

# MWUG

Manchester WordPress User Group

19th March 2014

## PERFORMANCE FOR BEGINNERS

Theory & Practice

@philipvalentino

# OBJECTIVES OF THIS TALK

Illustrate today's performance context on the web

Show you what can you do today

Demonstrate some tools to help you

# STRUCTURE OF THIS TALK

Some Theory

Some Practical

No Exam



# THEORY

# PERFORMANCE IS DESIGN



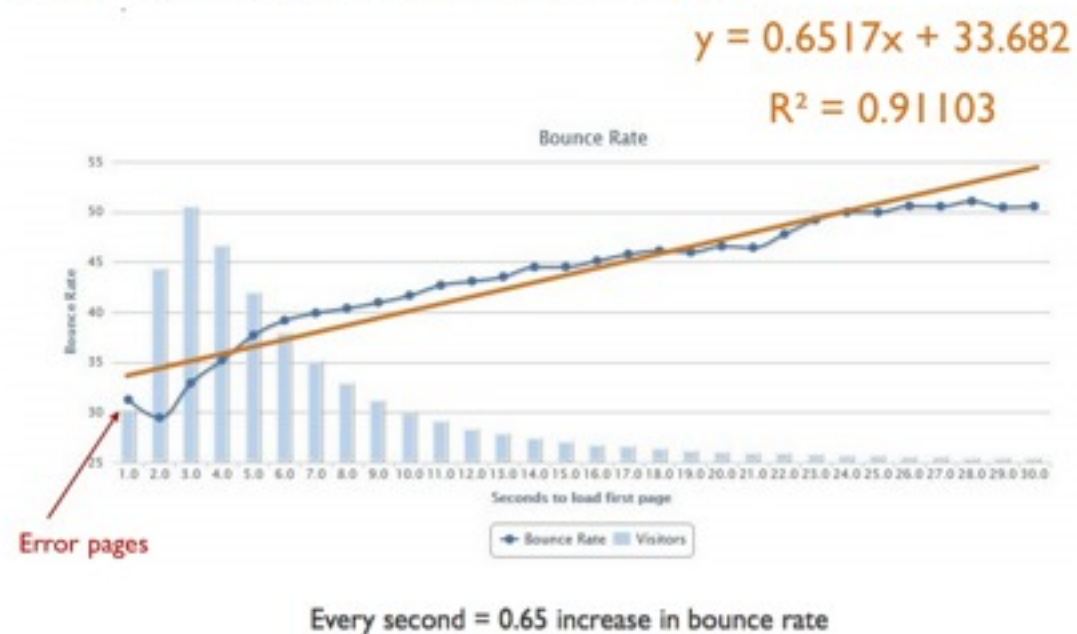


# THE NEED FOR SPEED

not speeding is likely to cost you

[There are many example of such curves on the web]

## How speed affects bounce rate



## "40% Abandon A Website That Takes More Than 3 Seconds To Load"



<http://www.igvita.com/slides/2012/webperf-crash-course.pdf>

<http://www.roaringtraffic.com/seo-tips-tricks/how-to-increase-conversions-by-7-and-improve-rankings-page-speed/>

# THE NEED FOR SPEED

Speed is a ranking factor for search engines

“We encourage you to start looking at your site's speed (the tools above provide a great starting point) — not only to improve your ranking in search engines, but also to improve everyone's experience on the Internet.”

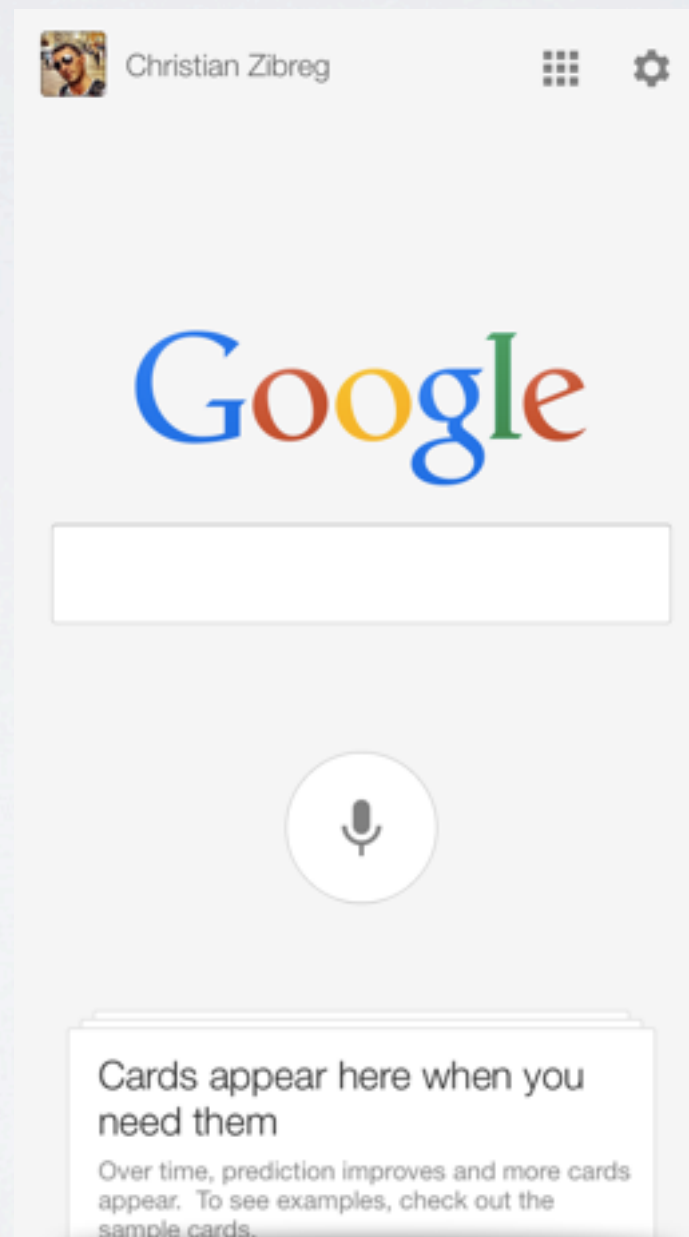
*Google said this in 2010...*

<http://googlewebmastercentral.blogspot.co.uk/2010/04/using-site-speed-in-web-search-ranking.html>



# USER EXPECTATIONS

... are now set high and will not be lowered





# WHAT IS THE WEB ?

**H** umans

**A** pplications

**N** etworks

**D** evices



# THE WEB IS VARIABLE

## HUMANS

*Different levels of skill, different physical abilities, different cultural norms*

## APPLICATIONS

*The universe of programs and data that do stuff for you (WordPress !)*

## NETWORKS

*Wifi, 2G, 3G, 4G, LANs, etc*

## DEVICES

*15,000 different devices access Facebook every day...*



# THE WEB IS HELL

*“The browser is the most hostile programming environment ever devised ...  
but then I discovered programming for mobile.”*

Douglas Crockford

“javascript elder”

