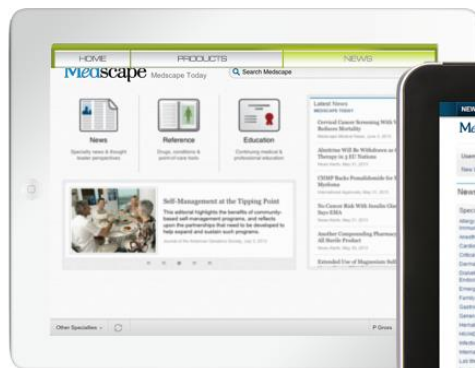


WEB BROWSING WITH TABLETS: COMPARING THE EXPERIENCE ON MULTIPLE PLATFORMS

A better Web browsing experience*



Apple® iPad® 4



Intel® Atom™ processor-based tablet

More issues than just Flash

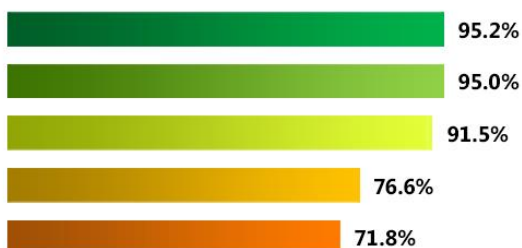
Testing uncovered more than just Flash problems on iOS and Android™. We experienced a range of issues from touchscreen, HTML5, and Java, to missing links, import/export issues, zoom problems, and bad formatting.

Less dependence on apps

Intel® Atom™ processor-based tablet did not require workaround apps which take up space on the Home screen and internal storage, and can require frequent updates via app stores such as Apple iTunes™ and Google Play.

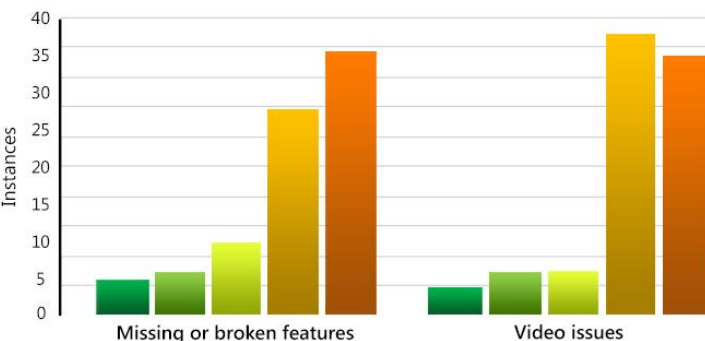
Fewer problems encountered means a fuller Web experience

The Intel Atom processor-powered tablet handled 95 percent of the sites we tested without issue



Intel Atom processor-based tablet with IE10®

Intel Atom processor-based tablet with Google Chrome™



Missing or broken features

Video issues

Android tablet with Google Chrome

Apple iPad 4 with Safari®

*versus the Web browsing experience on an Apple iPad, a representative Windows RT tablet, and a representative Android tablet.

Tablet devices vary considerably in terms of supporting the full range of Web content and technologies. Wouldn't you like your tablet to encounter fewer problems, be less dependent on workaround apps, and be more likely to just work the way you expect?

To learn about how different tablets handle a vast array of Web content, Principled Technologies staff visited over 400 sites chosen from Alexa's Top Sites list. We found that of the several browser/tablet combinations we tested in our lab, the Intel Atom processor-powered tablet running the Windows 8 Pro operating system and either the Microsoft® Internet Explorer® or Google Chrome browser experienced the fewest problems. Our findings suggest that this type of tablet is likely to deliver the feature-rich Internet browsing experience you have come to expect without filling precious storage space with extra apps.



HOW MUCH WEB DO YOU LOSE WITH A TABLET?

Many users have come to rely on tablet devices as highly portable tools for accessing Internet resources. For some, tablets augment a desktop or notebook system—if you try to visit a particular site and your tablet runs into trouble, you can easily reach for an alternative. When you're traveling light and relying solely on your tablet, however, such instances of incompatibility can become a roadblock to achieving your goals.

To learn more about the browsing experience of popular tablets, we tested 433 popular Web sites using the following five browser/tablet combinations, or platforms:

- Microsoft Internet Explorer 10 on an Intel Atom processor-powered HP ElitePad with Windows 8 Pro 32-bit
- Google Chrome on an Intel Atom processor-powered HP ElitePad with Windows 8 Pro 32-bit
- Microsoft Internet Explorer 10 Modern UI app on a Microsoft Surface RT with Windows 8 RT
- Google Chrome on a Samsung® Galaxy Tab® 2 with Android 4.1.1
- Safari on an Apple iPad 4 with Apple iOS 6.1.3

(See [Appendix A](#) for configuration details on each tablet.)

THE BEST TABLET WEB EXPERIENCE STARTS WITH INTEL INSIDE®

Below, we present a summary of our findings. ([Appendix B](#) provides a complete list of sites and the issues we encountered.)

- We observed 152 individual problems or issues.
- Of 433 sites, 139 sites had an issue on one or more platforms.
- Most issues occurred with the iPad (122) and the Galaxy Tab 2 (101).
- IE 10 Modern UI on the Surface RT had 37 issues.
- The two browsers on the Intel Atom processor-powered ElitePad had the fewest issues: 21 with Internet Explorer 10 and 22 with Google Chrome.

Figures 1 and 2 show the percentage of sites with which each platform had issues.

Figure 1: Using two different browsers, the Intel Atom processor-powered tablet had the fewest issues with the set of popular Web sites we tested. (Lower numbers are better.)

