



Eye tracking in web UX research

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Analysis products



Assistive products



OEM products

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Analysis products




T60 / T120



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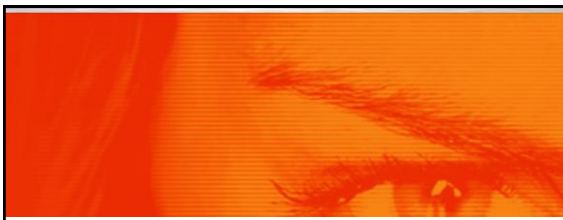


T60 XL



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INTRODUCTION TO EYE TRACKING IN USER RESEARCH

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Our eyes are the mirrors of our soul (brain)




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What do we see?

5°
2-3°
time there was a little fox live
Parafoveal
Peripheral

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The Human Eye

Iris
Pupil
Cornea
Lens
Retina
Macula & Fovea
Many rod cells 94%
Many cone cells 6%

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Fixation
Saccade
Foveal vision, sharp image

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Eye tracking is not a new invention!

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How eye tracking works

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How eye tracking works

Pupil
Reflections

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Eye trackers

Tobii x120 Tobii T60 / T120

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Using the T60 / T120

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Using the X60 / X120

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Attention

- Attention and awareness are important
- Covert attention (the attention of our mind)
- Overt attention (the attention of our eyes)

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**If people don't see it
they won't click on it...
or do anything at all**

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What can eye tracking tell us?

...WHY?

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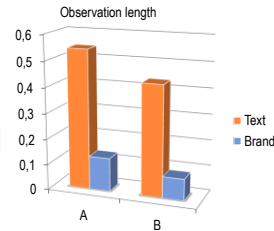
What is the impact of the design on the behavior

Extra gentle for the most sensitive skin.




A

Observation length



Design	Text	Brand
A	~0.55	~0.15
B	~0.45	~0.10

Extra gentle for the most sensitive skin.



B

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Objective data

What a user does is often quite different from what a user says i.e. behavior is not consistent with attitudes

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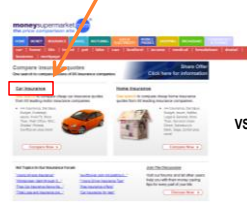


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What is more convincing?

We recommend that the underlined headline is made clickable. People are focusing on it for a long time and some are trying to click on it.

We recommend that the underlined headline is made clickable



VS



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For telling the users' story



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A problem that is not fixed is still a problem – just finding it does not fix it

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Different ways of using eye tracking

- Eye tracking as the sprinkle on the icing
- Eye tracking as the icing
- Eye tracking as the cake



How eye tracking can be used

1. As a complement in qualitative research to help describing behavior and supporting the findings for example design testing
2. To show live to others what the user is experiencing
3. As a complement or standalone method in quantitative research to describe the typical user behavior
4. In experimental research as the dependent variable

Why eye-tracking?

- Objective results reveals true human behavior
- What has been seen?
- How was it seen (how did the person process it)?
- Clear additional insights into behavior
- Measurable behavior

Why eye-tracking?

- Hard deliverables, data (numbers) and images
- Makes it easier to interpret human behavior
- Very visual results for better understanding
- Persuasive results
- Clicks don't tell the entire story
- Find out WHY people don't behave the way you want

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When is eye-tracking valuable?

- When combined with other methods
- When the main goal is to improve the design of an interface
- When it is used early in the development cycle
- In a situation when it gives more and/or better information than other methods
- When objective unbiased data on human behavior is important
- If you have clear questions you want to find an answer to
- When comparing different design alternatives
- In both qualitative and quantitative research
- When adapting an interface based on typical behavior

