

Usability Testing

Refs: D. Petkovic

J. Rubin: “Handbook of Usability testing”,
Wiley Technical Communication Library,
Testing Guru

Content

- Concept
 - Types of usability tests
 - Test environments
 - Typical test plan format
 - Task selection for evaluation
 - Measurements and Questionnaires
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 - Analyzing Data
-

Usability Testing

- Process that **employs representative target population participants** to evaluate product usability using specific usability criteria
- Usability testing is **not a guarantee for product success**, but it should identify at least the key problems



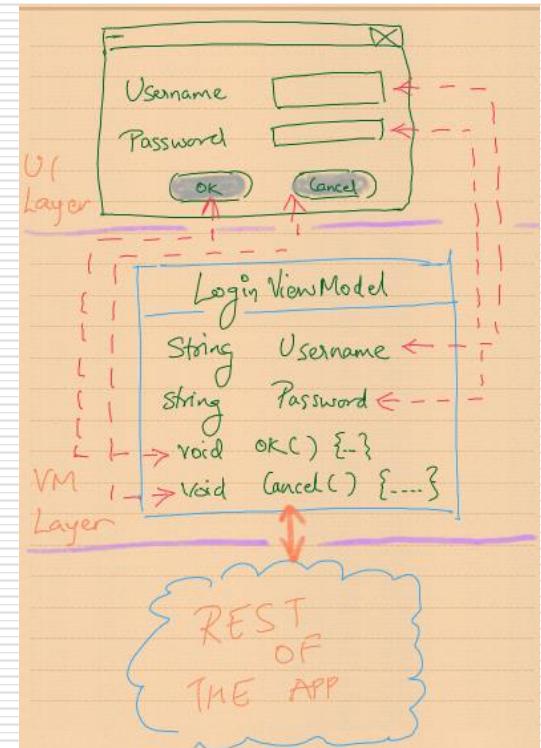
Basic components

1. Development of specific problems statements and test plans and objectives
 2. Use of **representative sample** of end users
 3. Representation of the **actual work environment**
 4. **Observation of end users during** product use or review
 5. Collection of **quantitative and qualitative** measurements
 6. **Analysis of results and recommendations**
-

Types of usability tests

Exploratory:

- Early in the process
- Can be based on any form of the GUI (sketch, wire diagrams etc.)
- Evaluate preliminary, basic design concept
- Perform representative tasks in a “shallow” mode
- Informal test methodology, a lot of interaction
- Discuss high level concepts



Types of usability tests

Assessment

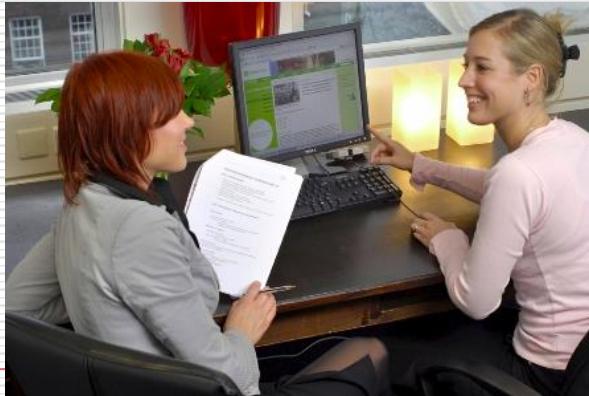
- Done After fundamental concepts are done
- Evaluates usability of lower level operations
- The users actually perform set of well defined tasks
- Less interaction with test monitor
- Quantitative measurements are collected

Usability Testing



UX METHODS TRADING CARDS

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Types of usability tests

Validation

- Done late in development cycle, close to release
 - Goal is to certify product usability, “disaster insurance” against launching a poor product
 - Often the first time when the whole product si tested (including help and docs)
 - Evaluate wrt. some predetermined usability standard or benchmark
 - Standards come from **previous testing, competitive information, marketing** etc.
 - Very specific quantitative tests
 - Can establish standards for future products
 - Can be also done by beta customers
-

