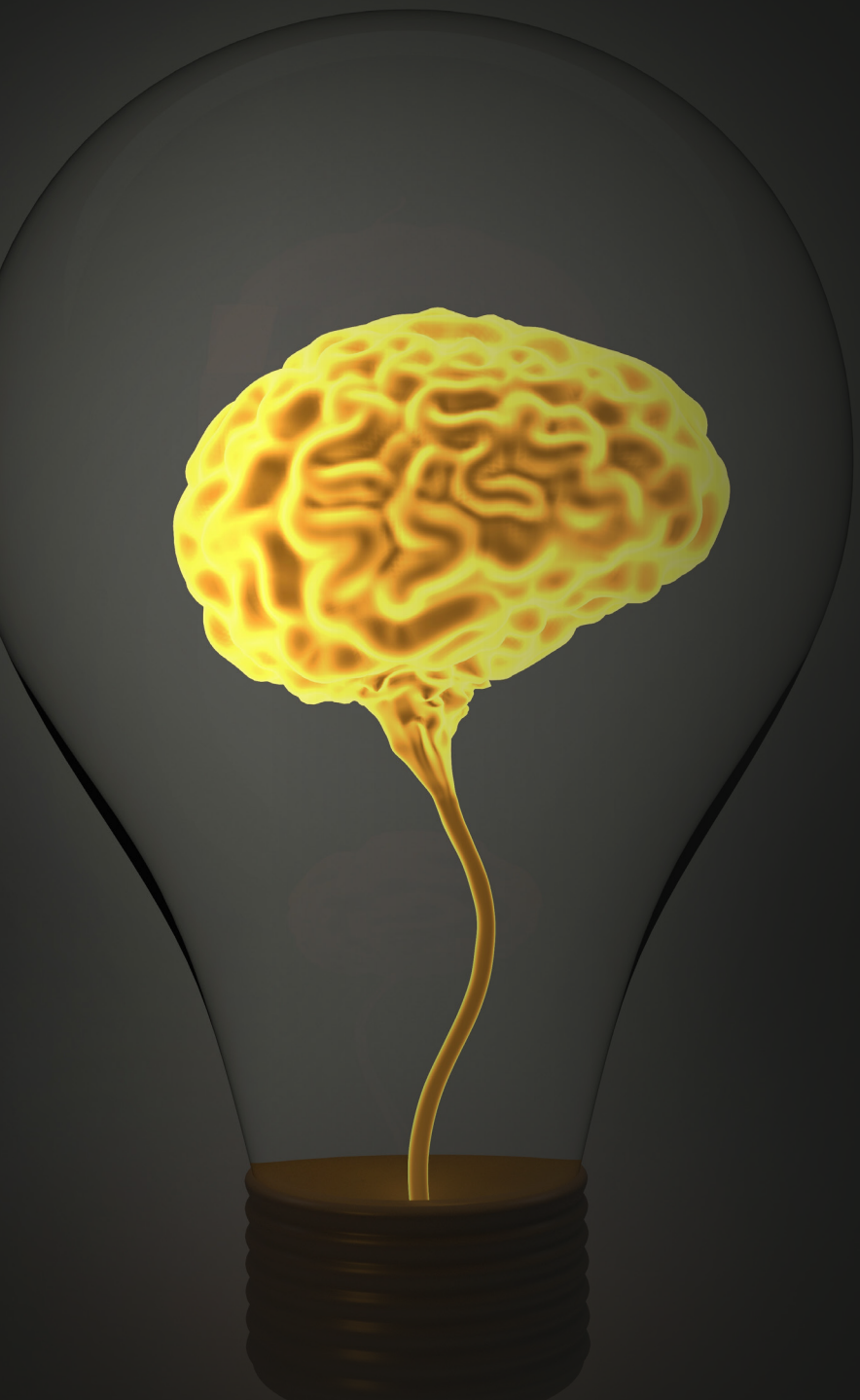
Introducing the

CUSTOMER EXPERIENCE INDEX



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Introducing CEXi

A great web experience has the power to compel users to devote precious time, money, and mental space to your brand. While factors like performance, design, security, and usability each contribute to the result, it's only when every last aspect comes together to form an experience that you can see the power of the web at work.

