



CAREER GROWTH SECRETS

Why community is the key to Cassidy Williams' success

FLAWLESS VERSION CONTROL

Deliver remote projects without commit clashes

The voice of web design

net

Issue 311 : October 2018 : net.creativebloq.com

*BUILDING A BUSINESS

TAKE THE FAST TRACK TO CEO

Grow from self-employed to running an agency

FIND YOUR CAREER FOCUS

SHOULD YOU TACKLE THE FULL STACK OR SEEK OUT A CLEAR SPECIALISM?

GO SOLO IN ECOMMERCE

SUSS OUT SERVICE WORKERS

APPLY SHADERS TO 3D SHAPES

WHY AI IS THE FUTURE OF DEV SKILLS

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*WELCOME

EDITOR'S NOTE

 Whether you're a fresh-faced freelancer cutting your teeth on your first commercial project or one of the industry's leading lights with decades of experience, it's important to be able to take a step back occasionally and plot out the path along which you'd like your career to progress.

In light of this, we've decided to focus this issue on growing your professional skills and standing. That's why Tom May has dug out his magnifying glass and is scrutinising the subject of specialising versus tackling the full stack, looking at whether it's better to narrow your focus or become a versatile jack of all trades.

And that's only the half of it: elsewhere, we take a look at how you can make your way as a solo developer in the competitive world of ecommerce. Alternatively, if you're looking to eventually sit at the helm of a bigger brand, Chris Murphy is taking a look at how you can grow your business, building your web design empire from a simple single-developer outfit to a multi-employee agency.

Finally, we also look at how you can ensure you're practising impeccable version control, even when managing remote teams a continent away.

So no matter what stage you're at in your career, this issue has something for you.

FEATURED AUTHORS

TOM MAY



May is a freelance writer and editor with more than 20 years' experience and is currently editor of Professional Photography. On page 60, he asks that perennial question: should you go full stack or specialise?

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CHRIS MURPHY



Murphy is a designer, writer and speaker who enables businesses to grow and thrive. Who better then to offer you advice on growing your budding web design business? Check it out on page 68.

t: @fehler

DANIEL CRISP



Crisp is a senior front-end contract and freelance developer who specialises in JS, HTML and CSS. On page 82, he covers how you can use service workers to slash your site's loading times.

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CHIMMY KALU



Kalu is a UX designer and a member of the accessible web guild at Condé Nast International. On page 87, she looks at how accessibility isn't just about giving yourself a warm fuzzy: it's also good business sense.

t: @geekaspora



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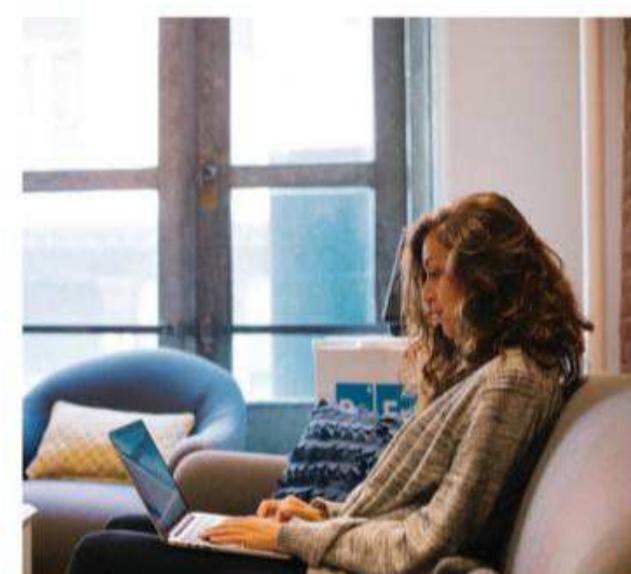
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THIS GIFT





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EXCHANGE

Send your questions to netmag@futurenet.com

Practical
advice from
industry experts

THIS MONTH FEATURING...

HEYDON PICKERING



Pickering is a freelance inclusive design consultant who has worked closely with The Paciello Group and Smashing Magazine. He's the author of the book Inclusive Design Patterns and his drawing of a 'crocoduck' is part of the W3C HTML specification.

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SARAH RICHARDS



Richards owns the Content Design Centre, which provides training and consulting in content design for organisations around the world. Previously head of content design for the UK Government Digital Service, she is the author of the book Content Design.

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t: @escmum

*QUESTION OF THE MONTH

Can UIs both respect user conventions and be visually enticing and original?

Dee Pattinson, Hertfordshire, UK

HP: There's no harm in breaking conventions so long as you're breaking the right ones. When you're flouting convention arbitrarily just to attract the attention of other designers, you're not doing right by your users. But some conventions are just conventional wisdom and ought to be challenged.

Do different if (and only if) it means doing better. But be aware that an objectively poor pattern that's well established will be easier to use than a better pattern that's unfamiliar, at least to begin with. So it's important to over-communicate new ideas and possibly provide alternatives and fallbacks (see the 'Offer choice' principle: inclusive-design-principles.org/#offer-choice).

In general, users are interested in innovative content, not innovative interfaces. Your job is to guide them into and through the content. So reinventing navigation conventions is best avoided.



- **Ergonomic features:** Providing synchronised closed captions makes your video accessible. But making them customisable, color coded, and repositionable provides a more comparable experience.



The principles of inclusive design are available at inclusive-design-principles.org or as a set of illustrated posters (2MB) by @BarclaysAccess (bit.ly/inclusive-posters)

Content design

WORDS AND PICTURES

How do you best combine effective writing with effective visual design?

Emily Jacobs, Cumbria, UK

SR: Have your designers and content people work together from day one.

It still amazes me when organisations create a design in one place and 'throw it over the wall' with a box people can

put words into. It's just not efficient.

How many times have you looked at a page and thought: 'Not reading that, it's all over the place'? Often, it's just because the type of information was never going to fit that particular design.

If the designer and content person worked together, they'd both understand the intention of the page and work towards it.



As Sarah Richards explains in her book Content Design, respecting your audience, understanding they have limited time and making your microcopy relevant and to-the-point is the key to engaging with them

At the Content Design Centre, we work to intention, not traffic or likes. We work to: 'Has the page fulfilled the user need?' That's the only real metric that counts. And that only really works when the content is properly designed.

Inclusive design **IT'S CLEAR TO SEE**

Can you give some examples of best and worst practices when it comes to legibility?

Dan Harris, Florida, US

HP: There are many aspects to text legibility. Conventions from print, such as a reasonable measure (line length) and leading (line height) are just as relevant on the web. The difference is in how these things are set, with regard to user settings, dynamic text wrapping and responsiveness. Although many users increase their font size by activating full-page zoom (CMD and +), some – about the same number as there are MS Edge users – still adjust their font size in browser and operating system settings. So it's important not to set 'font-size' in pixels, as it will not be affected.

Accordingly, a 'line-height' set in pixels will not grow proportionate to the 'font-size'. Instead, you should use a unitless 'multiplier' value – 1.5 is typical. Measures set in pixels can have the opposite effect to that intended, since a smaller 'font-size' will result in a longer measure. Since measure is a question of characters-per-line,

it should be set using the 'ch' unit. Of course, this should be set via 'max-width' rather than 'width' or the text won't wrap!

Content design **DEVICE INDEPENDENCE**

How do you plan onboarding text (part of microcopy) for a device-independent UX, fully expecting that users may be using either their desktop or phone?

Vinish Garg, Chandigarh, India

SR: We humans think we are so special but we fall into patterns pretty quickly. We take those patterns and create content, refine and move on. So many designers take note of device as they go through but never actually design for it.

At the Content Design Centre, we always plan content based on user journeys and micro-messaging at each point. We take the whole journey, online and offline, from the point someone first thinks about the task until completion. We map to the channels people are on, decide what vocabulary to use (vocabulary can change per channel) and write user or job stories for each point. We map what messages should be at what point of the journey. When we do this, we usually have five or six trigger points – instances where people start this journey.

Our audiences' time is valuable. If you respect that, you'll know what time you have on each part of the journey and work to that, regardless of device.

3 SIMPLE STEPS

There are many accessibility testing tools but is there an equivalent for inclusive design?

Pat Johnson, Sydney, Australia



Broad strokes

HP: Many things regarding inclusive design are too difficult to qualify in that way. For example, the 'Add value' inclusive design principle (inclusive-design-principles.org/#add-value) is too broad and abstract to determine a simple pass/fail grade.

DNT protocol

+ However, there are some things that can be 'detected'. When working with the Bulb energy company recently, we committed to supporting the Do Not Track (DNT) protocol. Locating 'navigator.doNotTrack' in the code would indicate that DNT is supported in Chrome.



Measuring performance

+ Performance is an inclusive design concern too. Using the Lighthouse extension in Chrome, you can run both performance and accessibility audits.

COOL STUFF WE LEARNED THIS MONTH

PINTEREST'S PROGRESSIVE WEB APP

 Last year Pinterest set out to build one of the world's largest PWA and the numbers are seriously impressive: after just six months it already has 800,000 people every week using it from their home screen like a native app and all the key metrics have increased massively.

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

WHY BLUE LIGHT IS SO BAD

 Amber Case looks at the physics of the blue light emitted by our devices and explains why it's so bad for our health. Technology manufacturers are only now beginning to reduce the amount of harmful blue light; this article explains how to lessen your exposure in the meantime.

<https://medium.com/@caseorganic/why-blue-light-is-so-bad-the-science-and-some-solutions-d992a352464b>

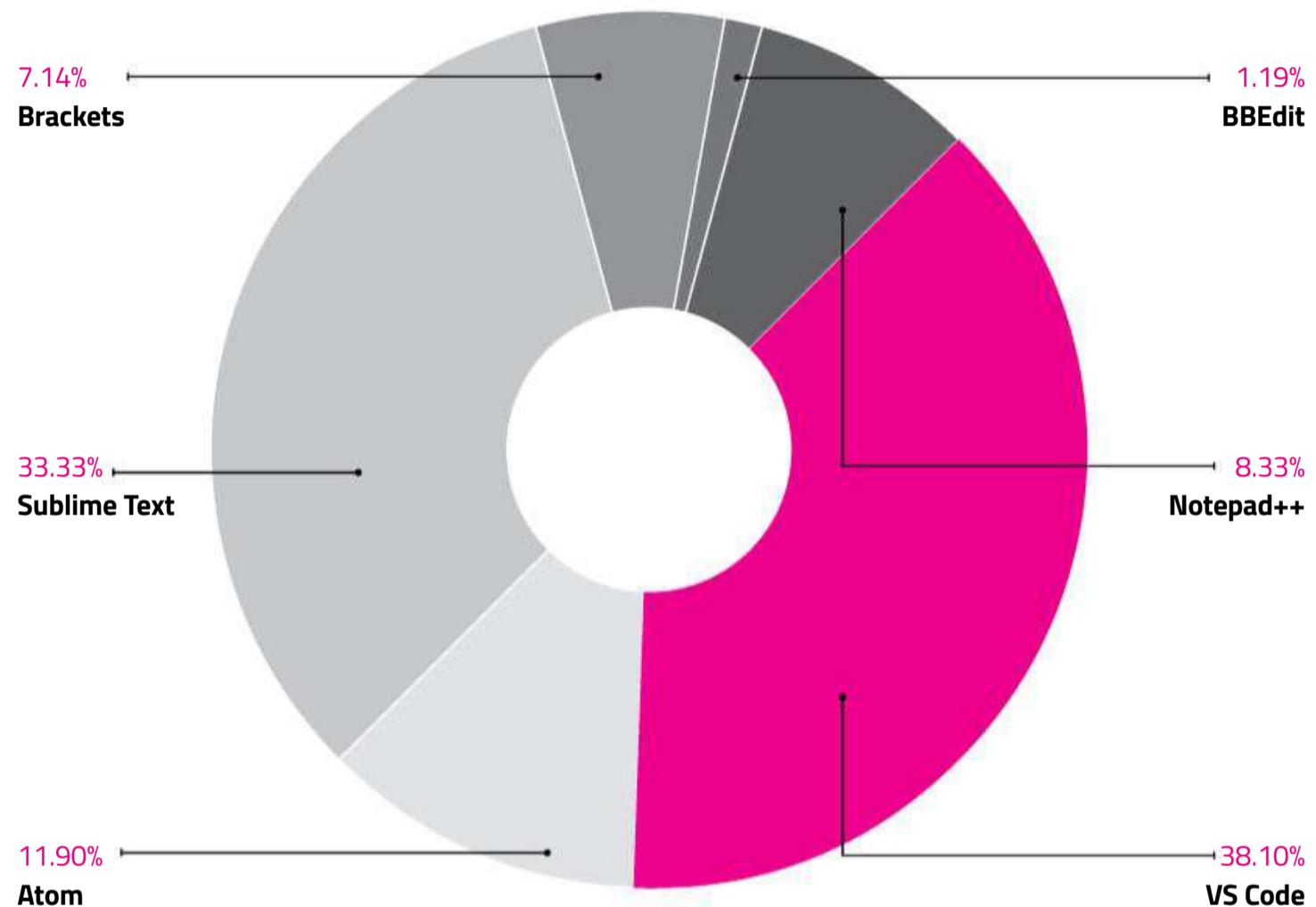
LOGICAL STYLING WITH CSS

 The third part of a series by Una Kravets highlighting powerful things you can do with CSS, this explains logical styling based on the number of given elements, with absolutely no JavaScript required.

<https://css-tricks.com/solved-with-css-logical-styling-based-on-the-number-of-given-elements/#more-274090>

*THE POLL

WHICH CODE EDITOR DO YOU USE?



From our timeline

What's the most annoying web design trend?



Aggressive pop-ups / interstitials that ask you to subscribe to a newsletter or similar. Also: too many different fonts on one page, dodgy transitions, intrusive chat facilities.

@Designer_Webs



Pretending Brutalism is a legitimate digital design movement.

@jordanmoore



Cookies pop up followed by newsletter pop up, followed by 'follow us'

pop up, followed by 'please disable ad blocker' pop up, followed by a captcha that takes 20 ticks.

@robbydesigns

Too much JavaScript, too [much] code causing poor performance and complexity in maintenance.

@mnemonicCloud

Asking for permission to use notifications and location as soon as I land on the page, whole page adblock disable requests and pop

ups when my mouse leaves the page... to name a few

@jacknevdev



Grey font colour on a grey background.

@RafAndersson



Parallax scrolling, but don't see much of it these days. Thankfully.

@Dotnetster



Infinite (theoretically) vertical scrolling.

@rajeevedmonds



Push notification requests [that appear] on the first page load.

@nic_o_martin

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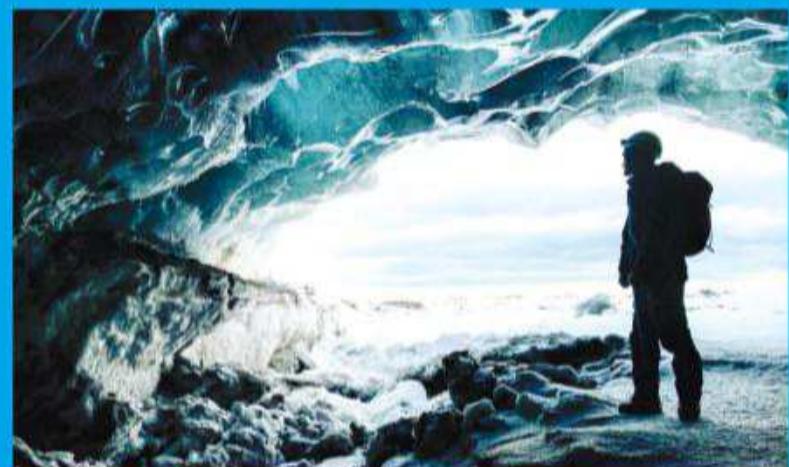
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People, projects
& paraphernalia

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This month a web developer is told by their client that their design needs a little more cowbell



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all categories Latest Top Categories

Topic	Category	Users
Should designers code?	UI Design	482
Photoshop vs. Sketch	UI Design	362
What are the best tools and practices to share research insights?	UX Research	109
Dealing with close minded developers	Career	220
What could be a good UX toolkit for your organisation?	UX Research	158
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Are service designers to replace BAs and Architects?	Service Design	147

UX OVERFLOW

Sergei Golubev gives us a peek at his platform that allows UX designers to share best practice

* SIDE PROJECT OF THE MONTH



SERGEI
GOLUBEV

job: Pixel-perfect UX and UI designer, entrepreneur and foodie. Founder of The School of UX and The UX Conference in London.

w: <http://aperfectpixel.co.uk>

t: @sgolubev

Tell us what UX Overflow does.

UX Overflow (<http://uxoverflow.com>) is a free public platform for designers to find answers: from sharing the best user experience research practices and prototyping tools to career advice and book recommendations. All designers are welcome, from those who are just starting out to seasoned unicorns.

Why did you create it?

Compared to software developers who have StackOverflow as the go-to website for code-related answers, designers only seem to have private Slack groups, tons of comments in Medium articles and somewhat difficult to follow Twitter threads – knowledge is spread all over the place so we have to repeat ourselves over and over again.

The idea came to my mind during my interview for BlocThinking podcast run by brilliant chaps Jonathan Gall and Werner Puchert (<http://bit.ly/2JZfn6K>). When discussing the challenges designers face every day, I thought out loud “I wish there was a platform where

all designers could help each other”. So, a few sleepless night later, there it was.

What were you hoping to achieve?

It's not just a collection of Q&As I'm aiming for. Once there's enough information the end goal is to have a summary of the most voted for answers in sort of a Wiki for every question. I've started with a few major categories like service design, accessibility, UX research, career and UI design – to make all the topics easily navigable, which often gets neglected on forums. I'm very keen to keep UX Overflow tidy and well-moderated.

What technologies were used in building it?

I've used a brilliant open-source community platform called Discourse. I've set it up on Docker cloud-hosting platform DigitalOcean, customised it myself using HTML and CSS, as well as configured Facebook and Twitter login for the simplicity of members registration. I can't say it was "Simples!" but these were a really interesting couple of days.

How has it been received?

So far I've had positive feedback from my designer colleagues on LinkedIn, which I'm really thankful for. Although it's early days, the site had a few hundred signups and numerous interesting discussions, with “Should Designers Code?” being the most popular.



* HOW TO

AVOID PITFALLS ON BIG PROJECTS

Working on big projects with large or multiple teams brings a particular set of challenges to overcome. We asked the @netmag followers what troubles they've encountered and how you can avoid them.

COMMUNICATION

Underestimating the necessity of effective communication and how much work that requires is a key pitfall – without it, teams work past each other and simply waste time. "The more people on the team, the more coordination needed – it eventually becomes a full time job for someone," says @_LeonBrown.

"Teams not working together, like APIs changing every week, needed APIs not getting done," is a common outcome of poor communication, according to @edwinmdev. "The solution is putting teams working on the same software next to each other, not in different buildings."

FOCUS ON THE CUSTOMER

@michaelgearon notes that a larger team means more opinions and many competing visions. His solution is to "focus on the customer and their needs; don't let the team's personal opinions drive the process."

DOCUMENT EVERYTHING

"Planning, discussion and documentation are key. There may be fresh eyes on the project in the future. They will need to understand the process and decisions made," says @fishnaldo.



MOAR DESIGN PLZ?

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

* CLIENTS FROM HELL

I'm an IT admin for a small company but I've got a pretty solid background in web design, so people ask me to do small jobs for them. One of our elderly staff members runs a company that provides first-aid training to young adults. She wanted to know if I'd redesign it for her.

I sent her 10 different example designs to choose from and she picked one she liked. She said that we'll catch up again once she returns from vacation to sort out payment and transfer of ownership. Two weeks pass and her vacation ends. Another week passes and she still hasn't spoken to me. And another. And another.

Eventually some six weeks later she catches me in the car park as I'm leaving for the day. Client: Hi! So what's happening with the website then? You haven't said anything or made any progress and it's been taking so long.

Me: What do you mean? I thought we were all finished?

Client: When are you going to do the design?

Me: The design?

Client: Yes you know – the DESIGN.

Me: I'm sorry but I don't know what you mean.
Client: It needs more design.

Me: What specifically do you want to change on the site? I'm open to any feedback and it shouldn't take too long.

Client: It needs more design around the edges.

Me: The edges? Can you give me some ideas as to what you'd like? More images? A border?

Client: Just more design.

Me: Okay I can change whatever you like but I need some point of reference, can you choose a site that you'd like to imitate or maybe print a page and sketch the changes you'd like.

Client: Oh no I'm not good at that but if you can just add some more design as soon as possible, this really has been going on for some time now.

Me: Okay I'll take a look and get back to you. This was three weeks ago. I've been avoiding her ever since.

CLIENTS FROM HELL
clientsfromhell.net

ADVENTURE BLOGGING

Nick Lewis explores how blogging about the great outdoors has helped improve his ability to deal with dev pressures

* BEYOND PIXELS

I've always loved the outdoors. Growing up in a small village in the West Country, it's no wonder why, as there is little else to do as a child than go out and explore.

I was never great in school but I've always been a keen learner. I kept myself busy in my younger years, mostly with sports and outdoor activities, including the Scouts, which played a large part in my appreciation for the outdoors.

Since getting into the digital sector after university, I've found an appreciation for creativity in the coded form. The ever-changing nature of technology means there's always something new to learn and ever-increasing challenges to face. However, like many in similar fields of work, I get bogged down in too many hours on screen.

After a spell of too many migraines and feeling like I needed to escape, my partner and I decided to do something to get ourselves outdoors more often. We decided to start a blog: Mountain and Co. Taking into account our shared enjoyment of outdoor spaces, this was another creative output for us both to enjoy – and a way of forcing us to escape the desk and head out on an adventure.

Having creative outputs that are separate to my day job has been a great way to help me organise my time, free my mind from bugs and

rejuvenate my senses for another week of chasing deadlines. It has helped me to solve those issues I often leave at my desk the day before. When you focus on something totally unrelated to your problem, it is amazing how your brain can come up with a solution.

Since starting the blog a couple of years ago, we've managed to grow a readership from all around the world, tally up nearly 10,000 Instagram followers and make many new friends in a different industry. We've also been able to go on a number of amazing adventures, such as canoeing Canada's Lake Louise, through-hiking in Sweden and a polar expedition on dog sleds.

It's incredible how good it feels to get outside and go on an adventure. Whether it's five minutes from your house or on the other side of the world. I find it not only beneficial for my physical health but for my mental health too. Freeing up the brain to think about other things – and hopefully help solve that bug I was facing. ■

PROFILE *



Nick is a creative technologist at Fiasco Design and a blogger
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STUFF I LIKE



DAN WISEMAN

Founder

webwisemedia.co.uk

GRAVITY PERKS

Out-of-the-box Gravity Forms is one of my most essential premium WordPress plugins – but with the Gravity Perks add-on it becomes crazily powerful. This bundle of extras adds functionality to your web forms such as advanced conditional logic.

<https://gravitywiz.com/>

AND.CO

I recently switched from a popular accounting tool to this app. Why? Because it's simple and entirely free! It's owned by the company behind Fiverr.com and pitched as a free tool for freelancers.

Great if you don't need all the bells and whistles.

<https://www.and.co/>

BUX

I'm always looking for places to invest, sometimes even outside the world of website design and marketing. With the BUX app, it makes trading stocks fun and accessible. It has super low fees and you can even "battle" your friends! (You can trade with fake play-money too!)

<https://getbux.com/>



CLEARLEFT

Andy Budd guides us round Clearleft's converted offices, replete with graffitied suntraps and adaptable event spaces

* WORKSPACE

After eight years of renting studios in shared offices, in summer 2012 we bit the bullet and bought our own place on Middle Street in Brighton. The building already had a long heritage serving the local digital community in its former guise as the pioneering Brighton Media Centre. But the place had fallen into disrepair, providing us with the perfect blank canvas to create our dream office.

The first thing we did was knock out a huge hole between the first and second floors in order to create an atrium. (1) As well as letting the light flood in, we wanted to connect the two spaces and avoid the challenges of splitting the team between multiple floors.

Next, we knocked out the back wall and installed large patio

doors. This gave us access to the back roof, which we fitted with decking to create a new space. (2) The back deck acts as a suntrap all year round and is the perfect space for a morning stand-up, social lunch or end-of-work BBQ. To make the space feel more personal, we recently commissioned internationally renowned graffiti artists, Gary X Pref, to brighten up the walls with some typographically inspired work.

On the ground floor, we ripped out the dark offices at the back of the building and opened them up into a bar and event space. (3) During the day we use the auditorium for client workshops or rent it out to local businesses or folks from London looking for an inspiring location for their

company off-site. In the evenings, when we're not using it to watch movies or sporting events, we provide the space to the local community for meet-ups and other events.

One of my favourite rooms is the smaller meeting room on the ground floor (4), which we've kitted out to be a cosy yet creative environment. But when we need to, we can open the electric garage door that acts as a divider to form a single connected space. This illustrates the main ethos that drove the design of the building: we wanted to create an environment that could quickly react to the needs of the inhabitants.

Meeting space is always at a premium, so we've packed the space with lots of cubby holes. My favourite spot is the coffee pod, (5) which is perfect for a private phone call, one-on-one or as a quiet spot to get a bit of work done. ■

* PROFILE

Budd is the co-founder of digital consultancy, Clearleft. A regular speaker, Budd also curates the UX London and Leading Design conferences.



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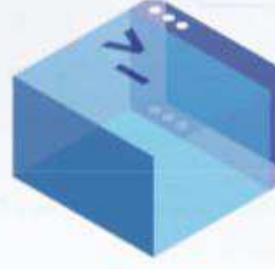
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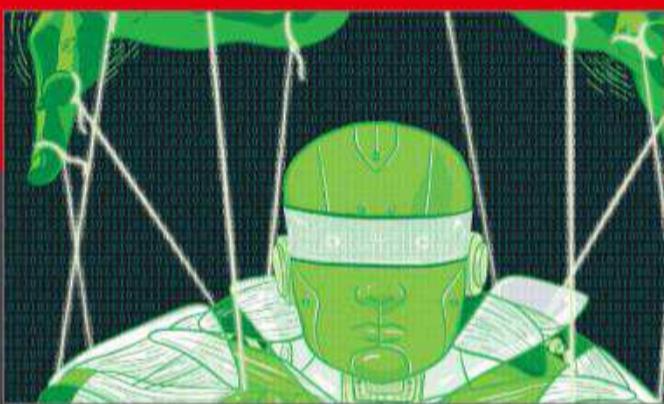
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* FREELANCE DEVELOPMENT

GOING SOLO AS A DEVELOPER

Robert Kent shares his advice for succeeding as an independent ecommerce developer



Running a single-person web-development agency is hard, especially in the world of ecommerce. As a lot of agencies know, there are projects that turn a decent profit and others that seem to drag on into eternity. As a one-man company it's even more important to make this process as smooth as possible – both for yourself and your client. It's vital to keep your eye on profitability when developing ecommerce websites. As the solo developer, it's all too easy to get sucked into a problem and end up losing out financially.

During my career as a senior web developer I've seen the best and worst of what our industry has to offer. After parting ways and travelling the world for a year, I decided to go it alone upon my return. Here I set out some of the best advice I've gleaned from my experiences, my contacts in the industry and people who inspired me to take the plunge.



PRICE ACCORDINGLY

Can a one-man band charge the same as a large agency? Yes and no.

Obviously your own overheads should be nowhere near that of an agency and the client will know this. What you want to do is price your projects solely on the quality of your work. If you're a top-class developer, you might even charge a premium for your services! In many cases, undercutting the market rate by a small margin and delivering high-quality projects will lead to more business for you in the long run.

PREPARATION IS KEY

Ecommerce requires multiple elements working together and information gathering at the start will lead to a smoother and faster process. The last thing you want is a website being held up because the client didn't know they had to sign up for a payment gateway, write a privacy policy and input their product information. A delayed website means a delayed payment and an urgent reshifting of projects to hit your own monthly targets.

HONEST LEAD TIMES

You want to build a pipeline with honest estimates for starting and completing the project. If you fail because you double-booked yourself, you may just lose out on an entire project, which can be very costly. Always plan two to three months in advance; in my experience a typical WooCommerce or Magento website should take between four and eight weeks to complete. Have the next project lined up and ready to go or supplement your lack of large projects with smaller items from within your network of contacts.

OUTSOURCE YOUR HOSTING

Hosting can be profitable but also time-consuming. If you're a wizard with servers and don't mind taking the blame when things go wrong, then you can definitely make money here. However, there are partnerships to be struck in the UK where servers are bought and paid for by your clients and a generous monthly referral fee is given back to you from the hosting

company. This is a stress-free, worry-free income stream that can build up to big numbers over time.

OUTSOURCE YOUR WEAKNESSES

Nobody is a master of everything! If, like me, you struggle with conceptualising a design, then outsource it. Pay the cost but make sure that it's separated on the invoice from the other work that you have tasked yourself to do. Only outsource to trusted partners however, as their quality is a reflection on your own business.