Types of usability tests

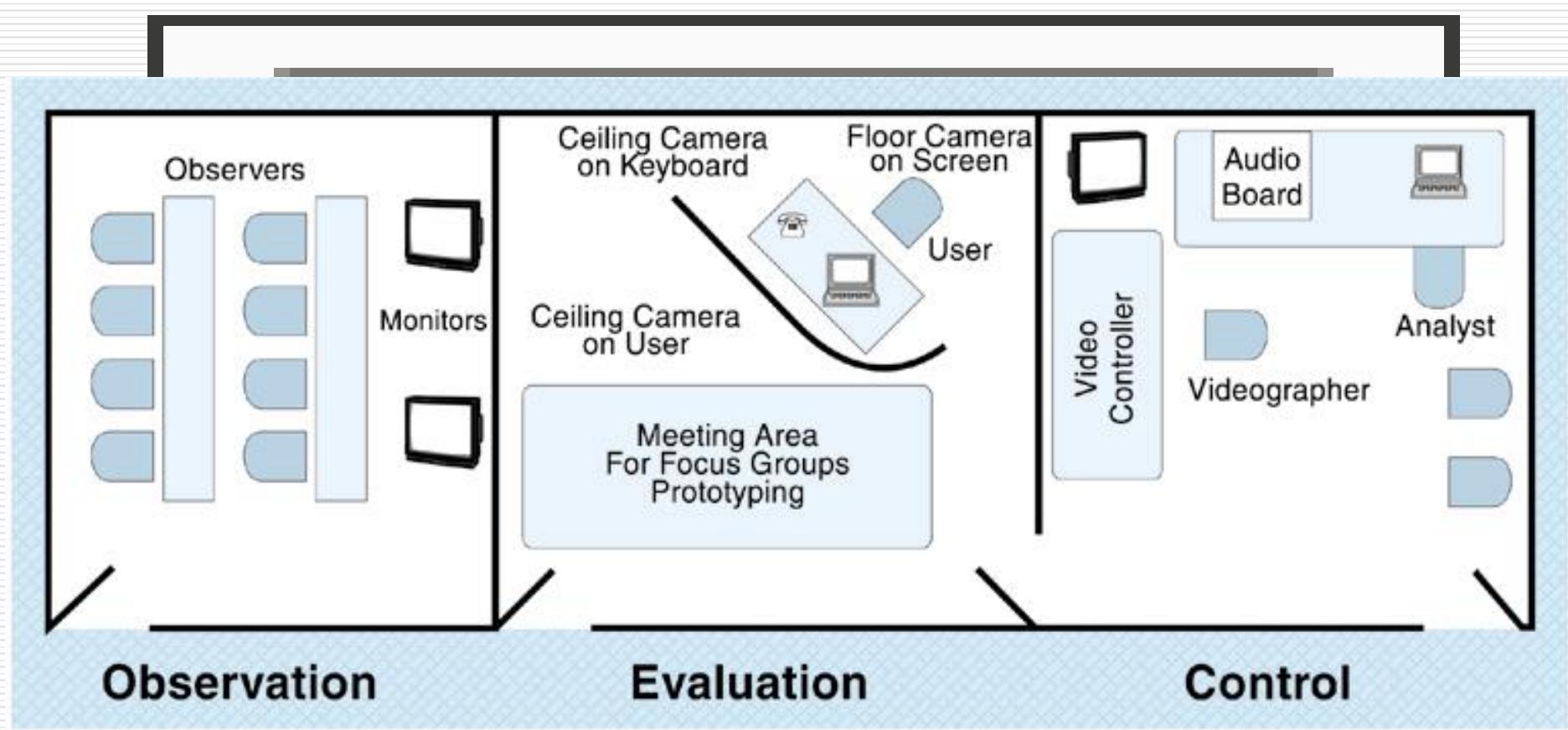
Comparison

- Can be done at any point in the development cycle
 - Compare alternatives using objective measures
 - Can be informal or formal, depending when it is done
 - Often, best of alternative designs is combined
-

Test environments

- Simple single room setups
 - Observer/monitor close to evacuator
 - Observer removed from evaluator
 - Electronic observation room
 - Classic elaborate usability lab
 - Mobile lab
-

Example



Typical test plan format

- Purpose: what is the main purpose of the test
 - Problem statement: specific questions you want resolved
 - Test plan and objectives: tasks the user will do
 - User profile: who will be the users
 - Method and test design: how will you observe it, how will you collect the data etc.
 - Test environment and equipment
 - Test monitor role
 - Evaluation measures and data to be collected: how will you collect the feedback and how will you evaluate it
 - Report: what will final report contain
-

Task selection for evaluation

- Tasks to be evaluated are functions users want to do with the product. **Focus is on user view of the tasks and NOT at the components and details** that you used to implement it. Examples:
 - Create and file document
 - Import several images
 - Find the right document
 - Objective is to indirectly expose usability flaws by asking the user to perform typical tasks and **NOT telling them exactly how to do it.**
 - Choose **key and most frequently** done tasks
 - **The task has to be specific and measurable** (quantitatively or qualitatively)
-

Task components

TASK	DESCRIPTION
Task	Load paper into copier
Machine state	Paper tray empty
Successful completion criteria	Paper properly loaded
Benchmark	Completed in 1 minute

Selection of evaluators and test groups

- Evaluators should **be representative of the targeted users**
 - Independent groups or within-subject design (but be careful to avoid exposing users to same tests since this will bias the results)
 - Adequate numbers of testers
 - Offer motivation and rewards
-

Measurements and Questionnaires

- Performance data: measures of user behavior such as **error rates, number of accesses to help, time** to perform the task etc.
 - Usually can and should be objectively and automatically measured
- Preference data: measures of **user opinion, thought process such as rankings, answers to questions, comments etc.**
 - Use questionnaires.

