patterns and relationships within the answers
- Questionnaires may be:
  - Self-Administered (the respondent answer on their own)
  - Administered by the researcher

# Questionnaire

- Qualitative vs. quantitative data; self-report
  - opinions, beliefs, attitudes, behaviour
  - bias -> social desirability often there is an expectation that one answer is preferred

$$\underline{\text{questionnaire score} = \text{true score} + \text{error}}$$

- only as good as the questions asked

# Source of Errors

- Systematic (bad design of the questionnaire)
- Random (this is not a problem in large sample)
- Use different items and techniques to address the same concept (average)
- Triangulation

# Psychometric characteristics

- Reliability (reproducibility factor):
  - test-retest reliability: stability over time
  - internal reliability: stability over items
- Effective range in the scale (sensitivity):
  - scale must be chosen according to variable peculiarities.
- Validity:
  - measures must reflect what it is investigated.

# Surveys

- Systematic extraction of data from and about a population of people (or events) in a standardised & systematic manner
- The extraction of patterns from the responses from a sample enables statements and inferences about the whole population
- Sampling issues (random sample is often the best choice, but at times unfeasible)
- Requirements elicitation / adoption studies

# Snow-ball sample

- Self-selected sample
- Shopping Web Sites
- Chat Sites
- Personal Sites
- Fan Sites
- Such sites are selected on the basis of convenience rather than for any in depth investigation



# Scales of measurement

- Nominal data (nominal or categorical data)
  - Identity.
    - gender, (1= male; 2= female), ethnicity
    - Numbers are meaningless
  - Ordinal data (ordered data)
  - identity + magnitude (socioeconomic class)
    - Student ranks (1 = no pass; 2 = pass; 3 = merit; 4 = distinction)
    - Numbers reflect an order but arithmetical operations are limited
- Interval data (scores data)
  - identity + magnitude + equal intervals (evaluation scales)
    - I feel
  - Happy 1 2 3 4 5 6 7 Unhappy
    - This lecture is boring
  - strongly agree 1 2 3 4 5 Strongly disagree
- Ratio data (scores data)
  - identity + magnitude + equal intervals + a true zero (number of bugs)
    - There is a true zero
    - Age, height, annual turnover

# Questionnaire design

- Questionnaires must be properly designed to elicit the answers you want from the respondent
- Answers should be valid and meet the researchers' need
- Each question has to effectively elicit an answer that contributes to addressing the overall research question

# Questionnaire design

- Iterative approach
  - Establish the purpose of the questionnaire
    - what information is sought? how would you analyze the results? what would you do with your analysis?
    - determine the audience you want to reach
    - determine how would you will deliver the questionnaire
  - Define thematic areas
    - IT experience, attitudes toward technology, user satisfaction
  - Compose and pilot the items
    - wording issues, response biases
    - select scales (precision; effort needed to decide on a response)
    - do not ask questions whose answers you will not use!
  - Write instructions
  - Pilot

# Pilot

- How long did it take to complete?
- Were the instructions clear?
- Were any questions ambiguous?
- Were any questions objectionable?
- Was the layout clear and easy to follow?
- Were any topics omitted?

# Questions

- **Brief:** ideally 20 words or less, providing the question is still understandable
- **Relevant:**
  - each question should be relevant to the overall questionnaire and its purpose
  - each word within the question must be relevant to the overall (research) question you want to ask

# Questions (2)

- Avoid 'and' questions
  - The web-site is interesting and appealing
  - The web site is interesting
  - The web site is appealing
- Avoid 'negative' questions
  - The web site design is not appealing
  - The web site design is ugly

# Practical guidelines

- Don't use jargon or abbreviations
- Keep questions simple and as short as possible
- Don't use vague terms: be precise.
- Avoid 'loaded' or 'leading' questions that hint at the answer you want to hear
- Avoid "AND" questions: asking more than one question
- Avoid 'double-negative' questions
- Use common concepts
- Take care over questions that involve memory/recall

# Practical guidelines

- Hypothetical questions need to be worded especially carefully. Are they really needed? Can the question be misinterpreted?
- Take care when covering embarrassing or sensitive issues.
- Avoid using negative words or implicit negatives as this might bias your responses.
- Avoid 'presumption' questions: do not assume that everyone has the same standards.
- Watch out for prestige bias in the question: social bias happen even if the responses are anonymous,



# Styles of Questions

- Open-ended questions
  - asks for unprompted opinions
  - good for general subjective information
    - but difficult to analyze rigorously

“Can you suggest any improvements to the interface?”