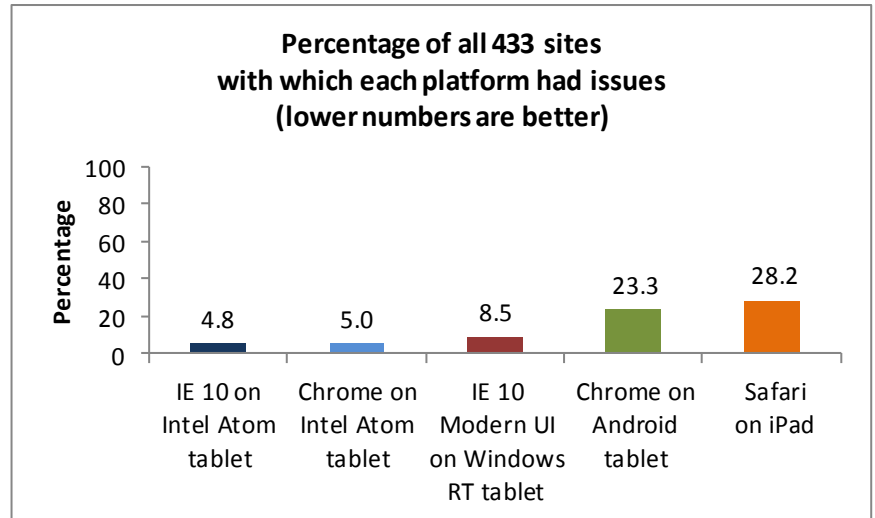
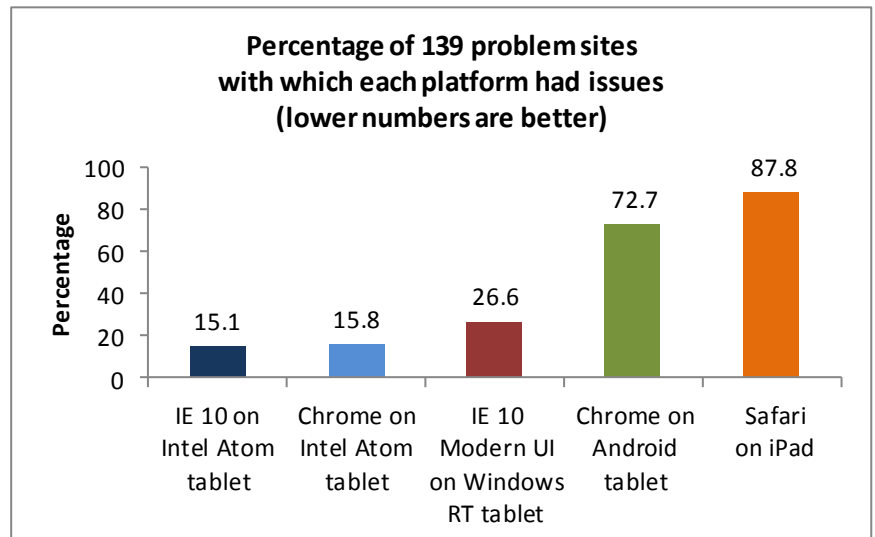


Figure 2: Using two different browsers, the Intel Atom processor-powered tablet had the fewest issues with the subset of popular Web sites with which we encountered problems. (Lower numbers are better.)



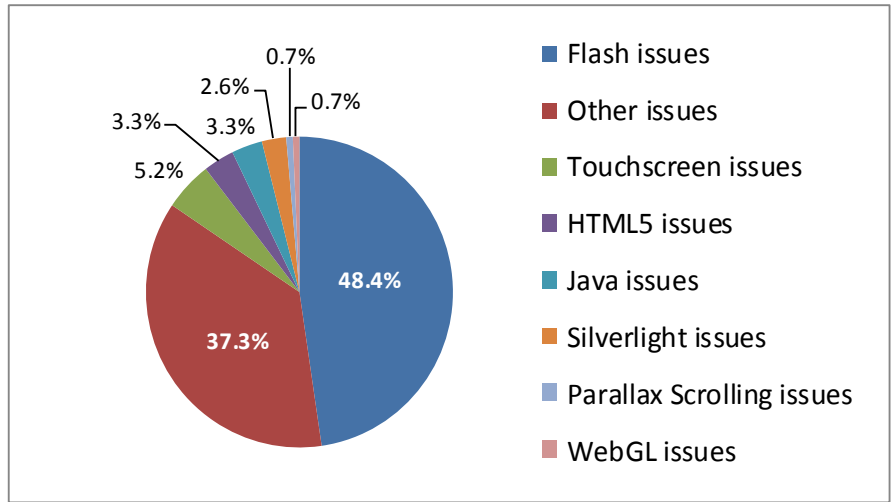
Assuming that our selection of sites is representative (see [Appendix C](#) for a discussion of how we identified them), we can conclude from our testing that an Intel Atom processor-powered Windows 8 Pro tablet such as the HP ElitePad we tested could deliver a more stable, predictable Web experience with fewer errors compared to the other tablets we tested.

MORE THAN JUST FLASH

Lack of support for Flash is a well-known limitation of iPad tablets. However, Flash issues accounted for less than half of the problems we encountered. As Figure 3 shows, 37.3 percent of issues fell into the “Other” category. This includes such problems as missing links, import/export issues, zoom problems, and bad formatting—things we could not attribute to any one technology, but that result from poor code translation

between full desktop browsers and tablet browsers. (See [Appendix D](#) for a glossary of Web technologies.)

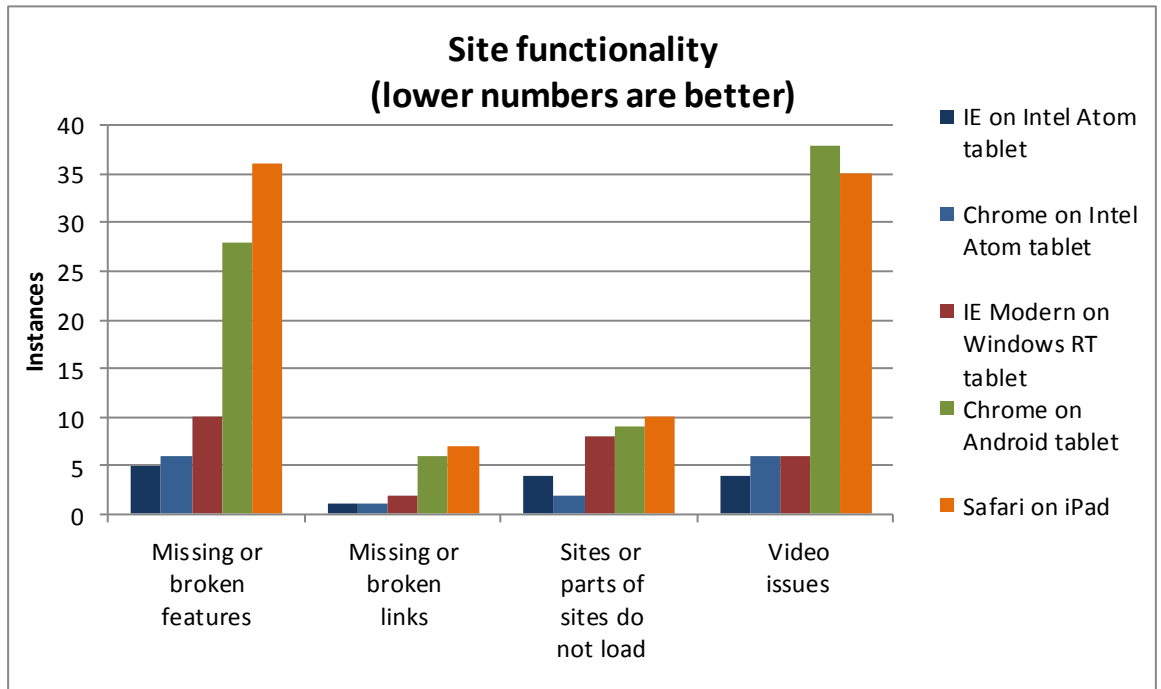
Figure 3: A breakdown of the types of issues we observed.



