

LFE Medieninformatik • Korbinian Huff

Evaluating Prototypes for Web Applications

Medieninformatik Hauptseminar

Wintersemester 2009/10

„Prototyping“

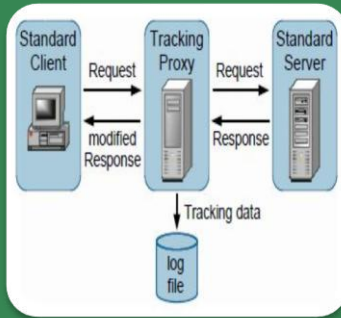




Methods to evaluate Prototypes of Web Applications

```

04 +0100] "GET /~h
Firefox/3.5.4 (.NE
28 +0100] "GET /~h
o/20091016 Firefox
08 +0100] "GET /~h
o/20091016 Firefox
05 +0100] "GET /~h
o/20091016 Firefox
6 +0100] "GET /~h
    
```



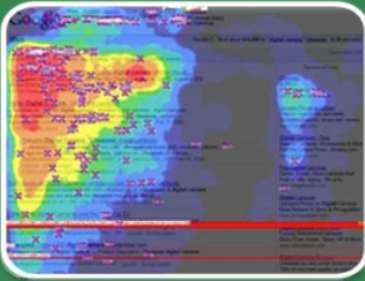
Analyze
web server
log data

Deliver
web pages
through a
proxy that
adds a
tracking
script

Install
software
on testers
computers
to log user
behavior

Observe
users

Methods to evaluate Prototypes of Web Applications



Use eye
trackers



Question-
naires



Face-to-
Face
interviews



Ask an
expert
panel to
rate the
application



Analysis of Web Server Logs

- Most web servers automatically save access logs

```
04 +0100] "GET /~hu  
Firefox/3.5.4 (.NET  
28 +0100] "GET /~hu  
o/20091016 Firefox,  
08 +0100] "GET /~hu  
o/20091016 Firefox,  
05 +0100] "GET /~hu  
o/20091016 Firefox,  
16 +0100] "GET /~hu
```

Contents of a logfile:

- IP address
- Exact request from client
- Date & time
- HTTP status
- Filesize
- Referring site
- User client information



What can be Evaluated using Server Logs?

Not Found

The requested document was not found on this server.

Broken links

Pageviews ↓

35
14
14

Most & least often used pages

Avg. Time on Page

00:00:56
00:00:19
00:00:20

Time spent in the application

Exits ↓

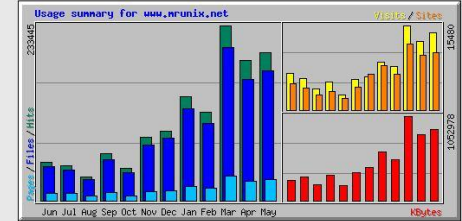
Exits	Exits
17	43.59%
7	17.95%
5	12.82%

The exit page



How can this be Evaluated from the Server Logs?

Webalizer



Summary by Month

Month	Daily Avg				Monthly Totals					
	Hits	Files	Pages	Visits	Sites	KB/Bytes	Visits	Pages	Files	Hits
Apr 1999	6377	5570	903	455	10484	884568	14119	28004	172671	197696
Mar 1999	7530	6582	1046	499	12128	1052978	15480	32432	204059	233445
Feb 1999	4712	4128	656	321	6629	511793	8048	16419	103203	117816
Jan 1999	4470	3934	607	284	8079	605694	8808	18844	121980	138571
Dec 1998	2998	2673	411	197	6524	410110	6120	12769	82875	92951
Nov 1998	2910	2567	400	192	4260	346705	5588	11627	74468	84403
Oct 1998	3052	2668	457	202	2203	189253	2839	6399	37360	42738
Sep 1998	2072	1826	345	169	3475	314492	5075	10376	54807	62165
Aug 1998	1014	901	211	125	2693	196560	3890	6571	27958	31455
Jul 1998	1484	1325	302	184	4041	298225	5716	9383	41102	46019
Jun 1998	1707	1502	322	222	4809	251502	6675	9687	45077	51227
Totals	5883848	94952	188269	1127404	1284990					