Some performance measures (measure what can be measured)

- Time to complete each task
 - Number and percentage of tasks completed successfully/unsuccessfully
 - Time required to access information
 - Count of incorrect selections
 - Count errors
 - Time for system to respond
 -
- Data should be collected automatically or manually in an objective way.
-

Questionnaires (for preference data)

Likert scale

- I found GUI easy to use (check one)

___ Strongly disagree ___ Disagree

___ Neither agree or disagree

___ Agree ___ Strongly agree

(can also assign numbers from -2 to 2)

Semantic differentials

- I found File Open menu (circle one)

Simple 3 2 1 0 1 2 3 Complex

Questionnaires

Fill in questions

- I found the following aspects of GUI particularly easy to use (list 0-4 aspects)

Questionnaires

Check-box

- Please check the statement that best describes your usage of spell check
 - I always use spell check
 - I use spell check only when I have to
 - I never use spell check
-

Questionnaires

Branching questions

- Would you rather use advanced search
 - NO (skip to question 19)
 - YES (continue)
 - What kind of advanced search would you like? (check one)
 - Boolean
 - Relevance
-

Summarizing performance results

- Performance data
 - Mean time to complete
 - Median time to complete
 - Range (high and low)
 - Standard deviation (độ lệch) of completion times
 - System response time statistics
 - Task accuracy
 - % of users completing the task within specified time
 - % of users completing the task regardless (không quan tâm) of time
 - Same as above, with assistance
 - Average error rate
-

Summarizing preference results

- For limited choice questions
 - Count how many participants selected each choice (number and %)
 - For Likert scale or semantic differentials provide average scores if there are enough evaluators
 - For free form questions
 - List questions and group answers into categories, also into positive and negative answers
 - For free comments
 - List and group them at the end of the report
-

Analyzing Data

- Identify and focus on tasks that **did not pass the test** or showed significant problems
 - Identify **user errors and difficulties**
 - Identify **sources of errors**
 - Prioritize problems by criticality = severity AND probability of occurrence
 - Analyze differences between groups (if applicable)

 - Provide recommendations at the end
-

Problems statements and performance data to collect

Problem Statement	Performance Data Collected
How effective is the tutorial	Compare error rates of users who used and not used this
How easy is it to perform task X	Error rate OR Number of steps needed

Note: this is Performance data measurement only. You also need to asses user Preference data (see next slide)

Problems statements and preference data to collect

Problem Statement	Preference Data Collected
How effective is the tutorial	Ask user to rate it from very ineffective to very effective (Lickert scale or semantic differentials) + free comments
How easy is it to perform task X	Ask user to rate it from very easy to very difficult (Lickert scale or semantic differentials) + free comments

Relate problem statements with tasks

Problem Statement	Task
How effective is the tutorial	GroupA: Import image w/o using tutorial GroupB: Same but use tutorial first
How easy is it to Create Virtual Machine	Create Virtual machine with “this” properties using New VM Wizard

Task components

TASK	DESCRIPTION
Task	Create VM using New VM Wizard
Machine state	VMware WS SW just loaded
Successful completion criteria	Working VM created
Benchmark	Completed in 30 sec.

Some Suggested GUI issues to cover in preference data collection

Use GUI principles as general measures of quality to evaluate

- Screen layout matches tasks
- Amount of information is adequate
- Good use of text (headlines, help, messages, warnings...)
- Good use of colors
- Proper grouping of related info
- Navigational problems
- Users get lost in the system
- Organized by user tasks
- Icons are self-explanatory
- Consistency

Note: ask these questions in the context of concrete user tasks not in vacuum

How can we design GUI checklist ?

- UI elements
 - User requirements
 - Standards
 - Trends
-

<http://www.loop11.com/>

- Loop¹¹ is a web-based user-experience testing tool, allowing you to conduct remote, unmoderated usability testing on any kind of digital interface providing you with detailed quantitative usability metrics
-



Create New User Test

[Hide website preview](#)

Preview your website first to ensure it loads correctly.