# Closed questions

- Restrict responses by supplying alternative answers
- easy to analyze
- watch out for hard to interpret responses!

Do you use computers at work:

often                       sometimes                       rarely

vs

In your typical work day, do you use computers:

- over 4 hrs a day
- between 2 and 4 hrs daily
- between 1 and 2 hrs daily
- less than 1 hr a day

# Multi-choice

- Respondents offered a choice of explicit responses

How do you most often get help with the system? (tick one)

- on-line manual
- paper manual
- ask a colleague

Which types of software have you used? (tick all that apply)

- word processor
- data base
- spreadsheet
- compiler

# Ranked

- respondent places an ordering on items in a list
- useful to indicate preferences
- forced choice
- Limit the number of items

Rank the usefulness of these methods of issuing a command  
(1 most useful, 2 next most useful..., 0 if not used)

\_\_\_**2**\_\_\_ command line

\_\_\_**1**\_\_\_ menu selection

\_\_\_**3**\_\_\_ control key accelerator

# Likert Scales

- User judge a specific statement on a numeric scale
- usually corresponds with agreement or disagreement with a statement

The characters on the computer screen are hard to read

1		2	3	4	5
Strongly agree	agree	neutral	disagree	strongly disagree	

# Combination

- Combining open-ended and closed questions
  - get specific response, but allows room for user's opinion

It is easy to recover from mistakes:

disagree                      agree  
1   2   3   4   5

comment: the undo facility is really helpful

# Semantic differential scale

- Bi-polar attitudes about a concept
- pair of adjectives

The look and feel of the web-site is

exciting	1	2	3	4	5	6	7	boring
annoying	1	2	3	4	5	6	7	pleasing

# Appearance

- Make the questionnaire attractive
- Use space generously; avoid a cramped, untidy appearance
- Make headings and instructions clear
- Make sure the method of answering is obvious
- Don't split a question between two pages
- Number all questions
- Take care over question order. Generally start with broad, straightforward ones and include more complicated, specific or sensitive ones later
- The questions should proceed in a logical manner (group by thematic areas)
- End questionnaire with a "Thank you" and give a clear deadline for responses.



# Usability Questionnaire

## SUS – System Usability Scale

- 10-item Likert-scale: overview of satisfaction with software
- Developed by [John Brooke](#)
- Freely available for use providing acknowledgement is made of the source.

# SUS

	Strongly Disagree				Strongly Agree
1. I think I would like to use this website frequently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I found the website unnecessarily complex.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I thought the website was easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I think I would need Tech Support to be able to use this website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I found the various functions in this website were well integrated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I thought there was too much inconsistency in this website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I would imagine that most people would learn to use this website very quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I found the website very cumbersome to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I felt very confident using the website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I need to learn a lot about this website before I could effectively use it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

# QUIS

- Questionnaire for User Interaction Satisfaction
    - Measures attitude towards different interface factors (screen factors, terminology and system feedback, learning factors, system capabilities, technical manuals, on-line tutorials, multimedia, voice recognition, virtual environments, internet access, and software installation)
    - <http://www.cs.umd.edu/hcil/quis/>
-

Overall Reaction to the Website		0	1	2	3	4	5	6	7	8	9	NA	
1.	terrible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	wonderful	<input type="radio"/>
2.	difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
3.	frustrating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	satisfying	<input type="radio"/>
4.	dull	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	stimulating	<input type="radio"/>
5.	rigid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	flexible	<input type="radio"/>

Web Page		0	1	2	3	4	5	6	7	8	9	NA	
6. Reading characters on the page	hard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
7. Organization of information	confusing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	very clear	<input type="radio"/>
8. Sequence of pages	confusing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	very clear	<input type="radio"/>

