



# DESIGN FOR DEVELOPING NATIONS

Ire Aderinokun on why devs need to bear their next billion users in mind

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# net

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\*WELCOME

# EDITOR'S NOTE

Despite its reputation as a global medium, the early days of the net tended to be focused on a rather white western web. Things have certainly moved on over the last three decades – a Pew Research Center survey this year found the proportion of adults in the developing world owning a smartphone or using the internet at least occasionally has rocketed from 42 per cent to 64 per cent in the last four years (<https://netm.ag/2RUInt7>).

But it can still be easy to forget that many of our users in developing nations might not be packing 20GB-a-month 4G connections; as Ire Aderinokun comments in our interview this month, designing for

the future of the internet requires you to consider a “huge spectrum of users [with] many varying needs”.

In light of this, it’s important to rethink our approach: shipping MBs of JavaScript with our sites is no longer an effective strategy. That’s why we’ve asked Google’s Addy Osmani to offer up his insight into how you can code faster, lighter JavaScript and offer a silky user experience, whether your user is in Camden or Cambodia. We also have a practical guide on performance UX and how you can systematically refine sites to achieve better and better results.

Plenty to get your teeth into, no matter where you’re reading from.

## FEATURED AUTHORS

**ADDY  
OSMANI**



Osmani is an engineering manager with the Chrome team at Google and is dedicated to making the web fast. He's offering up his expertise on page 60, outlining how you can make your JavaScript really fly.  
**t:** @adduosmani

**CARL  
CAHILL**



Cahill is a UX and UI creative for brands, who was awarded Creative of the Year in the Wirehive 100 2013. Turn to page 68 to access his advice on the best 20 UI design tools.  
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**YELENA  
GAUFMAN**



Gaufman is strategy partner at Fold7, the creative advertising agency behind Audible's Mindful Moments ad campaign. On page 22, she explores why meaningful app experiences beat going cold turkey.  
**w:** fold7.com

**DARRYL  
BARTLETT**



Bartlett is a front-end developer specialising in JavaScript, PHP and mobile. On page 82, he talks you through the steps required to build an Alexa skill users can use to update your site.  
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# EXCHANGE

Send your questions to [netmag@futurenet.com](mailto:netmag@futurenet.com)

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advice from  
industry experts

## THIS MONTH FEATURING...

### MAX OTTIGNON



Ottignon is co-founder of Ragged Edge, a London consultancy that defines, creates and implements brands with the power to disrupt crowded categories through integrity and purpose. Clients include Grey Goose, BBC, Google and Bombay Sapphire.  
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### TONY FOGGETT



Foggett is CEO of Code Computerlove, a digital product consultancy based in Manchester that uses product thinking to help its clients be more effective at evolving their digital touch points. Clients include Asda, BBC, Bentley, Co-op, HMV and Oxfam.  
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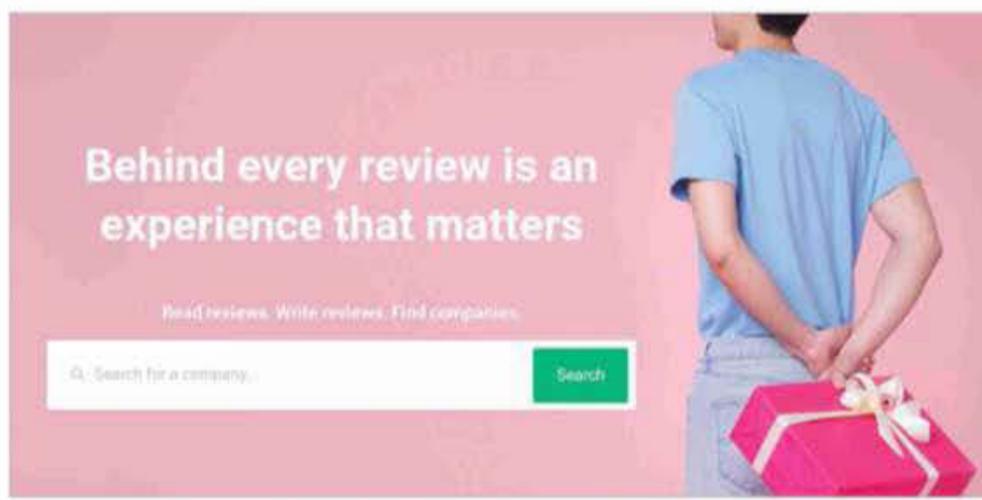
### ★ QUESTION OF THE MONTH

## How can a digital-first brand earn trust in an era of Facebook scandals and fake news?

**Jackie Clifford, Ontario, Canada**

**MO:** This is a great question and one all digital brands need to think about. Design and tone of voice are an easy fix. If your brand looks and feels considered, you'll reassure consumers that you care about their experience. Likewise if you can show up in a coherent way across multiple channels, from your website through to social, you'll prove there's depth to what you're doing.

But looking trustworthy is just the first step. To stand out as a brand with genuine integrity, you need to show how you're walking the walk. The trend for cost transparency, started by Everlane in the US, is a good way of doing this. Third-party endorsements are helpful, too. Although Trustpilot does have its flaws, its near ubiquity on every ad for a digital brand shows how it has become a shorthand for integrity. Anything you can do to prove that you deliver on what you promise will provide a big impact.



Customer review site Trustpilot's near-ubiquity means it has quickly become a shorthand for proving integrity

### Client briefs

#### ALL OVER THE MAP

What is your approach when a client prescribes a direction, especially when it's the kind you've seen produce weak results in the past?

**Darrell Estabrook, Richmond, VA, USA**

**TF:** We do still get quite a few clients coming to us with a list of deliverables and our first question is always the

same: 'What outcomes are you looking to achieve?'

For us the starting point isn't the 'how', it's the 'what' and we ask all clients to focus on the outcomes before we start. By doing this – and working with clients in this more collaborative way from the start – we often manage to steer the brief in a more meaningful direction, away from something that we

**code**

Our Work What We Do Product Thinking Blog Careers Events

## What we do

We create brilliant digital products that help our clients get ahead and stay there.

When working with clients, Code Computerlove's first question is always: 'What are you trying to achieve?'

**don't believe in. If we have clarity on the outcome we can explain the how.**

Of course we need to be respectful in challenging the client's wishes and be mindful that any new solutions or way of approaching the problem fits in with their individual culture and organisational structures.

Digital branding

### GENERATION TRAP

When it comes to digital branding, do you find terms like millennials or Gen Z useful or just a distraction?

**Alison Stewart, Nottingham, UK**

**MO:** The more you know about your audience, the easier it will be to speak to them in a way that's relevant. Five years ago, talking about millennials was a helpful reminder that a new generation of customers had come of age and had very different wants and needs to the audience we had been dealing with.

As an industry, we needed to rethink how we spoke to young people. But terms like millennial or Gen Z are the very bluntest of instruments. They can be useful as a starting point but generalisations that cover an entire generation globally are hardly going to deliver the razor-sharp insight you need to cut through.

Client relationships

### IT'S NOT ME, IT'S YOU

Is it ever appropriate to 'break up' with a client that's just not on board with what you're recommending and, if so,

how do you go about it without gaining a reputation for being difficult yourself?

**Patricia L, Orlando, USA**

**TF:** It's absolutely appropriate if the differences cannot be reconciled. We have had scenarios where we have had to part company with a client, all for different reasons.

For us the key thing is to go through a process that makes sure everything has been done correctly and that no fault lies in our actions. Sometimes it's the client's culture or operations not fitting with our way of working, which is never a master / servant kind of relationship, but an open and collaborative one.

It's important to question whether things have been done correctly and then to work with the client to almost mutually agree it's maybe not working, not apportioning blame but to both share honest feedback delivered in a constructive and well managed way. It's an opportunity for everyone to learn.

Most importantly, break up with integrity and in a way that the relationship might someday work again. As the agency partner do your best to leave the situation in a way that makes it easy for the client – even help them find another solution.

And don't feel bad if things don't work out: sometimes a client / agency relationship isn't right and it's best to admit it and move on. Your staff will thank you for it because it's often them who are bearing most of the burden of an incompatible relationship.

## 3 SIMPLE STEPS

Is social media becoming more important than the website for your clients?

**Trevor Williams, Isle of Man**



### Website traffic

**MO:** While social media is obviously incredibly important to a brand, its purpose is often primarily to drive people to the website. That was certainly the case for a direct-to-consumer client like Batch Organics.

### Image building

**MO:** On the flip side, we also do a lot of work for spirits brands, where social media is often more about building image and less about driving a direct purchase. In this case, the website has a relatively small role.



### Case by case

**MO:** The trick is to understand the role of each channel and build the brand accordingly. If the website has a clear purpose and a genuine reason for people to visit, it should be treated accordingly.

## COOL STUFF WE LEARNED THIS MONTH

### GOOGLE AMP – A 70% DROP IN OUR CONVERSION RATE

In this article, Nathan Kontny tells the story of how lead flow on his site dramatically declined after rebuilding things in Google AMP and looks at possible explanations for why this might be. He concludes that as things stand today, AMP might not be the right thing for landing pages.

[www.rockstarcoders.com/  
google-amp/](http://www.rockstarcoders.com/google-amp/)

### GOOGLE CHROME AT AGE 10

Ten years since the launch of Google Chrome, this article considers whether the browser's biggest challenge might actually be its own success. Chrome certainly helped modernise the web but now many high-profile websites prioritise it to the detriment of other browsers and the openness of the web as a platform.

<https://netm.ag/2E802D8>

### RESPONSIVE IMAGES

Properly optimised images are essential for making sure your site performs well and Mat Marquis' new book, *Image Performance*, explains everything you need to know. To get a taste, A List Apart has published this excerpt on the pros and cons of the img tag.

[https://alistapart.com/article/  
responsive-images](https://alistapart.com/article/responsive-images)

### \*THE POLL

# WOULD YOU EVER SWITCH FROM CHROME TO FIREFOX?



## From our timeline

How do you think WordPress 5.0 will affect you?



It's a great opportunity to rebuild some websites the right way. Mobile and SEO friendly, optimised images, less plugins, etc.

**@SantiagoCab1**



The seven websites I manage for the international corp I work for will no longer be running on WordPress within a year or two. The way its development has been handled and feedback has been dealt with means we have

lost all confidence in it as a platform for enterprise websites.

**@frontendben**

A large learning curve as a plugin developer to make plugins compatible with the new Gutenberg editor.

**@polevaultweb**

I've been writing a lot with Gutenberg and now can't stand classic editor. I think WordPress users have run software upgrades that

change the administrative UI before and can deal with change. The writing experience is really powerful, and the shortcut keys & focus make it smooth.

**@Josh412**



Lots of explaining to existing site owners, refactoring code where needed and training people is what I foresee. Mixed feelings.

**@tomhermans**



As a WordPress agency owner we're preparing for some challenges, in both educating ourselves, and our clients. Hopefully, it'll all be worth it.

**@keithdevon**

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# FEED

People, projects  
& paraphernalia

## THIS MONTH FEATURING...

### CLIENTS FROM HELL 14

This month a web dev finds themselves holding a site hostage till their truculent client coughs up



### BEYOND PIXELS

**Bryan Hickey** explains how jiu-jitsu helped him gain humility and become a champion web designer

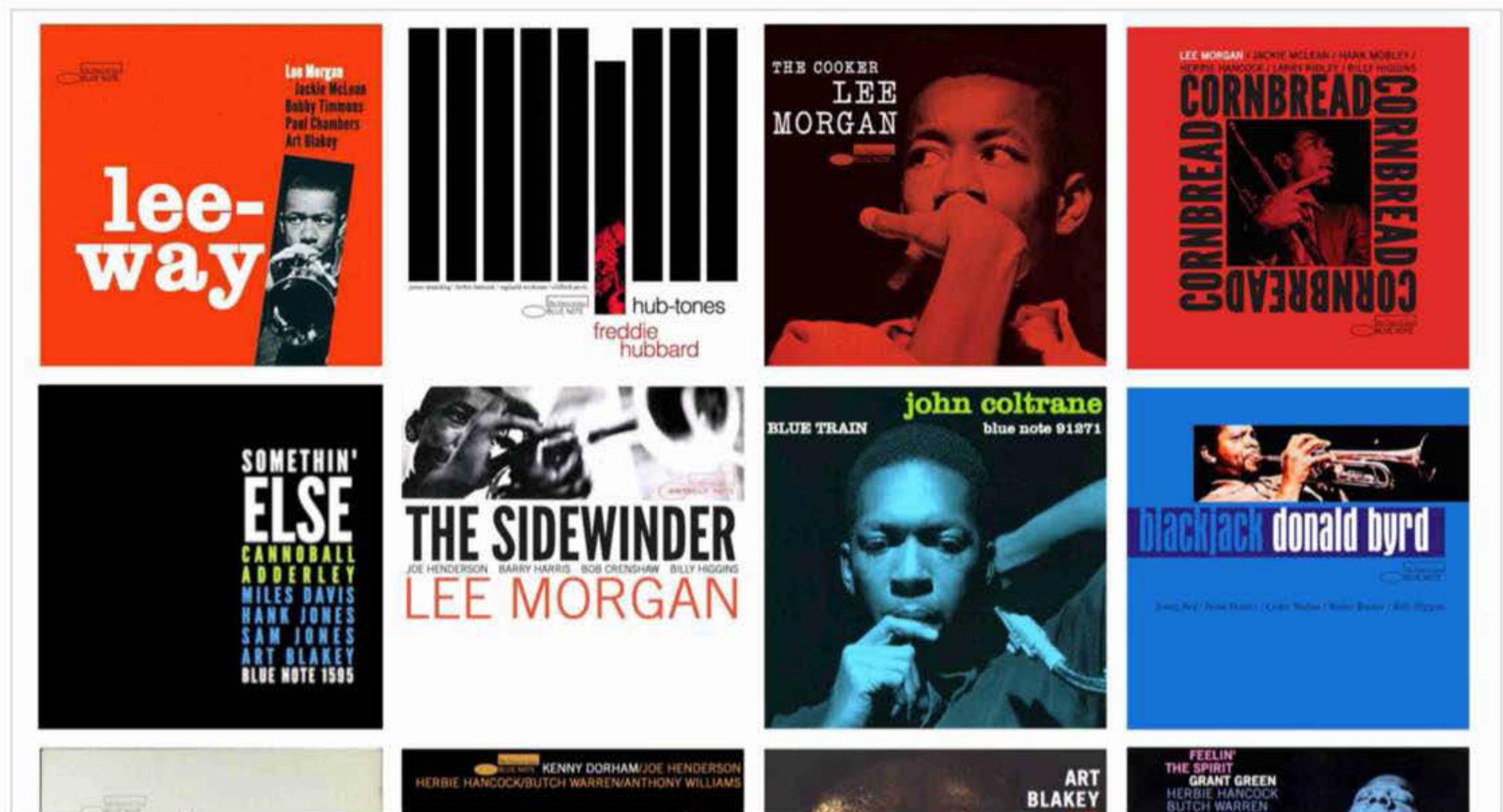
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### WORKSPACE

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## BLUE NOTES

Steve Honeyman goes on the record about his side project recreating classic album covers in CSS

### \* SIDE PROJECT OF THE MONTH



**STEVE HONEYMAN**

**job:** Brighton-based creative front-end developer

**w:** [stevehoneyman.co.uk/](http://stevehoneyman.co.uk/)  
**t:** @stevehoneyman

#### Tell us what your side project does

Blue Notes recreates classic Blue Note album sleeves from the 1950s and 1960s using HTML and CSS. All the layouts and typography are responsive.

#### Why did you create it?

My first real exposure to graphic design came through the jazz, funk and hip-hop scene of the early 1990s. Late last year I wanted a side project that would showcase my love for graphics, typography, layout and web development. Recreating these sleeves seemed like a great way to do this.

#### What were you hoping to achieve?

While this project was part homage and part test of my chops, it was also inspired by a desire to create and experiment with radically different layouts. My focus was on recreating the sleeves as exactly as possible and making them responsive – or, better put, fluid. As a devotee of web standards I wanted to incorporate lean, accessible, semantic code wherever I could.

Technically I wanted to learn more about fluid typography and incorporate clipping paths, blend modes, filters and other exciting CSS properties. But I also wanted to make designs I loved and had a real emotional connection with come to life in browser.

#### What technologies were used in building it?

Layouts were initially created with floats, padding, margins and percentages. Then I switched to CSS Grid and got fantastic results – especially with regard to accessibility and separating source order from visual appearance. I used a mixture of ems, viewport width, calc(), CSS locks and media queries to make type fluid and used font-face, letter-spacing and rotate to incorporate and set type. The humble span element was invaluable in helping me target and style letters.

#### How has it been received?

Really well! I was incredibly honoured to speak about the project at Ampersand Conference this year and spoke at WordUp Brighton and WordCamp London too. I've been bowled over by the feedback I received.

#### What do you think you'll do next with it?

I'm working on some new sleeves, all of which are more ambitious. I'm also excited about variable fonts and can't wait to incorporate these – the potential to target the x-height, serifs, ascenders and descenders of individual letters blows me away! ■



\* HOW TO

## TEST YOUR SITE ACROSS BROWSERS AND DEVICES

This issue we were intrigued about how people approached the vital task of testing sites, so got in touch with @netmag's followers to discover which tools and techniques they use to make sure their sites work on every device and platform.

### A SUITE OF TOOLS

"Initially, @googlechrome's emulation before moving on to Xcode's simulator with @browsersync, and @browserstack, for the "final showdown" (finding edge cases)," reveals @bluemwhitew. @Rilrvng likes @BliskBrowser: "We believe it's as reliably close to the real thing as possible," he says.

### ACTUAL DEVICES

"I've found <http://crossbrowsertesting.com> to be really handy for testing on old versions of IE and Android devices. But, you can't beat the real thing," says @blueocto. @therrealmizza and @\_LukeBailey also like actual devices, supplemented with BrowserStack or Browsersync.

### EMULATORS

"Use the standard browsers on Mac – Chrome / Safari / Opera / Firefox. Then use virtual box running the Windows VMs offered by Microsoft. I then use my own iPhone to test along with iOS simulator and Android emulator," says @jordanairwave.

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## HOSTING HOSTAGE

**Exclusively for net:** The latest in a series of anonymous accounts of nightmare clients

\* CLIENTS FROM HELL

A friend of a friend approached me to make a website for her. I drafted a contract where I would set her up with a site, PayPal integration and lessons on how to update it. I asked for half of the fee up front, which she paid.

Within weeks, I developed a site for her. She also asked me to make a business card. I agreed to do it free of charge and delivered a print-ready image. She was ecstatic.

I gave her a few lessons, which didn't go as well, so I agreed to upload her next few updates. We agreed that once I did that, she would pay the remaining 50 per cent of my fee.

I finalised the site, having done much more than we had agreed upon and sent an email with a notification and the invoice that the site was ready and I was happy to wrap the project up.

No reply.

I called her several times. She never picked up. I emailed her and tried to reach her through Facebook. After two months of unsuccessful attempts to reach her, I redirected her domain name to an 'Under Construction' page

considering that, since the project hadn't been paid for, it shouldn't be delivered. IMMEDIATELY I got a call from her:

**Client:** (furious) So what? You're keeping my site hostage now? That is so unprofessional!

**Me:** I've been trying to contact you for two months for the remainder of my payment. The moment you pay, your site goes back up.

**Client:** That's ransom!

**Me:** It's really not.

Very soon she paid me in full but demanded that I published all the content she had, which (in her words) I "promised to do". I hadn't but decided it would be easier to just publish the content and say our goodbyes.

About a year later she contacted me because she had run out of business cards and wanted the file again. I said I didn't have it anymore but would recreate it for a fee. She never responded.

**CLIENTS FROM HELL**  
clientsfromhell.net

# BRAZILIAN JIU-JITSU

**Bryan Hickey** explains how jiu-jitsu helped him gain humility and become a champion web designer

\* BEYOND PIXELS

I started Brazilian jiu-jitsu (BJJ) accidentally. A friend invited me for a weights session at his gym, which was a mixed martial arts academy – Renegade MMA. I expected to meet alpha males, hungry for blood and victory. But what I saw fascinated me and would end up changing my life.

BJJ is a martial art that teaches you to control and subdue an opponent while seeking joint locks and choke holds until your opponent concedes defeat (tapping). In my first class I grappled against people who I thought I should have dominated but I failed repeatedly. BJJ is not what it seems. Its founder, Hélio Gracie, was a small man who taught that a smaller/weaker opponent could defeat a larger/stronger opponent using leverage and technique rather than brute force.

My career had taken a nose dive around the time I started training. I was burnt out, broken and depressed. In those moments when I grappled, the strangest thing happened. I forgot about the depression. While grasping for air and desperately trying to keep my limbs safe, there was no time to ruminate on the trauma of the past. BJJ got me out of my head and allowed me to live an embodied life, a balanced life. I was being restored through grappling (with the help of endorphins – glorious endorphins!).



Unique friendships developed too. Something about your opponent trying to choke you or break your arm builds friendships that are hard to quantify but inherently valuable. Real trusting friendships were vital for my work as a freelancer. They are an antidote for the isolation.

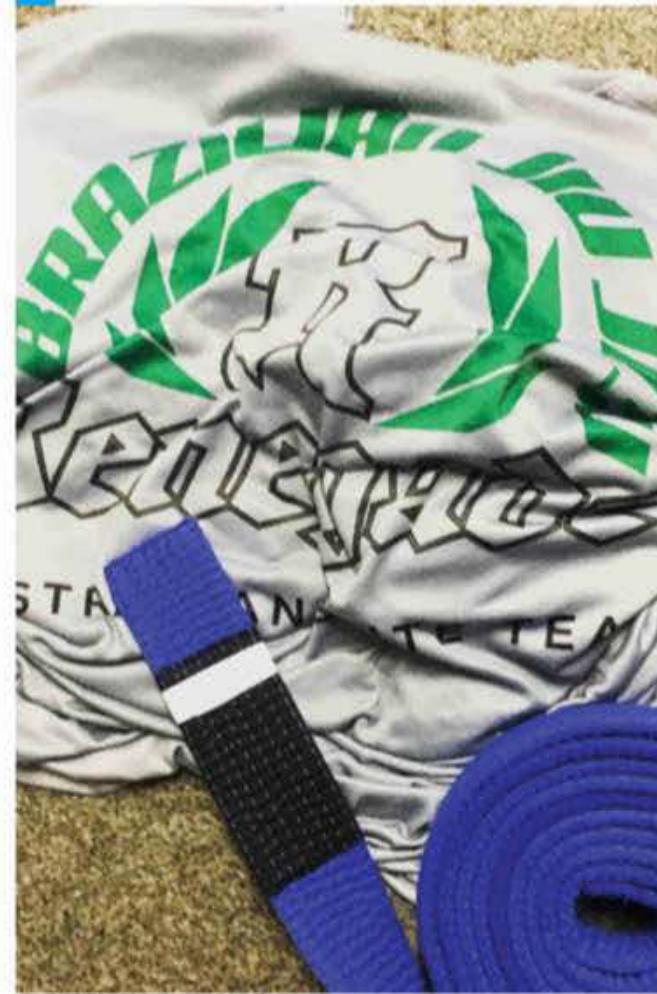
I think we all know the happiness that arises from overcoming challenges. BJJ constantly challenges and its rewards are gratifying. The real joy of jui-jitsu is striving to learn by sacrificing small wins each day so you grow over the course of months and years. Tapping frequently breeds humility and self-awareness. It is an admission that on this occasion I was bested.

The path to black belt is normally a 15-year journey; I'm getting towards the end of my blue belt after six years, so I have a while to go. The physical struggles of training have brought clarity to the struggles of working in an evolving industry. Practising BJJ gives me confidence to face everyday challenges. ■



PROFILE \*

Bryan Hickey is the founder of Happy Widget, a web design studio. Code, coffee and Jesus are his addictions.



## STUFF I LIKE



**ORLANDO ARIAS**

**Experience designer**  
[singlestoneconsulting.com](http://singlestoneconsulting.com)

### BEAR

I have completed my switch to a digital-only workflow with the help of Bear. This beautiful piece of software enables me to take notes utilising Markdown and keep them organised while at meetings or when capturing my thoughts on the go. It is a crucial part of my day.

[bear.app](http://bear.app)

### MAGNET

Multitasking is part of everyone's working day and having multiple windows open at the same time can get in the way. With Magnet,

I'm able to organise my workspace by resizing my applications to fit my screen.

[magnet.crowdcafe.com](http://magnet.crowdcafe.com)

### FLINTO

While working as part of a cross-functional team, Flinto has aided me in communicating with teammates and clients. I can easily put together animation demos that serve as conversation-starters even before anything is built. Flinto is what Sketch is missing.

[flinto.com](http://flinto.com)



## BOPGUN

**David Mathews** reveals how an open-plan office and origami oxen have helped build the agency's success

### \* WORKSPACE

**>** Situated between the beautiful Georgian city of Bath and the vibrant city of Bristol, the Bopgun ([bopgun.com](http://bopgun.com)) studio is nestled on a farm in Wick with more than 40 acres of land, perfect for our office dog Dexter. Over the past decade we've been busy building brands, campaigns and digital solutions for a wide variety of clients including Sainsbury's, London & Country, Hachette Partworks and Martin Grant Homes to name a few.

Our office space is open plan for easy communication. We feel it's important that we can all work together, bounce ideas off each other and keep the creative

energy flowing. We completed a rebrand two years ago, where we commissioned local signage company Voodoo Design to create our new logo in stainless steel [1] – and we love it! With its own spotlight, this wall feature puts the Bopgun stamp on our studio space.

We love to be challenged here at Bopgun; in fact challenges are core to what we believe in. The bull symbolises that so we have a few reminders around the studio. From our origami bull [2] to our bull print, these inspire us to tackle any challenge and push ourselves every day.

As children, we were always told not to draw on the walls but here

we encourage it. With our yellow dry-erase wall [3], we can get down all of our ideas on to one big visual space. Situated in our meeting room, it's a great area for coming up with creative solutions to our client's problems.

Upstairs is our photo studio [4] where we often shoot images of our client's products to add to their website or for promotional material. At the time of writing, we are currently busy photographing Boka bars ([bokafood.co.uk](http://bokafood.co.uk)) for use on an email marketing and social media campaign.

In November we are celebrating ten years of Bopgun and as a celebration we have created our very own Bopgun gin [5], celebrating who we are and what we have achieved. ■

### \* PROFILE

*Commercial director, David Mathews, is one of the co-founders of Bopgun. He's obsessed with customer journeys and focused on creating outstanding customer value.*

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Opinions, thoughts & advice



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**Yelena Gaufman** defends meaningful apps in an age we're being driven to distraction



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\* SOCIAL MEDIA

## REFLECT THE BEST OF SOCIAL MEDIA

**Aaron Griffiths**, design director at Battenhall, outlines what social media can teach designers



It's safe to say the simple days of web design are long gone. Designing for the internet used to be text and image working together to connect with the user. But with the growth of mobile and social media, as well as a younger generation of consumers, sites now have to suit new behaviours and expectations.

The biggest drivers of this shift have undoubtedly been Facebook, Twitter and Instagram, as over the last decade they've essentially changed how web traffic is funnelled, building entirely new user journeys. That's ultimately a path we're still on – as it continues to evolve around us now – but there are already some clear lessons that we, as web designers, can learn and factor into builds.

### SIZE OF IMAGERY IS KEY

If you look at Instagram, the platform has typically attracted a younger audience but today there's an older demographic that's

getting involved. That has in turn had an impact on how we use it, as often now the image to copy ratio per post is tailored to each specific audience – younger versus older audiences. For example, Gatwick Airport's Humans of Gatwick series on Instagram has a very long caption aimed at a more mature audience who will read all of it, whereas a brand like Adidas focused more on the visual and less on the copy when releasing the new Solar Boost range, aimed at younger consumers.

The lesson here for web design is to tailor the image to text ratio of your design to each specific audience. Adapting and introducing this level of audience understanding helps smoothly transition a user from social media to when they arrive on the website, thus helping to set the site's content hierarchy as a whole.

### KEEP FONTS CONSISTENT

On Twitter, my design team often use a large font in images, so users don't need to click to expand to be able to consume the message. This font is something that, when designing for web, we will connect to the first line of the website so a user can in turn connect the two and not get lost from the initial interaction from social. Continuity is key, so we would either follow on from or directly replicate it using the font and message so it has brand consistency across all channels, be it social or website. Font consistency builds brand awareness and helps to become an icon for the client or company.

### COLOUR MATTERS

There is a single flat colour trend on social media at the moment that sees influencers and celebrities build and stick to a specific colour scheme for their profiles or a specific colour grading for their YouTube or Instagram Stories footage. These seemingly subtle colour choices can connect with the target audience and in turn make the overall theme synonymous with that content creator. It's a brand guideline but not as we typically know it and there are lessons for web designers.

Taking this trend of subtle colour changes or consistent background colour to the front end of a website helps connect



to the specific audience that is coming from social media. This system is perfect for a campaign for example, as the colour theme enables a campaign to stand out on its own while still not straying too far from the core branding.

### PATTERNS IMPRESS

Burberry recently had a huge brand design overhaul and used the same monogram pattern across all of its social media channels and on its website. As designers, it's common to hide such patterns in the background and lower the opacity so that they're nearly non-existent but Burberry did the complete opposite of this, featuring the patterns in its imagery and thus drawing the user's attention to it.

It's a fashion-focused way of using patterns on clothing and accessories but this tactic instantly changed the way people recognised the pattern and proved that less isn't always more. It's an easy way to build brand recognition across social media, online and in physical spaces, which is something I'd expect to see more of moving forward.

### ONE SIZE DOESN'T FIT ALL

Most social media platforms have a mobile-first way of thinking, which means we design with mobile at the heart of a website. But it's not always the case. Some clients have multiple campaigns across three different social channels, which means something that was once a one-size-fits-all website turns into three sizes then back into one.

In these cases, web designers should look at designing different landing pages or sub-pages that connect better with the audience or content from each social channel a user is being directed from.

This responsiveness, alongside repetition and consistency, are key design lessons from social media. However, if you wander too far from the tree, you risk losing the fresh pickings, so my advice would be to not get too hooked up on social media. Use the lessons here but don't let them define your design. ■

Aaron Griffiths is senior design director at Battenhall, the multi-award winning communications agency.

PROFILE  
\*



★ GOOD APPS

# SINCERE INTERACTION OVER EMPTY DIVERSION

Illustration by Kym Winters

**Yelena Gaufman** speaks up in defence of meaningful app experiences in an age when we're being driven to distraction

Do you remember the last time you needed to unlock a blank phone, refresh your email, Instagram, WhatsApp, Twitter – and then repeat it seconds later having found nothing new or interesting? Maybe you felt a phantom vibration in your pocket or thought you caught a sneaky notification out of the corner of your eye.

This behaviour sounds bizarre when it's written down but the ongoing tech distraction is an accepted part of our lives. After all, we all rely on our phones, so it should be no surprise we pay them so much attention. But according to some doctors, policymakers and increasingly us as users, these distractions appear symptomatic of something more sinister.

A study conducted by the Economist and the Kaiser Family Foundation recently discovered 23 per cent of British adults "always feel lonely". Smartphones and social media are easy scapegoats here, particularly for young people. The same study, however, revealed almost as many young people find social media helpful as those who find it makes them feel worse. Maybe then the difference lies in which apps they're using and how (not to mention, how often) they're using them?

## DIGITAL DETOX

Recently installed health secretary (and former 'digital minister') Matt Hancock is one of those policymakers who feels something drastic needs to be done. He has asked chief medical officer, Sally Davies, to draw up a

new set of official guidelines on social media usage. He is reportedly doing this so that "individuals, schools and parents don't have to decide" how to regulate usage amid concerns about tech addiction and its links to everything from anxiety and depression to serious sleep disorders.

There is undoubtedly a serious problem here but this solution seems far too black and white. Blanket guidelines run the risk of driving widespread disengagement, not only from platforms such as Twitter, Instagram and Facebook but from the mentally enriching experiences offered by Headspace, 8fit, Kindle and many other platforms that benefit our health and wellbeing.

Hancock's misgivings are shared by the Royal Society for Public Health, the organisers of the Scroll Free September movement, which offers up a raft of reasons why we should be spending less time on our screens. This campaign argues our tech is having a negative impact on us mentally, physically, emotionally and socially. These opinions are shared by swathes of the general public, as Ofcom recently found 79 per cent of UK adult internet users are concerned about at least one aspect of their online lives, while 66 per cent are concerned primarily by the intent and the quality of online content.

So if content was more meaningful and fulfilling, would there be a change in public opinion? There is, after all, a great deal of proven value in the connectivity, convenience and utility of our smart devices, which would be cast asunder if we all underwent a digital detox. ►

- Perhaps we don't need a detox per se. We simply need a readjustment.

### GOOD APP, BAD APP

The apps that arrest our attention on a regular basis are those that have been designed to do so. They dazzle us with perpetual visual stimulation, supplying waves of content without purpose that keep us hooked. Many of these apps wouldn't survive a positive shift in our digital priorities, which could also buoy those apps that reward us with meaningful and useful experiences.

To ascertain precisely which apps we can derive meaningful experiences from, I looked to the Center For Humane Technology (CHT). This is a non-profit organisation run by digital campaigner Tristan Harris who, in a former life, was an employee at Google. Harris and his team conducted a survey of over 200,000 iPhone users that attempted to correlate how many hours a day a user spent on an app with how happy it made them.

The results revealed that utility-driven apps (maps, calendars etc) made people most 'happy' while social media (including dating apps) and pay-to-win games

simply swiping at our screens like apes on autopilot. Something like devouring a good book.