[Why do I need to do this?](#)

<http://www.fit.hcmus.edu.vn>

Preview

Projects Under Construction

PROJECT

CREATED

TASKS

EDIT

DELETE

[View full list](#)



Launched Projects

PROJECT

LAUNCHED

RESPONSES

STATUS

REVIEW

ANALYSE

DELETE

[SAMPLE PROJECT - Yahoo!](#)

13 Apr 2009

224

[Closed](#)

[View design](#)

[View report](#)

[Delete](#)

[View full list](#)



COMMON QUESTIONS

[If I require help and submit a query via email how long will it take to get a response?](#)

[Can I provide feedback about Loop¹¹?](#)

[Can I speak to someone at Loop¹¹ if I need assistance?](#)

[Is credit card payment the only method of purchase?](#)

BUY TEST CREDITS

Pre-purchase credits instead of paying as you go.

[Go to purchase page](#)



<http://fivesecondtest.com/>



Create a new test

1 Pick a test option

Choose the level of test you need based on your required number of responses, priority and features.

results

free

5



free!
(0 tokens)

priority

bronze

~\$1

custom instruction

silver

~\$7

extra feedback

gold

~\$4

price

you need to sign in to
create premium tests
[sign in or register](#)



US\$ 5
(1 token)



US\$ 10
(2 tokens)



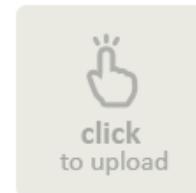
US\$ 15
(3 tokens)

2 Upload your design

Upload a mockup or screenshot of the design you want to test.

2 Upload your design

Upload a mockup or screenshot of the design you want to test.



3 Pick a test format

Choose the type of action you want your testers to perform.



Memory test

Ask users what they remember about your design



Click test

Ask users to click on parts of your design

4 Allow random testers to participate?

Select if you want your test to be available to random testers or not. If you disable this we can't guarantee the number of results you will receive.

Yes please!



or cancel

<http://userfly.com/>

A screenshot of the Userfly landing page. The header features the "userfly" logo with a blue swoosh icon. The main headline reads "Usability testing has never been this easy." Below the headline is a bulleted list of four benefits: "Watch videos of your real users.", "See every mouse movement and click.", "Install in seconds with one line of code.", and "Increase conversions on landing pages.". A yellow call-to-action button with the text "Sign up for free" and "Takes less than 30 seconds." is centered. Below the button is a link "Try the demo." The background has a light blue grid pattern.

userfly

Usability testing has never been this easy.

- ✓ Watch videos of your real users.
- ✓ See every mouse movement and click.
- ✓ Install in seconds with one line of code.
- ✓ Increase conversions on landing pages.

Sign up for free

Takes less than 30 seconds.

Try the demo.

http://userfly.com/



Welcome, lamquangvu.temp@gmail.com. [log out](#)

[Install](#) [Affiliate Program](#)

free plan, 10 captures remaining this month, [upgrade](#) for more.

Welcome to userfly :). You have 10 user recordings this month, so let's get you up and running.

Add the following inside the <head> tag of your site:

```
1 <script type="text/javascript">
  var userflyHost = (("https:" == document.location.protocol)
    ? "https://secure.userfly.com" :
    "http://asset.userfly.com");
  document.write(unescape("%3Cscript src='"
    + userflyHost +
    "/users/47609/userfly.js' type='text/javascript'%3E%3C
```

If you have a blog, install userfly with one click:



1

2 Visit your site to record your first user session.

3 [Click here](#) to watch your first recording!

[Install](#) [Affiliate Program](#)

free plan, 10 captures remaining this month, upgrade for more.

Switch your plan You currently have the Free plan.

Enterprise

\$200/month

The "loaded" plan

10000 captures/month

Unlimited domains

Recordings stored for 90 days

Record **HTTPS** pages[Upgrade](#)

Business

\$50/month

Ecommerce solution

1000 captures/month

Unlimited domains

Recordings stored for 60 days

Record **HTTPS** pages[Upgrade](#)

Pro

\$25/month

Great value

1000 captures/month

Unlimited domains

Recordings stored for 60 days

[Upgrade](#)

Basic

\$10/month

Perfect for a quick usability study

100 captures/month

Unlimited domains

Recordings stored for 30 days

[Upgrade](#)

<http://www.usertesting.com/>



Home

FAQ

Buzz

About Us

Try It

Usability Testing Has Never Been Easier

The fastest, cheapest way to *find out why users leave your website*

For \$39 you get:

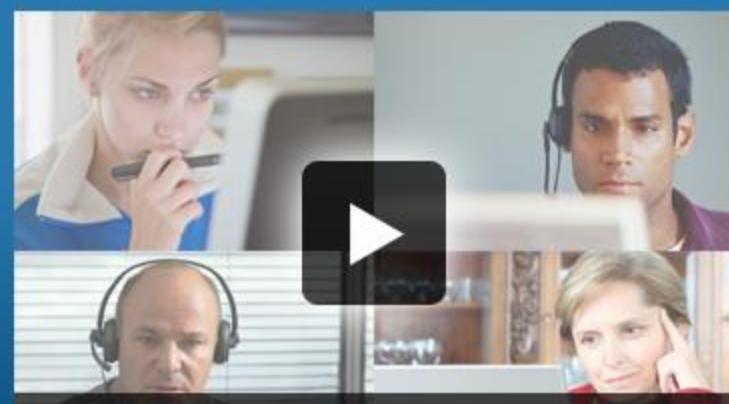
- Video of a visitor speaking their thoughts as they use your site
- Written summary describing the problems they encountered

“Use it and your site will get better.”

Evan Williams | **twitter** Co-Founder [More »](#)

Try It Risk-Free

1-Year Money-Back Guarantee



Quick Tour

UserTesting.com provides on-demand usability testing

<http://www.clicktale.com/>

- Similar to Userfly, [ClickTale](#) captures the actions of your website's visitors, including clicks, scrolling, and keystrokes. Other features offered include a scrolling heat map, form analytics, and individual link analysis (e.g. how many clicks or hovers did each link get?).
 - ClickTale has a free plan that records 400 page views per month for one domain. Some of the features in the free plan are limited; for example, the scrolling heat map is available only for your most popular page.
 - Paid plans start at \$99 a month, which is still a competitive price for the features that this service offers.
-

Customer Experience Analytics

Watch actual browsing behavior

Optimize website usability

Boost conversion rates



Plans & Pricing

3 months Free inside

[Enterprise Solution](#)

[Request a Demo](#)

[Take Product Tour >>](#)



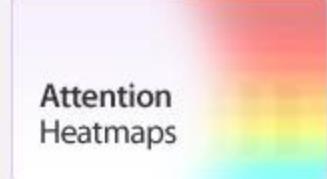
[Watch Visitors](#)



[Mouse Move
Heatmaps](#)



[Form
Analytics](#)



[Attention
Heatmaps](#)



[Advanced
Filtering](#)

[40,000 Customers and Counting >>](#)

[Resources >>](#)

[http://smt.speedzinemedia.com
/smt/](http://smt.speedzinemedia.com/smt/)

□ [Simple Mouse Tracking](#) is another free tool to track a visitor's mouse movements and clicks on your site. You'll need PHP on your server to run it, although the actual pages don't have to be PHP-based; they just require a bit of JavaScript.

(smt) simple mouse tracking

[preface](#) [abstract](#) [features](#) [system architecture](#) [references](#)

[demo](#) [examples](#) [downloads](#)
[comments](#) [contact](#)

O_o



“

The way to create something beautiful is often to make subtle tweaks to something that already exists, or to combine existing ideas in a slightly new way. This kind of work is hard to convey in a research paper.

Paul Graham - Hackers and Painters

<http://silverbackapp.com/>

Silverback makes it easy, quick and cheap for everyone to perform guerrilla usability tests with no setup and no expense, using hardware already in your Mac.

so says [Softpedia](#) | [Next testimonial »](#)



Cleleft presents

Silverback

Spontaneous, unobtrusive
usability testing software for
designers and developers.

- 🍌 Capture screen activity
- 🍌 Video the participant's reactions
- 🍌 Record the participant's voice
- 🍌 Add chapter markers on the fly
- 🍌 Control recording with the remote
- 🍌 Export to Quicktime

Download

FREE FOR 30 DAYS



Purchase

\$49.95

10% OF ALL PROFITS GO TO SAVE THE GORILLAS

<http://www.etre.com/tools/colorblindsightulator/>

Colour Blindness Simulator

These are the results of your colour blindness simulation.

Original

This is the image you uploaded.



Simulation

This is how your image may appear to a person with protanopia.



Protanopia is a more common form of colour blindness, occurring in between 1% and 5% of males (varying by race) and in approximately 0.1% of females. You may like to simulate how someone with deutanopia or tritanopia views your image.

Other tools

- Link checker
 - HTML validator
 - CSS validator
 - Browser compatibility
-

Link checker

LinkChecker 9.3

File Edit Help

URL: Start

URLs: active 0 queued 0 checked 0 Info: 1 URL selected.