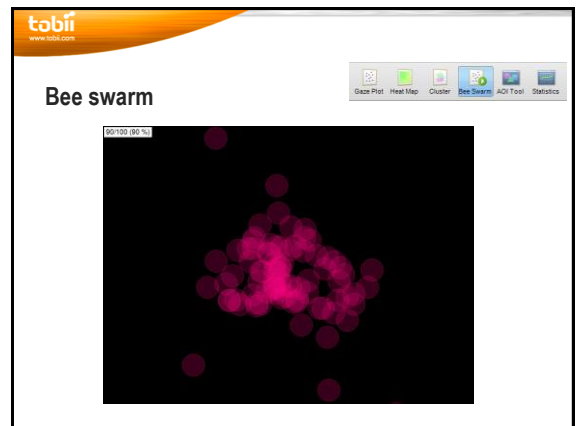
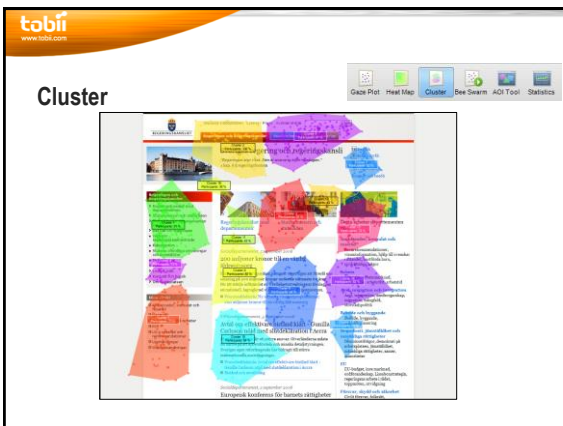
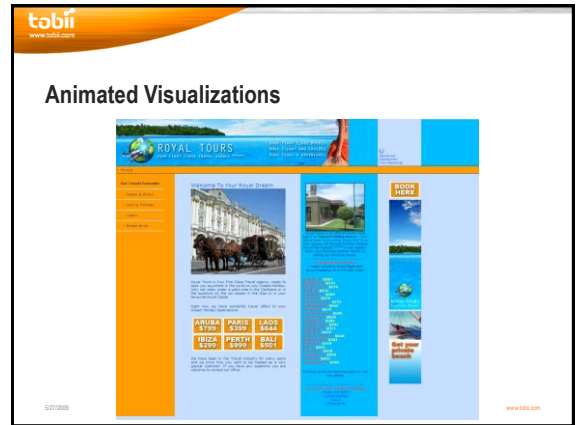
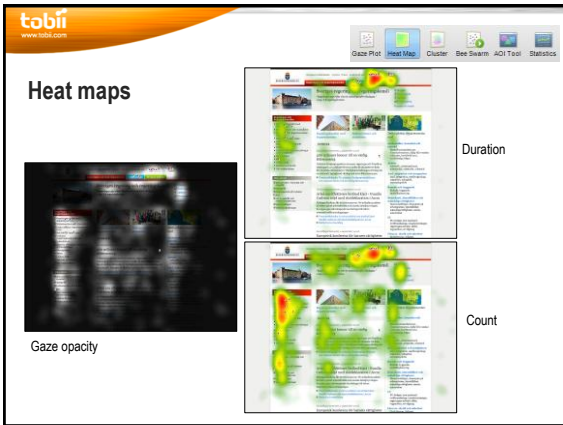
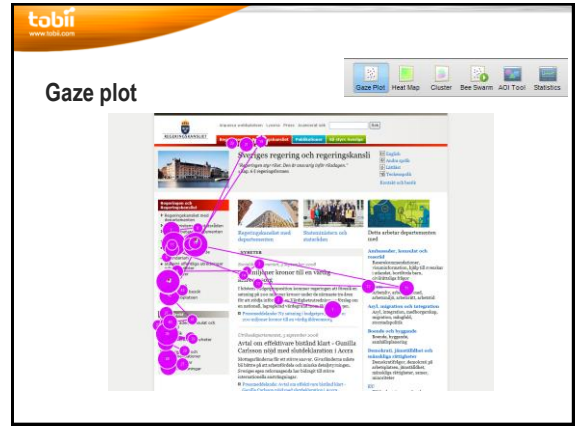


**EYE TRACKING AS A METHOD IN USER RESEARCH FOR
INTERPRETING, DESCRIBING AND ILLUSTRATING BEHAVIOR**

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How do we search for information?