This is a great start but every tech brand with something genuine to offer our heads and hearts needs to start proving that their platforms are meaningful uses of our time. They can do this not only through more thoughtful material and content but by ensuring time spent on their platforms is utilitarian and genuinely enriching. This should help change the way we view these brands in a positive way and help foster a more meaningful and mindful relationship between brand and consumer.

Even the brands that are arguably largely to blame for many of our negative perceptions surrounding technology have admitted that they need to be doing something to this effect. In a post from earlier this year, Facebook CEO Mark Zuckerberg said that companies such as Facebook have a responsibility to make sure their services "aren't just fun to use but also good for people's well-being". He added that they must implement a "major change to how Facebook is built" so that time spent on the site is "time well spent", which, perhaps intentionally, references the name initially given to the CHT.

**"There is a great deal of proven value in the connectivity, convenience and utility of our smart devices, which would be largely cast aside if we all decided to undergo a digital detox"**

(the notorious Candy Crush Saga sat second on the 'unhappy' list just below Grindr) made people less happy the more time they spent on them. Alongside the utility apps that you would expect to score well on the survey (given that they exist solely to fulfil a need as quickly as possible), apps such as Headspace and Audible also scored highly, which is certainly encouraging.

What is less encouraging, however, is how little time we spend on these fulfilling 'good' apps as opposed to the unfulfilling 'bad' apps. These bad apps are dominating the conversation and the only way we can turn the tables is if the good apps step forward to do something about it. Our digital priorities will only be shifted if the apps that have the power to catalyse that readjustment are able to make themselves heard over the noise and colour of the time sinks.

### MINDFUL MOMENTS

Fold7 recently helped Audible, the Amazon-owned audio entertainment brand, become the first major brand to take a position on the idea of 'mindful' over 'mindless' tech with the Mindful Moments campaign. The campaign posits the idea that our smart devices can be used as a means of tapping into something more meaningful than

### FINDING A BALANCE

A life without tech is a ludicrous proposition in 2018. Finding a better balance in our lives should be the answer and this will involve readjusting our relationships with tech brands, not cutting them out completely. Stricter social media guidelines, however well-intentioned, are unlikely to work and could end up doing more harm than good when it comes to silencing those brands that are actually attempting to rectify the problem.

As with any relationship, understanding is key here. If we can understand the difference between 'addictive' and 'meaningful' usage, we can transform our digital distractions into digital aides that enrich our daily lives in an unobtrusive and organic way. We just need to make sure the right brands are allowed to lead the conversation. Because if the worst platforms are given the spotlight, they could end up completely masking the benefits and the balance that good tech can offer. ■

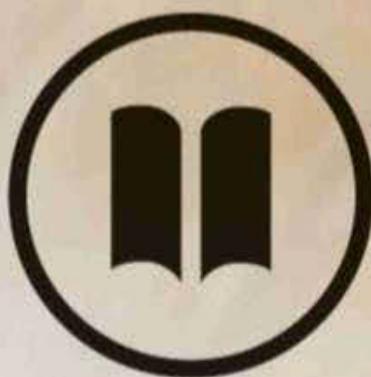
PROFILE  
+ \*



Yelena Gaufman is strategy partner at Fold7, the creative advertising agency behind the Mindful Moments ad campaign for Amazon's audio entertainment brand Audible.

# PUT A PAUSE IN YOUR DAY

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**pauseyourday.co.uk**



### INFO

**job:** Front-end developer and UI designer

**w:** [ireaderinokun.com](http://ireaderinokun.com)

**t:** @ireaderinokun



## Ire Aderinokun

Words by Oliver Lindberg

Self-taught front-end developer and UI designer Ire Aderinokun on building sites for the next billion users, enabling Nigerians to trade cryptocurrency instantly and going from tinkering with a fan site for online game Neopets to speaking at events all over the world

Unlike many of us, Ire Aderinokun has experienced first-hand what it's like to develop websites for the much-talked about next billion users – people who are coming online for the first time in countries such as India, Indonesia, Brazil and Nigeria, where Aderinokun lives.

"One of the most annoying things about Nigeria is the lack of consistent internet," Aderinokun explains. "If it rains heavily, for example, the internet will not work very well and you just need to accept that. I have four or five different ISPs in my house. When one doesn't work, I just use another one. It's a lot of patchwork."

People also tend to use very different devices (typically low-end mobiles) and browsers than those in developed nations, while two-thirds of users in Nigeria are on 2G. For Aderinokun, who went to school and university in England, where she got used to fast, reliable internet connections, that was the biggest shock on her return to Nigeria.

"I was working for a company here in Lagos and in Google Analytics I saw that maybe 20

per cent of the users were using Opera Mini," she remembers. "I wasn't even aware of that browser at the time! I downloaded it, opened up the business's site in Opera Mini and almost everything was broken!"

This prompted Aderinokun to think a lot more about the different experiences people have and test more on real devices and browsers. It also helped her understand how every aspect of writing and serving CSS impacts the user, including the selectors and properties you use, the order you write CSS and how the styles are eventually delivered. She found that progressive enhancement and performative CSS were the fundamental things to consider.

"It's easy to view and test your sites in Chrome and Firefox but that's not necessarily what our users are on," Aderinokun explains. "I've learned to shift my mindset and not just go for the better developer experience and use the latest cool thing. For example, Flexbox has just been introduced to Opera Mini but CSS Grid isn't there yet. There were times when I wanted to do something in Grid

but I realised that the users were on Opera Mini and that I could achieve the same thing in Flexbox, which allowed me to make an informed decision."

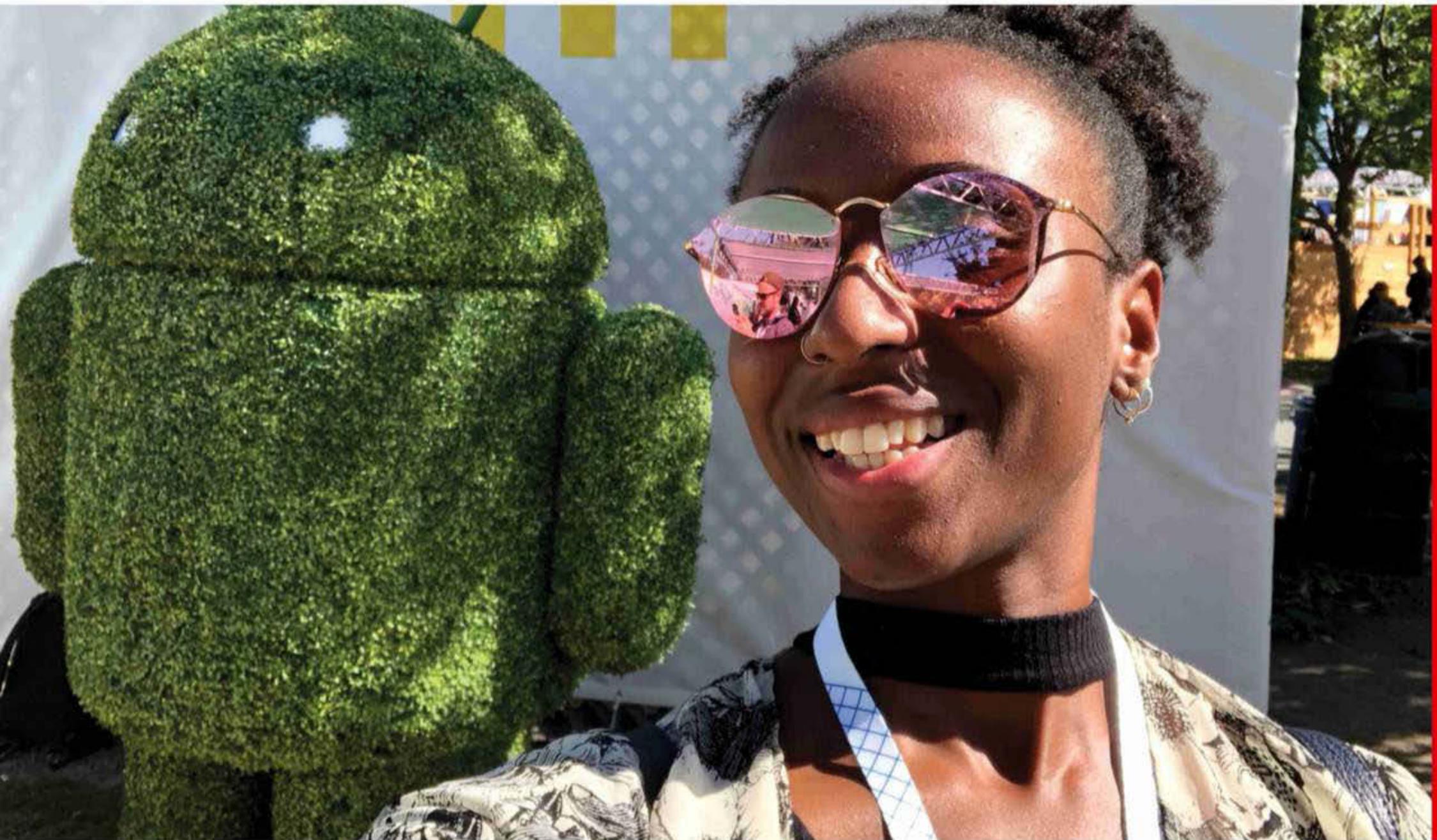
But Aderinokun points out that it's not just about emerging markets. "There's just a different user base on the internet today," she explains. "Twenty years ago, maybe 99 per cent of your users were on desktop machines, in the US or Europe, male and very well versed in technology. It was a small subset of the actual population of the world but the demographic we're targeting today is growing in both quantity and diversity. For example, you can't guarantee that people in rural areas, even in the US, have a fast internet connection. You can't guarantee much about anything anymore. We are now dealing with a huge spectrum of users that have so many varying needs, from people who use assistive technology to browse web pages to people who browse those same pages on \$50 mobile phones. So the next billion users is a shift in the mindset of how you see your users. Nowadays, we're actually targeting a population that's more in line with the actual human population rather than just a subset of it."

The best and most malleable sites, therefore, are built with as few assumptions about the end user as possible. This doesn't mean your site needs to work for absolutely everyone. Aderinokun advises to start with knowing your actual user base. "If you're building a site that's supposed to be viewed by the average person in Nigeria, for example, that's a completely different website than if you're trying to build sites for the average person in the US. Knowing your user base helps a lot because it narrows down who you're building for, even though anyone in the world can access it."

Aderinokun has always been interested in technology. In primary school she made laptops out of paper and first got into building websites through online game Neopets when she was just 14. She was so obsessed with the game that she built her own fan site, using some basic HTML, to share graphics she created in GIMP for people to download. She was enthralled by the process of creating the site and spent hours improving it.

At the time, however, most people (including her parents) considered it to be just a hobby and not something to be pursued





professionally. As she explains in her SuperYesMore article *An Unexpected Journey*, when she applied for one school in England, the headmaster told her that she was “not the kind of person we are looking for”, because spending so much time on a computer made her seem like “someone who doesn’t have any friends”.

Temporarily put off by this crushing experience, she ended up studying first experimental psychology at Bristol university and then law. But it was while at university that she became aware you could actually study computer science and programming. Aderinokun decided to give it a shot and started tinkering around with websites again, teaching herself with the help of online tutorials, courses like Codecademy and Udacity and by studying other people’s code. “One of the things that I love about being a front-end developer is that everything is public,” she enthuses. “If I see something on a website that I don’t

know how to do, I can just inspect it and figure it out.”

Aderinokun also started contributing to open source and working on personal projects and set up her blog *bitsofcode* (*bitsofco.de*) as

**“20 years ago, maybe 99 per cent of users were in the US or Europe and male; the demographic we’re targeting today is growing in both quantity and diversity”**

a way to build up her skills and contribute to the community. “I challenged myself to learn something new and write an article about it every single week, which then could also be used to teach someone else. I told myself

that if nobody ever reads my blog, it’s still useful because it’s an archive for all the things that I’ve learned.”

Fortunately Aderinokun’s notion that people might not read her blog turned out to be completely unfounded. Her articles – over 100 and counting – have gathered half a million page views each year and to date her newsletter has attracted 3,000 subscribers. It put her on the map and led to her first major speaking gig at Fronteers in Amsterdam two years ago. “At that point I hadn’t really spoken at conferences at all, only at one in Nigeria,” Aderinokun explains. “And that one was a very small meetup here in Lagos, so Fronteers was so scary! It was a completely different experience because I knew I was going to be speaking in front of people who were much more advanced than the audience in Nigeria.”

Another big step was being selected as a Google developer expert in 2006. Aderinokun had heard about the program at a Women ➤



“It’s okay to not know everything.

For example, I haven’t done much with React but I know Angular; you don’t have to know every framework”



► Techmakers event in Lagos, applied and became the second expert in Nigeria. Not only did this give her validation and result in more invites to conferences all over the world, it also enabled her to travel to events like the Chrome Dev Summit and Google Experts Summit and will see her present a talk on CSS for the next billion users at Pixel Pioneers Belfast in November (her first speaking engagement at a UK conference).

But her blog wasn't just the first step on a physical journey: it also played a big part in Aderinokun overcoming imposter syndrome. Being self-taught and working alone for the most part made her unsure of whether what she was doing was correct and caused her to doubt her abilities. "The writing really helped," she says. "The more I wrote and the more attention my blog got, the more people said they liked what I was writing and that it helped them. I still get imposter syndrome but I remind myself that it's okay to not know everything. So, for example, I haven't done

much work with React, which people always talk about, but I know Angular. That's the framework I usually work with and you don't have to know every single framework."

Last year Aderinokun decided to leave the media company in Lagos she had been working at as head of technology and began looking for a new challenge. However, her blind applications were rejected. It was only when she tweeted that she was looking for a job that companies began actively courting her. One of them was eyeo, a German company that produces open source software like Adblock Plus, which is arguably the most popular browser extension ever with over 500 million downloads. As a passionate open-source advocate, Aderinokun quickly jumped at the opportunity.

Aderinokun's latest project is a cryptocurrency exchange for Africa called BuyCoins ([buycoins.africa](http://buycoins.africa)); co-founded by her and a friend, the startup has just completed Y Combinator's Summer 2018 program.

"Buying any sort of cryptocurrency in Nigeria is incredibly difficult" she explains. "There's no product that works like Coinbase at the moment. A lot of trading actually happens through services like WhatsApp but it's just such a convoluted and fault-prone process."

When Aderinokun wanted to buy an iPhone last year, there was no easy way for her to transfer her Nigerian naira into dollars to enable her friend in the US to buy it for her. Deciding that there had to be a better way, they started with a peer-to-peer exchange called Bitcoin Afrika and have now created an app that people use to buy and sell cryptocurrency, including Bitcoin and Ethereum, directly with their local bank account or debit card. It's a huge opportunity. There is already \$4bn traded in cryptocurrency in Nigeria and the market is growing quickly. Once again Aderinokun's inside knowledge of the local user base in Nigeria has helped her create a better service and fulfil a real need. ■



\* THE DESIGN OF BUSINESS

# TRUST

**Christopher Murphy** explores trust – one of the most valuable commodities for any business



**job:** Writer, designer and educator  
**w:** mrmurphy.com  
**t:** @fehler

► Regardless of whether money is involved, there's one commodity in business that always changes hands: trust.

Whether you're working on a client project that involves confidential information or gathering your customer's intimate personal details within a SaaS product, it's important that you keep the bond of trust between business and customers sacred.

Over the last year, we've witnessed a number of high-profile cases where the bond of trust between business and customer hasn't been handled with the respect it deserves.

Facebook's launch of Portal – and the subsequent backlash the product received on social media – is evidence of how a breach of trust can erode brand loyalty in a manner that can rapidly spiral out of control. Why? Because the business abused the trust of its customers. Facebook's handling of the Cambridge Analytica scandal – particularly the reticence of Mark Zuckerberg, Facebook's CEO, to accept some responsibility – significantly eroded trust in the brand.

Compounded by earlier reports that Zuckerberg had branded Facebook's customers "dumb f\_cks", for trusting the business with their data (<http://bit.ly/fbdumbfucks>), this added up to a culture of disregard

for consumers' trust. And – as these things have a habit of doing – this came back to haunt the business. Facebook, of course, is not alone.

## GOOGLE MINUS

On 8 October, Google announced 'Project Strobe', an initiative designed to protect customers' data, improve the business's third-party APIs, and – tucked away at the end of the list – sunset Google+.

Buried in the announcement was an admission that one of Google+'s APIs had leaked the private information of over 500,000 users to third-party developers between 2015 and 2018.

Leaking the private information of half a million users is bad enough but worse was the fact that an internal memo, obtained by the *Wall Street Journal*, revealed Google had covered up the breach for fear of regulatory repercussions. As the *Journal* summarised, the memo, "warned the company's senior executives that disclosing the incident would spark 'immediate regulatory interest' and 'almost guarantees [CEO] Sundar [Pichai] will testify before Congress'."

That Pichai was aware of this and yet chose to keep the breach buried anyway is alarming. It demonstrates either: a staggering lack of understanding of the importance of the bond of trust between a business and its customers or a flagrant disregard for those customers.

The damage that this breach of trust does to Google's brand is measured not in days, weeks or months, but in years. There are, of course, lessons to be learned here and you don't need to be a company the size of Google to learn them.

## TRUST IS YOUR MOST IMPORTANT COMMODITY

Cultivating an open and honest business culture will pay dividends in the long run. When things go wrong, as they occasionally do, own up and take responsibility. Your customers will appreciate your honesty and you'll protect the all-important bond of trust that, deep down, drives your business. ■



With Facebook's tarnished trustworthiness, it's no surprise that Portal launched to widespread backlash



★ Q&amp;A

# CHRIS MILLS

The web-standards veteran on how Mozilla's making its docs and data more useful



INFO

**job:** MDN content lead and writers' team manager, Mozilla  
**w:** developer.mozilla.org  
**t:** @chrisdavidmills

## Can you introduce yourself to those who might not know you?

Sure! I'm fairly well-known on the web-dev scene for my work in web-standards education and evangelism. Originally I worked on print books in the early 2000s, then at Opera Software (doing talks and working on [dev.opera.com](http://dev.opera.com)). Also I was a fellow at W3C working on Web Platform Docs and more recently writing documentation at Mozilla on the awesome MDN Web Docs. I'm also a drummer and music lover, appreciating heavy music.

## What have you been up to at Mozilla this year that you'd like developers to know about?

On MDN Web Docs, we've been concentrating on making our documentation and data more flexible and useful to as wide an audience as possible. The first big project I want to talk about is browser-compat-data ([github.com/mdn/browser-compat-data](https://github.com/mdn/browser-compat-data)), a repo containing structured browser compat data for nearly all web standards features, which currently covers 95 per cent of features documented on MDN Web Docs. This data is not only used to generate the compat tables on our site but it is also published under an open license and is already being used in other projects such as VS Code ([code.visualstudio.com](https://code.visualstudio.com/)).

I am also very proud of my team's work on our interactive examples ([github.com/mdn/interactive-examples](https://github.com/mdn/interactive-examples)). From this repo we generate all the live editable examples you can now see at the top of our HTML, CSS and JavaScript reference pages. These are interactive, completely editable code widgets within the page. They have massively improved the user experience on our reference pages. We are looking to start adding them to the most popular Web API reference pages in the near future too.

We've also started adding more useful data to our data repo (<https://github.com/mdn/data>), including CSS property short descriptions and reference page URLs. There is great interest from projects like VS Code in consuming this data to provide better in-context help for developers when writing CSS. This is on top of all the work we do to document the mass of new features appearing in the web platform all the time!

## That's a lot. How do you keep up with it all?

We've started collaborating with other browser vendors to help spread the load, identify issues and make better, more informed choices about the prioritisation of work. We've got representatives from Microsoft, Google, Samsung, W3C and others working on MDN documentation and we also come together regularly as the MDN Web Docs Product Advisory Board, a committee dedicated to discussing related topics of interest. We also make the site the best it can be.

## What's exciting you most in the field of web design right now?

I'm very excited about WebAssembly ([developer.mozilla.org/en-US/docs/WebAssembly](https://developer.mozilla.org/en-US/docs/WebAssembly)). This is a real game changer, opening the floodgates for major web app performance enhancements and allowing us to write code in lower level languages and compile them to the web. The web can now be a publishing target for nearly any language, provided you're prepared to write an appropriate compiler toolchain for it (you can already compile C/C++ and Rust to WebAssembly).

If you're interested in Rust and WebAssembly, you might enjoy [rustwasm.github.io/book](https://rustwasm.github.io/book): the Rust team has done a whole bunch of ES Module/npm integration work recently, making it easier for developers to write and integrate WebAssembly into their applications, with all the safety of Rust.

I'm also really excited about all the CSS advancements we've seen in recent times. Features like Flexbox and Grid have finally solved many long-standing issues with layout on the web and other technologies like CSS Shapes are providing new and exciting design opportunities. All in all, we are entering another golden era of the web! ■

## ★ USEFUL RESOURCES

# WHAT NEW TOOLS HAVE YOU DISCOVERED IN 2018?

Could a new tool improve your workflow or creativity? Check out some that have set our panel alight this year



IAN PARR

**Web developer and designer**  
[devolute.net](http://devolute.net)

Sharing an office with telesales, office dogs or singing project managers can be damaging to productivity. As a freelancer I was able to escape but there's still the Wikipedia rabbit hole. My solution has been SelfControl ([selfcontrolapp.com](http://selfcontrolapp.com)) for macOS. Enter your particular vices (or rather their URLs) into the blacklist and this app blocks them for however long you wish. I put in 45 minutes but usually find two hours later that I'm still focused and productive... if my phone is charging in the next room, of course.



BEN READ

**Web developer, Zopa**  
[deliciousreverie.co.uk](http://deliciousreverie.co.uk)

I have a lot to thank Apple for but sometimes the walled garden is just too... walled. So I've been moving to Linux for my development and design work. I use Pop!\_OS ([system76.com/pop](http://system76.com/pop)), which is for makers and creators. The design of icons and UI elements has a wonderful 1970s vibe and stays in the background, so I can focus on my tasks. I've had to learn some new workflows but I've decided to stick with it. Now I can control everything I need to stay productive.



DANA JAMES MWANGI

**Branding and website strategist,**  
**Cheers Creative**  
[www.cheerscreative.com](http://www.cheerscreative.com)

The best investment I made this year was purchasing Dubsado ([dubsado.com](http://dubsado.com)), a client management system that helps creative professionals nurture leads, build client relationships and fine-tune project workflows. For me, a website project goes really well and has a higher success rate when the client trusts my guidance 100 per cent. Dubsado increases that trust factor and ensures nothing in my projects falls through the cracks. You will spend some concentrated time on the front-end creating workflows for your services. But as your business becomes more organised, it will run like a well-oiled machine and you can spend more time actually being creative.



**GERGELY  
VARGA**

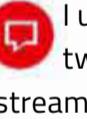
Technical director, You Could Travel  
[www.youcouldtravel.com](http://www.youcouldtravel.com)

 I'd been looking for an online tool to sketch out ideas and iterate through versions before I started coding. Earlier this year, I found Figma ([figma.com](https://figma.com)), a browser app that has the same level of functionality as Sketch or Adobe XD. You can easily create prototypes and share or collaborate on them with your team and clients. You can work on designs anywhere and, as a bonus, you can view the design files on your mobile. The community around Figma is growing and new features are constantly rolling out.



**CATALIN  
ZORZINI**

Founder, Unblock  
[unblock.net](http://unblock.net)

 I used to multitask. I used to procrastinate. I used to check my email every two minutes instead of being focused on my work. I used to browse endless streams of designer news, product hunts, Twitters and Instagrams. And I used to feel guilty about it all. Thanks to applying some basic mindfulness techniques (like focusing on my breath, which started to reveal my thinking patterns), I managed to uncover my deep-rooted anxiety and to become friends with it. Two mindfulness apps that I've found very helpful have been Headspace ([headspace.com](https://headspace.com)) and Plum Village ([plumvillage.app](https://plumvillage.app); full disclosure – I'm working on this one).



**ADAM  
TOMAT**

Lead developer, Rareloop  
[www.rareloop.com](http://www.rareloop.com)

 At Rareloop, we've been enjoying WordPress development since we created Lumberjack ([docs.lumberjack.rareloop.com](https://lumberjack.rareloop.com)). It's an MVC framework that makes WordPress a viable option for bespoke, non-trivial sites. It was built to be as unintrusive and unopinionated as possible and you can use as little or as much of the framework as you need. You can either use the Lumberjack starter theme or add it to an existing Timber theme. For me, the fluent query builder, the router for custom URLs and the dependency container are absolute game-changers. It makes our themes so much easier to change and maintain.



**KATHERINE  
CORY**

Web designer and front-end developer  
[katherinecory.com](http://katherinecory.com)



Drupal has always been my CMS of choice, so I'm surprised to say the new tool I've been using this year is Squarespace ([squarespace.com](https://squarespace.com)). During my GDPR audits I noticed a lot of my clients don't update their content. With the release of Drupal 8 and its focus on enterprise-level websites, many of my clients don't require the flexibility it offers. Squarespace has also broadened the audience I can work with; because I can build sites more efficiently, my services have become more affordable.

## RESOURCES

### 30 WEB DESIGN TOOLS TO SPEED UP YOUR WORKFLOW

<https://www.creativebloq.com/features/best-web-design-tools>

 The right tools can streamline your workflow. In this post, Tom May brings together 30 tools that all have the potential to save you time, energy and money.

### THE ESSENTIAL GUIDE TO TOOLS FOR DESIGNERS

<https://www.creativebloq.com/advice/the-essential-guide-to-tools-for-designers>

 Whether you're refitting your design studio, looking to become more efficient, or are just keen to make freelance life easier, Nick Carson has compiled a resource to help.

### 7 ESSENTIAL TOOLS FOR TODAY'S WEB DESIGNER

<https://www.creativebloq.com/news/7-essential-tools-for-todays-web-designer>

 Every web designer needs a reliable toolkit. Here Steve Jenkins provides a selection of web design tools to help you achieve all the results you need.



\*CONTENT MANAGEMENT SYSTEMS

# CMS SOS

**Simon Billington** takes a look at what you need to consider when choosing the right CMS for your site

When it comes to a CMS, we live in complicated times. Which system do you choose and what do you want to achieve? If your goal is simply to build an 'editable website' you need to rethink your goals. You should be aiming to create the beating heart of your digital ecosystem.

So what exactly needs to be considered when making the toughest choice in digital? Here are a few pointers to get started.

## WHAT IS YOUR AIM?

A CMS should be designed to support all of the critical interactions and functions your business needs. I hear now more than I have ever done: 'We have invested all this money in a website but it's not delivering what we expected.' Establishing real KPIs for the site will help you make the right decision.

## HOW IT WILL BE MEASURED

If you create KPIs for a site's success, match them with the right level of insight. In my view, you can never have enough data around website usage. The greatest amount of time

should be given to this aspect of the CMS strategy. If you can't integrate an adequate level of analytics into the considered CMS, walk away. Also consider the rest of the ecosystem: ensure you have measurement in place to track the impact of changes across your digital real estate.

## HOW IT WILL BE MANAGED

A website is a living, breathing thing: it needs to be fed. Up front, think about your organisation's ability to manage it moving forward. If you are a team of one or two and are targeting a content-hungry website, you will be battling competing demands so ensure you consider how you will feed it. Sites that have been designed with high content demands will suffer far worse in the hands of small teams than those with more modest content needs.

## HOW IT WILL BE MAINTAINED

Before you get in bed with one particular CMS, consider what happens further down the line. Digital changes constantly. Things

will break. Code will need updating. This is where careful consideration should be given to choosing between a bespoke, an open-source or a proprietary CMS.

With a bespoke CMS you get the functionality you need. Your budget has paid for what you are going to use and not for things you won't use. However, its biggest asset is its greatest limitation. In most cases, a bespoke CMS is developed by a single developer or a team. Their approach to development can sometimes make it very hard for another developer to take over. A bespoke CMS will need constant updates, so consider the real cost of a relationship with those developers breaking down.

Open source is free to use. This can be all someone needs to hear to make it the weapon of choice. But, as with all open source, nobody really owns it. Yes, there are more developers out there who can develop for that platform, making it easier and cheaper to recruit. But, without the defined development roadmap of the proprietary CMS, you are somewhat at the mercy of the masses. The subscription fee that comes with the proprietary CMS guarantees not only a defined roadmap but also accountability and a support network moving forward.

## DON'T OVER-PERSONALISE

Beware the lure of personalisation. This is some advice based on experience. True personalisation is very hard to achieve: it will require a great deal of investment. Managing and creating specific journeys for individual personas requires time. As with all decisions when choosing a CMS, consider the reality of living day-to-day with your chosen platform. Consider using as many automated approaches to content personalisation as possible. The flexibility of a CMS is reflected in the experience a user has. If you can't put in, visitors will get out.

These are just some of the considerations when choosing a CMS and every option will come with its positives and negatives. As long as you are clear with what you need it to do up front, you will always reduce the risk of making the wrong choice. ■

Simon Billington is an executive creative and digital director with 20 years' experience, currently unifying creative, brand, digital and design at LEWIS Communications.

PROFILE  
\*

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<sup>†</sup>UNFAO, Global Forest Resources Assessment 2005-2015.

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Discover 10 design skills to help bring home the bacon, build your business to boost your cash and learn to be a CSS Grid grandmaster



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Explore the evolution of progressive web apps, stay nimble using agile design and become a machine-learning master



#307 JUL 2018

Soup up your design process and put your dev work into top gear, test your way to success and use Node.js to minimise memory drain



#305 MAY 2018

Learn how augmented reality has changed the web-design landscape. Become a data-viz whizz, prettify pop-ups and perfect parallax FX



#304 APR 2018

Explore CSS animation with Animista.net's creators. Code custom WebGL effects, prototype with Origami and top PWA tips



#303 MAR 2018

A pro guide to all the best tools in web and UI design, 10 expert React.js tips, the 5 best code editors and Blockchain explained



#302 FEB 2018

50 amazing dev tools for 2018, plus prototyping at Netflix and a free, bumper 20-page design trends supplement

## PREFER TO READ ON ANDROID, PC OR MAC?

net is also available on Google Play and Zinio, as well as Kindle, Nook, Windows 8 and more

[NETM.AG/NET-GOOGLEPLAY](http://NETM.AG/NET-GOOGLEPLAY)



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# GALLERY

Sensational design and superb development

\* GSAP JAVASCRIPT ANIMATION, SCROLLMAGIC, HTML5

## BANG & OLUFSEN AW18

<https://www.beoplay.com/en/collection/aw18>

 Bang & Olufsen's biannual colour collections site is outstanding work. Jakob Kahlen, creative director at Trouble, gave us an insight into its process, which didn't just include the website but also defining the colours of the products and executing the entire campaign. He revealed how the process started from a solid design research in culture and lifestyle trends, then moved on to creating a colour concept for the product palette. The limestone grey, terracotta red and dark plum purple are wonderful. The idea that people need to feel human and more in touch with nature as the world gets more technology-driven is at the driving force of the concept.

To bring the AW18 collection to the market, Trouble went to the ancient and beautiful city of Marrakech. With its clay

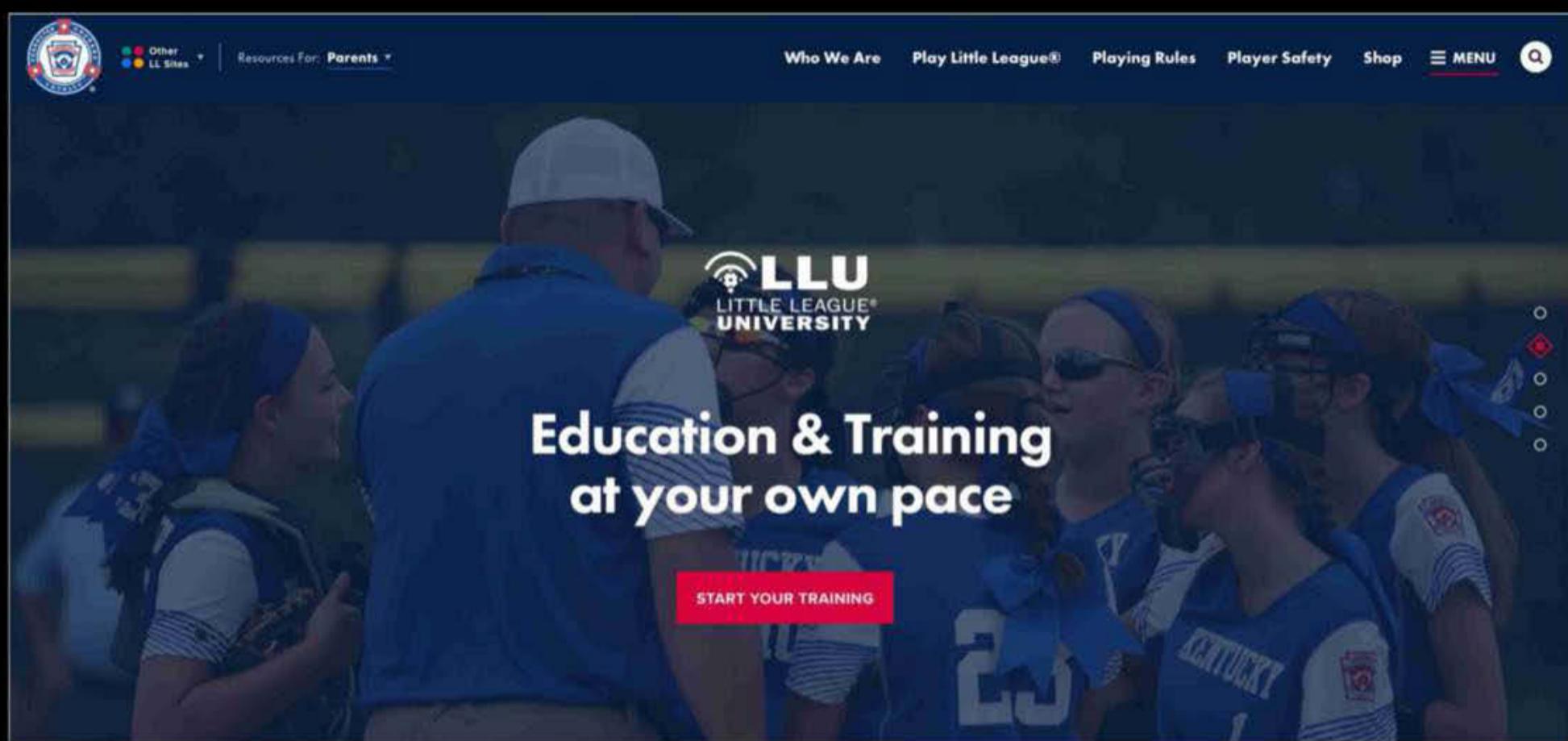
walls and terracotta rooftops, it was the perfect place to stage the story. The collection website is the heart of the campaign: it was designed to convey the feeling of having your feet on the ground, looking towards the future. This is achieved by contrasting the beautiful fashion photography captured in Marrakech with subtle scroll-controlled animations of clouds. On the technology side, animations on the site are made by using the GSAP library in combination with ScrollMagic to trigger animations and control timelines.