LESS FRUSTRATION, GREATER PRODUCTIVITY

Figure 4 summarizes the instances of reduced functionality we encountered on the Web sites we tested. Following the table, we explain each type of issue and present examples.

Figure 4: Summary of reduced functionality issues we encountered. Lower numbers are better.



- Missing or broken features.** These sites had errors that made it difficult or impossible to use certain site features. Examples include Ikea's site, which doesn't

allow users on certain browsers to use online planning tools; Shutterfly, which has Flash-based tools for uploading pictures; and deviantART Motion Books are not supported on some browsers.

- **Missing or broken links.** These sites had links that either did not work or we found missing when we compared the site on the mobile device to the site on a non-tablet PC. Examples include Sprint's Web site where a link labeled "Got questions? Click to chat," which allows users to initiate support chat, is missing on some browsers; and Adobe's site where certain navigation bar links are missing on the home page on some devices.
- **Sites or parts of sites do not load.** These sites had errors when loading the full site, or parts of the site. Examples include the Wizarding World of Harry Potter site, which redirects some browsers to a more general Universal Studios Parks site; Fox Sports, which redirects to a site that doesn't load properly on some browsers; and T-Mobile's site, which doesn't load properly when trying to initiate support chat on some browsers.
- **Video issues.** These sites were unable to properly load and/or play the videos embedded in their sites. Examples include the ABC Web site, where the TV episodes failed to stream on some devices; the Food Network site, where videos and tutorials do not load on some devices; and many of the major sports sites such as NFL, NCAA, and CBS Sports, where videos failed to play on several of the browsers.

FEWER ISSUES ACROSS A RANGE OF TECHNOLOGIES

Users of Web browsers on tablets occasionally encounter problems stemming from technology such as Adobe Flash, Microsoft Silverlight®, Java, WebGL, WebM, Parallax Scrolling, and various HTML5 CODECs. We found that the Intel Atom processor-powered tablet accessed Web sites using these technologies with fewer errors than the other tablets we tested. In the case of WebGL, Google Chrome on the Intel Atom processor-powered tablet was the only browser to run the technology properly.

The tools that Web designers and programmers use to create content for mobile browser users are continually evolving. Currently, less than 1 percent of Web sites run Java or Silverlight. Adobe removed their Flash app from Google Play some time ago and Microsoft recently announced plans to phase out support of Silverlight. So expect the world of Internet browsing to continue to change as technologies evolve.

GREAT-LOOKING WEB SITES WITHOUT APPS

Roughly 61 percent of the Web sites with which we encountered issues offer apps that work around the issues. ([Appendix B](#) identifies these sites and the platforms for which apps are available.) While some users welcome these alternatives, they are not an ideal solution for everyone. Workaround apps can clutter up the tablet screen, take up space on the internal storage, and can require frequent updates via app stores such as iTunes and Google Play. In addition, apps can pose a burden on IT staff—they must keep up with an ever-changing array of apps and perform a more complex initial setup process for users. Many organizations set up custom app repositories, which also require management. Finally, not all apps provide the full functionality that the Web site does. Users may be able to access some form of the site with the app, but be unable to do everything they could do on the full site.

FOR A WEB EXPERIENCE YOU CAN RELY ON, CHOOSE INTEL INSIDE®

Many factors go into the process of selecting a tablet—size, price, styling, and more. The ability to visit a wide range of Web sites with confidence that they will behave as intended should also be high on the list.

In our testing, the Intel Atom processor-powered tablet running the Windows 8 Pro operating system, which offers an experience similar to Windows-based desktop and notebook systems, encountered the fewest problems. Depending on the browser we used, the Intel Atom processor-powered tablet handled either 95.0 percent or 95.2 percent of the 433 sites without issue. For the other tablets we tested, this number was as low as 71.8 percent.

Based on these findings, an Intel Atom processor-powered Windows 8 tablet is a wise choice for those who need their tablets to handle the widest range of Web resources with the least chance of incompatibilities.

APPENDIX A – SYSTEM CONFIGURATION INFORMATION

Figure 5 provides detailed configuration information for the test systems.

