

# TDDD90 – Usability Testing

Användbarhetstestning

Shafiq Urréhman

# Course info - Learning Outcomes

- Use **methods and techniques** for concept design and detailed design to **define problems and alternative solutions** for digital interactive products and services.
- Give an account of system objectives, and **analyse design qualities** and **user experience** for digital interactive products and services.
- Define **purpose, content, and form** for digital interactive products and services.
- **Argue for one's interaction design ideas** using multimedia, visualisations, or oral and written presentation.
- **Summarise and analyse the meaning of concepts from interaction design and use them to analyse design work.**

# Where are we ...

## • Lectures

- Lecture 1, 14/9 at 10:15-12 - [Course introduction](#) (Shafiq Uhhrehman)
- Lecture 2, 20/9 at 13:15-15 - [Sketching details](#) (Stefan Holmlid)
- Lecture 3, 28/9 at 10:15-12 - [Sketching concepts](#) (Mattias Arvola)
- Lecture 4, 11/10 at 13:15-15 - [Ubiquitous computing](#) (Guest lecturer Dipak Surei)
- Lecture 5, 18/10 at 13:15-15 - [Creativity & Innovation in UX](#) (Guest lecturer Dawid Ziobro)
- Lecture 6, 6/11 at 08:15-10 - [Use Qualities](#) (Mattias Arvola)
- Lecture 7, 23/11 at 10:15-12 - Usability testing (Shafiq Uhhrehman)

# Where are we ...

- **Seminars**

Instructions about the seminars can be found [here \(SWE\)](#) or [here \(ENG\)](#), and the seminar groups [here](#).

- 30/11 at 13:15-17:00

- Group 1-4 in R37, Group 5-8 in R44 - *Seminar 1: Paper prototype*

- 13/12 at 13:15-17:00

- Group 1-4 in R36, Group 5-8 in R44 - *Seminar 2: Pilot test*

# Where are we ...**Individual project**

- Individual Assignment (project) – Sketching & interactivity
- **Read the full task first!**
  - Concept Design Phase
  - Detail Design Phase
  - Prototyping
    - analysis
  - final Proposal

# Where are we ...Individual project

- **Text from the task description ...**
  - Design Assignments - Individual Continuation from assignment 2 (Grupparbete). A concept shall be further developed and detailed, prototyped and analyzed. The work is documented in the form of a description. **The description** is a chronological account of how the work has been done from start to finish and where it is stated: what ideas and alternatives have been explored and evaluated and what design decisions have been made and on what grounds.
  - As a continuation of GroupWork/assignment 2, based on the ideas explored and the storyboard generated, a detailed solution to the assignment should be worked out and evaluated. **Even ideas and concepts that were not included in the final proposal presented as a storyboard can be included and weighed in.**

# Where are we ...**Individual project**

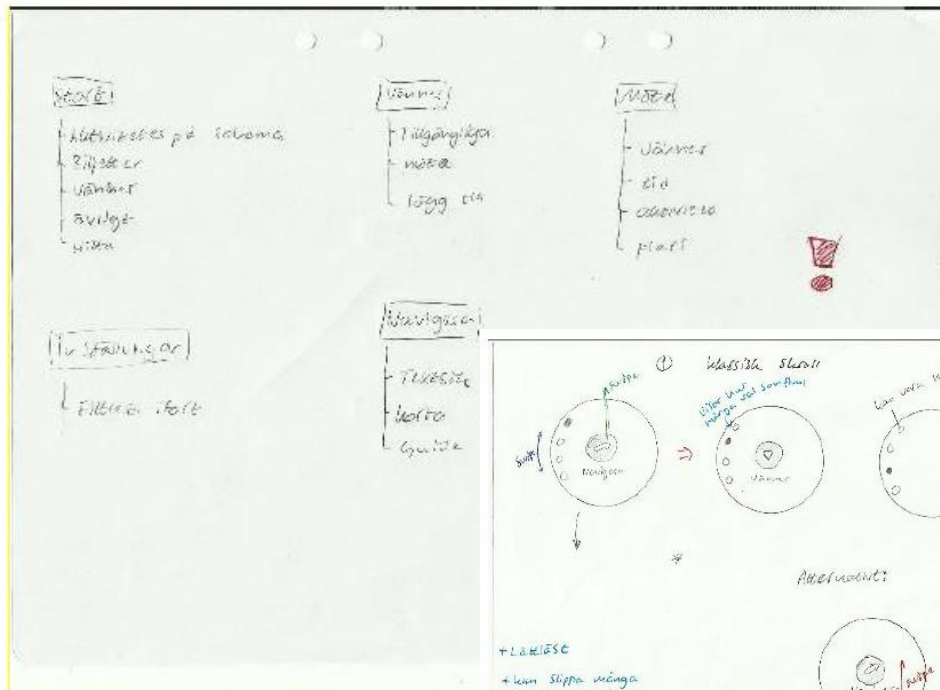
- **key elements**

- Begin sketching on a more conceptual level with inspiration from Group-Work assignment-2. Make sure not to do all sketch work on one go and at the same occasion, but rather spread over several instances.
- For the most important design decisions in detail design work, alternative solutions should be explored.

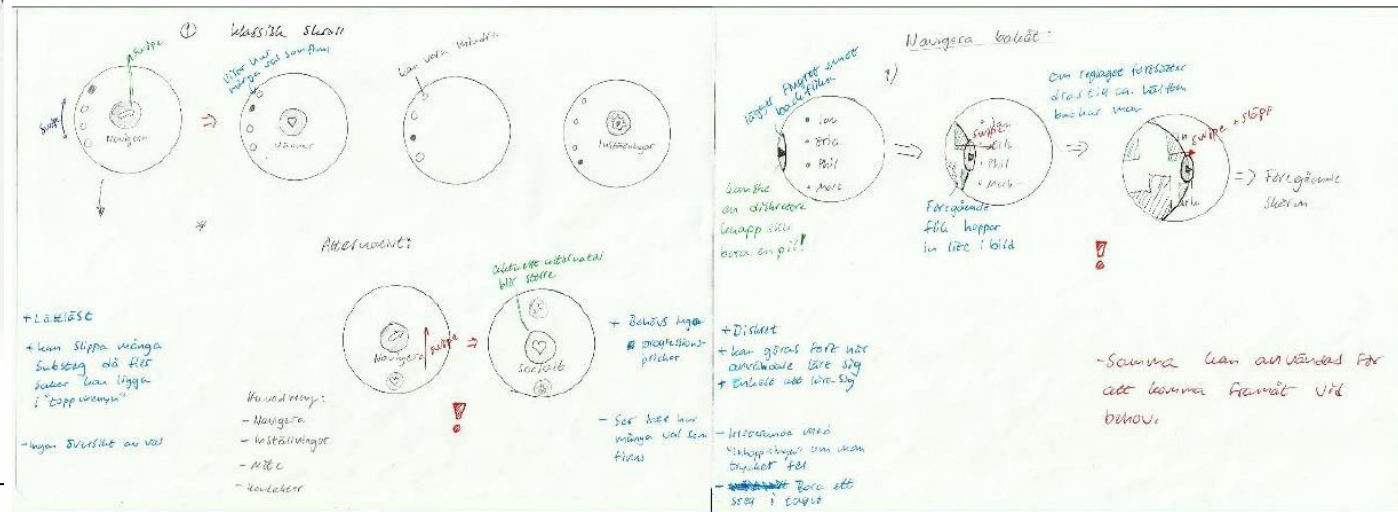
# Where are we ... Individual project

## • Detail design

For the most important design decisions in detail design work, alternative solutions should be explored.