## NEIL BERRY



Berry is senior UX designer at Charities Aid Foundation, one of the UK's largest charities. He loves solving problems through design, gadgets and is a keen runner.

**t:** @neil\_berry



★ WEBPACK, BABEL, NODE.JS/NPM

## LITTLE LEAGUE

<https://www.littleleague.org>

The Little League site is a great example of clean, consistent design and UX but with a complex information architecture. The responsive brackets are expertly designed too.

We caught up with Kyle Unzicker, director of design at Modern Tribe, who worked on the project, to learn more. "We had a diverse set of stakeholders. Our aim was to build a site that allowed a central team to edit, manage and create individual sites within the same administrative dashboard and to quickly and easily share content across multiple properties. We developed a design system that could be shared across all properties yet supported unique branding aspects such as swapping primary and secondary colours and logos when appropriate. The information architecture needed to support both users already involved in Little League but also introduced the organisation and its values to those who may not be involved with LL."

Unzicker continues: "For the LL World Series site specifically, we aimed to create a visual system that heightened the fan experience by prominently featuring team logos, colours and player photos. With an emphasis on scores, schedules and a live tournament bracket, the site allows millions of fans to track the progress of their favourite teams."

Download the 2018 Little League Baseball® World Series Tournament PDF Bracket.

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**UNITED STATES WINNERS BRACKET**

**GAME 2** 8/16  
**MIDWEST** 2



\* CANVAS, WEBGL, PHOTOSHOP

## KIKK FESTIVAL 2018

<https://www.kikk.be/2018>

 This stunning site is linked to a digital culture festival, the KIKK Festival, taking place in Belgium later this year. The theme is all about microorganisms seen through the lens of a microscope. Just look at those vibrant colours and the playfulness!

The transitions, hover effects and animations while scrolling and navigating are delightful and visually so impressive, as are the little touches throughout the responsive design. As you navigate deeper, a great example of implementing a complex, detailed timeline layout on mobile are the schedule pages, which need to quickly give us details and timings of the festival's events.

We chatted with Henry Daubrez, CEO of Dogstudio, whose team was behind the site and he explained how they wanted to convey a hand-drawn feeling to the whole design, so during the build they hand animated, frame-by-frame, all of the organisms – that's attention to detail! He went on to explain how it runs on Dogstudio's own content management system (Emulsion) and is fully editable, which is a feat for a website this crafted. A worthy winner of site of the month.

“Bold colours, beautiful fonts and stunning animations bring to life the creativity of the festival. Unique design at its best.”

CHRISTINE BERRY, LEAD UX DESIGNER, COOK

\* HTML, SASS, CSS GRID PROTOTYPE

## NEW ADVENTURES CONFERENCE

<https://newadventuresconf.com/2019/>

There's a lot to admire in the returning New Adventures site with its modern visual identity. Designer Simon Collison reveals how after nailing the basic visual approach over a complicated grid in Sketch, he began building a prototype using CSS Grid. "It was my first attempt with Grid and I found it to be incredibly intuitive, flexible and lots of fun." This prototype became actual but it was only a few days before launch that device testing revealed how poorly it would perform in IE11 and some older mobile OSs. He felt the New Adventures comeback couldn't be a diluted visual experience, so he spent two days rebuilding every bit of HTML and CSS just before launch. A few

precise alignments and pleasing bits of responsive fluid magic were lost but the site is now mostly consistent across all browsers and devices.

Still, what a phenomenal way to build: Grid really lends itself to prototyping in the browser. He went on to explain: "Around 50 per cent of the design was done with paper and Sketch and the remaining 50 per cent in the browser. CSS is one of the best design tools and I've always enjoyed taking a rough idea into the browser and then exploring and refining all possibilities in code."

So in the end a very simple build; just HTML and preprocessed (Sass) CSS and most graphic decoration is SVG, but a great insight into his design process.

\* REACT, MAPBOX, TRIPADVISOR BOOKING API

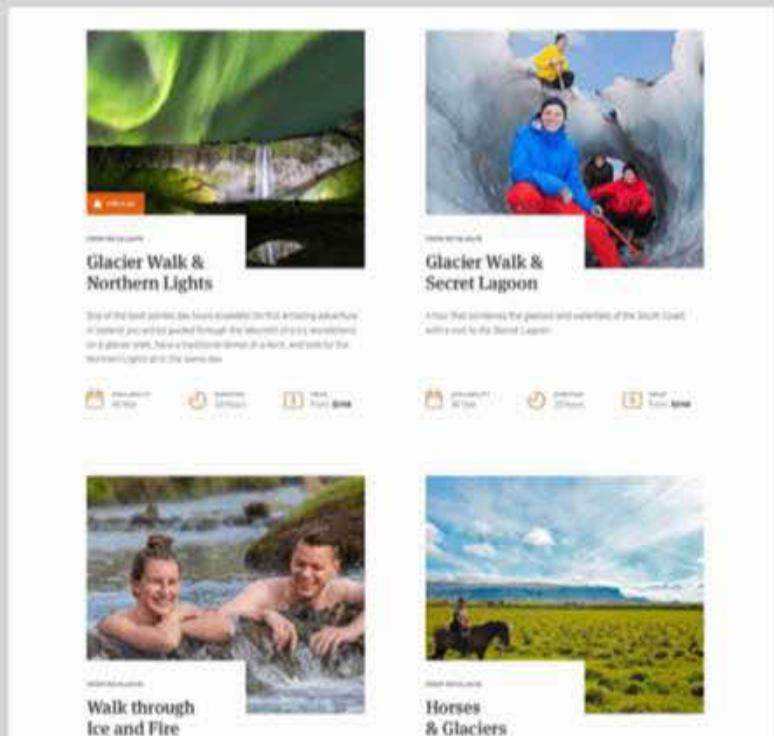
## ICELANDIC MOUNTAIN GUIDES

<https://www.mountainguides.is>

I recently ticked off Iceland from my travel bucket list – its breathtaking landscapes and incredible waterfalls everywhere you turn were unforgettable. Before I set off on my trip I really wish I could have planned and booked my sightseeing and tours all in one place. Introducing the new Icelandic Mountain Guides (IMG) website. It's an absolute beauty – across all devices – showcasing the amazing adventures and experiences the company offers.

Founded in 1994, IMG has been providing premium outdoor experiences in Iceland for tourists and locals alike. Across its tour pages it has implemented custom maps using Mapbox, an open-source mapping platform, to show more detailed itineraries as well as exact routes. This function is particularly impressive when using it on mobile devices.

Marco Coppeto, design lead at Ueno, explained that his team worked with IMG on redesigning and developing the website and updating its digital branding. They created a new, intuitive way for website visitors to search for and book tours. This experience now includes interactive itineraries, image galleries and enables customers to book activities in a brand new seamless checkout experience. I'm on the next plane to Reykjavik if anyone needs me.



**ICELANDIC MOUNTAIN GUIDES**

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HIKING ADVENTURES

## Kingdom of Volcanoes and Glaciers

Discover the Most Beautiful Landscape of South and South-East Iceland. Geysir, Gullfoss, Skálfafell, Jökulsárlón and Laki volcano.

1 Adult | Select Tour Date | Departure Time | Price from: \$2,450 | **BOOK**

Discover the Most Beautiful Landscape of South and South-East Iceland

This is an outstanding trip to one of Iceland's most attractive areas, including the famous Geysir and Gullfoss waterfall, the Skálfafell part of Vatnajökull National Park, Jökulsárlón glacier lagoon and the famous Laki volcano. On this tour you will be hiking through stunning volcanic sceneries with breathtaking panoramic views over glaciers and spectacular mountain peaks.

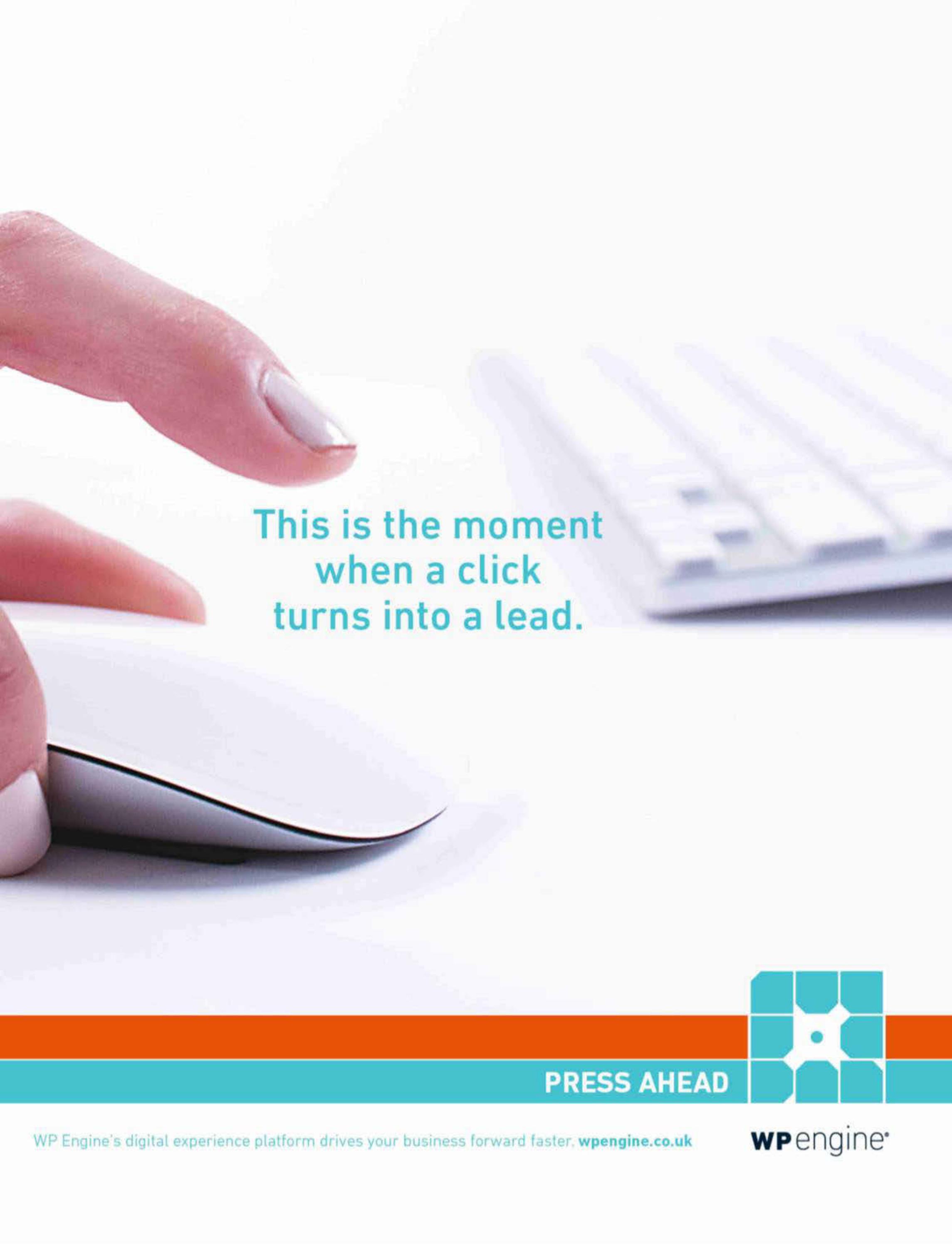
Whether it is the glacier lagoon and its amazing icebergs, the incredible volcanic landscapes of the Laki area or

Skálfafell that impresses you the most, you can be certain to have an outstanding adventure.

And maybe, if weather conditions permit we might enjoy the dramatic and phenomenal midnight sun decorating Vatnajökull icecap. The evenings and nights will be spent at a nice and comfortable countryside hotel in the close vicinity of the small town of Kirkjubæjarklaustur in the southeast. Transport in comfortable minibus.

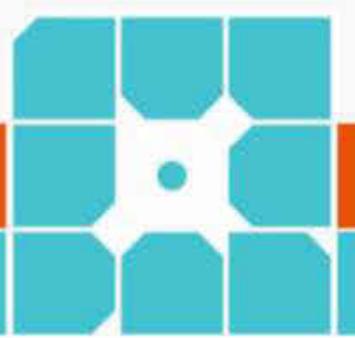
Tour code - IMC03

**Tour Overview**



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# SHOWCASE

Sublime design & creative advice

THIS MONTH FEATURING...



## PROFILE

50

Adam Robbins is a design director with a portfolio of luxury brands. He tells us why he left the studio he co-founded to work abroad



## HOW WE BUILT

56

The team from Rabbit Hole explain how they helped architecture firm Page\Park showcase its work – and the clever thinking behind it

# DESIGN CHALLENGE

This month...

## INDEPENDENT CINEMA

\* PROFILES



### WILL AYLING

Ayling is digital product designer at Big Radical. His clients include Maserati and Mind Charity.

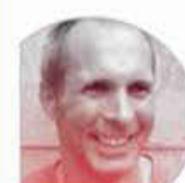
w: [bigradical.com](http://bigradical.com) t: @will\_ayling



### GAVIN FILMER

Filmer is a senior designer at Cotidia, a digital transformation agency in Birmingham.

w: [cotidia.com](http://cotidia.com) t: @cotidia



### JOHN TAYLOR

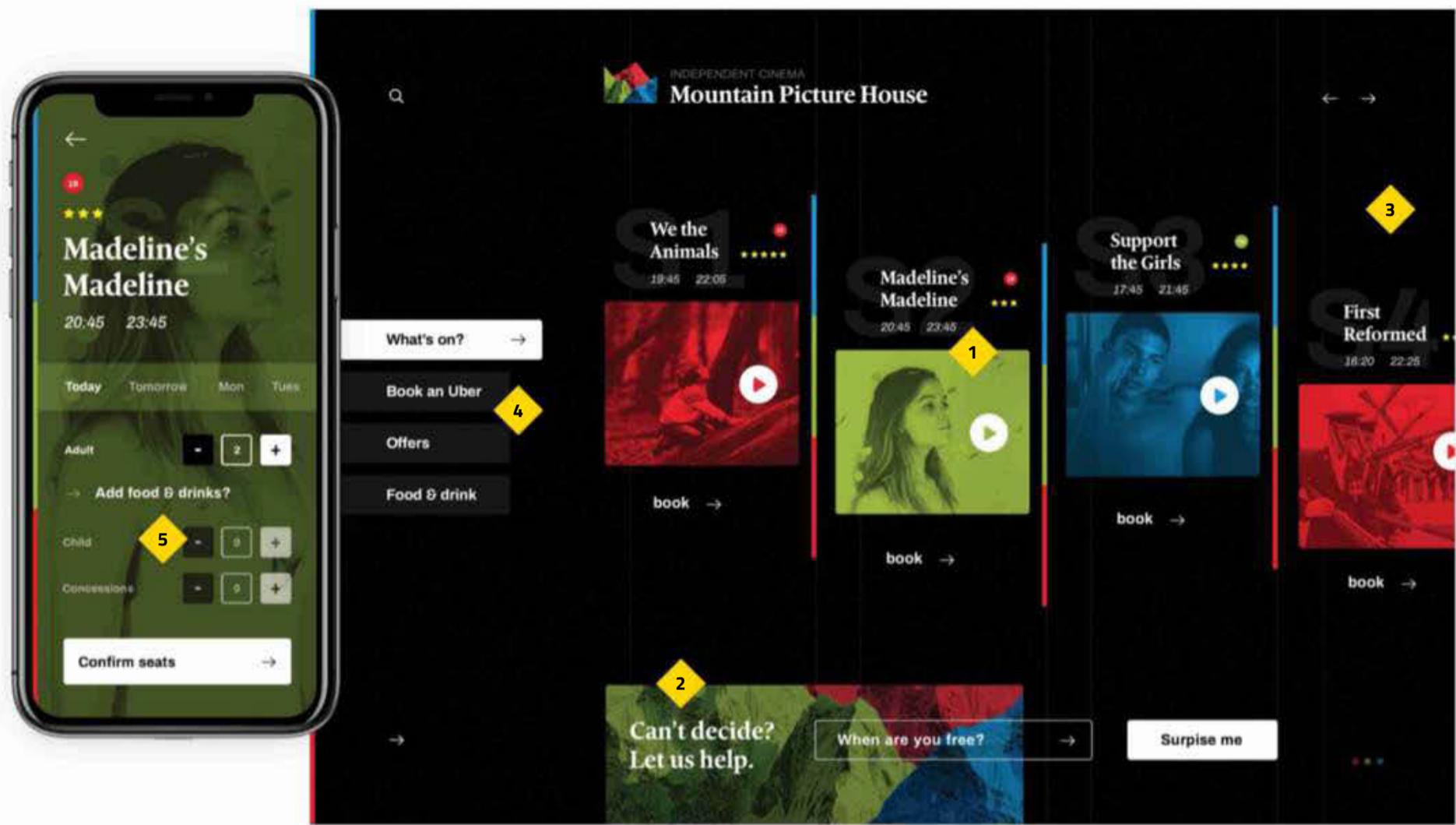
Taylor is a freelance designer who has been designing sites for over 15 years.

w: [www.johntayloronline.co.uk](http://www.johntayloronline.co.uk) t: @JT3000



### BRIEF

This month we would like you to design a website for a fictional independent cinema that shows art-house films. We would like your site to have an alternative vibe, so feel free to experiment and break away from traditional design patterns.



\* WILL AYLING

## MOUNTAIN PICTURE HOUSE

A website that integrates with other services to cover every aspect of your trip to the cinema

**>** Mountain Picture House is a fully equipped, brand new, independent art-house cinema, presenting all the best from new filmmakers and appealing to the younger film enthusiast.

The inspiration for the colour palette is from the RGB colour model. Curved edges within the UI reference spool holes on the side of film roll.

The page scrolls from left to right, just as an analogue film camera would. The films themselves are separated by screen numbers. Doing this enables the films to sit consistently on the site but also create a level of intrigue, which is what the independent film industry does best.

With just a single entry field, visitors can quickly select and book films. The ability to scroll through the films while choosing means lesser-known films surface. By adding another service layer, visitors can plan and book an Uber or another form of transport to the cinema. This means we can create a seamless journey from browsing, selecting, booking and arriving.

### CLOSE UP

**(1)** The user is able to play a trailer of the chosen film without feeling like they've left the page. **(2)** A 'quick book' feature enables the user to not only quickly book a film but also prevents them having to leave the main screen. This seamless procedure is devised to encourage them to see more things they wouldn't normally watch, which not only expands their enjoyment but supports independent films further. **(3)** The interface is scrollable from left to right so that the user can immediately see all of the films that are playing. Taking inspiration from how we scroll through films and TV shows on Netflix, this navigation method reduces the cognitive load on users. **(4)** Being able to order an Uber straight from your house to the cinema ensures you get there on time. This stress-free organisation could possibly extend for the audience to pick up dinner as well, if it was integrated with Uber Eats. **(5)** Another option enables the user to add food and drink to the ticket order and have it delivered to their seat.

### MY MONTH

What have you been working on/doing this month?

Prototyping a new route maker for a Paris travel group, refining a set of infographics for a fintech company and experimenting with our brand identities.

Which two websites have you visited for inspiration?  
KIKK Festival and Vue.

What have you been watching?  
*The Bodyguard* on BBC is tickling my fiction fancy at the moment. Pretty consumed by all of AJ&Smart's design YouTube content too.

What have you been listening to?  
Podcasts: Product Breakfast Club. Tunes: rediscovering Jurassic 5 has been a delight.

★ GAVIN FILMER

## UNDERGROUND ART CINEMA

*A dark colour scheme and artistic font choice set the mood for this characterful site*

➤ Underground Art Cinema is a stylish alternative to traditional cinemas, specialising in art-house films in a comfortable underground setting, with the inclusion of a licensed bar and kitchen.

The logo arrangement reflects the steps to the cinema, while the font nods to art-house films from the 1970s. The title font, Didot, brings the art feel. A clean, simple sans-serif font keeps clarity for the body text. All fonts have a relationship in size, using a square root of two font scale (1.414), giving a natural scaling ratio.

With a dark feel, the site captures the character of art-house films. Subtle gradients and strong shadows give the page depth and placement, emphasising the film images.

There are two key areas for visitors: the featured film in the hero and the booking form, which deliver instant information and make it simple for visitors to book.

### CLOSE UP

(1) The hero area showcases featured films in a cinematic 21:9 aspect ratio. It gives a brief overview of the film along with key CTAs to view the trailer and book tickets. (2) The booking process is quick and easy, enabling users to book a movie with their friends and also add any food and drinks. Like the rest of the site, the form's tone is suited to the audience: relaxed and straight-talking. (3) The homepage content will respond as the user scrolls, with the hero area condensing to the depth of the header, giving more space for the page content and the intro content sliding below it. The side panel containing the booking form and film listing will use `position: sticky` so it is always on the screen. (4) The palette uses warm greys with a hint of red to add character. (5) Visitors can invite a friend to a screening through various social media channels or via email. The site can be easily shared, with Open Graph data delivering suitable content for the page and film info.



\* JOHN TAYLOR

## MOVIEDROME

This site is based on Craft CMS to make things easy for admins and there are no front-end frameworks

**>** Moviedrome has been an independent cinema since the late 1980s, showing art-house, foreign and cult films. The site's main purpose is to provide information on upcoming films, as well as help customers plan their visit to the cinema. It also needs to let people know about the benefits of becoming a member and how they can support the cinema.

The stark design has a retro feel, reflecting the aesthetic tastes of its patrons, who tend to work in the creative industries. The main reason people will visit the site is to find out what films are on, so the homepage helps them do this.

The site will be built on Craft CMS so admins can manage film timetables, ticket bookings and membership applications, as well as keep the site updated. It won't need to use any front-end frameworks, as CSS Grid and Flexbox will be used for the layout, applied using feature queries and progressive enhancement techniques.

### CLOSE UP

**(1)** The site's style is retro and basic but it's designed and built using modern UX and coding best practices. There's nothing fancy going on, just standards-compliant and accessible HTML, CSS and progressively enhanced JavaScript. This also means that pages will load quickly. **(2)** User research revealed there are only a few reasons people visit the site, so these are all reflected in the navigation. **(3)** The main reason people visit it is to find out what films are on. The homepage is designed to take care of this, providing a distraction-free experience. **(4)** The main feature is used to promote films that are currently showing and links through to detailed information. CSS techniques can be used to make it adapt to a horizontal format and rotate slightly on larger screens. **(5)** The rest of the homepage is used to promote upcoming films, which are listed, along with some basic info about each one. Each tile links through to details about the showings.

### MY MONTH

What have you been working on/doing this month?

Helping a large international client redesign their websites and develop a new design system. I've also been learning CSS Grid.

Which two websites have you visited for inspiration?

Design Systems Repo is great for researching design systems. Pages has superb examples of UI and UX design.

What have you been watching?

John Simons: A Modernist and Wainwright Record Attempt.

What have you been listening to?

Jura Soundsystem's Transmission One. Radio 6 Music.



★ PROFILE

# ADAM ROBBINS

[www.adamrobbins.co.uk](http://www.adamrobbins.co.uk)

We speak to a design director with a portfolio full of luxury brands, who's just left the studio he co-founded to explore opportunities abroad

➤ Adam Robbins is a design director currently living and working in London who co-founded his own digital studio, Rotate°, in 2014, primarily designing and building ecommerce websites for luxury and lifestyle brands. With a nine-year career spent working in digital roles at a range of London-based studios across numerous clients, he's recently said goodbye to Rotate° in order to pursue new ventures. We caught up with him to find out more.

**How did you get started in web design?**  
My post-university plan was always to move to London. I graduated in graphic design in July 2009, then spent a week at a music festival in Spain. After that I flew home and applied for a handful of junior roles. My final major project at university had quite a digital spin: I did a series of experiments with an eye-tracker, including drawing a typeface with just my eyes. The guys at Zone were really positive about my post-university portfolio and they happened to be doing some good-looking digital work, so when they offered me a position I went for it. Given the fact I'd only designed one site before joining them (my own), you could say I pretty much stumbled into web design.

**You've just left Rotate° after four years. How would you describe your time there? It was an incredible learning experience. I'd previously worked as a designer at** ►



**INFO**

**Location:** London, UK

**Established:** 2009

**Expertise:** digital strategy, UX design, UI design

**Clients:** Seedlip, LOEWE, Chilly's, Armoury, Helm

studios ranging in size from more than 100 people right down to just 10. In all instances my day-to-day role was solely about design. When I got to 26, an opportunity presented itself to me to start my own studio with an associate (Jim Tattersall, a super talented developer). I saw this as the perfect way to learn about how the other side of a creative agency works, including disciplines like pitching, quoting, scheduling, hiring and managing.

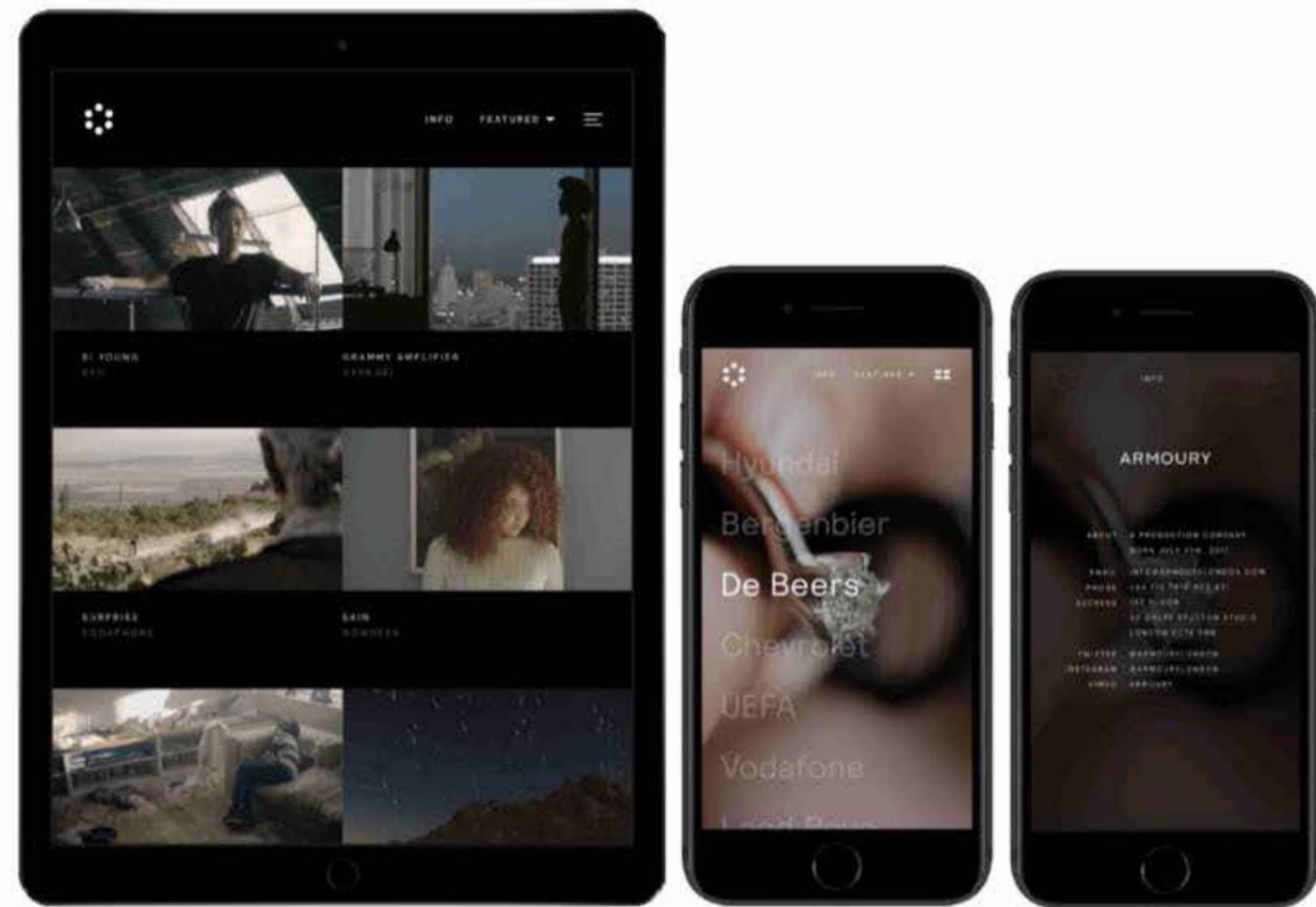
It's been a complete roller coaster. We worked remotely in year one, got our first studio and won the international fashion brand LOEWE as a client in year two, collaborated with awesome and established studios in year three (DesignStudio) and relocated our now eight-person team to a slick new studio space in year four.

As originally expected, I've learned so much more than I would have learned in a design-only role. It's been a total eye-opener and pretty invaluable for my professional development. I'd recommend making the leap sooner rather than later to any aspirational creative or tech professionals out there.

#### You worked on an online store for Seedlip's non-alcoholic spirits. Was that a tough sell?

Bizarrely not. The brand positions its range as "the world's first distilled non-alcoholic spirits", the thing you "drink when you're not drinking". Its products are perfect for the designated driver, the expectant mother or someone who finds themselves in a bar or at a dinner party on a weeknight.

There's often pretty tight shipping restrictions around purchasing alcohol online; however with Seedlip being an alcohol-free product, we managed to steer the brand towards having an ecommerce store and therefore becoming one of the web's first direct-to-consumer spirits brands. It's awesome to work with and at Rotate° we fully believe in how it's disrupting the drinks industry. I've been lucky enough to lead the design of both its pre-launch and existing websites. I've also just put the finishing touches on its new website,



Rotate°'s design for Armoury was approached with maximum scalability in mind, ensuring that the UI felt as comfortable in the palm of the hand as it did on a television screen

which launches later this year. Watch this space.

#### HELM provides luxury yachting holidays. What are the challenges of building a site for such a high-end brand?

HELM ([www.helm.yt](http://www.helm.yt)) exists to provide luxury sailing vacations to people who may not have any previous sailing / yacht-hire experience. During the discovery phase of this project I realised that, due to customers' unfamiliarity with sailing, the brand needed to do more than simply show them what yachts were available for their desired dates in a traditional search result.

We proposed a sequential booking system in which customers answer questions like 'Have you sailed before?' and 'What would you like to do on your trip?' in order to best understand their needs. The team at HELM then utilise a platform we produced for them to create custom packages, tailored to each individual customer's needs, therefore guiding their customers in the sailing-vacation booking process.

#### Can you tell us about the portfolio site you created for Armoury?

Armoury ([www.armourylondon.com](http://www.armourylondon.com)) is an award-winning London-based film

production company. It approached Rotate° in search of a new portfolio site to house its awesome catalogue of work. I led it through a discovery process where I learned that what it sought was as much a portfolio site as a presentation tool; something that could be used to impress new clients, face-to-face, across a meeting room table.

I wanted to create a site that felt as comfortable in the palm of the hand as it did on a 60-inch TV in a meeting room. The ideal solution took the form of a super immersive typographic index, supported by edge-to-edge background video. The whole site feels more akin to a smart-TV app UI than an actual website, creating a really cinematic feel and elevating their works.

#### Chilly's needed an updated store for their sustainable, reusable bottles. What was the solution?

When the Rotate° team and I first started working with Chilly's ([www.chillysbottles.com](http://www.chillysbottles.com)) it had a rather dated looking website that somehow still managed to boast an above industry standard conversion rate, yet it sought to increase this further. To me this sounded like the perfect design challenge – an opportunity to create something visually



Part of the design challenge was to evolve Chilly's current visual identity into an enhanced design system that felt true to its existing brand

superior that made a positive impact on its business.

Again, after leading them through a discovery phase the team and I arrived at the concept of a super-modular design system, one that would allow Chilly's to easily experiment with different content hierarchy and functionality, on a page-by-page basis. Post-launch this would permit us, in collaboration with Chilly's, to make ongoing modifications to the site, to find out what resonated with customers and what didn't, therefore nurturing and growing its conversion rates. Thankfully the concept worked. They now boast a multi-currency, multilingual ecommerce site with a conversion rate that's more than double the industry standard.

#### **What was the brief for the Digital Mums site you created?**

This project presented the team and I with a particularly interesting design challenge. Digital Mums ([digitalmums.com](http://digitalmums.com)) focuses its business on two audiences: mothers who are looking to start a career in social media and business owners who seek a social media expert to represent their brand online. The challenge was creating a site that serviced both distinct audiences.