System	HP ElitePad	Microsoft Surface RT	Samsung Galaxy Tab 2	Apple iPad (4 th generation)
General				
Number of processor packages	1	1	1	1
Number of cores per processor	2	4	2	2
Number of hardware threads per core	4	1	1	1
Total number of threads	8	4	2	2
System dimensions (length x width x height)	10.3" x 7.0" x 0.4"	10.8" x 6.8" x 0.4"	10.1" x 6.9" x 0.4"	9.5" x 7.3" x 0.4"
System weight (pounds)	1.4	1.5	1.3	1.5
CPU				
Vendor	Intel	NVIDIA®	Texas Instruments™	Apple
Model number	Z2760	Tegra® 3	OMAP™ 4430	A6X
Core frequency (GHz)	1.8	1.3	1.0	1.4
L1 cache	32KB Instruction + 24KB Data (per core)	32 KB + 32 KB (per core)	32 KB + 32 KB	32 KB + 32 KB
L2 cache	1 MB (512 KB per core)	1 MB (256 KB per core)	1 MB	1 MB
Memory				
Amount of RAM (GB)	2	2	1	1
Speed (MHz)	533	1,500	400	533
Type	DDR3	DDR3	DDR2	DDR2
Storage				
Vendor and model number	eMMC SSD flash storage	Integrated flash storage	Integrated flash storage	Integrated flash storage
Size (GB)	32	64	16	64
Operating system				
Name	Windows 8 Pro	Microsoft Windows RT	Android 4.1.1	Apple iOS 6.1.3
Graphics				
Vendor and model number	Intel Graphics Media Accelerator	NVIDIA Tegra 3	PowerVR SGX540	PowerVR SGX554MP4
Resolution	1,280 x 800	1,366 x 768	1,280 x 800	2,048 x 1,536
Wireless				
Vendor and model number	802.11a/b/g/n	Marvell® AVASTAR® Wireless-N	802.11a/b/g/n	802.11a/b/g/n

System	HP ElitePad	Microsoft Surface RT	Samsung Galaxy Tab 2	Apple iPad (4 th generation)
Ports				
USB type	N/A	1 x USB 2.0	N/A	N/A
Other	Power connector, headphone/microph one combo jack	Micro HDMI, Micro SD, headphone jack	Micro SD, headphone jack	Headphone jack
Display				
Type	Capacitive multi-touch screen with digitizer	LED-backlit ClearType HD Display	LED-backlit PLS TFT touchscreen display	LED-backlit Multi-Touch display with IPS technology
Screen size	10.1"	10.6"	10.1"	9.7"
Battery				
Type	2-cell (25 WHr) polymer HP Long Life battery	Built-in Lithium Ion	Built-in Lithium Ion	Apple A1389 integrated Li-polymer
Rated capacity	25 Wh	31.5 Wh	7,000 mAh	42.5 Wh

Figure 5: Detailed configuration information for the test systems.

APPENDIX B – OUR FINDINGS IN DETAIL

The following nine pages contain the details of our Web site testing, which we conducted from April 15 to April 25, 2013. For each site we visited, the table presents the issues we observed and identifies which tablet/browser combinations experienced the issue. For sites that offer apps, the table notes the platforms for which these apps are available.

Please note that for the sake of brevity, we have condensed some extremely long URLs into more manageable hyperlinks.

Site	Specific URL	Error type	Specific error	Is the specific error present on the system?					Platforms for which alternative apps are available
				IE 10 on IA HP ElitePad	IE 10 Modern UI ARM Microsoft Surface	Safari iPad iPad 4 64GB	Chrome Android Samsung Galaxy Tab 2 10.1	Chrome IA desktop HP ElitePad	
23 and Me	www.23andme.com	Flash	Many of the videos and game trailers required Flash to play.	No	No	Yes	Yes	No	Android
A1C Champions	www.a1cchampions.com	Flash	Prompted user to load Flash. Videos did not play.	No	No	Yes	Yes	No	N/A
ABC	www.abc.go.com	Flash	Prompted user to load Flash. Videos did not play.	No	No	Yes	Yes	No	iPad, Windows 8
About	about.com	JavaScript	Articles zoomed improperly.	No	No	No	Yes	No	N/A
Absolute	cc.absolute.com	Other	Trouble exporting to and importing from CSV files, as well as downloading and viewing reports.	No	No	Yes	Yes	No	N/A
Adobe Systems Inc.	www.adobe.com	JavaScript	Many links were missing from top navigation bar.	No	No	Yes	No	No	N/A
ADP	http://www.adp.com/tools-and-resources/calculators-and-tools/401k/payroll-savings-integration-calculator.aspx	Flash	Finance calculators required Flash to use.	Yes	No	Yes	Yes	No	Android
Amazon	www.Amazon.com	JavaScript	A list of departments appeared when accessing specific departmental shopping via drop-down menu.	No	Yes	No	No	No	iPad, Android, Windows 8
Amazon Instant Video	Amazon.Instant	Flash	Web site required viewing app. Videos did not play properly.	No	No	Yes	Yes	No	iPad
Ancestry	www.ancestry.com	JavaScript	Drop-down menu links in member account option did not work.	Yes	No	No	Yes	No	iPad, Android
Ask	www.ask.com	Flash	Videos required Flash to play.	No	No	Yes	Yes	No	Android
BabyCenter	babycenter.com	Flash	Timeline feature at the top of the page required Flash to view.	No	No	Yes	Yes	No	N/A
Barnes and Noble	John Green - Featured Author	Flash	About the Author videos did not play.	No	Yes	Yes	Yes	No	N/A
BigFish Games	www.bigfishgames.com	Java/Flash	Games required Java Plugin for play. *Some games required keyboards.	Yes	Yes	Yes	Yes	No*	iPad, Android
BigFish Games	www.bigfishgames.com	Plug-in errors	Games required Flash to play.*After loading, some games required keyboards.	Yes	No	Yes	Yes	No*	iPad, Android
Bio Digital Human	www.biodigitalhuman.com/home/	WebGL	The browser did not support the 3D Graphics required to view the model.	Yes	Yes	Yes	Yes	No	iPad