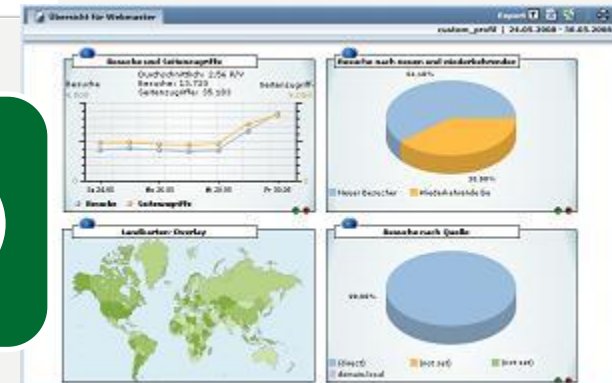
AWStats

Seiten-URL (Top 10) - Gesamte Liste - Einstiegsseiten - Exit Seiten

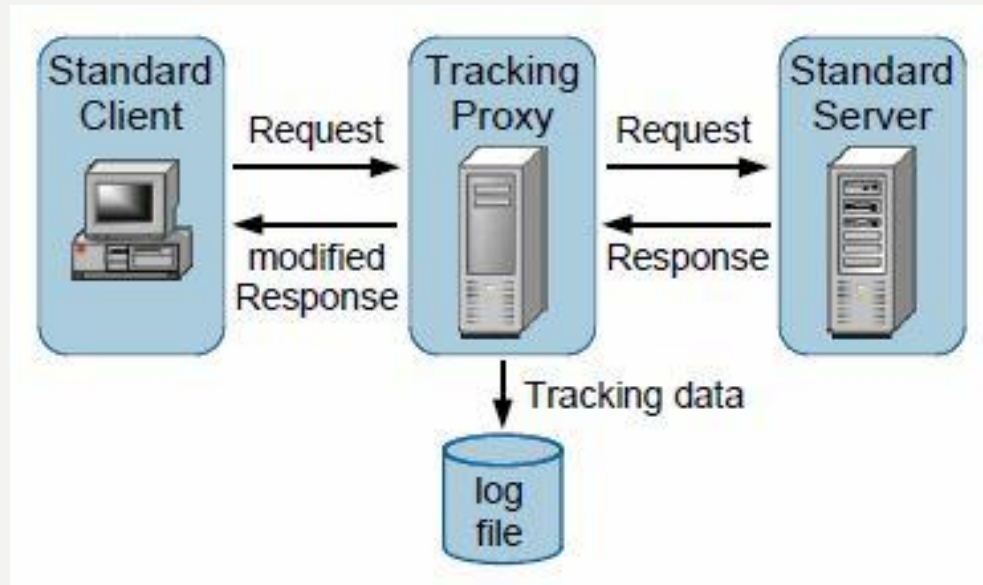
23 Unterschiedliche Seiten

	Zugriffe	durchschnitt. Größe	Einstiegsseiten	Exit Seiten
/	640	9.75 KB	486	416
/phpwebgallery/	332	2.86 KB	114	123
/pages/prof/cv.php	122	4.08 KB	50	64
/pages/doc.php	67	4.18 KB	18	24
/pages/prof/coordprof.php	56	4.84 KB	13	17
/pages/perso/coord.php	41	5.95 KB	14	18
/pages/perso/pres.php	35	6.82 KB	2	10
/pages/projets/chien_et_chat.php	31	4.88 KB	6	15
/phpwebgallery/template-common/csshover.htc	25	3.77 KB	2	3
/phpwebgallery/template-common/inputfix.htc	24	899 Bytes	3	12
Sonstige	79	2.62 KB	22	26