The statement you just read probably doesn't seem earth-shattering. Perhaps it even sounds obvious.

But it's also deceptive. This statement, as with much of the prevailing web strategy, hinges on a word – experience – that is difficult to define, and even harder to quantify. While a company might set a high-level goal to "improve the online experience," the only way it can measure success is to use narrower metrics such as bounce rate, page load time, or repeat visits as loose proxies. If we really talk about experience head-on we end up discussing something that's so subjective that it's like talking about how blue the sky is, or how great pizza tastes. No wonder it sounds boring.

That is, until now.

Yottaa's Customer Experience Index, or CEXi, is an index of several key indicators of the performance and composition of web pages that approximates the average experience of using a web application far more accurately than any single metric. We are seeking to give the "experience" term some teeth with a repeatable, metrics-driven process.

In this guide we lay out what's inside the equation, some basic findings, and conclusions. We hope you'll agree that web experience is a topic that deserves a "cexier" measurement.

Experience in "experience"

Yottaa was founded in 2009 with the goal of improving web performance (a.k.a. page speed) for modern web applications. After years of working directly with our customers, learning from them and understanding their problems, we struck upon a simple, crucial realization: what's important is not performance, page speed, or anything else. It's all about the user experience. In other words, ***Experience Is Everything***.

It was a seemingly small adjustment, but had an outsized impact. As we shifted our approach to solving directly for experience, we began to see amazing results in top-line metrics for our customers. Conversion rate, average order value, and revenue-per-customer were directly impacted by our service, often in double-digits. These results are a far cry from the industry-standard practice of using page load time as the authoritative metric for success. We knew *how* to achieve these results, but there was no singular way to quantify the changes that took place to bring them about.

To fill this gap, the we've developed a new way to programmatically measure the user experience of web and mobile web applications. The Customer Experience Index focuses on three aspects: speed, parity of experience (across devices), and how well optimized the site is in relation to its complexity.

Our goal in creating the index is to achieve a measure that goes beyond a simplistic readout from a performance test to approximate the actual feeling, positive or negative, of using a web application for a modern, cross-device user.

If you want to learn about the nuts and bolts, keep reading. Otherwise skip down to the next section to check out some of our findings.

How CEXi works

First: speed.

In performance measurement there's a range of timing metrics that cover the entire process of a web page loading. These metrics mean very different things to different people. In the world of networking and cloud computing, for instance, the key measurements involve the time it takes for a bit of data to travel across the internet – metrics like "time to first byte" and "round trip time".

While interesting for operations geeks, these metrics matter very little for a user's experience. Data typically traverses the internet in under 200 milliseconds – quite literally in the blink of an eye – while the web application the user is requesting often takes several seconds to be rendered in the browser.

If we're thinking from the user's perspective, then, there are only a couple of timing metrics that really matter.

"Time to start render" (TTSR) is the point at which the user sees the first visible elements appear on the screen. It's crucial because as soon as content is painted in the browser, the user knows they are in the right place, and any feelings of impatience are put off, if only momentarily. Moreover, if the page is properly sequenced, that first item to appear should be the central content the user came to see, whether it's the text of an article or images of a product.

"Time to display" (TTD) is the point at which the user witnesses a level of completeness that allows him or her to start engaging with the full breadth of what the web app has to offer. All the visible content will have been rendered, and anything left to load is either invisible or not important.