# IT GETS WORSE

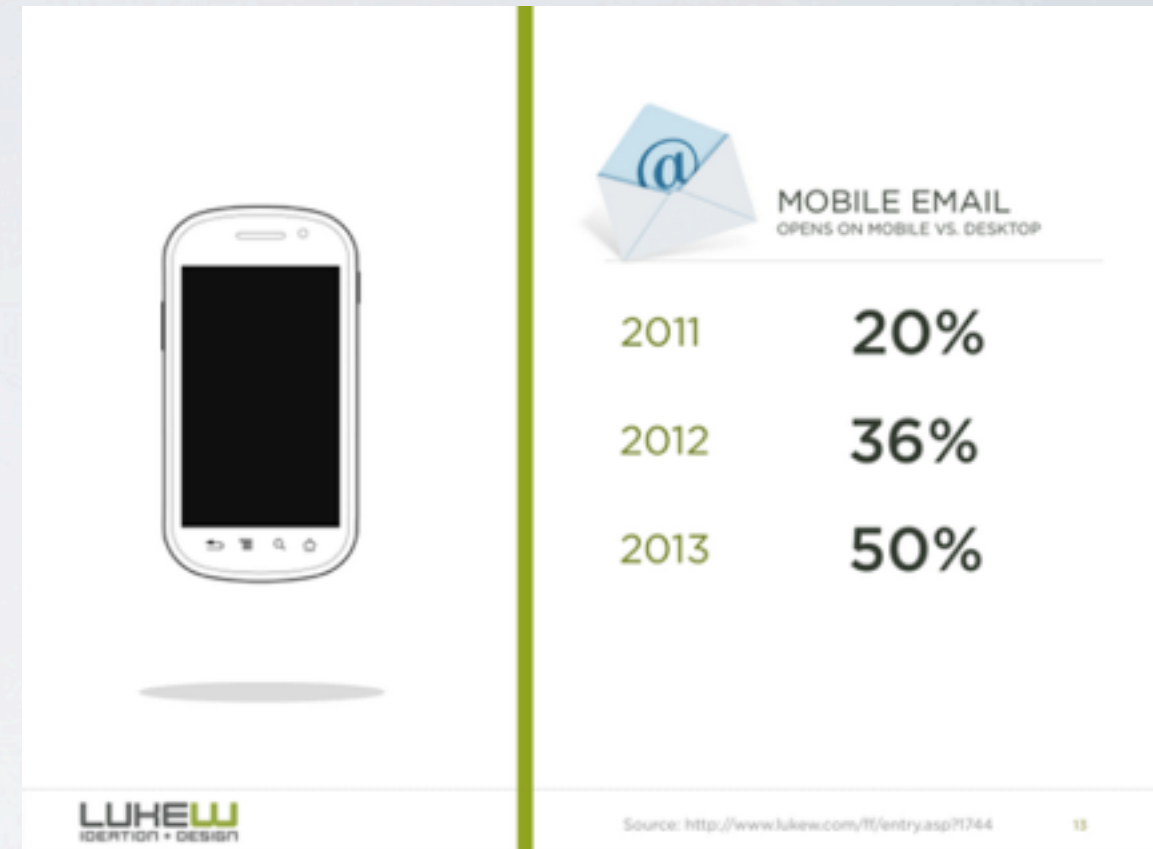
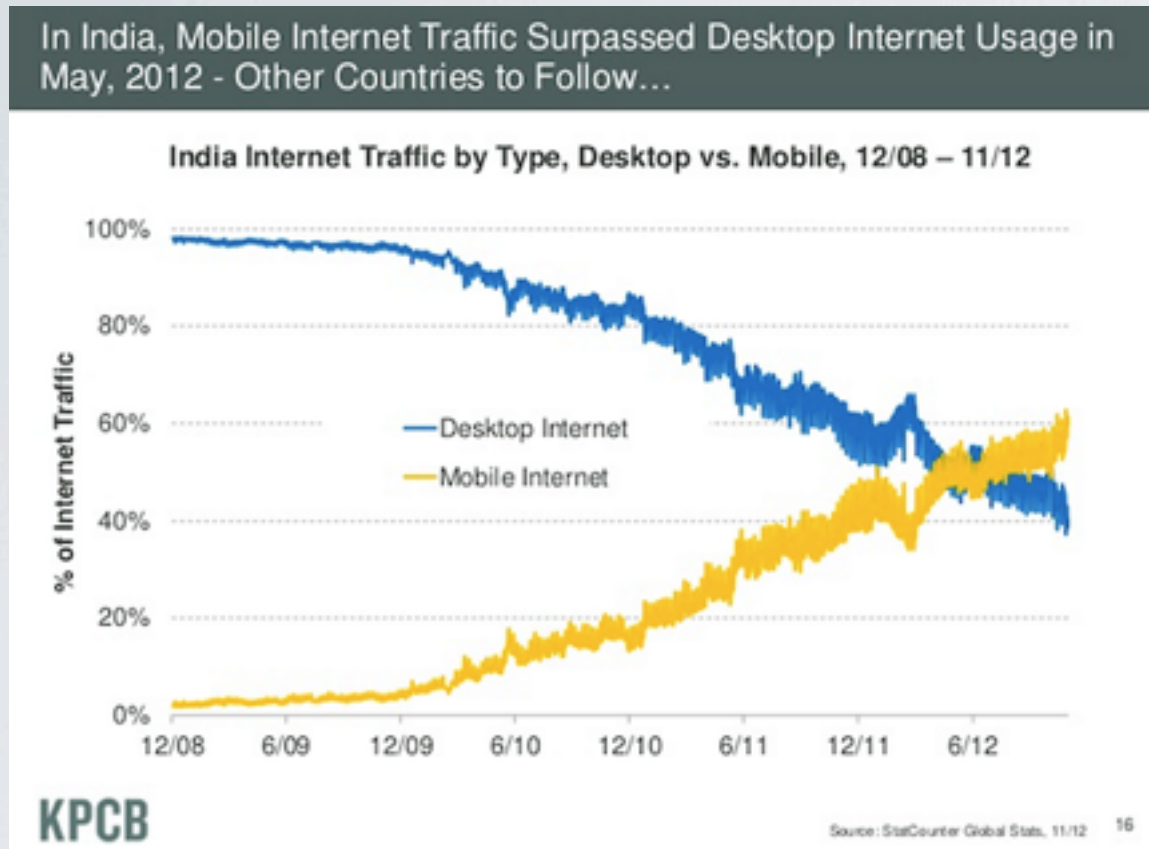
Modern browsers on modern devices are faster and support more of latest web technologies.

*Your website visitor may have none of the above.*

BUT once you have traffic you can measure this 😊



# ALONG CAME THE DEVICES



“There are now 2.4 billion Internet users around the world, and the total continues to grow apace. Mobile usage is expanding rapidly...”

Mary Meeker KPCB May 2013

# DOES IT WORK ON DEVICES

[The fancy term for this is “responsive”]

The screen dimensions are different

Smartphones invariably have “touch”

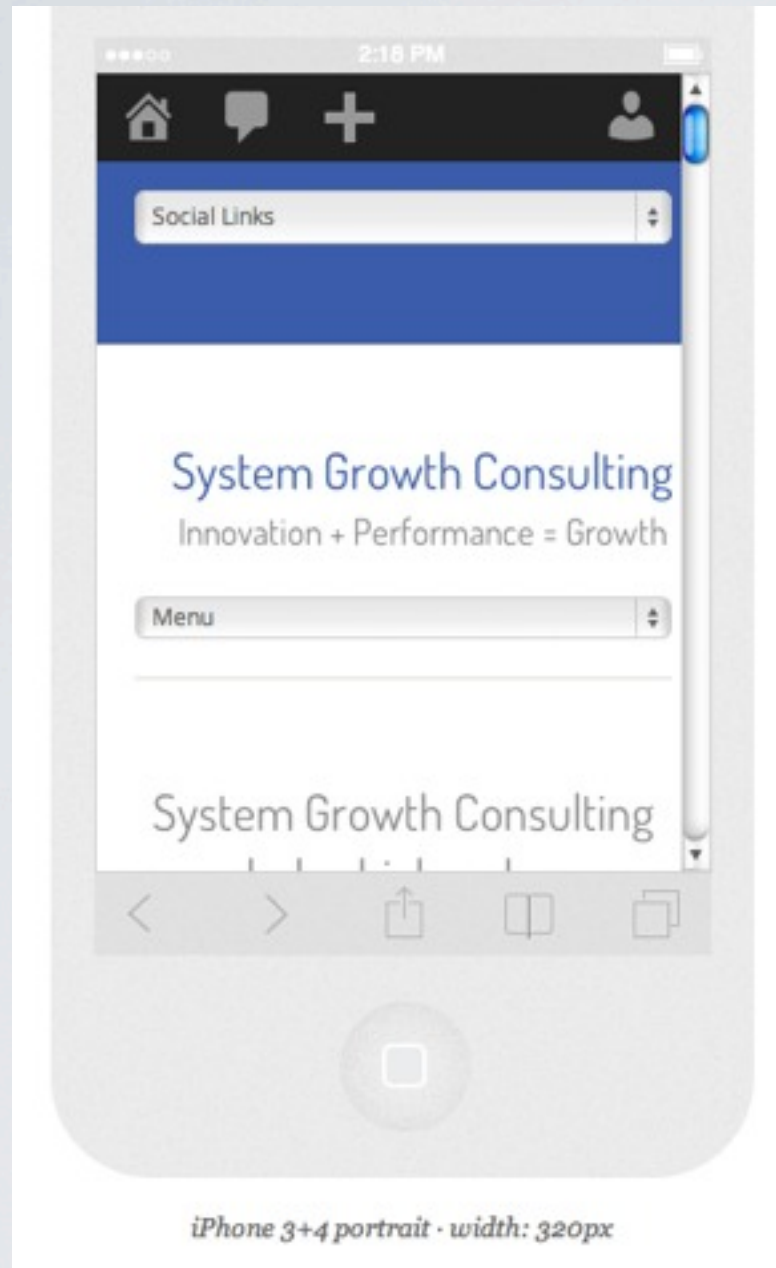
fingers are “fatter” than mouse pointers