**Detaljer-** "För de viktigaste designbesluten i detaljdesignarbetet ska alternativa lösningar utforskas."

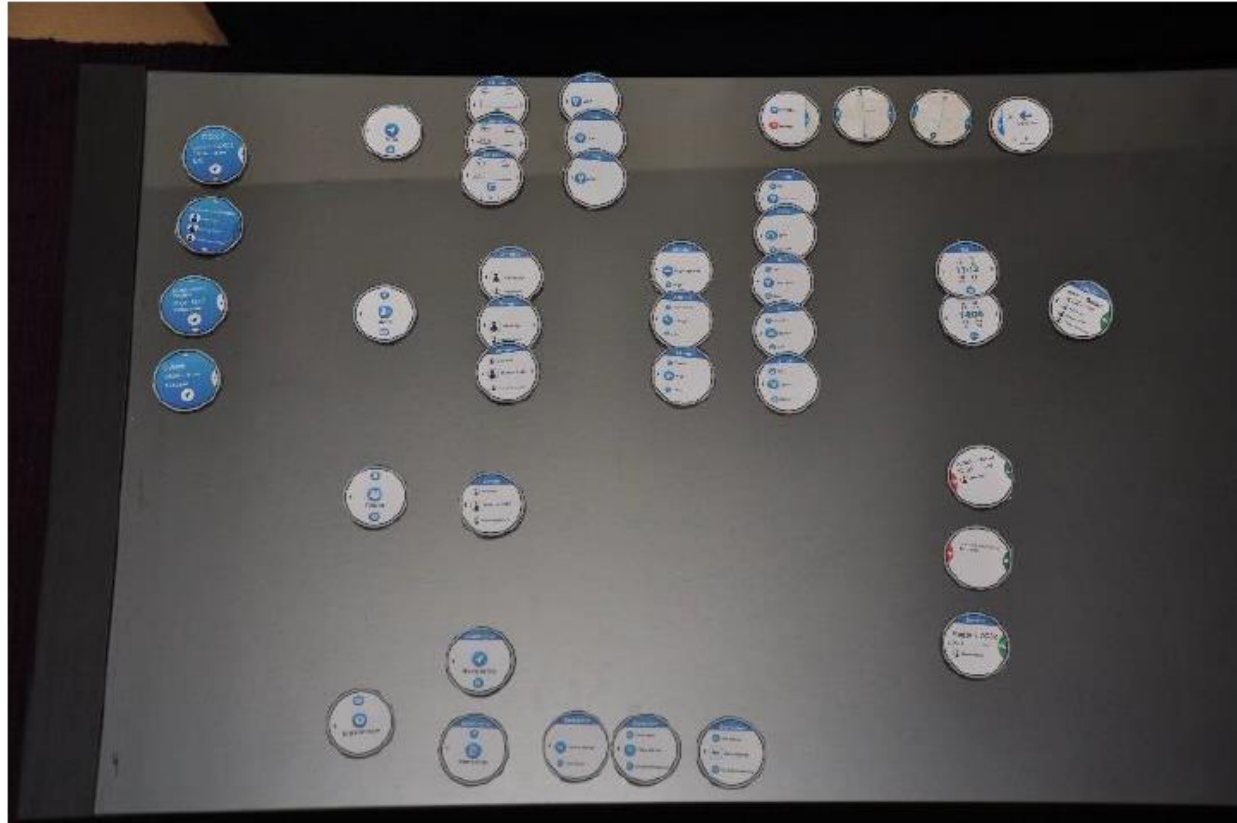


Figur 11 - Navigering



# Where are we ...Individual project

- **Paper Prototype**

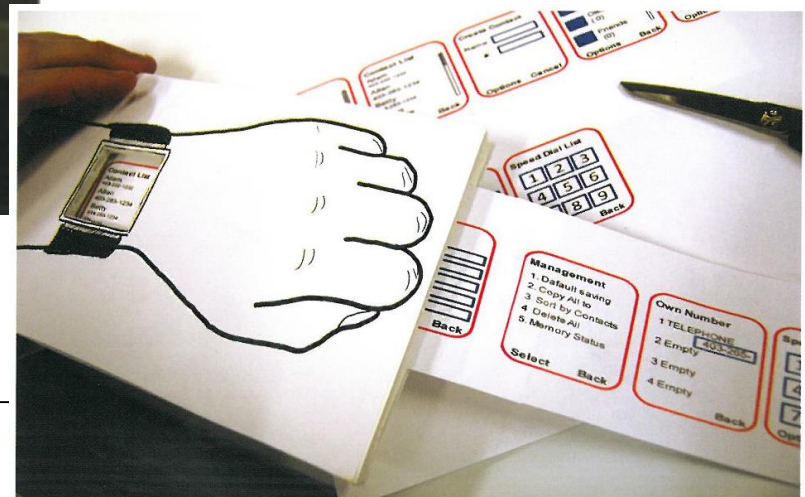
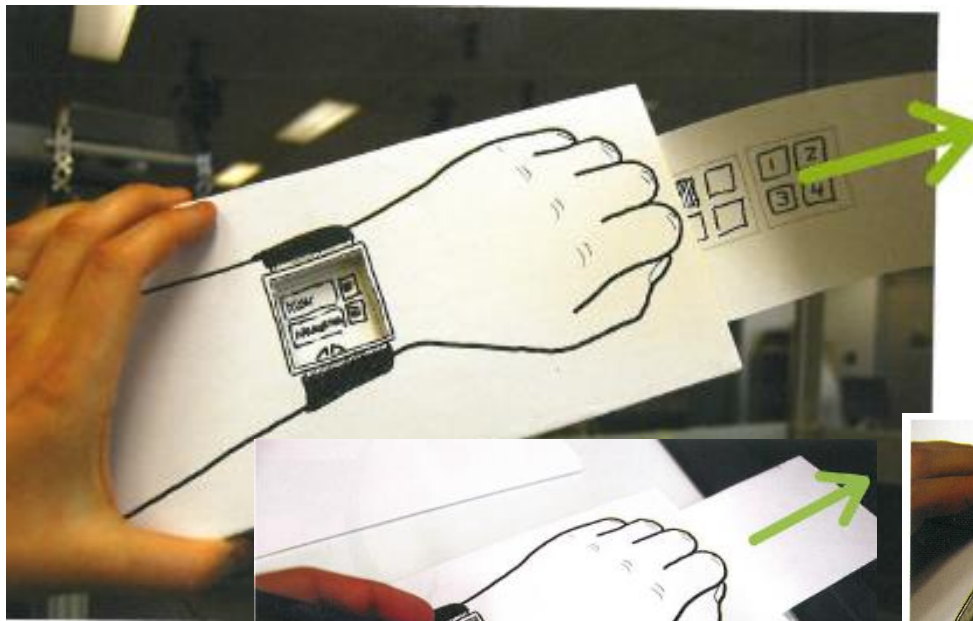


*Figur 23 - Pappersprototyp översikt*

# Where are we ...Individual project

- Paper Prototype**

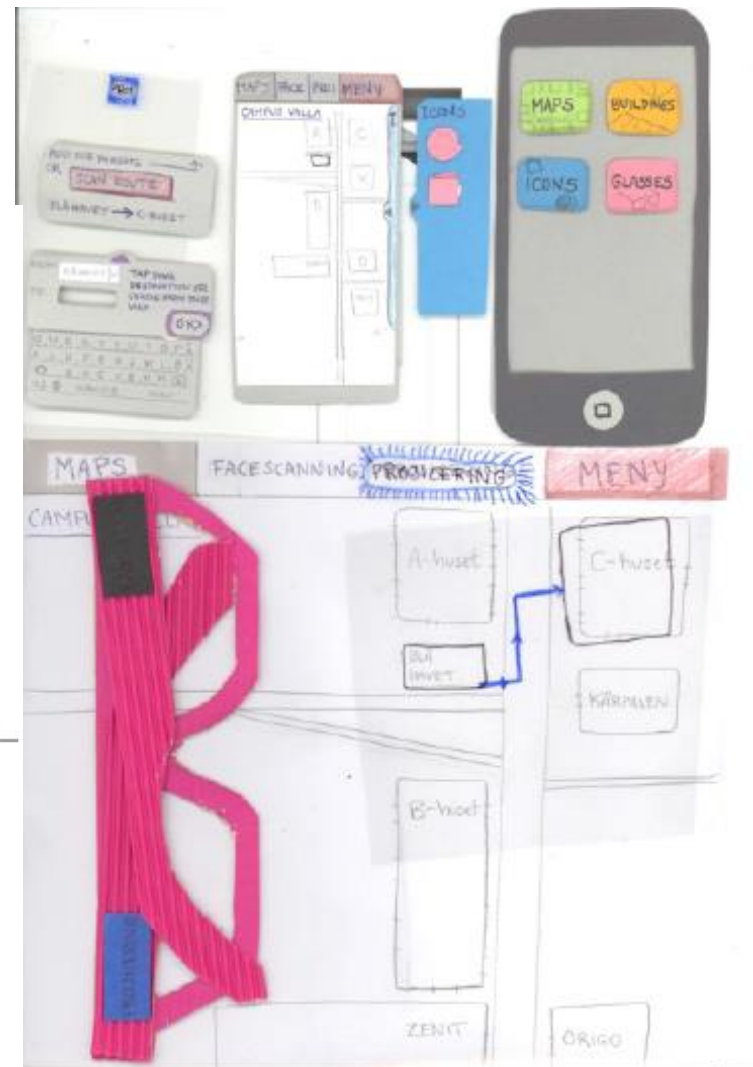
The presentation/description 'format' plays a key role ...



# Where are we ... Individual project

## • Paper Prototype

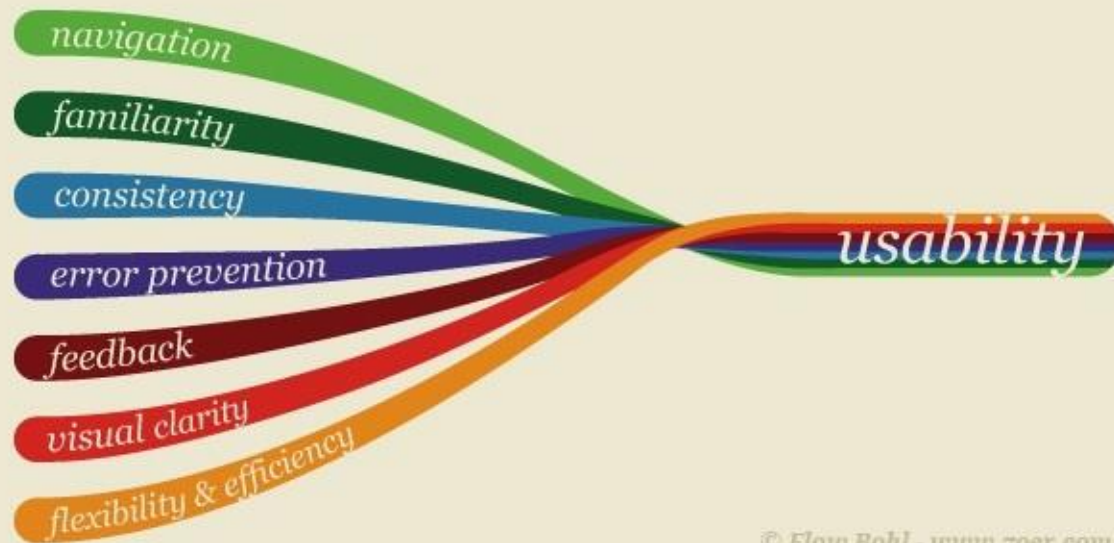
- The presentation/description 'format' plays a key role ...
- There are mobile phone and other templates that you can print ...



# Where are we ...Individual project

## Prototype Seminars

- Create a paper prototype of the final design proposal in accordance with Rettig (1994). **The prototype should be displayed and discussed at seminar 1.** Then make changes based on peers' feedback and create a more high resolution prototype. This version can be done by hand or digitally. **The final prototype you will be tested/shown and discussed at seminar 2.**
- Can be paper based or digital
- Text to support seminars and groups is available on the website

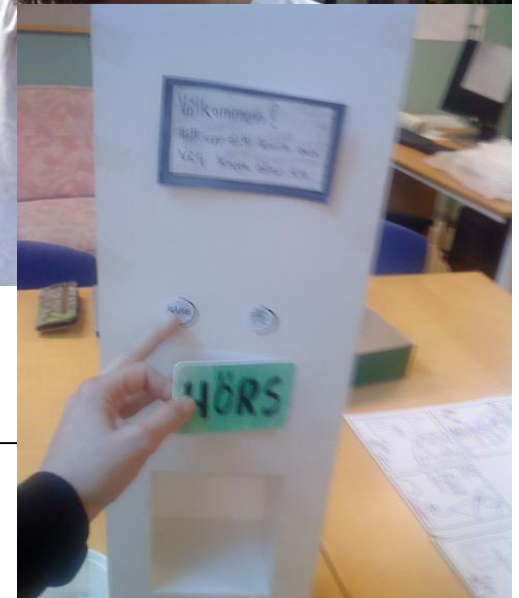


# Today's Lecture- Usability Testing

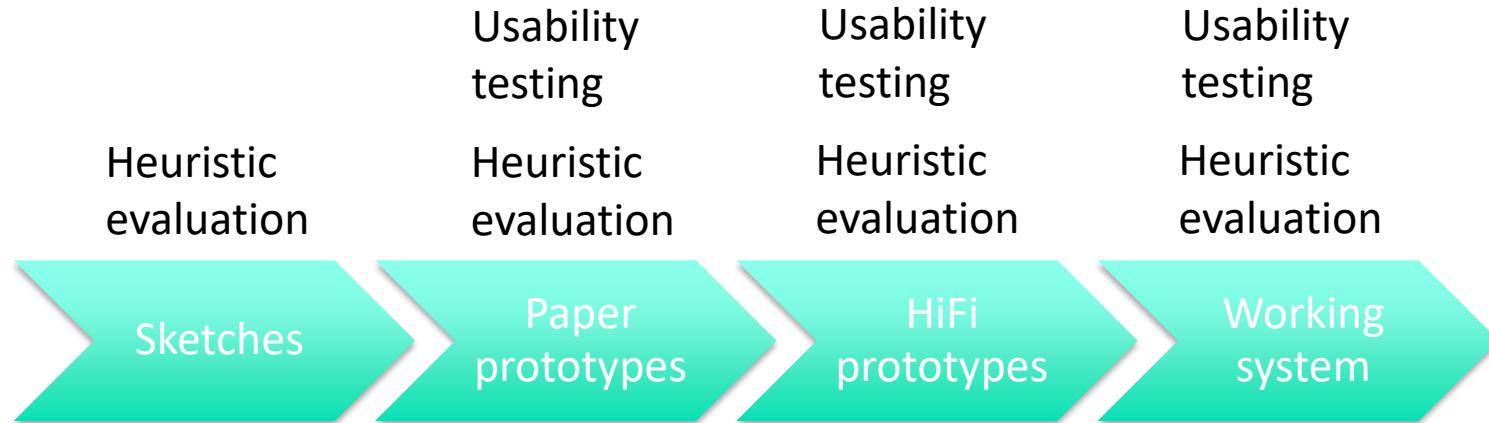
- A definition from ISO standard 9241
  - The extent to which a product can be used by specified users to achieve specified goals with **effectiveness**, **efficiency** and **satisfaction** in a specified context of use.
- Effectiveness (ändamålsenlighet):
  - accuracy and completeness in achieving goals
- Efficiency (effektivitet) :
  - resources expended...
- Satisfaction (tillfredsställelse):
  - comfort, acceptability (happiness, pleasure)