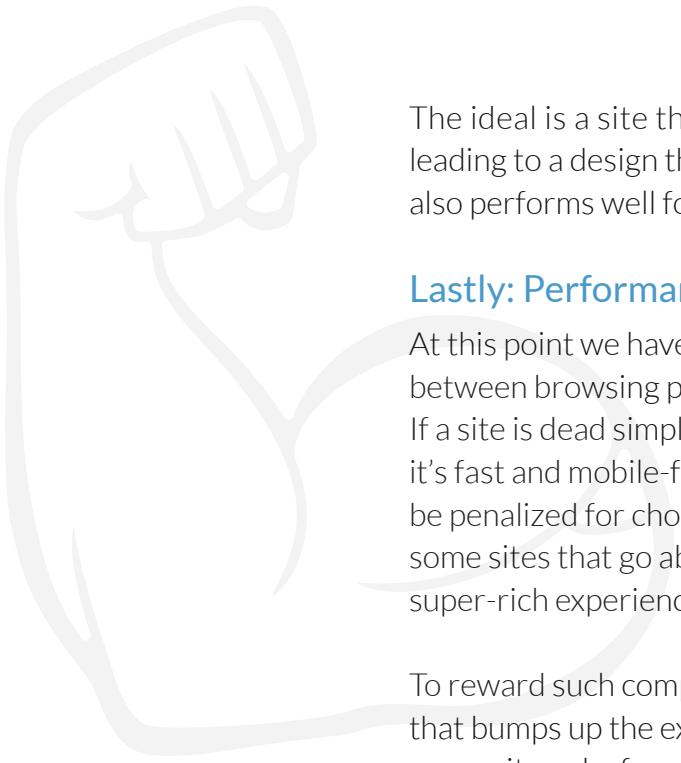
For the CEXi we collect and blend TTSR and TTD, weighted 50/50, for both mobile and desktop users. The mobile user simulation uses a 3G connection and an iPhone 5 with Safari browser, while the desktop user simulation uses a standard broadband connection and the latest Chrome version. Then we take the two resulting figures and weight them 60/40 - 60 percent mobile, 40 desktop, to match the current trends in web device usage in the U.S.

Next: Device parity.

We're not in a position to judge experience based on how many features or how much "stuff" is on a page. Google, with its famously spartan home page, proves that sometimes simplicity wins. Amazon's wildly feature-rich pages, meanwhile, show that complexity is the recipe for success in other cases.

We *do* know, however, that users don't like it when they're presented with a smartphone experience that's radically different or reduced from what's offered on the desktop. This was the downfall of many early "m.dot" websites that offered an ersatz version of the desktop experience. The result was poor user engagement, and in a short time after, the rise in adoption of RWD and AWD. But this unfortunate phenomenon still persists.

Knowing this, we added to the CEXi a simple comparison the complexity of the desktop site with the mobile site. The closer they are the better.



The ideal is a site that has been built up on mobile-first principles, leading to a design that is equivalent for all users in functionality, and also performs well for all users.

Lastly: Performance Power

At this point we have a score that measures (1) speed and (2) parity between browsing platforms, but it still could be seen as a bit unfair. If a site is dead simple to begin with, for example, it's easy to make sure it's fast and mobile-friendly. And while we maintain that no one should be penalized for choosing to create a simple site, the fact is there are some sites that go above and beyond the call of duty by providing a super-rich experience that's also remarkably fast.

To reward such companies as those, we developed a "bonus" score that bumps up the existing score by 25-50% depending how much power it packs from an optimization perspective. We do this by comparing the page weight and Time to Start Render for mobile (the more difficult of the two platforms to optimize for). Conversely, we give an equivalent penalty to those sites that *should* be fast, because they're relatively lightweight, but are not. For a site that roughly matches its level of performance with its weight, the score from the first two components holds steady.

In practice, the "performance power" bonus affects the scores of roughly half of all sites we have initially studied, either positively or negatively.

The scores

While developing the index we utilized a test batch of 175 URLs that were randomly selected from ***Internet Retailer's*** compendium of high-earning U.S. eCommerce companies. The data was collected over a single week using the same software that runs Yottaa's public WebsiteTest.com application. 10 samples were collected from the same location for both mobile and desktop for each URL. Sites with scores clearly skewed by errors were omitted.