The navigation will likely be different

Things that work on big screens but not small ones



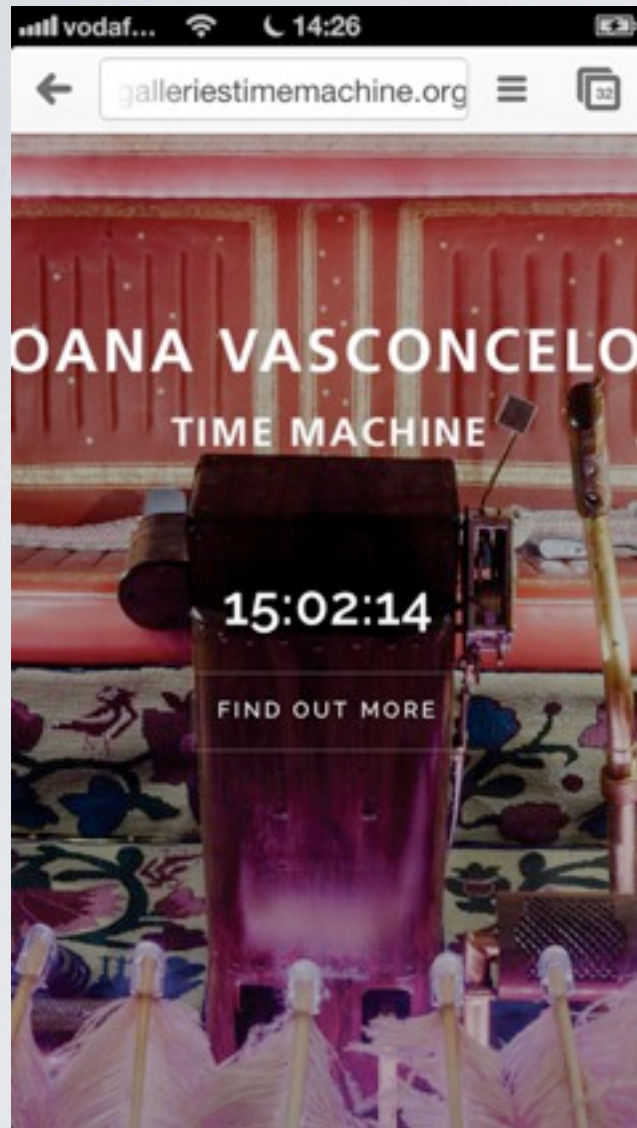
# BAD



Little content of value visible on the initial device view



# REALLY BAD

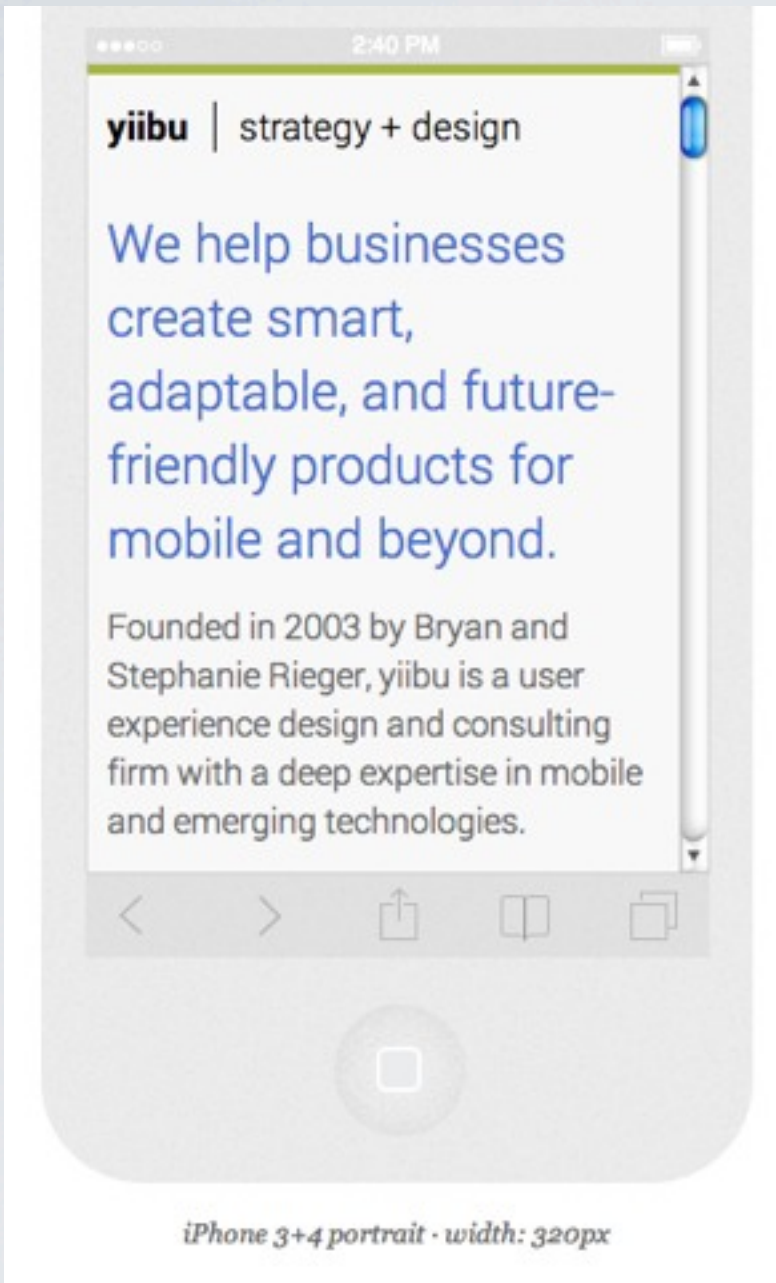


loads..... very..... slowly..... and title truncated

<http://www.manchestergalleriestimemachine.org/>



# GOOD



yiibu | strategy + design

We help businesses create smart, adaptable, and future-friendly products for mobile and beyond.

Founded in 2003 by Bryan and Stephanie Rieger, yiibu is a user experience design and consulting firm with a deep expertise in mobile and emerging technologies.

## How we work

### WE'RE SMALL :-)

When you hire Yiibu, you get the two of us. Period. Staying small means we have little overhead and can focus entirely on the work we do. We don't leave your project to juniors, or farm work out to other companies or contractors. As such we tend have a lot of repeat business; so much in fact that we typically work with only a few very special clients each year.