One simple yet highly effective UX solution that helped me solve this issue was an omnipresent toggle button in close proximity to the main navigation that read: 'I'm a Mum / I'm a Business'. Interacting with this would essentially serve two different versions of the site with content tailored specifically to the selected audience. Simple, yet effective.

#### **Can you tell us what you're working on at the moment?**

I've just started work on the design of an ecommerce site for a Warby Parker inspired eyewear startup, based in the UK. It's a super interesting new brand with a great product range and real vision (no pun intended).

#### **What sort of projects do you most love to get your hands on?**

I've spent the last four or so years working largely on ecommerce-focused projects for luxury and lifestyle brands. The projects I've enjoyed most are the ones where I've really believed in the mission of the client and what I'm helping them to sell. The benefit of working in the luxury and lifestyle sector is that the clients often appreciate the value of commissioning photo shoots and video content, therefore the visual



**ADAM ROBBINS**

**What's on your desktop?**  
MacBook Pro and Cinema Display, a lonely plant and a small stack of books.

**Little things that make your life worthwhile**  
Websites: [exposure.co](http://exposure.co), [vox.com](http://vox.com) and [themodernhouse.com](http://themodernhouse.com)  
Apps: Instagram, VSCO and Citymapper.  
Music: On a good day, Radiohead. On a bad day, Whitney Houston. Go figure.  
Reading: *Shoe Dog* by Phil Knight.

**What do you have on the walls?**  
A handful of prints by Hey (Barcelona-based design studio), one from Otl Aicher and a one from George Shaw.

**What will you do for lunch?**  
Change my field of vision. Walk, eat, think. Occasionally visit the barbers.

**What hours do you work?**  
Right now a typical day is 9:30-18:30.

**What else do you do in the office?**  
I tend to assume the role of the office joker – although I take design incredibly seriously, I'm a firm believer that work should be enjoyable.

**How often do you hang out with other designers?**  
Most of my closest friends in London are designers. We all work in very different studios so it's pretty useful to get a fresh perspective on things.

**Describe your working culture in three words**  
Progressive. Rational. Fun.



## ★ TIMELINE

Key dates for Adam Robbins

JULY 2009

Graduates from Arts Institute at Bournemouth with first-class honours graphic design BA.

SEPTEMBER 2009

Moves to London. Hired as a digital designer at Zone.

SEPTEMBER 2010

Completes projects for Bupa, Coca-Cola and Channel 4.

SEPTEMBER 2011

Hired as a digital designer at Fivefootsix.

MARCH 2012

Completes projects for BBC, Ben & Jerry's and UEFA.

APRIL 2012

Hired as a digital designer at The New Black.

APRIL 2013

Completes projects for Warner Records and Universal Music.

JANUARY 2014

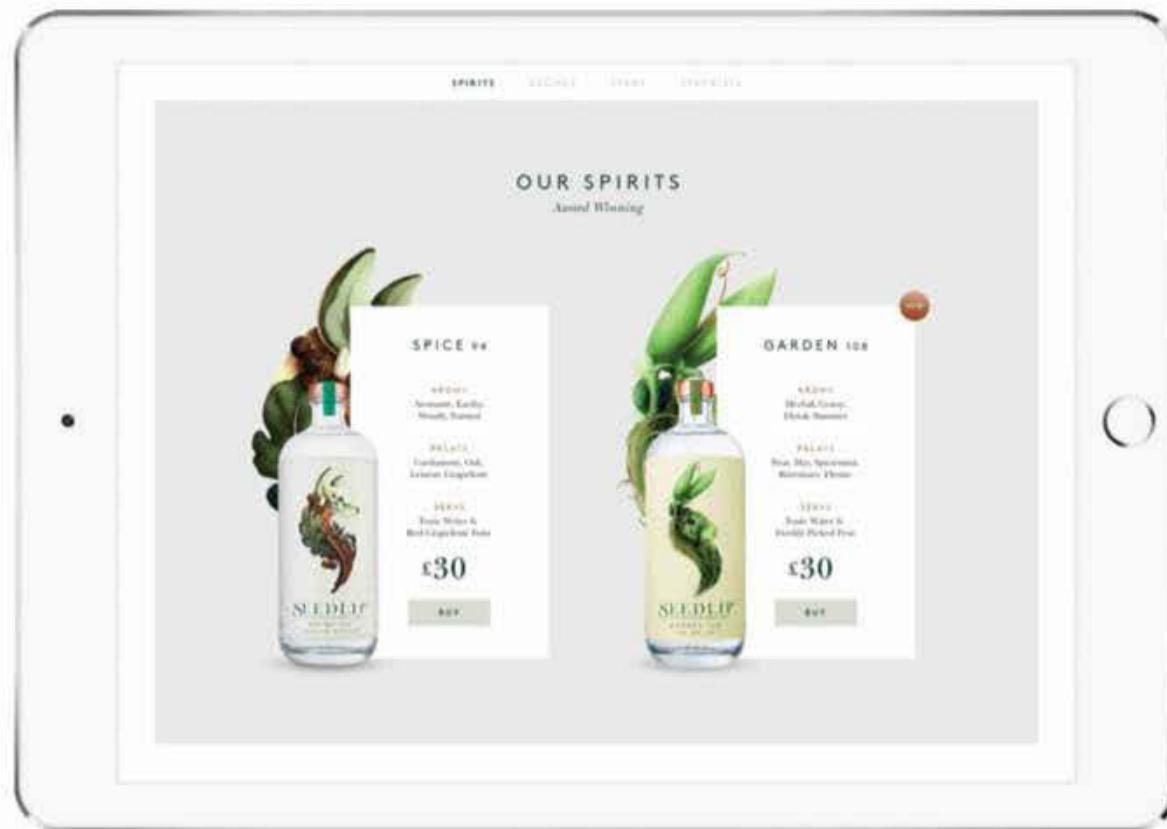
Co-founds his own digital studio: Rotate°.

JANUARY 2016

Rotate° expands from two to five people. Acquires Truefitt & Hill, LOEWE and Seedlip as clients.

AUGUST 2018

Rotate° team grows to eight members. Acquires clients including Chilly's, Tracksmith and Bamford.



Provided with just a bottle, Robbins' task when designing Seedlip's online store was to translate the offline identity into a digital one – one that elevated the product while staying true to its form

► assets you get to work with are often superior quality, which makes my role easier and more enjoyable.

Aside from this, it's always exciting to work on something where the client wants to break new ground. With Seedlip ([www.seedlipdrinks.com](http://www.seedlipdrinks.com)) I had this because they were willing to become one of the web's first direct-to-consumer spirits brands. With HELM there was an opportunity to break the conventions of traditional holiday-booking platforms.

#### What's in your day-to-day toolkit?

Sketch, Photoshop, Illustrator and InDesign cover everything from wireframing to UI design and crafting presentations. I prototype in Marvel and do a little animation and interaction design in After Effects. Trello and Clear cover all my task management needs.

#### What do you find most exciting about the web right now?

To me, from a UI and UX design perspective, the web is like a pendulum. In the early days, websites were pretty basic looking. Then Flash came along and the pendulum swung the other way: things went nuts with animated loading screens, website intros and sound effects. The pendulum swung back and

we had Web 2.0 – clear UI elements that made websites feel almost like operating systems. The pendulum is on the move again, we're in an experimental period thanks to front-end technologies that enable us to do all the stuff Flash used to and more: 3D canvas experiments, widespread use of hamburger navigation systems and scroll hijacking.

In answer to the original question, I'm simply excited to see where the pendulum goes next. I wouldn't even want to hazard a guess.

#### How do you recharge?

Some days I change into my running gear, throw my laptop in a rucksack and run home. I've spent my entire London life living in Hackney. There's some decent green spaces and canals here: weather permitting I tend to get home and – if I haven't run – eat something, then just get outside to walk around.

#### What are your future plans?

I recently accepted an exciting new role on the Nike team at Instrument in Portland (US work visa pending). They're a great agency, one I've always admired, and I'm itching to get started over there. My time in London has been incredible but I'm excited to see what the US design scene has to offer. ■

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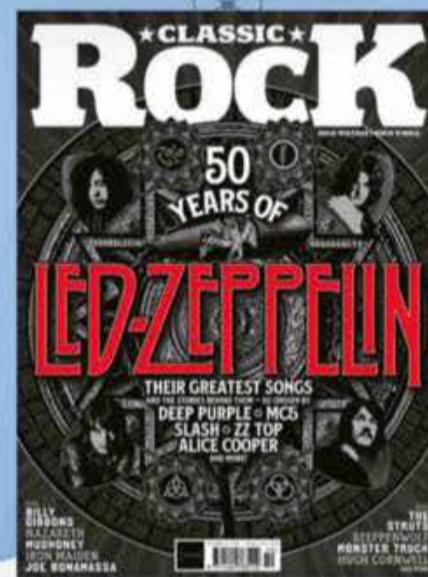


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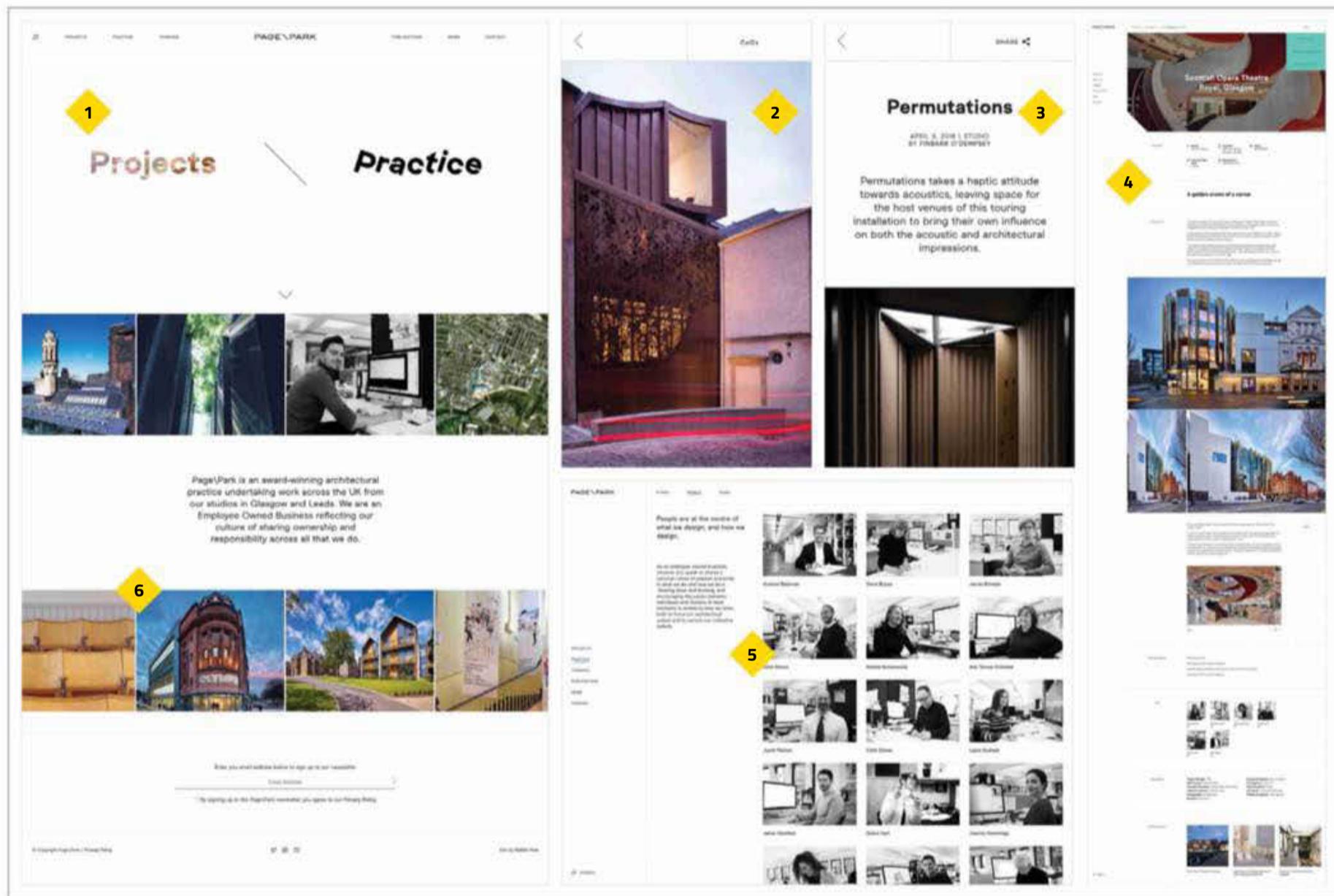


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★ HOW WE BUILT

# PAGE\PARK

The team from Rabbit Hole explain how they helped an architecture firm showcase its work – and the clever thinking behind it



## CLOSE UP

### BRIEF

Employee-owned architecture firm Page\Park required a new site that not only showcased its award-winning building work but also conveyed a sense of the clever thinking that drives such challenging projects.

**(1)** The site's 'Projects and Practice' introduction relates to the organisation's 'methodology and thinking' approach to architecture. In order to help convey this, the area features slide-in HTML5 video. **(2)** We decided to let the imagery do a lot of work on the website. Therefore the quality of the content is integral to the success of the website. **(3)** We decided early on that the site should feature clean, minimal, editorial-style design layouts. **(4)** By creating content

blocks that can be stacked and reordered in the back end (WordPress), we were able to give the client a lot of flexibility when creating content. **(5)** At the heart of this project was the desire to shine a spotlight on the faces, voices and minds in Page\Park who were behind the buildings. **(6)** The homepage is simply a random generation of content collated from throughout the site. We avoided curation to give all content a chance to feature on the front page.

## MARK MARTIN



Co-founder and managing director at Rabbit Hole. Martin was the project manager for the Page\Park website.

w: [rabbithole.agency](http://rabbithole.agency)

## TIM DEE



Dee is the co-founder and creative director at Rabbit Hole. He was also the designer for the Page\Park website.

t: [@timdee\\_](https://twitter.com/timdee_)

## GUY BANNISTER



Head of development at Rabbit Hole, Bannister took the role of lead developer for the Page\Park website.

w: [rabbithole.agency](http://rabbithole.agency)

**➤ Page\Park ([pagepark.co.uk](http://pagepark.co.uk)) is an employee-owned architecture practice from Glasgow. It believes designing buildings requires both methodology and clever thinking and has developed a culture of discipline, talking and dreaming. The firm brought in Rabbit Hole ([rabbithole.agency](http://rabbithole.agency)) to create its new site, not just to showcase its award-winning architectural work but also to convey the thinking behind its practice. We spoke to the Rabbit Hole team to find out more about this intriguing build.**

### What was Page\Park looking for from this new site? As an architecture firm, did it have its own design ideas?

**MM:** The brief for the website came to us as ‘Project Firecracker’; it was completely hand written and illustrated. One of the pages simply had scribbled across it: “We must demonstrate on every page how we are clever!”

One of the fundamental objectives of the new site was to place more focus on the people, thinking and ideas behind the buildings, rather than focusing solely on the brick and mortar of the buildings themselves. They made it clear they were a collective of distinct individuals, all with faces and voices, and that the site should reflect this.

**TD:** Design-wise, we were mostly given the freedom to design the site as we thought best. There was constructive feedback after every presentation but also trust that we were taking it in the right direction. From the start we were all on the same page in terms of taste

and style, so there was never any major contention when it came to the overall look and feel of the site.

### Can you talk to us about the site’s prominent design features?

**MM:** Because the main objective of the brief was to showcase the individual voices and ideas behind the buildings, we immediately decided the design needed to feel editorial and not just portfolio. We therefore took inspiration from books, magazines and some great editorial websites such as Six’s Kinfolk site ([kinfolk.com](http://kinfolk.com)).

We knew we wanted to design a website that was easy to get lost in – but in a good way. We wanted users to navigate through the site via the content, rather than using menus; so this is encouraged on every page with lots of clickable thumbnails. The slightly disorientating nature of exploring the site is intentional and was talked about from the start. The Page\Park team are great content creators, which is why I think this approach has ultimately worked.

### Each section of the site has its own distinct layout and behaviour. What’s the thinking behind this?

**TD:** Yes, each section and page has a different layout, yet everything also feels similar. Some of that is down to wanting users to dive right into the content and seamlessly transition from section to section but really all our sites tend to have multiple page layouts throughout. We try to make every section of a website feel unique, crafted and considered,



### \*TIMELINE

Key dates in the Page\Park project

JUNE 2017

‘Project Firecracker’ brief received from Page\Park.

JUNE 2017

Rabbit Hole responds with a proposal and some initial ideas.

JUNE 2017

Page\Park decides it is the right agency to partner with and it gets to work.

JULY 2017

First round of designs presented to the Page\Park team in Glasgow.

SEPTEMBER 2017

Final designs signed off and development starts.

NOVEMBER 2017

Page\Park team gets access to the CMS and starts entering content.

JANUARY 2018

Becomes clear original January live date is not going to happen and Page\Park and Rabbit Hole agree to push the project back by a couple of months.

MARCH 2018

All launch content is entered and the site is completed. Final browser and device testing carried out by the development team.

MARCH 2018

Site goes live.

APRIL 2018

After receiving user feedback, Rabbit Hole decides to make some amendments to homepage, ultimately simplifying it.

# SHOWCASE

How we built



## WHAT ARE OUR KEY AIM'S ?

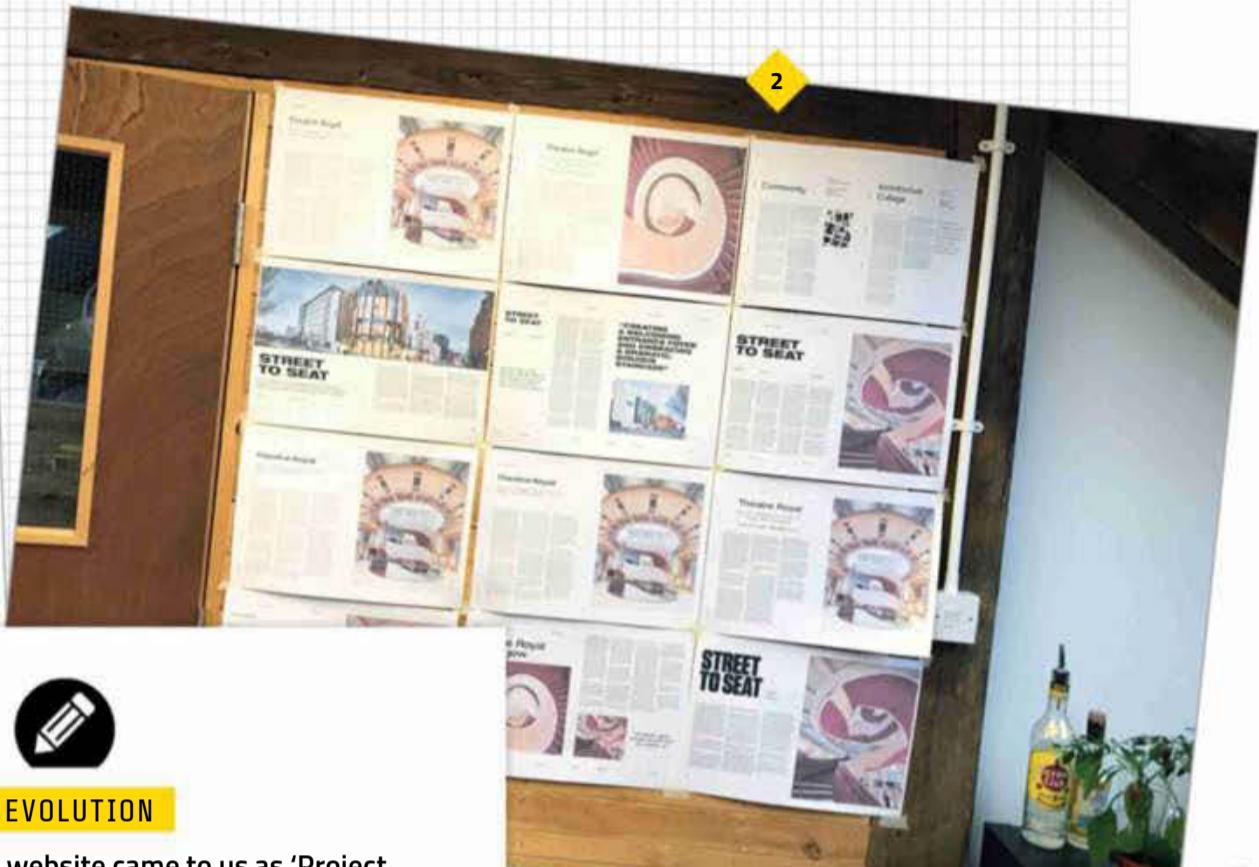
WE WANT TO DEFINE THE VOICE OF THE PRACTICE. WE ARE A TEAM OF PEOPLE WHO ARE DRIVEN BY:

- CLEVER SOLUTIONS
- CLEVER PROCEDURES
- CLEVER THINKING
- CLEVER GU
- CONSISTENTLY

3



5



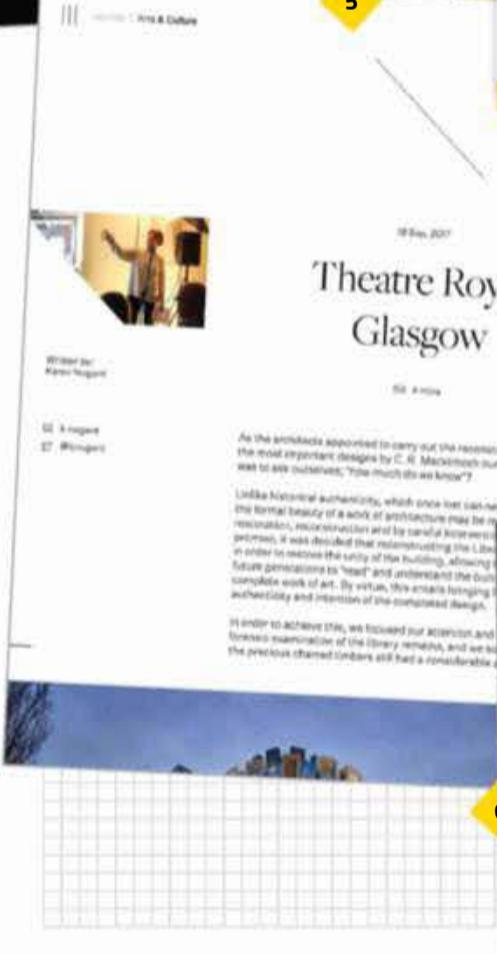
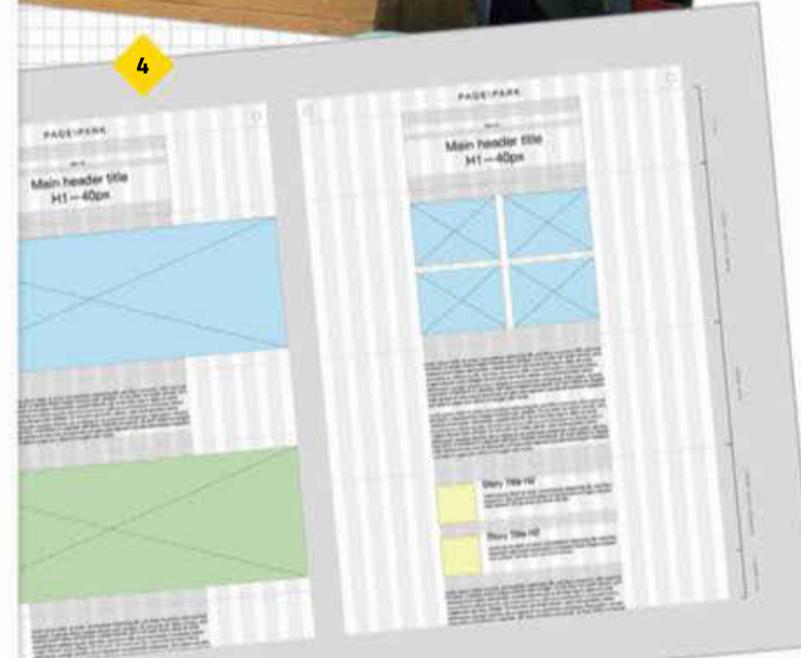
2



## ★ EVOLUTION

(1) The brief for the website came to us as 'Project Firecracker'; it was completely hand written and illustrated. (2) We decided early on that the website design should feel editorial and experimented with editorial design spreads to help us inform typographical and layout choices for the website. (3) We presented our ideas and designs regularly to up to 25 members of the Page\Park team and collected immediate feedback. (4) Some early article page wireframes. Our aim was to make content entry as flexible as possible by allowing them to stack and reorder different content blocks. (5) The first round of designs we presented. It was a joy to design with the incredible photography provided to us by the client. (6) The second round of designs presented to the client. At this point we were getting close to a final design. (7) Before the site went live, we helped Page\Park design some mail-outs. The slanted typography used was then fed back into the final website design.

4



6



7

► while avoiding the homogeneous ‘templated’ feel. In the age of Wix and Squarespace, hand crafting every page and creating bespoke layouts is part of the value we can provide over off-the-shelf alternatives.

#### **Can you talk us through some of the technologies running the site?**

**GB:** As with all our websites, the technologies used are fairly straightforward. We use WordPress, Elliot Condon’s Advanced Custom Fields, HTML5 (Boilerplate), Sass and a few JS plugins; most of the JS plugins we use are either adapted from open source or written in-house.

When building websites we follow the KISS principle (Keep It Simple, Stupid) and try to use as few third-party frameworks or plugins as possible. We’ve collaborated with developers that use four different frameworks and a plethora of plugins to create something relatively simple. If something is not vital or does not improve our output significantly then we won’t use it. You can do a lot of wonderful things using only a handful of basic tools.

#### **What did your testing process involve? Did it uncover any problems? How did you resolve them?**

**GB:** For device and browser testing we use Browserstack and some in-house test devices. We aren’t super strict on testing for every device. We don’t optimise for old IE browsers, nor do we spend time trying to get things perfect on terrible phones. But we do aim to make our sites perform well for the vast majority of users. This particular project produced no major hitches in this department.

#### **Did you learn any useful lessons while building this site?**

**TD:** We missed our initial launch date (4 January 2018) by around two months. So this project was a reminder of how long a content-heavy website can take to complete. Content takes a long time to produce so a healthy and realistic time frame should always be given to any site that relies on a large body of written, photographic or video content. The client



**Above** The Page\Park team: the decision to make the website so editorial in design and content was driven by the need to present the faces behind the work of Page\Park



**Above** An early workshop with members of Page\Park: there were regular meetings so the Rabbit Hole team could update the client with progress and get immediate feedback

will actually need this time just as much as you will, even if they are pushing for a tight deadline.

#### **Now that the site's live, what's the reception been like?**

**MM:** It's been great! We've had a lot of positive feedback and the site has been

shortlisted for an Archiboo Web Award in the Best Visual Design category. For us, the best thing to see post-launch is how the Page\Park team are using the site to broadcast their ideas and thinking. We've created something they want to invest in, use regularly and build upon. Which makes us happy. ■

# <CODE FASTER, LIGHTER JAVASCRIPT



JavaScript is the most expensive resource for web browsers to process on mobile phones. In this feature **Addy Osmani** covers how to load JavaScript quickly without throwing out the kitchen sink

## AUTHOR

### ADDY OSMANI

Addy Osmani is an engineering manager with the Chrome team at Google. His day-to-day job is leading a speed team who are dedicated to making the web fast. Their projects include Lighthouse.

t: @addyosmani

uilding interactive websites can involve sending JavaScript to your users. Often, too much of it. Have you been on a web page on your phone that looked like it had loaded only to tap on a link or try to scroll and nothing happens? We all have. Byte-for-byte, JavaScript is still the most expensive resource we send to mobile phones because it can delay interactivity in significant ways ([bit.ly/interactivity-matters](http://bit.ly/interactivity-matters)). Today we'll cover some strategies for delivering JavaScript efficiently to your users on mobile while still giving them a valuable experience.

### The web is bloated by too much user 'experience'

When users access your site you're probably sending down a lot of files, many of which are scripts. Perhaps you added a quick JavaScript library or plugin but didn't have a chance to check just how much code it was pulling in? It's happened to many of us. As much as I love JavaScript, it's always the most expensive part of your site. I'd like to explain why this can be a major issue.

Many popular sites ship megabytes of JavaScript to their mobile web users. The median webpage today currently ship a little less – about 350kB of minified and



► compressed JavaScript ([bit.ly/state-of-js](http://bit.ly/state-of-js)). Uncompressed, that bloats up to over 1MB of script a browser needs to process. Experiences that ship down this much JavaScript take more than 14 seconds to load and get interactive on mobile devices ([bit.ly/loading-speed](http://bit.ly/loading-speed)).

A large factor of this is how long it takes to download code on a mobile network and then process it on a mobile CPU. Not only can that 350kB of script for a median site from earlier take a while to download, the reality is, if we look at popular sites, they actually ship down a lot more script than this. We're hitting this ceiling across both desktop and mobile web, where sites are sometimes shipping multiple megabytes of code that a browser then needs to process. The

has the server started responding? ‘Is it useful?’ is the moment when you’ve painted text or content that enables the user to derive value from the experience and engage with it. And then ‘is it usable?’ is the moment when a user can start meaningfully interacting with the experience and have something happen.

I mentioned this term ‘interactive’ earlier but what does that mean? For a page to be interactive, it must be capable of responding quickly to user input. A small JavaScript payload can ensure this happens fast. Whether a user clicks on a link or scrolls through a page, they need to see that something is actually happening in response to their actions. An experience that can’t deliver on this will frustrate your users.

## We’re hitting this ceiling across both desktop and mobile web, where sites are shipping multiple megabytes of code

question to ask is: can you afford this much JavaScript ([bit.ly/can-you-afford-it](http://bit.ly/can-you-afford-it))?

Sites today will often send the following in their JavaScript bundles:

- A suite of user-interface components (for example, code for widgets, carousels or drawers)
- A client-side framework or user-interface library
- Polyfills (often for modern browsers that don’t need them)
- Full libraries vs only what they use (for example, Moment.js and locales vs a smaller alternative like date-fns or Luxon)

This code adds up. The more there is, the longer it will take for a page to load.

### Loading a modern web page

Loading a web page is like a film strip that has three key moments: is it happening? Is it useful? And is it usable? ‘Is it happening?’ is the moment you’re able to deliver some content to the screen: has the navigation started,

When a browser runs many of the events you’re probably going to need, it’s likely going to do it on the same thread that handles user input. This thread is called the main thread. Too much (main thread) JavaScript can delay interactivity for visible elements. This can be a challenge for many companies.

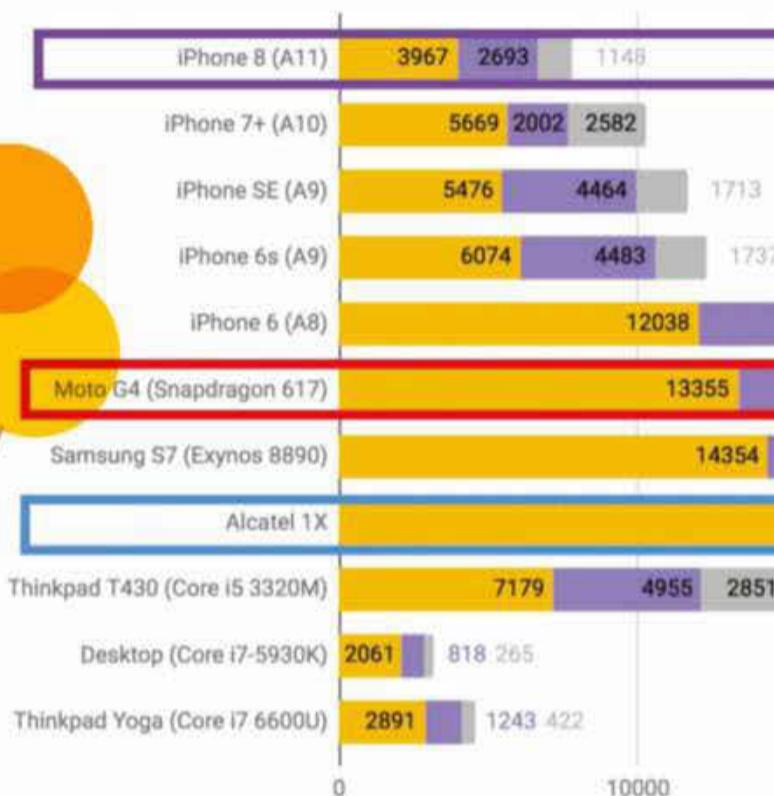
### So what is a good target for interactivity?

We on the Chrome team feel your baseline should be getting interactive in under five seconds on a slow 3G or 4G connection on a median mobile device ([bit.ly/time-to-interactive](http://bit.ly/time-to-interactive)). You might say: ‘My users are all on fast networks and high-end phones!’ But are they? You may be on ‘fast’ coffee-shop WiFi but effectively only getting 2G or 3G speeds. Variability matters.

### Who has managed to ship less JavaScript and reduce their time-to-interactive?

Pinterest reduced its JavaScript bundles from 2.5MB to < 200kB and reduced

## JS PROCESSOR



time-to-interactive from 23 seconds to 5.6 seconds ([bit.ly/pinterest-pwa](http://bit.ly/pinterest-pwa)). Revenue went up 44 per cent, sign-ups are up 753 per cent, weekly active users on mobile web are up 103 per cent ([bit.ly/pinterest-retrospective](http://bit.ly/pinterest-retrospective)). AutoTrader reduced its JavaScript bundle sizes by 56 per cent and reduced time-to-interactive by ~50 per cent ([bit.ly/autotrader-javascript](http://bit.ly/autotrader-javascript)).