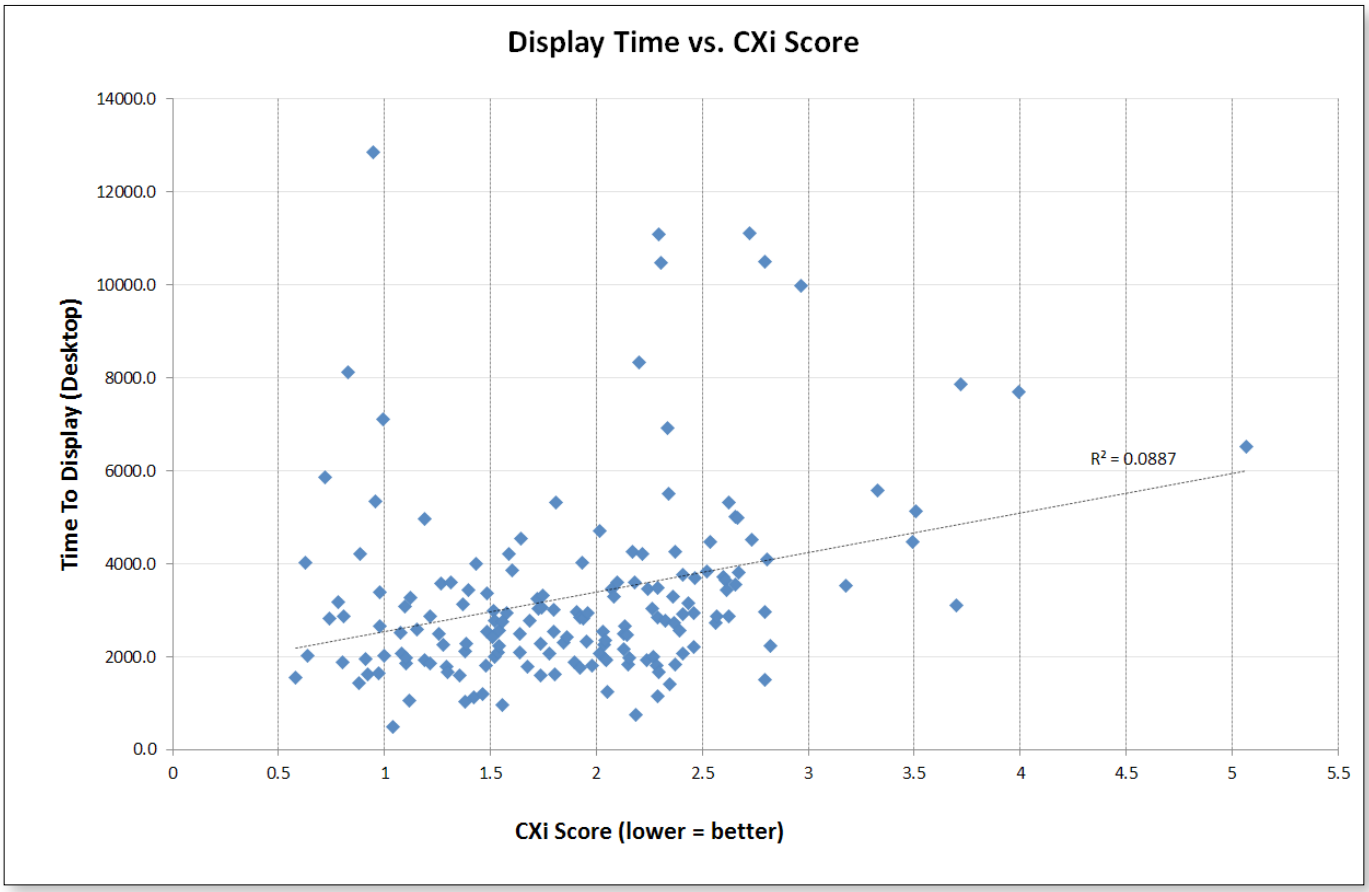
Within the final group of 168 URLs, **the mean CEXi score is 1.903; the lowest (best) score is 0.58; and the highest (worst) score is 5.01** (though that's an outlier – the next-highest is just 3.99).

Keeping in mind that our group is not representative of a full population of eCommerce sites, check out the top 50 scores here as a basis for comparison. More comprehensive studies of site populations will follow in the coming months.