### WE'RE EXPERIENCED

We have extensive mobile experience and specific expertise designing for highly diverse and globally-distributed audiences. Our process is highly iterative and includes frequent prototyping and on-device testing using our in-house lab. This enables us to spot performance and compatibility problems early on, and involve necessary stakeholders to ensure that your creative, technical and business goals are realized.

### WE WORK WITH YOU

If you choose to work with us, we will get to know your company, your customers, and your product. Not because we want to up-sell you, but because mobile isn't just a project—it's a journey. We're happy to work with your management, engineers and stakeholders to understand and explore the impact of mobile on the success and profitability of your organization.

## A few of our clients

vodafone

Microsoft

symbian

intel

dotMobi

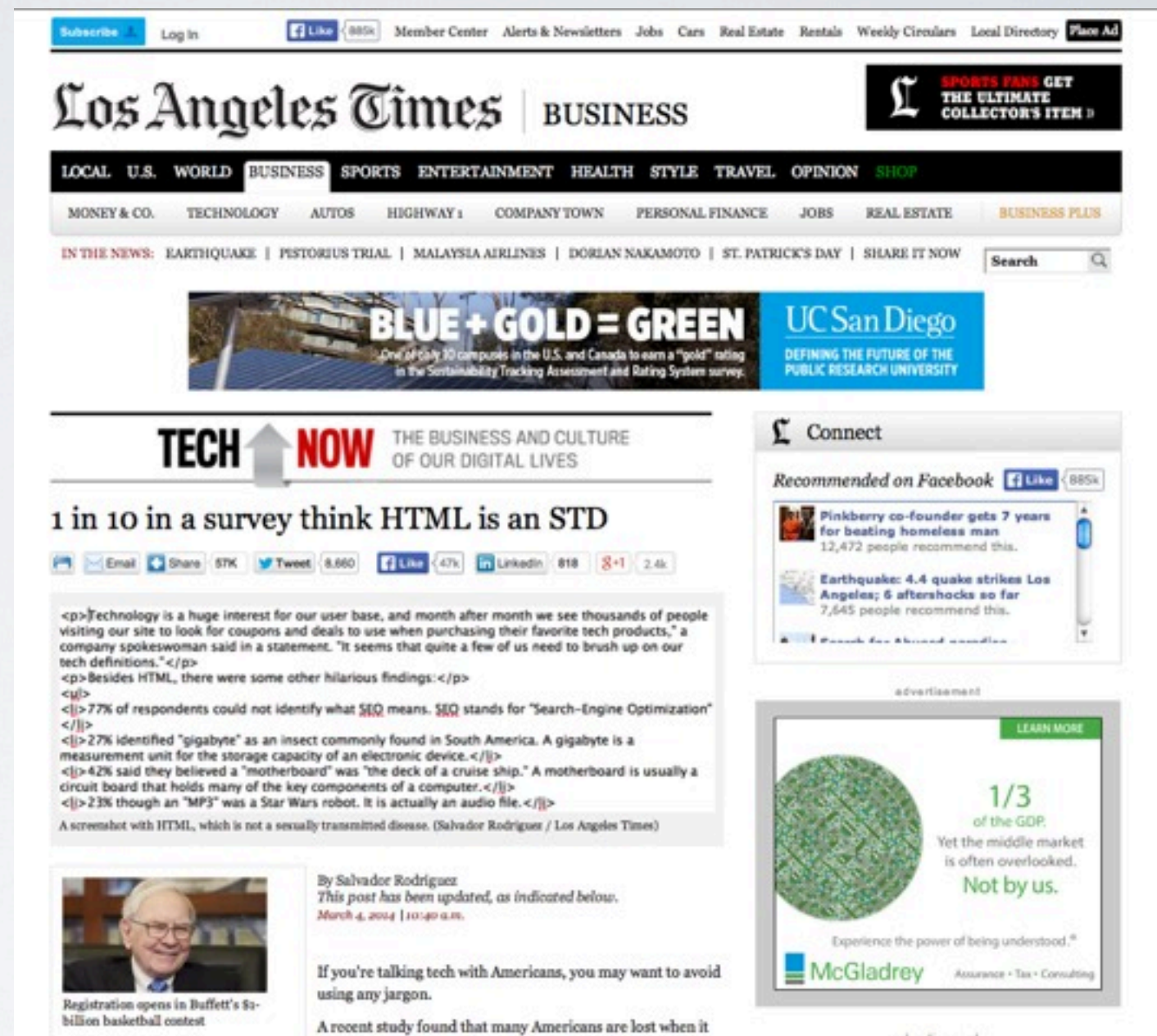
OPERA software

simple, clean, easy to read

<http://yiibu.com/>



# BAD



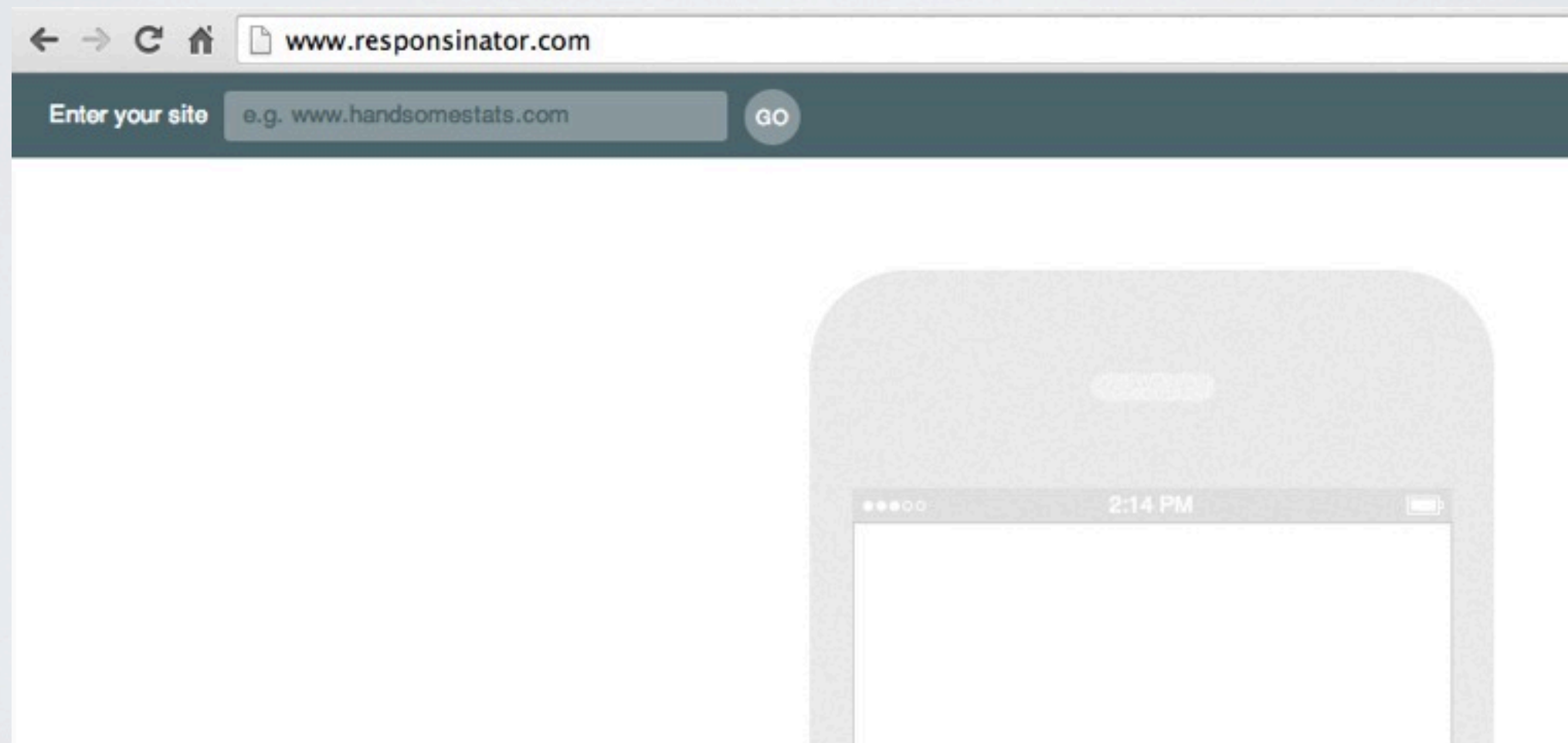
text on device is truncated...