Parent	URL	Name	Result
http://www.fit.hcmus.edu.vn/vn/Default.aspx?alias=www.fit.hcmus.edu...	http://www.fit.hcmus.edu.vn/vn/mttvt/	Phòng 173 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?alias=www.fit.hcmus.edu...	http://www.fit.hcmus.edu.vn/vn/cv/	Phòng 164 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=574&language=vi...	http://www.fit.hcmus.edu.vn/vn/cv/	Phòng 164 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=592, line 146, col 6	http://www.fit.hcmus.edu.vn/vn/mttvt/	Phòng 173 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=592&language=vi...	http://www.fit.hcmus.edu.vn/vn/mttvt/	Phòng 173 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=702, line 143, col 6	http://www.fit.hcmus.edu.vn/vn/mttvt/	Phòng 173 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=702&language=vi...	http://www.fit.hcmus.edu.vn/vn/mttvt/	Phòng 173 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=703, line 164, col 6	http://www.fit.hcmus.edu.vn/vn/mttvt/	Phòng 173 - 38354266 (ext...)	Error: 404 Not Found
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http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=705&language=vi...	http://www.fit.hcmus.edu.vn/vn/mttvt/	Phòng 173 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=706, line 128, col 85	http://www.fit.hcmus.edu.vn/vn/%E2%80%9Chttps%3A/www.coursera.org/course/cloudcomput...	https://www.coursera.or...	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=706, line 128, col 238	http://www.fit.hcmus.edu.vn/vn/%E2%80%9Chttps%3A/www.coursera.org/course/cloudcomput...	https://www.coursera.or...	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=706, line 128, col 351	http://www.fit.hcmus.edu.vn/vn/%E2%80%9Chttps%3A/www.coursera.org/course/cloudcomput...	https://www.coursera.or...	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=706, line 128, col 419	http://www.fit.hcmus.edu.vn/vn/%E2%80%98https%3A/www.coursera.org/course/cloudcomput...	https://www.coursera.or...	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=706, line 149, col 6	http://www.fit.hcmus.edu.vn/vn/mttvt/	Phòng 173 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=706&language=vi...	http://www.fit.hcmus.edu.vn/vn/%E2%80%9Chttps%3A/www.coursera.org/course/cloudcomput...	https://www.coursera.or...	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=706&language=vi...	http://www.fit.hcmus.edu.vn/vn/%E2%80%9Chttps%3A/www.coursera.org/course/cloudcomput...	https://www.coursera.or...	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=706&language=vi...	http://www.fit.hcmus.edu.vn/vn/%E2%80%98https%3A/www.coursera.org/course/cloudcomput...	https://www.coursera.or...	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=707, line 227, col 6	http://www.fit.hcmus.edu.vn/vn/cv/	Phòng 173 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=707&language=vi...	http://www.fit.hcmus.edu.vn/vn/cv/	Phòng 164 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=708, line 199, col 6	http://www.fit.hcmus.edu.vn/vn/cv/	Phòng 164 - 38354266 (ext...)	Error: 404 Not Found
http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=708&language=vi...	http://www.fit.hcmus.edu.vn/vn/cv/	Phòng 164 - 38354266 (ext...)	Error: 404 Not Found

URL properties

URL
Name Phòng 173 - 38354266 (ext 703)
Parent URL [http://www.fit.hcmus.edu.vn/vn/Default.aspx?tabid=703](#)
Base
Check time 3.368 seconds
D/L time
Size 1KB
Modified
Info
Warning
Result Error: 404 Not Found