# Usability Testing

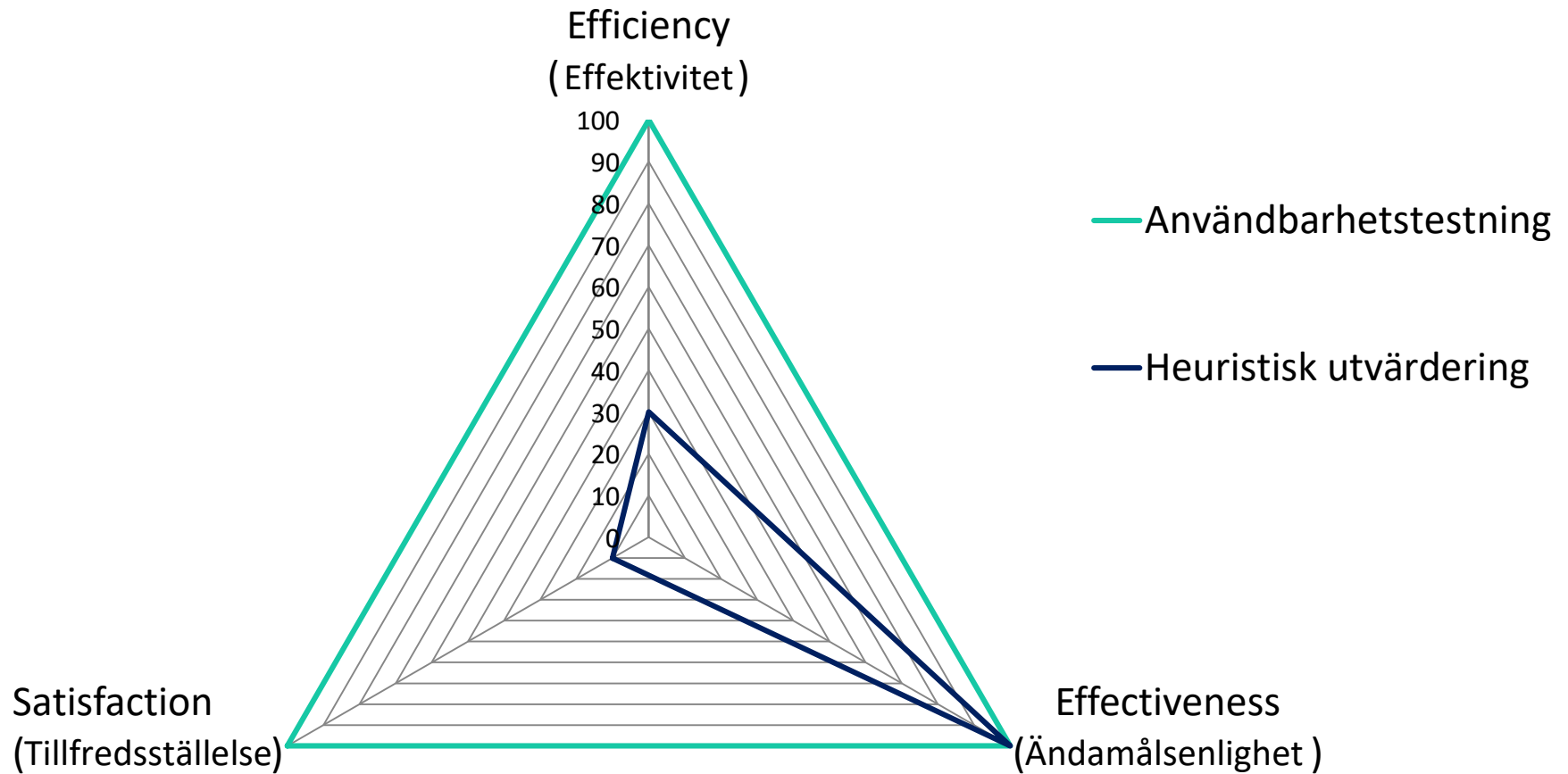


# Usability Testing vs Heuristic Evaluation





# Usability Testing vs Heuristic Evaluation



# Questions

- Formative study
  - What are the most important usability issues?
  - What aspects of the product work well for the users? Is there anything that frustrates them?
  - What are the common mistakes users make?
- Summative study
  - Have the usability goals been achieved?
  - New product more effective than present?
  - Comparison with competing products?

# 'Roles' in testing

- **Users** - Try to solve a given task by interacting with the prototype
- **Computer** - knows the program logic and controls the interface, simulates the computer's response without comments
- **Test Leader** - Manage the test session, give instructions to the user and ask for opinions and thoughts
- **Observer** - notes silently

# Tasks Formulation

- A reasonable number (lagom)
  - Representing, what the user is expected to use the system for
  - Max 1 hour, including surveys, interviews, etc.
- Give the tasks to the users one at a time and on separate paper
- On right level of detail
  - Not too many clues
  - Describe *what* the user must do, *not how*

## Uppgift 1

Skapa en användare med ditt eget förnamn.

## Uppgift 2

Ta fram ett matsedelsförslag utan att göra några egna inställningar.

## Uppgift 3

Ta fram en ny omgång matsedelsförslag baserat på egna inställningar. Dina inställningar ska ta hänsyn till följande påhittade behov:

- Du vill ha matsedelsförslag för de kommande 4 dagarna.
- Förslaget ska gälla för lunch (inte frukost eller middag).
- Du har älgkött i kylen som du gärna vill använda de kommande dagarna.
- Du tycker inte om vitlök och vill därför inte ha några recept som innehåller vitlök.
- Matsedelsförslaget ska ha god variation, och innehålla lättlagade recept.

## Uppgift 4

Titta igenom de olika matsedelsförslagen. Sätt betyg på några av recepten baserat på hur goda de verkar vara. Ta fram en ny omgång matsedelsförslag och se vad dina betyg får för effekt.

# Think About ...

- Ethical Issues
  - Never defend the design to the user
  
- Practical preparation
  - Icebreaking
  - Training when needed
  - Always do a pilot study with 2-3 people

# Criteria for selecting participants

- Self-reported expertise
  - E.g. Beginner, Average, Expert, ...
- Frequency
  - Number of visits per month ...
- Amount of experience
  - Days, months, years
- Activities
  - Used special function

# Terminology 1

- Within-subjects
- Between-subjects
- Balance for (possible) learning between Tasks

Fp	Uppg 1	Uppg 2	Uppg3	Uppg 4
Fp1	U1	U2	U3	U4
Fp2	U3	U1	U4	U2
Fp3	U2	U4	U1	U3
Fp4	U4	U3	U2	U1



# Terminology 2

- Independent variable – that which is being manipulated or controlled , for example
  - Characteristics of participants (age, gender, relevant experience)
  - Different designs-solutions or prototypes being tested
  - Tasks
- Dependent variable - what you measure, for example
  - Task success
  - Time
  - System Usability Scale (SUS) score
  - ...

# Data Types

- Nominal (categorical)
  - For example, man, woman; Design A, Design B
- Ordinal
  - For example, ranking of 4 designs, from most beautiful to the least beautiful
- Interval
  - For example, 7-point scale of agreement: "This design is beautiful. Totally agree ... Do not agree at all "
- Ratio
  - For example, Time, Task Success%

## Data Types (Cont..)

- Are these scales equal?

Poor    Fair    Good    Excellent  
 Poor                Excellent

- The upper is ordinal. Just calculate response rate.
- The lower can be considered as interval. You can calculate average.

# Usability Measurement

- Performance Measurement
  - Data success, time, error ...
- Problem-based measurements
  - Number of issues, type of problem ...
- Behavioral and psychological measurements
  - Verbal behavior, facial expression ...
- Self-reported measurements
  - Expectations, System Usability Scale(SUS), ...

## How / when should the measurement be used?

- Depends primarily on usability goals
- But, often applies:
  - In an early phase, task-related-success is most important
    - Task-related-success requires that serious problems are eliminated (*problem-based measurements*)
- Experience is important - Does the user want to use the system?
  - Capture through behavioral measurements and self-reported measurements
- Time often has a threshold (but which?)
  - Should it be become Binary(below or above the threshold?)

# Performance Measurement

- Task-related Success
  - Binary or different-levels
- Time
  - How long does it take for a task to complete
- Errors
  - Which errors or amount of errors are made per task
- Efficiency
  - number of clicks
- Learnability
  - How does performance change over time

# Performance Measurement, Task-related Success → Binary

- Requires well-defined tasks with clear final terms
- "Find the price for the sofa 'Älmhult' in standard version."
  - OK?
- "Investigate different ways of retirement."
  - OK?

Participant	Task 1	Task 2	Task 3	Task 4	Task 5
P1	1	0	1	0	0
P2	1	0	1	0	1
P3	1	1	1	1	1
P4	1	1	1	1	1
P5	0	0	1	1	1
P6	1	0	0	1	1
P7	0	1	1	1	1
P8	0	0	1	1	0
P9	1	0	1	0	1
P10	1	1	1	1	1
P11	0	1	1	1	1
P12	1	0	1	1	1
<b>Average</b>	<b>67%</b>	<b>42%</b>	<b>92%</b>	<b>75%</b>	<b>83%</b>
<b>Confidence Interval (95%)</b>	<b>28%</b>	<b>22%</b>	<b>29%</b>	<b>29%</b>	<b>29%</b>

# To think about

- Reasonable threshold values?
  - Start from expert time , double it
- Handling outliers
  - Discount unreasonable times (long or short)
- Only successful-tasks or all tasks?
  - For failed tasks, if the user decided when to quit, use the time, otherwise don't
- Measuring time with think aloud?
  - Postpone extensive discussions to after the task has been completed
- Telling the user about the time measurement?
  - Ask the user to carry out all tasks as quickly and carefully as possible, without telling about the time measurement. If they ask, tell them that the start time and the end time is being noted



# Confidence intervals

- Suppose this is your data from task-related-success with 6 users

Försöks-person	Uppgift 1
Fp1	1
Fp2	1
Fp3	1
Fp4	0
Fp5	1
Fp6	1

- What does it mean?
- What does it mean for: how 'good' is your design?

# Confidence intervals

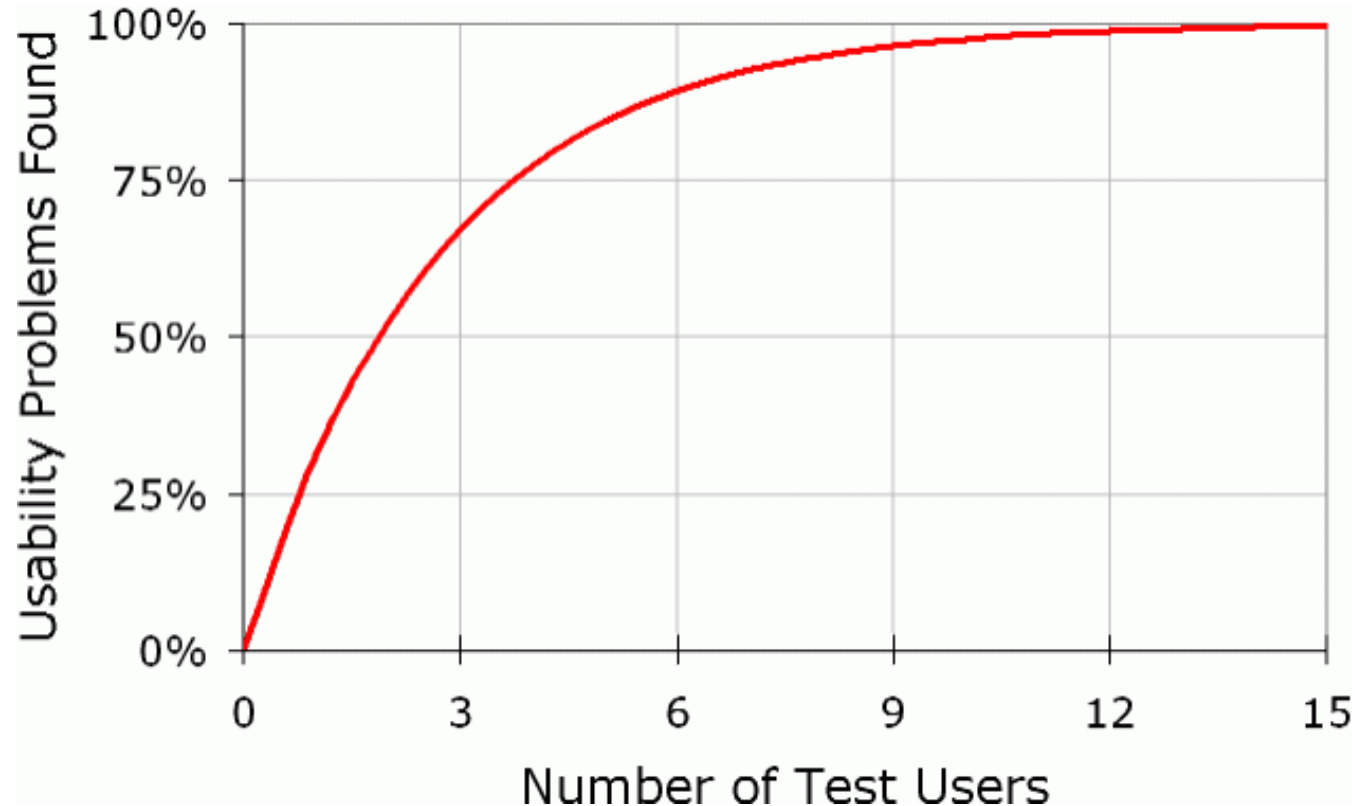
- Task-related-success –
  - discrete numbers, binary data
- Time measurement –
  - continuous numbers, however, can be made to binary using thresholds

# Number of “users”

- The purpose of the test
- Tolerance to error margin

Antal lyckade	Antal fp	Nedre 95% konfidensintervall	Övre 95% konfidensintervall
4	5	36%	98%
8	10	48%	95%
16	20	58%	95%
24	30	62%	91%
40	50	67%	89%
80	100	71%	86%

# Number of Users



- Nielsen - 5 users identify 85% of user problems

# Number of Users

- “The short answer: Testing five users is not enough and magic numbers are strictly hocus-pocus /. / A mix of usability evaluation methods is most effective.”