Site	Specific URL	Error type	Specific error	Is the specific error present on the system?					Platforms for which alternative apps are available
				IE 10 on IA HP ElitePad	IE 10 Modern UI ARM Microsoft Surface	Safari iPad iPad 4 64GB	Chrome Android Samsung Galaxy Tab 2 10.1	Chrome IA desktop HP ElitePad	
Bleacher Report	www.bleacherreport.com	Flash	Videos required Flash to play.	No	No	Yes	Yes	No	iPad, Android
Blogger	www.blogger.com	Other	Post preview option did not work.	No	No	Yes	No	No	iPad, Android
BMWUSA	http://www.bmwusa.com/standard/content/byo/n ewbyo.aspx	Other	360-degree rotation to view vehicles did not work with the "Click (tap) and drag" motion in some cases.	Yes	Yes	No	Yes	Yes	N/A
Boston	http://www.boston.com/real estate/new/?	Click and drag	When adjusting prices, slider bar did not work. *Directed to mobile site.	No	No	Yes	No*	No	N/A
Bravesites	www.bravesites.com	Click and drag	Other than swapping images, photo content was unmanageable.	Yes	Yes	Yes	Yes	Yes	N/A
CA government	www.ca.gov	Flash	Videos required Flash to play.*Loaded mobile site.	No	No	Yes	No*	No	Android
Cabela's	www.cabelas.com	Click and drag	Product zoom did not function properly.	Yes	No	Yes	No	Yes	Android
Canon	Canon - Sample Images & Movies	Other	When zooming in on a downloaded image, it did not render well. *Loading zoomed image was slow.	No*	No	Yes	No	No*	N/A
Capital One	www.capitalone360.com	JavaScript	Log in only accepted via Go on the keyboard. Continue did not function.	No	No	No	Yes	No	Android
Capital One	www.capitalone360.com	JavaScript	No option to log in sans mouse.	No	No	Yes	No	No	Android
Capital One	Locate an ATM	Touch hover issues	Mouse-over tips did not display. Tablets with USB worked fine with a USB mouse-pointing device attached.	Yes	Yes	Yes	Yes	Yes	Android
Capital One	www.capitalone360.com	JavaScript	ATM location map did not load.	No	No	Yes	No	No	Android
CBS Local	www.cbslocal.com	JavaScript	Location links did not appear.	No	No	Yes	No	No	N/A
CBS News	www.cbsnews.com	Flash	Videos required Flash to play.*Loaded mobile site.	No	No	Yes	No*	No	iPad, Android
CBS Sports	www.cbssports.com	Flash	Videos did not load properly.	No	No	Yes	Yes	No	iPad, Android
ChaCha	www.chacha.com	JavaScript	Text overlapped.	No	No	Yes	No	No	iPad, Android
Charter	www.charter.net	Flash	TV shows required Flash to play.	No	No	Yes	Yes	No	Android
Chili's	www.chilis.com	Mobile site	Partially loaded the mobile site, instead of the full desktop version.	No	No	Yes	Yes	No	Limited Android (not supported on Galaxy Tab 2)
Cisco	https://supportforums.cisco.com/community/netpro/small-business/onlinechat-support	Popup	Chat window was viewed as a pop-up, prompting a warning from the browser. Tapping Allow did not grant access to the chat window.	Yes	No	Yes	No	No	iPad, Android

Site	Specific URL	Error type	Specific error	Is the specific error present on the system?					Platforms for which alternative apps are available
				IE 10 on IA HP ElitePad	IE 10 Modern UI ARM Microsoft Surface	Safari iPad iPad 4 64GB	Chrome Android Samsung Galaxy Tab 2 10.1	Chrome IA desktop HP ElitePad	
Cisco ScanSafe	Scancenter Scansafe	Flash	Data in tables and charts required Flash to view.	No	No	Yes	Yes	No	N/A
CNBC	cnbc.com	Flash	Videos required Flash to play.*Loaded mobile site.	No	No	Yes	No*	No	iPad, Android
CoolMath Games	www.coolmath-games.com	Flash	Games required Flash to play. *After loading, some games required keyboards.	No*	No*	Yes	Yes	No*	N/A
Coupons	www.coupons.com	Application error	Download requirement to print coupons did not work.	Yes	No	Yes	Yes	No	iPad, Android
Cox	cox.net	Flash	Videos required Flash to play.	No	No	Yes	Yes	No	iPad, Android
deviantART	http://browse.deviantart.com/motionbooks/	Flash	Motion Books required Flash to view.	No	Yes	Yes	Yes	No	N/A
Disney	Return of the Platypus	Flash	Flash errors occurred throughout the Web site for browsers on iOS and Android. *We had only moderate success on the other platforms as the game was not touch-screen friendly.	No*	No*	Yes	Yes	No*	N/A
Drudge Report	www.drudgereport.com	Other	Site was off-center.	No	Yes	No	No	No	iPad, Android
E Online	www.eonline.com	Flash	Videos required Flash to play.	No	No	Yes	Yes	No	Android
eCollege	www.ecollege.com	Flash	The main banner on the main page required Flash to view.	No	No	Yes	Yes	No	N/A
eHow	ehow.com	Flash	Videos required Flash to play.*Converted to QuickTime.	No	No	No*	Yes	No	iPad, Android
ESPN	ESPN - 2013 NCAA Hockey Tournament Bracket	Hover	Touch-hover gestures to show team name over abbreviation did not work.	No	No	Yes	Yes	Yes	iPad, Android
Fiverr	www.fiverr.com	Flash	Videos required Flash to play.	No	No	Yes	Yes	No	iPad, Android
Food Network	foodnetwork.com	Flash	Videos required Flash to play.*Converted to QuickTime.	No	No	No*	Yes	No	iPad
Fox News	www.foxnews.com	Other	"Source Not Supported." Video did not play.	No	No	No	No	Yes	iPad, Android
Fox Sports	www.foxsports.com	Other	The site redirected user to a Web site that did not load.	No	No	No	Yes	No	Android
Fritz Obermeyer	http://fritzo.org/	HTML5	"Keys" were very jerky, input was not always detected, and there was no sound output.	Yes	No	Yes	No	No	N/A
Fritz Obermeyer	http://fritzo.org/	HTML5	Graphical error: rounded key corners had constantly shifting pixels that bled around the edges, making the corners squared.	Yes	No	No	No	Yes	N/A