STRIKE UP PARTNERSHIPS

I work with over six separate agencies on all manner of projects. Not only does this improve my skill set but it also opens doors. A successful partnership is never a one-way street: although it may start out as a helping hand hiding behind the curtain of another agency, eventually it will lead to bigger and better things. I've picked up maintenance contracts, small one-off projects and even full website builds through these channels.

*
PROFILE

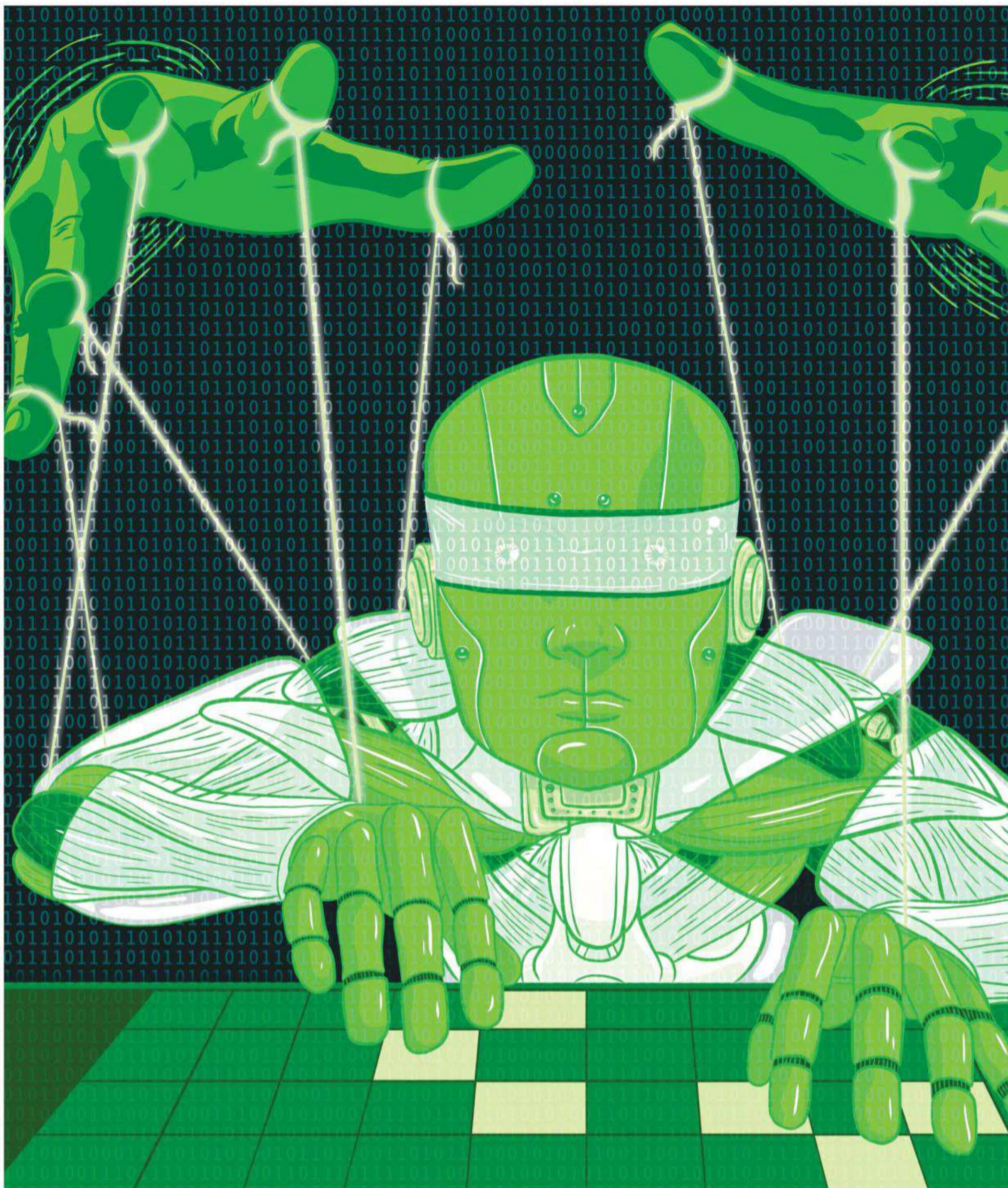
Robert Kent is the director of RKD. He has been in the web development industry for over nine years.

CHARGE FOR MAINTENANCE

Ecommerce is a different challenge compared to your run-of-the-mill 'brochure' websites; it's not often a client will take their finished online store and disappear without a backward glance. Clients who sell online are always seeking an edge over the competition, which invariably leads to website maintenance, updates and improvements. Build this in at the start of the process and it will lead to an ongoing and mutually beneficial relationship.

CHARGE FOR TRAINING

It is incredible how often this is overlooked. Build in the charge for training because I guarantee you that if the client is untrained on the system, you will spend many unpaid hours teaching them when you could be doing what you do best – developing websites! ■



★ WEB PREDICTIONS

FORESEEING THE FUTURE OF WEB DESIGN

Illustration by Kym Winters

Whether it's AI increasingly being trusted to recode sites to better suit users or AR being embedded in web apps, **Carl Bergenhem** makes some predictions about what's up ahead for web design

> Predicting what will happen in the future of development is always tricky. Get it right and you are praised for being ahead of the curve. Get it wrong and you are met with a flood of "I told you so's". That being said, I'm going to push my luck to see if I can provide some insight into the future of web design.

We have seen some vast changes in the past decade: the HTML5 revolution, mobile-first app development and now native features in web apps. With the increasing use of machine learning, cross-platform frameworks and a more diverse developer base building everything, there's going to be some exciting changes in our industry.

DEVELOPERS FLOCK TO THE WEB

In the past, everyone stuck to their favoured programming language. Then along came HTML5 and JavaScript went from being the language only for web to almost a universal programming language. Of course, JavaScript has its own set of choices. While I cannot predict the rise and fall of JS frameworks, I believe that once the dust settles developers will realise that the basic concepts of these frameworks are completely transferable. This shifts the focus to better programming habits and architecture of web applications rather than picking your favourite flavour of ice cream.

Frameworks such as NativeScript and React Native will also play a big part in bringing more developers to web

technologies, since they provide a single code base for web and native mobile applications. Additionally, concepts like progressive web applications (PWAs) will continue to blur the line between native mobile apps and web. Developers will then be able to purely focus on the user experience without worrying about specific platform choices.

Web Assembly is another technology that brings more developers to the web. Thanks to Web Assembly, C++, C#, Rust and other programming languages can now target the web. Projects like Blazor, which leverages .NET in the web, take advantage of the promise of Web Assembly and will help open the web to even more languages. This means that in the future, all developers can be web developers, regardless of programming language.

LENDING A DIGITAL THIRD HAND

Artificial intelligence is too hot to not bring up. While it might not be as flashy as a self-driving car, the web can certainly connect to AI. Machine learning is going to take analytics to the next level. In the past, analytics was more of a reactive approach: log the data and then use it for your next release. The future is going to be about capturing data of how your app is used and improving the user experience by driving the website to change and adapt to this by itself. This means that, depending on ►

- ▶ the data available on a user, the application can act like a chameleon and change itself to provide the ideal UX for them. This will create truly personalised sites that act different and show different features depending on the individual using it.

ALEXA, SHOW MY INSTAGRAM FEED

With the explosion of voice assistants such as Alexa and Siri, conversational interfaces are bound to become a natural part of an application's fabric. As more users become accustomed to interacting with the world using their voice, developers will need to ensure that this is a seamless experience even in web applications. Imagine having users sit on their couch and view their social media feed or tell their favourite voice assistant to pull up and read a news article for them – all without traditional inputs.

AUGMENTED REALITY IN THE WEB

Augmented reality will take the web by storm. AR has a larger daily impact than VR since it does exactly as the name implies: augments reality. We can see this already

and WAI-ARIA to ensure that our web components follow accessibility requirements out of the box. This positive trend in accessibility focus will continue in the web. Whether this comes from development practices naturally emphasising accessibility or if governments and legislature step in to enforce adherence, we will have more accessible applications.

I also think we will see a resurgence in attempting to make applications as small as possible. Previously the size of an application would be the biggest focus for web developers. However, recently this has taken a back seat as developers increasingly focus on their new favourite framework. The average application has grown significantly in size and although bandwidth has increased tremendously this is only for a small group of people. The size of our applications will hit a tipping point and we will see the trend go the other way where developers take pride in how small their applications are. This will not only serve to provide a seemingly quicker application; it will also help with delivering the application to markets with slow and expensive internet connections where every byte is precious.

“Depending on the data around a user, the application can act like a chameleon and change itself to provide the ideal UX for them. This will create truly personalised sites”

today in seemingly trivial scenarios like the filters on Snapchat or monsters in Pokémon Go. This will only expand and continue to be used in not just social media and video games but also in everyday applications that we use today. The beauty of AR is that it does not require full immersion via a clunky headset but instead can be used with the phones that we walk around with in our pockets today. Why should this be limited to just the native mobile applications on a device? Why not use it on the web? Offering AR services through your web application without needing it to be installed as a native app can have huge benefits from a user experience perspective. Imagine being in a grocery store and doing a quick web search for a recipe. AR integration could provide users with turn-by-turn navigation through their mobile device to find all the ingredients within that store – all within your web app.

A WEB FOR EVERYONE

Accessibility is no longer a luxury; it should be an absolute requirement. We're seeing this pop up more and more and this trend will just continue. Something that we have pushed hard with Progress Kendo UI is to ensure that we follow common accessibility guidelines like WCAG 2.1

WHAT DOES A DEVELOPER LOOK LIKE?

Beyond the technology, I believe what we see as the average developer and their background will also change. We already see this happening today but code camps will continue to provide us with more diversity in the developer workforce. Although not all coding camps are created equal, the overall concept is a great way of providing programming skills to an audience that would not normally have a chance to learn about development. The emphasis on learning the basic tools and concepts of development and then continuing this education on the job is already proving to be a very good way of creating great developers. This trend will most likely continue and is a big step on the way to create a richer and more diverse community of developers, which is ultimately better for everyone. ■



Carl Bergenhem is the product manager, developer tooling at Progress, the global tech company providing enterprise integration, data interoperability and application development.

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Cassidy Williams

Words by Oliver Lindberg

A senior software engineer at CodePen, Cassidy Williams discusses the art of designing for voice, the value of side projects, why she lives by the motto 'lift as you climb' and how playing an active part in the developer community can open doors



INFO

job: Software engineer

w: cassidoo.co

t: @cassidoo



> Cassidy Williams' career path is a great example of the importance of networking and the opportunities that can come your way if you put yourself out there and create a personal brand. It's an especially inspiring story for young women wanting to get into the tech world, women who Williams is very active in supporting.

Straight after graduating from Iowa State University, Williams joined a New York startup as a software engineer and developer evangelist and was featured as one of '35 Women Under 35 Who Are Changing the Tech Industry' in *Glamour* magazine. Two years later, she moved to the West Coast and, this February, Amazon approached her to head up its developer voice programs.

"I'm basically the person between the third-party developers and the Amazon product teams," she explains. "For example, I request feedback from the developers, give them surveys, show them demos, pass on

their comments and suggest how the product teams should alter their roadmap."

Williams is also one of the first people to try new features as they're being built at Amazon. She creates an application or Alexa skill with them and feeds back on her experience. "They refer to me as 'developer zero,'" she laughs. "Once I've worked on those projects, I give them back to the product teams, they refine them and then we pass them to the developers."

Amazon's user experience team establishes best practices for voice design and defines the rules for voice-first applications. Every Alexa skill, for example, should pass the one-breath test. If you can say the response out loud without taking a breath, the response is probably the right length. If you need to take a breath, the user might get overwhelmed, so think about how you could shorten your response or break it into chunks as the user progresses through

the flow of your skill. "Designing and defining a conversation is very unique," Williams admits. "Whenever I build a skill, I write out a script of how I expect it to go. So the user and Alexa are talking back and forth and it all makes sense when I type it, but when I actually build the skill, all of a sudden it'll come off completely differently. I'll have to rework it to sound more natural."

Williams co-hosted a video show, *C+C Hacking Factory*, with her sister Cami on Twitch and – over the course of eight episodes – they built an Alexa skill from the ground up. Although they loved doing the show, a second season is currently up in the air because, when we catch up with her, Williams has actually just decided to leave Amazon and move to front-end developer playground CodePen.

"One of the reasons I'm leaving is because I've really learned I like small companies," she reveals. "I'm joining CodePen as a senior software engineer and will be their eighth employee. I'm really excited about going back to my web roots, building a lot of cool tools for developers and being able to work on some fun side projects on the site."

It also ties in with Williams' upcoming Generate London talk on creating art with CSS. "A few years ago I decided I was going to practise my web skills by making cool things with HTML and CSS. I made as much as I could on CodePen and dabbled with new CSS features like Flexbox and Grid that stretch the imagination of what people realise you can do with these tools. Honestly, a lot of people just think that they're easy and not real programming languages, but when you make very cool stuff with them, it blows their mind."

Williams has so many side projects on the go that it's difficult to keep up. Apart from creating CSS art, she is in a couple of bands in Seattle, has put together a Udemy course on JavaScript and React for developers (www.udemy.com/js-and-react-for-devs/) and designed, licensed and launched the official Scrabble mechanical keyboard (www.producthunt.com/posts/massdrop-x-hasbro-scrabble-keyboard). Another side project is a to-do list with a progress bar called todometer (cassidoo.github.io/todometer/). "I built that application purely because I needed more than just a calendar to make sure I get everything done and





maintain my schedule,” she explains. “These projects are very time-consuming and can be exhausting at times but they keep me learning and excited about everything that I’m doing. All the projects flex different muscles in my brain that I wouldn’t usually get to play with. It expands my knowledge in different areas and helps me focus at work because I’m able to apply things that I’ve learned outside of work and bring them to the office.”

Williams first got into tech in middle school. She was in the eighth grade and walking home when she heard someone referring to their website. It piqued her interest and she started teaching herself how to make, customise and market a website. She built little sites for her biology class and forums for her friends before Facebook got really big. She then majored in computer science and interned at Microsoft and Intuit. In her junior year, she took part in a hackathon on a plane from San Francisco to London. “We had to create an application but didn’t have Wi-Fi, and it was all very hectic,” she remembers. “There were a lot of really neat people on the plane, like Craig Newmark, who invented Craigslist, Megan Smith, the CTO of the United States at the time, and

Kelly Hoey [author of *Build Your Dream Network*], who is still my mentor today.”

Williams’ team ended up winning the hackathon and was invited to speak at the United Nations in New York during her senior year, which sealed the deal for her. It also made her realise that she can do more than just code and she started looking for jobs that would also let her do public speaking, which led her to development evangelism.

“All these projects flex different muscles in my brain I wouldn’t usually get to play with. It expands my knowledge in different areas”

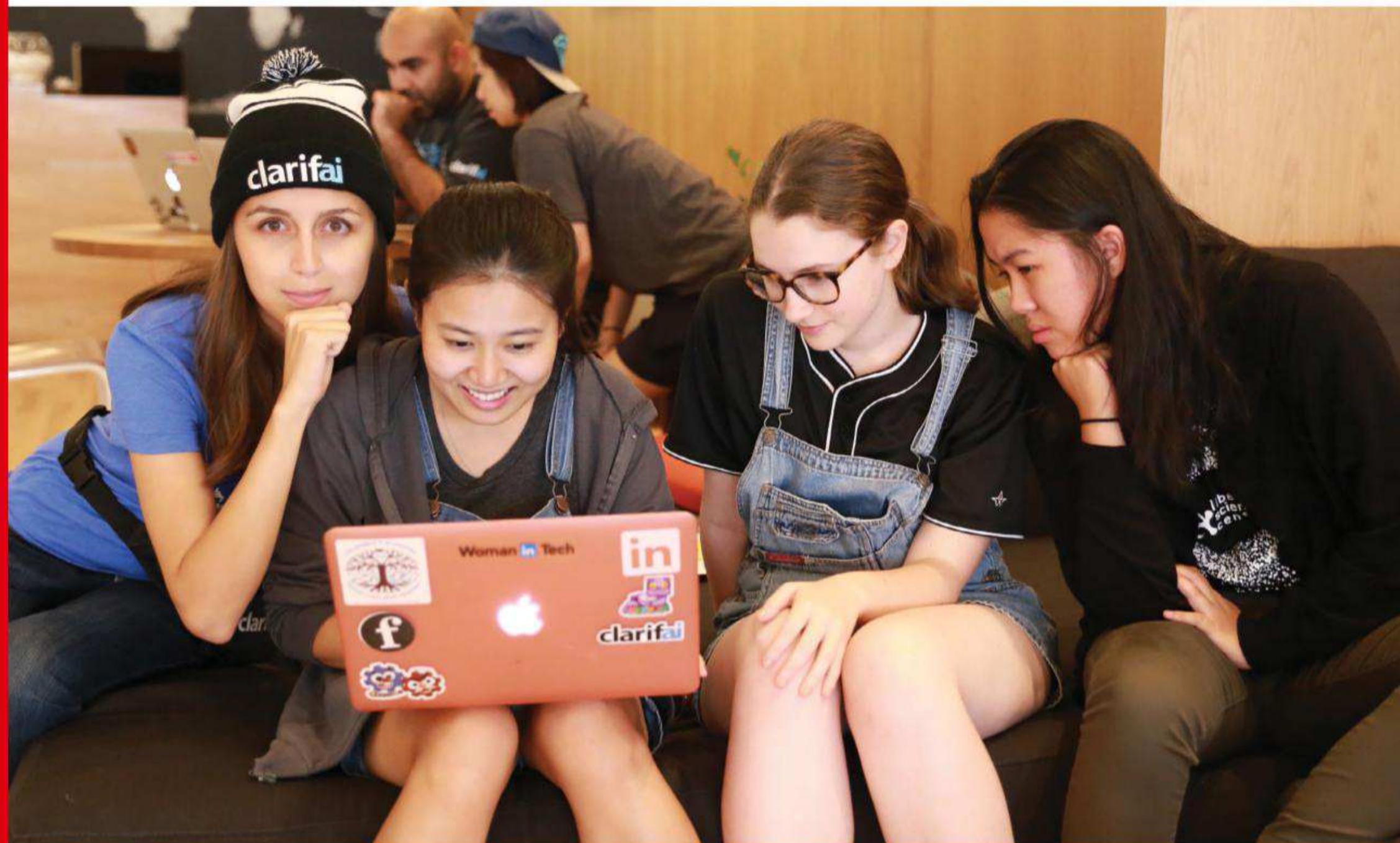
When she graduated, Williams got job offers from Google, Apple, LinkedIn and Intel – but she instead chose mobile payment startup Venmo. “It was a tough decision but a few evangelists I talked to pointed out that an evangelist at a small company is on a mission to make it known, while an evangelist at a big company is just making

the machine a little bigger. So I figured I could make a bigger impact at Venmo as their first developer evangelist.”

As Venmo had been acquired by Braintree, which in turn had been bought by PayPal, Williams was able to make the most of the resources of a large company, while still pushing up and promoting the smaller company. She loved the experience, but started to realise just how comfortable she was becoming and felt like her growth was starting to plateau a little. Her mentor, Kelly Hoey, referred her to the founder of AI startup Clarifai, who happened to be looking for developer evangelists. He kept emailing her and eventually convinced her to join as lead developer evangelist and first female engineer.

Building a community around herself, creating a personal brand and helping others has been crucial for Williams’ career progression. “I wouldn’t be where I am today if it wasn’t for the community around me,” Williams points out. “You can do pretty well on your own in tech but you can really succeed if you have a community that you help that then helps you in return.”

Williams met her mentors at events, typically hackathons and conferences. ►



► She would get their business card and then follow up and email them occasionally to ask questions, for example on how to get a pay rise in a certain situation or how to get promoted. It's a two-way relationship: Williams receives tips from her mentor Kelly Hoey but she also helps her, for instance with her website or by connecting her to someone. It's a process she calls 'lift as you climb', one of the best pieces of advice she's ever been given.

"Kelly said that once you start really establishing yourself, you have to help the next generation of people who come into this field because they need help and, whether they want to ask for it or not, providing resources for people to learn, getting their names out there and their foot in the door is key to making the tech industry better. It builds a network and community that is supportive and always growing. I'm trying to do that as much as I can every day."

Her efforts include making her talks and projects open source, referring young women to job opportunities, getting their mindset ready for the next job interview, and helping to run a group called Ladies Storm Hackathons. "A lot of people tend to say you're separating women more if you have women-only tech groups, but there isn't a community out there right away when you enter the tech fields. When I first walked into my computer science class, I was the only girl!"

Williams is very vocal about her support of young women in tech (*HuffPost* has just named her one of '5 Inspiring Young Women Who Are Leading The Way In STEM'), which has also been met with some hostility. Trolls have made fake Twitter, GitHub and dating profiles of her and sent her anonymous text messages demanding she deletes certain posts but she had her community to fall back on. "I've had some crappy experiences,"

she remembers. "But luckily I have my community to support me and put a stop to that kind of terrible behaviour by calling it out and showing that it's unacceptable. You need to do that as soon as you see it. I'm very fortunate to have those people around me."

In the end, the positive effects of her work far outweigh the negatives. Another way Williams gives back to the community is through her weekly newsletter (tinyletter.com/cassidoo), which features interesting links and resources as well as examples of job interview questions. "I've had multiple people email me back, saying they got a job because of the newsletter. That just completely makes my heart soar. It's why I do it: I love being able to help." ■

"A lot of people tend to say you're separating women more if you have women-only tech groups, but there isn't a community out there right away"



* THE DESIGN OF BUSINESS

BEACONS

Christopher Murphy explores how interviews, as a part of a content strategy, can extend your reach



job: Writer, designer and educator
w: tinybooks.org
t: @fehler

In an age of all-encompassing, world-dominating multinationals, business might appear to be a brutal, dog-eat-dog affair but there's no rule book that states that you can't adopt a different, less competitive approach.

Running a business doesn't have to be 'me, me, me' – focused solely on you and your product. In fact there's a great deal to be said about celebrating the work of others, even your competitors or those who work in adjacent industries.

In my article 'Share' (Issue #298) I explored content strategy and content marketing. As I noted: "your product is an extension of you and your values. By sharing content focused around your values and interests you can raise awareness of your brand and – as a welcome by-product – drive a few sales in the process."

There's no reason why your content marketing can't also be widened to include your competitors, through interviews or features celebrating what they offer, especially if it complements your offering. This approach – shining a positive light on competitors – might seem a little counterintuitive but I believe it works.

One of the things that binds our industry together is its sense of community. The ability to 'View

Source' allows us to see our competitors' and peers' trade secrets. Little, if anything, is hidden. Interviewing competitors can serve as an extension of that, helping to build the sense of a wider, shared purpose. They're a great way to learn; they offer different perspectives and they help you see the world through others' eyes. They also make compelling content for your audience.

A DOZEN QUESTIONS

Many moons ago, as one half of The Standardistas, an important part of my website (webstandardistas.com) was a periodical where my partner-in-crime, Nicklas Persson and I undertook a series of interviews with peers in the industry like Jessica Hische, Swiss Miss, Josh Brewer and others.

These individuals stood out. We considered them to be 'beacons' of our industry and we were interested to learn more about them. Of course, seen through one lens these were our competitors in the cut-and-thrust world of digital design but, no matter, we thought they were interesting.

They taught us – and our readers – lessons but they also helped bring others into our orbit. An interview with Swiss Miss, for example, attracted a considerable amount of her audience to our website. Not only were they able to enjoy our interview with her, but they could also discover our own particular thoughts on design, thus widening our reach.

This strategy requires hard work but it more than pays off. Firstly, make a list of interesting people from a range of different backgrounds. Secondly, put together some questions to ask them: who are they? What do they do? What lessons have they learned?

The beauty of this approach is that interviews can be efficient to create, with a core set of standardised questions, along with a set of bespoke questions for each individual. The result is content that's easy to create and interesting into the bargain.

Reputation isn't a zero sum game. Shining the spotlight on others' work is a nice touch and can help you into the bargain. Win, win. ■

The screenshot shows a dark-themed website for 'Web Standardistas'. At the top, there's a yellow star icon and the text 'Web Standardistas' followed by a URL. Below this is a section titled 'Periodical' with a sub-section 'A Dozen Questions for Ms Roth Eisenberg'. To the right, there's a sidebar with a bio for 'Tina Roth Eisenberg' and a logo for 'SWISS MISS'. The bottom of the page has social media links and a 'REVIEW ISSUE' button.

Interviews with others – even your competitors – not only teach you new lessons, they also help to widen your reach



* Q&A

ALEXANDRA ETIENNE

The Lightform evangelist explains why AR is poised for massive adoption around the world



Job: AR/VR evangelist and digital wild child, Lightform

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T: @AndraConnect

What first attracted you to working for an augmented reality company?

The effect that AR has on people. When you show AR to somebody for the first time, the effect is almost always of pure awe. I remember the first app I saw: an AR colouring book. It was one of the ones where you draw a dinosaur or a fairy with the colours you want and then, through an app on your phone, it comes alive in front of you with a cool animation and those same colours you chose. When I saw that, I wanted to be a child again, use AR to play and discover what else I could do with it. AR struck me as the kind of tech that could be both useful and fantastic and I knew I wanted to become an advocate for it.

What should designers and developers know about Lightform?

It is the world's first user-friendly design tool for projected augmented reality. It allows anyone with basic design skills to create immersive AR experiences. You can display amazing effects on

any surface, creating magical installations and epic visuals. It enables you to project digital effects onto the real world without an HMD device or your phone.

Lightform's end-to-end design system consists of two parts: the LF1 hardware – a tiny computer and scanning device – and the Lightform Creator design software for content creation. They work together to let you build real-life AR experiences.

For example, you can scan an existing mural or painting and create a projected wallpaper that comes to life, project funky effects onto retail products or restaurant menus, add remarkable effects to an advertisement campaign, surprise your wedding guests with an interactive cake or make your executive meeting less boring.

What do you say to people who think AR is a “gimmick” that won't be around for much longer?
I'd say look at the scope of application. Imagine how different education will be. AR is already being implemented at schools and it increases the level of attention and interest in students. Surgeons have been training with AR devices before tackling complicated operations. Industrial manufacturing conglomerates have been embracing AR to optimise their processes and minimise errors and costs.

Advertising firms are investing in AR not only as a trend but as a new way to enhance the customer experience. Mobile AR and smart glasses could approach 3.5 billion installed base and \$85bn to \$90bn revenue within five years. And applications will only get better with the boost of creative minds in our society. AR taps into our natural tendency to want to evolve even further. Plus, it has that cool factor that will help promote it for massive user adoption, until it is widespread around the globe.

What will your Generate London talk focus on and why shouldn't people miss it?

I will present the possibilities and reality of AR and projects that are enabling the consolidation of this technology in the world today. I will talk about web-based AR, how you can easily experience and create your own AR application, how the AR.js project has evolved, the influence of ARkit and ARcore and what's coming next. ■

Alexandra Etienne will be giving a talk at Generate London, 19–21 September 2018. For more info, visit www.generateconf.com.



★ RELAXATION TIPS

HOW DO YOU UNWIND AFTER A LONG CODING SESSION?

When you've spent several hours coding intensely, it can be tricky to sleep.
Seven web designers explain how they go about it



ROCHELLE DANCEL
Experience design strategist,
Randomly
www.eversorandomly.com

 One of the challenges I have is switching my brain off, either so I can relax or switch gears and work on something new. So it's always good to get the blood going again. I took up bouldering [a form of rock climbing] a couple of years ago; I love it because my brain and my muscles have to be in perfect harmony or I'll literally fall off the wall. I'm not very good at it but it's the perfect reset button for me. It's also a great way to spend time with your team that doesn't involve alcohol.



ANTHONY MIROBALLI
Front-end developer, *50000feet*
www.50000feet.com

 It's always difficult to unwind after a code sprint. I usually work on a creative project in a field outside of coding. For me, that's electronics, video editing or designing 3D models for printing. This helps my brain shake off the stress while leaving me with another thing to feel accomplished on. The secondary effect is to prevent stress build-up from getting behind on other projects. After this process, I will usually be ready for bed or a quick nap before starting the next sprint.



TIM WHITLOCK
Maker of
Loco
localise.biz

 It can take some hours to snap out of the concentration required for long coding sessions, particularly if you've had to leave a problem unsolved or a task unfinished. It's not uncommon for me to watch a two-hour film while still thinking about code the whole time. Because of this, I make sure I finish work at least three hours before sleeping but most importantly, I try to finish the day at a satisfactory point. The latter can sometimes be difficult to plan but I find that avoiding new tasks in the late afternoon can really help. If you need to start something big and it's past 3pm, simply save it for the next day and tackle something smaller or easier instead.