Easy Access On / Off

Does different groups behave differently?

Unexperienced Internet users
Absolute Duration

Experienced Internet users
Absolute Duration

Where do we "think" more?

Menu Area	Fixation length
Main menu	0.35
Top right menu	0.84
Bottom right	1.26

Fixation length

- Main menu
- Top right menu
- Bottom right

How long does it take to find information?

Menu Area	Time to First Fixation
Main menu	0.11
Top right menu	1.47
Bottom right	28.16

Time to First Fixation

- Main menu
- Top right menu
- Bottom right

Redesigning based on typical behavior

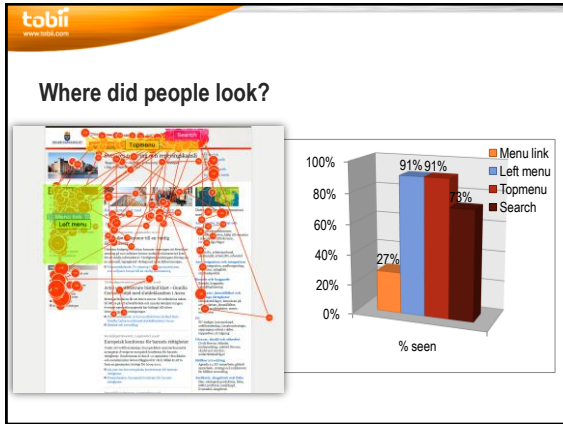
SEARCH ON / OFF

Where did people look often?

Area	Observations
Left menu	4
Publications	2.6
Search	0.8
Press	0.5

Observations

- Left menu
- Publications
- Search
- Press



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Client case: MarketWatch

Research questions

- Users navigate differently depending on the design and placement of banners and special offers, promoting companies' own products.
- Does banner blindness have an impact on the navigation strategies online?
- Is it good for a company use banners on their own website to promote their own products and services?

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Client case: MarketWatch

The study

- Study conducted by MarketWatch in Sweden
- Four Swedish telecom operators: Telia, Telenor, Tele2 and 3 (Hi3G).
- All were promoting mobile broadband services
- 28 test participants, at least six were customers to each telecom operator
- Participants were instructed to locate "Mobile broadband services" and "Customer service" on the four different websites.
- A qualitative interview was also included

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Client case: MarketWatch

Results

- The results of the study indicated that the banner format had a negative impact on both navigation (function) and overall user experiences.
- Clear support for "banner blindness"
- Most users avoided mobile broadband offers looking like banners
- The larger and more obvious the design of a traditional banner, the less the participants looked at it and the less it helped them to navigate.
- Moving banners were less looked at than moving ones.

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Client case: MarketWatch

User experience

- The design and placement of the offers also had an impact on the overall user experience as web sites without obvious banners were rated higher
- User quote: "It doesn't look like they are trying to sell me stuff, everything is nicely arranged",

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Client case: MarketWatch

Why MarketWatch use eye tracking

- “Eye Tracking provides spontaneous reactions, hard to catch with traditional methods. It provides deeper insights into why a user behaves as he/she does. For example, you can get information about what is seen before a user moves the mouse over or clicks on a link, revealing search patterns and the effectiveness of visual cues. In website surveys, participants can use the Internet freely without a test leader sitting in, asking questions. When participants do not feel observed they get closer to a natural situation and behavior.”

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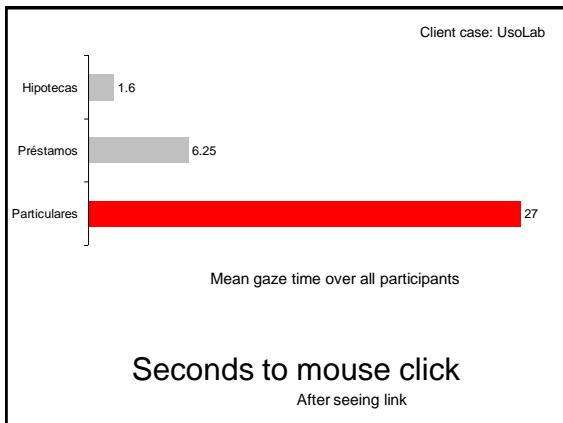
Client case: UsoLab