Martin Schmettow -

<http://www.utwente.nl/gw/cpe/en/Employees%20CPE/Schmettow/>

# Efficiency

Combine task completion and time

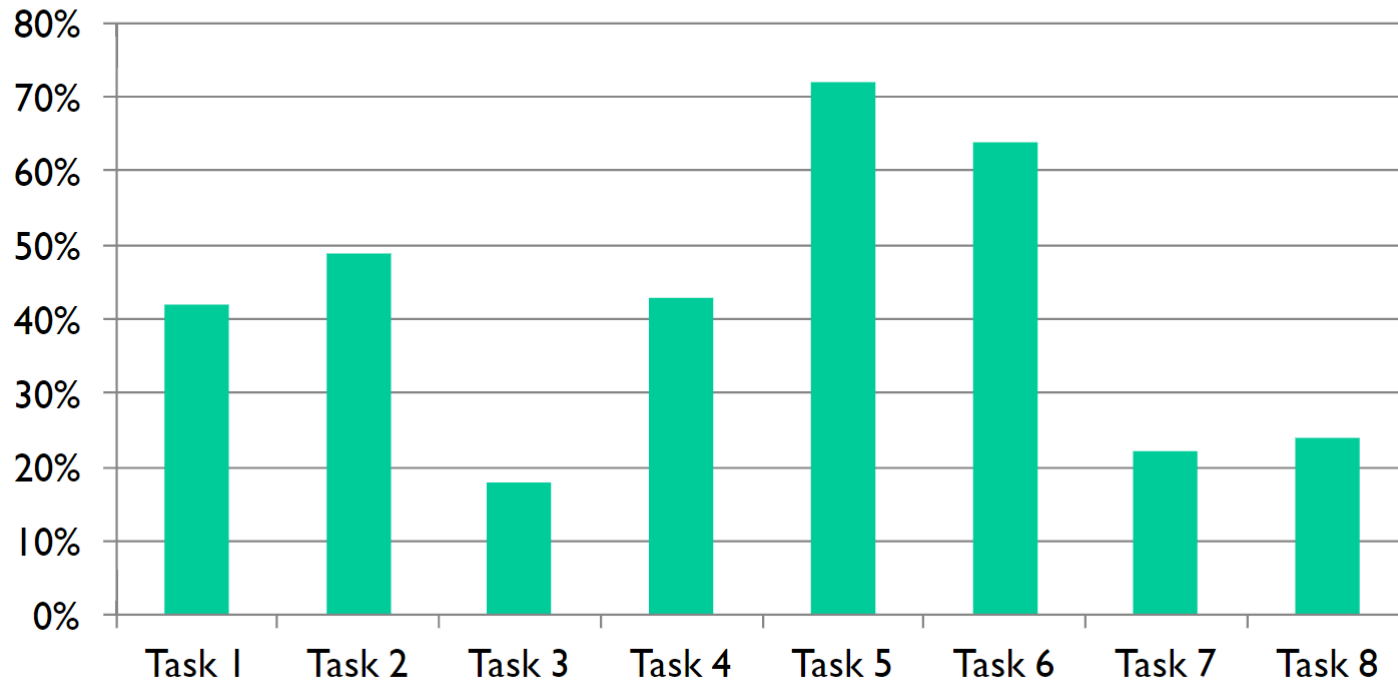
$$\text{Effektivitet} = \frac{\text{Uppgiftsframgång}}{\text{Tid}}$$

$$\text{Exempel: } \frac{0.65}{1.5} = 0.4333 \dots$$

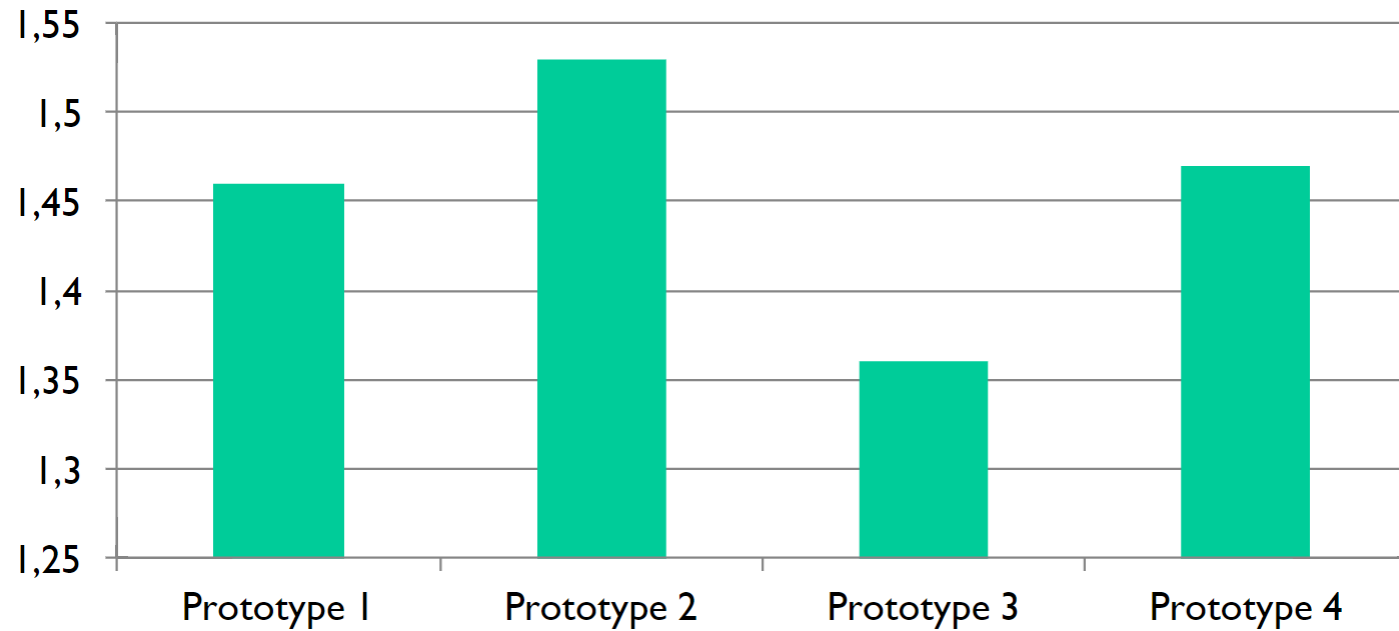
	Uppgiftsframgång	Tid (medel, i min)	Effektivitet (%)
Task 1	65%	1.5	43
Task 2	67%	1.4	48
Task 3	40%	2.1	19
Task 4	74%	1.7	44
Task 5	85%	1.2	71
Task 6	90%	1.4	64
Task 7	49%	2.1	23
Task 8	33%	1.3	25

# Example

## Efficiency (Task success per minute)



### Average efficiency (Tasks successfully completed per minute)

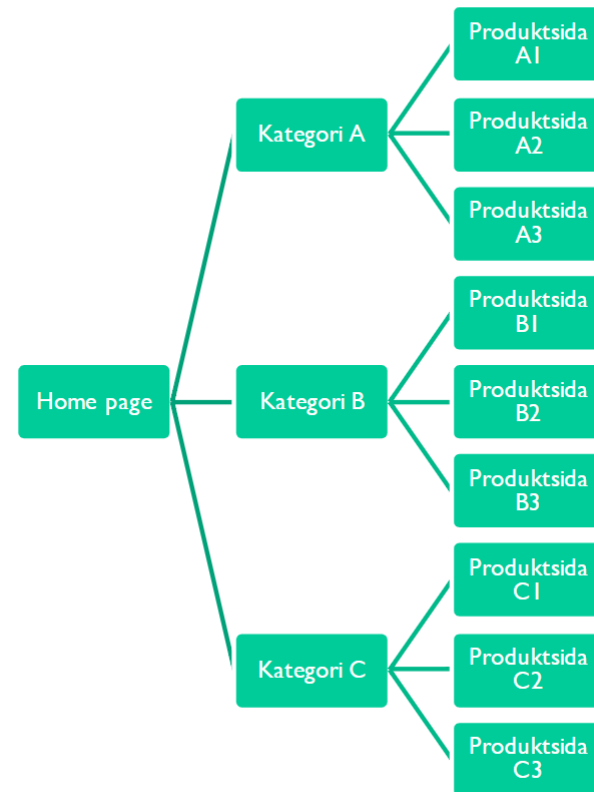




# Lostness

- $N$ : Antal *olika* webbsidor som besöks under en uppgift
- $S$ : Det *totala* antalet webbsidor som besöks under en uppgift
- $R$ : Det *minimala* antalet webbsidor som måste besökas för att klara en uppgift

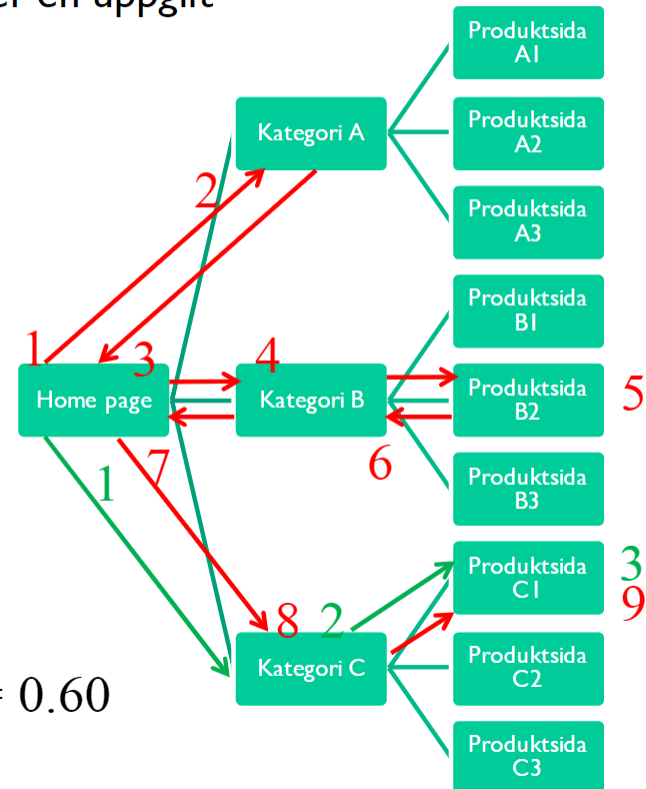
$$L = \text{sqrt} \left[ \left( \frac{N}{S} - 1 \right)^2 + \left( \frac{R}{N} - 1 \right)^2 \right]$$



# Exempel

En användare löser en uppgift

- $N = 6$ 
  - antal olika noder som besökts
- $S = 9$ 
  - totala antalet noder som besökts
- $R = 3$ 
  - antal noder som måste besökas



$$L = \text{sqrt} \left[ \left( \frac{6}{9} - 1 \right)^2 + \left( \frac{3}{6} - 1 \right)^2 \right] = 0.60$$

# Usability Measurement

- Performance Measurement
  - task success, time, error ...
- Problem-based measurements
  - Number of issues, type of problem ...
- Behavioral and psychological measurements
  - Verbal behavior, facial expression ...
- Self-reported measurements
  - Expectations, System Usability Scale (SUS) ...