	Url	CEXi
1	BeyondTheRack.com	0.581
2	Zazzle.com	0.628
3	OvernightPrints.com	0.638
4	FocusCamera.com	0.719
5	Columbia.com	0.742
6	ULTA.com	0.782
7	ColdwaterCreek.com	0.800
8	Fathead.com	0.809
9	DSW.com	0.829
10	MicrosoftStore.com	0.879
11	Onlineshoes.com	0.884
12	PersonalizationMall.com	0.912
13	Billabong.com	0.921
14	JellyBelly.com	0.947
15	PartyCity.com	0.957
16	Shindigz.com	0.970
17	Toms.com	0.978
18	DrJays.com	0.978
19	Express.com	0.992
20	Ikea.com	0.996
21	AJMadison.com	1.039
22	Dillards.com	1.074
23	UGGAustralia.com	1.083
24	Fossil.com	1.098
25	ShoeMall.com	1.100
26	Brookstone.com	1.103
27	Coastal.com	1.119
28	AmericanGreetings.com	1.121
29	AirCompressorsDirect.com	1.151
30	CharmingCharlie.com	1.188
31	Orvis.com	1.191
32	FragranceNet.com	1.215
33	CafePress.com	1.216
34	eBags.com	1.256
35	OpticsPlanet.com	1.265
36	ShopHQ.com	1.278
37	Sweetwater.com	1.292
38	VeraBradley.com	1.300
39	Replacements.com	1.316
40	AutoPartsWarehouse.com	1.355
41	1800Contacts.com	1.369
42	Abt.com	1.379
43	TheNorthFace.com	1.382
44	ShopNastyGal.com	1.388
45	AutoZone.com	1.399
46	TheLimited.com	1.422
47	Carters.com	1.432
48	Barneys.com	1.463
49	EdibleArrangements.com	1.479
50	Golfsmith.com	1.486

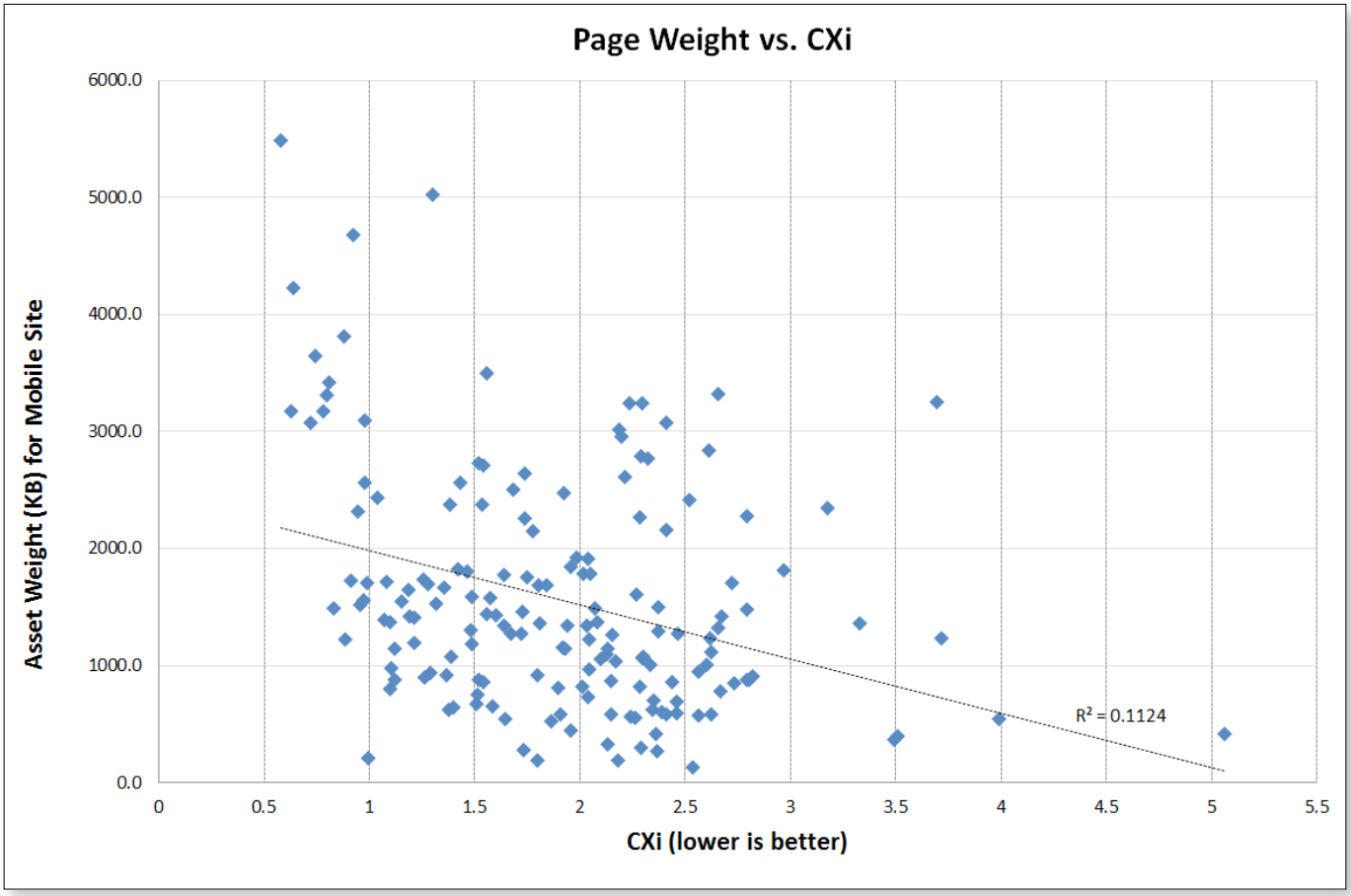
Next, we have a few charts comparing different "ingredients" of the CEXi to the overall score.