Case Study – Find mortgage

- » Goal: Find mortgage to buy house
- » 3 Websites of renowned banks in Spain
- » 21 Participants



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Quote

- “Simply enabling observers of the test to see where the participant is looking in real time is extremely valuable. Even if you do no further analyses of the eye-tracking data, just this real time display provides insight that would not be possible otherwise.”
- From “Measuring the user experience” 2008, pp 175-176

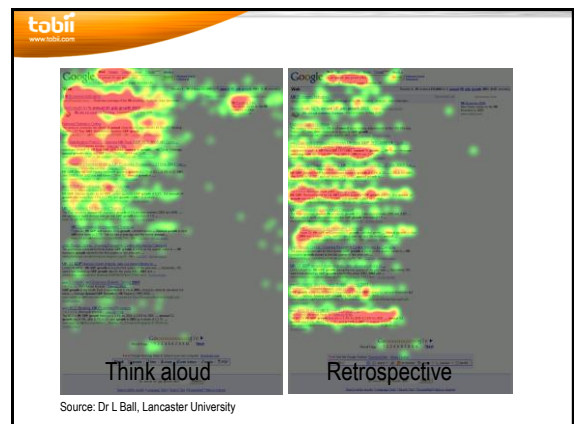
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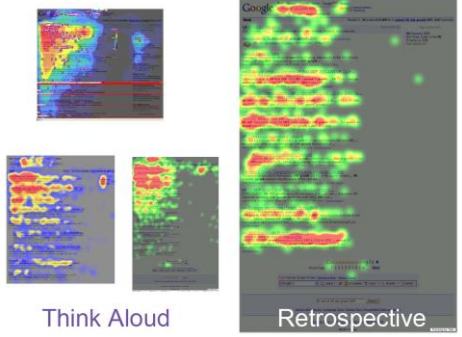
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PEEP - Post Experience Eye Tracked Protocol

- User completes tasks, moderator watch live eye tracking, moderator returns and uses the analysis tools in Studio to post evaluate experience which helps the user to remember what they did and thought during the session
- No need for test participant to think aloud
- Discovers significantly more usability problems than think aloud
- Participants achieve significantly more correct responses to tasks 79% vs. 42%
- Participants find it significantly more pleasant than think aloud
- Gaze paths makes the verbalizations more precise
- “better quality” verbal data from PEEP
- More verbal data from PEEP

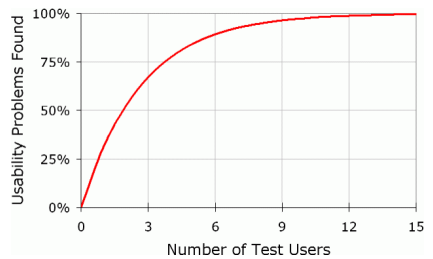
Sievers / Bai et al / Merja Lehtinen, Salla Oksa, Kari-Jouko Rähä





Think Aloud

Retrospective



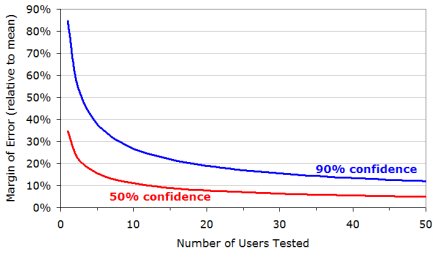
Qualitative Studies: How many participants?

Usability Problems Found

Number of Test Users

Add a few in eye tracking studies!

Nielson: <http://www.useit.com/alertbox/20000319.html>



Quantitative Studies: How many participants?

Margin of Error (relative to mean)


Number of Users Tested

50% confidence

90% confidence

Add a few in eye tracking studies!