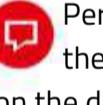
**LEONIE WINSON**

Freelance web developer, Line and Form
lineandform.co.uk

 When I became a freelance web developer, I promised myself I would keep sensible hours. If I am honest, I still keep longer hours than I should. This results in too many nights awake and thinking very loudly. To relax, I use a sleep sounds app. My favourite ones are river sounds. The knack is to find a sound you can concentrate on. It can't be too fast and you have to get the volume right. I set my timer for 40 minutes, concentrate on the sound and 95 per cent of the time I'm asleep before the sounds stop.

**NILESH
PRAJAPATI**

Digital designer
www.nileshprajapati.com

 Personally, I find doing something that's completely unrelated to my work is the best approach to unwinding after a long coding session. So depending on the day of the year, I'll take a long walk to a nearby park, for example. Or I'll find a comfortable spot in the garden with a nice chilled drink, while listening to an album of my favourite artist or a podcast episode on my headphones. I find this approach highly effective in taking my mind off that stressful deadline or difficult coding problem I've been trying to fix all day.

**DEMETRIOS KONTIZAS**

Director of web development technology, Mirum
www.mirumagency.com

 The evening after finishing a strenuous coding deliverable, your mind is still racing, thinking about code optimisation, best practices and design patterns. You lie awake in bed or toss and turn, despite being mentally exhausted. Even if you are able to get some rest, often it's the case that you struggle to stay asleep. So my strategy is simply to write things down. I feel as though having a brain dump of the code utilised on the project – even if it's a high level sketch of the design pattern – helps to release the code from my conscious mind and therefore enables me to get a good night's rest.

**JAY
AINSWORTH**

Junior developer, FINE
www.wearefine.com

 It's hard for me to fall asleep after coding during the day. The catch, though, is my brain feels the most relaxed, creative and free during that 30 minutes or hour it takes me to fall asleep. In terms of mental stimulation and satisfaction, it's my favourite time because it feels like a rare opportunity to analyse the thoughts my brain subconsciously has throughout the day. The only downside is that I end up lying there trying to decide if any of the potential solutions to code challenges are worth getting out of bed for.

RESOURCES

TEN WAYS TO DEFEAT BRAIN DRAIN

<https://netm.ag/2LVDoR2>

 Using your brain too much can lead to mental exhaustion and longer, less productive hours at your computer. In this post for Lifehacker, Gina Trapani lists common signs that your productivity is suffering from 'brain drain' and offers 10 practical solutions.

RETHINK YOUR AFTER-WORK ROUTINE

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

 The best way to avoid getting into a bad mood after work, writes Sue Shellenbarger, is to devise routines and rituals that create mental space between the day's frustrations and the evening's rewards.

8 BEST PODCASTS TO DE-STRESS

<https://netm.ag/2NU2EVt>

 From mindfulness to interesting TED talks, there's a wealth of podcasts to help you unwind at the end of a hard day's work. This article for the Evening Standard by Amelia Heathman lists eight of the best and explains why you should add them to your playlist.



*UX

HOW UX SHAPES SITES' SPEED

Aaron Dicks looks into site speed, its impact on user satisfaction and how you can get started

Agencies and website owners can be slow to adapt to changes in technology, often because the latest fad can fall out of favour as fast as it emerges. The newest software isn't always best. Instead, we have a tendency to rely on more tried and tested solutions, which aren't always the fastest and therefore don't always deliver the best user experience.

Even so, there are several ways any site could improve its speed and, therefore, UX. Here are some techniques you could try.

JAVASCRIPT FRAMEWORKS

Using a JavaScript framework is one way that web apps can be built for speed. The approach has risen in popularity over the last few years in particular and wider industry support exists for most packages. With this approach,

the site is typically built as a single-page application (SPA) that loads only the minimum content required to your browser. This approach is faster but more suited to web applications over websites, as sadly it isn't as SEO-friendly without a lot of customisation and server work.

PROGRESSIVE WEB APPS

Progressive web apps (PWAs) adapt websites or web apps to make them functional offline when added to mobile home screens. They typically use web browser features to store data offline – perfect for patchy internet connections. If you want users to return to your application often, consider a PWA. You can prompt mobile users to add these sites to their home screens for quick access and immediate loading.

AMP

A Google-led working group released AMP in February 2016 to load pages submitted in the correct format instantly from Google's global network. The technology, like Facebook's Instant Articles, requires businesses to maintain additional code bases and gives access to fewer design features but offers better search engine visibility and usability. It's great for media producers with topical content in particular.

CDNS

Content delivery networks (CDNs) aren't new but plenty of websites still don't use them. CDNs let you move the job of delivering a website and its assets from the server itself to a global distribution network, which is faster. CDNs enable sites to run much faster, as the user isn't waiting for the end server to do all of the work. They're especially helpful for sites built for design over functionality.

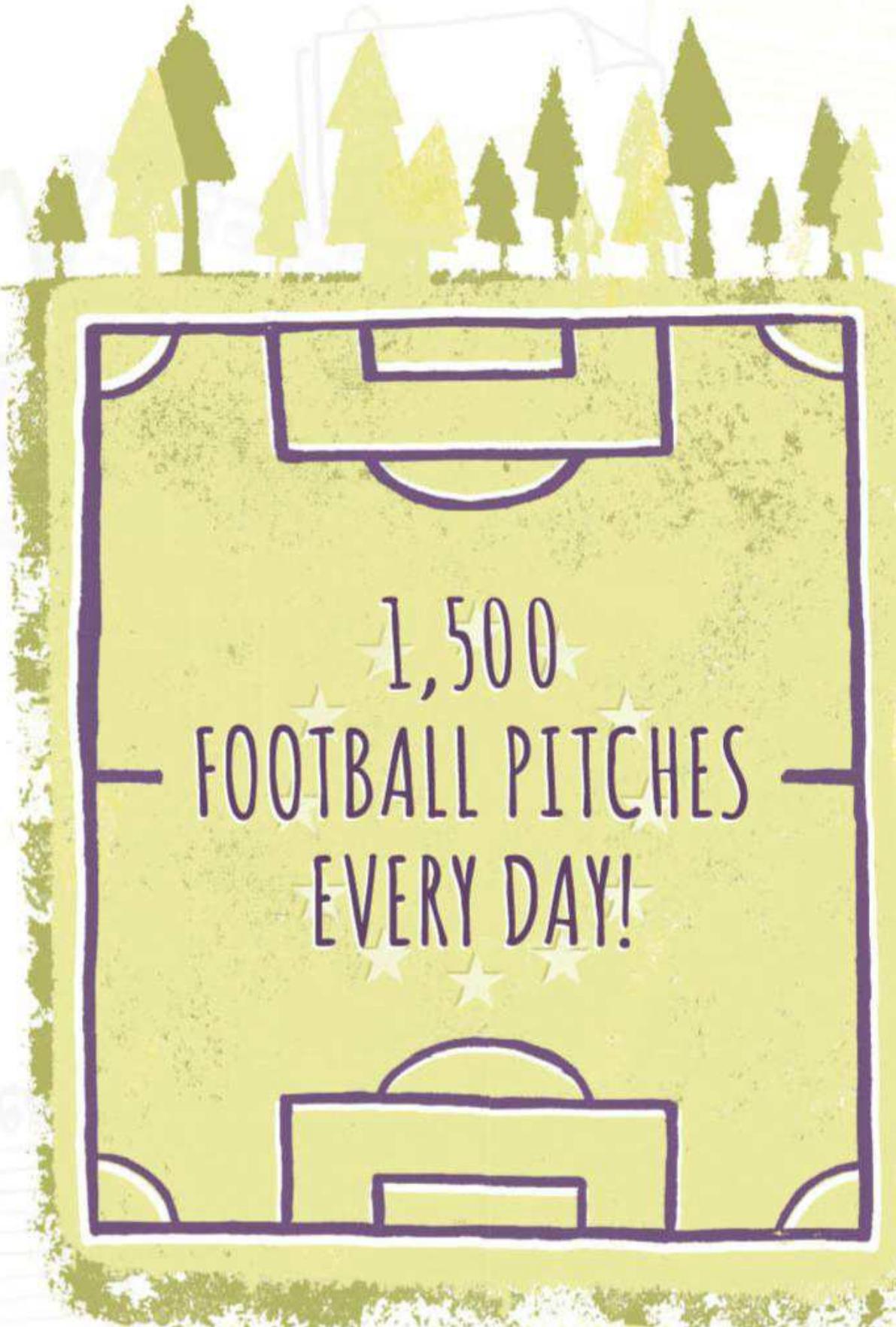
CACHING PLUGINS

Caching plugins are an often ignored feature of content management systems. WordPress, for example, offers many. Within the software, your server will store snapshots of pages rather than compiling a new page for every request. This means end users get the same speed impact as if you were serving them a static website. Businesses can couple caching with CDNs to improve site speed significantly.

Technology has a peculiar way of getting worse before it gets better. The tech to provide better online experiences is currently going through this cycle. Sites used to be simple but, with additional design and features, file size has increased exponentially. Fortunately, there are many options available when looking at how to improve your site speed but the benefits will depend on the purpose of your website. The faster your site loads, the better the user experience. With better user experience comes an improved conversion rate and increased revenue. ■

Aaron Dicks is the founding managing director of Impression, a multi-award-winning UK digital marketing agency.

PROFILE *



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†UNFAO, Global Forest Resources Assessment 2005-2015.

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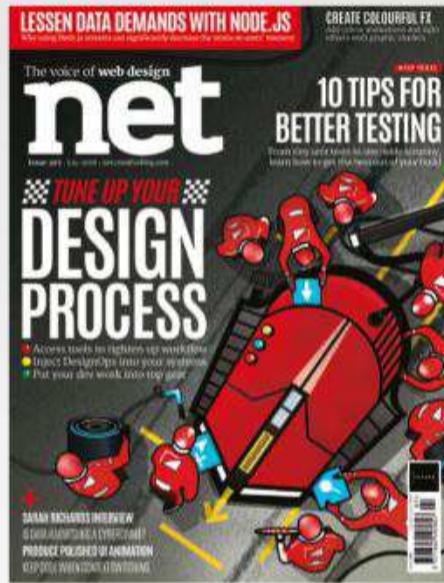


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A pro guide to all the best tools in web and UI design, 10 expert React.js tips, the 5 best code editors and Blockchain explained



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



#301 JAN 2018

Next-gen UX. Revealed: how to design for the invisible interface revolution, plus master the science of Conversation Rate Optimisation



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Web visionaries investigate what's next for design and the internet in our special 300th edition, plus 30 greatest web moments

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GALLERY

Sensational design and superb development

**SITE OF
THE MONTH**



* ANIMATION, PARALLAX, WEBGL, REACTJS

EWZ ANNUAL REPORT

<https://www.ewz.ch/gnb/de/startseite/ss2/clever-parkieren.html>

> KiloKilo, an interactive agency from Switzerland, has made possibly the most impressive corporate report I've seen. EWZ is committed to environmentally friendly energy and its new site is a world of discovery covering its innovations.

Users are greeted with a large chunk of rock that can be zoomed into and explored. The sounds complement the visualisations perfectly. Car horns, dogs barking and children playing suggest a future that is not far away from the present, while a horizontal scroll takes you through the city of the future as if it's a platform game.



The illustrations have fantastic detail, with blur adding depth of field and focusing the users' eyes on the buildings, mountains, wind farms and even elephants that underpin the work that EWZ is doing.

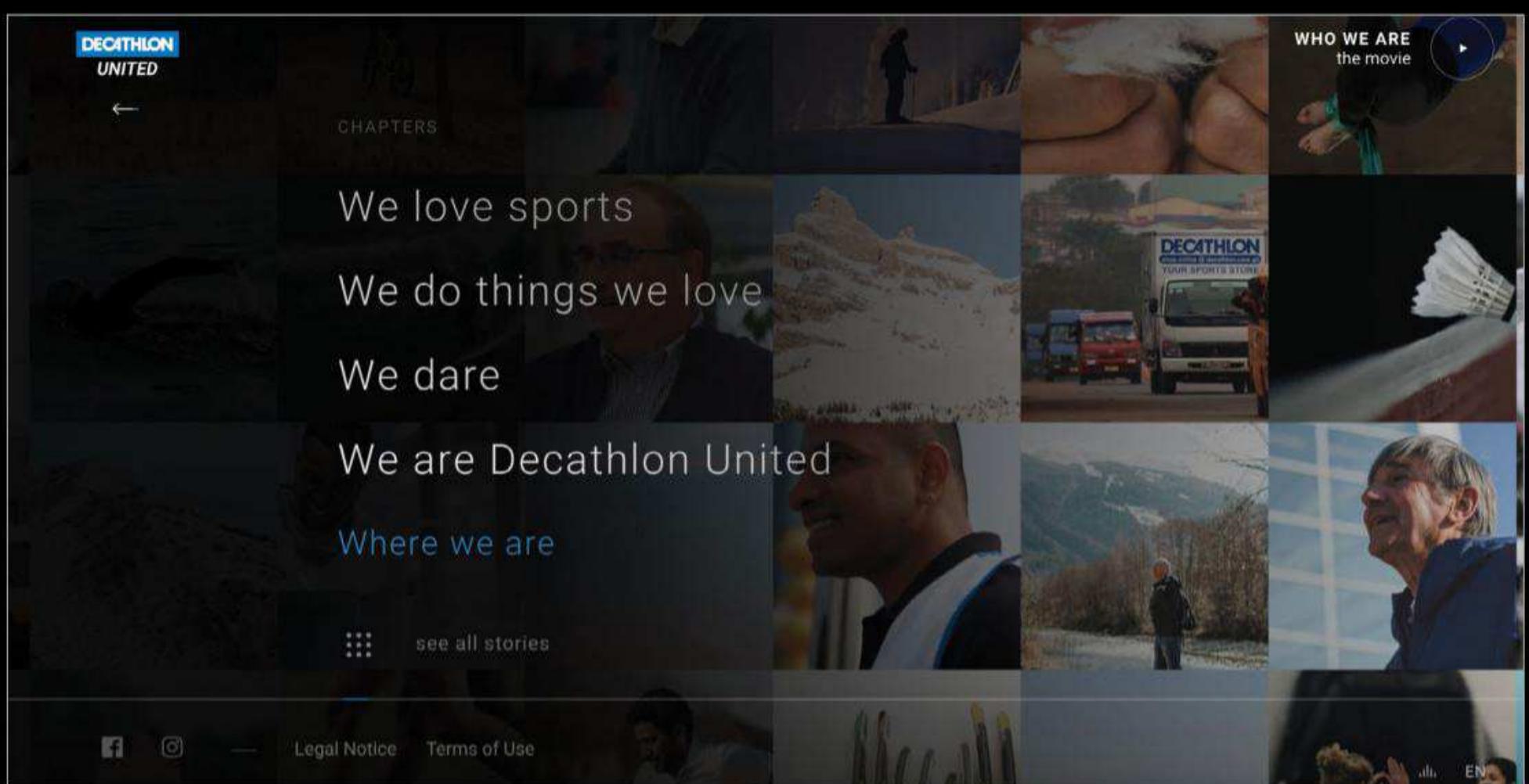
The transition into an article about a particular innovation is also worth mentioning but the illustrations are centre stage within this website. Each building and environment has been wonderfully crafted. The sounds also help to transport you into EWZ's depiction of a future town. The site works just as well on mobile and makes you feel like you're playing a game.

NEIL BALLINGER



Ballinger is UX director at Nimbletank, a digital agency in the East End of London. He spends his days building empathy into business, technology and product.

t: @NeilBallinger



* HTML5, CSS3

DECATHLON UNITED

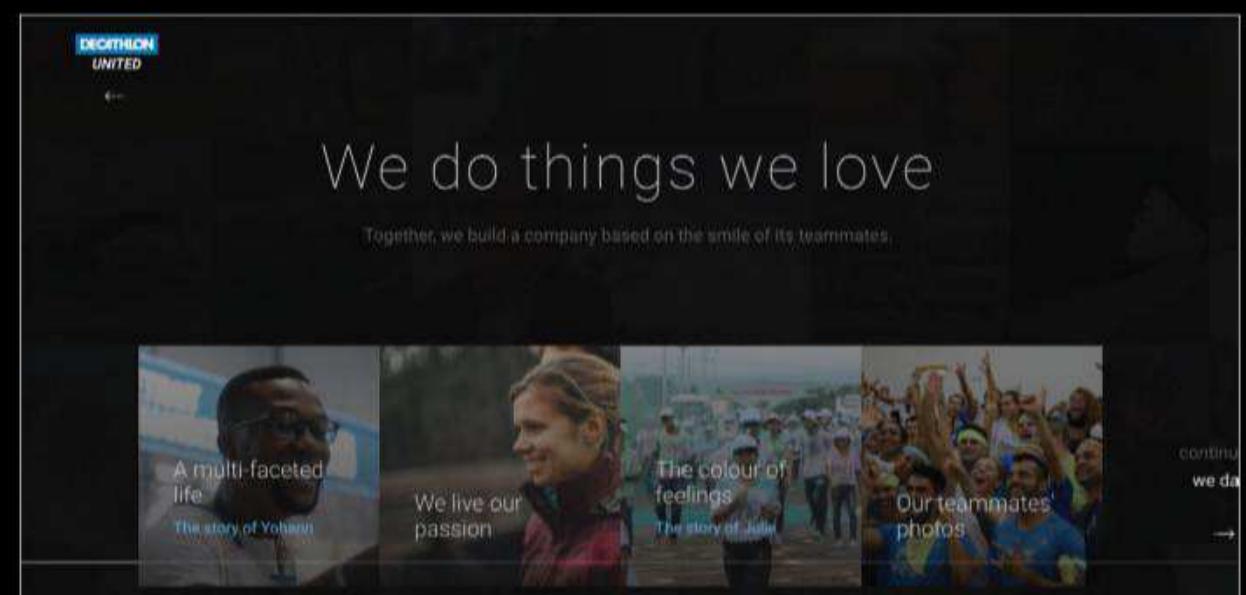
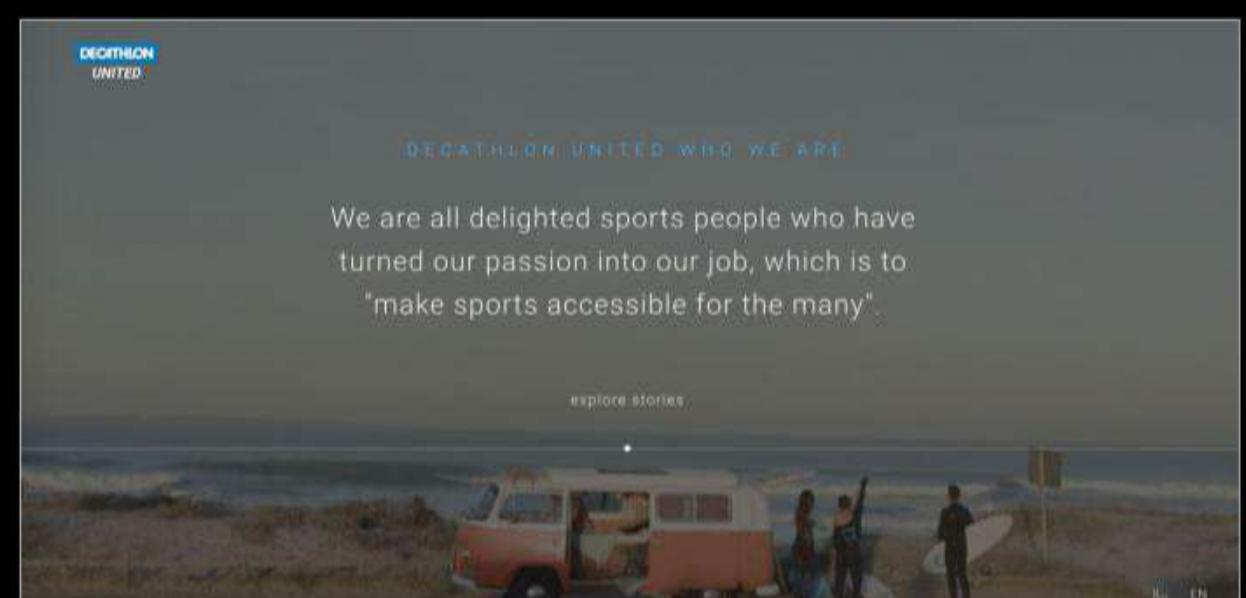
<https://www.decathlon-united.com/en>

Decathlon United is a collection of the insightful and unique stories of Decathlon's teammates from all around the world assembled by Immersive Garden. It's interesting to see a brand that does not have the high street or brand power of someone such as IKEA or Nike looking to tell stories in a digital format.

Decathlon, which sells affordable sports goods, does a great job of aligning its values of inclusion with stories of local sportsmen. The level of content on the site is high, meaning the timeline is likely to provoke high engagement with interested readers.

The concept is truly strong and the high quality of the build, sleek navigation and high-quality assets really make you believe in Decathlon's advocacy of sports men and women.

Storytelling through timeline is an art form in digital that's been used over and over again. Decathlon, however, pulls it off well by putting energy and effort into developing tactile and slick transitions while keeping the user focused exclusively on the content. The png sequences within the story work well to keep readers engaged as they scroll down the page.



In the storm, we party.



Silent Tour with Tasting — Picnic among the Vines — Exclusive Horizontal Tasting of Blanc de Blancs — The Cart of Flavours — Gala of Flavour's — Smallest Restaurant in Franciacorta — Evening Visits — Exclusive Tasting with creations of Chef Mainardi



download schedule



From 10am to 2am - Cantine Bersi Serlini: Via Cereto, 7 - 25050 Provaglio d'Iseo (Bs) - Tel: +39 030 9823338 Mail: festival@bersiserlini.it Saturday 15

★ HTML5, CSS3, GSAP ANIMATION

BERSI SERLINI FESTIVAL 2018

<https://festival.bersiserlini.it>

Bersi Serlini, a winery just outside of Brescia in northern Italy, puts on a food and wine festival every year. Though it's a small event, a great deal of love and attention goes into its marketing, especially the event's dedicated interactive website, developed by Adoratorio.

Users are brought into a simple homepage, which carries a paragraph containing the activities happening during the festival. Each activity title generates a beautiful illustration into the centre of the viewport. The illustrations, activated on rollover, all carry a wonderfully consistent style and continue to animate while the user holds their cursor.

The transitions that take the user through to each individual page are just as slick. The illustrations animate into the page, connecting the user's journey and the text animates down the page, leading the reader's eyes through the detail.

Though the animation and overall design of the pages are great, it's essentially the illustrations, however, that really bring the site to life. Each one carries consistent colours and uses shadow so effectively that they almost look like 3D models.

Festival Franciacorta

In the storm, we party.

Blancs

The Court of Flavours

Gala of Flavour!

The Smallest Restaurant in Franciacorta

Nocturnal visits

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2018

corta

* ANIMATION, 3D, HTML5, CSS3

REFACTORING UI

<https://cowboy.bike/>

> Cowboy is a new generation of electric bikes, targeted at city dwellers in the US. As a result, its website had to be slick in order to communicate the value of a product that is looking to revolutionise a market known for churning out unattractive, clunky bikes.

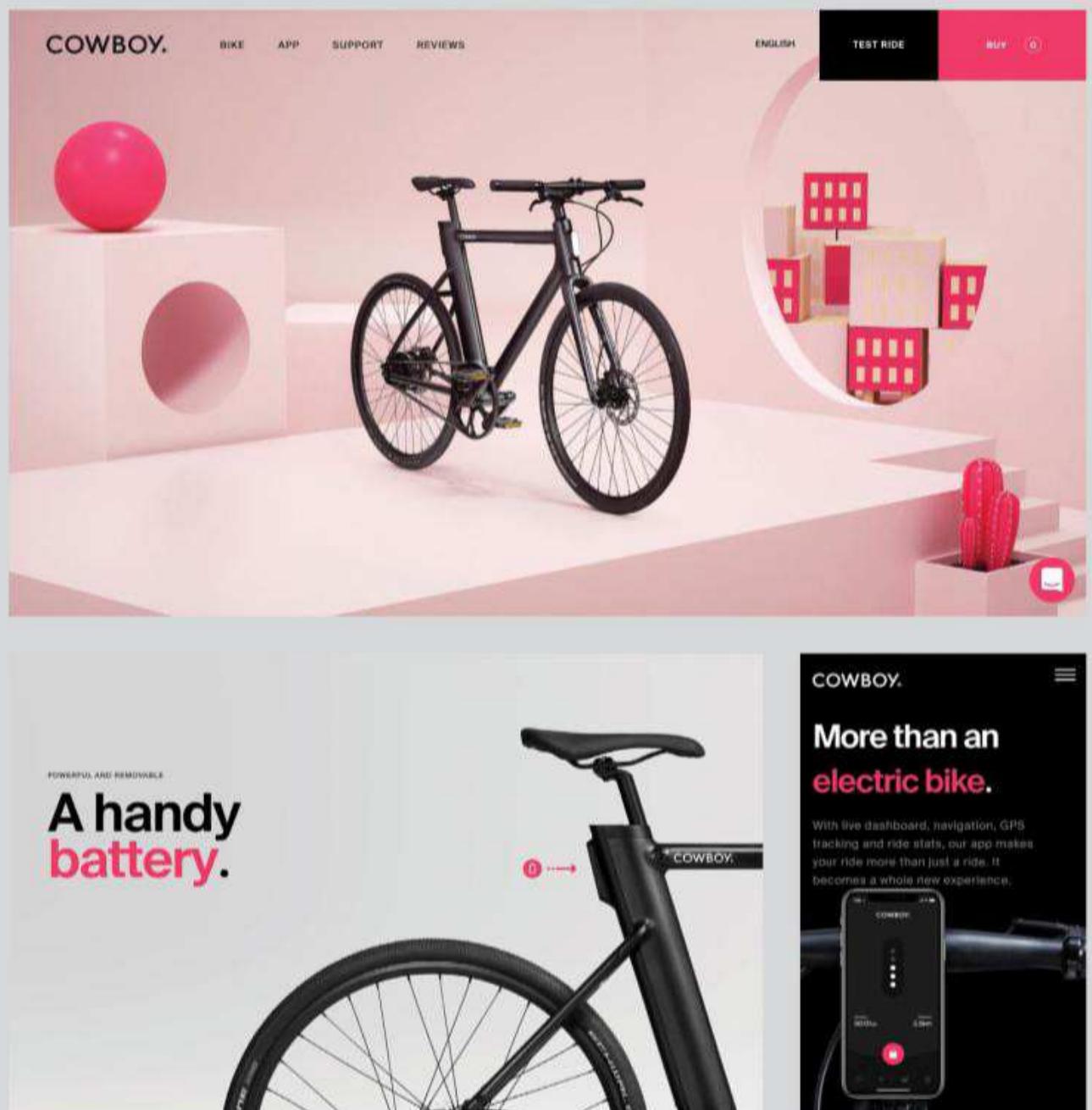
Created by Ueno, the site uses bold typography, strong colours, great photography and is built really well, offering a first class experience to users. The bike itself takes centre stage and immediately draws the eyes of the user.

What strikes me most about the site are the features that support the visual style. Cowboy gives users the option of booking test rides ahead of purchase,

which can be booked quickly through a three-step process.

The transitions and magnification of bike features, as the user scrolls down, are kept subtle so the bike remains central. The focus on content and not over-engineering the experience also means the site loads quickly across all devices and is very responsive. The app for the bike has its own page and parallaxes between features. The performance data offered reveals the connected nature of the product and parallax within the boundaries of the device beautifully.

I never thought I would want an electric bike. I may consider moving to New York to get one!