Site	Specific URL	Error type	Specific error	Is the specific error present on the system?					Platforms for which alternative apps are available
				IE 10 on IA HP ElitePad	IE 10 Modern UI ARM Microsoft Surface	Safari iPad iPad 4 64GB	Chrome Android Samsung Galaxy Tab 2 10.1	Chrome IA desktop HP ElitePad	
Garrett Popcorn	www.garrettpopcorn.com/tin-builder/	Flash	Tin Builder feature did not work.	No	Yes	Yes	Yes	No	N/A
Google Apps for Business	Google Apps for Business	Other	User and report management did not import or export to CSV.	No	No	Yes	No	No	N/A
Google Maps	maps.google.com	Possibly missing mobile jquery to allow dragging	When changing a route, various click-and-drag options were not supported.	No	No	Yes	Yes	Yes	Android
Hard Rock Café	memorabilia.hardrock.com	Silverlight	Total zoom access required Silverlight for viewing memorabilia.	Yes	Yes	Yes	Yes	No	N/A
Harvard University Extension School	http://isites.harvard.edu/icb/icb.do?keyword=k67633	Flash	Some course videos did not load or play.	No	No	Yes	Yes	No	N/A
Hasbro Clue	Clue	Flash	Received blank screens or an information site for purchasing Hasbro products.	No	No	Yes	Yes	No	N/A
Home Depot	www.homedepot.com	Flash	Videos did not play properly.	No	Yes	Yes	Yes	Yes	Android
Home Shopping Network	www.hsn.com	Flash	Videos required Flash to play. *Converted to QuickTime.	No	No	No*	Yes	No	iPad, Android
Host Gator	www.hostgator.com	Click and drag	Slider bars did not function.	No	Yes	Yes	Yes	Yes	N/A
How Stuff Works	www.howstuffworks.com	Flash	Videos required Flash to play.*Converted to QuickTime.	No	No	No*	Yes	No	iPad, Android
HubPages	www.hubpages.com	Other	Videos did not load properly.	Yes	Yes	No	No	Yes	Android
Hulu	www.hulu.com	Flash	Videos did not function. Safari did not load the Web site but rerouted to a sign-up page for Hulu Plus.	No	No	Yes	Yes	No	iPad, Android, Windows 8 (requires paid sub. to Hulu)
Hulu	www.hulu.com	Flash	Browser drop-down menu disappeared before user clicked on an option.	Yes	Yes	No	No	No	iPad, Android, Windows 8 (requires paid sub. to Hulu)
Ikea on-line kitchen planning tool	Ikea - Plan Your Kitchen in 3D	Compatibility	The VPUIPlayer required to use the tool was unable to download.	Yes	Yes	Yes	Yes	No	Non-English iPad
Imgur	imgur.com	Other	Upload button did not function.	Yes	No	No	Yes	No	iPad, Android

Site	Specific URL	Error type	Specific error	Is the specific error present on the system?					Platforms for which alternative apps are available
				IE 10 on IA HP ElitePad	IE 10 Modern UI ARM Microsoft Surface	Safari iPad iPad 4 64GB	Chrome Android Samsung Galaxy Tab 2 10.1	Chrome IA desktop HP ElitePad	
Incredibox	www.incredibox.com/en/#/application	Flash	Flash requirement message appeared with the information that Incredibox was not yet available for iPad.	No	No	Yes	Yes	No	N/A
Intuit	www.intuit.com	Flash	Videos required Flash to play.*Loaded mobile site.	No	No	Yes	No*	No	N/A
iStockPhoto	www.istockphoto.com/video	Flash	Videos required Flash to play.	No	No	Yes	Yes	No	N/A
Java	java.com	Java	User experienced Java detection errors.	Yes	Yes	Yes	Yes	Yes	N/A
Jess & Russ	jessandruss.us	Parallax scrolling	Images that were intended to scroll did not move. Android lacked some elements.	No	No	Yes	Yes	No	N/A
Langstrasse Zurich	www.360langstrasse.sf.tv	HTML5	Links for viewing inside buildings did not work.	No	No	Yes	No	Yes	N/A
Lego	www.lego.com	JavaScript	Alignment and size of Web site were incorrect.	No	No	Yes	No	No	N/A
Lego	www.lego.com	Flash	Images that were intended to scroll did not move.	No	No	Yes	Yes	No	N/A
Lego	Lego Minifigures	Flash	"This page requires Adobe Flash Player!"	No	No	Yes	Yes	No	N/A
Live Strong	www.livestrong.com	Flash	Videos required Flash to play.	Yes	No	Yes	Yes	No	iPad, Android
LogMeIn	www.logmein.com	Other	Controlling user-created clients on the Web site required an app.	Yes* (requests desktop IE)	No	Yes	No	No	iPad, Android
Mail Chimp	www.mailchimp.com	Other	Main page video did not work.	No	No	No	No	Yes	Android
MapQuest	www.mapquest.com	Click and drag	Map and/or click-and-drag destinations and routes did not resize.	Yes	No	Yes	Yes	Yes	Android
Media Fire	www.mediafire.com	Other	Upload only worked with the default photo app, so documents did not upload. Document creation was slow to respond.	Yes	No	Yes	No	No	Android
Medscape	www.medscape.com	Flash	Prompted user to load Flash but Flash was not supported. Videos did not play. *Converted videos to QuickTime.	No	No	No*	Yes	No	iPad, Android
Merriam-Webster	www.m-w.com	Flash	Videos required Flash to play.	No	No	Yes	Yes	No	iPad, Android
MTV	www.mtv.com	Flash	Videos required Flash to play.	No	Yes	Yes	Yes	No	N/A
MySpace	www.myspace.com	Other	Videos redirected to main mobile site when attempting to play.	No	No	Yes	Yes	No	N/A
NBA	www.nba.com	Flash	Videos did not play. *Converted videos to QuickTime.	No	No	No*	Yes	No	iPad