Nielson: http://www.useit.com/alertbox/quantitative_testing.html




Sample sizes

- What is the intention of the study? Qualitative or quantitative? Design?
- The sample size is depending on three main factors in quantitative research
 - 1) the subgroups that will be analyzed independently
 - 2) the degree of risk involved in the decisions being made based on the results
 - 3) the amount of available resources (time & money)
- Which statistical tests will be used for analysis
- How complex is the stimulus and what will be analyzed
- 25-100 persons per cell is commonly used in quantitative research
- Check for saturation: every new participant adds very little to the results (heatmap). Depends on the complexity of the stimulus but saturation is noticeable from around 25 people.



QUANTIFYING HUMAN BEHAVIOR: EYE MOVEMENT METRICS IN ONLINE RESEARCH

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Research questions

- The goal of the study was to optimize banner ad design and placement on web sites. In a study done for a satellite TV service provider, eye tracking was used to come up with recommendations regarding messaging, graphical elements and banner placement.
- Which is the best banner design?
- What is the best placement on page?
- What specific elements of the banner attracted most attention?

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tobii Client case: Realeyes

The Study

- Two different banner designs targeted at a web page for buying and renting movies were used, one design was "Red" and the other "Blue".
- 50 people were included of which 60% were females and 60% were aged over 30.
- Testing in a London café, matching the target audience closely.
- Two offline web pages with the different banners were shown to all respondents in randomized order.
- The task on the web pages was to buy or rent a DVD.

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tobii Client case: Realeyes

The results

- The "Red" design attracted more attention than the "Blue" design, improving the overall result of the campaign.
- In the top area the Red design attracted 22% more attention (103 fixations compared to 86 fixations).
- The "Top" banner area performed 2.3 times better visually than the "Bottom" area.
- Using the red banner for the top area and the blue banner in the bottom area resulted in an additional 14% increase in total ad exposure.

	Top	Left	Bottom
Attention deployment			
Time to first eye-fixation (s)	2.8	10.2	11.5
Information processing			
Observation length (s)	1.0	0.9	0.5
Attention quality			
Average fixation duration	50%	80%	117%
Visibility			
% people noticing the area	69%	24%	55%

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tobii Client case: Realeyes

The results

- The Red banner: number 4 captured the most attention
- The Blue banner: the number 29 captured the most attention
- Numbers and clear, large product names contributed most to visual attractiveness. The word "Free" was practically ignored

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tobii Client case: Realeyes

Why Realeyes use eye tracking

- "Eye tracking can be used to improve communication through online advertising, by maximizing visibility of the message. A unique benefit of eye tracking is that it makes it possible to objectively measure actual ad exposure rather than click-through rates, which is currently a standard success measure of most online campaigns. An increase in ability to attract visitors' attention doesn't lend itself to be measured by mouse clicks because people might look at the brand but not click on it for other reasons."

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Defining Areas of Interest (AOI)

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Time to first fixation

- The time in seconds from when the stimulus was shown until the start of the first

Category	Not on AOI (Seconds)	AOI (Seconds)
A	~0.2	~1.4
B	~0.2	~1.9
C	~0.2	~0.4

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Fixation length

- The length of the fixations in seconds within an AOI.

Category	Percentage
Not on AOI	0.25
A	0.23
B	0.23
C	0.23

Fixation count

- The number of fixations within an AOI.

Category	Count
Not on AOI	15
A	3
B	3
C	3

Observation length

- The total time in seconds for every time a person has looked within an AOI, starting with a fixation within the AOI and ending with a fixation outside the AOI.

Category	Percentage
Not on AOI	0.0
A	0.7
B	0.6
C	0.4

Observation count

- The number of visits and re-visits to an AOI.

Category	Count
Not on AOI	0.0
A	0.8
B	1.2
C	1.4

Fixations before

- The number of fixations before the participant fixated within an AOI for the first time.

Category	Count
Not on AOI	1
A	13
B	11
C	4

Participant %

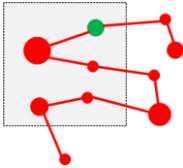
- The percentage of participants that have fixated at least once within an AOI.