Check results

Valid URLs 18845 Warnings 0
Invalid URLs 105

Content type statistics

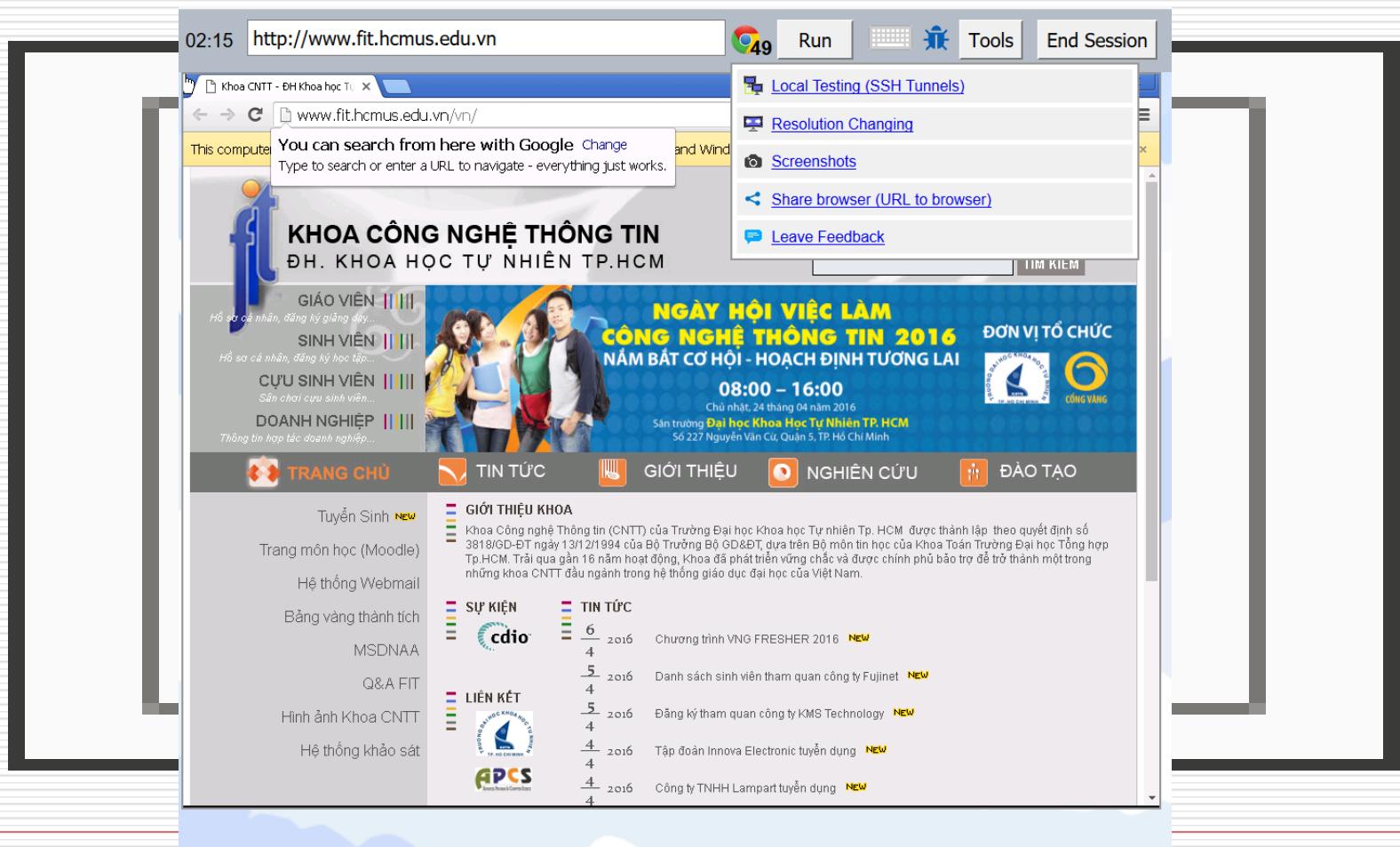
Image 5280	Text 6606	Application 1475
Audio 0	Video 0	Mail 48
Other 5541		

URL statistics

Min. length 21	Avg. length 89
Max. length 319938	

1 URL selected.

www.browserling.com



<https://crossbrowsertesting.com>

Why Choose CrossBrowserTesting?



2050+ Browser Configurations

Test Chrome, FireFox, Safari, Edge, IE, Windows, OSX, iOS, and more.



100% Real Devices

Test on physical, real devices like the iPhone, Samsung Galaxy, iPad Pro, and more.



Debugging Tools

Native debugging tools like FireBug and Dev tools.



Trust & Security

Enterprise grade security on all of your test data and connections.



Local Testing

Securely test behind your firewall, on a staging server, or locally.



Rest API

Intuitive API lets you test using our entire platform from the command line.



Screenshot Engine

Take automated screenshots across multiple browsers or devices.



Responsive Testing

Quickly test mobile layouts & responsiveness.



Screenshot Comparison

Compare screenshots side-by-side for easy visual regression testing.

<https://www.toptal.com/designers/colorfilter>

Colorblind Web Page Filter

What are color blind anomalies? ⓘ

Please indicate a resource to be viewed, and a color filter to be applied to that resource.

Type a URL:

<http://www.fit.hcmus.edu.vn>

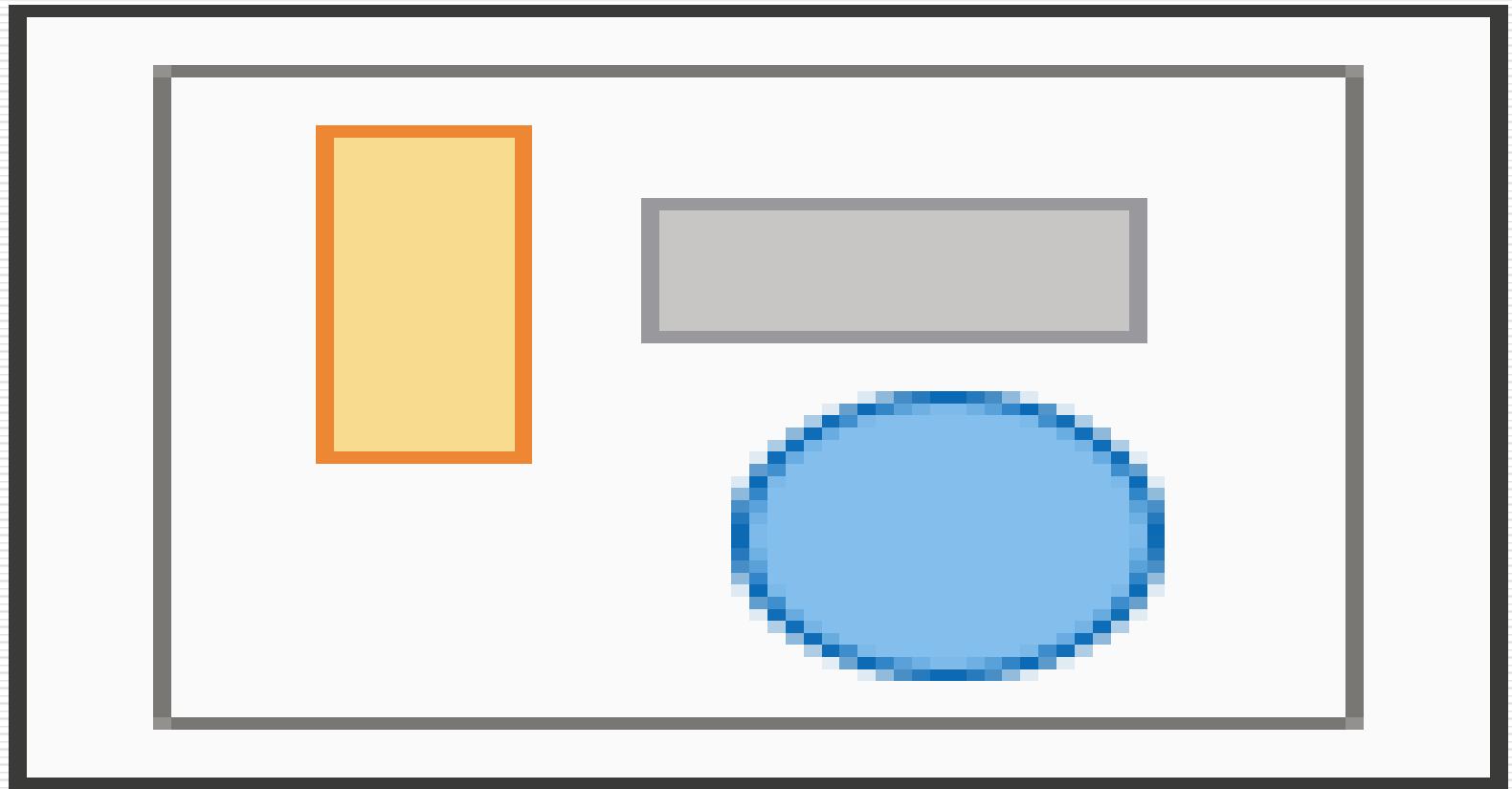
And then pick a color filter:

Protanopia

FETCH AND FILTER!

The screenshot shows the homepage of the Khoa Công Nghệ Thông Tin (FIT) at <http://www.fit.hcmus.edu.vn>. The page features a blue header with the university logo and the department name. Below the header is a navigation bar with links for TRANG CHỦ, TIN TỨC, GIỚI THIỆU, NGHIÊN CỨU, and ĐÀO TẠO. The main content area includes sections for GIÁO VIÊN, SINH VIÊN, and DOANH NGHIỆP, along with news articles and event announcements. The overall design uses a light blue and white color scheme.

The screenshot shows the same website after applying the Protanopia color filter. The colors have been adjusted to be more monochromatic, appearing in shades of grey, blue, and yellow. The text and buttons remain legible but lack the original color contrast. The layout and content are identical to the original version.



SmartBear SecureTunnel

Desktop App

Command Line

If you haven't already, [download the SmartBear SecureTunnel App.](#)

Select Connection Type

- Internal Websites
- Local HTML Files
- Proxy Server

Configuration Options

- Bypass tunnel for public URLs (speeds up tests)
- Accept all SSL certificates

[Help docs](#)

[Close](#)

[Connect](#)

Refs:

- <https://uxchecklist.github.io/>
 - <https://www.checklist.design/>
 - <https://strongqa.com/qa-portal/testing-docs-templates/checklist>
 - <https://www.hotjar.com/usability-testing/template-checklist/>
 - <http://www.colorvisiontesting.com/>
-