Terminology and Website Information		0	1	2	3	4	5	6	7	8	9	NA	
9. Use of terms throughout website	inconsistent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	consistent	<input type="radio"/>
10. Terminology is intuitive	never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	always	<input type="radio"/>
11. Position of messages on screen	inconsistent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	consistent	<input type="radio"/>
12. Prompts for input	confusing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	clear	<input type="radio"/>
13. Website informs about its progress	never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	always	<input type="radio"/>
14. Error messages	unhelpful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	helpful	<input type="radio"/>

<b>Learning</b>		0	1	2	3	4	5	6	7	8	9	NA	
15. Learning to use the website	difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
16. Exploring new features by trial and error	difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
17. Performing tasks is straightforward	never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	always	<input type="radio"/>
18. Help messages on the screen	unhelpful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	helpful	<input type="radio"/>
19. Supplemental reference materials	confusing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	clear	<input type="radio"/>

<b>Website Capabilities</b>		0	1	2	3	4	5	6	7	8	9	NA	
20. Website speed	too slow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	fast enough	<input type="radio"/>
21. Website reliability	unreliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reliable	<input type="radio"/>
22. Sounds associated with this website	detracts value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	adds value	<input type="radio"/>
23. Correcting your mistakes	difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
24. Designed for all levels of users	never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	always	<input type="radio"/>

# Italian version

Stefano FEDERICI, Simone BORSCI, Fabio  
MELONI

Le misure dell'usabilità: Studio sulle  
caratteristiche psicometriche del QUIS e  
del SUMI nella versione italiana

Giornale di Psicologia (2009), Volume 3,  
Numero 2 (Giugno)

# PVA

- Perceived Visual Aesthetic scale Lavie and Tractinsky
- Two dimension of aesthetics
  - Classical Aesthetics
  - Expressive Aesthetics

# PVA

The screenshot shows a web browser window with the address bar displaying `http://app.sgizmo.com/preview_survey.php?id=192987`. The browser tabs include 'SurveyGizmo - Project: Overview' and 'Preview Survey'. The page title is 'PREVIEW: User Experience'. The survey content is as follows:

### User Experience

1. Please use the following adjectives to evaluate the website \*

	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree
Easy to navigate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Can count on site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicates desirable image	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Convenient use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Represents likeable things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Original design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of special effects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creative design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sophisticated design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fascinating design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clear design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easy to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easy orientation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clean design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Site provides reliable information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Symmetric design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Site contains no mistakes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Positive message about user	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aesthetic design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creates positive associations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fits personality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pleasant design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Pleasurable Interaction



# Factors

- Usability: Easy to navigate, Convenient use, Easy to use, Easy orientation
- Expressive aesthetics: Original design, Use of special effects, Creative design, Sophisticated design, Fascinating design
- Classical aesthetics: Clear design, Clean design, Symmetric design, Aesthetic design, Pleasant design
- Service quality: Can count on site, Site provides reliable information, Site contains no mistakes
- Symbolism: Communicates desirable image, Represents likeable things, Positive message about user, Creates positive associations, Fits personality

# Information Quality

- Info. provided is useful
- Website conveys important info.
- The content is of good quality
- The level of detail is good
- Right amount content provided
- The information reported is well-documented and researched
- The site reports up to date info.
- The content of the website is relevant
- De Angeli et al. 2007

# Interface Quality Scale

	<i>Factor</i>		
	Content	Usability	Pleasure
The level of detail of the content is good	<b>.816</b>	-.171	.140
The right amount of content is provided	<b>.709</b>	.076	-.023
The content is relevant	<b>.559</b>	.099	-.103
The content is of good quality	<b>.502</b>	.119	.124
The website is easy to use	.023	<b>.912</b>	-.079
I feel in control when I am using this website	-.027	<b>.807</b>	.033
The website requires little effort to use	-.030	<b>.763</b>	.058
Using the website is effective	.221	<b>.638</b>	.091
I feel pleasure interacting with the website	-.165	.038	<b>.923</b>
The website is pleasurable to look at	.070	-.055	<b>.737</b>
The website has design features I like	.145	-.020	<b>.692</b>
The website evokes positive feelings	.020	.097	<b>.641</b>