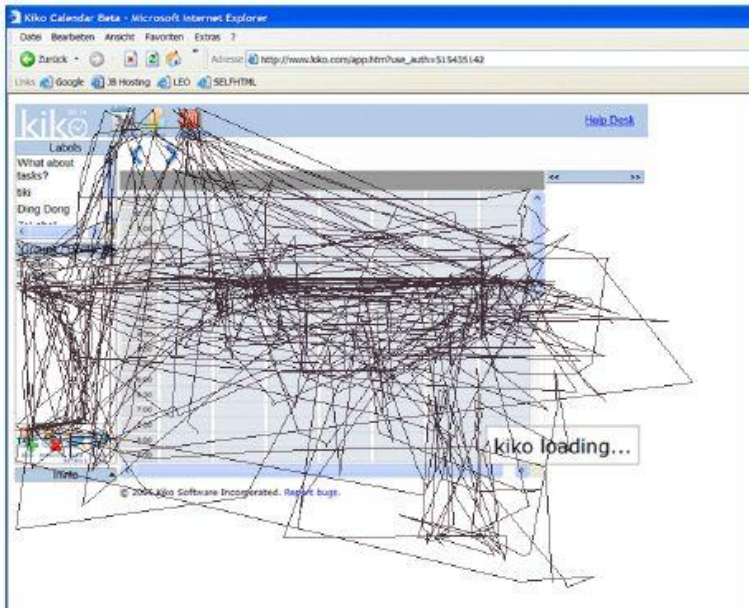
Urchin Software (Google)



Add Tracking Scripts through a Proxy Server



What can be Evaluated using Tracking Scripts that are added through a Proxy Server?



Mouse movements

Programs that can be used for this evaluation:

WebQuilt, UsaProxy



Mouse clicks and
key presses



User Tracking Software



Tracking software

Tracking data



What can be Evaluated using User Tracking Software?