# GO RESPONSIVE TODAY

Install responsive theme(s) or use the demo theme(s)

Run a sanity check using responsinator on a desktop



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

# BANDWIDTH

*How much “stuff” can come down the pipe per second*

[ jQuery is a file commonly used by WordPress plugins ]

A network with download speeds of 1Mbps can download  
125KB in a second.... jQuery takes

229ms to download on the worst mobile networks (1Mbps),

46ms to download on average mobile networks (5Mbps),

19ms to download on awesome mobile networks (12Mbps).

<http://flippinawesome.org/2014/03/10/is-jquery-too-big-for-mobile/>



# LATENCY

*How long before “stuff” starts coming down the pipe*

In the context of web applications, latency is the amount of time it takes for the browser to connect with an external server on the network. Historically, we didn't worry too much about latency for **desktop development**, as RTTs on wifi networks are small – typically well **under 50ms**.

We have no such luck with mobile. In 2012 the **average** RTT time on a **mobile network** in the United States was **344ms**. And that 344ms applies to not only every HTTP request – which the average web page now makes **93** of – but also every DNS lookup and TCP connection.

The RTT data is from 2012, and average RTTs have improved some. For example Virgin Mobile advertises that the average latency on its **4G network is now 150ms**. But while average RTTs are improving, there are only small additional gains to be had, as current networks are within a small factor of the theoretical limit dictated by physics.

<http://flippinawesome.org/2014/03/10/is-jquery-too-big-for-mobile/>

# PRACTICE



# THINK 80/20

## **The Front-End**

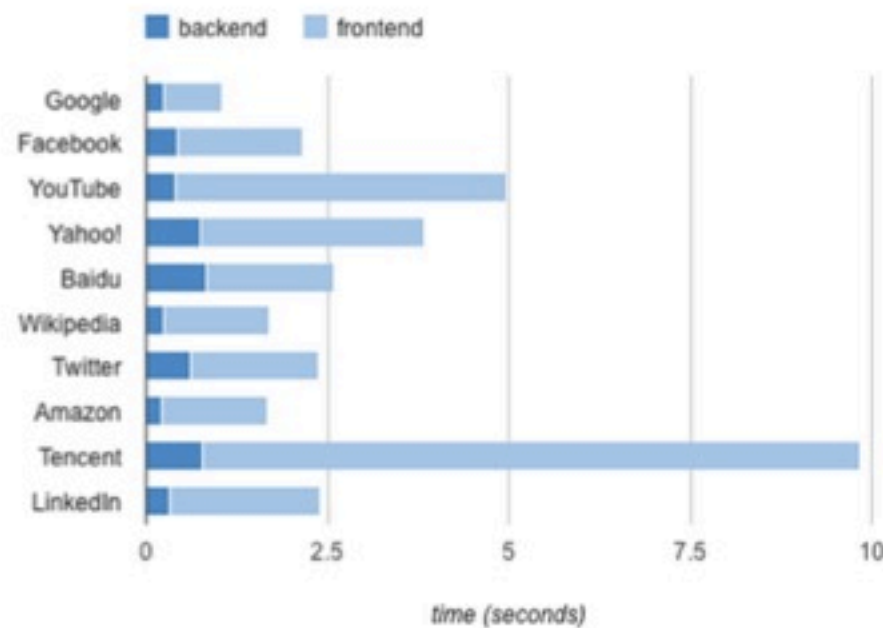
Focus on the size and numbers of “assets” - *especially images* - that you are sending to the browser - due to bandwidth & latency constraints, and variable device capabilities

## **The Back-End**

WordPress [ the application ] on servers [somewhere] is *unlikely* to be a bottleneck on performance

# THINK 80/20

## What do we mean by "frontend" performance?



*Frontend this... backend that...*

**Focus on the *lifetime* of the page.**

*It just so happens that our pages are growing in complexity, and many resources are now scheduled by the browser. Not surprisingly, that's where you will find many optimization opportunities.*



*“80-90% of the end-user response time is spent on the front-end. Start there.” Steve Souders*

<http://www.stevesouders.com/blog/2012/02/10/the-performance-golden-rule/>



# AVERAGE PAGE STATS

According to the [HTTP archive](#) the *average* Web page now

- is over 1.7MB,
- makes over 90 HTTP requests,
- has over 275K of JavaScript,
- makes 17 HTTP requests for JavaScript alone,
- includes over 1MB of images,
- makes only 46% of its resources cacheable.

Use the following ‘Speedometers’ to gather your own website baseline (average over say 6 tests)

Source: <http://flippinawesome.org/2014/03/10/is-jquery-too-big-for-mobile/>

# SPEEDOMETERS (I)

PageSpeed Insights 8+1 14k

[http://en.wikipedia.org/wiki/Firefox\\_OS](http://en.wikipedia.org/wiki/Firefox_OS)

**Mobile** Desktop

**61 / 100** Speed

**Should Fix:**  
Eliminate render-blocking JavaScript and CSS in above-the-fold content  
→ [Show how to fix](#)

Leverage browser caching  
→ [Show how to fix](#)

**Consider Fixing:**  
Optimize images  
→ [Show how to fix](#)

**7 Passed Rules**  
→ [Show details](#)

PageSpeed Insights 8+1 14k

[http://en.wikipedia.org/wiki/Firefox\\_OS](http://en.wikipedia.org/wiki/Firefox_OS)

Mobile **Desktop**

**79 / 100** Suggestions Summary

**Should Fix:**  
Eliminate render-blocking JavaScript and CSS in above-the-fold content  
→ [Show how to fix](#)

**Consider Fixing:**  
Leverage browser caching  
→ [Show how to fix](#)  
Minify HTML  
→ [Show how to fix](#)

**7 Passed Rules**  
→ [Show details](#)

PageSpeed Insights gives Mobile & Desktop scores, and some recommendations... covered later

<https://developers.google.com/speed/pagespeed/insights/>



# SPEEDOMETERS (II)

The Page Analysis tab has some useful summaries

**Pingdom Website Speed Test**  
Enter a URL to test the load time of that page, analyze it and find bottlenecks

http://mwug.info **Test Now**

Save test and make it public

**Test from:**

Amsterdam, Netherlands  New York City, New York, USA  
 Dallas, Texas, USA

Settings

**http://mwug.info**  
Tested from Amsterdam, Netherlands on March 19 at 15:28:15

Perf. grade	Requests	Load time	Page size
79/100	60	1.06s	166.2kB

Your website is faster than 88% of all tested websites

DOWNLOAD HAR [Tweet](#) [Post to Timeline](#) [Email](#)

Waterfall Performance Grade Page Analysis History

## Size Analysis

### Size per Content Type

Script	100.7 kB
Image	40.9 kB
CSS	16.2 kB
HTML	10.4 kB

## Request Analysis

### Requests per Content Type

Script	40
Image	10
CSS	9
HTML	1

<http://tools.pingdom.com/fpt/>

# SPEEDOMETERS (III)

WebPageTest VMHOSTS.CO.UK CLOUD HOSTING WITHIN REACH

HOME TEST RESULT TEST HISTORY FORUMS DOCUMENTATION ABOUT

Web Page Performance Test for news.bbc.co.uk

PageSpeed 1.12 Score: 88/100

Need help improving?