# Problem-Based Measures - What's a Problem?

- All as for anyone who is on wrong track
  - Everything that creates confusion
  - Everything that creates an error
  - Not to see something that should be noted
  - To assume that something is right when it is not
  - To assume that a task is finished when it is not
  - To perform the wrong function
  - To misunderstand something/details
  - Not understanding of the navigation
-

# Problem-based measurements--Details

- When does a problem start and end?
- Several observers?
- Granularity?

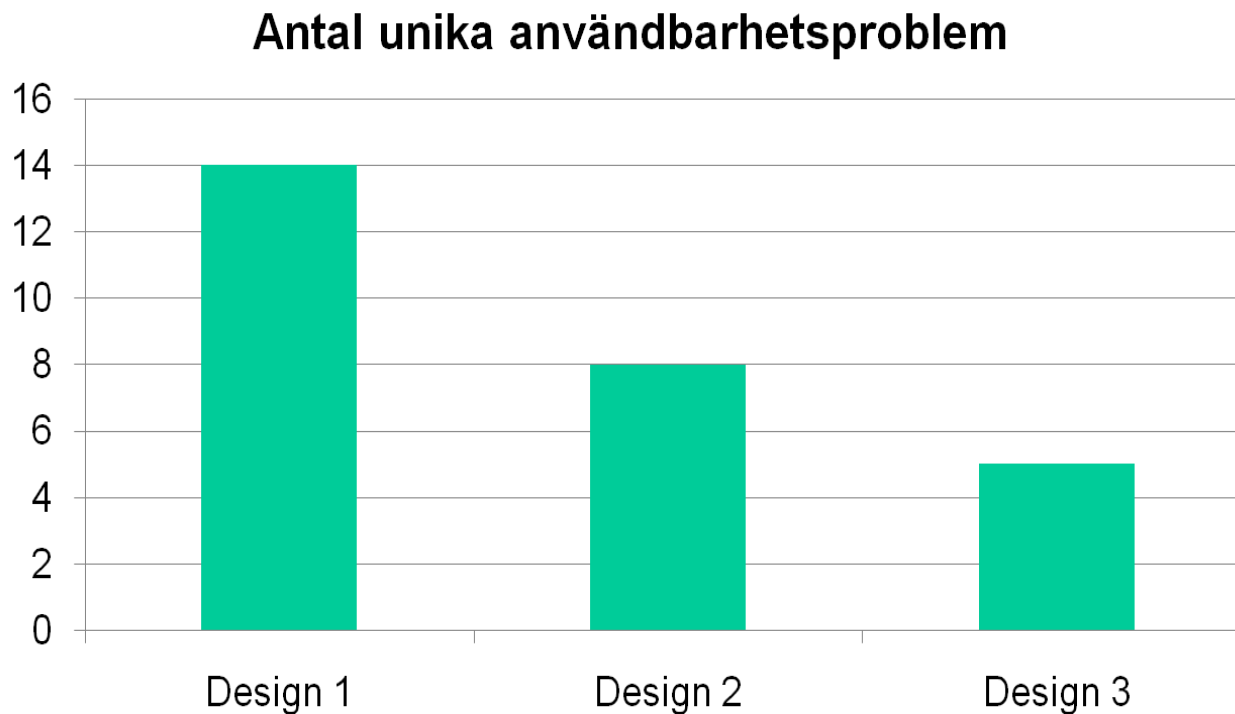
# Severity (Allvarlighetsgrad)

	Few 'fp' experiencing a problem	Many 'fp' experiencing a problem
Small impact on the user experience	Low severity	Moderate severity
Great impact on user experience	Moderate severity	High severity

- The result of the evaluation should then be **summarized and visualized in an appropriate and correct manner.**

# Severity (Allvarlighetsgrad) Cont...

## Results - example

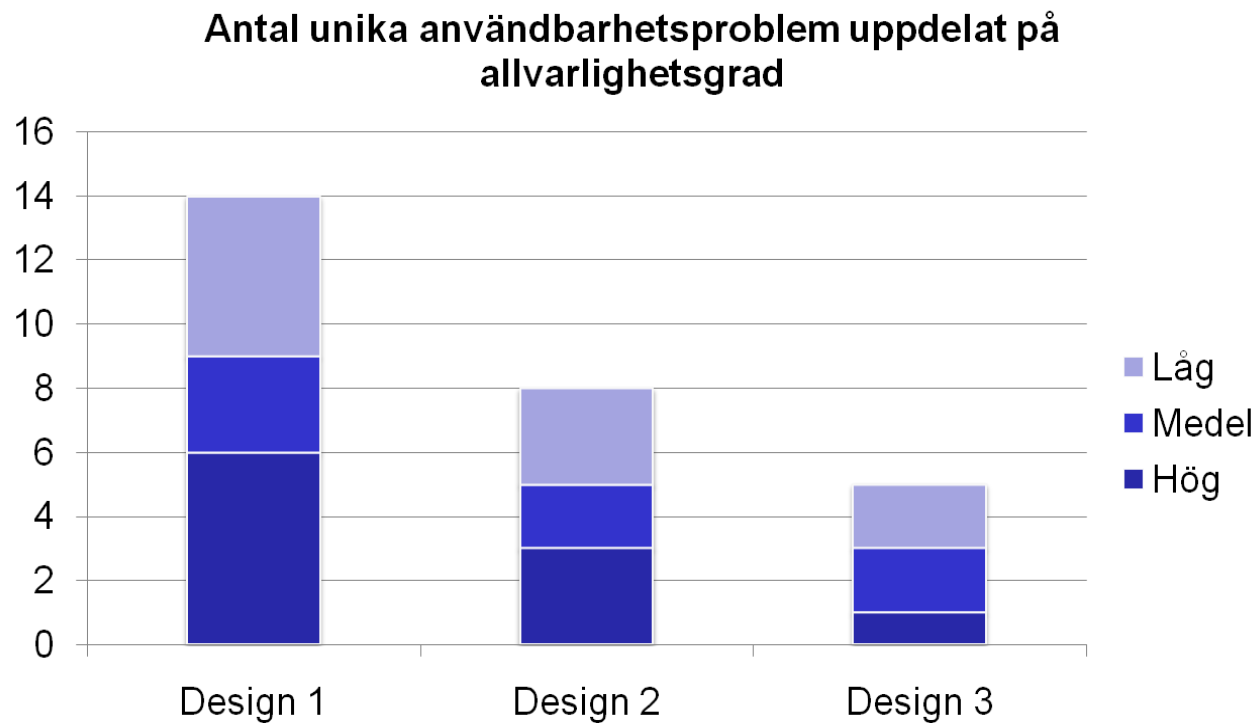


Note -> The result of the evaluation should then be summarized and visualized in an appropriate and correct manner.



# Severity (Allvarlighetsgrad) Cont...

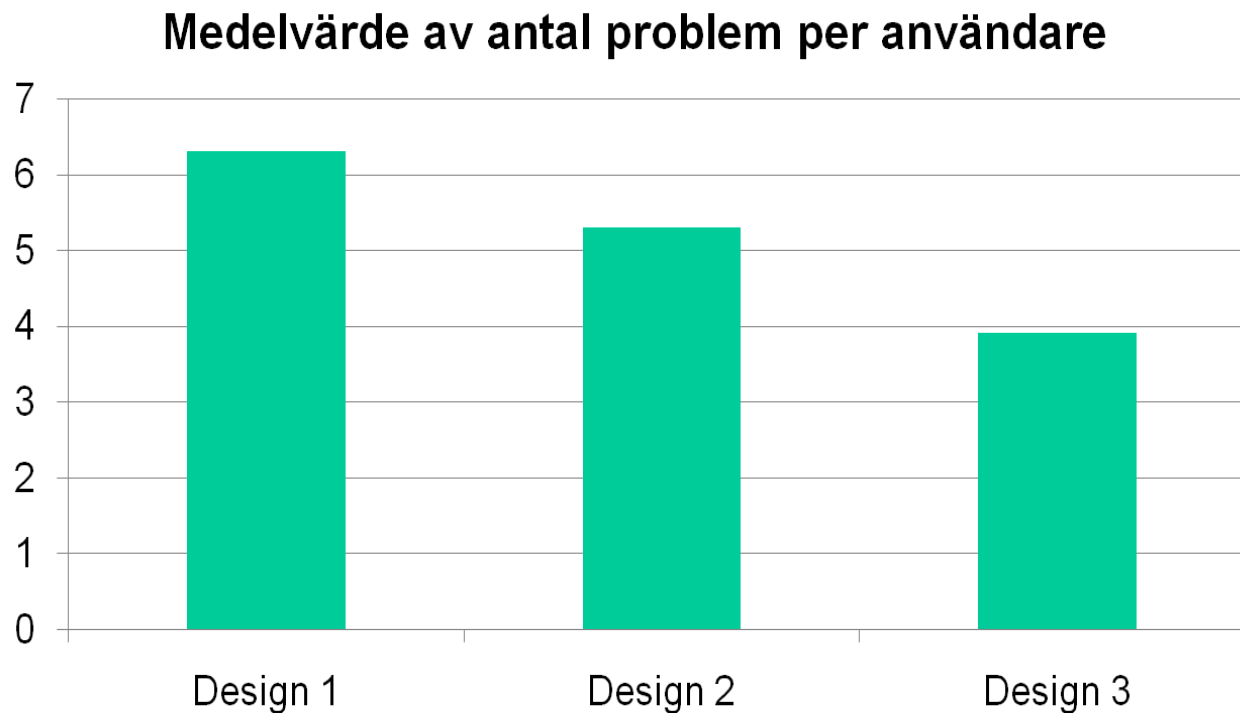
## Results - example



Note -> The result of the evaluation should then be summarized and visualized in an appropriate and correct manner.

# Severity (Allvarlighetsgrad) Cont...

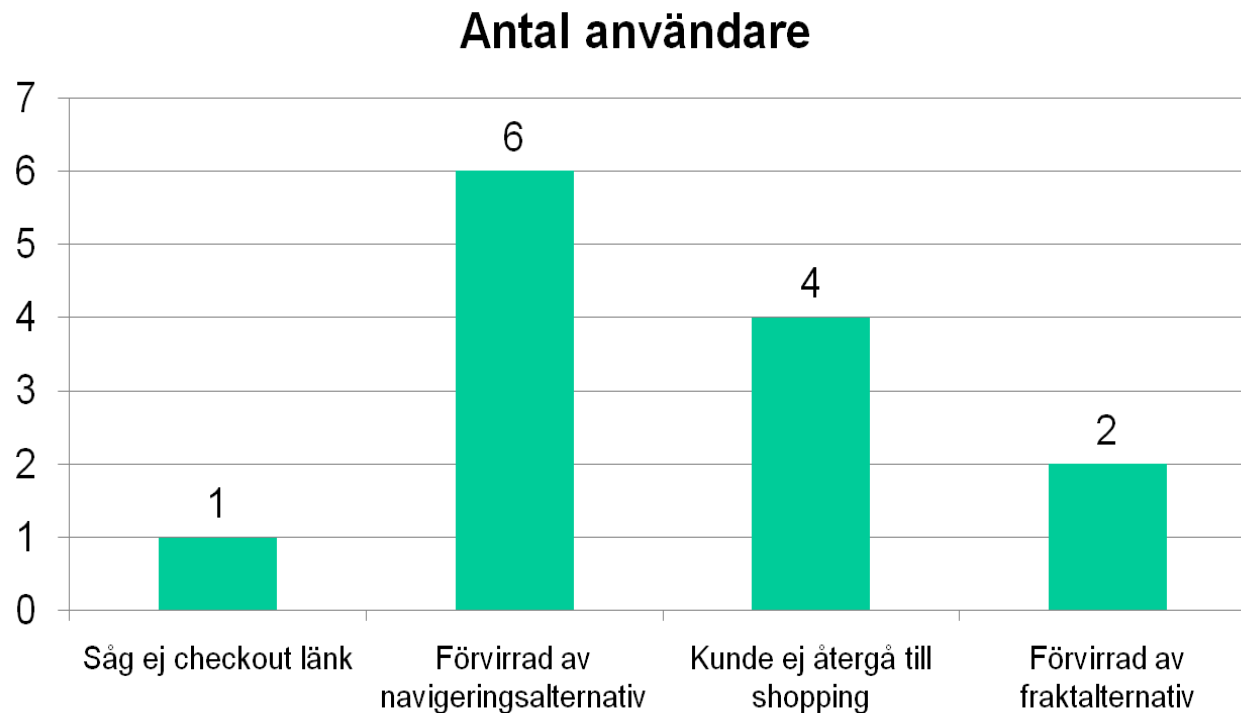
## Results - example



Note -> The result of the evaluation should then be summarized and visualized in an appropriate and correct manner.