Mouse activity

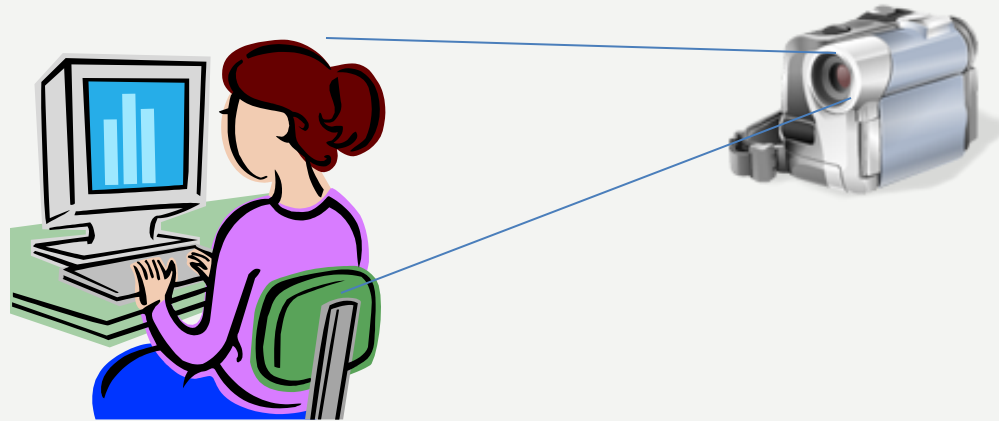


Key presses

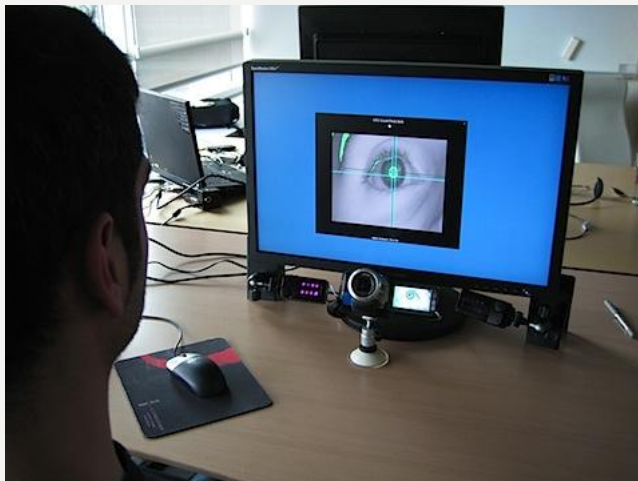
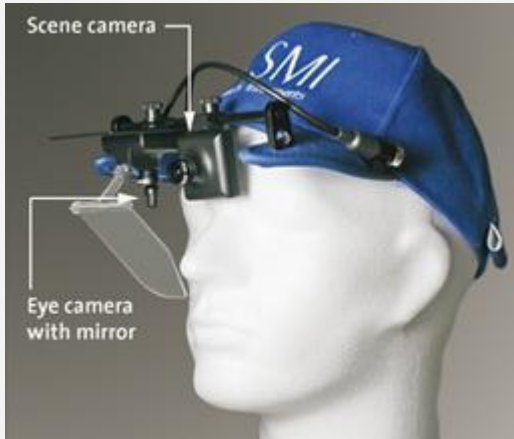


Virtually anything happening
on the computer

Observe Users



Use Eye-Tracking Devices



What can be Evaluated using these Techniques?



Feelings



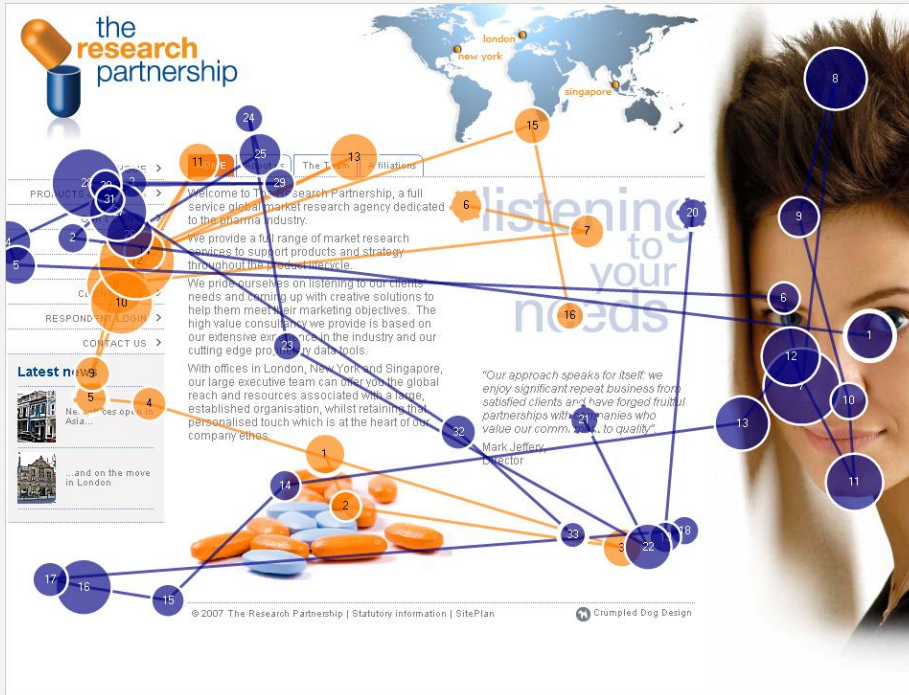
Device specific
problems



Layout
problems



How can this be Evaluated?