* REACTJS, CSS3, WEBGL

NIKE REACT

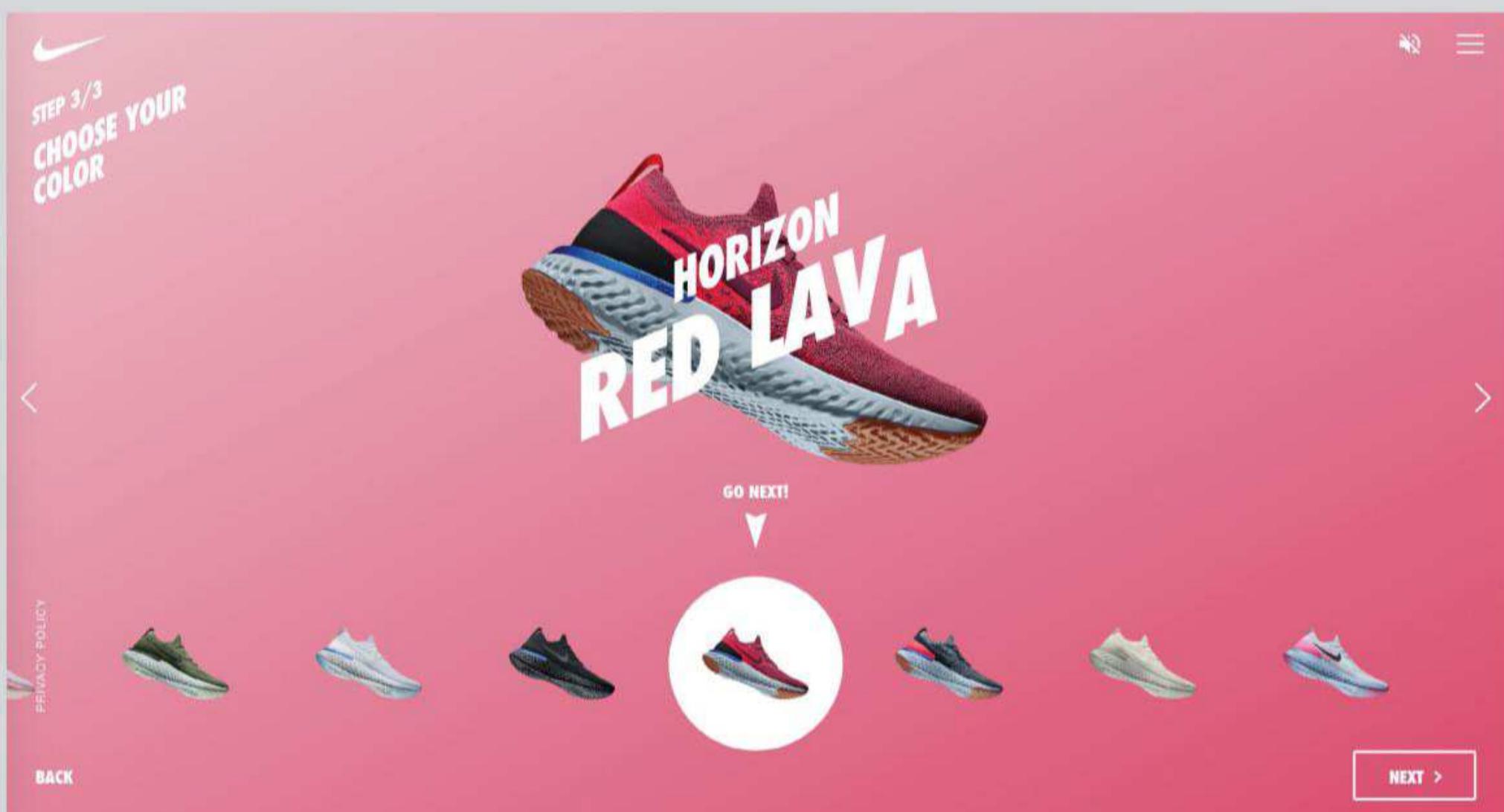
<https://www.nike-react.com>

Nike recently released its first trainer with an all-foam bottom, using a new supporting technology called React. The market release has been supported by a fun 3D WebGL experience that was beautifully crafted by DPDK and conveys just how light and comfortable Reacts are to run in.

Users are able to craft and visualise their own breathtaking React shoes, aside a unique running figure, by being triaged through a selection of well-crafted 3D models that have been designed to reflect the comfort of the shoe, ranging from stress balls to teddy bears.

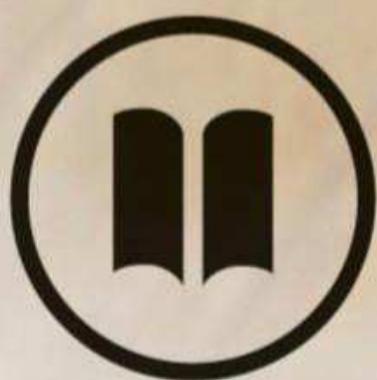
What is most impressive about the site for me is how well it works on mobile. The 3D models and animation have been optimised and designed to perfection to produce a smooth and considered mobile experience.

The avatar animations created are wacky, wonderful, interactive and can be shared with friends. Most importantly, you can buy the shoes that your model is wearing. The USPs of Nike's new running shoes are brilliantly communicated.



PUT A PAUSE IN YOUR DAY

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SHOWCASE

Sublime design
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THIS MONTH FEATURING...



PROFILE

50

We chat to the Flash-averse Anglo-Italian Roll Studio about creating stunning online experiences in HTML



HOW WE BUILT

56

M&C|XD and Pixel<to>Code explain how they restructured, redesigned and rebuilt the online home of one of the UK's most iconic buildings

DESIGN CHALLENGE

This month...
NATIONAL PARKS

* PROFILES



BARBARA MARCANTONIO

Marcantonio is a UX/UI designer at Human Made, a global WordPress agency.

w: grarighe.dribbble.com t: @grarighe



MATTHEW CROUD

Croud is a designer and front-end developer based in Kent.

w: octavector.co.uk t: @Octavector



DAN DAVIES

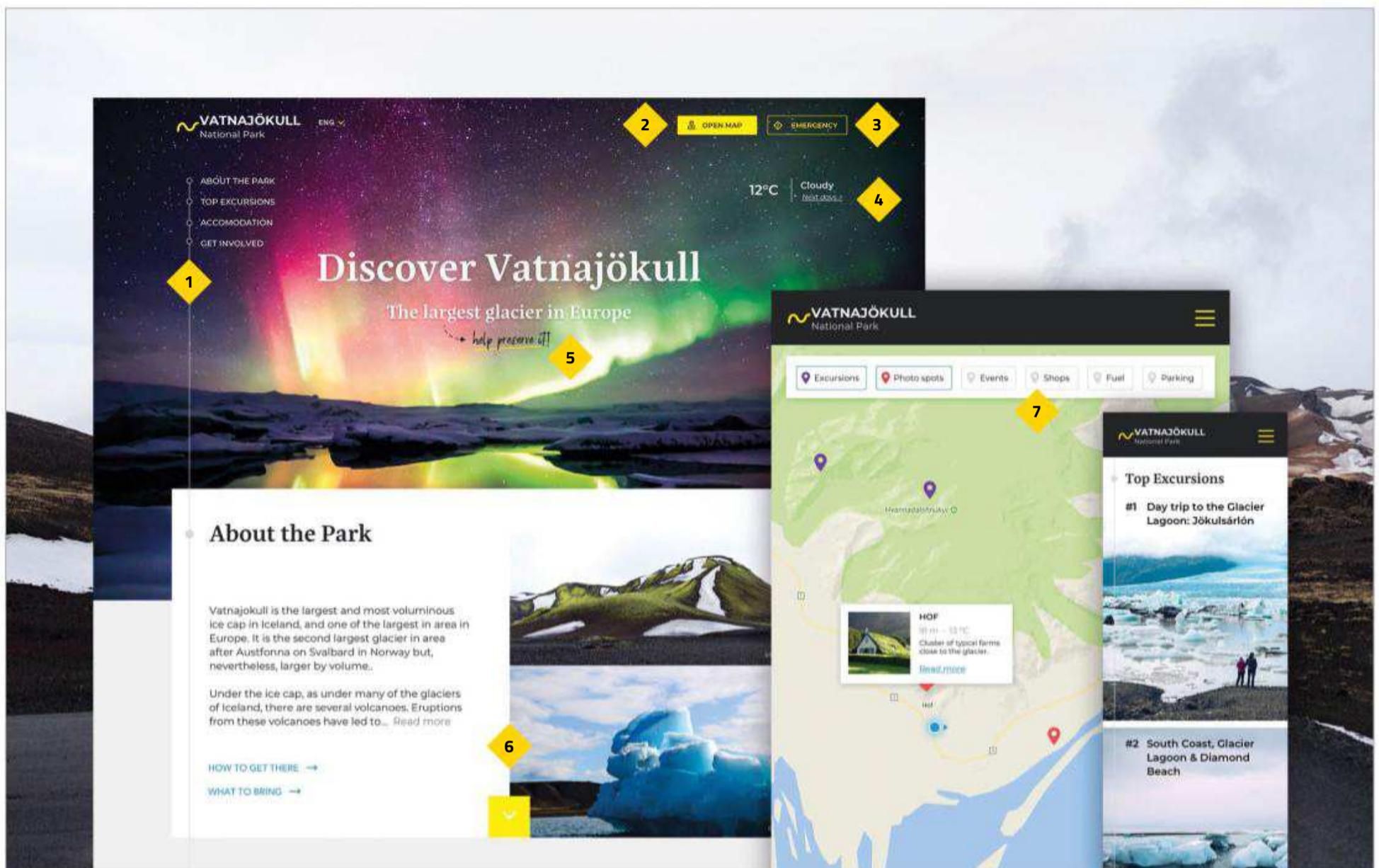
Davies is a front-end developer and designer, working for Space48 in Manchester.

w: www.dan-davies.co.uk t: @danjdavies



BRIEF

This month we would like you to design a homepage for a national park. Websites for national parks typically contain huge amounts of information, so we'd like to see some thoughtful prioritisation that makes it easy for people to find what they're looking for.



★ BARBARA MARCANTONIO

DISCOVER VATNAJÖKULL

A site that leads with strong imagery and presents key information in a visual way

 The site is aimed at travellers who want to include a visit to the Vatnajökull National Park during their stay in Iceland.

The landing page welcomes its users with a beautiful night shot of the Northern Lights above the glacier and it's structured in a series of blocks that users can navigate by scrolling the page or by clicking on the menu in the top left. Each block/category is thought to answer the user's most frequently asked questions and links to more granular information about each topic.

Users have the option to read the content or explore the region by opening the map, where they can easily find events and sightseeing spots next to their location. The perfect photo spots are marked on the map and every photo on the site is captioned with its location. The design is inspired by Nordic minimalism and simplicity and aims to promote the region by making the glacier more accessible to tourists while spreading awareness about the threat of global warming.

CLOSE UP

(1) The side navigation is a guided narrative to discover the most useful information and it's a quick shortcut to the blocks on the rest of the page. **(2)** For people who prefer visualising information rather than reading, opening the map is often the best way to learn about a location. **(3)** An anti-panic button connects users with emergency numbers, sharing their location if available. It's the most sensible call to action for parks that are a high risk for explorers. **(4)** The site shows weather and temperature in the area to help travellers plan their visit. **(5)** A "Help preserve it!" call to action is there to encourage users to get involved in eco-initiatives to support the glacier as well as learning how to respect the environment during their visit. **(6)** The down arrow scrolls the page down to the next block with a smooth animation. **(7)** The map shows what really matters to travellers: photo opportunities, available activities and tours, events, food, shops, parking and fuel. The user can decide which categories to display on the map.

MY MONTH

What have you been working on/doing this month?

I worked on a newsletter and various white papers while travelling through at least four countries in Europe. I also worked hard on my photography skills.

Which two websites have you visited for inspiration?

Sidebar.io, InVision blog

What have you been watching?

I watched many photography and animation video tutorials. I also started watching the *Sense8* TV series.

What have you been listening to?

I listened mostly to Pearl Jam after having seen them live in Rome!

* MATTHEW CROUD

PINEMOOR NATIONAL PARK

A rotatable, 3D visualisation of the park reveals educational facts to visitors

> The design for Pinemoor National Park is tasked with gaining the interest of a younger, more tech-savvy audience. Photographs of natural beauty and lengthy body copy are toned down and balanced with interactive pieces and quicker reads. Bold colours, meaty geometric fonts and simple vector work provide a modern edge for an age-old landscape.

The focal element on the homepage is a 3D visualisation of the park, which users can rotate and interact with to reveal fun facts and snippets of information about particular areas. The 3D style is comparable to a cell-shaded video game, and fine details are dropped in favour of a cartoon-like style that embraces the angles of simple mesh work.

Virtual reality content is featured heavily in the proposal – VR makes a great bridge between the natural world and those who enjoy indoor, electronic entertainment.

CLOSE UP

(1) The 3D park model was created in Blender. For development the model would be rendered with a baked lightmap and exported as a glTF for easy implementation with three.js. (2) Pop-up info cards appear above the 3D model when the user clicks or taps the marker icons. (3) For mobile devices the rotatable model will remain; however horizontal room constraints would likely see the clickable markers replaced with a series of slides the user can click through. (4) A two-tier navigation bar separates the main content from the supplementary articles and pages. (5) The educational potential for VR is vast and an obvious technology for such an organisation to get involved with – 3D videos and interactive experiences are fun and highly immersive. (6) This desktop visual was created in Figma. Last year I transitioned away from Adobe and now use tools like the Affinity products and Figma to produce web mockups.

1

2

3

4

5

4

* DAN DAVIES

THE SHIRE

A website that's light on images and fast to load on flaky countryside mobile connections

> The Shire National Park website is built from mobile-up and designed around the body of information about the park, the community that lives there and the events that drive their economy.

I wanted to go down a different design route to most national park sites and chose a text-heavy approach. Reducing the amount of imagery should help bring page weight and load times down, important for a site used a lot outdoors. Sites such as GOV.UK inspired this approach; content is easily searchable and accessible.

The site is built using CSS Grid and is quite neutral in colour. I wanted to use a nice clean font so I chose Rubik, a lovely typeface with rounded corners from Google fonts.

As the park is big and very busy, site situations change daily so it was important that the site keeps visitors up to date with events. The alerts are animated using CSS transitions.

CLOSE UP

(1) The weather can be a huge factor during trips out so the forecast is always at hand. Forecast updates, as well as other park-related messages, appear as pop-outs to ensure time at the park is well-spent and not ruined by rain. **(2)** I want the visitors to have quick access to contact channels as it's a social-driven website. **(3)** The tone of voice on the site is important. As there is plenty of text to be read, I wanted it to be friendly and informal. **(4)** This is real-time information based around a weather update. As it's raining, we want to try and give alternatives that might be a better option such as the indoor activities suggested. **(5)** It's an information-rich site so the design is built around that, with a plan to only use vivid images where absolutely necessary. People will probably be using this site on the hills, out of reach of decent signal, so data usage should be lower and the site should be quick to load up.

MY MONTH

What have you been working on/doing this month?

This month has been spent mostly getting a Magento store live and looking to design and build a pattern library for future projects.

Which two websites have you visited for inspiration?

Most inspiration I get comes from Twitter or blog posts. People share good stuff.

What have you been watching?
Westworld.

What have you been listening to?
I listen to a lot of stuff ranging from trance to classical. When I work, I listen to ASMR or white noise like fans or washing machines.



★ PROFILE

ROLL STUDIO

www.rollstudio.co.uk

We speak to a Flash-averse Anglo-Italian studio about creating online experiences in HTML, keeping up with technology and the importance of pizza breaks

► Formed in Avellino, Italy back in 2008, the HTML-focused Roll Studio (www.rollstudio.co.uk) was already way ahead of the game when Flash was starting to falter, and it's been continuing to grow ever since, with clients including the BBC, the British Council and BNP Paribas. Roll opened a second studio in London in 2012 and has most recently expanded northwards with its new Sheffield studio. We spoke to its Anglo-Italian team – Renato Formato, Orlando Festa, Luisa Tatoli and Melodie Ash – to find out more.

Hi there! Can you tell us a bit about how Roll came together?

OF: Let's start with our name: Roll is an acronym of the founders' first names (Renato, Orlando and Luisa).

We started as a collective of individuals working collaboratively on projects. We decided to focus on HTML more than Flash, which sounds like a silly choice to make back in the early 2000s; it didn't seem that the market was keen to have 'static' pages when they could have had fancy intros in Flash with sounds on their websites. But on the 9th January 2007, when Steve Jobs announced the iPhone wouldn't support the Flash plug-in, this sparked a change in the industry. Off the back of this announcement, we had an influx of client requests and we decided that it

Photographer: Rino Pucci / The Lemon Twist





INFO

Location: London and Sheffield, UK; Avellino, Italy

Established: 2008

Team size: 10

Expertise: Digital creative agency

Studios: Stink Studios, B-Reel, Nexus Interactive, HUSH

Clients: British Council, BBC Studios, BNP Paribas, The Welcome People

Awards: Webby Awards, Lovie Awards, FWA, CSS Design Awards, Awwwards, DDA

was the right time to found our own company: Roll Studio.

You're based in London, Sheffield and Avellino in Italy. How does this work?

LT: As an Italian agency, Avellino is the spiritual home of Roll and is the hub for our development team. We opened up an office in London six years ago to build our creative team and become more active in the digital community here in the UK. At the start of the summer, we decided to expand the team and build a presence outside of London in Sheffield, headed up by our northern producer Melodie. We are a close-knit team despite our international locations and have always prided ourselves on our collaborative ethos. Trips to Italy in the summer to soak up the sun and good food are always seen as office perks!

How would you describe your process?

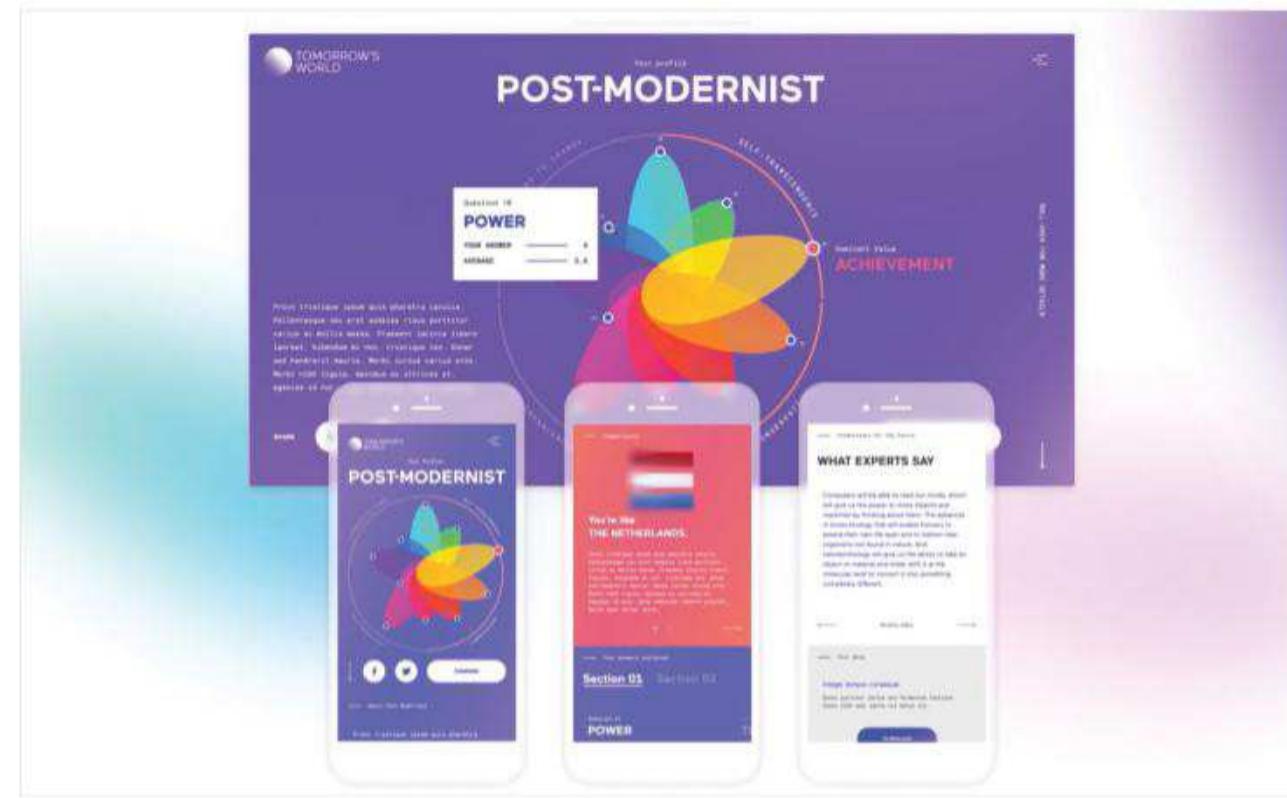
MA: Our production process is agnostic and dependent on our clients; the prescriptive nature of the lean flow isn't suitable of our clients so we've opted for a hybrid of agile and waterfall methodologies. We take a fluid approach to design, investing heavily in the discovery phase, focusing on concept development and analysis to ensure we establish core objectives before we fully shape the design. This has allowed us the autonomy to build projects from the ground up and has enabled us to create strong client relationships.

What tools and technologies do you prefer at the moment?

RF: We love React, React Native and Webpack, which we use on almost all of our projects. We prefer to write our code following the latest specifications, thanks to our companion Babel. We also love Python – and its most famous framework Django – and Node.js, which let us build custom servers. We also use continuous integration and Docker on them – it's so cool!

You have an impressive roster of clients. What makes Roll attractive to them?

LT: It's our investment to continually push innovation, looking at solutions



The BBC Global Values microsite was grounded in scientific research and used research data to reveal your very own 'value fingerprint' and explore how you compare to your peers

that not only solve an immediate client need but build a foundation for long-term growth. We are lucky enough that the core of our business is clients we've been working with for over four years.

Masbooth is a product that sounds like a lot of fun. What's the story there?

MA: Masbooth (masbooth.com) was the very first R&D project we produced at Roll for an indie festival in Avellino (Masfest). It was so far the best project we did as it involved everyone in the company and it wasn't only about designing and developing the app; we actually built the whole structure. It was a massive achievement if you consider that we were fitting it in around paid client work. The booth was a huge success and it gave us determination to continue to invest our time in R&D passion projects.

You built the technical foundations for a webdoc: The Most Northern Place (www.themostnorthernplace.com). What were the big challenges?

RF: The challenge here was to create a multisensory experience on both desktop and mobile platforms in the most effective way possible, one that was both truly immersive and accessible

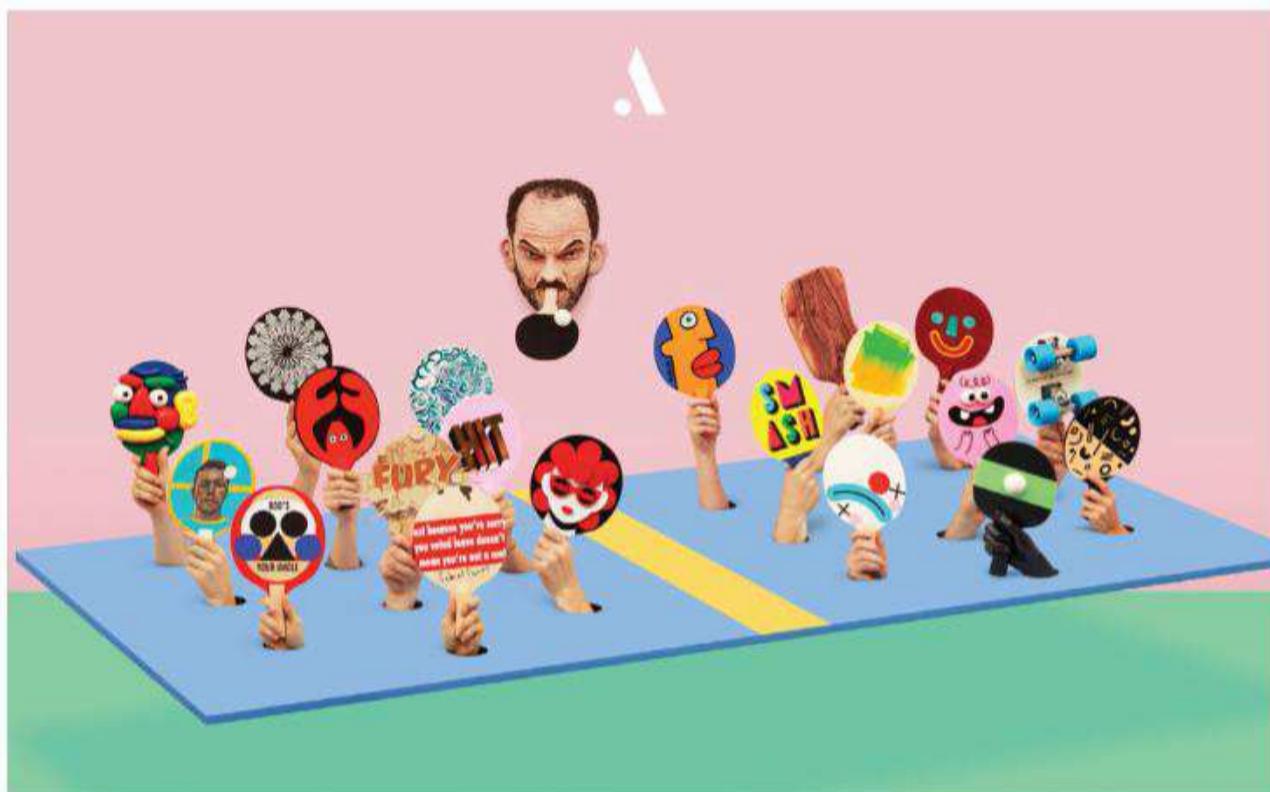
despite the limits of the technology, bandwidth and device performances. Each part of the site has been carefully considered in order to enhance the story, with specific focus placed on the transitions as a device to help control pace. While visitors are reading a chapter, the next slides are loading behind the scenes, allowing a seamless transition between slides: what users don't see is just as important as what they do. It was a long process testing frameworks and technologies to get the results visitors can still appreciate now.

An experiment on your site attempts to describe how happy London is. How does it do that?

RF: It's pretty simple. We have a background task that gathers all tweets geolocated around London and uses a naive Bayes classifier we trained (yep, AI) to determine whether each tweet mood is happy or sad, depending on what emoticons people use.

You've worked on two successful projects with the BBC: Global Values and 6 Degrees. Tell us about them.

MA: BBC approached us to create a new interactive and editorial platform that would encourage users to take a more



Roll designed the app and a responsive site for The Art of Ping Pong, a charity auction featuring 21 bespoke ping pong paddles with all proceeds going to BBC's Children in Need.

playful approach to digesting content.

6 Degrees (*6-degrees.pilots.bbcconnectedstudio.co.uk*) uses a gamification approach, allowing users to make interesting connections between random facts that take the user on a range of different narratives. It was a fantastic opportunity to delve through the incredible BBC Archive for content!

Launched in the summer, the Global Values microsite (*netm.ag/2nsTFzq*) was our second project with the BBC. The format was an online interactive questionnaire created in collaboration with Professor Sander van der Linden at the University of Cambridge. The tool uses psychological research to explore the guiding principles that make up our personal values. The project was grounded in scientific research and used research data to reveal your very own ‘value fingerprint’ and explore how you compare to your peers.

Mix The Body is the third part in a series of ‘Mix’ projects and enables users to create contemporary dance pieces. Could you explain more?

OF: We’re passionate about creating immersive content, the ‘Mix’ projects have all given us an outlet to really push ourselves creatively and work with some

amazing partners in the process. We worked collaboratively with creative agency Flying Object and the British Council to shape the brief and we’re really proud of the output.

Mix The Body (*mixthebody.britishcouncil.org*) offers users the opportunity to delve into the creative process of a choreographer. We wanted the experience to feel tangible and seeing your actions synchronised to movement was a really playful and engaging way of exploring dance.

We crafted a gesture-recognition algorithm that is run in the browser to let users draw shapes on screen that are then connected to segments of the choreography. We then built a system to synchronise the choreography video to create a seamless experience with a low load time.

The Roll Summer Social saw you getting into events. What did that involve?

LT: The Roll Summer Social (*summersocial.rollstudio.co.uk*) was born in 2016 when we hosted our first event in our space in Bethnal Green. We hosted a Lovie Talk presented by Gianfranco Chicco, European marketing director at the Lovie Awards, about digital trends. We took the opportunity to invite


SPOTLIGHT




**ORLANDO FESTA, DIRECTOR
MELODIE ASH, PRODUCER**

What's on your desktop?

MA: My iPhone (as a producer I can't be without it), a Japanese stationery set from Tokyo, my Post-it notes, a soya latte and a bar of vegan dark chocolate.

OF: A notepad, magazines and a glass of water (and a long list of things to do).

What do you have on the walls?

MA: We are decorating our Sheffield office so currently just white walls!

OF: The London studio has a very minimal setup. The office in Italy is more vibrant – we've accumulated a lot of stuff over the years, from gig posters, stencils to awards, VR headsets and even a weather station!

What will you do for lunch?

MA: I like to get out and stretch my legs and increase my daily step count.

OF: During summer it's lovely to get out to Hoxton Square or a park for lunch.

What hours do you work?

MA+OF: We try and maintain a healthy work-life balance and keep the working hours within 40 hours per week.

What else do you do in the office?

MA+OF: We are a close-knit family at Roll so we often stop for cake, coffee and, of course, pizza breaks.

How often do you hang out?

MA+OF: Usually every month we organise something together or an away-day to bond as a group.

Describe your office culture in three words

MA+OF: Autonomous, collaborative and caring.





★ TIMELINE

Key dates for
Roll Studio

AUGUST 2008

Roll Studio is founded

SEPTEMBER 2011

Slavery Footprint is endorsed by Barack
Obama

NOVEMBER 2012

Roll Studio opens its doors in London

JANUARY 2013

The company is completely rebranded:
new office, new life!

FEBRUARY 2014

Roll's first FWA goes to The Most
Northern Place

NOVEMBER 2014

MixThePlay is tweeted by JK Rowling
(Oh yes!)