First up is a comparison of desktop Time to Display:



A correlation between TTD and CEXi exists, but statistically speaking it's small. This aligns with our initial hopes for the CEXi. We know from working with our customers that scoring well in "traditional" industry-standard measures of page load time (like TTD) is not a guaranteed link to great user experience. Web apps are more complex than that. The relationship seen here underscores that page load time is just one of many factors and that it's neither a silver bullet nor a nail in the coffin.

Next, let's look at page weight for mobile against the CEXi.

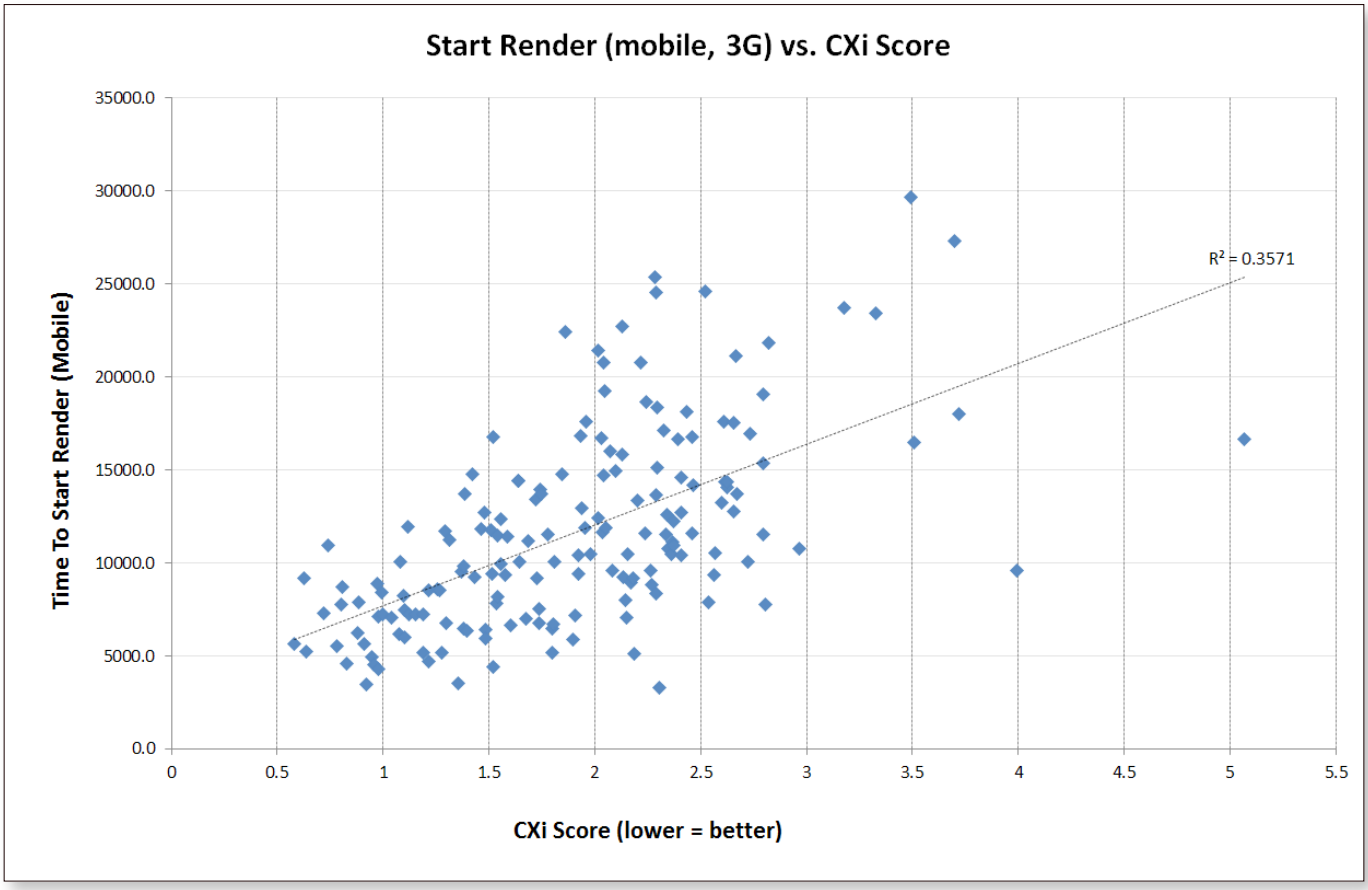


The prevailing orthodoxy says that as page weight rises, performance declines and with it goes user experience. Dozens of articles have been written (including some by Yottaa) about the trend of rising page weight across the web, its problematic effects on performance, and how to shrink your own page size.

We also know, however, that it's possible to break this apparent relationship using advanced techniques in optimization to make a heavy page perform brilliantly. Such a feat has been accomplished by a number of leading web companies, and the CEXi shows this effect in action. Counterintuitively, *there is actually a correlation between higher page weight and better CEXi score*. We can see that there are several star performers here, that have among the heaviest pages and the highest scores due to great performance. Meanwhile, some extremely light pages have decidedly average scores. The outlier with a CEXi score over 5, for example, is light, but has the worst score. In this case

the weight is, partially, its downfall: its mobile performance is merely average, but its light page weight (less than half of the median) would suggest it should be stellar. Thus it was penalized by the performance power score.