Selected Features of NYANZ	Std	Prof	Arch
Text, Image, Screen Content	✓	✓	✓
Mouse	✗	✓	✓
Gallery	✗	✓	✓
Presentation Extension	✗	✓	✓
E-Phone Extension	✗	✗	✗
Dynamic Web	✗	✗	✗
Core Data	✓	✓	✓
Keyboard and Mouse Events	✓	✓	✓
Synchronised Information	✓	✓	✓
Web Pages with Scroll Compensation	✗	✓	✓
Dynamic Webcontent	✗	✗	✓
Local Event Logging	✓	✓	✓
Local User Viewer	✗	✓	✓
Click Time Filter	✓	✓	✓
Scrapbook	✓	✓	✓
Site Subset Heatmap	✓	✓	✓
Group Comparison Analysis	✓	✓	✓
Areas of Interest (incl. Statistics)	✓	✓	✓
Scene Analysis	✓	✓	✓
Video Gaze Overlay	✓	✓	✓
WebTask Analysis	✗	✓	✓
WebSite Cluster	✗	✗	✓
Clickmap	✗	✗	✓
Dynamic Areas of Interest	✗	✗	✓
Click Data	✓	✓	✓
Analysis Images	✓	✓	✓
Analysis Videos	✗	✓	✓
NYANZ Demore Central Center	✗	✓	✓
Hotspot Logging	✗	✗	✓
User Extension	✗	✗	✓
Audio Event Logging	✗	✗	✓
User Face Detection	✗	✗	✓

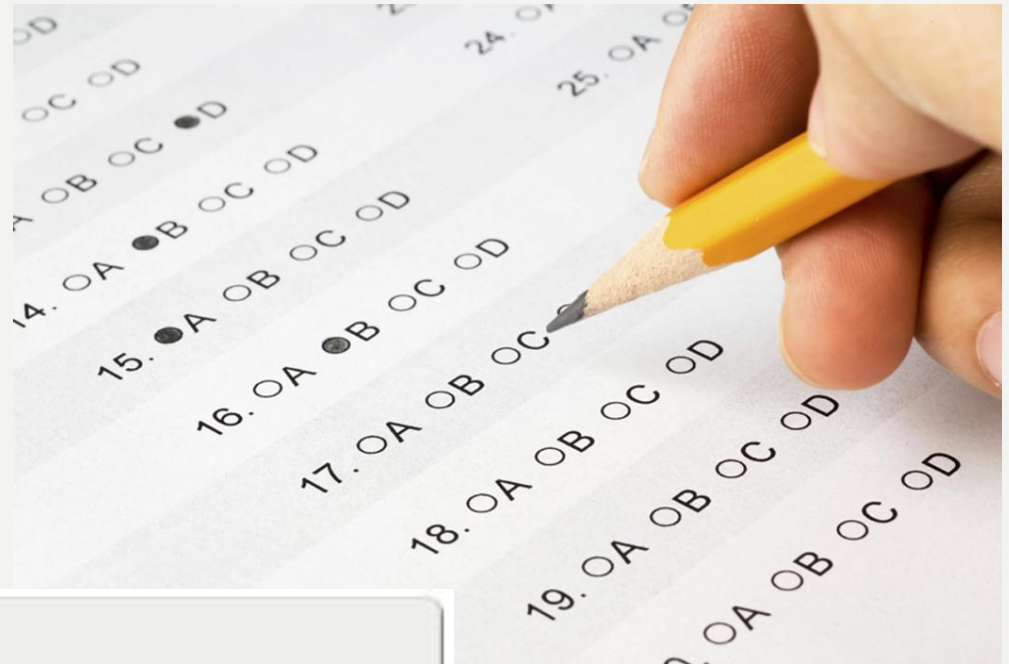
Note for NYANZ users: The NYANZ Standard Edition contains all features of NYANZ (in fact it contains even more).

copyright ©2008 by interactive minds GmbH | login | contact

Software: Nyan 2.0XT, WebEyeMapper, ITU Gaze Tracker (Open Source)



Questionnaires



How likely is it that you would recommend

Product XYZ to a colleague?

Not likely
at all

Extremely
likely

0 1 2 3 4 5 6 7 8 9 10

Visual representation of a Likert scale with 11 radio buttons corresponding to the numbers 0 through 10.



Face-to-Face Interviews





What can be Evaluated using these Methods?