SEPTEMBER 2015

Roll has epic trip to Italy for the launch
of Influssi

APRIL 2016

Mix the City wins Webby Award, after
winning its sister Lovie Award

JULY 2016

First of a series of events curated by
Roll, Roll Social

MAY 2018

Roll Studio's new office opened in
Sheffield



Roll Studio pride themselves on their collaborative, close-knit team structures, despite having office locations across two different countries.

► industry peers and other professionals in our network to discuss VR, AR, MR and upcoming technologies, with an eye to turning the event into an annual one, replicating the same format. The feedback was really positive. Despite being quite late this year, we are still keen on hosting the 2018 edition.

What is the hardest thing about working in the web industry right now?

OF: After almost 20 years in the business, we still struggle to make clients understand the importance of delivering an outstanding experience without compromising on costs and quality. The market has also become a lot more competitive and saturated over the last few years.

And what's the best thing about it?

LT: The continuing focus on innovation, with the emergence of new technologies particularly with VR and AR. We've never had so many tools at our disposal to communicate with our audiences, which is really exciting.

You've now been in business for 10 years. How do you see the next 10 years unfolding?

RF: If there's one thing we learned from our experience, it's that trying to predict

how technologies will develop is pretty much impossible. We want to continue to learn and hone our craft, expanding to more ambitious projects and digital media. We believe that trends will be increasingly leading towards the possibility of connecting online and offline experiences together no matter what technology is being used.

As time passes it also has an impact on the type of projects we do. Twenty years ago, when all of us started this career, we all felt an excitement of the unknown. We were pioneers: our purpose was to shape the future of the internet, from digital experiences to internet of things along with interactive installations and mobile applications. We were always striving for new ways to tell stories and develop a universal digital language.

We are lucky enough to have been chosen by several startups to build and develop their products; what we are aware of, in doing that, is that we have replaced the discovery with the engineering of processes. We hope that, in this scenario, our approach and desire to wander will be maintained, will bring new exciting discoveries and challenges. We are still pioneers of the future. We can't wait to discover what will come next. ■



A WebVR experiment telling the story of the mystic Rok developed by Renato Formato.

SIGN UP TO THE

The voice of **web design**

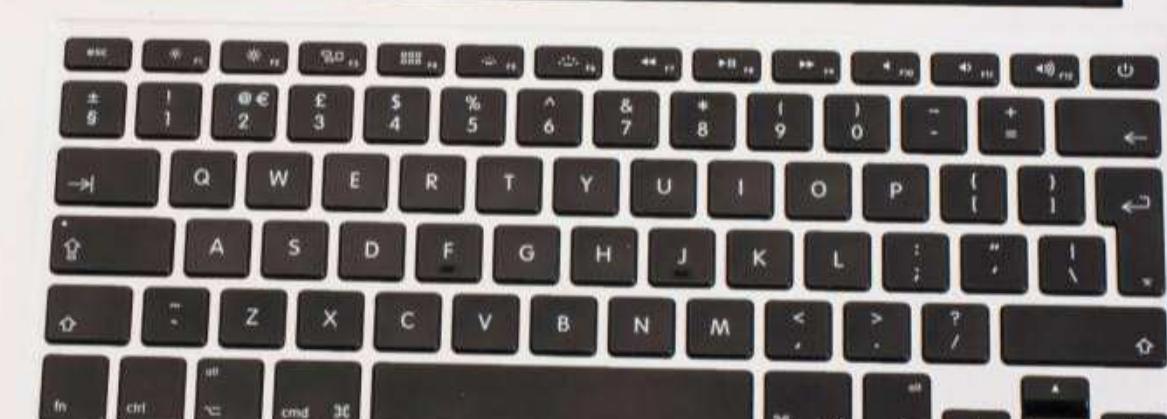
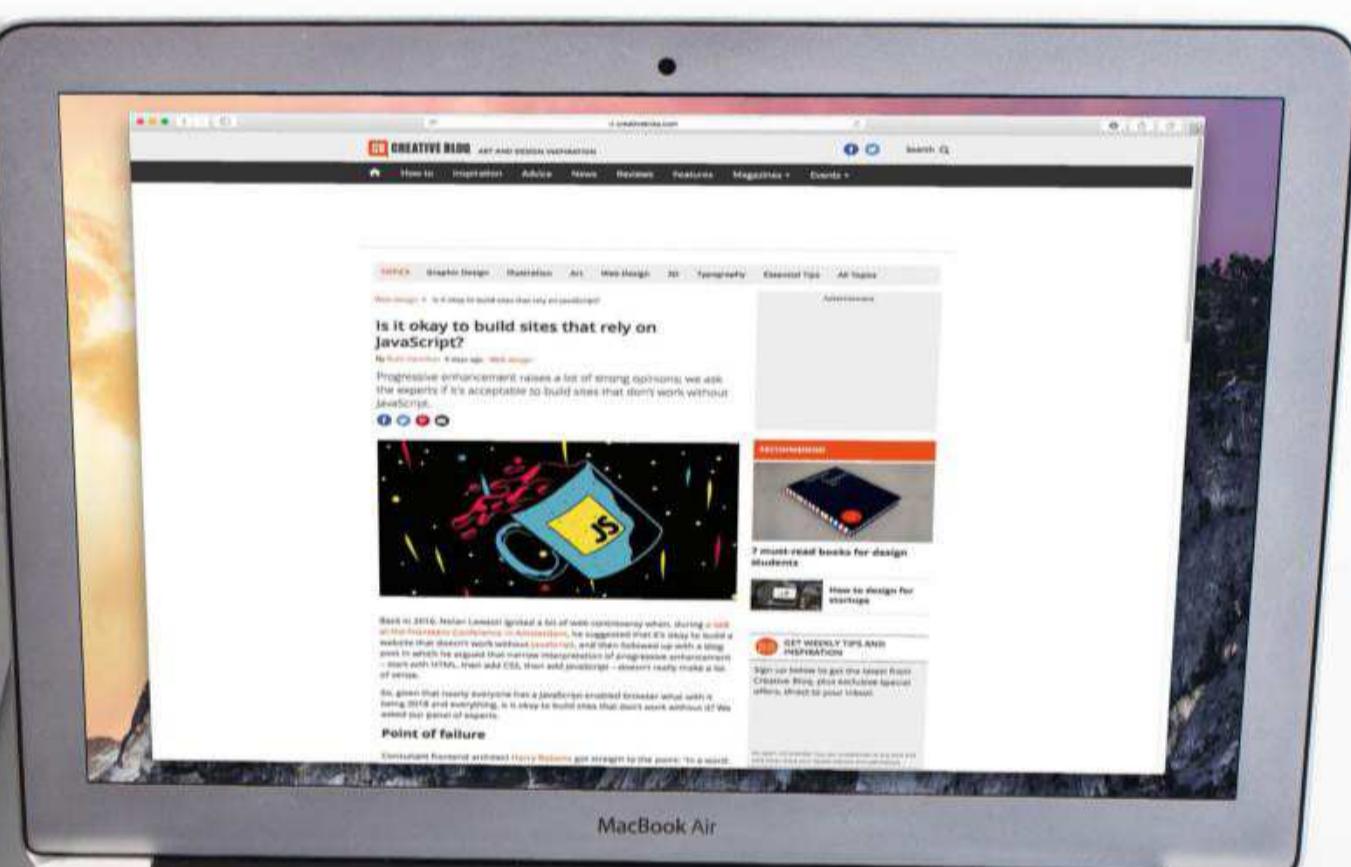
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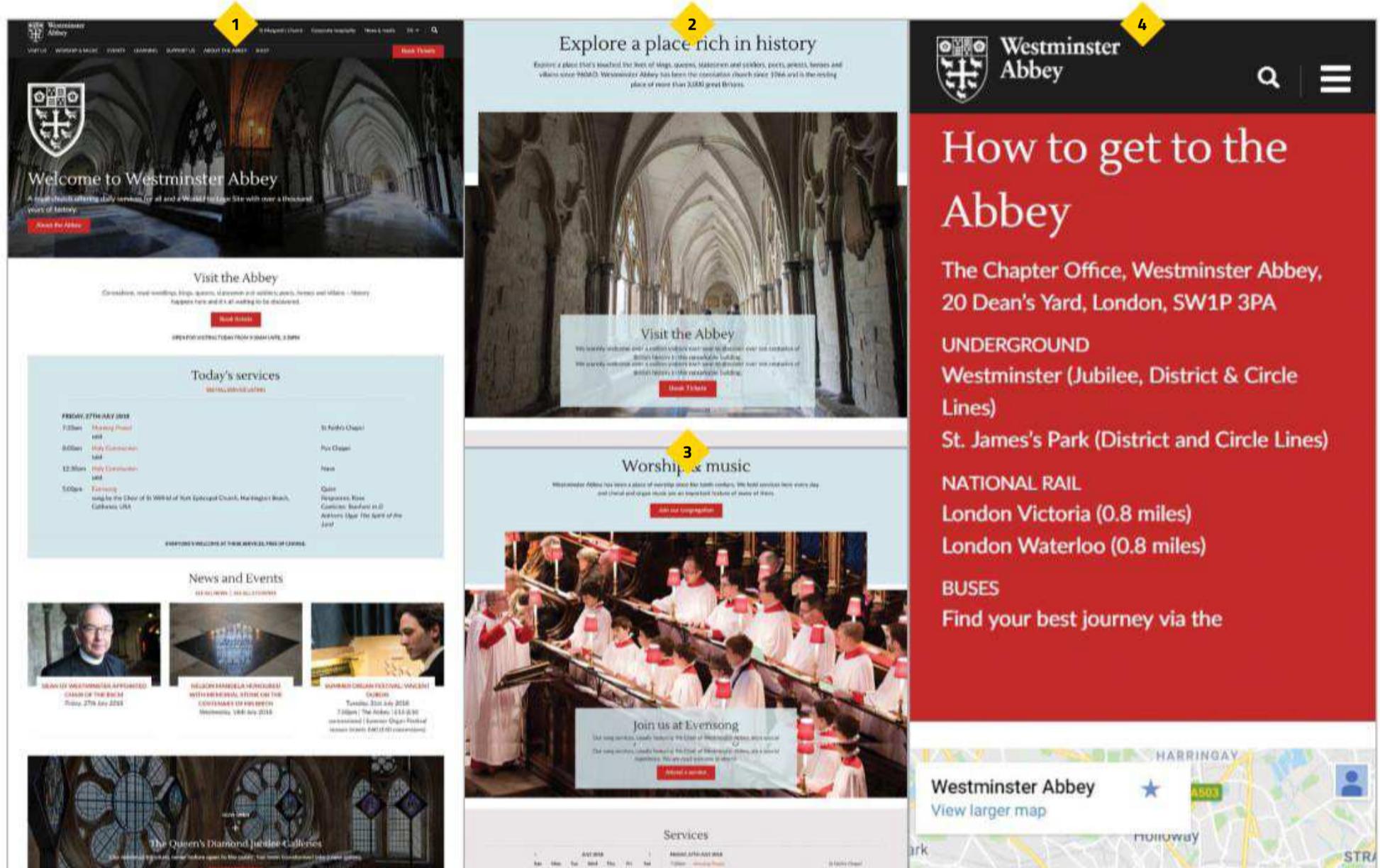
**SIGN UP
NOW!**



★ HOW WE BUILT

WESTMINSTER ABBEY

M&C|XD and Pixel<to>Code explain how they restructured, redesigned and rebuilt the online home of one of the UK's most iconic buildings



BRIEF

Create a site as beautiful and special as the Abbey itself and provide a user experience that reflects the welcome given by the Abbey to visitors and worshippers, with especial consideration for mobile and tablet views.

CLOSE UP

(1) The home page is designed to lead users to the content they seek quickly but also draw their attention to other areas; for example, visitors looking for information on opening times would also see which services are being conducted. **(2)** All pages are modular, allowing editors the flexibility to add content components and control the layout. The landing pages present content drawn from several sources, so performance and flexibility were key considerations. **(3)** Events

and services are presented in either calendar format or lists, with the ability to drill down for further detail, such as what the choir was going to be singing, further information about the musicians and the ability to listen to samples of recordings of that music. **(4)** With tourists trying to get information on the Abbey while out and about in London forming a substantial part of the site's audience, getting the mobile experience right was a major driver in the design process.

DAVID CURLESS



Curless is a co-founder and creative director of M&C|XD, an agency providing strategy, UX and design. He directed the site design with Pal Bhachu, art director.

DARREN AMER



Amer is an experience designer and co-founder of M&C|XD. Amer's work centres on enhancing the relationship between customers and clients.

CHRIS DIXON



Dixon is technical director at Pixel<to>Code, an agency that specialises in back-end development using the Umbraco CMS.

> Westminster Abbey has hosted every English coronation since 1066 as well as royal weddings, funerals and memorial services. One of the biggest tourist destinations in the UK with more than a million visitors per year, it's also a working church welcoming worshippers to the daily services and hosting events including choral, musical and organ recitals. Its website, though, was letting it down, so the Abbey brought in M&C Experience Design (M&C|XD) and Pixel<to>Code to help restructure, redesign and rebuild it.

How long has Westminster Abbey been online? Why the need for a new site?

DC: The previous site had grown organically since launch in 2014 and had become a confusing user experience, with new content areas bolted on as and when demanded. Navigation had become overly complicated and the site did not render at all well on tablet and mobile, a major frustration for a large proportion of its users who are tourists visiting London and with access only to their mobile devices.

DA: We wanted to ensure that users could not only achieve their primary goals quickly and easily but that the website would also enrich the entire experience of visiting the Abbey. We wanted it to be a valuable pre-visit companion piece.

Can you tell us a bit about the brief?

DC: Westminster Abbey receives no funding from the church, the crown or the government; it relies on visitor entry

fees and donations to provide the £10m a year it takes to maintain it. The brief set out pragmatic objectives sharply focused on increasing visitor numbers, getting them to buy tickets online, increasing interest in attending services and other events, promoting the membership scheme and encouraging more online donations and generally making users more aware of the transactional offers – for example the shop, the restaurant and so on. It had to be a fine balancing act between God and Mammon. We never had to forget that the Abbey is also a functioning church and place of worship.

How did it feel to be working with such an iconic institution?

DC: Exhilarating. Just going to meetings there was always something to look forward to. Which centuries-old room would we be in this time and what might we see on this visit we hadn't seen before? Everyone we came into contact with, from the dean to the security guards, was universally charming, helpful and enthusiastic about what we were engaged in.

DA: The place staggered me every time I went there. The website is the starting point for most people planning a visit and we felt a huge responsibility to show the Abbey in the best possible light, ensuring that we showed the grandeur and majesty of it whilst also making it simple for users to book tickets and discover how to make the most of their visit. Our challenge was to enlighten and inspire people.



*TIMELINE

Key dates in the Westminster Abbey project

DEC 2016

M&C|XD engaged as creative agency
Pixel<to>Code contacted as development partners

FEB 2017

Final draft of the website brief released

MAR 2017

Umbraco demonstrated to Abbey team

APR 2017

The Dean of Westminster approves the project

MAY 2017

Kick-off meeting held to agree scope and timescales

MAY - SEP 2017

User journey testing, information architecture, design concepts, user testing, copy and tone of voice requirements defined

AUG - SEP 2017

Pixel<to>Code works on custom data management portal and site structure

SEP 2017

Final designs approved

OCT 2017

Front- and back-end CMS development commences

NOV 2017 - JAN 2018

Migration of famous people commemorations, news items, sermons and lectures

NOV 2017 - APR 2018

Client creates content, generates assets and updates migrated content

APR - MAY 2018

Bug fixing, load testing and final content updates conducted

MAY 2018

The website goes live on an Azure cloud-based server platform, managed by Zebedee Creations



SHOWCASE

How we built

The screenshot shows the official website of Westminster Abbey. At the top, there's a navigation bar with links for PRESS, SHOP, LIBRARY & RESEARCH, VENUE BOOKINGS, and a SEARCH function. Below the header, the main menu includes WORSHIP, MUSIC, VISIT US, EVENTS, EDUCATION, HISTORY, THE INSTITUTE, ST MARGARET'S CHURCH, CHOIR SCHOOL, and SUPPORT THE ABBEY. The main content area features a large image of the organ pipes and a banner for the 'SUMMER ORGAN FESTIVAL'. To the right, a sidebar lists 'TODAY'S SERVICES' with times for Matins, Holy Communion, Sung Eucharist, Evensong and Procession, and an Organ Recital. A link to 'VIEW ALL SERVICES' is also provided.

1

This section illustrates the iterative design process. It includes:

- Image 1:** A hand-drawn sketch of a layout, showing initial concepts.
- Image 2:** A wireframe diagram, representing a later stage in the design process.
- Image 3:** A photograph of visitors testing a prototype outside the abbey, with a free entry pass given to participants.
- Image 4:** A large 'Content Wall' in the CMS back end, where editors link sections of the designs to the reusable components.

2

This section illustrates user testing and content management:

- Image 3:** A photograph of visitors using a tablet device in front of the abbey, likely testing a mobile version of the site.
- Image 4:** A photograph of a 'Content Wall' in the CMS back end, covered in various sticky notes, prototypes, and small screens displaying different design elements.

3

► **Talk us through the design features.**

DC: One of the issues I had with the old site was that it didn't project any sense of the grandeur and jaw-dropping effect the building has when you go and visit it. We employed an image reveal on the main-section banner images, activated on scroll, to give the impression of being drawn into the building.

DA: Key user journeys were identified and, unsurprisingly, they focus on the most popular activities such as booking tickets, getting information about visiting times and what to see in the Abbey. To enhance this rather workmanlike experience we employed one of the core values of the Abbey: 'enlightenment'. This aims to surprise and delight visitors, welcoming them into the site and adding to their knowledge and awareness of what the Abbey offers. We have used animation in certain areas to give users a sense of opening a door, revealing more than they expected to see.

You built the site on Umbraco. Did this bring any challenges with it?

CD: The Abbey was finding the huge amount of content hard to manage in a proprietary CMS; they were drawn to Umbraco by its reputation for user-friendliness and strong recommendations from other organisations. It's open source, yet supported by a corporate HQ and popular with developers because it gives you a clean slate to work with – meaning we could deliver exactly the site as designed, in a way that is easy to edit.

Tell us about your testing process. Did it uncover any major issues and, if so, how did you resolve them?

CD: We used BrowserStack to test the front end on various browser and device combinations and Trello as a communication tool to report and handle issues. Our main focus in testing was to ensure that the website could cope with the inevitable traffic loads and spikes during a royal event or release of tickets for the Christmas services. Using load-testing tools like Locust, along with Application Insights and the

Above One of greatest challenges for the team was to present quantities of biographical information in an engaging format. A number of visual effects are applied to draw attention to the content as it scrolls.

Charles Darwin

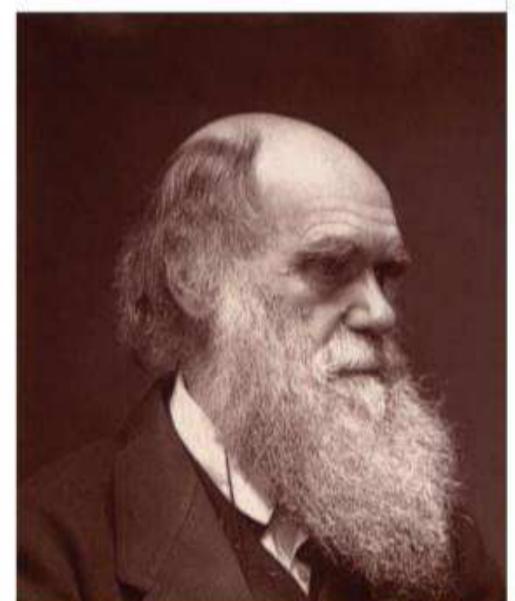
Scientist and Writer

Charles Robert Darwin, naturalist, is buried in the north aisle of the nave of Westminster Abbey, not far from Sir Isaac Newton. He was born in Shrewsbury on 12th February 1809, son of Robert Waring Darwin (1766-1848) and Susannah, daughter of Josiah Wedgwood. He studied with his brother Erasmus at Edinburgh University but disliked the idea of following in his father's footsteps as a doctor. At Cambridge University he became very much interested in natural history and sailed on the ship HMS Beagle in 1831 to South America and the Galapagos Islands. In 1839 he married his cousin Emma Wedgwood and they went to live at Downe, a small village in Kent. His famous work 'The Origin of Species by natural selection' was published in 1859 and he continued working although his health was often poor. He died at Down House on 19th April 1882.

Burial

The Dean of Westminster, George Granville Bradley, was away in France when he received a telegram forwarded from the President of the Royal Society in London saying "...it would be acceptable to a very large number of our fellow-countrymen of all classes and opinions that our illustrious countryman, Mr

BORN
12th February 1809
DIED
19th April 1882
FUNERAL
26th April 1882
FIELD
Scientist; writer
LOCATION
Nave: North Choir Aisle
MEMORIAL TYPE
Grave; bust
MATERIAL TYPE
Bronze



Above Faceted search allows interested viewers to find information on individuals and organisations commemorated within the Abbey and nearby St Margaret's Church, with links to related content.

Azure performance tests, we were able to pinpoint and resolve areas of stress.

The site went live in May. How has it been received?

DC: Feedback from internal staff and the public has been universally positive, with hugely increased engagement on the site and through online ticketing.

Access from mobile devices has risen exponentially, which was expected as the previous site was unusable on mobile.

CD: The reaction within the Abbey has been universally positive, meaning that our efforts to make editing the site easy and present large amounts of information in an effective way appear to have been successful. ■

FIND YOUR CAREER FOCUS

Should you become a jack of all trades or a master of one? We speak to industry experts and get their advice on the best career path to concentrate on in 2018



It's a perennial question in the web industry. Should you specialise in one specific language, discipline or methodology or offer a broad range of design and development skills?

There's no simple answer that applies to everyone. But there are some clues as to which route might suit you better personally. We speak to experts across the sector to get their advice on how to choose the best path for you.

Find work

There are many obvious benefits to being a specialist, believes designer and developer Matt Wiggins. "You get to master the skills you love and, if you're good enough, people will seek you out for these abilities," he says. But there's also a downside. "Frankly, it's going to be harder to get a full-time job," he explains.

Wiggins offers up himself as an example. "I own a small creative studio, Legwork, in Denver, Colorado, and I use specialists all the time... but only as freelancers," he says. "I'm certainly not looking to hire someone who isn't well-rounded, especially when times are tight. I always look for generalists in the people that I hire."

There will, of course, be more full-time opportunities for specialists in larger firms. "There are certain roles that require a high degree of technical aptitude or design capability, where

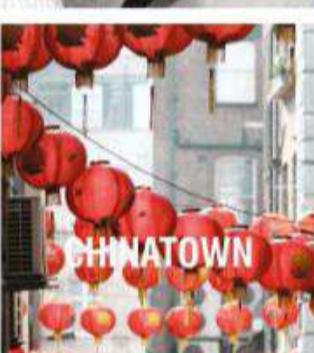
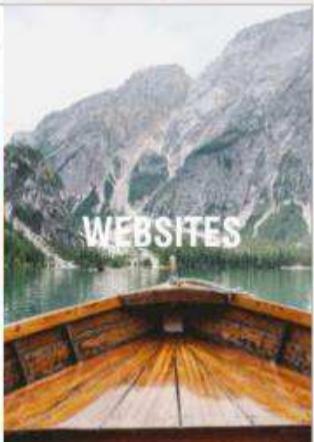
AUTHOR

TOM MAY

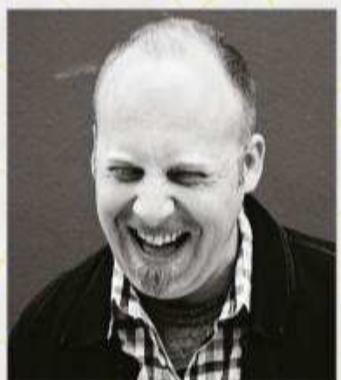
Tom May is a freelance writer and editor with more than 20 years' experience. He is currently editor of *net*'s sister title *Professional Photography*.
t: @tom_may

FEATURES

Find your career focus



Above "When it comes to hiring, it's not a simple question of looking for people with generalist or specialist skills," says Nadia Turan of DAM Digital, "because to be successful in today's industry you have to be adapt very quickly"



Above Kevin M. Hoffman, Philadelphia-based designer, author, speaker and VP design at Capital One
t: @kevinmhoffman
w: kevinmhoffman.com

► it's vital to remain a specialist," says Maggie McKosky, head of UX and product design at Shutterstock in New York.

"For instance, some organisations have dedicated visual designers or front-end UI engineers dedicated to a singular focus, such as working on a design system, specialising in visual design or front-end CSS styling. Information architecture, localisation and copywriting are other examples of areas where specialists are in demand."

Get hired

But it's not just about what jobs are available. It's also about how you get hired, something else that can differ wildly depending on whether you're a generalist or specialist.



Above Toby Pestridge, creative director of Bournemouth studio Createful
t: @TobyPestridge
w: https://www.createful.com/

"What you often find when recruitment is left to a company's HR department or a recruitment agent is that they search based on the widest range of buzzwords they know," says Leon Brown, developer and owner of Nextpoint, an educational content company that's based in Liverpool. "So if your CV doesn't mention all of the keywords they can think of, there's a high chance they will skip past it without speaking to you. In these circles, being a generalist definitely pays off."

Being a specialist, however, pays off once you build up a reputation for yourself. "People who require specialist skills tend to be the department managers, who speak to other people in those circles," explains Brown. "Reputation allows you to get direct recommendations, bypassing the barrier that is HR and recruitment agents. You also benefit from the credibility of people who recommend you; it's assumed you must be good if you're recommended by someone the hiring manager trusts."

On the job

But what about when you've actually got the job? What does the cost/benefit analysis look like then, when choosing between a generalist and specialist path?

Undoubtedly, depth of focus is a definite boon for the specialist. "The main benefits of being a specialist are being able to complete specific tasks at a very high level of quality, being seen as a master in your domain and a go-to individual within your organisation," believes McKosky. "On the downside, there is the potential loss of context on projects, since you're only being brought in at specific points throughout the product development cycle."

Conversely, she sees the main positive to being a generalist as being able to bring perspective from a range of other disciplines. "You're able to handle a variety of tasks, while having the experience to see a problem from different and unique perspectives,"

CASE STUDY



A front-end developer working in Leeds, Adam Norris believes the best people are ones with 'T-shaped skills' – in his words: "Someone who has an understanding of most things but has a specific area that they know really well."

Norris was a teacher for six years then left to pursue a career in web development. "In my first agency job, as a digital designer at marketing agency Harris, I've had the opportunity to develop a wide range of skills," he explains. "These have ranged from front- and back-end development, UX and web design to SEO and analytics. Over time though, I've taken a keen interest in accessibility and inclusive design, which is fast becoming my speciality."

“I'M AIMING FOR T-SHAPED SKILLS”

Adam Norris

acnorris.uk

His interest in this area began when iOS7 was released in 2014. "Apple added a zoom animation when apps were opened and closed and I found it so disorientating," he recalls. "They soon released a patch that let you turn it off and this is when I started thinking more about how we can design systems that work for a wide range of people, regardless of their circumstances."

He's developed his skills in this area by reading blog posts and books, following relevant people on Twitter, watching conference videos and taking online courses. "I'm indebted to people such as Steve Faulkner, Adrian Roselli, Laura Kalbag, Heydon Pickering, Scott Vinkle, Rob Dodson, Marcy Sutton and many others," he adds.

In his day job, Norris tries to use what he's learned on every new project. "It's pretty much impossible to get everything right first time; you're always learning and picking up tips as you go," he says. "But I read some great advice on accessibility once that said you should 'just aim to do a little better than you did last time', which is what I try to do."



Above Matt Wiggins, designer and developer and partner at Legwork Studio
t: @wigz
w: legworkstudio.com

she says. Meanwhile, the obvious downside is being less well-versed in each area you apply yourself to. "The risk is that you're good at many things but rarely truly exceptional at one thing and potentially have lower velocity, due to juggling multiple areas at once."

It all comes down to that age-old phrase 'jack of all trades, master of none' – the idea that as a generalist you'll never be particularly amazing at any one area, just competent at best. "Whether we call them generalists, unicorns, full-spectrum designers, triple-threat designers or whatever, some would argue that no, it's not possible to master several areas at once," says McKosky. "I tend to agree but I also know designers with exceptional experience or skill who can master the generalist role because they have a strong understanding of the other roles around them and what is required."

"That said, although they are able to 'do it all', they also need to spread their knowledge across multiple fields and remain focused on a few areas in particular. Otherwise they may fall into a trap of being really good at everything but not truly excelling at anything."

Non-binary choice

Right now, though, we should probably take a time out. Up to this point, we've treated the choice between being a generalist and a specialist as a simple, binary decision. But actually it's wrong to think too strictly in terms of pure generalists and specialists. In reality, most web designers and developers exist somewhere on a spectrum between the two.