# Severity (Allvarlighetsgrad) Cont...

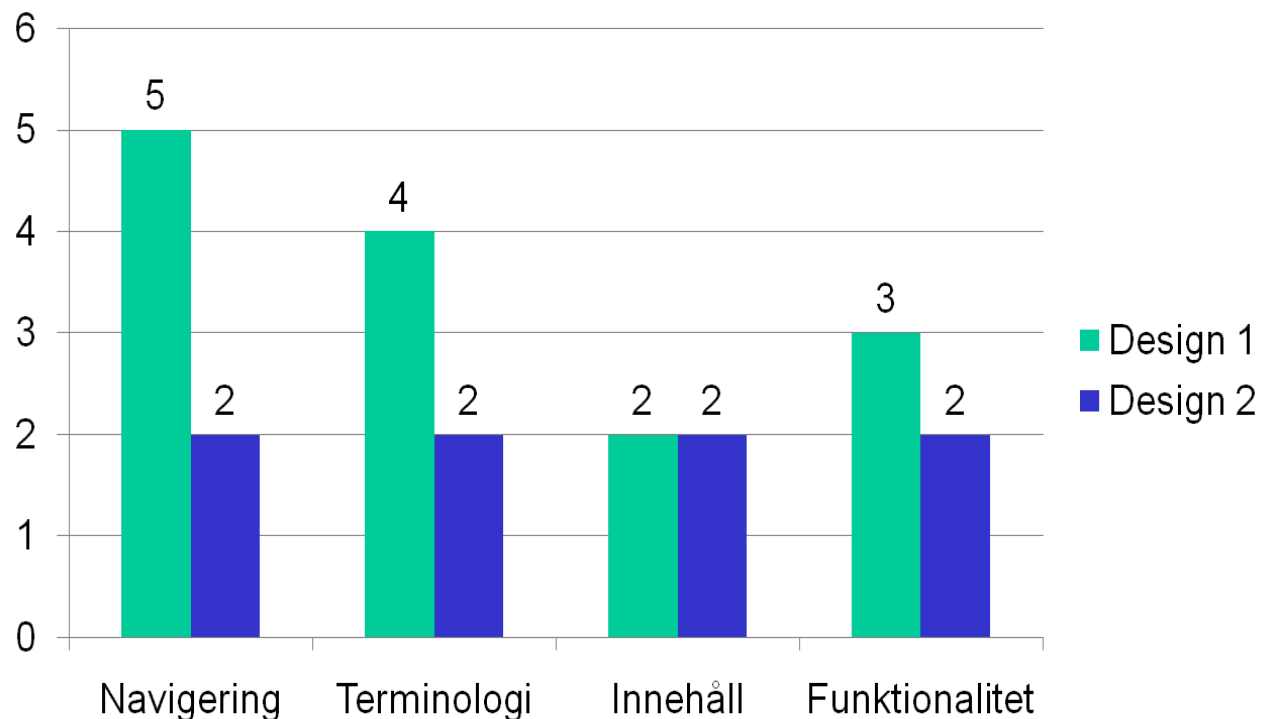
## Results - example



Note -> The result of the evaluation should then be summarized and visualized in an appropriate and correct manner.

# Severity (Allvarlighetsgrad) Cont...

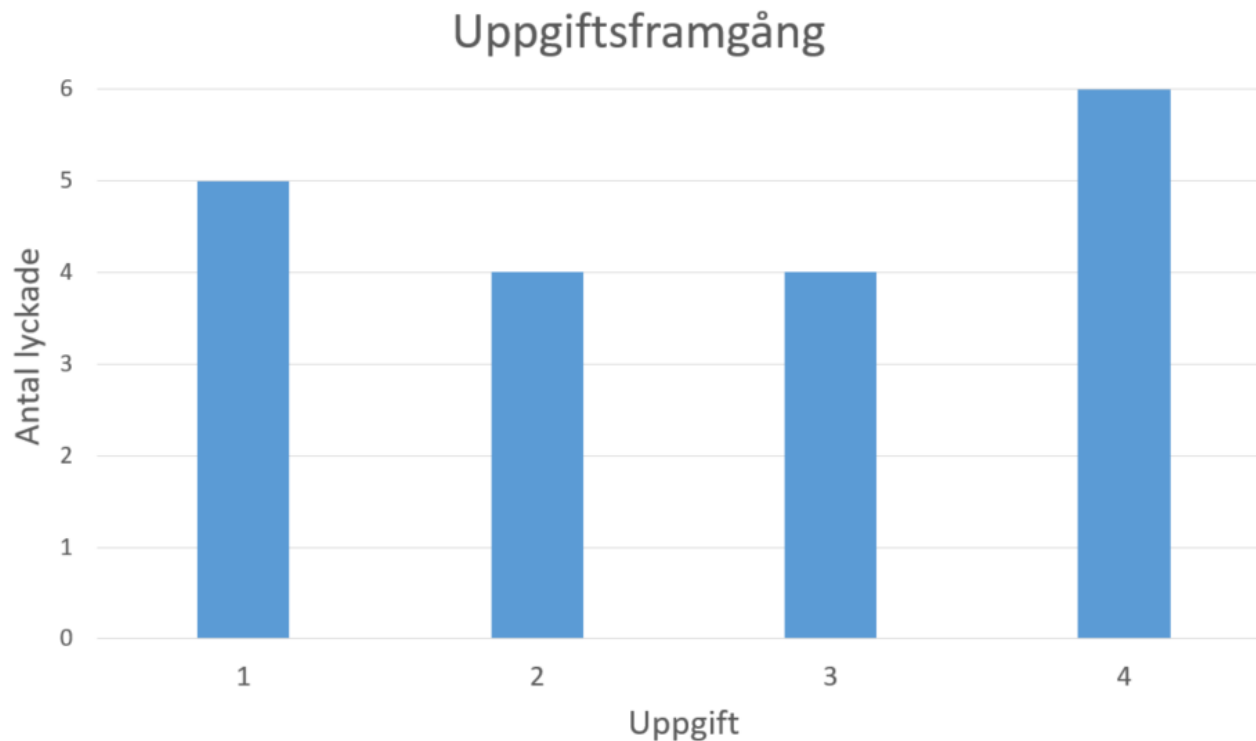
## Results - example



Note -> The result of the evaluation should then be summarized and visualized in an appropriate and correct manner.

# Severity (Allvarlighetsgrad) Cont...

## Results - example

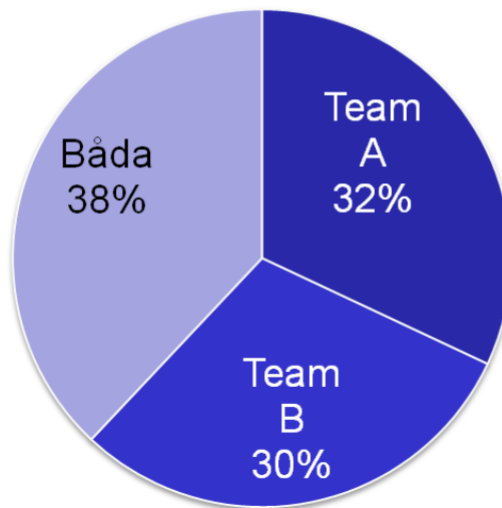


Note -> The result of the evaluation should then be summarized and visualized in an appropriate and correct manner.

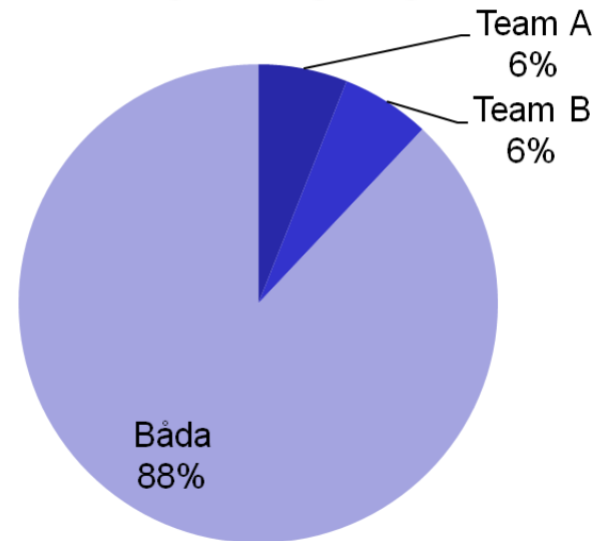
# Severity (Allvarlighetsgrad) Cont...

## Results - example

Total andel problem identifierade



Andel identifierade problem med hög allvarlighetsgrad



Consequence in problem identification

# Thinks about – “Noise”

- Participants
- Information
- Method
- Artifact
- Settings
- Moderators

# Usability Measurement

- Performance Measurement
  - task success, time, error ...
- Problem-based measurements
  - Number of issues, type of problem ...
- Behavioral and psychological measurements
  - Verbal behavior, facial expression ...
- Self-reported measurements
  - Expectations, System Usability Scale (SUS) ...



# Behavior and psychological measurements

- Verbal behavior
- Facial expressions
- Eye-tracking
- Pupil Feedback
- Heart Rate
- ...

# Behavior and psychological measurements

- Eye-tracking



<https://www.filfak.liu.se/presentation/namnder/ikt/iktstudion/kontakt?l=en>

# Usability Measurement

- Performance Measurement
  - task success, time, error ...
- Problem-based measurements
  - Number of issues, type of problem ...
- Behavioral and psychological measurements
  - Verbal behavior, facial expression ...
- Self-reported measurements
  - Expectations, System Usability Scale (SUS) ...

# Self-reported measurements

- Expectation Dimensions
- [System Usability Scale \(SUS\) scale](#)
- [The computer system usability questionnaire \(CSUQ\) scale](#)
- [Questionnaire for User Interaction Satisfaction \(QUIS\)-scale](#)
- ...

# Self-reported measurements → Expectation Dimension

- Ask participants ('fp') *about expected severity before performing the task*
- Ask how easy/hard it really was, immediately after each task
- Use the 7-point scale in both cases
  - Very easy to very difficult

# Self-reported measurements → Expectation Dimension

**Task 1. Find out how many people report to Jeremy George's manager. (Include Jeremy in this number.)**

How Difficult or Easy do you expect this task to be?

Very Difficult      Very Easy

**Task 2. You need to return a notebook to someone but only know that he works on the 4th floor of 245 Summer St (building code V, floor 4), and that his manager's name is Tom. Find this man and report his corplD.**

How Difficult or Easy do you expect this task to be?

Very Difficult      Very Easy

**Task 3. You remember talking with someone named John and want to contact him, but don't remember his last name. You only know that his last name starts with S. You also remember that he works at 500 Salem St. in Smithfield (Building code OS) and works in FISC. Find this man and report his corplD.**

How Difficult or Easy do you expect this task to be?

Very Difficult      Very Easy

**Task 4. You know a woman who works in FISC whose first name is Cyta and you need to call her. What are the last four digits of her phone number?**

How Difficult or Easy do you expect this task to be?

Very Difficult      Very Easy

Task1 - Microsoft Internet Explorer

Task 1 of 7: Find out how many people report to Jeremy George's manager. (Include Jeremy in this number.)