Feelings

Suggestions

Problems that were not part of the initial question



Evaluation by an Expert Panel



Links	Eigene Seite	Wettbewerber
Sind Links immer als solche zu erkennen?	gut	Sehr gut
Folgen Links einem seiteninternen Standard (Unterstreichung, Farbgebung, Icons)?	Sehr gut	Sehr gut
Sind besuchte Links gekennzeichnet (z. B. durch Farbwechsel)?	Sehr gut	Sehr gut
Sind Informationen vorhanden, die anzeigen, wohin ein Link führt (z. B. Texte, Mouseover)?	Sehr gut	Sehr gut
Ist eine größere Anzahl von Links durch Überschriften gegliedert?	Sehr gut	Sehr gut
Gibt es auf jeder Seite mindestens einen weiterführenden Link?	Sehr gut	Sehr gut
Gibt es Hinweise auf die Größe der Datei, bevor man sie herunterlädt?	befriedigend	Sehr gut
Gibt es Hinweise auf das Format der Datei, bevor man sie herunterlädt?	befriedigend	Sehr gut
Sind die Thumbnail-Bilder groß genug für eine Vorschau?	gut	Sehr gut



What can be Evaluated Using the Expert Panel Approach?



Navigation



Interaction



Quality



Up-to-dateness



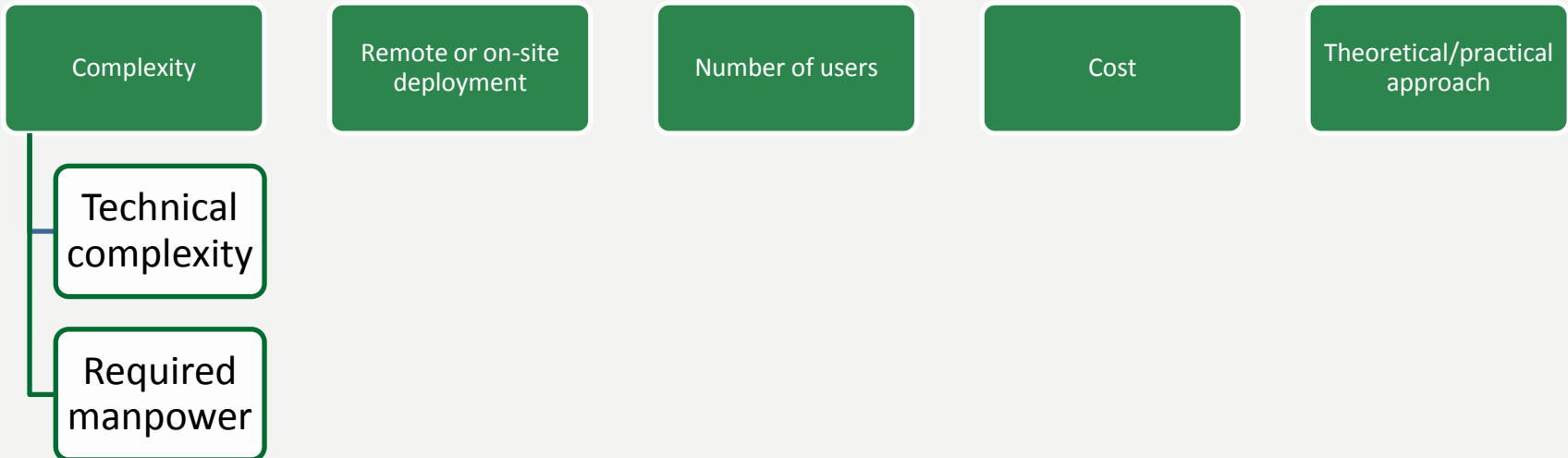
Accessibility



Design



Methods of Classification





Technical complexity

	Method	Technical complexity
	Analysis of web server logs	●
	Tracking scripts	●●
	User tracking software	●●
	Observation of users	●
	Eye tracker	●●●
	Questionnaires	●
	Face-to-face interviews	●
	Evaluation by an expert panel	●