Let’s design for a more resilient mobile web that doesn’t rely as heavily on large JavaScript payloads. Interactivity impacts a lot of things. It can be impacted by a person loading your site on a mobile data plan or coffee shop WiFi or just being on the go with intermittent connectivity.

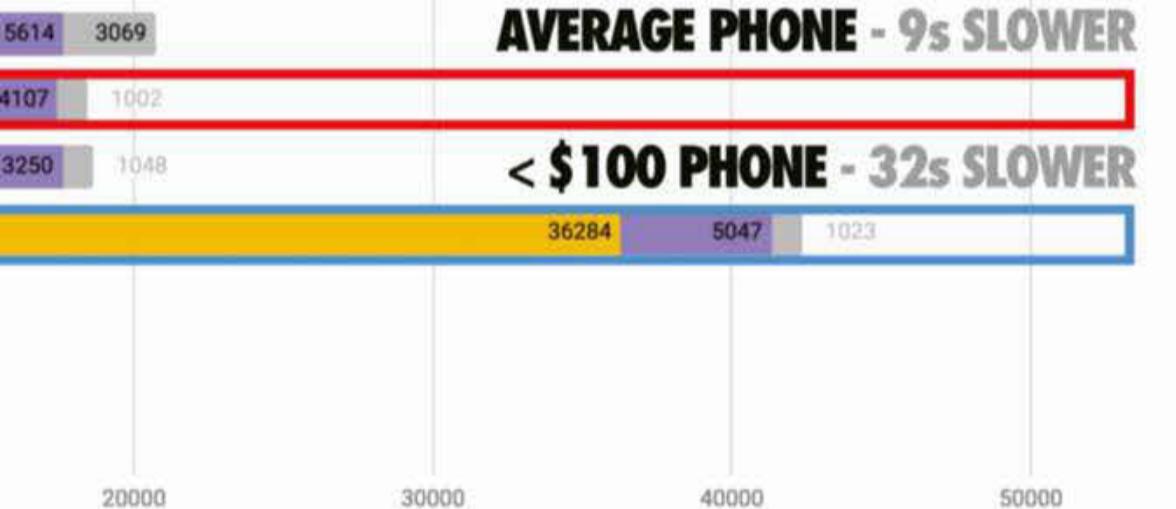
### Why is JavaScript so expensive?

A request is sent to a server, which then returns some HTML. The browser parses that markup and discovers the necessary code (CSS and JavaScript) and resources (images, fonts etc) composing it. Once complete, the browser has to download and process these files.

If we want to be fast at JavaScript, we have to download it and process it

# ING FOR CNN.COM

## HIGH-END PHONE



## THE MEDIAN WEBPAGE

**350KB** JAVASCRIPT  
UNTIL INTERACTIVE

quickly. That means we have to be fast at the network transmission and the parsing, compiling and execution of our scripts. If you spend a long time parsing and compiling script in a JavaScript engine, that delays how soon a user can interact with your experience.

Keep in mind that resources on the web have different costs. A 200kB script has a different set of costs to a 200kB JPG. They might take the same amount of time to download but when it comes to processing the costs aren't the same.

**Top:** JavaScript processing times for CNN.com as measured by WebPageTest. A high-end phone (iPhone 8) processes script in ~4s. Compare to the ~13s an average phone (Moto G4) takes or the ~36s taken by a low-end 2018 phone (Alcatel 1X).

**Above:** Statistics from the HTTP Archive state of JavaScript report, July 2018, highlight the median webpage ships ~350kB of minified and compressed script. These pages take up to 15s to get interactive.

## Case study: Shrinking Pinterest

Zack Argyle, engineering manager, core experience at Pinterest

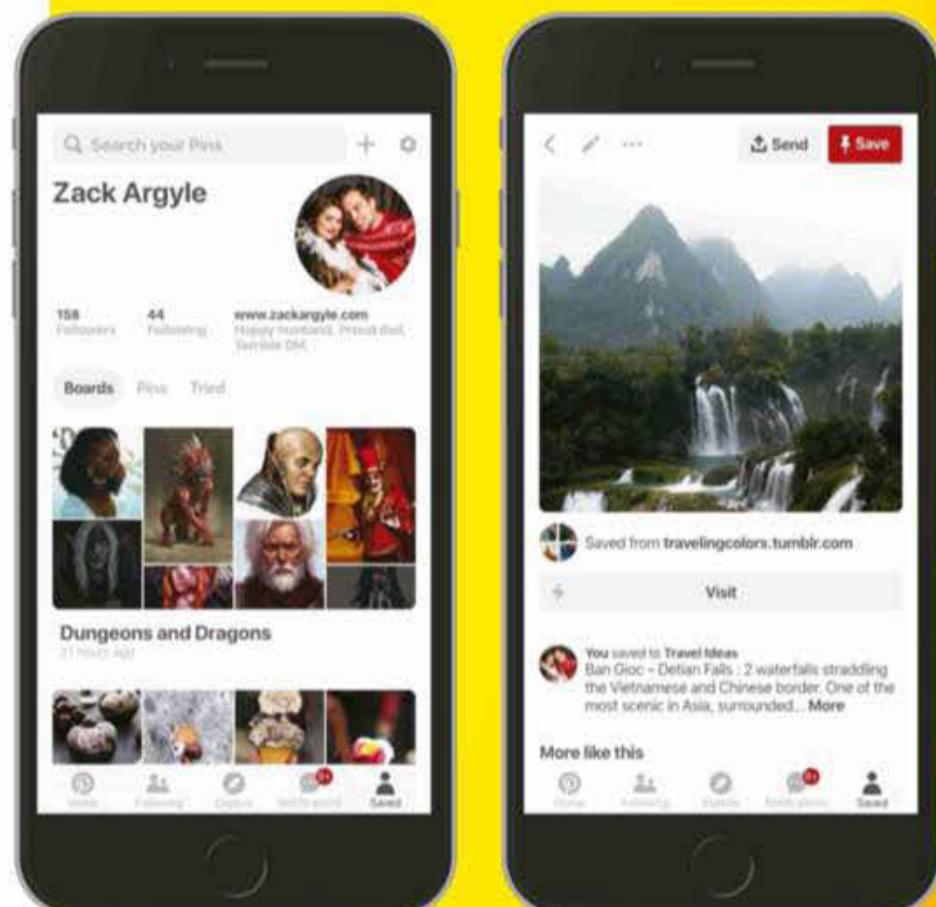
One year ago, we brought a team together to rewrite our mobile website from scratch as a progressive web app. This was the culmination of several years of conversation, metrics and one large hypothesis: mobile web can be as good as a native app.

With more than half of all Pinners based outside the US, building a first-class mobile website was an opportunity to make Pinterest more accessible globally and ultimately improve the experience for everyone.

How did we make it fast? Performance was baked into the goals and process because of how tightly correlated it is to engagement and how sensitive it is on a mobile connection. In fact, our homepage JavaScript payload went from ~490kB to ~190kB. This was achieved through code splitting at the route level by default, encouraging use of a <Loader> component for component-level code splitting.

After one year, there are ~600 JavaScript files in our mobile web codebase and all it takes is one ill-chosen import to bloat your bundle. It's really hard to maintain performance! We had graphs reporting build sizes with alerts for when bundles exceed permitted growth rates. We also had a custom eslint rule that disallows importing from files and directories we know are dependency-heavy and will bloat the bundle.

Now for the part you've all been waiting for: the numbers. Weekly active users on mobile web have increased 103 per cent year-over-year overall. Logins increased by 370 per cent and new signups increased by 843 per cent year-over-year. And we're just getting started!



**Above:** Pinterest's progressive web app loads fast, requiring just 190kB of JavaScript. Zack Argyle, the company's engineering manager, core experience, gives us the scoop

# FEATURES

Code faster, lighter JavaScript

## Top tips

### Lessen JS load times

Modern sites often combine all of their JavaScript into a single, large bundle. When JavaScript is served this way, download and processing times can be significant on mobile devices and networks. Here are a few tips for how to ensure you load your JavaScript quickly:

- To stay fast, only load JavaScript needed for the current page. Prioritise what a user will need and lazy-load the rest with code splitting (<https://webpack.js.org/guides/code-splitting/>). This gives you the best chance at loading and getting interactive fast. Learn to audit your JavaScript code to discover opportunities to remove non-critical code.
- Use compression, minification and other JS optimisation techniques. Compression and minification are good optimisations for shipping fewer bytes of JavaScript to your users. If you're already gzipping JavaScript, consider evaluating Brotli (<https://github.com/google/brotli>) for even more savings. Building a site using Webpack and a framework? Tree shaking (removing unused imported code), trimming unused libraries and polyfills, opting for leaner versions of utilities all add up to some nice savings.
- If client-side JavaScript isn't benefiting the user experience, ask yourself if it's really necessary. Maybe server-side-rendered HTML would actually be faster. Consider limiting the use of client-side frameworks to pages that absolutely require them. Server-rendering and client-rendering are a disaster if done poorly.
- Embrace performance budgets and learn to live within them. For mobile, aim for a JS budget of < 170kB minified/compressed ([bit.ly/perf-budgets](https://bit.ly/perf-budgets)). Uncompressed this is still ~0.7MB of code. Budgets are critical to success; however, they can't magically fix performance in isolation. Team culture, structure and enforcement matter.

### REMOVE UNUSED JAVASCRIPT FROM THE CRITICAL PATH

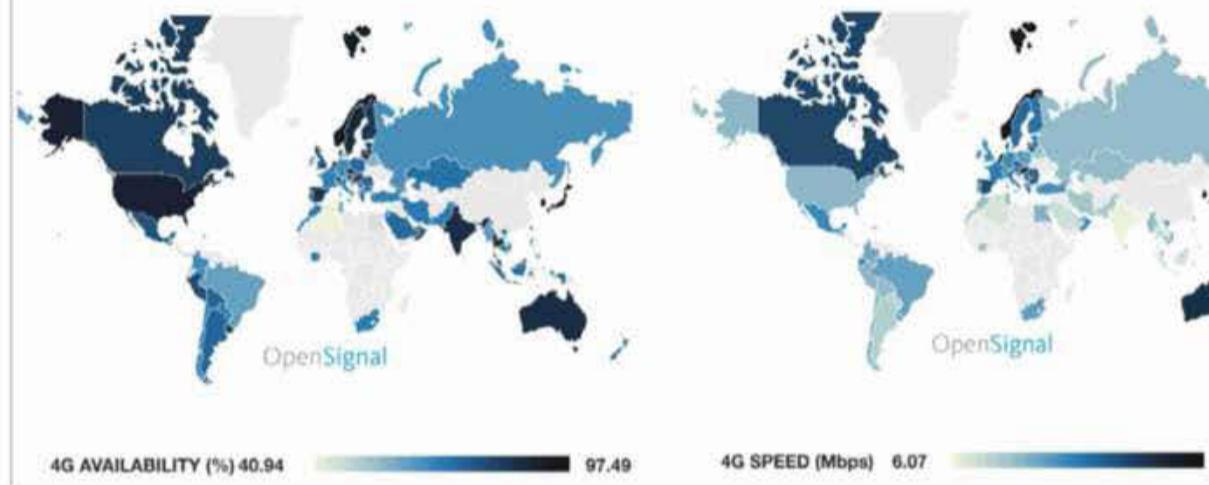
[bit.ly/code-coverage](https://bit.ly/code-coverage)



**Above:** There are many tips for loading JavaScript quickly. These include lazy-loading non-critical code, something the Chrome DevTools Code Coverage tool can help you identify.

## GLOBAL 4G

### AVAILABILITY VS SPEED



4G AVAILABILITY (%) 40.94

4G SPEED (Mbps) 6.07

**Above:** This chart from OpenSignal shows how consistently 4G networks are available globally and the average connection speed users in each country experience. As we can see, many countries still experience lower connection speeds than we may think. It's also worth noting that rural broadband speeds, even in the US, can be 20% slower than in urban areas.

**Top right:** Measuring the time-to-interactive of Google News on mobile, we observe large variance between a high-end getting interactive in ~7s vs a low-end device getting interactive in 55s

**Bottom right:** Not all bytes weigh the same. A 200kB script has a very different set of costs to a 200kB JPG outside of the raw network transmission times for both sets of bytes.

► A JPEG image needs to be decoded, rasterised and painted on the screen. This can usually be done quickly. A JavaScript bundle needs to be downloaded and then parsed, compiled and executed. This can take longer than you might think on mobile hardware.

### Different types of mobile

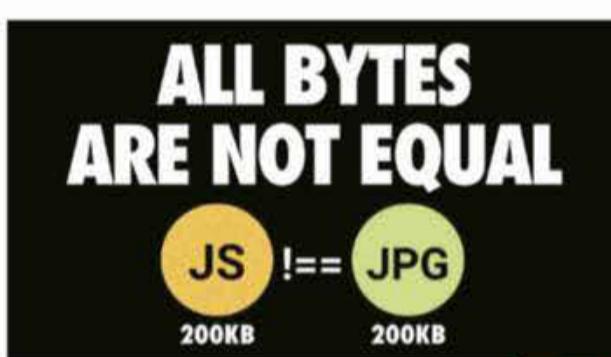
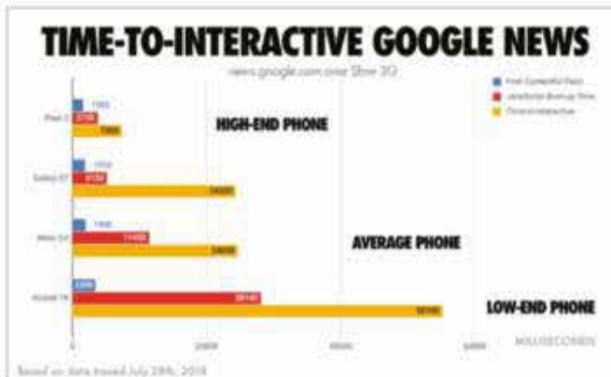
Mobile is a spectrum composed of low-end, median and high-end devices. If we're fortunate, we may have a high-end phone but the reality is that not all users will have those devices.

They may be on a low-end or median phone and the disparity between these multiple classes of devices can be stark due to thermal throttling, difference in cache sizes, CPU, GPU – you can end up experiencing different processing times for resources like JavaScript, depending on the device you're using. Your users on low-end phones may even be in the US ([bit.ly/android-go-usa](https://bit.ly/android-go-usa)).

Some users won't be on a fast network or have the latest and greatest phone, so it's vital that we start testing on real phones and networks. Fast devices and networks can actually sometimes be slow; variability can end up reducing the speed of absolutely everything. Test on a real phone or at least with mobile emulation. Developing with a slow baseline ensures everyone – both on fast and slow setups – benefits.



# Code faster, lighter JavaScript



Checking your analytics to understand what devices your users are accessing your site with is a useful exercise. WebPageTest has a number of Moto G4 phones preconfigured under the Mobile profiles ([webpagetest.org/easy](https://webpagetest.org/easy)). This is valuable in case you're unable to purchase your own set of median-class hardware for testing.

It's really important to know your audience. Not every site needs to perform well on 2G on a low-end phone. That said, aiming for a high level of performance across the entire spectrum ensures that every potential user accessing your site has a chance to load it up fast.

## How to send less JavaScript

Code splitting helps you break up your JavaScript so you only load the code a user needs upfront and lazy-load the rest ([bit.ly/js-code-splitting](https://bit.ly/js-code-splitting)). This helps avoid shipping a monolithic "main.js" file to your users containing JavaScript for the whole site vs just what the page needs.

The best approach to introduce code splitting into your site is using the dynamic import() syntax ([bit.ly/js-dynamic-import](https://bit.ly/js-dynamic-import)). What follows is an example of using JavaScript Modules to statically 'import' some math code ([bit.ly/javascript-modules-syntax](https://bit.ly/javascript-modules-syntax)). Because we're not loading this code dynamically (lazily) when it's needed, it will end up in our default JavaScript bundle.

```
import { add } from './math';
console.log(add(30, 15));
```

After switching to dynamic import(), we can lazily pull in the math utilities when they are needed. This could be when the user is about to use a component requiring it, or navigating to a new route that relies on this functionality. Below we import "math" after a button click.

```
const btn = document.getElementById('load');
btn.addEventListener('click', () => {
  import('./math').then(math => {
    console.log(math.add(30, 15));
  });
});
```

When a JavaScript module bundler like Webpack (<https://webpack.js.org/>) sees this import() syntax, it starts code splitting your app. This means dynamic code can get pushed out into a separate file that is only loaded when it is needed.

Code splitting can be done at the page, route or component level. Tools like Create React App, Next.js, Preact-CLI, Gatsby and others support it out of the box. Guides to accomplish this are available for React ([bit.ly/react-code-splitting](https://bit.ly/react-code-splitting)), Vue.js ([bit.ly/vue-code-splitting](https://bit.ly/vue-code-splitting)) and Angular ([bit.ly/angular-code-splitting](https://bit.ly/angular-code-splitting)).

If you're using React, I'm happy to recommend React Loadable (<https://github.com/jamiebuilds/react-loadable>), a higher-order component for loading components efficiently. It wraps dynamic imports in a nice API for introducing code splitting into an app at a given component.

Here is an example statically importing a gallery component in React:

```
import GalleryComponent from './GalleryComponent';
const MyComponent = () => (
  <GalleryComponent/>
);
```

With React Loadable, we can dynamically import the gallery component as follows:

```
import Loadable from 'react-loadable';
const LoadableGalleryComponent =
Loadable({
  loader: () => import('./GalleryComponent'),
  loading: () => <div>Loading...</div>,
});
const MyComponent = () => (
  <LoadableGalleryComponent/>
);
```

Many large teams have seen big wins off the back of code splitting recently. In an effort to rewrite their mobile

**Some users won't be on a fast network or have the latest phone. Developing with a slow baseline ensures everyone benefits**

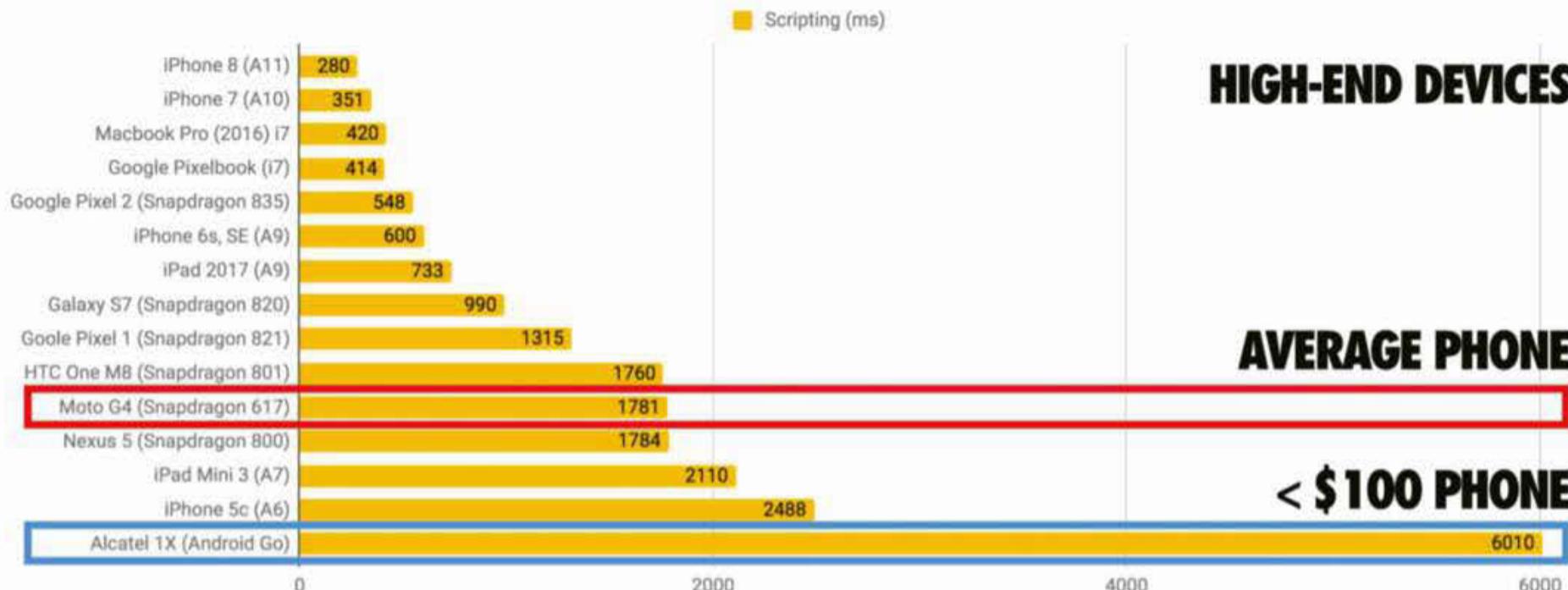
## LOADING IS A JOURNEY



**Left:** We're shifting to increasingly caring about user-centric happiness metrics. Rather than just looking at onload or domContentLoaded, we're now asking when a user can use a page. If they tap on a piece of user-interface, does it respond right away?



# 2018 JAVASCRIPT PROCESSING TIMES



Tests run during July, 2018 on hardware running the latest versions of Android and iOS available

1MB JS UNCOMPRESSED (200KB min/compressed)

▶ web experiences to make sure users were able to interact with their sites as soon as possible, both Twitter ([bit.ly/twitter-lite-case-study](https://bit.ly/twitter-lite-case-study)) and Tinder ([bit.ly/tinder-pwa-study](https://bit.ly/tinder-pwa-study)) saw up to a 50 per cent improvement in time to interactive when they adopted aggressive code splitting.

Stacks like Next.js [React] (<https://github.com/zeit/next.js/>), Preact CLI (<https://github.com/developit/preact-cli>), and PWA Starter Kit (<https://github.com/Polymer/pwa-starter-kit>) try to enforce good defaults for quickly loading and getting interactive on average mobile hardware.

Another thing many of these sites have done is adopt auditing as part of their workflow. Thankfully, the JavaScript ecosystem has a number of great tools to help with bundle analysis. Tools like Webpack Bundle Analyzer ([bit.ly/webpack-bundle-analyzer](https://bit.ly/webpack-bundle-analyzer)), Source Map Explorer ([bit.ly/source-map-explorer](https://bit.ly/source-map-explorer)) and Bundle Buddy ([github.com/samccone/bundle-buddy](https://github.com/samccone/bundle-buddy)) enable you to audit your bundles for opportunities to trim them down.

## Measure, optimise, monitor and repeat

If you're unsure whether you have any issues with JavaScript performance,

check out Lighthouse ([bit.ly/lighthouse-tools](https://bit.ly/lighthouse-tools)). Lighthouse is a tool baked into the Chrome Developer Tools and is also available as a Chrome extension ([bit.ly/lighthouse-extension](https://bit.ly/lighthouse-extension)). It gives you an in-depth analysis that highlights opportunities to improve performance.

We've recently added support for flagging high JavaScript boot-up time to Lighthouse ([bit.ly/lighthouse-js](https://bit.ly/lighthouse-js)). This audit highlights scripts that might be spending a long time parsing/compiling, which delays interactivity. You can look at this audit as opportunities to either split up those scripts or just do less work.

Another thing you can do is make sure you're not shipping unused code down to your users: Code Coverage ([bit.ly/code-coverage](https://bit.ly/code-coverage)) is a feature in Chrome DevTools ([bit.ly/chrome-dt](https://bit.ly/chrome-dt)) that alerts you to unused JavaScript (and CSS) in your pages. Load up a page in DevTools and the Coverage tab will display how much code was executed vs how much was loaded. You can improve the performance of your pages by only shipping the code that a user needs.

This can be valuable for identifying opportunities to split up scripts and defer the loading of non-critical ones until

they're needed. Thankfully, there are ways we can try to work around this and one way is having a performance budget ([bit.ly/tim-perf-budgets](https://bit.ly/tim-perf-budgets)) in place.

## Devise a performance budget

Performance budgets are critical because they keep everybody on the same page. They create a culture of shared enthusiasm for constantly improving the user experience and team accountability. Budgets define measurable constraints so a team can meet their performance goals. As you have to live within the constraints of budgets, performance is a consideration at each step, as opposed to an afterthought. Per Tim Kadlec, metrics for performance budgets can include:

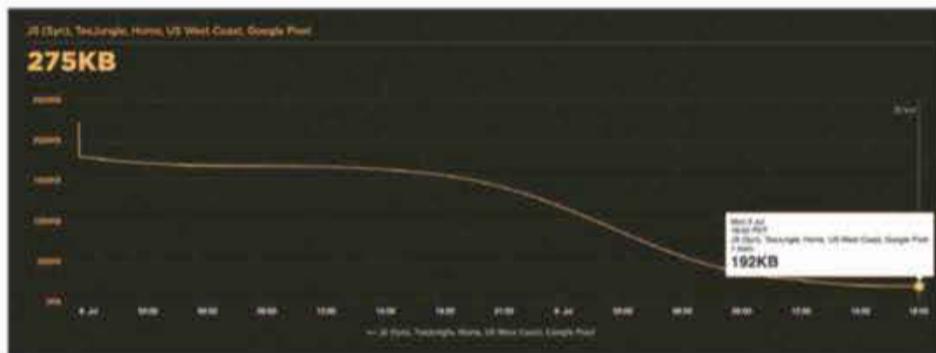
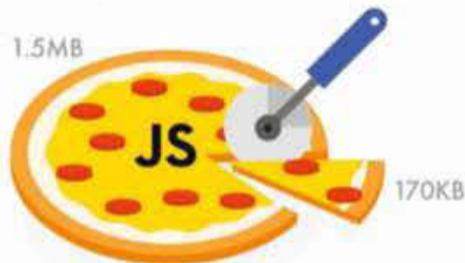
- **Milestone timings** – timings based on the user-experience loading a page (eg time-to-interactive)
- **Quality-based metrics** – based on raw values (eg weight of JavaScript, number of HTTP requests). These are focused on the browser experience
- **Rule-based metrics** – scores generated by tools such as Lighthouse or WebPageTest. Often a single number or series to grade your site.



Code faster, lighter JavaScript

# USE JAVASCRIPT CODE-SPLITTING

Split by page  
Split by route  
Split by component



Performance is more often a cultural challenge than a technical one. Discuss performance during planning sessions. Ask business stakeholders what their performance expectations are. Do they understand how performance can impact the business metrics they care about? Ask engineering teams how they plan to address performance bottlenecks. While the answers here can be unsatisfactory, they get the conversation started.

What about tooling for performance budgets? You can set up Lighthouse scoring budgets in continuous integration with the Lighthouse CI project ([bit.ly/lighthouse-ci](https://bit.ly/lighthouse-ci)). A number of performance monitoring services support setting perf budgets and budget alerts including Calibre (<https://calibreapp.com/>), Treo (<https://treo.sh>) and SpeedCurve (<https://speedcurve.com/about/>).

## Get fast, stay fast.

Many small changes can lead to big gains. Enable users to interact with your site with the least amount of friction. Run the smallest amount of JavaScript to deliver real value. This can mean taking incremental steps to get there but, in the end, your users will thank you. ■

## Resources

### Real-world performance budgets

<https://bit.ly/perf-budgets>

A deep-dive into why performance budgets matter. This guide by Alex Russell questions if we can afford all the JavaScript we load for users on median mobile phones given their impact on user experience.

### Reducing JavaScript payloads with code splitting

<https://bit.ly/js-code-splitting>

A practical guide to reducing how much JavaScript you're loading Webpack or Parcel. It also includes links to code-splitting guides for React, Angular and others.

### Reducing JavaScript payloads with tree shaking

<https://bit.ly/js-tree-shaking>

Tree shaking is a form of dead code elimination. This guide covers how to remove JavaScript imports not being used in your web pages to help trim down your JavaScript bundles.

## Lighthouse

<https://developers.google.com/web/tools/lighthouse/>

Lighthouse is a free automated tool for improving the quality of web pages by the Chrome team. It has audits for performance, accessibility and more.

**Above:** You give Lighthouse a URL to audit, it runs a series of audits against the page and then it generates a report on how well the page did. Audits include highlighting if your JavaScript is impacting interactivity.

**Above:** Tools like webpack-bundle-analyzer visualise your JavaScript bundles as interactive treemaps. This enables you to investigate what dependencies you're actually sending down to your users.

# FEATURES

20 best UI design tools



## AUTHOR

### CARL CAHILL

Carl Cahill is a UX and UI creative for brands, who was awarded Creative of the Year in the Wirehive 100 2013 and has over 10 years experience.

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# 20 BEST UI DESIGN TOOLS

If you're looking to design the perfect user interface, you need to make sure you choose the best tool for the job. And now more than ever there are powerful applications available that cater to every need

We now design in a world with an abundance of tools that can fit almost every design process and meet your creative requirements. There truly is a solution out there for everyone and the possibilities are incredible. It's such a great time to explore new tools and see what's available to design and showcase your amazing projects.

The big challenge is which ones should you use? Over the last few years, the combination of Sketch and InVision has been a popular choice for many designers but the rise of other tools has offered competitive features and options. There has never been a better choice out there, so we thought it was a good time to have a closer look at some of the best.



### ► **Wireframing** **MockFlow**

 MockFlow is a suite of applications that are very helpful for a number of tasks in the typical project process. Primarily, the WireframePro app is a good alternative prototyping tool for you to use, especially if you're testing out some new ideas.

If you just need to create wireframes, then take a look at MockFlow. It's great for working on initial ideas and enables you to build basic layouts quickly, which is sometimes all you need to get thoughts into a presentable form.

### **Balsamiq**

 If rapid wireframing is what you're looking for then Balsamiq is a strong suggestion. You can quickly develop structure and layouts for your projects with ease. The drag-and-drop elements make life easier and you can link buttons to other pages. This means you can quickly start to plan your interfaces and then share them with your team or clients.

### **Axure**

 Axure has always been one of the best wireframing tools on the market and is great for more complex projects that require dynamic data. With Axure, you can really focus on mocking up projects that are more technical and require extra attention when it comes to structure and data.

### **Adobe Comp**

 Adobe Comp is a nice addition for those that find themselves creating



Above: Balsamiq uses a drag-and-drop system that enables you to quickly build layouts

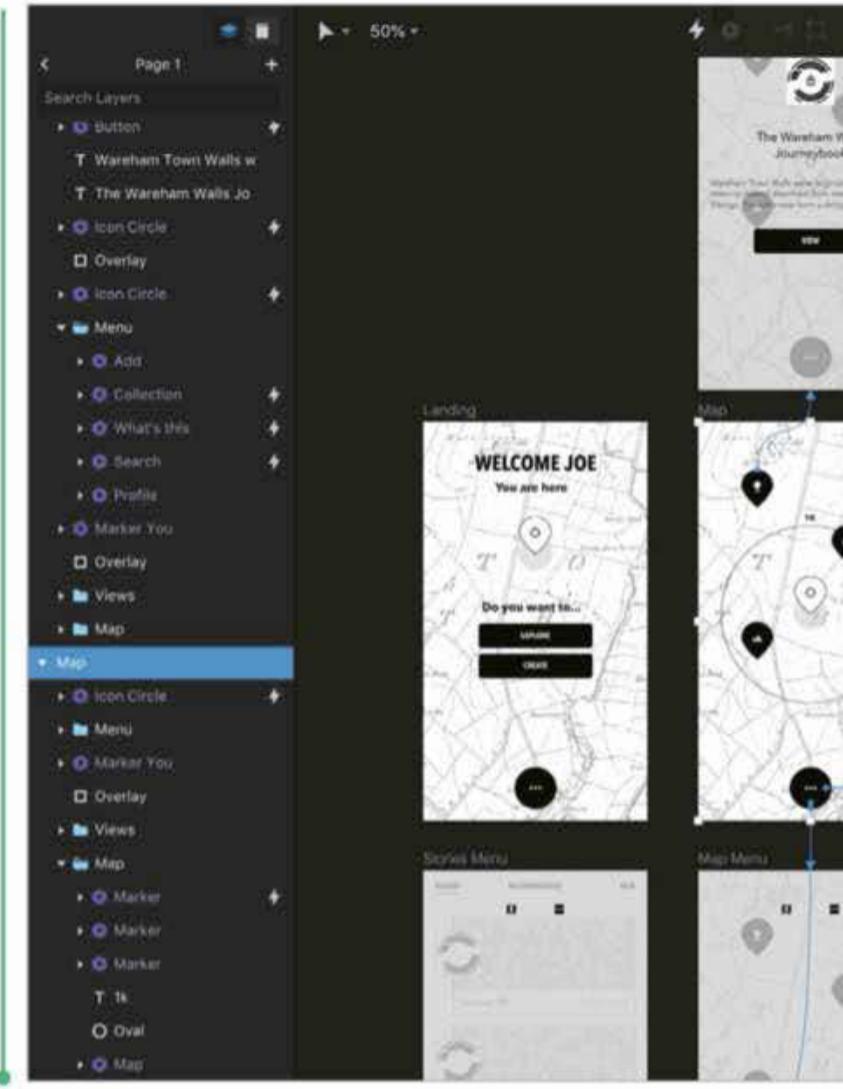
and conceptualising on the go. Got a tablet with a smart pencil? This will be worth the download just in case inspiration strikes for developing a new concept for a layout when you are away from your main workspace.

### **UI design and prototyping** **Sketch**

 Sketch is a very popular tool within the design community that enables you to create hi-fi interfaces and prototypes. One of the great features is Symbols, where you can design UI assets and elements for reuse. This helps create design systems and keep your interfaces consistent. From there, you can easily export your design into a clickable prototype. If you are an InVision user, make sure you check out the Craft plugin.