Enter answer:

Over all, this task was:  
Very Difficult      Very Easy

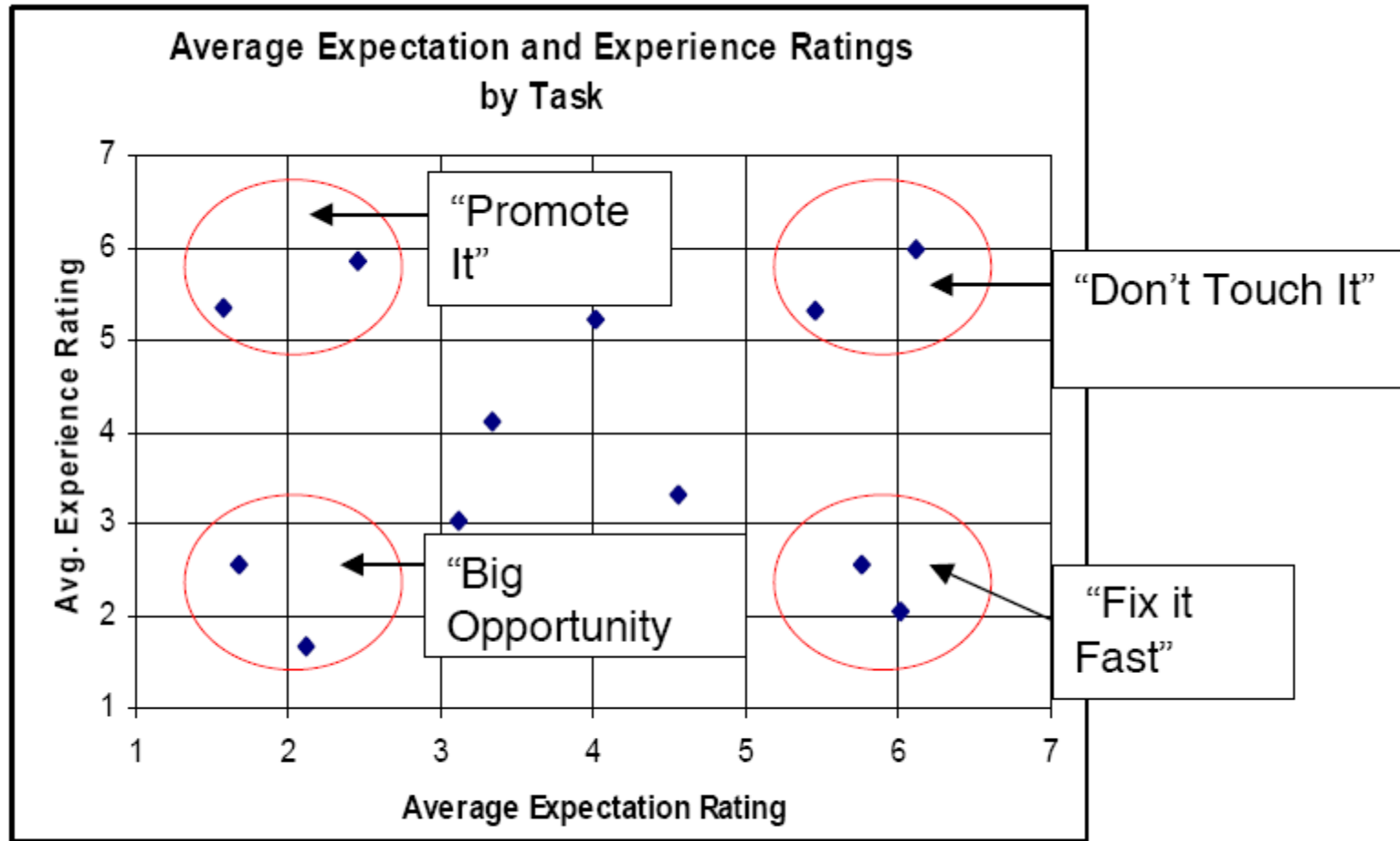
NEXT Task >>

# Self-reported measurements → Expectation Dimension

- For each task, calculate two mean values
  - Average for the expected value
  - Means of experience value
- Visualize data as a two-axis scatter plot
  - expected value
  - experience value
  - The four quadrants are interesting

# Self-reported measurements → Expectation Dimension

1=Difficult  
...  
7=Easy



1=Difficult; 7=Easy



# Self-reported measurements → SUS- System usability scale

- [SUS](#) Developed at Digital equipment corporation([DEC](#))
- Consists of 10 questions
- Can replace "website" against "system" against "product" ...

# Self-reported measurements →

## SUS- System Usability Scale

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

# Self-reported measurements →

## SUS- System Usability Scale

1. Jag tror att jag skulle vilja använda denna produkt ofta.

1	2	3	4	5
Instämmer inte alls				Instämmer helt

2. Jag tyckte att denna produkt var onödigt komplicerad.

1	2	3	4
Instämmer inte alls			

3. Jag tyckte att denna produkt var lätt att använda.

1	2	3	4
Instämmer inte alls			

4. Jag tror att jag kommer att behöva hjälp av en teknisk person för att kunna använda denna produkt.

1	2	3	4
Instämmer inte alls			

5. Jag tycker att de olika funktionerna i denna produkt är väl samordnade.

1	2	3	4
Instämmer inte alls			

6. Jag tyckte att det fanns för mycket information i produkten.

1	2	3	4	5
Instämmer inte alls				Instämmer helt

7. Jag kan tänka mig att de flesta skulle lära sig att använda denna produkt mycket snabbt.

1	2	3	4	5
Instämmer inte alls				Instämmer helt

8. Jag tyckte att denna produkt var mycket besvärlig att använda.

1	2	3	4	5
Instämmer inte alls				Instämmer helt

9. Jag kände mig väldigt trygg när jag använde denna produkt.

1	2	3	4	5
Instämmer inte alls				Instämmer helt

10. Jag behövde lära mig mycket innan jag kunde komma igång med denna produkt.

1	2	3	4	5
Instämmer inte alls				Instämmer helt

# Self-reported measurements → SUS- System usability scale

- SUS results in a total value. **The values for individual questions say nothing.**
- Calculation:
  - Each question's value varies between 0 and 4
  - Questions 1, 3, 5, 7, and 9 contribute with the position minus 1
  - Questions 2, 4, 6, 8 and 10 contribute 5 minus the position
  - Multiply the sum for all 10 questions by 2.5 for the total value.
- SUS values vary between 0 and 100

# Self-reported measurements → SUS- System usability scale

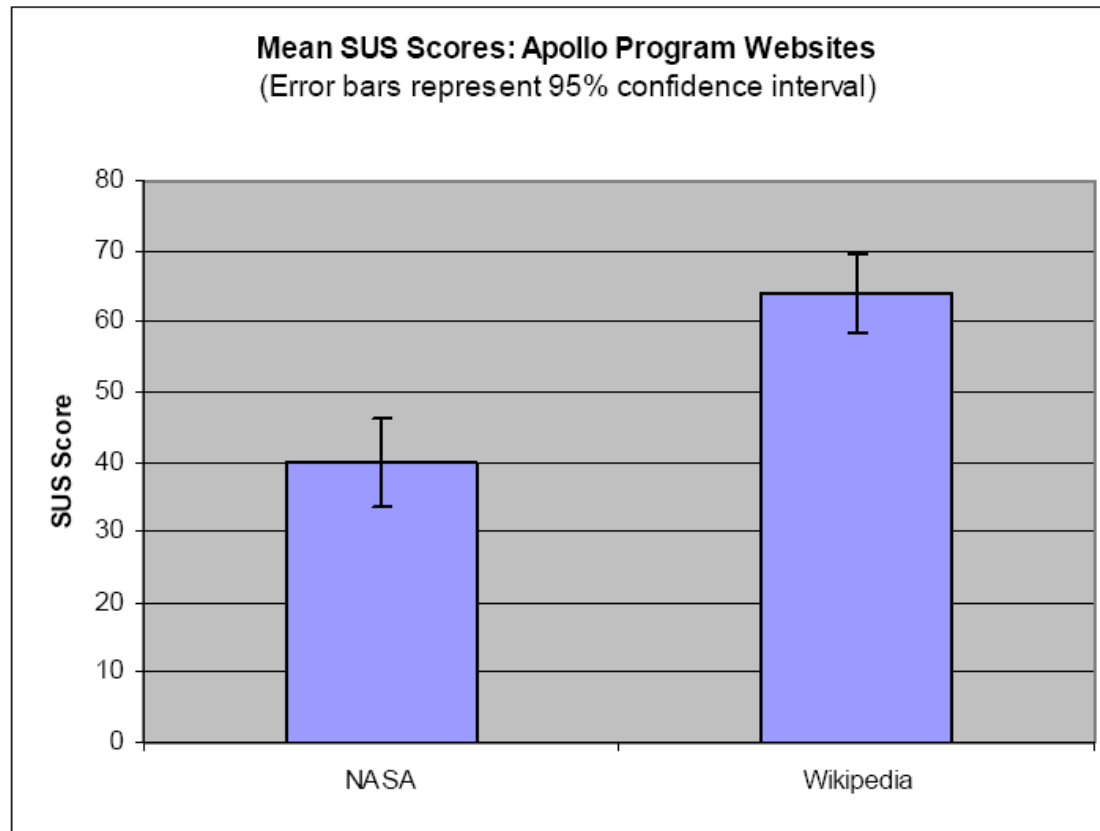
FEBRUARY 18, 2019

69

	Strongly disagree					Strongly agree	
1. I think that I would like to use this system frequently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		4
2. I found the system unnecessarily complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1
3. I thought the system was easy to use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1
4. I think that I would need the support of a technical person to be able to use this system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		4
5. I found the various functions in this system were well integrated	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1
6. I thought there was too much inconsistency in this system	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2
7. I would imagine that most people would learn to use this system very quickly	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1
8. I found the system very cumbersome to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1
9. I felt very confident using the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		4
10. I needed to learn a lot of things before I could get going with this system	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		3

# Self-reported measurements → SUS- System usability scale

- Why SUS ?
- **Task Success** : Overall, users of the NASA site got **58%** of their tasks correct while users of the Wikipedia site got **71%** of their tasks correct,



# Self-reported measurements → SUS- System usability scale

- Why SUS

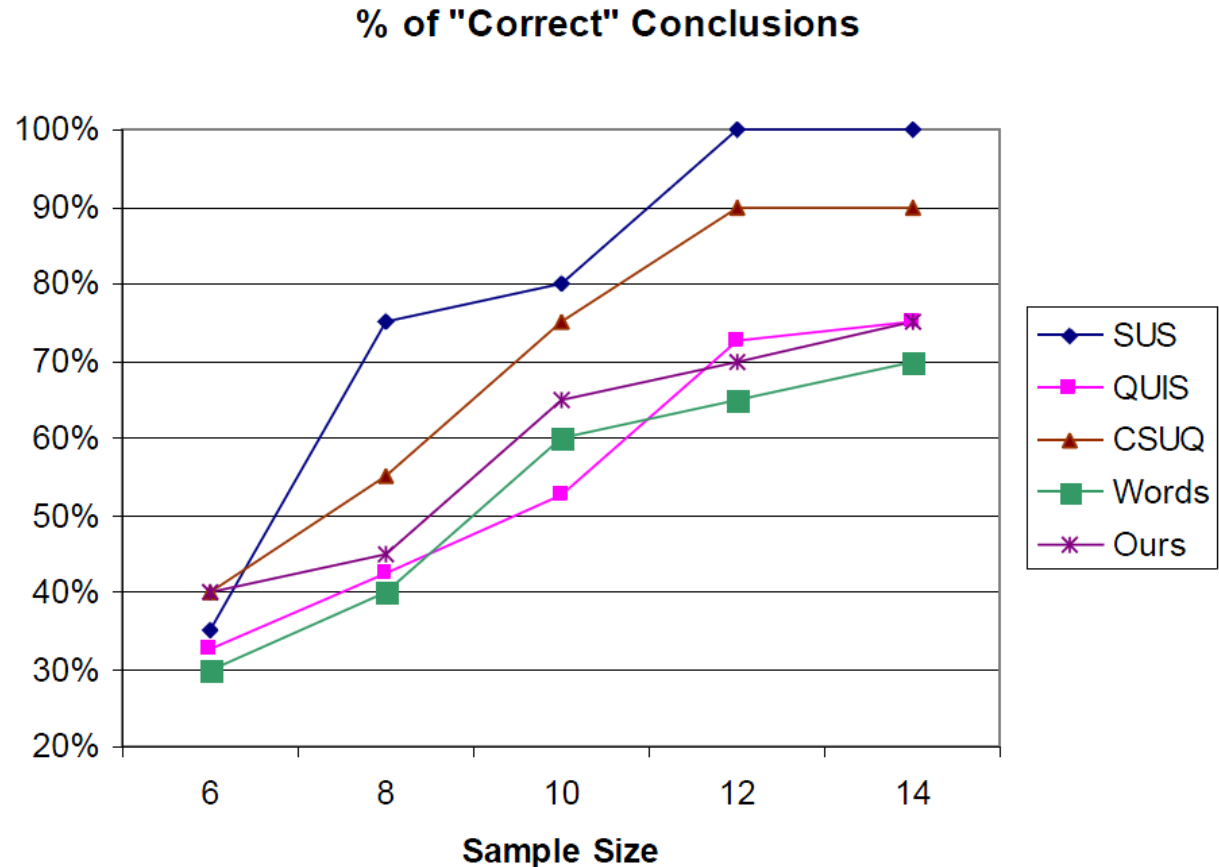


Figure 2. From "A Comparison of Questionnaires for Assessing Website Usability," by T. S. Tullis and J. N. Stetson, 2004, Proceedings of UPA 2004 Conference. Reprinted with permission.