C	A	C	B	F	B	✓
First Byte Time	Keep-alive Enabled	Compress Transfer	Compress Images	Progressive JPEGs	Cache static content	Effective use of CDN

From: London, UK - IE 9 - Cable  
3/19/2014 3:49:31 PM

Summary Details Performance Review PageSpeed Content Breakdown Domains Screen Shot

Re-run the test

Raw page data - Raw object data  
Export HTTP Archive (.har)  
See in ShowSlow  
View Test Log

	Load Time	First Byte	Start Render	Speed Index	DOM Elements	Document Complete			Fully Loaded		
						Time	Requests	Bytes In	Time	Requests	Bytes In
First View	8.829s	0.313s	4.160s	5339	1598	8.829s	156	1,031 KB	9.655s	175	1,103 KB
Repeat View	6.591s	0.345s	3.303s	4585	1591	6.591s	21	248 KB	7.972s	25	260 KB

Waterfall Screen Shot Video

webpagetest - you can test on london servers, against various browsers - plus traffic light scores

<http://www.webpagetest.org/>



# A PAUSE FOR REFLECTION

## HUMANS

*You have ( as good as ) no control over other humans*

## APPLICATIONS

**You have control over the application**  
**focus on the “80%” that arrives in the browser**

## NETWORKS

*You have no control over the network*

## DEVICES

*You have no control over the devices people use*

# WHAT TO DO ?

- i) Favour Simplicity over Complexity
  - ii) Minimise Your Requests
  - iii) Optimise Your Images
  - iv) Compress Your Assets
  - v) Cache Your Assets
- vi) Keep measuring against your baseline



# YOUR BASELINE

Current Score / Performance Grade

Total Requests

Load Time

Page Size

Bonus marks : number of image requests

*Think about setting a budget eg. 1MB max page size, 50 requests.*

*There is no correct budget here, but adding stuff infinitum ?*

# 1) FAVOUR SIMPLICITY

Does your theme have LOADS of options ?

Is your design loaded with distractions ? (LA Times)

Is the design clean and simple for devices (Yiibu)

For performance... text is cheaper than images

Great typography & fonts can give you good mileage

Search / filter for 'minimal', 'clean', 'simple' etc. themes



## 2) MINIMISE YOUR REQUESTS

- Does all that interactivity work on small devices ?

  - [ sliders, lightboxes, show/hide, animations ]

in broad terms these require more requests... and are often provided via plugins / theme options

- 50 x [ blog post + image ] on your homepage  
or will 5 or 10 posts do nicely ?

- Would more quality copy [i.e. text] be better for visitors, SEO, and performance - better than lots of stock photos ?

Note: the evidence is that Sliders / Carousels are bad for conversions...

<http://conversionxl.com/dont-use-automatic-image-sliders-or-carousels-ignore-the-fad/#>.

# 3) OPTIMISE YOUR IMAGES

*A possible workflow...*

- Take a copy / keep the master
- Rename the image for SEO and humans (accessibility)
  - Crop to the good stuff
- Reduce to the largest dimension it will be displayed
- Run it through a compression tool which strips off unnecessary “stuff” that cameras & software attach
  - Load it into WordPress