### **InVision Studio**

 Many UI designers' dreams are about to come true with InVision Studio. Still in its early release, this tool



**Proto.io is an incredible contender for creating prototypes from rough ideas right through to fully fledged designs**

will help you create beautiful interactive interfaces with a bucket load of features. You can create custom animations and transitions from a number of gestures and interactions. To top that, you can stop thinking about creating numerous artboards for multiple devices because responsive design can be achieved within a single artboard. This saves loads of time, so you can think of more ideas!

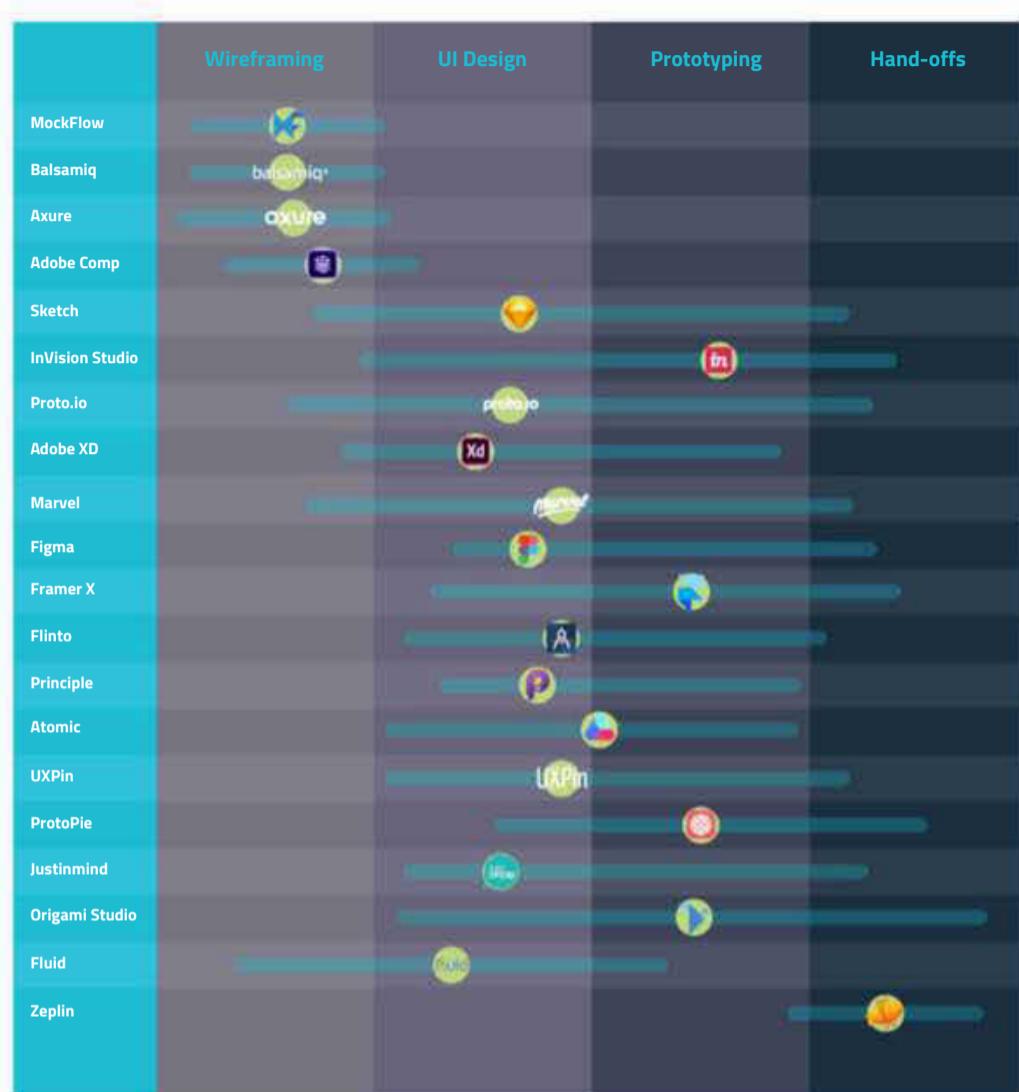
### **Proto.io**

 Proto.io is an incredible contender for creating lifelike prototypes from rough ideas right through to fully fledged designs. The tool also provides a lot of possibilities for your projects, including detailed animations and custom vector

animations too. You can start by developing initial ideas with a hand-drawn style, then work them into wireframes and finish off with a high-fidelity prototype. The Sketch and Photoshop plugins really help if you want to design using other tools but Proto.io does handle the end-to-end design process well. Other features like user testing will also help validate your designs. This is an all-in-one place solution with a great number of trusted brands already using it.

### **Adobe XD**

 Adobe XD offers the best environment for digital projects under the Adobe Creative Cloud collection



**Far left**  
Although in early release at the time of writing, InVision Studio has a raft of interesting features to aid your designs

**Left** Where each of the UI design tools sit on the spectrum in terms of the features they offer, from wireframing to hand-offs

## What makes a UI design tool?

There is an incredible array of apps available to help designers with their workflows and enable them to produce great work. A lot of the tools boil down to offering one or a number of these particular features:

### ● Wireframing

Planning your interfaces is important. The ability to quickly concept layouts, functionality and map user journeys will provide a nice structure to your project.

### ● Responsive artboards

Creating variations of your design for multiple devices can be laborious but is essential at times. With some tools, this is factored into the UI design workflow and is a time-saver.

### ● Interactive prototyping

This enables you to stitch together your designs so that a clickable prototype can bring your idea to life. There's nothing better than testing your designs and seeing how they flow.

### ● Interaction animation

This is the exciting part where you can breathe life into your designs by adding custom animations and transitions. This adds that nth degree to a polished prototype.

### ● Collaboration

Working with other designers can be tricky if you're working on the same thing. Many of these tools now enable more collaboration and help with consistency.

### ● Design systems

Collecting a library of design assets can be really handy for any project, especially when it comes to setting rules for components and styles. With one central design system, you will be sure to stay on track with your design's look and feel.

### ● Feedback

When it's off to the client for approval, an email back with all your changes can be a bit long-winded and certain aspects risk getting lost in translation. Commenting accurately on

design elements is a wonderful feature to have when working with clients.

### ● Presenting designs

The presentation of your designs can be really helpful when reviewing and testing your interfaces. If you're designing a mobile app, you should be reviewing it on a mobile.

### ● Design specs

Finished your designs and need to explain them to who is going to build it? At the tap of a button, your assets and specifications are all translated to a nice export. Job done.



of design tools. If you're a keen Adobe user and new to XD, you may not find the interface very Adobe-like to begin with – it is somewhat of a jump if you've been designing in Photoshop for a while. But it does stack up to the other leading tools out there and is worth it if you are a big Adobe fan.

## Marvel

 Marvel is another prototyping tool that's a great choice when it comes to producing quick ideas and refining an interface. As with many of the other applications of this type, Marvel offers a really neat way of building pages and enables you to simulate your design through a prototype. There are some wonderful integrations with Marvel, which means that you can insert your designs into your project workflow.

## Figma

 Figma is another design tool that enables you to quickly compose and design interfaces. The Figma platform prides itself on being a collaborative design tool whereby multiple users can work simultaneously on a project. A feature such as this is very effective when you have multiple stakeholders in a project that are involved in shaping the outcome. This is the kind of tool that would be ideal if you have a live project where a developer, copywriter and designer, for example, need to work on something at the same time.

## Framer X

 Framer X is a really exciting new design tool that is certainly worth a look for experienced UI designers who want more from their tools. Prototyping and creating interactions is really easy. If you are a big React fan, then look no further as you can design and code in sync. Besides being a great tool, there's a strong community of designers behind it offering UI assets and kits.

## Flinto

 Flinto is a nice and simple design tool that enables you to create unique interactions within your designs. You can utilise a number of gestures and

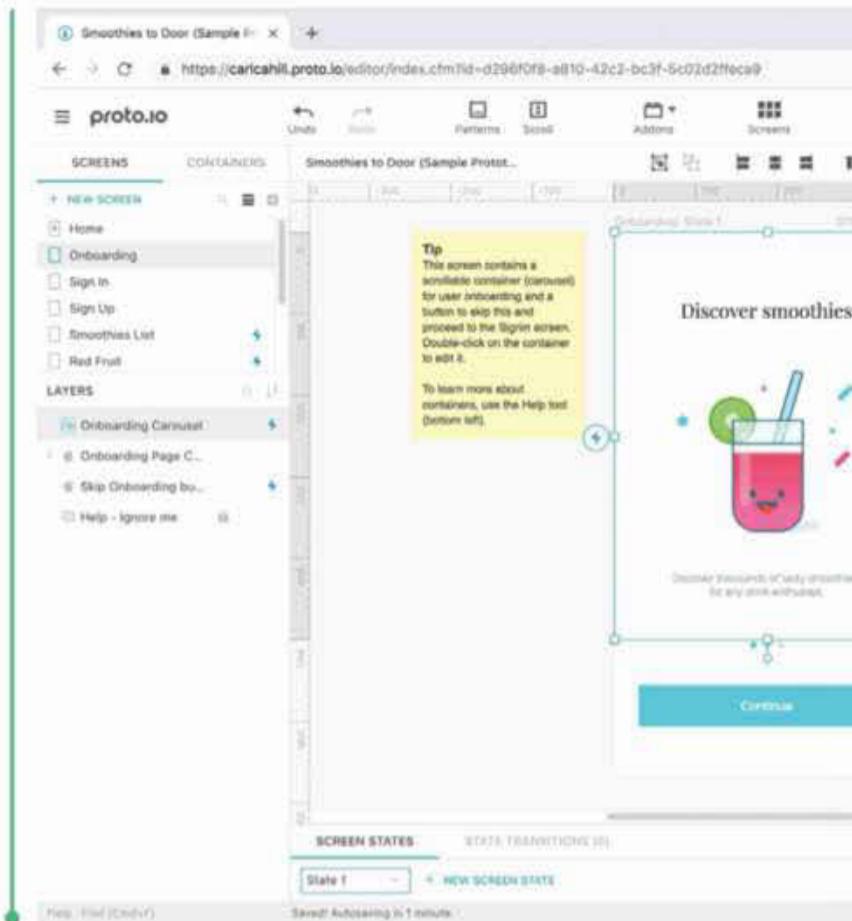
create easy transitions by designing the before and after states. Flinto simply works out the differences and then animates for you.

## Principle

 Interaction design is what Principle excels at, especially when it comes to mobile applications. Tweaking and getting animated interactions just right is a breeze with Principle. You can look at individual assets and how they independently animate, right down to timings and easing.

## Atomic

 Another interactive design tool but what sets Atomic apart is the ability to create form elements that you can actually type into. There is also a useful feature that enables you to import data



You can look at individual assets and how they independently animate, right down to timings and easing

and populate your designs. This really saves some time!

## UXPin

 Described as the 'end-to-end' UX platform, UXPin is essentially another design tool but with a powerful ability to create design systems. UXPin serves larger design teams that need to work off the same styles and guides, saving time with product development when collaboration plays a large part.

## ProtoPie

 This tool enables you to create quite complex interactions and get pretty close to how you would want your design to work. Perhaps the most standout feature is the ability to control the sensors of smart devices in your prototype, such as tilt, sound, compass and 3D Touch sensors. Depending on your

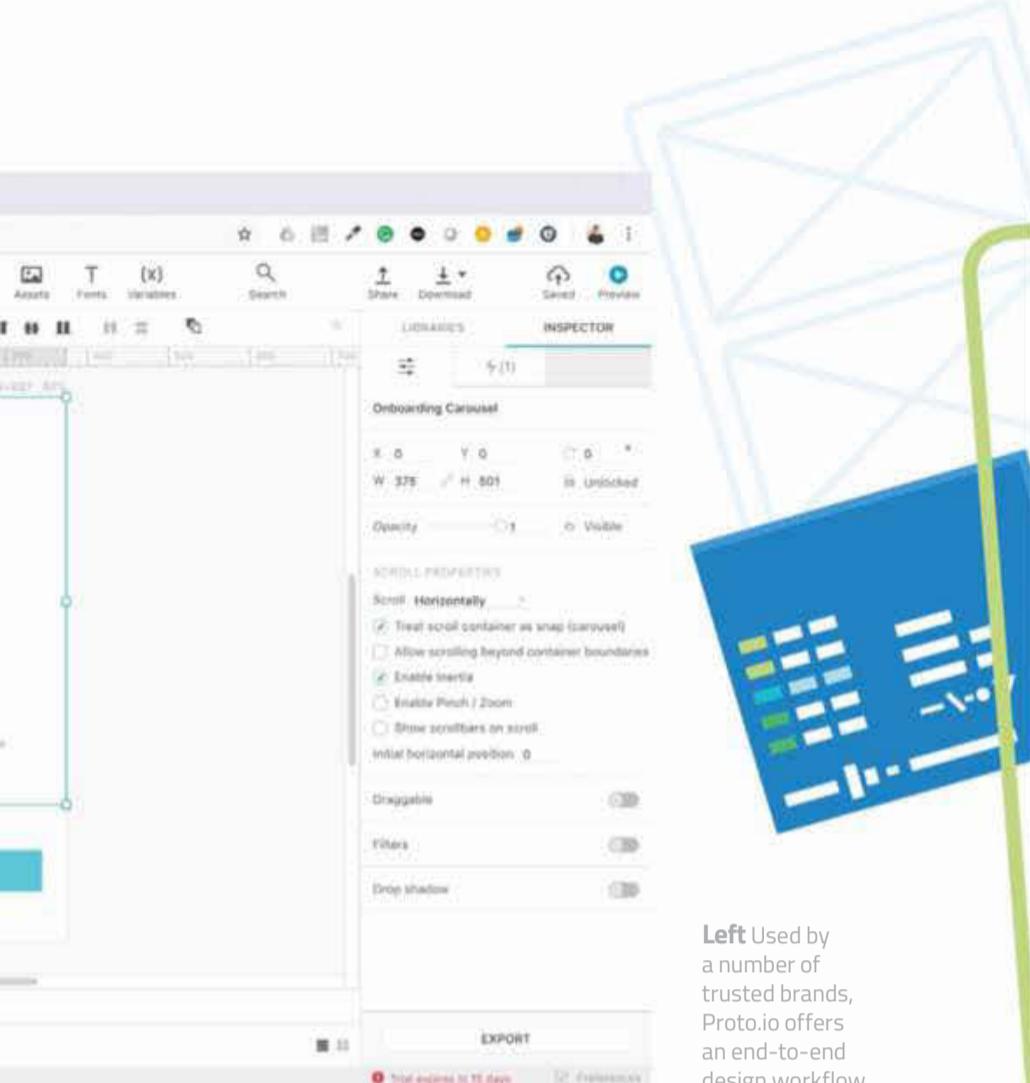
project, this is a great tool for encompassing native app features. It's easy as pie with no code required.

## Justinmind

 This tool helps with prototyping and integrating with other tools like Sketch and Photoshop. You can choose your interactions and gestures to help put your prototype together. It also contains UI kits, enabling you to put together screens quickly.

## Origami Studio

 Given Origami Studio is built and used by designers at Facebook, you might assume this must be a great tool. And you'd be right. There's a wonderful amount of features with Origami, including adding rules and logic to your interactions. How many times have you wanted a button to display or behave



**Left** Used by a number of trusted brands, Proto.io offers an end-to-end design workflow

differently because of something else? There's an opportunity to create a true-to-form prototype with Origami but it is very technical and requires some learning. Perfect for developers and designers working together.

## Fluid

 Fluid is an intuitive tool to build rapid prototypes and work up designs. It packs some nice assets out of the box to get you going with rapid prototypes and, once you've upgraded, it's easy to assemble your own symbols with your preferred UI assets.

## Hand-offs

### Zeplin

 Zeplin is not necessarily a prototyping tool but it very much fits in that post-design and pre-development stage alongside prototyping. It enables you to take your design and prototypes, hand them over to developers and make sure that your ideas are executed well. You can upload your Sketch, Photoshop, XD and Figma files to Zeplin and it will create an environment for developers and designers to hand over the project without the tedious task of creating guidelines. However, it's worth making sure that you need it first. 

## Which one do I use?

There are a lot of design tools out there, many more than there ever used to be. Deciding what to use is made more challenging by the fact there is a lot of crossover in terms of features, so where do you start? Here are a few pointers to help you decide:

### Support

Does this design tool offer tutorials or continual support? When learning something new, it's great to quickly find answers to those initial hurdles. Check out what help there is and how active the support is.

### Project requirements

Perhaps the number one reason for using a design tool is being sure it will meet your project requirements. How big or complex is the project? What is the required output? These answers will help you find the right tool for the job. It always pays to try a few tools and swap between them for different projects. So don't pin your hopes and dreams on one. Experiment and think about requirements.

### Upgrades

Like all products and tools, they'll need to adapt, reinvent and offer better ways of doing things. Does this tool look like it would upgrade or offer you more as time goes by? You don't want to be left with a tool that doesn't keep up with the industry standard.

### Integrations

Whatever your workflow is, does this tool help speed things up with compatible integrations? You will likely be using a number of different solutions to help you get through the day, so any form of integration could be of interest.

### Team

Who else do you need to consider when choosing your design tool? It will make work harder if you're all working

with different tools. Collaboration might not always be necessary but sharing files with others could be.

### Education

Is this tool something that requires a lot of learning and is it a big step from what you were previously using? Trialling a new tool is always a good idea before launching it on a client's project and only you will know if you find it easy to use. See what resources are available to help you learn and what time you can dedicate to it.

### Price

Always a pinch point in any situation. Can you safely maximise the potential of using a tool against its cost? Whether it's subscription or a fixed licence fee, factor in what value you would gain.

### Community

Check out what other designers are using and how supportive they are of these tools. Does the tool offer its own community? Some tools do and it's always a wonderful experience to share and gain inspiration from like-minded designers.

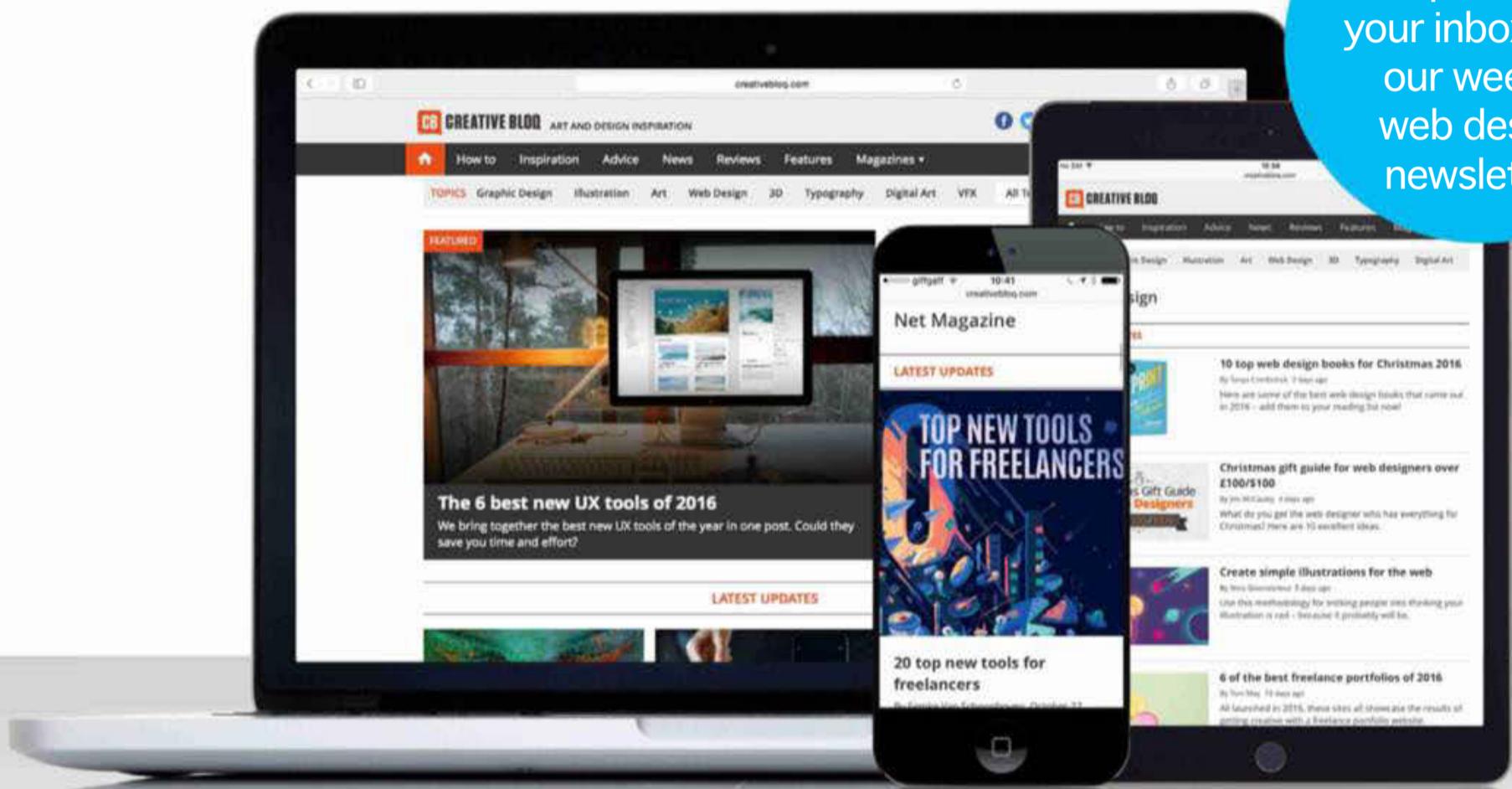
### Company

Who's behind the tool? Where else are the developers focusing and to what purpose? InVision, for example, says: "We believe the screen is the most important place in the world. That's why we are dedicated to helping you deliver the best possible digital product experience, with our platform and best practices from your peers." This dedication gives you confidence in the continual development of the company's tools and that it understands your needs.



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SHADERS

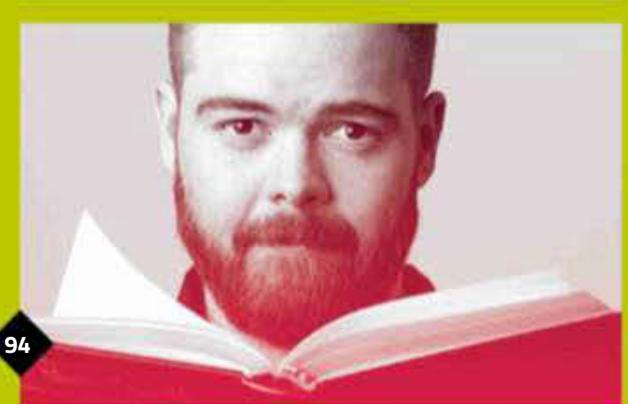
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CREATE AN ALEXA SKILL FOR YOUR SITE

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## ABOUT THE AUTHOR

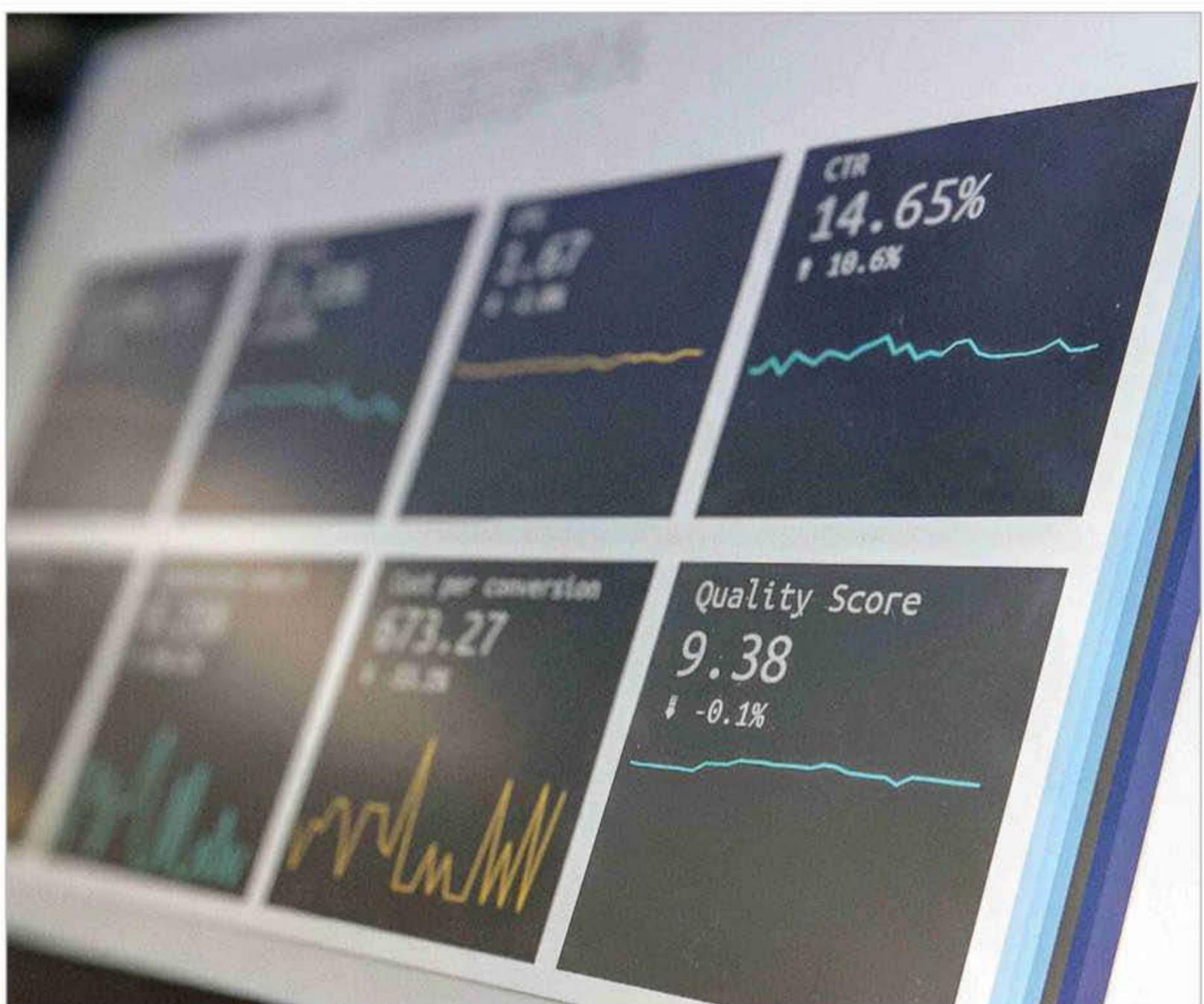
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## ★ PERFORMANCE UX

# A PRIMER ON PERFORMANCE UX

Wez Maynard reveals what you need to know in order to put performance at the heart of your UX strategy

The aim of this article is to provide an introduction to performance UX and help you understand its three core pillars. I'll delve into a bit of history and let you know where the need for performance UX initially came from and how it can get clients bought into (and understanding) UX. Lastly, I'll show you how to produce three performance UX tactical deliverables to help map your ongoing strategy. Performance UX is a perfect

solution for those of you who work on websites that are already live.

UX (within service delivery) has been at the heart of the most successful customer-centric businesses for many years. A decade or so ago the mid market started taking UX seriously and the results have been exactly what those already in the field thought they would be: exceptional. A study from [pointsource.com](http://pointsource.com) found that for every \$2 spent

on UX-related activities, \$2 to \$100 was yielded in return (<https://www.impactbnd.com/blog/the-business-value-of-ux-design>). Again, for many this is as far away from new information as you are likely to see.

Right here, right now, it really doesn't feel like those of us with a UX cap need to be backwards in coming forwards with new thinking and innovative ways of improving the experience of our clients and our clients' customers. The digital market figures support UX as a viable solution to achieve ROI. UX has become a bread and butter service offering for agencies.

So being a UX practitioner is brilliant and all of our clients think we're some kind of digital Dalai Lama, right?

No. It certainly wasn't this way for me, not for a long time.

## **“UX has been at the heart of the most successful customer-centric businesses for many years”**

### **THE EUXREKA MOMENT**

UX, for me, isn't something that ever finishes. It is an ongoing process, not a one-off project that has a start and end date. Within an agency, this thinking fits very nicely into a recurring (month-on-month) services model. I had long been an advocate of lean UX – it's really the most appropriate means of delivery in a fast-paced, multi-client agency environment. My whole digital product approach was already based on iterative cycles using agile/sprints, which helps to keep progress moving forward. Lastly, the part of me obsessed with clean code and optimising for search marketing needed to minimise bloat, keep things nice and streamlined as well as being future ready. Blending all these aspects together with UX tactics and strategy, it felt like I was on to something.

I put together an initial program of ongoing delivery that I called 'User Experience Optimisation'. It flopped. The results were good but prospects (more often than not) simply didn't understand it and didn't take it on. A month or so passed with slow progress until a wise Texan took me to one side and suggested I changed the name to 'Performance UX'. He theorised that businesses understood performance and already wanted help in making performance better.

The screenshot shows the homepage of the Center Centre website. At the top, there is a navigation bar with links for 'ABOUT', 'PROGRAM', 'TUITION', 'APPLY', 'BLOG', 'CONTACT', and a green 'DONATE' button. Below the navigation, a tagline reads: 'Center Centre is the user experience design school creating the next generation of industry-ready UX designers.' A purple header bar contains the text 'The Center Centre difference'. Underneath, a section titled 'Learning designed for you!' features a photograph of a classroom where several people are seated around tables, working on laptops. To the left of the photo, the text 'Team projects for real clients.' is followed by a subtext: 'You'll learn the interpersonal and technical skills you need to succeed as a user experience designer.' To the right of the photo, the text 'Projects tailored just for you.' is followed by a subtext: 'We'll meet you where you are and work with you to level up your skills.'



He wasn't wrong. The delivery program didn't change at all. Just the name. Service growth immediately surged.

So how can performance UX build on the already solid foundations established in the UX marketplace? To put it basically, it just requires a slight tweak to the perspective.

### **MOVING FROM ROI TO PERFORMANCE**

When talking about UX, we can sometimes shy away from talking about cold hard cash. In my experience, the client wants to know what UX means in terms of ROI or how long the UX project will take before they see results on their bottom line. Sometimes this can be impossible to quantify until the actual work starts. We need to move the conversation away from ►

**Top** Center Centre set out to create a place for UX training that is future ready and relevant

**Above** Working quickly and iteratively is a core part of performance UX. Books such as *Sprint* can help you improve efficiency.

**Above** Lighthouse runs in the browser (or in node/command line) and gives an insight into any technical performance issues.

- money and instead focus on performance, namely: technical, experiential and commercial performance. The three pillars of performance UX. These are tangible areas with the ability to benchmark and demonstrate progress.

## GET TO KNOW THE THREE PILLARS OF PERFORMANCE UX

Technical performance is all about clearing impediments and enabling your digital product to be the best it can be. You could have the best looking website on the market but if it's slow or not utilising the latest technologies, it wouldn't take much for it to be quickly left behind.

Experiential performance means understanding who your users are, what you want them to do on your site and being able to diagnose what they are actually doing.

Commercial performance requires you to become your client and understand their needs and the needs of the business. Knowing what each conversion, sale or interaction means to your client will help you prioritise your work and ensure you're reporting on what's important to them.

By separating the process into three core areas, you are helping the client understand that improving digital experience can be tangible – but these areas must work together to achieve the best results.

## WHO CAN DO PERFORMANCE UX?

I've found that the best UX professionals I've met have a varied skill set – it's almost a given if you've worked in UX for any length of time. The majority started in different areas and moved into user experience later in life. This varied experience makes an ideal performance UX campaign delivery manager. Performance UX works best when you can cover – by yourself or with a team – design, strategy, data analysis, code, project management and most importantly, excellent communication.

## STARTING YOUR FIRST PERFORMANCE UX SPRINT

This sprint is about understanding and benchmarking. Understanding your client should be the first step with every new digital campaign – but that doesn't mean it should be underrated. Hold a kick-off meeting with your client and conduct

a stakeholder interview. You'll need to interview whoever will be evaluating your work and, if you can, whoever evaluates their work. You need to learn about their business, what's important to them and what they expect from you (this works whether you're in-house or from an agency). These interviews are integral when it comes time to plan your strategic UX roadmap later.

For those unaware, a sprint is a measure of time. You set a list of tasks you believe you can achieve in your sprint and then report to your client at the end. In this example, my client has four days a month of performance UX. In this first sprint, I'll spread two days' worth of time over two weeks. As a recurring service this means we have at least three client touch points each month. One at the start of the first sprint, one at the end of the first (and start of the second) and one at the end of the second sprint.

In this sprint we'll deliver a technical diagnostics audit, experiential journey analysis and commercial goal review to our client. These documents will form the backlog for ongoing performance UX work.

**“In order to diagnose the current state of technical performance, we need to gather benchmark data”**

#### TECHNICAL DIAGNOSTICS AUDIT

Technical performance essentially boils down to speed. How quickly can the user find the site (in search)? How fast is your digital product in giving the user what they want? And how accessible is it? Although speed has been used in search ranking for some time, it was focused on desktop searches. This year, Google announced page speed will be a ranking factor for mobile searches. This now makes technical website performance more important than ever.

In order to diagnose the current state of technical performance, we need to gather benchmark data. We'll use three sources of data that are all free. You'll want to run your client's site through: PageSpeed Insights (<https://developers.google.com/speed/pagespeed/insights/>), GTmetrix (<https://gtmetrix.com/>) and Lighthouse (<https://developers.google.com/web/tools/lighthouse/>). For the latter you'll want to run all reports except the progressive web app one.