Category	Percentage
Not on AOI	100
A	60
B	75
C	85

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First fixation duration

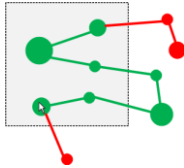
- The length of the first fixation in seconds within an AOI.



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Time from fixation to click

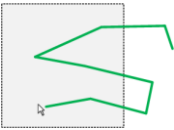
- The time from the first fixation within an AOI to the first mouse click within the same AOI.



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Time to first mouse click


- The time from start of the media until the first mouse click within an AOI.



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Mouse click count

- The number of mouse clicks within the same AOI.

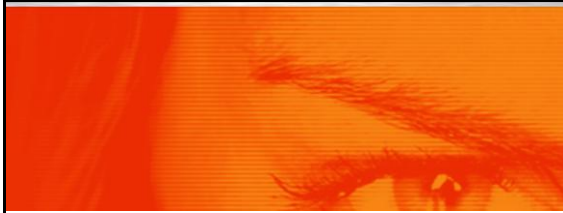


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Qualitative vs. Quantitative

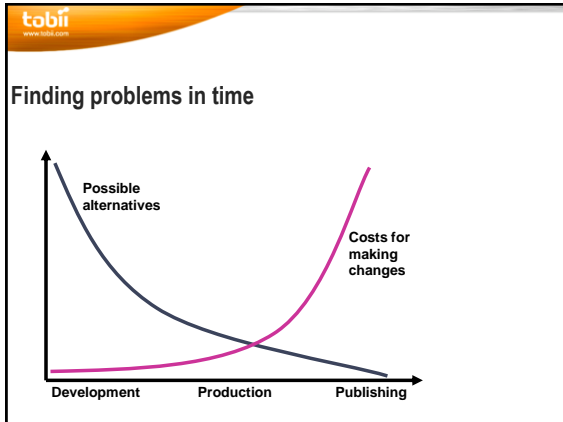
- Only eye tracking results from correctly conducted quantitative tests can be used for generalization and comparisons of groups
- Results from qualitative tests good for describing problems and making improvements, not for describing typical behavior

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WHY USABILITY? WHY EYE TRACKING? CLOSING REMARKS

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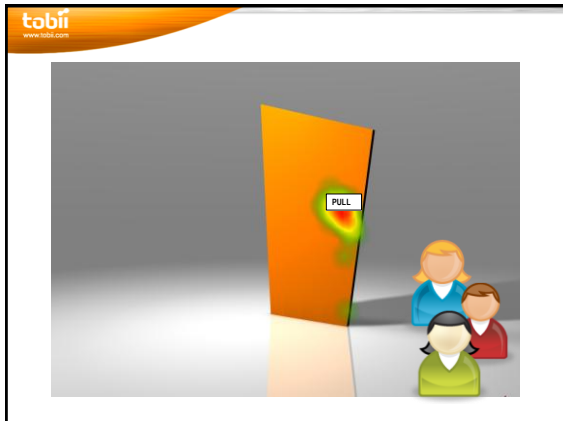


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A battle between two

Appearance
What kind of image do we want to sell?

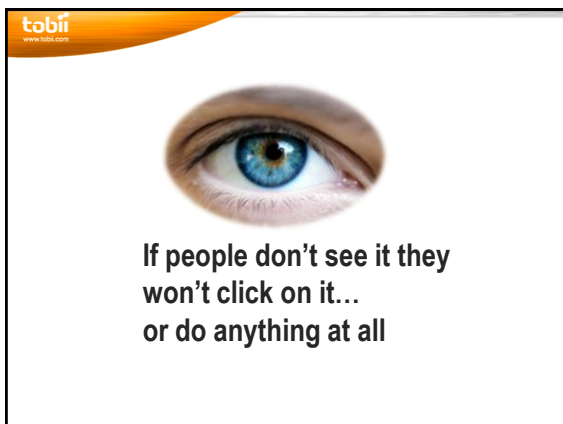
User friendliness
What kind of information does the user want and how?



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For telling the users' story

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Thank you!

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- For more information about Tobii eye trackers please visit www.tobii.com
- More on eye tracking on my Blog: www.eyetracking.me

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