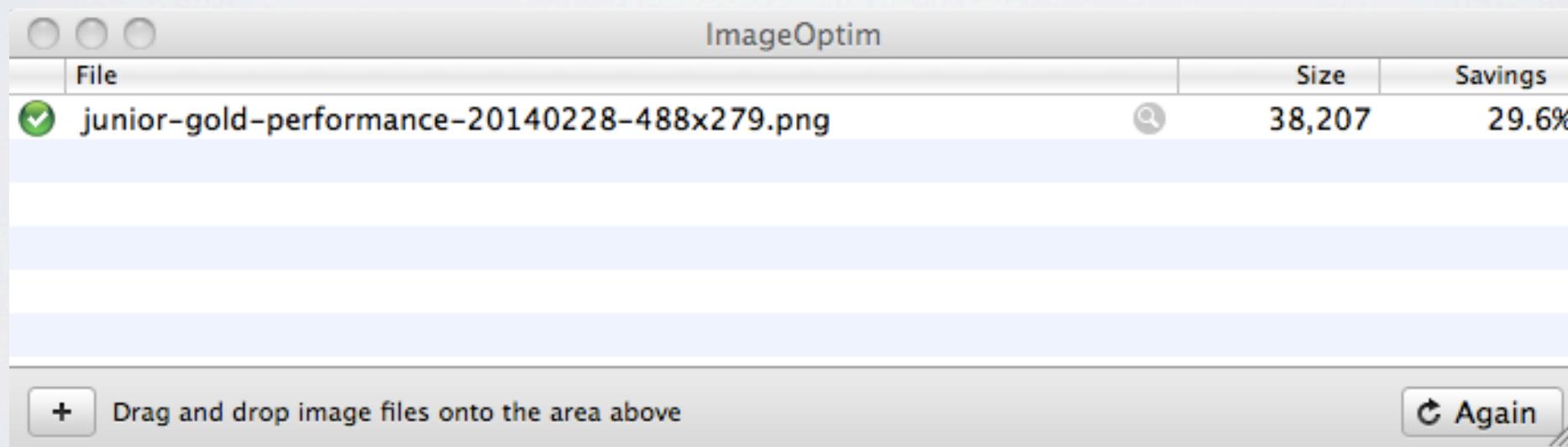


# IMAGEOPTIM / OSX

<http://imageoptim.com/>



drag & drop onto  
the dock icon

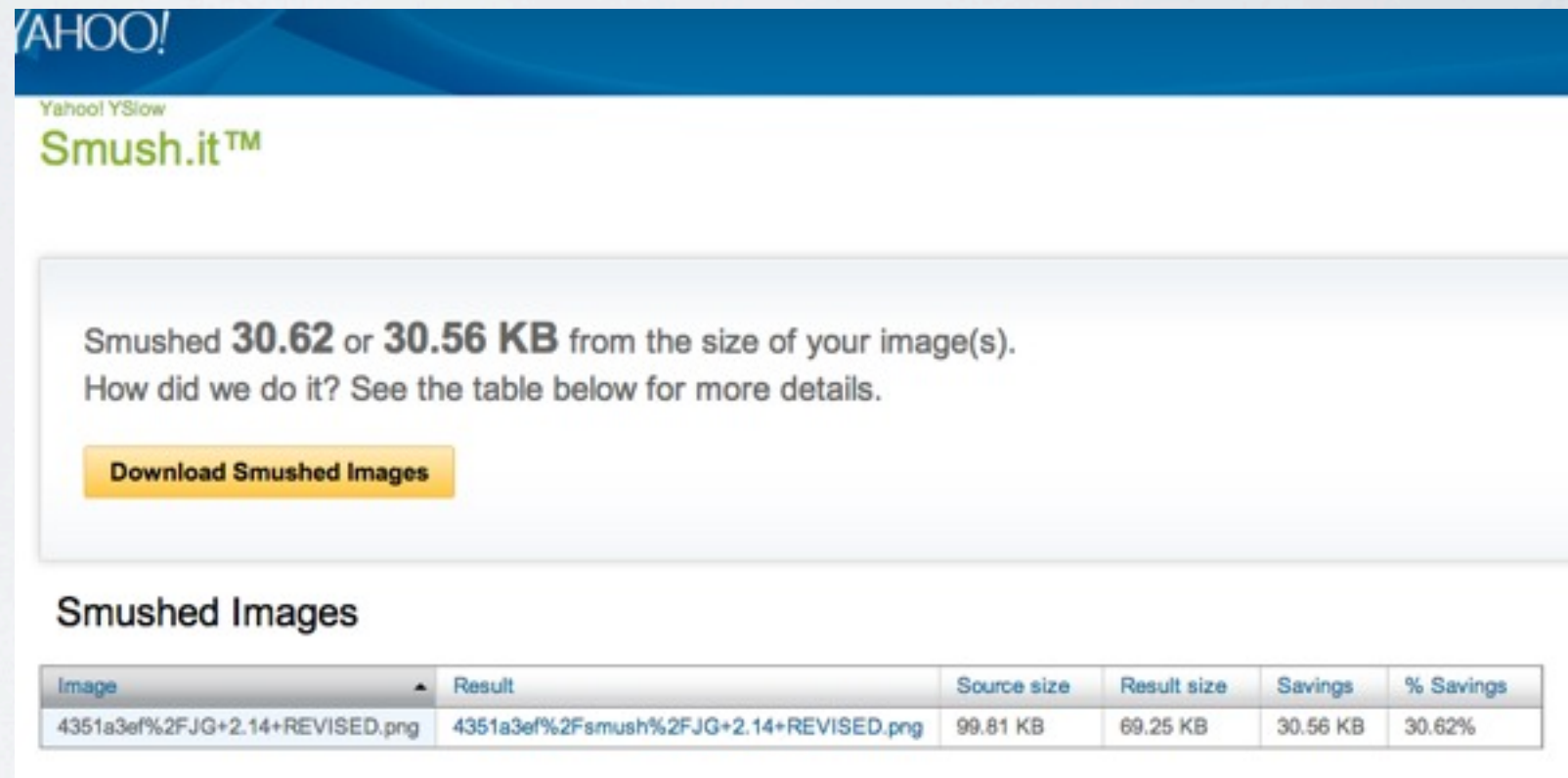


This image above was created in Excel on Windows... 30% saving

# SMUSHIT

<http://www.smushit.com/ysmush.it/>

A web based service...



... or get the plugin

<http://wordpress.org/plugins/wp-smushit/>




# WINDOWS

<http://www.creativebloq.com/design/image-compression-tools-1132865>

Tested	Runs on	Compression	Percentage file reduction: PNG test graphics	Percentage file reduction: JPG test graphics	Percentage file reduction: GIF test graphics
AdvanceComp 1.15	Windows	Lossless	-14.20%		
Caesium 1.4.1	Windows	Lossy / lossless	+18.7%		
FILEminimizer 3.0	Windows	Lossy / lossless	-26.8%	-39.3%	-16.5%
FileOptimizer 2.10.135	Windows	Lossless	-42.2%	-17.7%	-15.9%
ImageOptim 1.4.0	Mac	Lossless	-17.8%	-18.3%	-16.2%
JPEGmini Lite 1.4.1	Mac	Lossless		-8.2%	
jStrip 3.3	Windows	Lossless		-16.1%	
OptiPNG 0.7.3	Windows	Lossless	-32.3%		
PNGGauntlet 3.1.2.0	Windows	Lossless	-41.3%		
PNGOptimizer 2.2	Windows	Lossy / lossless	-39.8%		
PNGOutWin 1.5.0	Windows	Lossless	-40.5%		
PUNYpng	Web	Lossless	-32.1%	-27.5%	-16.1%
RIOT 0.4.6	Windows	Lossy	-21.7%	-39%	-42.8%
ScriptJPG	Windows	Lossy / Lossless		Failed	
ScriptPNG	Windows	Lossless	-40.1%		
Smush.It	Web	Lossless	-35.3%	-1%	-23.9%
TinyPNG	Web	Lossy	-48%		
Trout's GIF Optimizer 2.3	Windows	Lossy / lossless			-16.7%



Free Trial

## JPEGmini



Free Up Disk Space,  
Share Photos Faster

---

---


Best For:  
Home Users,  
Casual & Amateur Photographers

---

# \$19.99

[Buy JPEGmini](#)

---

[LEARN MORE](#) 

# POST PRESENTATION UPDATE

By the power of MWUG

this plugin was brought to my attention after the talk.

I have not tried it / but “roots” is well regarded.

<http://roots.io/plugins/html5-boilerplate-htaccess/>

## Overview

Automatically add **HTML5 Boilerplate's .htaccess** to your WordPress installation.



# 4) GZIP YOUR ASSETS

*In simple terms*

The server can compress assets...  
...and the browser can decompress them

*The simplest solution I can recommend - if you don't have FTP ?*

- 1) Using the YOAST SEO plugin to edit the **.htaccess** file
- 2) Take a backup copy of what is already there
- 3) Add a couple of blank lines...
- 4) Copy the **compression** code into the bottom of the input box - and save it

<https://yoast.com/wordpress/plugins/seo/>

# EDIT THE .HTACCESS FILE

**Yoast WordPress SEO: Edit Files**

**Robots.txt**

If you had a robots.txt file and it was editable, you could edit it from here.

**.htaccess file**

Edit the content of your .htaccess:

```
# BOX-SIZING POLYFILL
AddType text/x-component .htc

# BEGIN WordPress
<IfModule mod_rewrite.c>
  RewriteEngine On
  RewriteBase /
  RewriteCond %{REQUEST_FILENAME} !-f
  RewriteCond %{REQUEST_FILENAME} !-d
  RewriteRule . /index.php [L]
</IfModule>
# END WordPress
```

Save changes to .htaccess

the bottom option  
in the left sidebar  
for the YOAST SEO  
plugin “Edit Files”



# THE COMPRESSION CODE

<https://github.com/h5bp/html5-boilerplate/blob/master/.htaccess>

Search the referenced doc for **Compression**  
copy everything in that section

```
# -----  
# | Compression |  
# -----  
  
<IfModule mod_deflate.c>  
  
    # Force compression for mangled headers.  
    # http://developer.yahoo.com/blogs/ymn/posts/2010/12/pushing-beyond-gzipping  
    <IfModule mod_setenvif.c>  
        <IfModule mod_headers.c>  
  
            image/x-icon \br/>            text/css \br/>            text/html \br/>            text/plain \br/>            text/x-component \br/>            text/xml  
  
        </IfModule>  
  
    </IfModule>  
  
</IfModule>
```

# 5) CACHE YOUR ASSETS

*In simple terms*

Your device browser can store local copies of assets, and avoid loading them a second time over the wire\*

*The simplest solution I can recommend - if you don't have FTP ?*

- 1) Using the YOAST SEO plugin to edit the **.htaccess** file
- 2) Take a backup copy of what is already there
- 3) Add a couple of blank lines...
- 4) Copy the **Caching** code into the bottom of the input box  
- and save it



# THE CACHING CODE

<https://github.com/h5bp/html5-boilerplate/blob/master/.htaccess>

Search the referenced doc for **Expires Headers**  
copy everything in that section

```
# -----  
# | Expires headers |  
# -----  
  
# The following expires headers are set pretty far in the future. If you  
# don't control versioning with filename-based cache busting, consider  
# lowering the cache time for resources such as style sheets and JavaScript  
# files to something like one week.  
  
<IfModule mod_expires.c>  
  
    ExpiresActive on  
    ExpiresDefault "access plus 1 month"  
  
    # CSS  
    ExpiresByType text/css "access plus 1 year"  
  
    ExpiresByType font/opentype "access plus 1 month"  
    ExpiresByType image/svg+xml "access plus 1 month"  
  
</IfModule>
```

# CAVEAT - CHANGING IMAGES

\*If you change an image eg. on an existing blog post give it a new name before loading it into WordPress eg. add **-v2** to the image name [ not the file extension]

This will be a new image (i.e. URL)  
to be downloaded and cached by your browser.  
If you just put the new image into WordPress with the same name (i.e. URL) the browser knows no different.



# 6) KEEP MEASURING

“and feel the speed flow through you”

more seriously...

what do the speedometers say ?

are bounce rates declining ?

is your page ranking improving on search engines ?