To compile your findings, you should provide an executive summary of why you are conducting the audit (benchmarking) and show the scores

#### ★ PERFORMANCE UX TOOLS

## PROVE YOUR HYPOTHESES WITH GOOGLE OPTIMIZE



A big part of ongoing performance UX is suggesting ideas to your client about how to improve the experience for the user or increase a particular on-site metric (click-through rate, for example). In the past if you didn't have the development capacity to run experiments yourself, companies like Optimizely and VWO had the market cornered.

With Google Optimize, there is now a free alternative that not only is quick to pick up but that also works seamlessly with Google Analytics, so you can include the data it provides in your reports and dashboards.

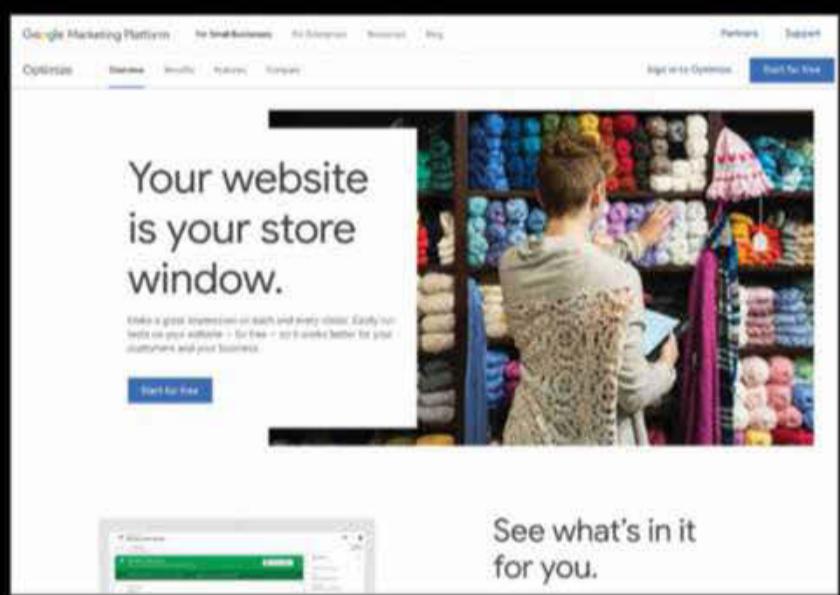
Optimize lets you run: server-side experiments and A/B, multivariate and redirect tests. It has a very easy to use visual editor that also enables you to alter the code directly should you want to get your hands dirty.

The nice thing I found with Optimize was the ability to determine how many users saw the test. This should keep nervous clients happy and let you ramp up the exposure if the experiment goes the way you'd hoped.

For those of you who work in larger organisations, Optimize 360 has some excellent (paid for) extended options, as well as adding an audience-customisation layer.

Each month a few experiments running in the background of other performance UX tasks can keep your client engaged and excited to learn the outcome of each new test.

Learn more about Optimize at [marketingplatform.google.com/about/optimize/](https://marketingplatform.google.com/about/optimize/).



**Above** Google Optimize offers simple, agile testing to site owners for free



## ★ RESOURCES

# BUILD A PERFORMANCE UX LIBRARY

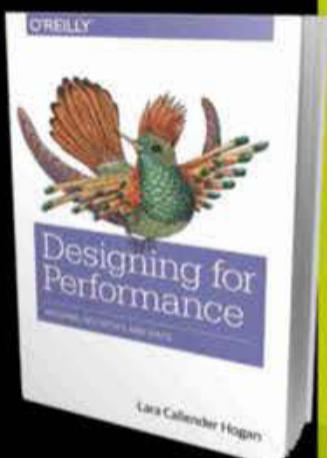
**+** The elements that make up performance UX are nothing new and there are already some fantastic books out there that make excellent reading for anyone wanting to start working with performance in mind.

Here are some useful resources that will sharpen up your skill set.

#### **Designing for Performance, Lara Kalender Hogan**

O'Reilly

If there was a book on web design I wish I'd written, it would be this one. The knowledge contained will help you understand and dominate technical website performance.



#### **Product Design, David Pasztor**

UXstudio

A neat little field guide on the product design process. Touching on things like; journey flows, A/B testing and onboarding, it's a good tool to brush up on some more general skills if you're missing them.

#### **Sprint, Jake Knapp**

Bantam Press

A book that is all about solving problems and testing ideas in a five-day sprint. I found this book especially useful for moving ideas through a team setting.

#### **Lean UX, Jeff Gothelf and Josh Seiden**

O'Reilly

The experiential performance element of performance UX owes a lot to lean UX processes. Rather than focusing on deliverables, this book will show you how to directly affect the experience itself.

#### **Design is a Job, Mike Monteiro**

A Book Apart

Working in a recurring model means you need to manage your client properly. Make sure you understand what they need from you and be confident in leading them. This book may just straighten your spine.

► from the three sources up front. You should ideally explain to the client what each source looks at and why you chose it. For the rest of the audit, compile the recommendations from the three tools into chapters with numbered lists of recommendations. Your chapters should be: basic site setup, speed and performance, accessibility and SEO. The chapters form themes you can use in the coming months and the numbers will enable you and the client to refer to line items during discussions. All of these elements directly affect the user and being able to talk about them is absolutely essential to being a user advocate to your client.

## EXPERIENTIAL JOURNEY ANALYSIS

In order to show how we've improved the experience for the user, we record how users are currently using the site. We'll do this using two industry-standard tools: Hotjar (<https://www.hotjar.com/>) and Google Analytics (<https://analytics.google.com/>). Sign up for Hotjar and get the tracking on your client's site as soon as possible, ideally before this sprint starts. Once the code is installed, log in to Hotjar and

**“You should take notes about the way users navigate through the site and the sequence of pages they take”**

activate Recordings – on the free plan you'll get 100 sessions, which is more than enough. Make sure you select sessions that include clicking and scrolling and that you ensure it's only recording sessions of over 30 seconds.

Once you've amassed a good few sessions, sort by the #pages column (high to low) and review what's been recorded. You should take notes about the way users navigate through the site and the sequence of pages they take. Ten to 20 videos of three or more pages should give you a good feel of how users are moving through their journey. You should document these journeys, pulling out any information of note (users ignoring CTAs, not using the menu you thought they would, using the site search, etc).

Next, within your client's Google Analytics, navigate to the Behaviour>Site content>All pages table. Set the date range for the last three months and make sure you're sorting by page views. What we're going to do now is show our client how users move through the site most of the time.

Take the top ten pages for page views. For each of these click on their URL in the table. This takes you to the page level screen and the graph will only show visits for that one page. Click on the tab that says Navigation Summary, found above the graph in the top-left corner – it's next to the one already selected that says Explorer. This navigation summary screen shows you which page users were on before the page you selected and usefully, where it was that they went afterwards. You should record this data for each of your client's top-performing pages (ten is a good number to start with).

Collate these findings in a document for your client and be sure to include a section where you note down anything of interest. You will refer to this document a lot in the coming months when justifying hypotheses or demonstrating journey improvements, for example 'this page used to account for four per cent of visits to the demo sign up; my work on improving messaging/layout has increased this to eight per cent'.

## COMMERCIAL GOAL REVIEW

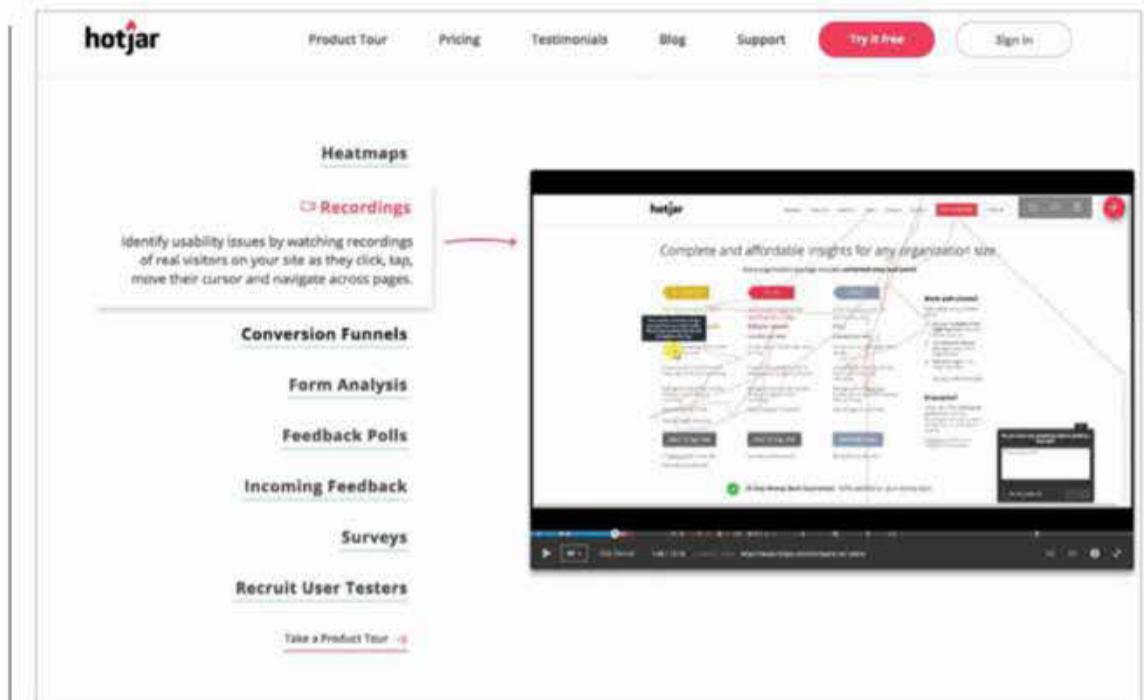
This task is exactly what it sounds like and can be somewhat painful for some less technical clients. The point of this exercise is to establish trust and to also let the client know you understand what is important to them.

Review your stakeholder interviews and distil what is important for your client to measure success. Is it product sales? Brochure downloads? Phone calls? Armed with this information, you should log into your client's Google Analytics and review their goal tracking (Admin>Goals). Note down which goals relate to what and, more importantly, note any missing goals you will need to add. Next arrange a call or meeting with your client (this is important – an email won't do) and run through each goal. Once you've established what each goal does and if any need replacing or amending, suggest any new goals you need to add.

For ease you should document what each goal is recording (in simple terms) for your client and then record the goals you mean to add on their behalf. It's at this point I'd recommend learning how to deal with regular expressions (RegEx), which will help no end in dealing with complex goal tracking; <https://regex101.com/> is an excellent debugging tool once you're up to speed.

## PROGRESS REVIEW

With your first sprint at an end, you now have three valuable documents ready to present to your client. It's important to get these right, because these documents will form the basis of how you



**Above** Hotjar has a number of tools to help with user behaviour insight. The journey recordings provide a good basis for ongoing hypothesis testing

plan your next three, six or 12 months. Ideally, the whole of the second sprint will be used to produce your performance UX strategy. After the work you've already put in, the client will understand the importance of getting this right.

Within your strategy document you should record what is important to the client in terms of key metrics. You should then detail, month-on-month, how you will work towards measurable progress. Always justify your tactics using technical, experiential or commercial performance reasoning. For example, instead of saying 'I need to do some card sorting to make the navigation easier to understand', try 'our experiential user journey research showed a disconnect in the labelling used on the current navigation – card sorting would allow us to find a better solution'. Ideally you should have a way of showing how your work is influencing the benchmarks you have recorded. I'd recommend a tool like Power BI or Google's Data Studio to make an dashboard with all the metrics updating in real time.

How you produce your strategy is ultimately down to you but I would strongly advise a varied strategy. Cover all three pillars whenever possible. Commercial is where users end up, experiential is how they get there and technical is what's stopping them on their journey. Too much technical work and you will lose your client's interest, too much experiential work and they might start to question value and too much commercial work just becomes conversion rate optimisation.

Performance UX is unique in that you get to be an advocate for the user and for your client. Your job is to be an old-fashioned 'middle man (or woman)' and make it as easy as possible for both parties to get what they want. So get out there and start greasing those wheels. ■



## ABOUT THE AUTHOR

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\* ALEXA SDK

# CREATE AN ALEXA SKILL FOR YOUR SITE

Darryl Bartlett demonstrates how you can use the Alexa SDK to communicate with your website content

Many of us now have some kind of voice assistant around the home, whether it be an Amazon Echo, Apple HomePod or a Google Home. It seems that voice is going to have a huge impact on the way we go about our daily lives and as web developers we need to ask ourselves, what are the ways we can implement voice into our websites and web applications?

In this tutorial, we are going to be building a simple Alexa skill that updates the news content on a website. The category type will depend on the voice input by the user. It would help if you have some experience with AWS already but there is a lot of documentation out there to help you out if you get in a pickle.

## WHAT WILL I NEED?

You will need to start by registering for an Amazon Developer account ([developer.amazon.com](https://developer.amazon.com)) and an AWS account ([aws.amazon.com](https://aws.amazon.com)).

Firebase will be used to store our user input, so make sure you sign up for a Firebase account ([firebase.google.com](https://firebase.google.com)). We will also be using the News API to get the latest news stories, so get yourself a free API key at [newsapi.org](https://newsapi.org).

## INTENTS, UTTERANCES AND SLOTS

Once you are set up, navigate to [developer.amazon.com/alexa/console/ask](https://developer.amazon.com/alexa/console/ask) and click on Create Skill. The first thing we need to do is set up Intents, Utterances and Slot Types inside the Alexa Developer Console.

[View source](#)
[files here!](#)


All the files you need for this tutorial can be found at  
<https://github.com/darryl-bartlett/alexa-webupdate>

An intent is what the user of the skill is trying to achieve. Utterances are specific phrases that users will say when talking to Alexa, for example: 'What day is it?'. A slot is a variable that relates to an utterance, for example: 'What time is it in {place}?'.

This would make {place} the custom slot.

Select Intents from the left-hand side of the dashboard and click Add Intent. Make sure Create Custom Intent is selected and type ContentUpdate in the text box: this will now become our function name later on.

We now move on to utterances, which is where we are going to need to take the category of the news that the user wants to update to. We will be using category as our slot name and then set up the following utterances:

```
"Update {category}"
"{category} stories"
"Update to {category}"
"Set stories to {category}"
```

Finally, we need to create a slot type, where we will write out a couple of inputs that we expect to get from the user. From the left-hand side of the dashboard, click Add next to Slot Types. Type in 'NewsType' and click the 'Create custom slot type' button. Under Slot Values, you will need to add in some news categories. We will use Sport, Business, Technology and Politics. Once you are finished, make sure you have selected NewsType from the dropdown as the slot type for category.

## AWS LAMBDA FUNCTION

We will now head over to Lambda inside AWS ([console.aws.amazon.com](https://console.aws.amazon.com)). Select Create Function and then select the Blueprints radio box. Make sure you select the alexa-skill-kit-sdk-factskill from the list and click Configure. Give your function a name and

**Above** Here are the utterances we have setup inside the Alexa Developer Console for our skill. Feel free to add more

★ KEY SKILLS

# DESIGN PROCESS FOR VOICE

**+** Here are a few pointers when designing voice experiences for Alexa.

**Identify the user intents**

When developing your skill, it's important to identify a list of all the things the user can do within the skill before planning the utterances. For example, the user might be able to update website content, update the website style and read posts.

Be sure to make use of the built-in intents: you can see a full list of them at <https://developer.amazon.com/docs/custom-skills/standard-built-in-intents.html>.

**Identify the utterances**

Think about how your user may communicate with Alexa. To update a style, the user might say 'Update background to red'.

It's also important to plan for miscommunication. Alexa might interpret 'red' as 'ref'. A good way to deal with this would be by using the code below:

```
'Unhandled': function () {
    this.emit(':tell', 'I am sorry, I didn't understand your request. Please try again.');
},
```

**Creating a script**

Make sure you plan out the script between the skill and your user. Be sure to keep interactions short but enough so that the user understands how they need to respond.

Below is a good conversation flow between Alexa and user.

**User:** 'Could I update my header to blue?'

**Alexa:** 'Sure, I can update your header to blue. Would you like that change to happen immediately?'

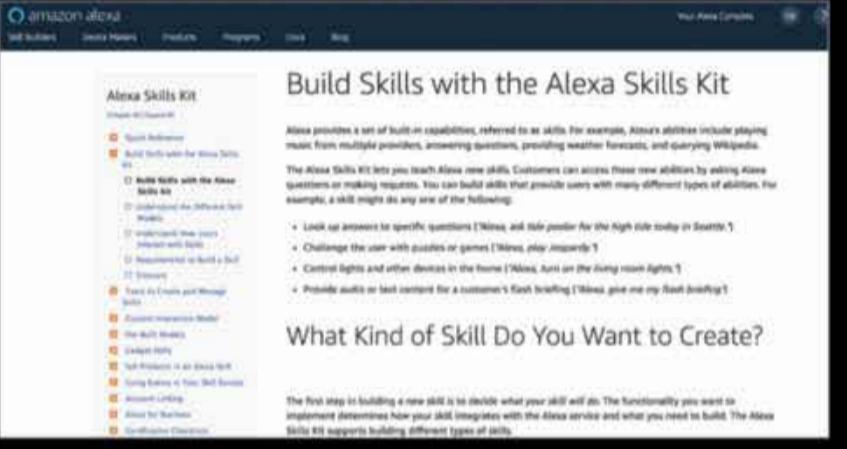
**User:** 'Yes please!'

**Alexa:** 'Great, that change has gone live!'

**RESOURCES**

# GOING FURTHER WITH ALEXA SKILLS

If you want to learn more about Alexa skills development after this tutorial, then check out the compiled list of resources below.



**Alexa Developer Home**  
<https://developer.amazon.com/alexa-skills-kit>

This is the best place to get started when building Alexa skills. It's full of useful documentation, videos and has all the latest news on Alexa development.

**GitHub: Alexa Skills Kit SDK for Node.js**  
<https://github.com/alexa/alexa-skills-kit-sdk-for-nodejs>

Here you will find lots of technical documentation and sample projects for the Alexa Skills Kit SDK.

**Comprehensive Alexa Skill Development Course**  
<https://www.udemy.com/comprehensive-alexa-skill-development-course>

This Udemy course created by IOT Wonders will introduce you to Alexa development in video format. You will get the opportunity to learn by building out several skills and it is aimed at developers of all levels.

**Essential React Native development tools**  
<https://aws.amazon.com/lambda/getting-started>

When developing Alexa skills, you are going to need a good knowledge of AWS Lambda. The official website for AWS is a great place for you to learn more.

► then create a new role. When finished, click Create Function at the bottom of the page. You will need to select Alexa Skills Kit as a trigger for your function, then we can move onto the function itself. We won't be using the built-in code editor for this project; instead we will be writing out the functions locally and then uploading a zip file. Make sure you copy the contents of the index.js file inside the Lambda editor, as we will paste this inside our local project.

## CREATE A LOCAL PROJECT

We will start by creating a new Node project locally. Inside our own index.js file, we will paste the contents we just took from Lambda. We need to import Firebase and the Alexa SDK using NPM.

```
npm install alexa-sdk
npm install firebase
```

Make sure you include the references at the top of your index.js file.

```
const Alexa = require('alexa-sdk');
var Firebase = require("firebase");
```

You should have some default code already there, one of which is called 'LaunchRequest'. This is used to welcome the user to the skill. All you need to do here is change the welcome message to 'Welcome to website update'.

```
'LaunchRequest': function () {
  this.emit(':ask', 'welcome to website update');
},
```

If you use the :tell command then Alexa will end the skill after the message, whereas if you use :ask then Alexa will listen for eight seconds for the next prompt. We will be using :ask, so that Alexa is ready to listen for our update prompt.

## FIREBASE CONFIGURATION

Next, we need to add our Firebase configuration details at the top of the index.js file.

```
var config = {
  apiKey: "<API_KEY>",
  authDomain: "<PROJECT_ID>.firebaseapp.com",
  databaseURL: "https://<DATABASE_NAME>.firebaseio.com",
  projectId: "<PROJECT_ID>",
  storageBucket: "<BUCKET>.appspot.com",
  messagingSenderId: "<SENDER_ID>"
};
Firebase.initializeApp(config);
```

## CONTENT UPDATE FUNCTION

If you remember earlier in the tutorial, we created an intent called ‘ContentUpdate’. This means we need to create a ContentUpdate function, where we will respond to the user input based on the Utterances we created. So, if the user said ‘Update to sport’ then this function would be called. We begin by creating a variable called categoryType, which takes the voice input of the user. We then store the category type inside the Firebase database and get Alexa to tell us the name of the category we updated to.

```
'ContentUpdate': function() {
  var categoryType = this.event.request.intent.slots.
    category.value;
  if(Firebase.apps.length === 0) {
    Firebase.initializeApp(config);
  }
  Firebase.database().ref('/').set({
    preference: categoryType
  }).then((data)=>{
    Firebase.app().delete().then()
  }).catch((err) => {
    console.log(err);
  })
  this.emit(':ask', 'you updated to ' + categoryType);
},
```

After you save your index.js file, you will need to zip up the project. Navigate to the project folder from the command line and type the following command.

```
zip -r index.zip *
```

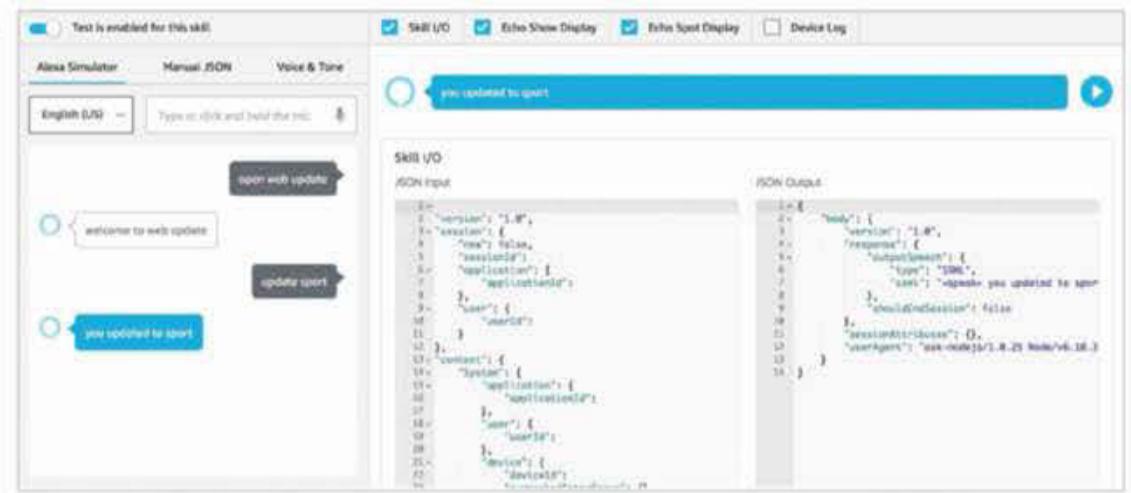
Head back to your function inside Lambda and scroll down to the Function Code section. From the drop-down box for code entry type, select ‘Upload a .zip file’. You will now be able to upload your zip file.

Before you test your project inside the Alexa simulator, take the ARN on the top right of the Lambda page and input this inside the Endpoint section of the Alexa console. To test your skill, all you need to say is ‘Open web update’ and Alexa will respond with ‘Welcome to web update’. If you now say ‘Update to sport’ Alexa should say ‘you updated to sport’. The word ‘sport’ should also appear under preference inside your Firebase database.

## NEWS PAGE

Finally, download the news page I created (index.html). Get the file from <https://netm.ag/2EjFwQb> inside the Alexa Project – HTML folder.

Open up the main.js file and enter in your own Firebase configuration details on lines 1-8, like we did earlier in the tutorial.



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Bethesda: Next gen consoles should be all about crossplay

**Top** The Alexa simulator is a great way of testing your skill on your machine without needing an Amazon Echo device

**Above** Here is what the final HTML page will look like. It will display the category that you requested through Alexa

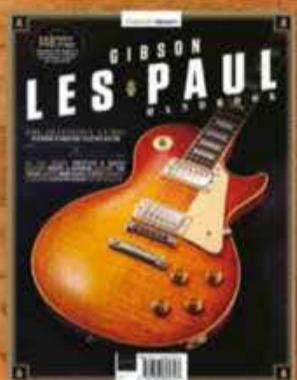
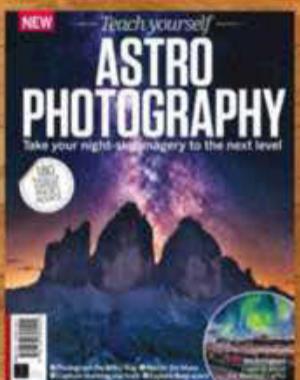
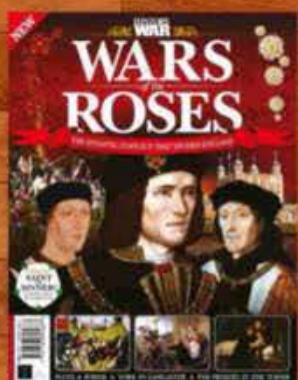
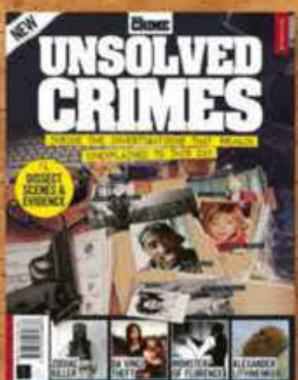
You will also need to enter your News API key from <newsapi.org> on line 11 of the main.js file.

```
var myAPIKey = "<YourAPIKey>";
```

If you now open the index.html file, it should load in some news stories from your chosen category. Every time you tell Alexa to update with a new category (sport, technology, business or politics), the news story category on the page will change.

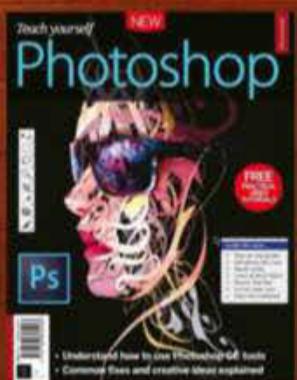
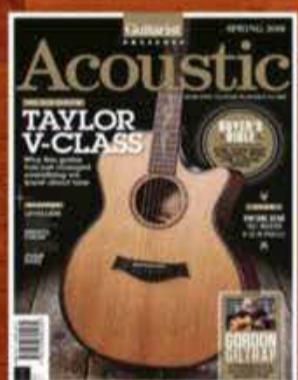
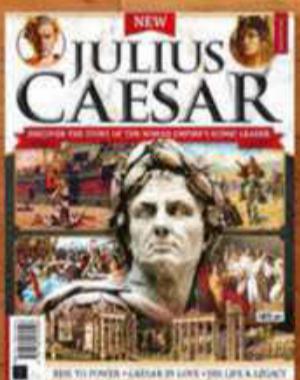
## CONCLUSION

This is only a small example of what you could achieve with Alexa and hopefully gives you a good foundation for any future voice projects. You could always add in more slot values to get more categories from the API or even update the project so that it pulls in your own website news/posts. I can't wait to see how web and app developers will include Alexa in their projects. ■



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## ★ ACCESSIBILITY

# UNLOCK ACCESSIBILITY WITH NEW TECHNOLOGIES

**Alastair Holmes** explains how emerging tech can help businesses make sure that no customer gets left out

Retail websites aren't just convenient for people with disabilities who might struggle to shop in a physical store – they are essential. This, coupled with the retailers' need to innovate in order to maintain market position, means that companies have to ensure that no customer is neglected – and rightly so. As web designers, we should not only aim to make websites accessible for all but also make full use of the capabilities of new and emerging technology. From VR to voice tech, we now have a wealth of tools that can be implemented to further benefit the accessibility sector.

As part of This Place's ongoing work for Woolworths, Australia's largest supermarket chain, we were asked to explore how to better serve the accessibility sector. We wanted to go beyond standard practices and see how we could use new tech to benefit this customer segment.

We presented Woolworths with a set of strategies, which included the use of VR to enable customers with difficulty leaving the home to get a real-world shopping experience. The proposed service would

also feature gesture-based navigation so people who struggle to use a keyboard or mouse could have access as well. When a customer finds an item they want to buy, they can virtually pick it off the shelf to view high-visibility nutritional information, prices, reviews and associated special offers.

The work for Woolworths Australia is not the first time This Place has created something for the accessibility sector. Another example is MindRDR, a service that uses wearable technology so people with severely limited motor control can browse and access BBC iPlayer content just by thinking. We published MindRDR as an open-source software and it's since been picked up and developed further by others around the world. There's a lot of potential in wearable tech but it's still in the early stages. It's our job as web designers to take it to the next stage.

All businesses should understand that catering to customers with accessibility needs should not be an afterthought. It's the right thing to do and also makes perfect business sense, especially now with the technology that's becoming available. ■

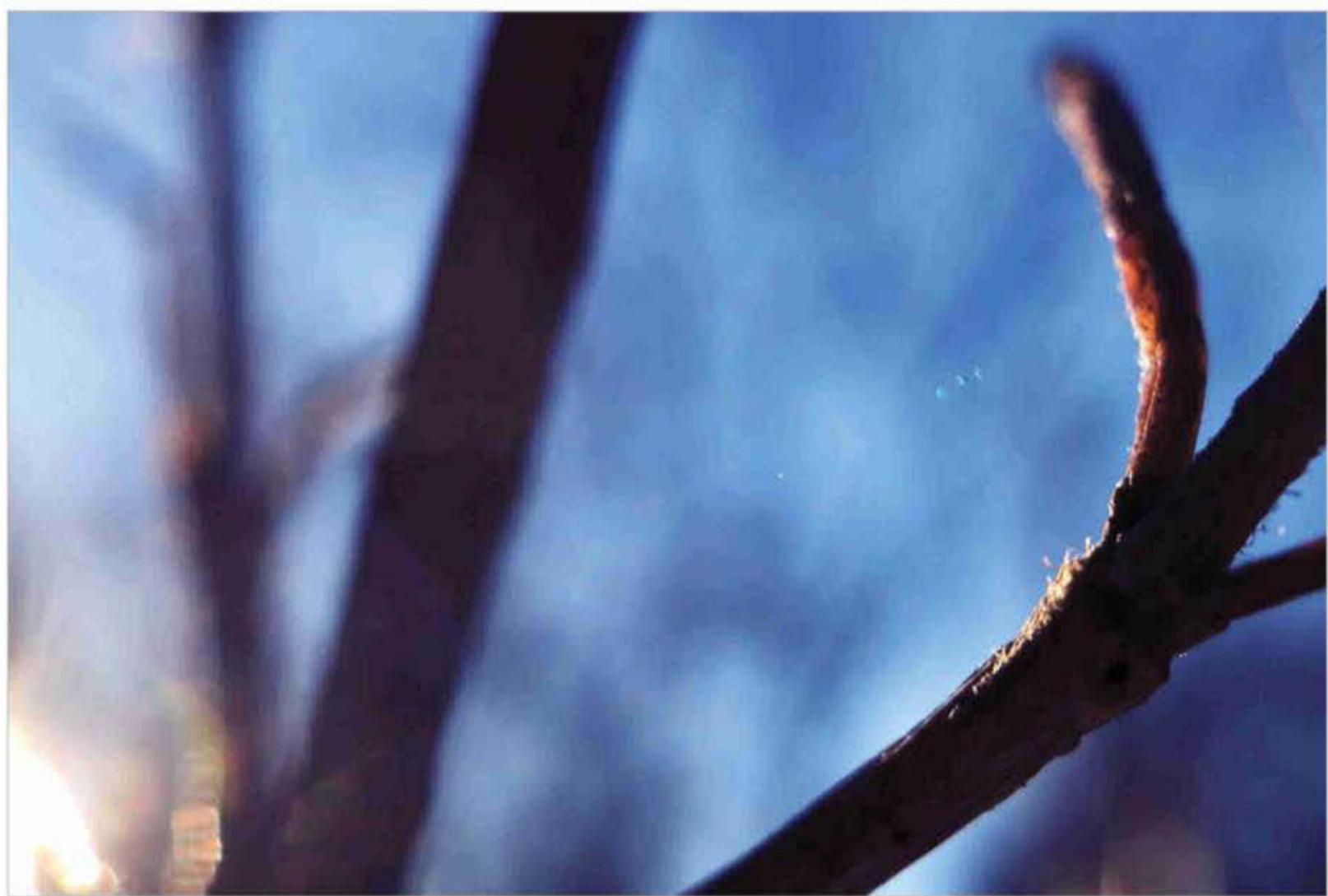
\* PROFILE

Alastair Holmes is associate creative director at This Place, delivering customer-facing digital experiences that are beautifully crafted and highly usable.



## ABOUT THE AUTHOR

## RICHARD MATTKA

**w:** [richardmattka.com](http://richardmattka.com)**t:** [@synergyseeker](https://twitter.com/synergyseeker)**job:** Interactive director,  
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Shaders, VFX, WebGL

## ★ VFX SHADERS

# BLUR 3D SCENES WITH VFX SHADERS

Richard Mattka continues his series on shader programming, showing you how to create blur post-processing effects for your 3D projects using Three.js and GLSL

 In previous articles, you have learnt about shaders and how to get them into your 3D projects. You learned how to make a cool Glitch shader in the last tutorial as well. This tutorial continues by showing you how to add post-processing effects via the EffectsComposer using Three.js and how to create your own blur effects.

The blur effect you will be creating will be applied to your entire 3D scene as a post-processing effect. You could also apply it as a ShaderMaterial in Three.js to specific objects. This effect is written as a graphics shader and can be applied in other frameworks such as Unity, openFrameworks or Processing.

## SET UP YOUR 3D SCENE

This tutorial uses the WebGL library, Three.js, which abstracts away the low level WebGL language, enabling you to focus on creating 3D scenes and shaders. If you need it, you can download it here: <https://github.com/mrdoob/three.js>.