● low
●● medium
●●● high




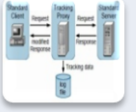


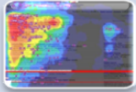



Required manpower

	Method	Required manpower
	Analysis of web server logs	●
	Tracking scripts	●
	User tracking software	●
	Observation of users	●●●
	Eye tracker	●●●
	Questionnaires	●/●●
	Face-to-face interviews	●●●
	Evaluation by an expert panel	●

● low
●● medium
●●● high



Remote / On-Site Deployment

	Method	Remote	On-site
	Analysis of web server logs	●	
	Tracking scripts	●	
	User tracking software	●	
	Observation of users		●
	Eye tracker		●
	Questionnaires	●	●
	Face-to-face interviews		●
	Evaluation by an expert panel	●	●



Number of Users

	Method	Number of users
	Analysis of web server logs	●●●
	Tracking scripts	●●
	User tracking software	●●
	Observation of users	●
	Eye tracker	●
	Questionnaires	●●/●●●
	Face-to-face interviews	●
	Evaluation by an expert panel	none

● low
●● medium
●●● high




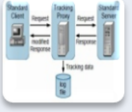






Cost

	Method	Cost
	Analysis of web server logs	●
	Tracking scripts	●●
	User tracking software	●●
	Observation of users	●●●
	Eye tracker	●●●
	Questionnaires	●●
	Face-to-face interviews	●●●
	Evaluation by an expert panel	●

● low
●● medium
●●● high



Type of Approach

	Method	Theoretical	Practical
	Analysis of web server logs		●
	Tracking scripts		●
	User tracking software		●
	Observation of users		●
	Eye tracker		●
	Questionnaires	●	
	Face-to-face interviews	●	
	Evaluation by an expert panel	●	

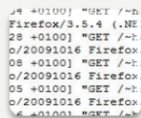
Conclusion



Only with a combination of methods all problems can be found.



Use cheap methods first, then more expensive methods



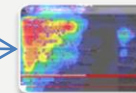
Analysis of web server logs



User tracking software



Evaluation by an expert panel



Eye tracker



Picture Sources

- Slide 2: Server logs: own screenshot
Proxy server: R. Atterer, M. Wnuk, and A. Schmidt. Knowing the user's every move: user activity tracking for website usability evaluation and implicit interaction. In WWW '06: Proceedings of the 15th international conference on World Wide Web, pages 203–212, New York, NY, USA, 2006. ACM.
- Slide 3: Heatmap: <http://inspiredimpressions.wordpress.com/2006/04/18/eye-tracking-with-heat-maps/>
- Slide 4: own screenshot
- Slide 5: own screenshots of Google Analytics <http://www.google.com/analytics/>
- Slide 6: AWStats: <http://awstats.sourceforge.net/>
Webalizer: <http://www.mrunix.net/webalizer/>
Urchin Software: <http://de.wikipedia.org/w/index.php?title=Datei:Urchin2.jpg&filetimestamp=20091030105204>
- Slide 7: see Slide 2
- Slide 8: Mouse Movements: as slide 2 proxy server
hide graphic: own screenshot of Google Mail <http://www.gmail.com/>
- Slide 12: line-by-line, left to right: <http://www.ied.ethz.ch/newsletter/newsletter4/researchnight/index>
<http://www.mangold-international.com/de/ueber-uns/news/artikel//2.html>
<http://www.i-cherubini.it/mauro/blog/2009/04/30/open-source-eye-tracker/>
http://www.tobii.com/market_research_usability/products_services/eye_tracking_hardware/tobii_t60_xl_eye_tracker.aspx
- Slide 14: Heatmap: <http://www.interactive-minds.com/en/eye-tracking-usability/>
Scanpath: <http://www.researchpartnership.com/products-and-services/eye-tracker>
- Slide 15: Likert: <http://survey.cvent.com/blog/likert-survey>
- Slide 18: Web Usability Index: own screenshot
- All other graphics: Microsoft Office 2007 ClipArt Gallery