Even so-called generalists usually still have specialist skills and interests. "Most generalists I've come across have one area they're better at and more passionate about than others," McKosky points out. "For example, some designers have excellent qualitative research, moderator or coding skills. And that's a good thing: it allows them to be more rounded, sharing their specialities to mentor their teammates, level any gaps and maintain a level of expertise that sets them apart from others. So it's all a matter of striking a balance and



Above Shane Mielke, award-winning creative director, designer, developer and author of *LAUNCH IT*
t: @shanemielke
w: shanemielke.com

▶ understanding that generalists bring breadth over specificity.”

Conversely, most specialists have knowledge and understanding in more than one area and commonly benefit from what’s known as a second-string specialism. “So even if you’re an amazing Perl developer, it helps to have some good understanding of other languages or work on your management, communication or project management skills,” says Rob Pellow, digital design director at Bristol CRM-agency Armadillo. “That way, you are offering yourself as more than just a specific type of developer.”

“Being a proper specialist is hugely valuable,” he continues. “But the wider you can cast your net with secondary skill sets, the greater your chances of making yourself invaluable in the long term and the more you will stand out in the crowd.”

Choose your specialism

So if you do decide to specialise, how do you decide what to specialise in? “In my experience, people naturally gravitate towards a specialism when it’s something they are good at and that inspires them,” says Nadia Turan, executive creative director at DAM Digital, a London user-experience agency. “In other words, if you enjoy a particular discipline and you’ve got a knack for it, you’ll work at it and it will become your specialism.”

Pellow agrees that the decision should not be about cold-hearted business logic but about following a personal passion. “You can chase the big pay cheque of a creative director or a senior JavaScript developer... but if that’s all you’re interested in, you’re in for a slog,” he says. “It’s important to find the bit that you love doing. The more you enjoy it, the better work you will produce.”

Philadelphia-based designer, author and speaker Kevin M. Hoffman, currently VP design at Capital One, offers some similar advice. “Ask yourself what kind of role gives you confidence and a sense of psychological safety,” he recommends. “What kinds of work can you have endless conversations about with



Above Anton Balitsky, a freelance UX designer based in Warsaw, Poland
w: <https://www.anton-balitsky.design>

CASE STUDY



After working for nine years as an award-winning 2D animation director, Sundeep Toor, who is based in County Durham, began a new career in January

2017 as a freelance web developer.

“I have found it difficult to decide what to specialise in as there are so many options,” she says. “After talking to a few developers though, moving to work on apps sounds exciting and looks like a way to future-proof my career. React is the on-trend skill to learn, a lot of companies

THE WEB IS TOO VAST TO LEARN EVERYTHING

Sundeep Toor

www.prolificpolymath.com

are asking for those skills. I’m also looking into React Native because I will be using it as part of my job.

“Starting out, everyone is a generalist,” she notes. “You pick up the basics: HTML, CSS, maybe some JavaScript or PHP. But if you want to move forward to work on bigger things with other people, you need to specialise. The web is too vast to learn everything, so you must pick a direction. Personally, I think I’ve spent too much time being a generalist and I regret not specialising sooner.”

“I think you can only be a generalist long term if you’re planning on building your own websites independently for your own clients,” she concludes. “If you’ve specialised, you are more likely to be hired for doing that one thing well rather than a generalist.”



Above Rob Pellow, digital design director at Bristol-based CRM agency Armadillo
t: @DastardlyBeard
w: dastardlybeard.com



Above Leon Brown, developer and owner of Nextpoint, the Liverpool-based educational content company
t: @_LeonBrown
w: nextpoint.co.uk

Right Legwork is a small studio working with big clients, such as this campaign for the NBA All-Star Weekend in collaboration with Nike Brand Design Studio. Due to its size, it employs only generalists and brings in specialists as freelancers

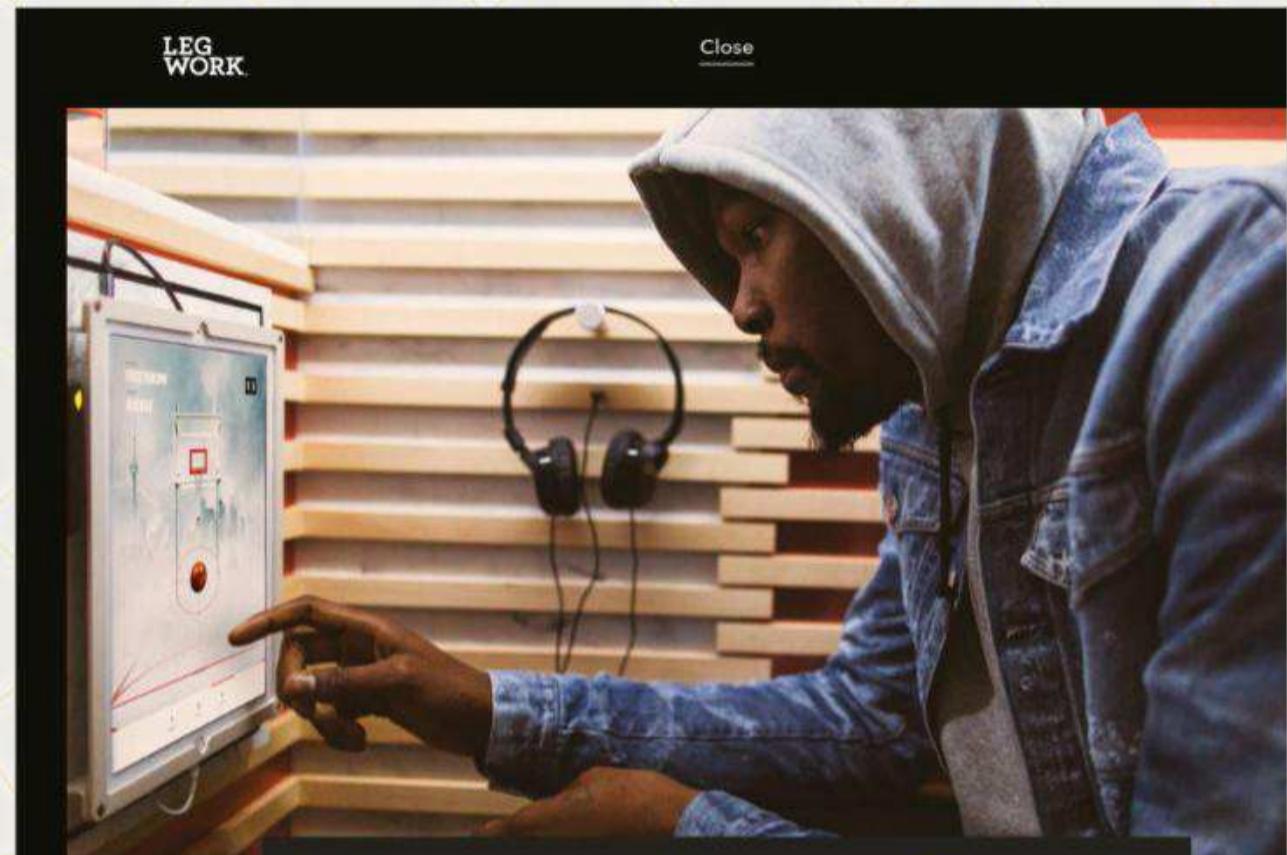
people who do that work? That's what you should choose."

Find your path

But what if you don't have a particular passion? There's no need to stress. Often the urge to specialise will come later on in your career. "Designers and developers who specialise tend to either follow or find their path," says Brown. "Those who follow the path to their specialism are people who've had a specific idea of what they wanted to do from early in their career. Those that find the path to their specialism, conversely, are products of the opportunities they've come across."

For Pellow, it was the latter. "For me, specialising was a natural progression," he says. "I've always been someone who rolls with opportunities, rather than setting out specific goals to achieve. I never thought that email would be the thing I specialised in. But essentially, it is just a new medium to apply creative thought to."

It's been a long journey from his beginnings as a generalist. "When I took



The screenshot shows the Armadillo website with a dark background. The logo 'armadillo' is in green and orange. A navigation bar at the top includes 'What we do', 'Who we are', 'Our work' (which is highlighted in yellow), 'Blog', and 'Contact us'. Below the navigation, there is a graphic of three green circles connected by dashed orange lines forming a curved path. The main headline reads 'Sparkling CRM that clicks every box'.

my first few steps into the world of web, I assumed I was going to be amazing at everything from design through to database development," he recalls. "That was clearly naive and I found my own sweet spot covering the middle ground of UX, front-end code and being able to work with the people at different ends of that spectrum. That doesn't make me a generalist though: it means my specialism is acting as a conduit between those personality types."

And you needn't worry too much about picking the 'right' specialism. "There is

Above Armadillo recruits both generalists and specialists, but digital design director Rob Pellow says: "It's not enough to be really good at your job; you need to be able to talk to people from all areas of the business"

a long-standing argument in the industry about which programming languages are the most relevant and which design software is being used," says Ashleigh More-Hattia, web developer instructor at RED Academy, a technology and design school with campuses in Vancouver, Toronto and London. "But the truth is that someone, somewhere out there is still using one or the other and if it is being pushed out of the economy, a specialist will surely know about it. Part of being a specialist means you



Above Maggie McKosky, head of UX and product design at Shutterstock in New York
t: @maggiemckosky
w: shutterstock.com

Left Stock image library and creative platform Shutterstock aims to strike a balance between hiring generalists and specialists, depending on the needs of the team and organisation at the time

► should have the ability to know what and when to change or upgrade, in order to keep things relevant.”

Adapt to survive

And that leads us on to another important point: choosing between generalism and specialism is not a ‘one-and-done’ decision you’ll be stuck with forever. As the industry continues to get more diverse, with new tech such as AR continually shaking things up, you can only benefit from staying adaptable.

For this reason, Toby Pestridge, creative director of Bournemouth studio Createful, believes that designers and developers need to follow Bruce Lee’s advice and ‘be like water’. “We should all follow the famous martial artist’s advice,” he says. “Because a failure to do so is to shackle oneself to the past. I don’t need to remind you of the pace of technological growth, adoption and innovation. I’m sure I’m not unique in discovering this as my career has unfolded before me.”

And being able to constantly adapt your skill set isn’t just about reacting to new

technologies. It’s also because clients often change their minds about what they want you to do. “In my experience as a freelancer, most customers have only a vague idea of what they need,” says Anton Balitsky, a freelance UX designer based in Warsaw, Poland.

Consequently, he has become what he describes as a “specialist on the outside, generalist on the inside”. “Project requirements can change overnight or even after the initial call,” he explains. “So the more skills you can pick up quickly, the more you can solve problems and keep customers happy.”

Generalise first, specialise later

If this all seems overly complicated, there’s one thing most people we talked to agreed on. It’s usually best to start your career as a generalist, even if you become a specialist later down the line. “My advice is that if you’re jumping into the idea of becoming a web designer, try to form a well-rounded set of skills,” says More-Hattia. “Be a generalist first and use those avenues and opportunities to discover your interests and potential specialities through that journey. You might not know what you want to do, so why not try as many as you can?”

Pellow offers some similar advice.

“Start with a broad understanding of the whole process, then specialise – but don’t leave everything else behind,” he urges. “We all work on designing and developing stuff for humans to use. All the best people I’ve worked with understand that and can apply that level of thought to how they are going to approach a task or a challenge.”

At the end of the day, as long as you’re doing fulfilling work and following your passion, it doesn’t really matter whether you move backwards or forwards on the spectrum between generalist and specialist, believes McKosky. “There is room in any organisation for a hybrid of the two,” she says. “Specialists have a tendency to turn into generalists without trying and in some cases out of necessity. Perhaps a designer working at a startup is required to wear many hats or there are shifts in the organisation, requiring them to take more on and learn other skills.”

“It ultimately comes down to the individual and the craft but I suggest all designers strive to strike an ongoing balance of thinking strategically, acting like a generalist who can explore many problems while also delivering designs that speak to a specialist’s focused expertise,” she adds.

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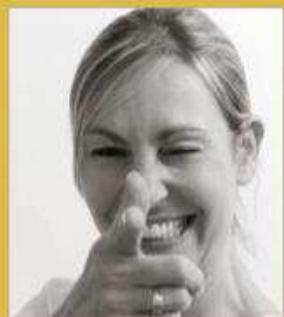
In fact, if you're a quick enough learner and have a long enough career, it's even possible to become both a generalist and a specialist. "A generalist can incrementally grow certain skills enough to become an elite specialist," points out Shane Mielke, an award-winning creative director based in California and author of *LAUNCH IT*. "A specialist who is forced to change skills can become a multitalented generalist. So you can have a fun and amazing career as a generalist, a specialist or both if you're in it for the long game."

And he offers himself up as an example. "Twenty-plus years into my career, I've been fortunate to achieve industry recognition for design, Flash, animation, photography, HTML, JavaScript and WebGL development because I chose to both specialise and generalise," he says. "As a result, I'm making more money, having more fun and securing better creative opportunities than ever before. So don't be afraid to specialise or try everything. Do it your way. Just have fun and stay in the game as long as possible." ■

Above "Web design seems to be moving in the generalist's favour because technology is growing at such a rapid rate," says RED Academy's Ashleigh More-Hattia. "Companies are still finding themselves, others are changing to catch up and there are so many different roles that need to be filled"



CASE STUDY



Nadia Turan, executive creative director at DAM Digital, a London-based UX agency, has worked at several big-name studios over the past two decades.

She's managed to transcend the simple divide between generalist and specialist.

"At my age, I've had the time to become not just a specialist but more of a polymath," she explains. "I've evolved with the demands of our industry and have had to specialise in various areas – but not in everything. For me, when we talk about design, UX design, IA, UI and interaction design, it's about bigger thinking. That's why we hire people who choose to focus or specialise in a particular area. They help us produce the best possible user experiences for our clients because they add different thinking as well as skills."

Even when hiring, though, it's not a simple question of looking for people with the 'generalist' or 'specialist' label. "To be successful in today's industry, you

GIMM LESS OF A SPECIALIST, MORE OF A POLYMATH

Nadia Turan

linkedin.com/in/nadia-turan-2457b116/

have to be flexible and adapt very quickly," she stresses. "We look for candidates who are bright, can adapt quickly, are flexible in terms of adopting new innovations and have the ability to constantly relearn."

"If you are a specialist, you need to have a deep understanding of your area but also the ability to see where your discipline lies within the bigger picture. We need to be on the same wavelength; for example, I want my front-end developers to work in harmony with my creative designers."



Above Ashleigh More-Hattia, lead web developer instructor at RED Academy, the technology and design school [w: redacademy.com](http://redacademy.com)

FEATURES

Take the fast track to CEO



TAKE THE FAST TRACK TO CEO

Christopher Murphy explores the process of building a business, from a company of one to an agency of many, sharing some strategies that help you plan ahead for future growth

AUTHOR

CHRISTOPHER MURPHY

Murphy is a tweed-clad designer, writer and speaker who works with purpose-driven businesses, enabling them to grow and thrive.

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In these days of relatively low-cost design tools and hyper-connectivity, it's easier than ever to establish and expand a business. There are clear strategies available for building a business, growing from a role as a freelancer in a company of one to managing multiple employees as

a boutique agency.

The good news is that opportunities for smaller, boutique agencies are growing. With the reach that the web affords, it's possible to establish a small, focused agency that can take on larger projects that have the potential for growth.

Even if you're starting out solo or in a partnership, it helps to plan ahead, getting the foundations for growth in place so that you're all set to go should the work come flooding in.

It's all about the clients

It's clearly impossible to build a business without clients so it's important to establish strategies upfront to develop a solid client base.

Word of mouth is often the best approach to finding new clients and – if all has gone according to plan – you should have at least a handful of initial clients who can act as your first wave of champions. Think of these as your trailblazers: they're the ones that you can gently encourage to share your story, passing on your details – and an all-important recommendation – to their peer network.

Happy customers often open the door to other – hopefully equally happy – customers. With that in mind, it's important to ensure that every client's experience is a delightful one. Under-promise, over-deliver and ensure your communications are always clear; even if you're running a little behind on a deliverable, honesty's the best policy.

Testimonials on your website – right up front on your primary landing pages – ►

► can make all the difference. Testimonials increase trust, showcase the scope of your client base and – above all – demonstrate client appreciation; they're useful for putting new clients' minds at rest, showing that you have an established track record. It's equally helpful to list your clients right up front – again, this builds believability.

Leads, leads, leads!

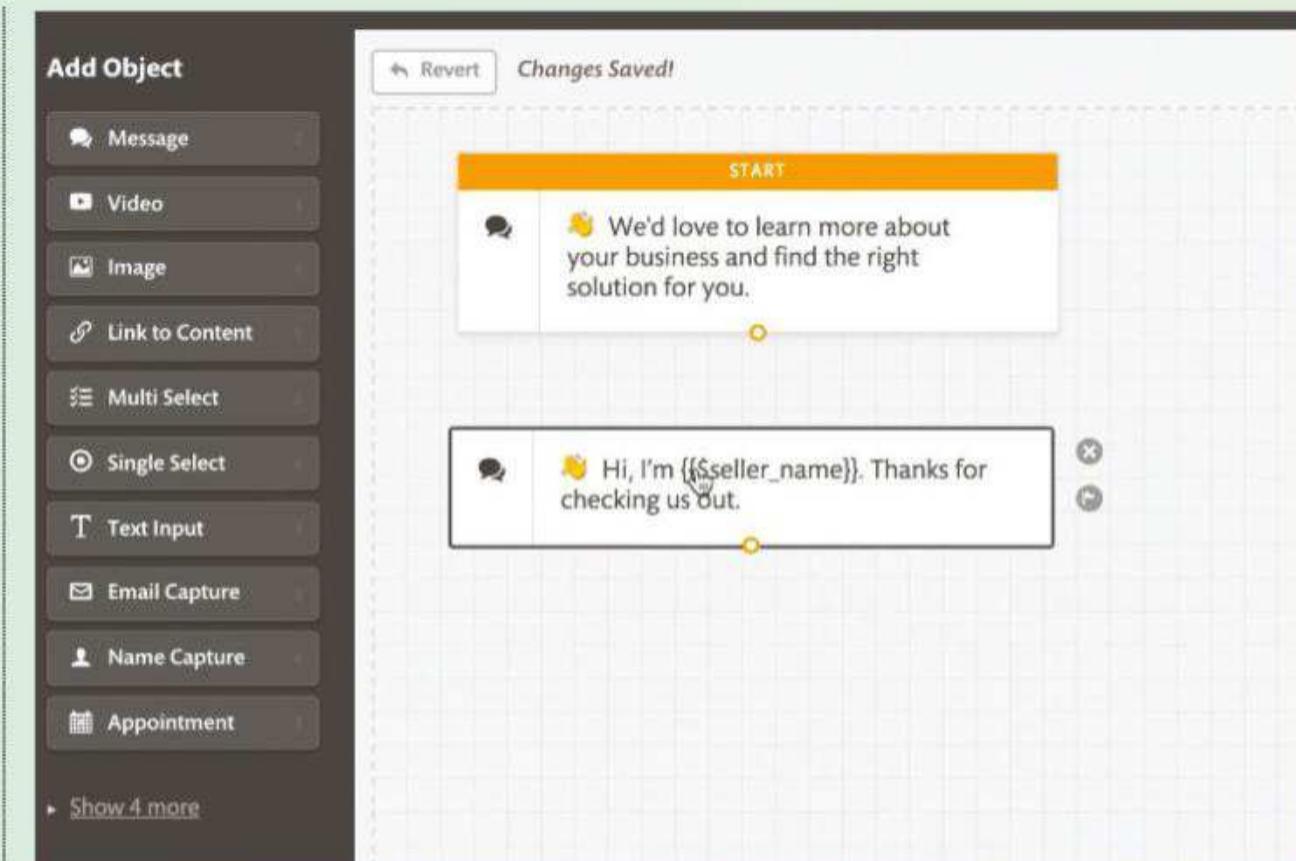
In addition to word of mouth there are a multitude of tools you can put in place for generating leads via your studio's website. Continually (*continually*, [Intercom](#) ([intercom.com](#)) and JivoChat ([jivochat.com](#)), for example, enable you to turn your website's passing visitors into possible clients.

By enabling you to start a conversation with your website's visitors, client engagement tools enable you to connect with potential new customers and increase your online sales. While word-of-mouth client recommendations are usually stronger, these tools are still a route to potential new leads. By allowing you to drag and drop content fragments to create conversational pitches, tools like Continually enable you to build intelligent digital sales assistants, available night and day.

There's been a huge growth in this category of tools thanks to the rise of big data, machine learning and conversational interfaces. Not only are client engagement tools useful to studios eager to grow, they're also a useful additional offering for clients. If you're looking for an all-in-one chat platform, JivoChat ([bit.ly/jivoreferral](#)) offers design studios 30 per cent in recurring commission for each client install plus free usage of their platform. This enables you to try the tool and earn money too. Win, win.

Develop lead magnets

In my article 'Share' (back in *net* #298) I explored the value of content strategy and content marketing. As I noted: "In today's connected world it's possible to share your thinking with a global audience who are just a click away. The web offers a wealth of content but that



Serve clients better and be proactive in assisting them and you'll soon supercharge your business growth

doesn't mean there isn't room for another voice: yours."

One powerful content marketing approach is the creation of 'lead magnets', incentives designed to build audiences. A 'lead magnet' is a term for a piece of content that attracts leads (hence the magnetic metaphor) and they're usually digitally downloadable content: e-books, and checklists, for example, as well as and other information-focused resources.

Googling 'lead magnet' returns 53,800,000 results so there's a great deal of noise you'll have to cut through but take a strategic approach and you can still stand out from the crowd. Focus on a specific niche – an area your studio specialises in – and then build your content around that. In time, you'll be rewarded with an audience that not only grows but that values you and your studio's perspective.

Lead magnets don't have to be time-consuming to build either. Beacon ([beacon.by](#)), a startup based in Belfast,

offers a web-based tool that enables you to create professional-looking magnets in minutes.

Customer lifetime value

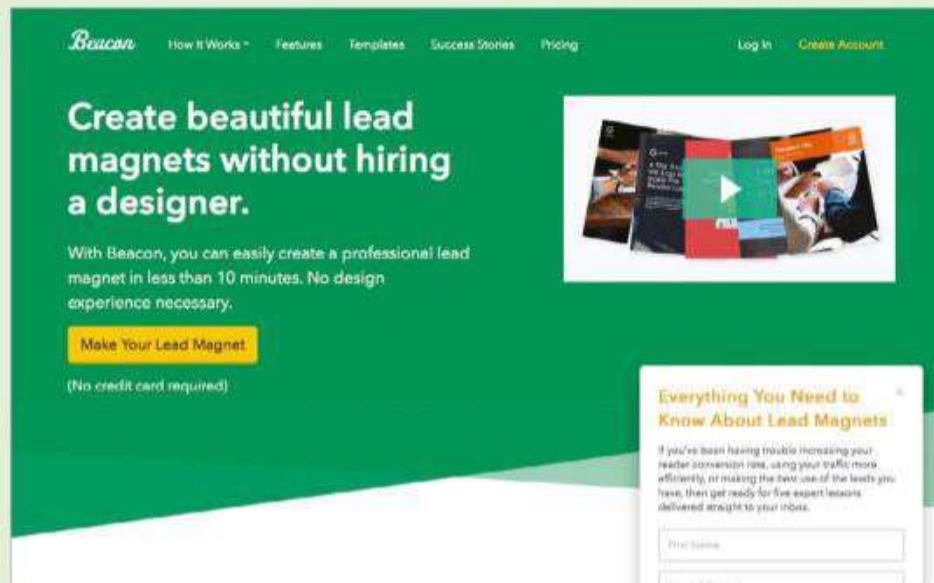
Acquiring new customers – whether it's through client-engagement tools or lead magnets – can be costly. A better approach to building your business is to focus on the customers you have and grow their value over time by maximising their customer lifetime value (CLV).

This was an idea which I explored in depth in my article 'Loyalty' (*net* #303), noting: "Customer lifetime value is the amount a customer spends with you over their lifetime and it's where your true growth lies."

Over time as you build your business, you'll very likely discover that a core set of clients contribute the majority of the income. It's absolutely critical that you take care of these core clients; they're the beating heart of your business. Consider how you can serve them better and be



the fast track to CEO



Create beautiful lead magnets without hiring a designer.

With Beacon, you can easily create a professional lead magnet in less than 10 minutes. No design experience necessary.

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Turn your website visitors into paying customers with JivoChat!

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proactive in assisting them and you'll soon supercharge your business growth.

Your relationship with your clients will – all being well – grow over time. Ideally, you'll nurture your clients and, as their business grows, so too will your opportunities to satisfy their need for additional services and maximise their CLV.

Build a team

As your client base grows and the scope of your projects widens, you'll need to give some thought to building a team. Early on in your business, your team will likely be loose and informal but – over time – it can become the foundation to build an agency upon.

One of the benefits of being a 'company of one' is that your working relationships are flexible at the outset. Hiring other freelancers on an ad hoc basis as you grow your business enables you to explore other designers' and developers' strengths and weaknesses. It also allows

Far right There are a growing number of client engagement tools that use automation to help you build a 24/7 virtual chatbot sales team.

Above Building your client base with lead magnets is simple with Beacon (<https://beacon.by>). Helpfully they provide a lead magnet that explains lead magnets. Meta!

Bottom Turn your website visitors into paying customers with JivoChat (<http://bit.ly/jivoreferral>).

Case Study: Little Thunder

littlethunder.co

A boutique experience design business based in Belfast, Little Thunder was founded in 2013 by designers Gaby Muldoon and Tim Potter. Over its half a decade history, the company has grown from a two-man team to a digital agency that now has a rapidly expanding team of designers, developers and animators.

As the company has grown, its client base has expanded from a local focus based largely in Belfast to an international focus with clients further afield.

Little Thunder now counts Electronic Arts (EA), Visa and PwC as clients and it's a measure of the esteem in which the company is held that many global businesses now pay a retainer to secure its services.

Muldoon and Potter graduated from Belfast School of Art's interaction design programme in 2004 and 2006 respectively. After joining the art school's teaching team they co-founded the company. As they like to describe it: "The 'co' originally stood for collaboration, now it stands for company."

Side projects are an important part of the company's culture. Their children's picture book, *Chalky and the New Sports Car*, successfully secured £13k on Kickstarter in 2014 and, more recently, they've spun out their lovingly illustrated learning materials *Little Steps* (littlesteps.to), turning it into a standalone, education-focused business in its own right.

They believe side projects are important for acquiring and honing new skills and they practise what they preach. Always learning, they're a team that's making its mark on a world stage, thanks to their work developing design systems for companies like EA and others.



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Electronic Arts

We worked with the larger EA Global Experience Design team at EA to create a design system that would provide consistency and consistency across their global IT domains.

FEATURES

Take the fast track to...

Customer acquisition

A company can't grow without clients, so the following tools are perfectly positioned for the task of generating and managing leads, enabling you to widen your client base.

The screenshot shows the Continually website interface. At the top, there's a navigation bar with links for Customers, Blog, Templates, Pricing, Log In, and Sign Up. Below the navigation, a large blue header section says "Get more qualified leads" and "Convert more website visitors to customers by responding automatically". It features a search bar and a button labeled "Try now for free". Below this, there's a preview of a web browser showing a scheduling tool interface. A sidebar on the left lists "Lead generation tools" such as "Email newsletters", "Social media", "Email newsletters", "Email newsletters", and "Email newsletters".

Continually

<http://continual.ly>

Designed by the team that built Typecast, Continually is a tool that's designed to get you more qualified leads. Using chatbots and machine learning, Continually allows you to respond to prospective leads automatically, out of hours and across time zones. It's like your virtual, always-on PA. Nice!

The screenshot shows the SuperBooked website. At the top, there's a navigation bar with links for Pricing, Blog, Tools, Log In, and Sign Up. Below the navigation, a main heading says "Find work with a little help from your friends." It features several sections: "Make recommendations" (describing how users can recommend others), "Match & Match" (describing how users can find work), and "Match recommendations" (describing how users can find work through their network). There are also sections for "Share work" and "Organise your contacts".

SuperBooked

<https://superbooked.com>

Currently in beta, SuperBooked – the brainchild of noted web-wranglers Dan Mall and Philip Zaengle – is designed to help you find work with a little help from your friends. Built on the idea that the best opportunities come from the people you know, SuperBooked connects you to work through people you trust.

fullstory

<https://www.fullstory.com>

Although not a lead generation tool per se, fullstory captures page insights from your site, helping you design a more enticing proposition. It helps identify points where people are confused and pinpoints content they engage with, helping you craft a better pitch.

The screenshot shows a GitHub repository named "Periodic Table of Elements - HTML/CSS" by Mike Golub. The repository has 138 stars and 31 forks. It includes files for HTML, CSS, and JS. The CSS file contains styling for the periodic table grid, including color-coded categories for alkali metals, alkaline earth metals, lanthanoids, actinoids, transition metals, metalloids, other nonmetals, noble gases, and unknown elements. The JS file contains logic for element interactions. Below the code, the actual periodic table grid is displayed, showing elements from Hydrogen (H) to Oganesson (Og) with their corresponding symbols, names, and atomic numbers.