Finally, let's look at what we consider one of the most important performance measurements: Time to Start Render.



Here we see a much stronger correlation with the CEXi. A couple factors are at play here. Mobile performance, as we mentioned, is weighted more heavily than desktop in the equation, so there's a built-in bias. But it's not enough to make such a pronounced difference. The other factor is priority and technology on the part of the businesses themselves. Based on our experience with more technology-forward companies, both mobile performance and start render time are big priorities. They know that mobile is where half or more of their traffic comes from(a proportion that's growing by leaps and bounds), and that nobody likes looking at a blank screen for very long. So it makes sense that companies that score well in experience would also score well in mobile start render time.

A Workable Index

We're pleased to see that the CEXi has aligned with some of our basic ideas for a new way of describing experience. But this is not an end in itself. Now our goal is to see what else we an learn about various site populations, trends in web design and language use, frameworks and platforms. And if need be, we will work on the methodology and equation to better judge a broader set of site types and experiences.

In the meantime, let us know if you have suggestions for ways you'd like to see the CEXi put to work. You can get in touch by emailing marketing@yottaa.com or tweeting @yottaa on Twitter.

Further reading:

- The 'beta' version of the CEXi we experimented with last year, with our Retail Madness Tournament

- Our eBook on Customer Experience from the perspective of the C-Suite, Hacking Value Delivery: The CIO and the Age of the Customer

- An exhaustive account of steps an online publication took to improve their performance, many of which align to the principles of CEXi: Improving Smashing Magazine's Performance: A Case Study.