Site	Specific URL	Error type	Specific error	Is the specific error present on the system?					Platforms for which alternative apps are available
				IE 10 on IA HP ElitePad	IE 10 Modern UI ARM Microsoft Surface	Safari iPad iPad 4 64GB	Chrome Android Samsung Galaxy Tab 2 10.1	Chrome IA desktop HP ElitePad	
NBC	www.nbc.com	Flash	Prompted user to load Flash. Videos did not play.	No	No	Yes	Yes	No	iPad, Android
NBC	www.nbc.com	Flash	Videos required Flash to play. *Converted to QuickTime.	No	No	No*	Yes	No	iPad
NCAA	www.ncaa.com	Other	Links did not function properly.	Yes	Yes	No	Yes	No	Android
NCSU MYPACK Portal	https://portalsp.acs.ncsu.edu/psp/EP91PRD/EMPLOYEE/EMPL/h/?tab=DEFAULT	JavaScript	Two-paneled pages fit improperly into the screen and their text overlapped.	No	Yes	No	No	No	N/A
Netflix	www.netflix.com	Silverlight	"To continue, you'll need the Netflix app for your platform." Videos did not play. Windows 8 RT, iOS, and Android browsers did not support Silverlight.	Yes	Yes	Yes	Yes	No	iPad, Android, Windows 8
New York Daily News	www.nydailynews.com	Other	Videos did not load properly.	Yes	Yes	No	Yes	No	iPad, Android
New York Post	www.nypost.com	Flash	Videos required Flash to play.*Loaded mobile site.	No	No	Yes	No*	No	iPad, Android
NFL	www.nfl.com	Flash	Videos did not play. *Converted videos to QuickTime.	No	No	No*	Yes	No	iPad, Android
NFL	www.nfl.com	Flash	Videos required Flash to play. *Converted to QuickTime.	No	No	No*	Yes	No	Android
Nickelodeon	www.nick.com/videos/	Flash	Videos required Flash to play. *Converted to QuickTime.	No	Yes	No*	Yes	No	iPad, Android
NY Times	http://lens.blogs.nytimes.com/	Flash	Photo galleries supported by Flash-based UI were viewed but without the same utility that the Flash UI provided.	No	No	Yes	Yes	No	iPad, Android
NY Times	www.nytimes.com	Flash	Photo galleries did not resize properly when rotating tablets.	No	Yes	No	No	Yes	iPad, Android
NY Times	NYT - Great Homes and Destinations	JavaScript	We observed a delay on slideshow transitions, and an annoying split transition effect.	No	No	Yes	Yes	No	iPad, Android
Oncology Nursing	www.onconursing.com	Flash	Prompted user to load Flash. Videos and tours did not play.	No	No	Yes	Yes	No	N/A
Optimum	www.optimum.net	Flash	Videos required Flash to play.*Loaded mobile site.	No	No	Yes	No*	No	iPad, Android
Pandora	www.pandora.com	Other	Web site required an app. User was unable to access site.	No	No	Yes	Yes	No	iPad, Android

Site	Specific URL	Error type	Specific error	Is the specific error present on the system?					Platforms for which alternative apps are available
				IE 10 on IA HP ElitePad	IE 10 Modern UI ARM Microsoft Surface	Safari iPad iPad 4 64GB	Chrome Android Samsung Galaxy Tab 2 10.1	Chrome IA desktop HP ElitePad	
PNC	www.pnc.com	Flash	The main banner on the main page required Flash to view.	No	No	Yes	Yes	No	iPad, Android
Pogo	www.pogo.com	Flash	Games required Flash to play.	No	No	Yes	Yes	No	Android
Practice Fusion	http://www.practicefusion.com/	Flash	Web app did not load. *The login page loaded without Flash errors but the fields for account name, password, etc. did not recognize virtual keyboard input.	No	Yes	Yes	Yes	No*	iPad/Android apps in beta
Progressive Insurance	www.Progressive.com	Security	After log out, clicking the back arrow re-opened previous pages with personal information viewable. *Slightly different UI that required a browser history dump for full security.	No*	No*	No*	No*	Yes	Android
Put Locker	www.putlocker.com	Other	Browse button was missing or unresponsive.	Yes	Yes	Yes	Yes	No	N/A
Qualtrics.com	Qualtrics.com	Other	Some features of the survey creation UI were missing.	No	No	Yes	No	No	iPad
QVC	www.qvc.com	Other	Video links disappeared.	No	No	No	Yes	No	iPad, Android
Recipes Finder	recipesfinder.com	JavaScript	Site was improperly resized.	No	No	Yes	No	No	N/A
RoadRunner	http://games.rr.com/	Flash	Games required Flash to play.	No	No	Yes	No	No	N/A
Roblox	www.roblox.com	Flash	Games required Flash to play.*After loading, some games required keyboards.	No*	No*	Yes	Yes	No*	iPad, Android
Salesforce	www.force.com	JavaScript	Tab menus did not work.	No	No	No	No	Yes	Android
San Francisco Chronicle	www.sfgate.com	Other	Mobile site loaded, but media did not play.	No	No	No	Yes	No	iPad, Android
Shutterfly	Shutterfly Sign-in	Flash	Images required Flash to upload. *Mobile site did not offer option to upload pictures.	No	No	Yes	Yes*	No	iPad
Shutterstock	www.shutterstock.com	Other	Videos did not load properly.	No	No	No	No	Yes	iPad
SiteAdvisor	www.siteadvisor.com/sites/google.com	Other	Graphs were missing.	No	No	No	Yes	No	N/A
Slate Magazine	slate.com	Other	Videos did not play properly.	No	No	Yes	No	No	iPad, Android
Soul Reaper	www.soul-reaper.com	HTML5	Mobile Web site was inaccessible or did not exist. Attempts to force the desktop version were unsuccessful.	No	No	Yes	No	No	N/A

Site	Specific URL	Error type	Specific error	Is the specific error present on the system?					Platforms for which alternative apps are available
				IE 10 on IA HP ElitePad	IE 10 Modern UI ARM Microsoft Surface	Safari iPad iPad 4 64GB	Chrome Android Samsung Galaxy Tab 2 10.1	Chrome IA desktop HP ElitePad	
Sprint	www.sprint.com/landings/chat/?ECID=vanity:chat	Script error	The "Got questions? Click to chat." option was missing.	Yes	Yes	Yes	Yes	No	N/A
Steam	http://store.steampowered.com/	Flash	Many of the videos and game trailers required Flash to play.	No	No	Yes	Yes	No	iPad, Android
Stock Analysis	www.stockanalysischarts.com	Silverlight	Prompted user to install Silverlight but browser is not Silverlight compatible.	Yes	Yes	Yes	Yes	No	N/A
Tag Galaxy	www.taggalaxy.com	Flash	"Needs a newer version of Adobe Flash Player." ARM compatibility information page appeared for IE Modern user.	No	Yes	Yes	Yes	No	N/A
Tagged	tagged.com	Other	Facebook sign in failed.	Yes	No	No	Yes	No	Android
TD Bank	http://www.td.com/careers/why-td/index.jsp	Flash	Videos required Flash to play.	No	No	Yes	Yes	No	Android
Teavana	www.teavana.com	JavaScript	Loaded mobile site by default, but had option to load full site. On full site, tea wall and cast iron tabs produced, "PAGE NOT FOUND."	No	No	Yes	No	No	N/A
TechCrunch	techcrunch.com	Other	Navigation bar disappeared.	No	No	Yes	No	No	iPad, Android
Telltale Games	www.telltalegames.com/bttf	Flash	Some game Web sites and most videos required Flash to play.	No	No	Yes	Yes	No	N/A
Ticketmaster	www.ticketmaster.com	Script error	Page displayed running script error.	No	Yes	No	No	No	Android
T-Mobile	http://support.t-mobile.com/welcome	Other	Drop-down menus required to fill out basic information to begin chat function did not load.	No	No	No	Yes	No	iPad
TV Guide	www.tvguide.com	Flash	Videos required Flash to play.	No	No	Yes	Yes	No	iPad, Android
Universeries	cinema-series.orange.fr/evenement/universeries/en	HTML5	Attempts to view details sent user back to main page.	No	No	Yes	Yes	No	N/A
US magazine	www.usmagazine.com	Flash	Videos required Flash to play.*Loaded mobile site.	No	No	Yes	No*	No	iPad
Washington Post	www.washingtonpost.com	Search pull-down	Clicking on the search bar suggestion did not activate the search but left the user on the same page with a blank search bar.	Yes	Yes	No	No	No	iPad, Android
Weather Channel	www.weather.com	Flash	Local forecast videos displayed: "The video you are trying to watch is a format not supported by the HTML video tag in this browser."	No	No	Yes	Yes	No	iPad, Android, Windows 8