Above Our industry moves so fast, it's important to keep learning. Side projects – undertaken in down time – are a great way to keep your knowledge current and they're good marketing too.

Far right Hop Onboard! (<https://github.com/fehler/hop-onboard/>) is an open source process that enables you to supercharge your client onboarding experience.

▶ you to pinpoint who has the skills that complement yours and, equally importantly, who is reliable.

As you build your team, build with the future in mind. Ideally the ad hoc team you build in the early days will be your future co-founders or employees.

We work in a competitive sector where skilled and talented freelancers are in high demand and can command generous salaries. As you start to build a list of potential partners and employees, bear in mind that the freelancers you hire will be vetting you as much as you are vetting them. Always be on your best behaviour!

T-shaped for the win

Our industry has expanded considerably over the last decade and now encompasses more areas of specialism than one person can realistically offer. Finding the right people – researchers, designers, developers and all the other areas of specialism – is the first step in building a business.

The reality is that you'll have to wear a lot of hats when you're starting out, so focus on learning as much as possible. The more you can develop a rounded vision of all the roles a project requires, the better. This early experience traversing disciplines will enable you to manage others more effectively.

When considering potential team members, look for 'T-shaped' designers. Tim Brown, the CEO of global design

Hop Onboard

An Open Source Client Onboarding Process

Context: I developed this repository to accompany an article on 'Building a Business' that I was commissioned to write for Net magazine (Issue #312). I hope others find it useful.

This process represents the culmination of 25+ years of work as a [designer](#) working with both clients and agencies. It's my methodology and, as such, it might not fit every situation, but I find it a useful to ensure that the projects I undertake are managed efficiently.

I use this structure to inform my teaching on Belfast School of Art's [BDes \(Hons\) Interaction Design](#) programme, ensuring that my students are industry ready and have an understanding of the systems and processes typical studios use.

Although my process is structured with a number of phases, these phases often run concurrently and everything is developed iteratively.

company IDEO, defines 'T-shaped' people as having two kinds of characteristics: the vertical stroke of the T represents their depth of skill in a field, whilst the horizontal stroke of the T represents their ability to collaborate across disciplines.

When building a team, try to ensure that the candidates you consider possess these characteristics. Focus on individuals who have different but overlapping specialisms and who share a common design vocabulary and you'll build a stronger, more effective team.

Learn during down-time

As you build your business it's important to keep an eye on the future. We work in an industry that is evolving at an alarming rate. New tools and techniques are emerging at a dizzying pace. As such, it's important to identify inquisitive individuals who are always eager to learn.

All studios have down-time, even the largest; down-time certainly shouldn't be dead-time however. Instead, re-purpose it and put it to good use for learning and skills acquisition.

Identify an up-and-coming skillset, something you don't know and put your mind to work on it. It might be conversational interfaces, connected

Early on, your team will likely be loose and informal but it can become the foundation to build an agency upon

products or something else entirely – the important thing is you're learning and future-proofing your studio.

Once you've learned something new, set aside some time and run a 'lunch and learn' session. These sessions – focused on sharing knowledge – are an opportunity to build team morale and strengthen your team's capabilities. Even better, share your learning beyond the studio. Build a project and share it on CodePen (codepen.io/), helping others in the process. This is the kind of work that gets you noticed, it can lead to new partnerships with other studios or help you establish a reputation as an individual or a team that's at the forefront of their thinking.

Streamline processes

With a team in place, it helps to put some thought into developing a standardised set of processes that you can use to

improve your efficiency. By encouraging the adoption of a modular approach towards your client work, you can build a more cost-effective service.

Just like we consider the onboarding experience for a website or an application, so we can also consider the onboarding experience for our clients, improving our workflows and the clients' experience.

Think of this as a 'design system' for your business and its future growth. By formalising your processes, you can ease new team members into your working methods as you grow and develop a flexible mix-and-match offering, able to be tailored to different client's needs.

In a short feature it's difficult to cover this process in depth, so – in the spirit of sharing best practice – I've built a GitHub repository that offers a deeper dive into the process (github.com/fehler/hop-onboard). I'm a firm believer in sharing

best practice, so I'm more than happy to open source my process. Feel free to fork the repo and tailor it to suit your requirements as your studio grows.

Closing thoughts

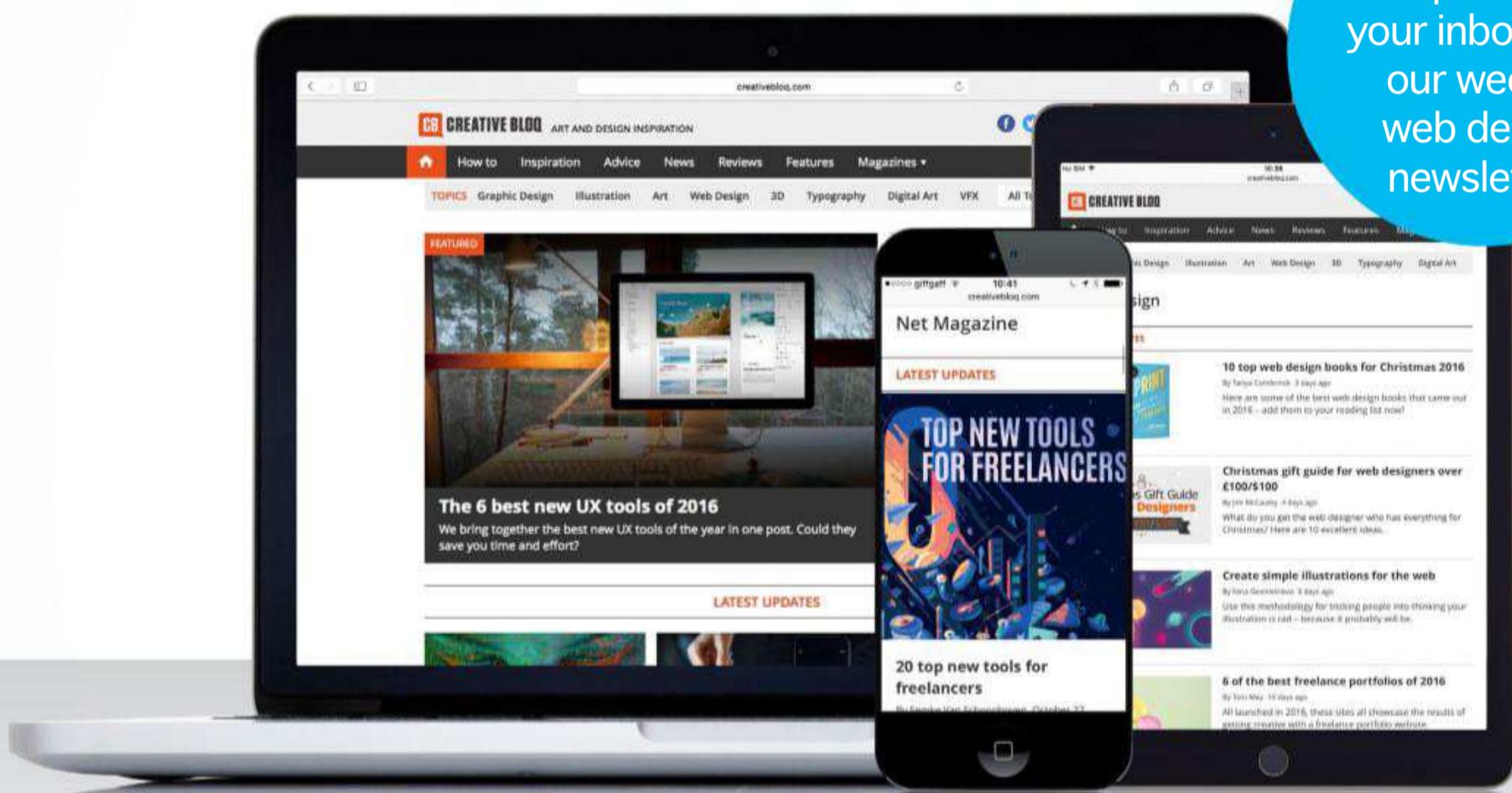
As you take the first steps on your business journey, it helps to set aside some time to plan ahead for the future. Establishing a vision at the outset provides you with a roadmap to follow.

You might be a company of one when you start out but there's no reason you can't grow into an agency of many. With the reach that the web affords, it's possible to establish a small, focused agency that can take on larger projects.

Many of the best-known studios started as solo projects or partnerships so there's no harm in dreaming big. Who knows, your studio might be the next super-studio. Good luck with your adventure! ■

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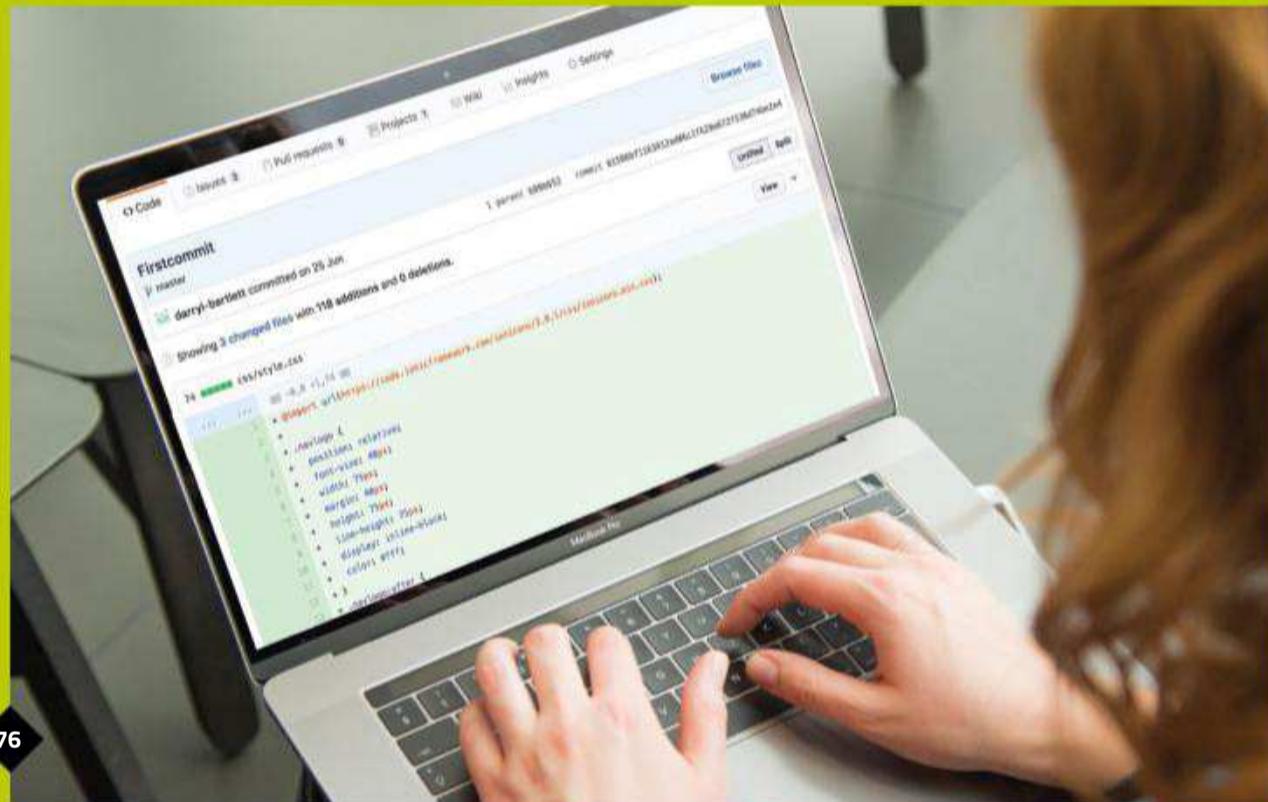
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THIS MONTH FEATURING...



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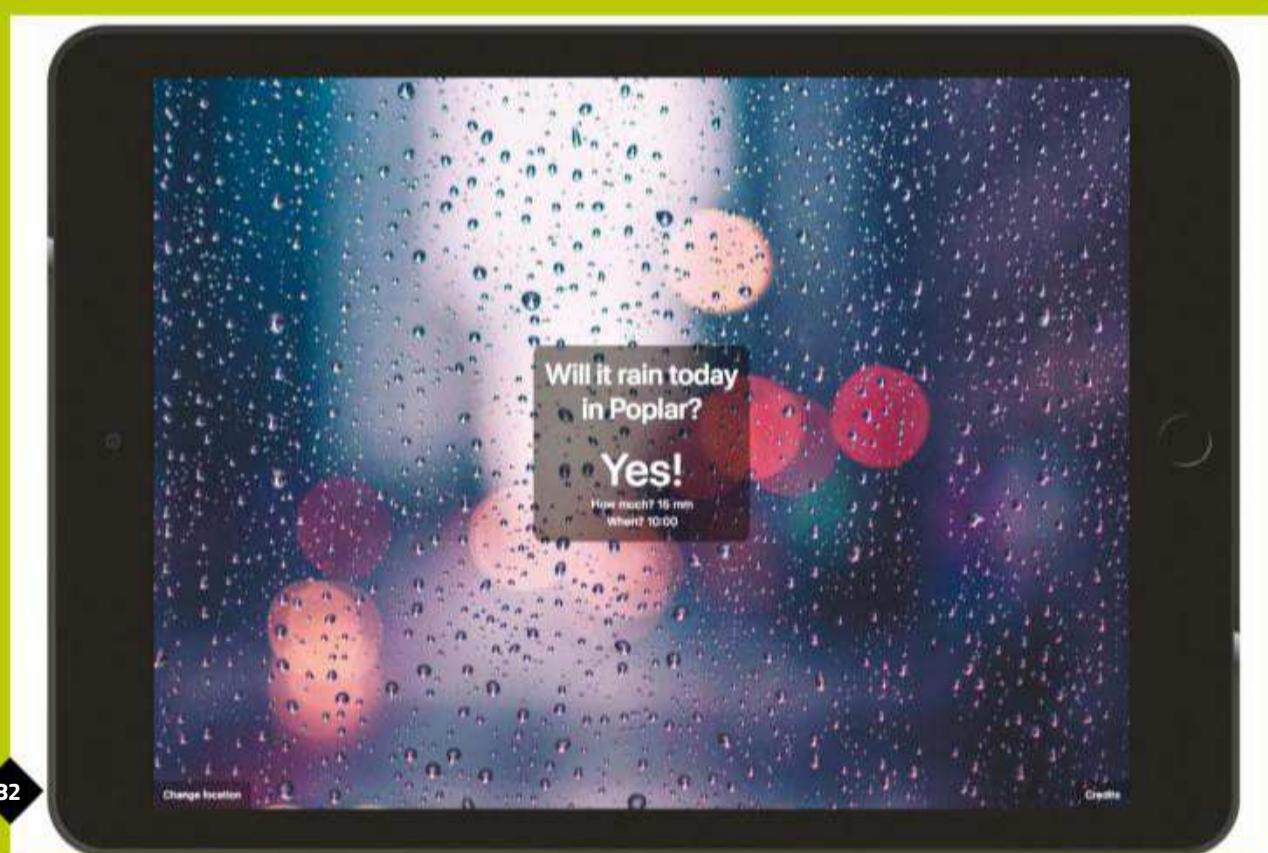
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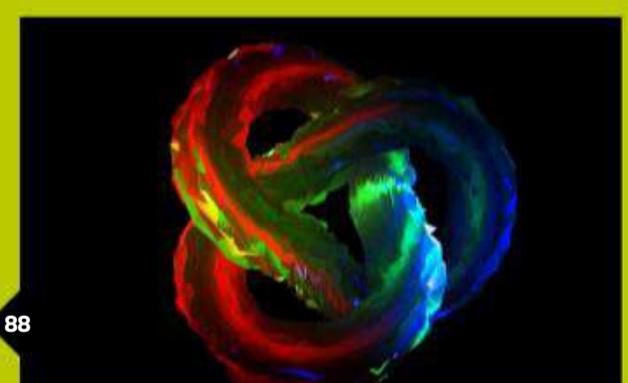
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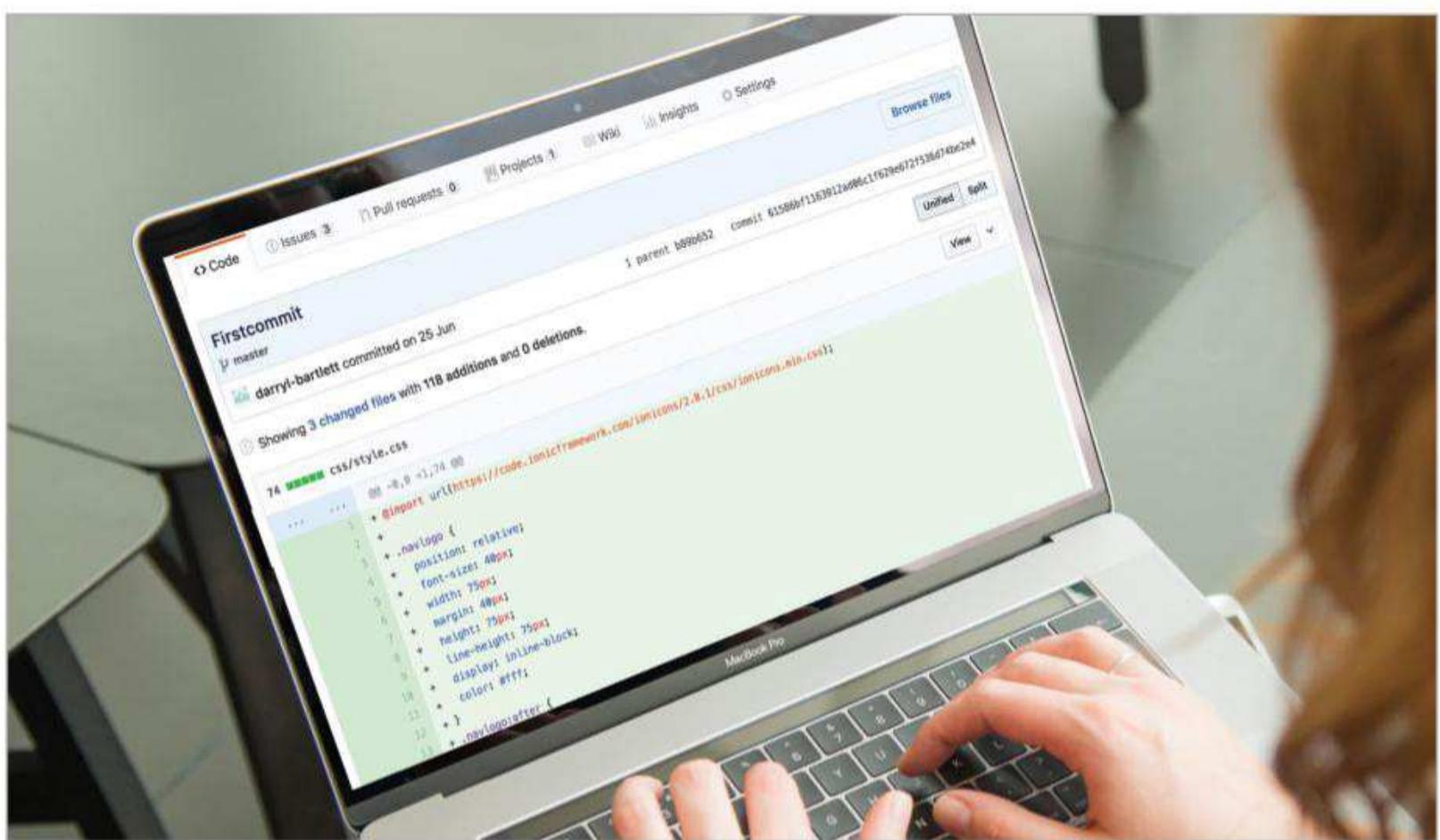
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STRICT VERSION CONTROL FOR REMOTE TEAMS

Darryl Bartlett explains how to ensure you're using meticulous version control when working with remote developer teams

Working remotely has become much more common in web development over the last few years. Before version control, working remotely on the same development project would have been an absolute nightmare. Developers would have had to send files to each other (probably through email), pasting in their own code before sending it back. There was no real way to track what had been added and when.

Thankfully, version control has arrived and made development on all fronts a lot more manageable. Web projects have become much easier to implement and manage, especially when it comes to working in a remote development team. You no longer have to worry about the current version of a website being overwritten – each team member is free to work on

any file at anytime – and there is no confusion as to where the latest version of a file is being stored.

In this tutorial, we are going to be using GitHub (www.github.com) to manage our code. There are numerous different types of version control tool out there, such as Bitbucket and TFVC, but even though they are all different, the principles remain the same when it comes to managing code.

Firstly, it's very important to have a successful branching model when working in any team to make the development and deployment process run smoothly. You are most likely going to have multiple developers working on the same project. When working with a remote workforce, I believe the best workflow is composed of three main branches as well as a set of temporary ones:

Develop branch: Every line of code has been tested and validated by the client.

Staging branch: This will correspond to the validation environment.

Release branch: This contains the last version of your website in production.

There will also be a set of feature branches. However, these will just be temporary to initially build out the new features.

MULTIPLE DEVELOPERS ON ONE PROJECT

Let's assume you run a team with two developers who work remotely. We will call them Sarah and James: they are both working on the same ecommerce website for a client. Sarah needs to develop a feature that registers the customer details.

We would break this down into three separate user stories – adding, editing and removing – and then add these three tickets into the sprint backlog.

“It’s very important to have a branching model to make development and deployment run smoothly”

FEATURE BRANCHES

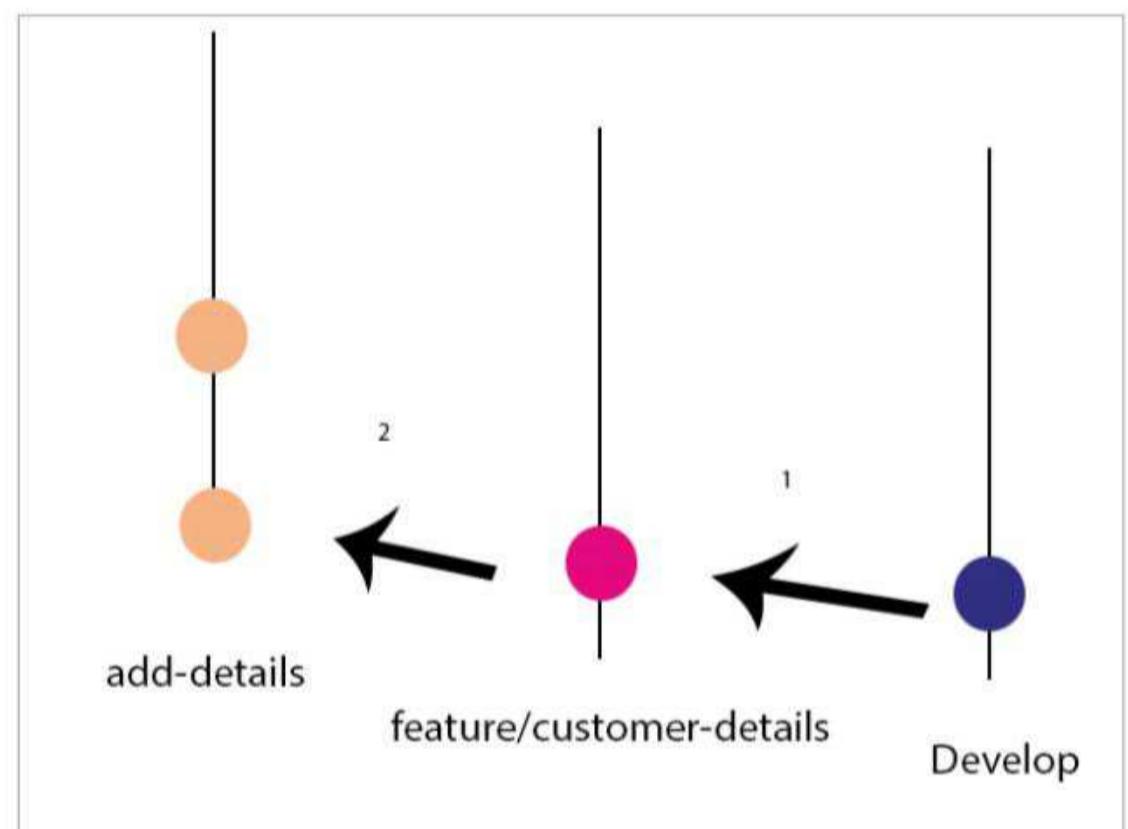
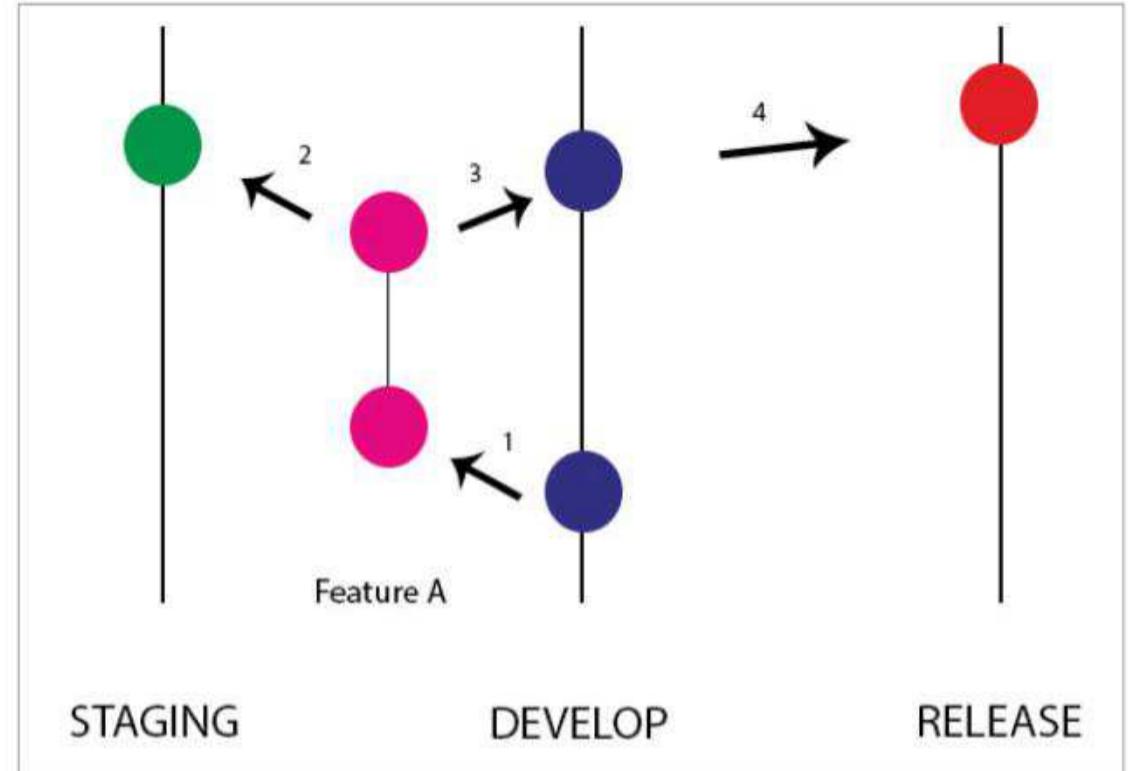
So, let's say that Sarah begins on the adding customer details section. She would need to create the feature branch `customer-details` and a user story one for the first task `add-details`.

```
git checkout develop && git pull origin/develop
git checkout -b feature/customer-details
git checkout -b add-details
```

Sarah would continue to work on the temporary branch `add-address` locally and commit her work as she develops. Now, let's say that James wants to help Sarah with the customer details feature, so he starts working on the details deletion.