# Eye-tracking video







**usa.gov**  
Government Made Simple

Gov Web Images News US  Search

**For Citizens** | **For Businesses and Nonprofits** | **For Government Employees** | **For Visitors to the U.S.**  
Kids Parents Seniors and Veterans Americans Abroad More Audiences >>

- Done Online!**
- Renew Your Driver's License
  - Replace Vital Records

- Shop Government Auctions
- Apply for Government Jobs
- Get or Renew a Passport



Change text size: A A A

- E-mail this page
- Print this page
- Receive updates by e-mail
- USA.gov RSS Feeds

### Government Information by Topic

**Benefits and Grants**  
Loans, funding, financial aid, stamps...

**Consumer Issues**  
Identity fraud, scams, recalls, consumer credit, debt...

**Domestic and International**  
International affairs, trade embassies, visas...

**Energy and Agriculture**  
Weather, gas, electricity, recycling, natural resources...

**Family, Home, and Community**  
Housing, human services, community development...

**Health and Nutrition**  
Medical, health care, insurance, diet, food stamps, fitness, public health...

**History, Arts, and Culture**  
Museums, libraries, genealogy, ethnic traditions...

**Jobs and Training**  
Employment, career, workplace, labor, school, students, teachers...

**Money and Taxes**  
Government money, credit, saving, retirement...

**Law and Enforcement**  
Law enforcement, disasters, emergencies...

**Reference and Government**  
Libraries, laws, photos, maps...

**Science and Technology**  
Space technology, Internet security, media, phone, radio, patents...

**Travel and Recreation**  
Transportation, air, train, international, tourism...

**Young and Elections**  
Voter registration, contact elected officials...

Visit the blog >>

**USA.gov**  
Your U.S. government blog

### News and Features

**Thanksgiving is Nov 22**  
Thanksgiving history, travel, and food.

**Happy Travels!**  
Travel tips and safety for the 38 million Americans traveling for Thanksgiving.

**National American Indian Heritage Month**  
View government web resources for tribal governments and Native Americans.

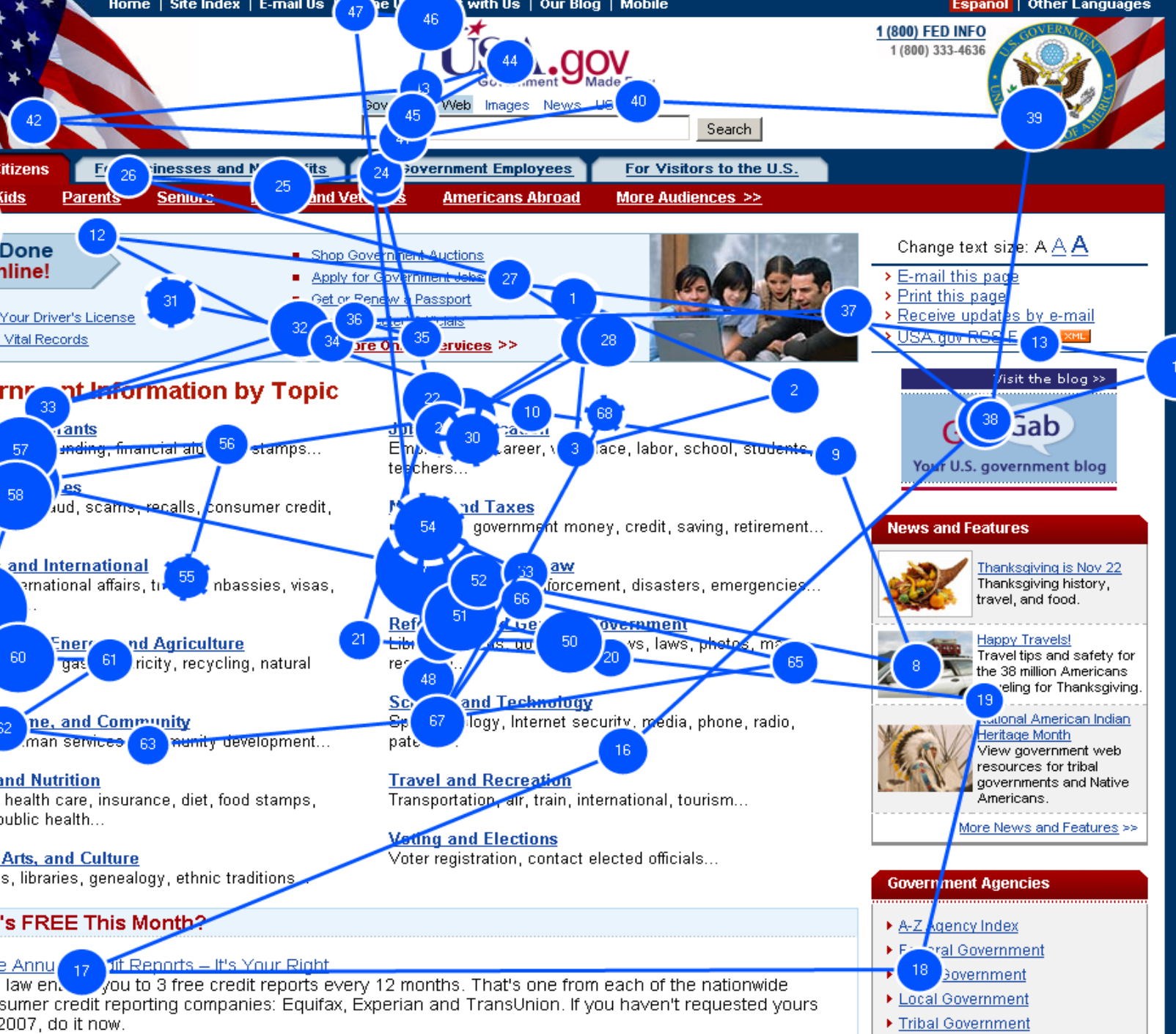
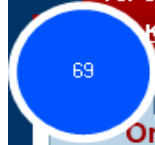
[More News and Features >>](#)

### Government Agencies

- A-Z Agency Index
- Federal Government
- State Government
- Local Government
- Tribal Government

### What's FREE This Month?

- Free Annual Credit Reports – It's Your Right**  
The law entitles you to 3 free credit reports every 12 months. That's one from each of the nationwide consumer credit reporting companies: Equifax, Experian and TransUnion. If you haven't requested yours for 2007, do it now.



Home | Site Index | E-mail Us | Phone Us | Chat with Us | Our Blog | Mobile Español | Other Languages

**USA.gov**  
Government Made Easy

1 (800) FED INFO  
1 (800) 333-4636

Government Web Images News USA.gov

**For Citizens** | For Businesses and Nonprofits | For Government Employees | For Visitors to the U.S.

**Kids** | Parents | Seniors | Military and Veterans | Americans Abroad | More Audiences >>

**Get It Done Online!**

- Renew Your Driver's License
- Replace Vital Records

[100 More Online Services >>](#)

Change text size: [A](#) [A](#) [A](#)

- > [E-mail this page](#)
- > [Print this page](#)
- > [Receive updates by e-mail](#)
- > [USA.gov RSS Feeds](#) [RSS](#)

**Government Information by Topic**

<p><b>Benefits and Grants</b> Loans, money, funding, financial aid, food stamps...</p> <p><b>Consumer Guides</b> Identity theft, fraud, scams, recalls, consumer credit, debt</p> <p><b>Defense and International</b> Military, international affairs, trade, embassies, visas, immigration</p> <p><b>Environment, Energy, and Agriculture</b> Weather, farms, gas, electricity, recycling, natural resources</p> <p><b>Family, Home, and Community</b> Housing, human services, community development...</p> <p><b>Health and Nutrition</b> Medical, health care, insurance, diet, food stamps, fitness, public health...</p> <p><b>History, Arts, and Culture</b> Museums, libraries, genealogy, ethnic traditions...</p>	<p><b>Jobs and Education</b> Employment, career, workplace, labor, school, students, teachers...</p> <p><b>Money and Taxes</b> Unclaimed government money, credit, saving, retirement...</p> <p><b>Public Safety and Law</b> Crime, prison, law enforcement, disasters, emergencies...</p> <p><b>Reference and General Government</b> Libraries, forms, government news, laws, photos, maps, research</p> <p><b>Science and Technology</b> Space, biology, internet security, media, phone, radio, patents</p> <p><b>Travel and Recreation</b> Transportation, air, train, international, tourism...</p> <p><b>Voting and Elections</b> Voter registration, contact elected officials...</p>
---	--

**What's FREE This Month?**

- **Free Annual Credit Reports - It's Your Right**  
The law entitles you to 3 free credit reports every 12 months. That's one from each of the nationwide consumer credit reporting companies. Equifax, Experian and TransUnion. If you haven't requested yours for 2007, do it now.

Visit the blog >>

**Gov Gab**  
Your U.S. government blog

**News and Features**

**Thanksgiving is Nov. 22**  
Thanksgiving history, travel, and food.

**Happy Travels!**  
Travel tips and safety for the 38 million Americans traveling for Thanksgiving.

**National American Indian Heritage Month**  
View government web resources for tribal governments and Native Americans.

[More News and Features >>](#)

**Government Agencies**

- > [A-Z Agency Index](#)
- > [Federal Government](#)
- > [State Government](#)
- > [Local Government](#)
- > [Tribal Government](#)

Page Last Reviewed or Updated: 11/19/2007

Home | About Us | Contact Us | Contact Government | FAQs | Website Policies | Privacy | Suggest-A-Link | Link to Us

**The White House**

**E-GOV**

**If you have questions about the federal government:**  
Check our frequently asked questions, e-mail USA.gov, or call 1 (800) FED INFO (1-800-333-4636).

USA.gov™ is the U.S. government's official web portal:  
Office of Citizen Services and Communications  
U.S. General Services Administration  
1800 F Street, NW, Washington, DC 20405

# Eye-tracking video

## Eye Tracking

- Learn how people interact with the UI by watching where they look
- Two types used:
  - Heat map
  - Gaze tracking
- Help to understand linguistic similarities and differences
  - Right-to-left reading languages
  - Vertical text languages

# Further Read

- <https://www.interaction-design.org/literature/topics/usability>
- [http://edutechwiki.unige.ch/en/Usability\\_and\\_user\\_experience\\_surveys](http://edutechwiki.unige.ch/en/Usability_and_user_experience_surveys)
- <https://www.nngroup.com/articles/usability-101-introduction-to-usability/>
- [https://www.researchgate.net/publication/235850976\\_Efficient\\_Measurement\\_of\\_the\\_User\\_Experience\\_of\\_Interactive\\_Products\\_How\\_to\\_use\\_the\\_User\\_Experience\\_Questionnaire\\_UEQ\\_Example\\_Spanish\\_Language\\_Version](https://www.researchgate.net/publication/235850976_Efficient_Measurement_of_the_User_Experience_of_Interactive_Products_How_to_use_the_User_Experience_Questionnaire_UEQ_Example_Spanish_Language_Version)

Slut

[www.liu.se](http://www.liu.se)