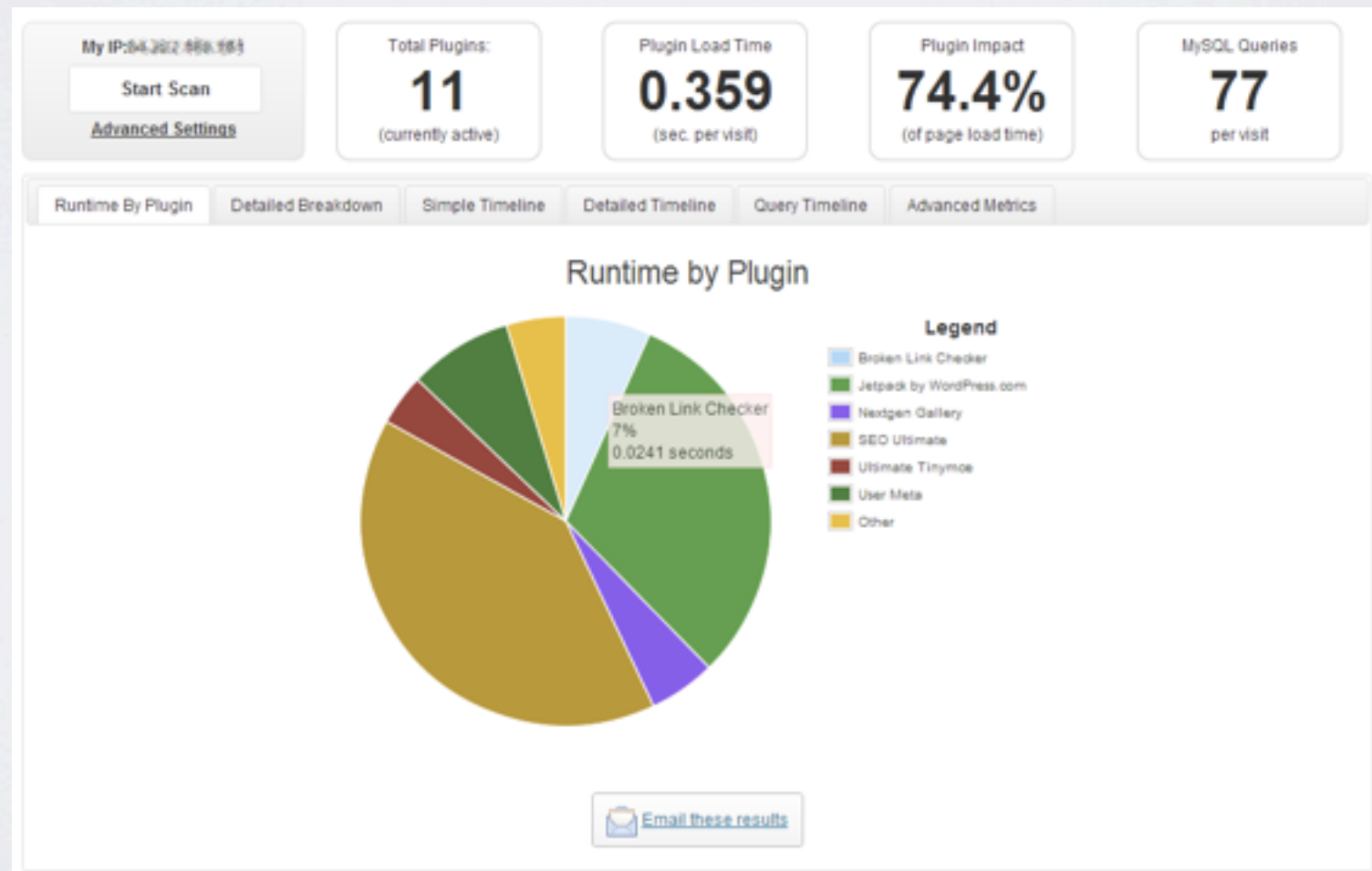
what do your users say ? ask a sample

how does it feel [under similar network conditions] ?

# BONUS TAKEAWAY

Check to see if any WordPress plugin is dis-proportionately harming performance

<https://wordpress.org/plugins/p3-profiler/>





THE END

*is almost nigh*

# GOOGLE ANALYTICS

Demographics	Browser	Visits	% Visits
Language	1. Safari	384	36.26%
Country / Territory	2. Chrome	344	32.48%
City	3. Internet Explorer	135	12.75%
<b>System</b>	4. Firefox	85	8.03%
Browser	5. Opera	40	3.78%
Operating System	6. Android Browser	31	2.93%
Service Provider	7. Safari (in-app)	27	2.55%
<b>Mobile</b>	8. Opera Mini	6	0.57%
Operating System	9. BlackBerry	2	0.19%
Service Provider	10. http:	2	0.19%
Screen Resolution			

[view full report](#)

and other analytics tools are a mighty big topic... for another talk

Demographics	Operating System	Visits	% Visits
Language	1. iOS	304	78.96%
Country / Territory	2. Android	73	18.96%
City	3. Windows Phone	4	1.04%
<b>System</b>	4. BlackBerry	3	0.78%
Browser	5. (not set)	1	0.26%
Operating System			
Service Provider			
<b>Mobile</b>			
Operating System			
Service Provider			
Screen Resolution			

[view full report](#)

BUT you can measure your users devices once you have traffic 😊



## Firefox smartphone hands-on review: the \$25 phone that lets you browse the web, send emails and play music

**\$25**

**Manufacturer:** Mozilla

By David Court | PC Advisor | 26 February 14

A smartphone that costs \$25 and works is a ridiculous idea, yet it is exactly what Firefox has managed to show off at MWC 2014. Here's our \$25 Firefox smartphone review.

EXPERT  
REVIEW

TECHNICAL  
SPECS

OUR  
VERDICT





## How Datawind, Canadian makers of 'world's lowest cost tablet,' is now aiming for a \$20 device



MICHAEL OLIVEIRA, CANADIAN PRESS | March 12, 2014 | Last Updated: Mar 12 2:50 PM ET  
More from Canadian Press



Datawind was recently named one of the world's 50 smartest companies by the MIT Technology Review magazine for launching low-cost tablets for students in India, branded under the Aakash name. PUNIT PARANLIPSIA/APP/Getty Images

### Aakash mark two

The UbiSlate 7Ci is the cheapest in a new line of Datawind tablets, which include the £50 3G data-enabled UbiSlate 7C+ and the £129 UbiSlate 3G7 – a slightly faster tablet with a higher resolution screen and 3G mobile data.

The UbiSlate tablet was originally produced by London-based Datawind for the Indian government as the Aakash (or "sky" in Hindi) series of tablets as part of India's effort to put ultra-low cost tablets in universities and colleges.

The Aakash was initially announced as a development by Indian scientists for a tablet computer that could be manufactured for just \$35 in 2010. Datawind later won the tender to build the tablets from the Indian government in 2011, before shipping them to Indian students in 2012 and following up with the Aakash 2 tablet on which the UbiSlate 7Ci is based.

"The development of the tablet stemmed from the realisation that lack of internet adoption in many parts of the world was primarily due to lack of affordability," said Singh Tuli. "We're bridging the gap by offering cost-effective, high-specification devices and internet access that offers excellent value to all."



**www.manchestergalleriestimemachi...**  
 Tested from Dallas, Texas, USA on March 21 at 00:07:31

Perf. grade	Requests	Load time	Page size
85/100	225	18.62s	23.4MB

Your website is slower than 94% of all tested websites

DOWNLOAD HAR | Tweet | Post to Timeline | Email

Dallas

**www.manchestergalleriestimemachi...**  
 Tested from Amsterdam, Netherlands on March 21 at 01:01:18

Perf. grade	Requests	Load time	Page size
85/100	217	5.63s	23.4MB

Your website is slower than 73% of all tested websites

DOWNLOAD HAR | Tweet | Post to Timeline | Email

Amsterdam

The grade seems high, but the load time ? the page size ?

Thankyou.