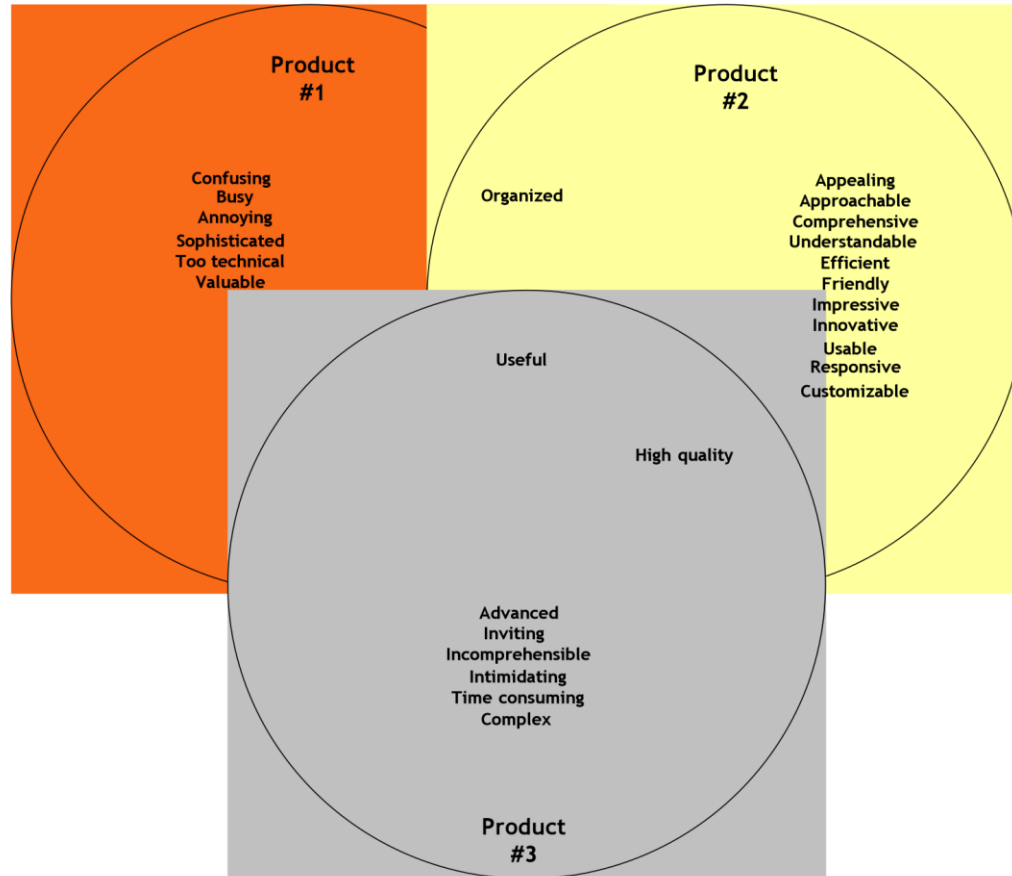
# Desirability Tool Kit

- Developed by Microsoft
- Example of use and tools
- <http://www.userfocus.co.uk/articles/satisfaction.html>

# Desirability Kit

Accessible	Desirable	Gets in the way	Patronizing	Stressful
Appealing	Easy to use	Hard to use	Personal	Time-consuming
Attractive	Efficient	High quality	Predictable	Time-saving
Busy	Empowering	Inconsistent	Relevant	Too technical
Collaborative	Exciting	Intimidating	Reliable	Trustworthy
Complex	Familiar	Inviting	Rigid	Uncontrollable
Comprehensive	Fast	Motivating	Simplistic	Unconventional
Confusing	Flexible	Not valuable	Slow	Unpredictable
Connected	Fresh	Organized	Sophisticated	Usable
Consistent	Frustrating	Overbearing	Stimulating	Useful
Customizable	Fun	Overwhelming	Straight Forward	Valuable

# Example data



# PrEmo

- Emotional responses elicited are difficult to measure because
  - their nature is subtle (low intensity)
  - they are often mixed (more than one emotional response at the same time)
- Instead of words, use animated cartoon characters
- Evaluation does not become a rational process



# PreEmo

*"To which extent do the feelings expressed by the characters correspond with your own feelings towards the stimulus?"*