Site	Specific URL	Error type	Specific error	Is the specific error present on the system?					Platforms for which alternative apps are available
				IE 10 on IA HP ElitePad	IE 10 Modern UI ARM Microsoft Surface	Safari iPad iPad 4 64GB	Chrome Android Samsung Galaxy Tab 2 10.1	Chrome IA desktop HP ElitePad	
Webroot	https://weblogin.webroot.com/	JavaScript	Web site admin portal was inaccessible. The link that allowed access to policies was misaligned and not visible.	No	No	Yes	Yes	No	N/A
Weebly	www.weebly.com	Flash	New or existing content required Flash to create or edit.	No	No	Yes	Yes	No	N/A
Wiget Media	www.wigetmedia.com	JavaScript	Site dimensions did not fit screen.	No	No	Yes	No	No	N/A
Wikia	wikia.com	Flash	Videos required Flash to play.*Converted to QuickTime.	No	No	No*	Yes	No	iPad
Wizarding World of Harry Potter	www.universolorlando.com/harrypotter/	Flash	Prompted user to load Flash or redirected to a related site for theme parks.	No	Yes	Yes	Yes	No	N/A
WRAL	www.wral.com	Touch hover issues related to JavaScript	Sectional tabs to access sites required user to tap twice.	No	No	Yes	No	No	iPad, Android
WRAL Traffic	www.wral.com/traffic	Coding: self-repeating iframe	Embedded traffic incidents with scroll bar did not scroll. Attempts to scroll moved the entire page.	No	No	Yes	No	No	iPad, Android
XBox Live	Xbox Live	Silverlight	After login, user avatars were still images rather than animated characters.	Yes	Yes	Yes	Yes	No	N/A
Xfinity	www.comcastsupport.com/ChatEntry/	JavaScript	The pre-chat, background information form did not appear.	Yes	Yes	Yes	No	Yes	iPad
Yahoo	www.yahoo.com	Flash	Videos did not play properly.	No	No	Yes	Yes	Yes	Android
Zappos	www.zappos.com	JavaScript	Various random images were missing.	No	No	Yes	No	No	iPad, Android
Zapps	www.zapps.com	Flash	Site loaded incompletely and experienced Flash errors.	No	Yes	Yes	Yes	No	N/A
zinio.com	www.zinio.com	Other	Page navigation did not properly function when zoomed in, making articles difficult to read.	No	Yes	No	No	Yes	iPad, Android
zscaler	https://admin.zscaler.net	Flash	The Dashboard, Analyze, and Reporting tabs required Flash to view.	No	No	Yes	Yes	No	N/A
Zynga	www.zynga.com	Flash	Games required Flash to play. *After loading, some games required keyboards.	No*	No	Yes	Yes	No*	iPad, Android
Zynga	zynga.com	Other	Videos did not load properly.	No	Yes	No	No	No	N/A

APPENDIX C – OUR SITE SELECTION PROCESS

We began with a list of 500 most frequently viewed Web sites from a major Web analytics company ([Alexa.com](https://www.alexa.com)). We purged questionable sites such as pornography and phishing sites and ended up with a list of 433 Web sites.

Once we had created our list, we went through all 433 sites on each browser/device combination, looking for any element of the Web site that did not perform as intended. We checked videos, special functions, moving parts, and general behavior for issues. We noted any problems we found, and calculated percentage failure by comparing the number of sites with problems to the total number of sites we tried as well as to the total number of sites that had problems on at least one browser.

APPENDIX D – GLOSSARY OF WEB TECHNOLOGIES

Flash	Flash is a plugin that plays videos and other interactive media. When users go to Web pages with Flash content using a platform that does not support it, they see an error message about lack of support for Flash or missing content, such as videos.
HTML5	HTML5 is the fifth revision of the HTML standard that allows multimedia and graphical content to run without the need for plugins. When users go to HTML5 Web pages using a platform that does not support it, they see various glitches in graphical content, such as flickering elements, and some multimedia content does not perform correctly.
Java	Java is a plugin for interactive content. When users go to Web pages with Java content using a platform that does not support it, they see an error message prompting a Java install and are unable to view the content.
Parallax scrolling	Parallax scrolling allows multiple layers of Web content to scroll independently of each other much like a multiplane camera. When users go to Web pages that use Parallax scrolling using a platform that does not support it, images that should scroll are usually static.
Silverlight	Silverlight is an interactive content plugin designed by Microsoft. When users go to Web pages with Silverlight content using a platform that does not support it, they see an error message prompting a Silverlight install and are unable to view the content.
WebGL	WebGL can render 3D graphics within a Website without having to resort to the use of plug-ins. When users go to Web pages with WebGL content using a platform that does not support it, they see an error message reporting that the browser does not support the 3D Graphics required to view the content.

ABOUT PRINCIPLED TECHNOLOGIES



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We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.

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