You should already have a 3D scene set to go in Three.js to follow along. If you need a quick sample scene, there are plenty of examples you can use here: <https://threejs.org/examples/>.

**Tip:** You should always run web code on a local web server or your remote web server if you have one.

If not, you may run into cross domain or origin restrictions loading assets.

## INCLUDE EFFECTS COMPOSER FILES

After you've got a Three.js scene up and running, the next thing you'll need to do is add some classes that will enable you to use the EffectsComposer in Three.js. This means you'll be able to route the render of each frame through a set of shaders, before finally outputting to the screen.

Add these files to the top of your HTML code. They are located in the 'examples/js/shaders' and 'examples/js/postprocessing' folders of Three.js.

```
<script src="libs/EffectComposer.js"></script>
<script src="libs/CopyShader.js"></script>
<script src="libs/RenderPass.js"></script>
<script src="libs/ShaderPass.js"></script>
<script src="libs/SMAAPass.js"></script>
<script src="libs/SMAAShader.js"></script>
<script src="libs/PixelShader.js"></script>
```

## ADD THE EFFECTSCOMPOSER AND FIRST RENDER PASS

Inside your init function, somewhere after you've declared your renderer, scene and camera, you need to add the EffectsComposer. Make sure that you include a reference to the renderer. We call each processing of the frame a render pass. We create a composer class in order to manage the passes.

Now you need to add the initial render pass to the composer, being careful that you reference the



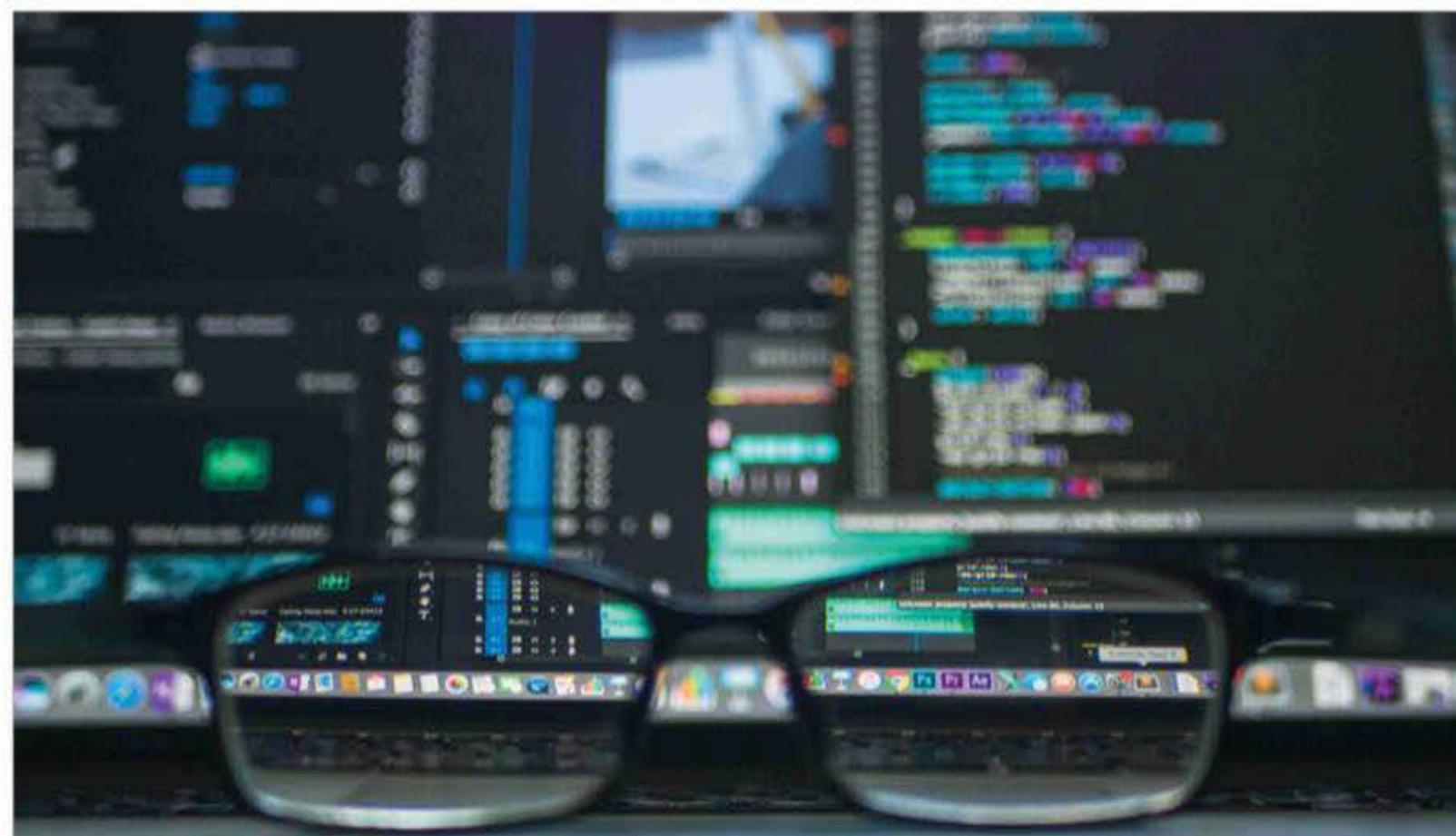
Above Three.js is the world's most popular 3D WebGL library

scene and camera. The following code will take care of all of this:

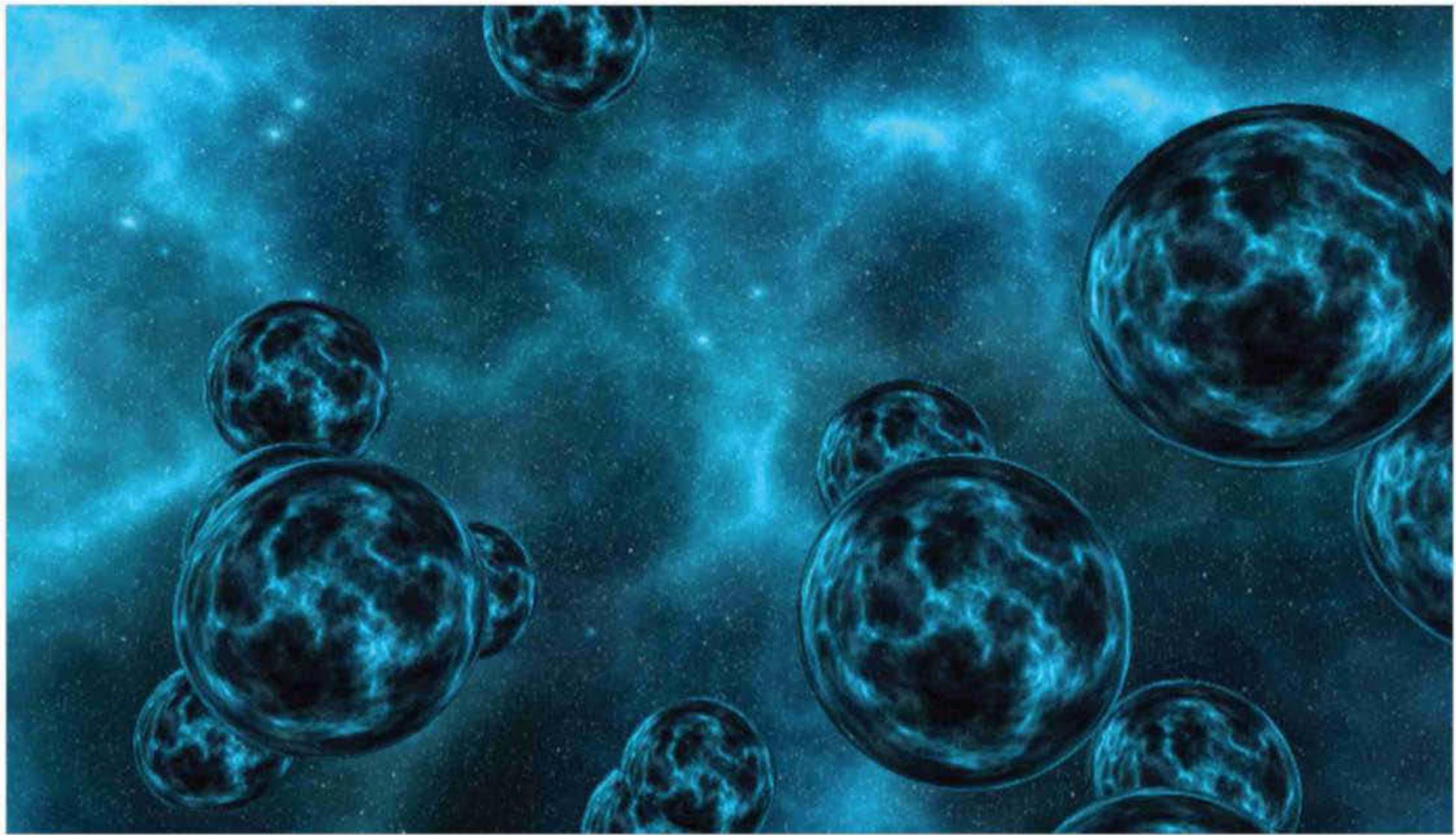
```
composer = new THREE.EffectComposer( renderer );
composer.addPass( new THREE.RenderPass( scene,
camera ) );
```

## ADD A SMAA PASS TO COMPOSER TO TAKE CARE OF ANTIALIASING

Antialiasing will no longer work as a setting for your renderer once you start applying post-processing effects. Instead, you can apply the SMAA shader to handle sub-pixel antialiasing to smooth out your scene. You also need to set `renderToScreen` to true in your last shader pass. Add this code next:



Left Using a blur on 3D objects as a material can create unique blurring effects



**Above** Antialiasing applied by the SMAA shader. Think of this as your 'no effects' version of your scene

```
► pass = new THREE.SMAAPass( window.innerWidth *
    renderer.getPixelRatio(), window.innerHeight * renderer.
    getPixelRatio() );
pass.renderToScreen = true;
composer.addPass( pass );
```

### RENDER WITH COMPOSER CLASS

Inside your render loop, you will typically have a line like this:

```
renderer.render( scene, camera );
```

For the effect to work properly, you need to remove or comment out that code and replace it with the composer render code, like this:

```
composer.render();
```

This will now use the composer to render your scene each frame.

### ADD A PIXEL SHADER PASS

If you ran your code now you should see a nice antialiased rendering of your 3D scene. But there are additional effects applied outside of antialiasing. To show you how easy it is to add an effect, you will now add the included Pixel Shader pass.

Between your first composer pass and the SMAA pass, insert this pixel shader pass:

```
pixelPass = new THREE.ShaderPass( THREE.PixelShader );
pixelPass.uniforms.pixelSize.value = 16.0;
pixelPass.uniforms.resolution.value = new THREE.Vector2(
    window.innerWidth, window.innerHeight );
pixelPass.uniforms.resolution.value.multiplyScalar(
    window.devicePixelRatio );
composer.addPass( pixelPass );
```

You can adjust the `pixelSize` uniform, which is set to 16.0 in this example, to see how it works. You'll now see a pixel effect in action!

### DUPLICATE THE PIXELSHADER.JS

Now that you have a working shader effect, it's time to replace it and make your own blur shader. Make a copy of `PixelShader.js` and rename it `BlurShader.js`. Then update your HTML to load this new file instead of `PixelShader.js`.

```
<script src="libs/BlurShader.js"></script>
```

### REPLACE THE PIXEL SHADER IN YOUR CODE

Replace the code you used for adding the pixel shader



**Above** A pixelated version of your scene can be seen using the included pixel shader

**“Your blur shader will use a type of blur called a box blur; this samples nearby pixels from the original and averages them together”**

pass with this code. This will make sure the new blur shader is added to the composer.

```
blurPass = new THREE.ShaderPass( THREE.BlurShader );
blurPass.uniforms.resolution.value = new THREE.Vector2(
  window.innerWidth, window.innerHeight );
blurPass.uniforms.resolution.value.
  multiplyScalar( window.devicePixelRatio );
composer.addPass( blurPass );
```

### CUSTOMISE YOUR BLUR SHADER

Open up the BlurShader.js file that you just created and then change the class name so that it now reads `THREE.BlurShader` instead of `THREE.PixelShader`. This will expose this new shader class to your JavaScript code in your main file where you loaded it.

### UPDATE THE SHADER’S UNIFORMS

Next, you need to update the uniforms that you will use for this shader. Update the uniforms object with this code:

```
uniforms: {
  "tDiffuse": { value: null },
  "resolution": { value: null },
  "iTime": { value: 0.0 },
```



## ★ SHADERS UNDERSTANDING GRAPHIC SHADERS



 GLSL (OpenGL Shading Language) shaders compile and run on a wide range of platforms. You can apply what you learn to any environment that uses OpenGL, OpenGL ES or WebGL. This means you can use this knowledge for websites, Three.js, iOS games, interactive installations, Unity, openFrameworks, Processing and many others.

#### The graphics pipeline

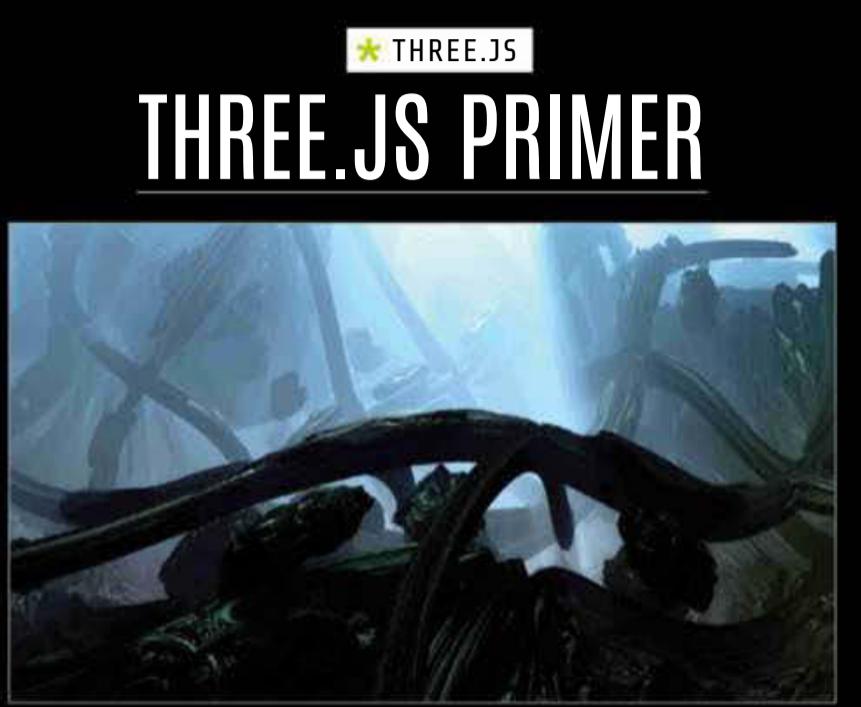
Multiple shaders work together in the graphics pipeline. Some are programmable, some are locked to the hardware. We’re most interested in two shaders in the pipeline – vertex shaders and fragment shaders. These are the core of the OpenGL Shading Language and the WebGL graphics pipeline.

#### Vertex shaders

Vertex shaders handle the processing of individual vertices, which can be thought of as points on the triangles that form a mesh. Vertex shaders are used to transform the attributes of vertices from their original space to the display space. This includes attributes such as colour, texture, position and direction.

#### Fragment shaders

This shader, which is typically the last in the pipeline, instructs each fragment or pixel as to what colour it should be. It manages to achieve this by setting a value for `fragColor` in the code’s main function. It’s where we’ll be creating our photo filters, animations, effects and so much more, by carefully manipulating the colours of the pixels.



You are using Three.js as the WebGL renderer in this tutorial. If you are not familiar with Three.js, here is a quick primer on the elements you will be using.

#### The scene

The scene is a container object that encapsulates the other objects and elements that we wish to show.

#### Camera

Three.js has a few different camera classes, including a perspective camera, which we will use for 3D, and an orthographic camera, used for rendering 2D scenes or UI elements.

#### Renderer

The renderer handles the display of the 3D scene using WebGL. It targets an HTML <canvas> element to draw into. Typically you will call the renderer to render each frame.

#### Materials

Three.js comes with several materials, such as Normal, Basic, Lambert, Phong and Shader. Materials are used to texture the faces of an object's geometry. Attributes include things such as textures maps, colour and opacity.

#### Geometry

Geometry defines the vertices of an object to draw it. Faces created by these vertices are also defined, which can be filled by a material. It can be defined manually through code or as predefined primitives such as planes or spheres. It can also be loaded from external files exported from 3D modelling software.

#### Mesh

A mesh is the combination of a geometry and a material. This mesh object is what we would typically think of as a physical object because it now has enough information to be seen.

```
> // "strength": { value: 5.0 }

}
```

## UPDATE THE FRAGMENT SHADER UNIFORMS AND VARYINGS

To keep things clean, remove the code between the two square brackets of the fragment shader.

Then add the uniforms varyings and constant, so you can pass external values into your fragment shader. The constant for strength is also needed for the code that will follow. Add this new code, between those square brackets:

```
uniform sampler2D tDiffuse;
uniform vec2 resolution;
uniform float iTime;
varying highp vec2 vUv;
//uniform float strength;

const float strength = 3.0;
```

## ADD THE MAIN FUNCTION

Every fragment shader requires a main function to output a final fragColor value for each fragment it is processing. Add the following code to create the basic main function and declare a variable to hold our colour as we work on it for the current fragment.

```
void main(){
vec3 total = vec3(0.0); // holder for the colour values

gl_FragColor = vec4(avg, 1.0);

}
```

## ADD THE LOOP IN ORDER TO SAMPLE MULTIPLE PIXELS

Your blur shader will use a type of blurring called a box blur. The concept behind this effect is to sample nearby pixels from the original image and average them together. When applied over the image this will decrease crispness by blending nearby pixels together. The strength of the blur is defined by the size of the box we use to sample – in other words, how many nearby pixels we average together. Add the following code to do this:

```
for (float i=-strength; i <= strength; ++i) {
    //if ( abs(i) <= strength ) {
        for (float j = -strength; j <= strength;
++j) {
            //if ( abs(j) <= strength ) {
                vec2 xy = vUv +
vec2(float(i)/resolution.x, float(j)/resolution.y);
```

```

vec4 col =
texture2D(tDiffuse, xy);
total += col.rgb;
}
}

float area = pow((2.0*(strength)+1.0),2.0); // area of box
vec3 avg = total.rgb/area;

```

There are a few commented out lines in the code. Leave those for now. You'll uncomment them shortly when we make the effect more dynamic.

As you can see in the code, we loop through both the x and y position, plus and minus the value defined by strength. This gives us a range, for example, of -3 to 3 in both the x and y directions. This makes a 49 pixel box of pixels that we sample (-3 through 0 to 3 = 7 squared). We add these to the total colour value as we loop. Then we divide that total by the area of the box, to get the average colour value of those pixels.

If you run your code now you should see a blur effect over your entire scene. Nicely done!

## MAKE THE BLUR ADJUSTABLE

In order to make the blur effect one that you can integrate into your work more easily, you need a way to adjust the strength of the blur externally. Start by uncommenting the strength uniform line in the uniform's object and the similar line in the fragment shader. Now we are able to pass in a value from our outside code.

Back in the main Three.js code, add the following before you add the blurPass to the composer.

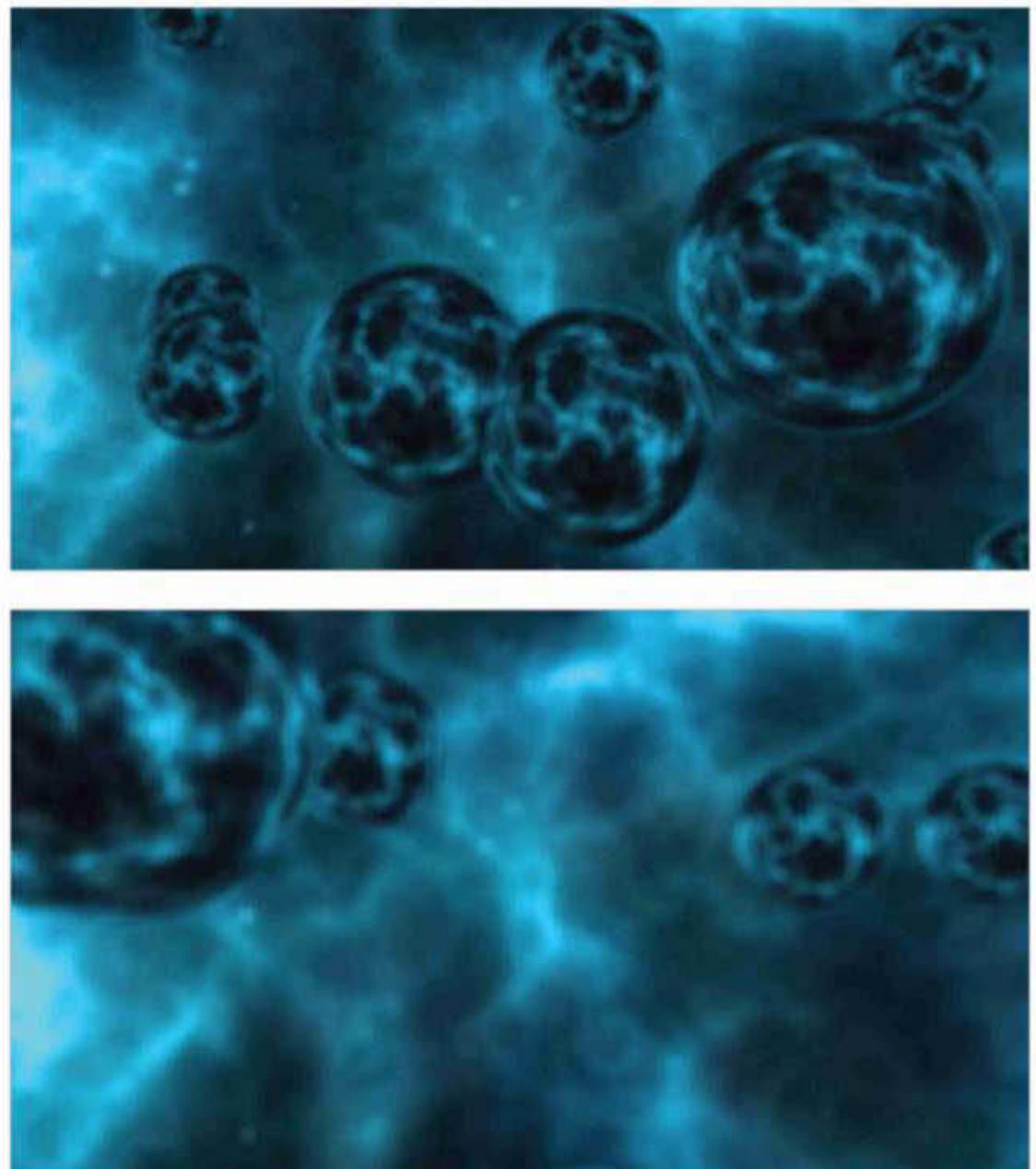
```
blurPass.uniforms.strength.value = 5.0;
```

## UPDATE THE FRAGMENT SHADER

There is a little trick you have to add to the blur shader next. In GLSL you can't define the number of iterations of a loop with a uniform value that can change. This is because shaders are 'unrolled' before executing, so the GPU knows exactly how many iterations of the loop are to be run. You must use constants to define loop lengths. So in order to make strength adjustable, we need to set up a new variable that will be our constant and use strength to abort the loop as we exceed its value.

Make sure to replace your const line for strength with this new one:

```
const float max_iterations = 10.0;
```



**Top** You now have a working blur effect shader. You can adjust this one manually in the shader code

**Above** The blur shader working with eternally adjustable 'strength'

Then, update your loop code in your fragment shader to look like this:

```

for (float i=-max_iterations; i <= max_iterations; ++i) {
    if ( abs(i) <= strength ) {
        for (float j = -max_iterations; j <=
max_iterations; ++j) {
            if ( abs(j) <= strength ) {
                vec2 xy = vUv +
vec2(float(i)/resolution.x, float(j)/resolution.y);
                vec4 col =
texture2D(tDiffuse, xy);
                total += col.rgb;
            }
        }
    }
}

```

Now when you run your code, you can see the blur applied and you can adjust the strength of the blur by setting the uniform externally! You could animate between strength values, turn blurring on and off on mouseover or remove it. You now have a useable blur effect you can apply to any 3D scene. ■


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**\* DRUPAL 8**

# INSTALL DRUPAL 8 ON UBUNTU 18.04

Open-source evangelist **Adam Innes** spreads the good word of Ubuntu as a perfect complement to Drupal

Many of us lean on Drupal for different projects because it provides us with the ability to tailor solutions for a wide variety of needs. Drupal gets us to a near-complete solution from commerce to brochureware – thanks to the community. And installing Drupal along with Ubuntu, a popular server operating system that dovetails nicely with the Drupal feature set and functionality, is possible in just a few simple steps.

The first thing Ubuntu 18.04 (or Bionic Beaver) needs is a LAMP server. Drupal will run on a variety of database programs but for the purposes of this tutorial we're going to install with MySQL/Maria.

## INSTALL APACHE

Apache is the server software of choice for many sites and is relatively easy to configure. First we update the package lists then install Apache.

```
$ sudo apt-get update  
$ sudo apt-get install -y apache2
```

Let's make sure that clean URLs are enabled, which are required by Drupal to make the website paths work properly.

```
$ sudo a2enmod rewrite
```

## INSTALL MYSQL AND ADD A USER

Once you've got the Apache server all set up, your next task is going to be installing the MySQL server. Drupal supports many database programs but, for the purposes of this tutorial, we're going to be sticking with MySQL.

```
$ sudo apt install mysql-server
```

Once you've installed the database server, you should lock down the MySQL installation by running the `mysql_secure_installation` script. This script sets up MySQL with some basic best-practice security settings. It will:

- Prompt you to set the root user account password.
- Prompt the removal of anonymous-user accounts.
- Prompt the removal of the test database.

```
$ mysql_secure_installation
```

Next, you'll need to create a database for Drupal to use. We'll call ours `drupal` but you can name this whatever you want.

```
$ mysql -u YourUsername -p  
$ create schema drupal;
```

## INSTALL PHP

PHP 7.2 is the most up-to-date version of PHP that is recommended to use with Drupal. It is strongly suggested for new builds to use PHP 7.2+.

```
$ sudo apt install php7.2-common php7.2-cli php7.2-fpm php7.2-mysql php7.2-json php7.2-opcache php7.2-mbstring php7.2-xml php7.2-gd php7.2-curl
```

## INSTALL COMPOSER

Composer is the PHP dependency manager. It's used to manage packages required by a project like Drupal. If you've done any significant development in PHP, you've probably worked with Composer or a project that works with it. Drupal should be installed with Composer to make maintenance easier and the repository lighter. By using Composer you can

commit only the composer.json file and rebuild your project from that instead of committing all the files in the project.

```
$ curl -sS https://getcomposer.org/installer | sudo php --install-dir=/usr/local/bin --filename=composer
```

## INSTALL DRUPAL WITH COMPOSER

In this step we're going to install Drupal into a folder at the path /var/www/html.

```
$ sudo composer create-project drupal-composer/drupal-project:8.x-dev /var/www/html --stability dev --no-interaction
```

If all goes well you should see the Drupal installation screen in your browser. Follow the simple directions to install. You'll need the database credentials you set up during the installation of MySQL.

## SET UP YOUR DEVELOPMENT INSTANCE WITH LANDO

Now that you have your server set up, you'll need a development instance, for which I highly recommend Lando. Lando is quickly becoming the development instance of choice for Drupal development, which is no surprise considering how amazingly simple and easy it is to use. Try it out by downloading it at [devwithlando.io](http://devwithlando.io) and spinning up an instance using these instructions.

Navigate to your copy of the code on your local and initialise the project by creating a lando.yml file in your project root with the following contents.

```
name: myproject
recipe: lamp
config:
  php: '7.2'
  webroot: www
  database: postgres:9.6
  config:
    php: config/php.ini
```

## NEXT STEPS

Now that you're up and running with a Drupal instance, take it to the next level and join the community. [Drupal.org](https://drupal.org) is where you are going to get access to the knowledge and support of the community. Drupal offers support through its website, IRC and Slack. Try joining its Slack channel to get questions answered faster. If you're a developer, join the cause by finding a module project and getting involved by contributing. Being a part of the community pays dividends in the knowledge and support you'll gain. [n](#)

### INSIGHT

## WHY DRUPAL?



Whether you're a developer or even an administrator who's familiar with using content management interfaces, you're no stranger to Drupal's continual evolution, particularly over the last few major versions. The current iteration, Drupal 8, is an incredibly versatile CMS that can bend to fit a wide range of solutions. The massive and enthusiastic Drupal community has contributed a broad range of modules to help turn a stock Drupal instance into a robust solution for virtually any need. If you haven't tried Drupal in a few versions, I recommend you take a fresh look. Drupal 8 has been rebuilt on top of the Symfony Framework, giving it a new level of power and flexibility.

Drupal's extensibility enables the development of any size project with relative ease. From blogs and brochureware sites to commerce applications, Drupal offers a robust fit, often with community-supported modules to suit your needs. Size matters when it comes to the community. Drupal boasts one of the largest and most active communities of contributors. You will not find another more welcoming or helpful community out there.

### INSIGHT

## WHY UBUNTU?



Linux is the go-to server operating system of choice for a majority of the market and Ubuntu is one of the most popular varieties. Ubuntu is free and secure and has a giant community working on the software and providing support. These facts make Ubuntu an excellent OS solution for your web-server needs.

Open-source software is cheaper and better. If you're spinning up an instance on Amazon Web Services, you will notice the significant differences in server prices. It's not the hardware that raises your costs; it's the licensing fees. Ubuntu is free of these excessive charges and will put money back in your budget.

Ubuntu benefits from the 'many eyes' approach to security that comes with open-source software. The code base is open and free for anyone to look at and, as a result, many more professionals are reviewing it for bugs and security holes. Ubuntu releases patches and updates on a rigorous schedule, making it very secure.

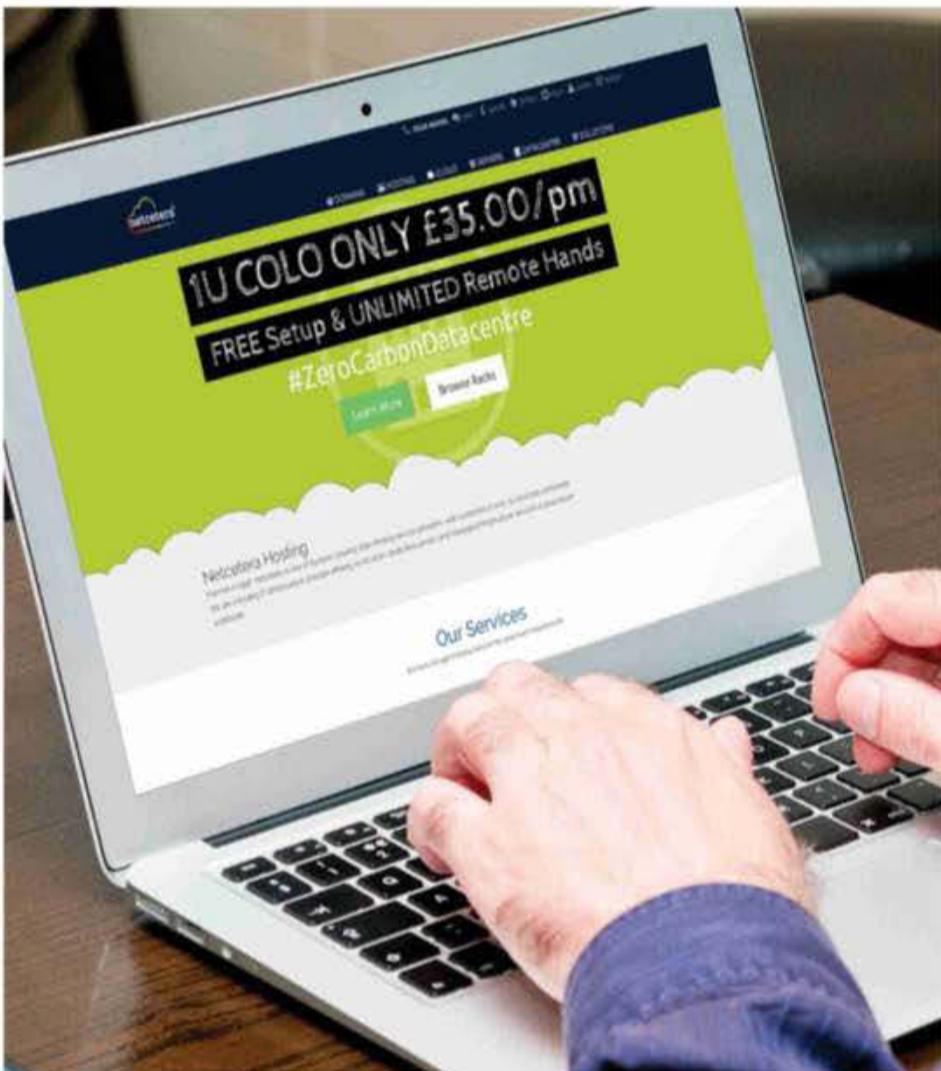
When you're scoping out a solution, the community is a vital indicator of how good the software is; the larger and more active, the better. Ubuntu has a global network of contributors that maintains the software and provides support to the community.

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Suzy Bean

\*EXPERT TIP

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