James would pull the last version of the shared branch and create a new branch for the user story `delete-details`. Then he can start making his own additions without worrying about overwriting Sarah's code.

```
git checkout feature/customer-details
git pull origin/feature/customer-details
git checkout -b delete-details
```



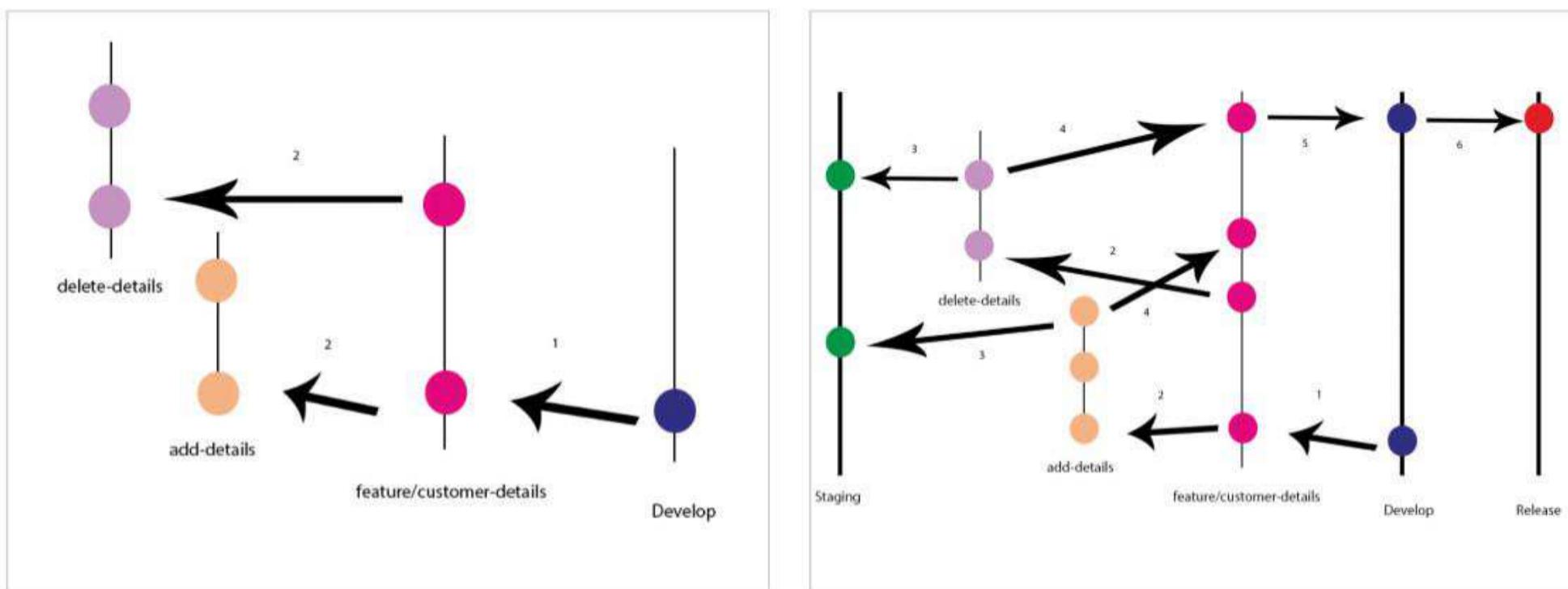
He will also use his temporary branch to code locally and commit any changes. Once Sarah has finished her feature locally, she puts the ticket into code review. She would push her code to the staging branch and open a pull request with the staging environment.

```
// She pushes her code to the staging branch
git push origin add-details
// She opens a pull request with the staging environment
git request-pull staging add-details
```

We would now have the `customer-details` feature branch and the two user story feature branches in development `add-details` and `delete-details`.

Top The best workflow is composed of three main branches: develop, staging and release

Above Adding a feature branch for the developing of a `customer-details` feature and adding a user story branch for `add-details` task



Above left Creating a new branch for the user story delete-details, allowing you to making additions without worrying about overwriting another person's code

Above right Once ready to deploy, merge develop into release and launch the deployment

MERGING

Once her code has been reviewed, she can merge her branch into staging. The ticket is now in the validation column, waiting for the validation from the lead developer.

```
// She gets the last version of the staging branch
git checkout staging && git pull origin/staging
git merge add-details && git push origin staging
// She builds the validation environment
// and asks the product owner to validate
```

Once Sarah's work has been validated, the ticket can be moved into the done column. She can merge her work into the feature branch and start another user story, like deletion of customer details.

```
// She pulls the last version of the feature branch
git checkout feature/customer-details
git pull origin feature/customer-details
git merge add-address && git push origin feature/
customer-details
```

When the whole feature has been validated by both the lead developer and client, Sarah can merge the feature branch into develop, as it's ready to go.

```
// She gets the last version of the develop branch
git checkout develop && git pull origin/develop
git merge feature/customer-details && git push
origin develop
```

DEPLOY TO PRODUCTION

Once all is complete and it's ready to deploy into production, James merges develop into release and launches the deployment. At this point he would

know that all code is correct and the client is happy. He tags the commit of the release to get the history of each version.

```
git checkout develop && git pull origin/develop
git checkout release && git pull origin/release
git merge develop && git tag 2.1
git push origin release --tags
```

RULES TO FOLLOW FOR THIS WORKFLOW

This remote development workflow can be pretty difficult to understand at first but if you get your

“If you work by this method, then you have a free working flow without needing to panic about overwriting files”

team to work by this method, then you have a free working flow without the need to panic about files being overwritten or your developers working on the same area.

There are some key things to remember:

- The first thing you will need to teach your remote developers is your version control workflow and make sure that they are all reading from the same book.
- If you are developing a feature, try to break this down into smaller user stories. This way it's easier to keep track of every commit.

- Don't miss out any steps: the same workflow must be followed each time.
- You will always need to merge your branch into develop to prepare the next release.
- You should clean the staging repository every week if possible. You should delete the staging branch, locally and remotely, and recreate it from develop branch – see example below:

```
git co develop && git pull origin/develop
git branch -d staging && git push origin --delete staging
git co -b staging && git pull origin staging
```

ADDITIONAL WORKFLOWS

With smaller projects, you may want to use a less complex workflow. You could use master, which contains the most up to date version, a develop branch and then a set of branches for each additional feature – whether that be forum, contact form, checkout system. It all depends upon your personal preference.

MANAGING MERGE CONFLICTS

Dealing with merge conflicts is difficult enough if you are all working in the same room but they can become even more of a nightmare if you are all working in a different office. The most important thing is to remember that you can always undo a merge and revert back to the state before the conflict occurred.

Whether you are doing all of the merges as lead developer or your team are the ones doing them independently, the first step is to understand what has happened.

- Did one of your co-developers edit the same line in the same file?
- Did they delete a file that you modified?
- Did you both add a file with the same name?

Git will tell you that you have unmerged paths via `git status`:

```
$ git status
# On branch checkout-system
# You have unmerged paths.
# (fix conflicts and run "git commit")
#
# Unmerged paths:
# (use "git add <file>..." to mark resolution)
#
#       both modified: checkout.html
#
no changes added to commit (use "git add" and/or "git commit -a")
```

DICIONARY CORNER

GIT TERMS EXPLAINED

 If you are not already familiar with version control, then here are a few terms you will be seeing quite a lot of when working on your projects.

Repository

This is essentially a project folder. Repositories store every single project file. They can be made public or kept private.

Commit

As a developer, you will be using this a lot. Think of it as saving an updated file to its original folder. It will overwrite an older version if necessary and the commit will usually come with a message that contains a brief description of the change. For example: "Header colour change".

Clone

You will use clone to take a copy of an existing repository. This can sit locally or remotely.

Branch

This will be used when you want to create a new feature or an upgrade for your website. You can merge a branch back into the master when you have completed your changes.

Fetch

You will use fetch when you need to get the latest changes from an existing repository.

Fork

When you fork a repo, you are taking a copy of another user's repository. This allows you to experiment without affecting the original project.

Push

This is used to push your committed changes to a remote repository. For example, you may have worked on something locally and want to push those changes.

Merge

You will use merge to take changes from one branch and apply them to another.

Issue

You can create issues for suggested improvements, tasks and even questions.

★ RESOURCES

DISCOVER MORE

Here is a list of resources that will help you on your way with learning and discovering more about version control, GitHub and working within a remote development team.

The new native
Extend your GitHub workflow beyond your browser with GitHub Desktop, completely redesigned with Electron. Get a unified cross-platform experience that's completely open source and ready to customize.

[Download for macOS](#) [Download for Windows](#)
By downloading, you agree to the [Open Source Applications Terms](#).

GitHub Guides
<https://guides.github.com>
There is no better place to learn about GitHub than from the official guides homepage, especially if you are new to GitHub or version control in general.

GitHub Desktop
<https://desktop.github.com>
If you don't like working with the command line, then GitHub offers a piece of software with a great UI that allows you to manage your GitHub repositories.

Guide to remote development teams
<https://x-team.com/remote-team-guide>
X-Team offers several great guides on the best ways to manage and communicate when working in a remote development team.

A visual guide to version control
<https://betterexplained.com/articles/a-visual-guide-to-version-control>
If you are completely new to version control, this guide gives a more visual explanation to how it works and why we use it.

► Now, the most common cause of a conflict is when changes affect the same files on the same line. So, let's have a look at the contents of the conflicted line. You will notice that Git is really good in the fact that it will mark the conflicted area by enclosing it in <<<<<HEAD and >>>>>[other/branch/name]. In this case, it's `checkout-system`.

<<<<< HEAD

This line was committed while working in the "user-form" branch.

=====

This line, in contrast, was committed while working in the "checkout-system" branch.

>>>>> refs/heads/checkout-system

"It's just as important as a lead developer to have a project management tool to manage things like tasks and bugs"

The contents after the first marker originate from your current working branch. After the angle brackets, Git tells us which branch the changes came from. A line with ===== separates the two conflicting changes.

You can now simply open the file in an editor, search for the conflict markers and make any necessary modifications. When you're done, the file needs to look exactly as you want it to look or, alternatively, you can tell Git that you'll simply go with one of the edited versions, called `ours` or `theirs`.

`git checkout --ours path/to/conflict-file.html`

There are also many merge tool applications that can help with this. Kaleidoscope is a great one for Mac.

PROJECT AND ISSUE MANAGEMENT

It's just as important as a lead developer to have a project management tool to manage things such as tasks and bugs, especially when your developers are not office based. There are numerous solutions out there, such as ZenHub and Asuna, but I believe GitHub's built-in project and issue system is the best.

You can do things like set up a new project, create boards or assign issues. And don't just confuse issues with problems: you can also use it for enhancements, questions and bugs, among other things.

The screenshot shows the GitHub interface with the 'Issues' tab selected. A modal window is open at the top, titled 'Label issues and pull requests for new contributors'. It contains the text: 'Now, GitHub will help potential first-time contributors discover issues labeled with `help wanted` or `good first issue`'. There is a 'Dismiss' button in the top right corner of the modal.

Below the modal, the main Issues page is visible. It features a search bar with the query 'is:issue is:open', a 'Filters' dropdown, and buttons for 'Labels' and 'Milestones'. On the far right is a green 'New issue' button. The issue list shows three items:

- #4 New Markup enhancement (labeled 'enhancement')
- #3 Create Navigation
- #2 Website Redesign Epic (labeled 'Epic')

At the bottom right of the issue list, there is a small icon with a red, green, and blue square.

HERE ARE A FEW OF ITS BEST FEATURES:

Built-in tagging system: Allows you to organise and prioritise your workflow and easily search through projects for relevant information.

Milestones: Perfect for associating issues with specific features or project phases, such as bugs that need to be fixed before a beta launch or tasks to be completed in October.

Multi assignments: Issues can be assigned to users in bulk, saving time and making you more efficient.

Commenting: Engineers and management teams can easily discuss progress and results at every step of the way using the inbuilt commenting system.

Task lists: Larger issues can be broken down into stages to discourage the creation of dozens of microscopic issues, keeping all of your work in the same place.

Markdown format: The ability to use markdown formatting will prove popular with your developers and it can be used in most places around GitHub.

Project boards: These can be used to house issues, pull requests and notes, categorising them as cards in columns of your choosing so you can look at larger projects as a whole.

High security: You can trust GitHub to keep your data safe and it's harder to breach than most other project management systems.

SETTING UP A PROJECT

- If you go to GitHub.com and then head to one of your repositories, you will see a tab that is called

Projects. From there you can select New Project, set up your project details and create a new project template.

- If you now select the Issues tab that is along the top and select New Issue, you will be able to create a new issue. You can then apply various labels – these are things such as bug, enhancement, question and duplicate. You might also use enhancement for a new feature or request. You can then assign various team members to the task, a milestone and also the project you just created.

Assigned members will then have a list of all their tasks and you can even use the project board to keep a track of what's currently being built. If you remember our earlier tutorial, we were talking about moving tickets to sprint backlog and validation. So GitHub works really well as an all-in-one tool for overseeing a project.

CONCLUSION

Hopefully, this has helped you understand the best ways to manage version control when overseeing a remote team. Although there are various methods out there and companies will already have their own procedures in place, I find these are the ones that work best. Sometimes it will depend on the kind of project you are overseeing but it's best to try and stick to the same plan each time.

Top Don't confuse issues with problems: you can also use issue labelling for enhancements, questions and bugs


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*** SERVICE WORKER**

LESSEN LOADING TIMES USING SERVICE WORKERS

Daniel Crisp shows you how to augment apps with a service worker to add offline support and provide caching for snappier loading times

In this two-part tutorial, we're going to show you how to progressively enhance your site or web app with a service worker to give you faster loading times and offline support.

In part one, we'll learn about service worker registration and set up a bare bones worker that will cache and serve our static assets, delivering a huge performance boost on subsequent loads. Next issue, in part two, we'll learn how to cache dynamic API responses and give our demo app full offline support.

You're going to need recent versions of Node.js and npm installed on your computer.

CLONE THE DEMO APP

We've knocked up a demo app that we will use as the basis for this tutorial. You can clone the project here: <https://github.com/danielcrisp/will-it-rain-today>

The app is a fun little project that fetches the five-day weather forecast based on the user's location.

It'll then check if rain is forecast before the end of the day and update the UI accordingly.

It has been built inefficiently (intentionally) using large, unnecessary libraries such as jQuery and Bootstrap, with big unoptimised images to demonstrate the difference in performance when using a service worker. It currently weighs in at a ridiculous 4.1MB.

GET YOUR API KEY

In order to fetch the weather data from the API you will need to get yourself a free API key from OpenWeatherMap:

<https://openweathermap.org/appid#gen>

Once you've got your key, open up index.html and look for the `window.API_KEY` variable in the `<head>`. Paste your key into the value:

```
window.API_KEY = 'paste-your-key-here';
```

[View source files here!](#)

All the files you need for this tutorial can be found at
<https://github.com/danielcrisp/will-it-rain-today/tree/tutorial>

START THE DEVELOPMENT SERVER

Now we're ready to start working on the project. First of all let's install the dependencies by running:

```
npm install
```

There are two tasks for the build tool. Run `npm start` to start the development server on port 3000. Run `npm run build` to prepare the 'production' version. Bear in mind that this is only a demo, so isn't really a production version – there's no minification or anything – the files just get 'revved'.

WHAT DOES 'REVVED' MEAN?

An algorithm is used to create a hash, such as `9c616053e5`, from the file's contents. The algorithm will always output the same hash for the same contents, meaning that as long as you don't modify the file, the hash won't change. The hash is then appended to the filename, so for example `styles.css` might become `styles-9c616053e5.css`. The hash represents the file's revision – hence 'revved'.

You can safely cache each revision of the file on your server without ever having to invalidate your cache, which is expensive, or worry about some other third-party cache serving up the incorrect version.

SERVICE WORKER

So what is a service worker? It's a script, written in JavaScript, that your browser runs in the background. It doesn't affect the main thread (where JavaScript usually runs on a web page), and won't conflict with your app code or affect the runtime performance.

A service worker doesn't have direct access to the DOM or events and user interaction happening in the web page itself. Think of it as a layer that sits between the web page and the network, allowing it to intercept and manipulate network requests (e.g. Ajax requests) made by your page. This makes it ideal for managing caches and supporting offline usage.

So, let's get started and create a file called `sw.js` in the root of the `src` directory. Then add these two event listeners to log the `install` and `activate` events:

```
self.addEventListener('install', (event) => {
  console.log(event);
});

self.addEventListener('activate', (event) => {
  console.log(event);
});
```

The `self` variable here represents the service worker's global read-only scope. It's a bit like the `window` object in a web page.

Next we need to update our `index.html` file and add the commands to install the service worker. Add this script just before the closing `</body>` tag. It will register our worker and log its current status.

```
<script>
if ('serviceWorker' in navigator) {
  navigator.serviceWorker.register('/sw.js')
    .then(function(reg) {
      if (reg.installing) {
        console.log('SW installing');
      } else if (reg.waiting) {
        console.log('SW waiting');
      } else if (reg.active) {
        console.log('SW activated');
      }
    })
    .catch(function(error) {
      // registration failed
      console.log('Registration failed with ' + error);
    });
}
</script>
```

Start your development server by running `npm start` and open the page in a modern browser. We'd recommend using Google Chrome as it has good service-worker support in its DevTools, which we'll be referring to throughout this tutorial. You should see three things logged to your Console; two from the service worker for the `install` and `activate` events, and the other will be the message from the registration.

LIFECYCLE

The life of a service worker follows a simple flow, but it can be a bit confusing when you're used to JS scripts just working immediately:

Installing → Waiting (installed) → Activating → Activated → Redundant

When your page is first loaded, the registration code we added to `index.html` starts the installation of the service worker. When there is no existing worker the new service worker will be activated immediately after installation – as we saw with our console logs in the previous step. A web page can only have one service worker active at a time.

If a worker is already installed, the new service worker will be installed and then sit at the waiting step (unless skipped – see next step) until the page is fully closed and then reloaded. Simply refreshing is not enough because you might have other tabs open. You need to ensure all instances of the page are closed otherwise the new worker won't activate.



- You don't have to close the tabs, you can just navigate away to another site and return.

Both `install` and `activate` events will only occur once per worker. Once activated, the service worker will then have control of the page and can start handling events such as `fetch` to manipulate requests.

Finally a service worker will become redundant if the browser detects that the worker file itself has been updated or if the `install` or `activation` fail. The browser will look for a byte difference to determine if a worker script has been updated.

It's important to note you should never change (or rev) the name of your service worker. Nor should you cache the worker file itself on the server, as you won't be able to update it easily, though browsers are now smart enough to ignore caching headers.

SKIPWAITING

We're going to tell our worker to skip the waiting step and activate now. Open the `sw.js` file and add this line anywhere inside the `install` event listener:

```
self.skipWaiting();
```

Now, when we update the worker script, it will take control of the page immediately after installation. It's worth bearing in mind that this can mean the new worker will be taking control of a page that may have been loaded by a previous version of your worker – if that is going to cause problems, don't use this option in your app.

You can confirm this by navigating away from the page and then returning. You should see the `install` and `activate` events fire again when the new worker has been installed.

Chrome DevTools has a helpful option that means you can update your worker just by reloading. Open DevTools and go to the Application tab, then choose service workers from the left column. At the top of the panel is a tick box labelled Update on reload, tick it. Your updated worker will now be installed and activated on refresh.

Let's confirm this by adding `console.log('foo')` call in either of the event listeners and refreshing the page. This caught us out because we were expecting to see the log in the console when we refreshed, but all we were seeing was the 'SW activated' message. It turns out Chrome refreshes the page twice when the Update on reload option is ticked. You can confirm this by ticking the Preserve log tick box in the Console settings panel and refreshing again. You should see the `install` and `activate` events logged, along with 'foo', followed by 'Navigated to `http://localhost:3000/`' to indicate that the page was reloaded and then the final 'SW activated' message.

LISTENING TO REQUESTS

Time to add another listener. This time we'll track the `fetch` event that is fired every time the page loads a resource, such as a CSS file, image or even API response. We'll open a cache, return the request response to the page and then – in the background – cache the response. First off let's add the listener and refresh so you can see what happens. In the console you should see many `FetchEvent` logs.

```
self.addEventListener('fetch', (event) => {
  console.log(event);
});
```

Our serve mode uses `BrowserSync`, which adds its own script to the page and makes websocket requests. You'll see the `FetchEvents` for these too, but we want to ignore these. We also only want to cache GET requests from our own domain. So let's add a few things to ignore unwanted requests, including explicitly ignoring the `/index` path:

```
self.addEventListener('fetch', (event) => {
  // Ignore crossdomain requests
  if (!event.request.url.startsWith(self.location.origin)) {
    return;
  }
  // Ignore non-GET requests
  if (event.request.method !== 'GET') {
    return;
  }
  // Ignore browser-sync
  if (event.request.url.indexOf('browser-sync') > -1) {
    return;
  }
  // Prevent index route being cached
  if (event.request.url === (self.location.origin + '/')) {
    return;
  }
  // Prevent index.html being cached
  if (event.request.url.endsWith('index.html')) {
    return;
  }
  console.log(event);
});
```

Now the logs should be much cleaner and it is safe to start caching.

CACHING THE ASSETS

Now we can start caching these responses. First we need to give our cache a name. Let's call ours `v1-assets`. Add this line to the top of the `sw.js` file:

```
const assetsCacheName = 'v1-assets';
```

Then we need to hijack the FetchEvents so we can control what is returned to the page. We can do that using the event's `respondWith` method. This method accepts a Promise so we can add this code, replacing the `console.log`:

```
// Tell the fetch to respond with this Promise chain
event.respondWith(
  // Open the cache
  caches.open(assetsCacheName)
    .then((cache) => {
      // Make the request to the network
      return fetch(event.request)
        .then((response) => {
          // Cache the response
          cache.put(event.request, response.clone());
          // Return the original response to the page
          return response;
        });
    })
);
```

This will forward the request on to the network then store the response in the cache, before sending the original response back to the page.

It is worth noting here that this approach won't actually cache the responses until the second time the user loads the page. The first time will install and activate the worker, but by the time the `fetch` listener is ready, everything will have already been requested.

Refresh a couple of times and check the cache in the DevTools > Application tab. Expand the Cache Storage tree in the left column and you should see your cache with all the stored responses.

SERVING FROM THE CACHE

Everything is cached but we're not actually using the cache to serve any files just yet. Let's hook that up now. First we'll look for a match for the request in the cache and if it exists we'll serve that. If it doesn't exist, we'll use the network and then cache the response.

```
// Tell the fetch to respond with this chain
event.respondWith(
  // Open the cache
  caches.open(assetsCacheName)
    .then((cache) => {
      // Look for matching request in the cache
      return cache.match(event.request)
        .then((matched) => {
          // If a match is found return the cached version first
          if (matched) {
            return matched;
          }
        });
    })
);
```

FURTHER READING

CACHING THE INDEX FILE

 The index file points to all of our revved assets but it isn't revved itself. If we change any of those assets and therefore their revved filenames change, we could end up in a scenario where the user gets stuck on an old version because they are using the index file from their cache, which points to the old versions.

For that reason we have explicitly prevented the index route from being cached in our assets cache. We'll return to this in part two of this article, coming next month.

```
}
```

```
// Otherwise continue to the network
return fetch(event.request)
  .then((response) => {
    // Cache the response
    cache.put(event.request, response.clone());
    // Return the original response to the page
    return response;
  });
}
});
```

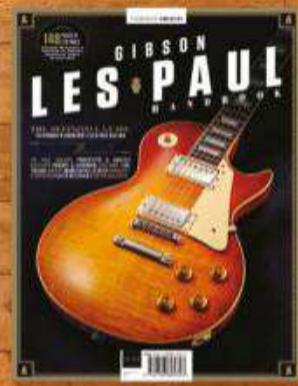
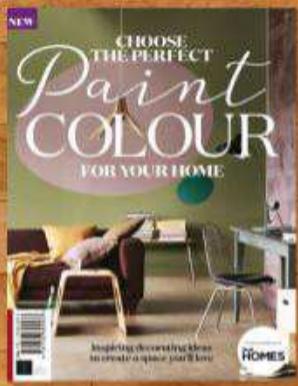
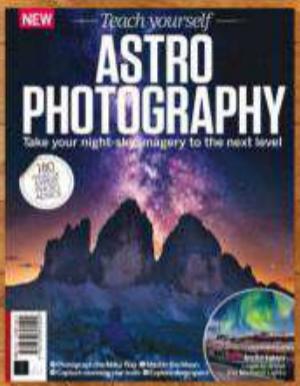
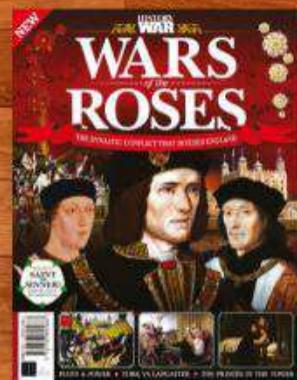
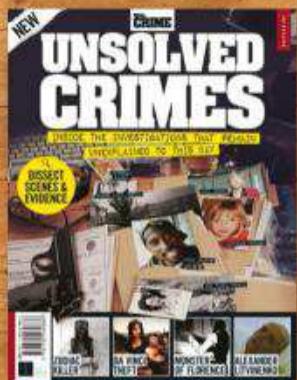
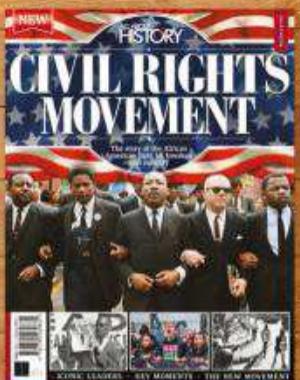
Save the file and refresh. Check DevTools > Network tab and you should see (from ServiceWorker) listed in the Size column for each of the static assets.

Pew, we're done. For such a small amount of code, there's a lot to understand. You should see that refreshing the page once all assets are cached is quite snappy but let's do a quick (unscientific) check of load times on a throttled connection (DevTools > Network tab).

Without the service worker, loading over a simulated fast 3G network takes almost 30 seconds for everything to load. With the service worker, with the same throttled connection but loading from the cache, it takes just under a second.

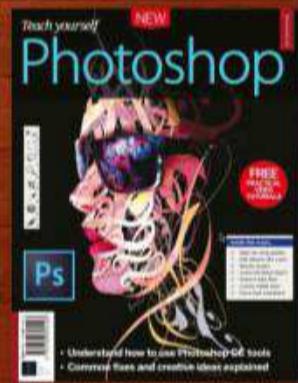
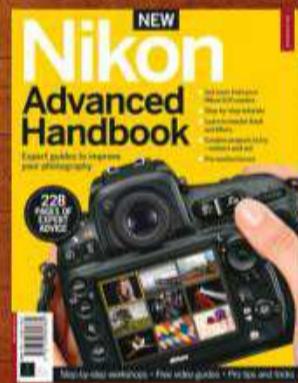
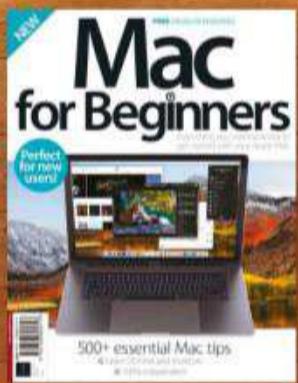
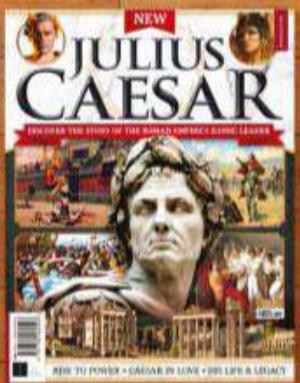
RESULT

Check the Offline box and refresh and you'll also see that the page loads without a connection, although we can't get the forecast data from the API. In part two, we'll return to this and learn how to cache the API response too. 



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★ ACCESSIBILITY

ACCESSIBILITY IS PROFITABLE

Chimmy Kalu on why all companies should realise accessible products are great for business

In most companies, accessibility is an afterthought because of the perceived additional cost. But accessibility is only expensive if it's not included from the beginning and it has far more benefits than are immediately obvious.

BEYOND PERMANENT DISABILITY

We are implored by the W3C to create websites that are perceivable, operable, understandable and robust.

Some features are easier to convince engineers and designers to implement because they're relatable:

- Combining colour and other sensory features with non-sensory elements (like text or icons);
- Ensuring that there is sufficient contrast between text and background colours;
- Using sans serif fonts that are legible and comfortable to read.

However, a few other things are really difficult to get people to implement because they assume the use cases are only for disabled users:

- Supporting navigation with the keyboard, using focus and hover states. People are often unable to think past screen readers or people with one arm;
- Writing alt text for all images – rarely considered because the effort is felt to be significant compared to the size of the disabled user base.

A LARGER SLICE OF THE PIE

The World Health Organisation describes disability as occurring at the interaction of people with society. Disability can be temporary – a broken arm – or situational. Many people's abilities are impacted, far beyond what we think of when we think "disability." Accessible design supports all of these users.

When we design for:

- Keyboard navigation, we support parents operating one-armed because they're holding their baby;
- Assistive technologies – like screen readers or voice – we support drivers unable to focus on their screens or people using phones in bright sunlight;
- The deaf using closed captioning for videos, we support non-native language speakers and situational deafness e.g. at airports;
- Declining dexterity, we enable inebriated, distracted or sleepy people to use our products too.

The examples above are just a few but show that accessible products are exposed to more traffic, increased usage and possibly higher conversion.

When Google started, you had to know how to spell to use their product. By using more accessible design, allowing for even the most egregious spelling errors, they've become synonymous with search. Drunk people get Ubers all the time. That's profitable. ■

PROFILE
Chimmy (@geekaspora) is UX designer and a member of the accessible web guild at Condé Nast International and helped make all BA.com US-facing websites AA standard.

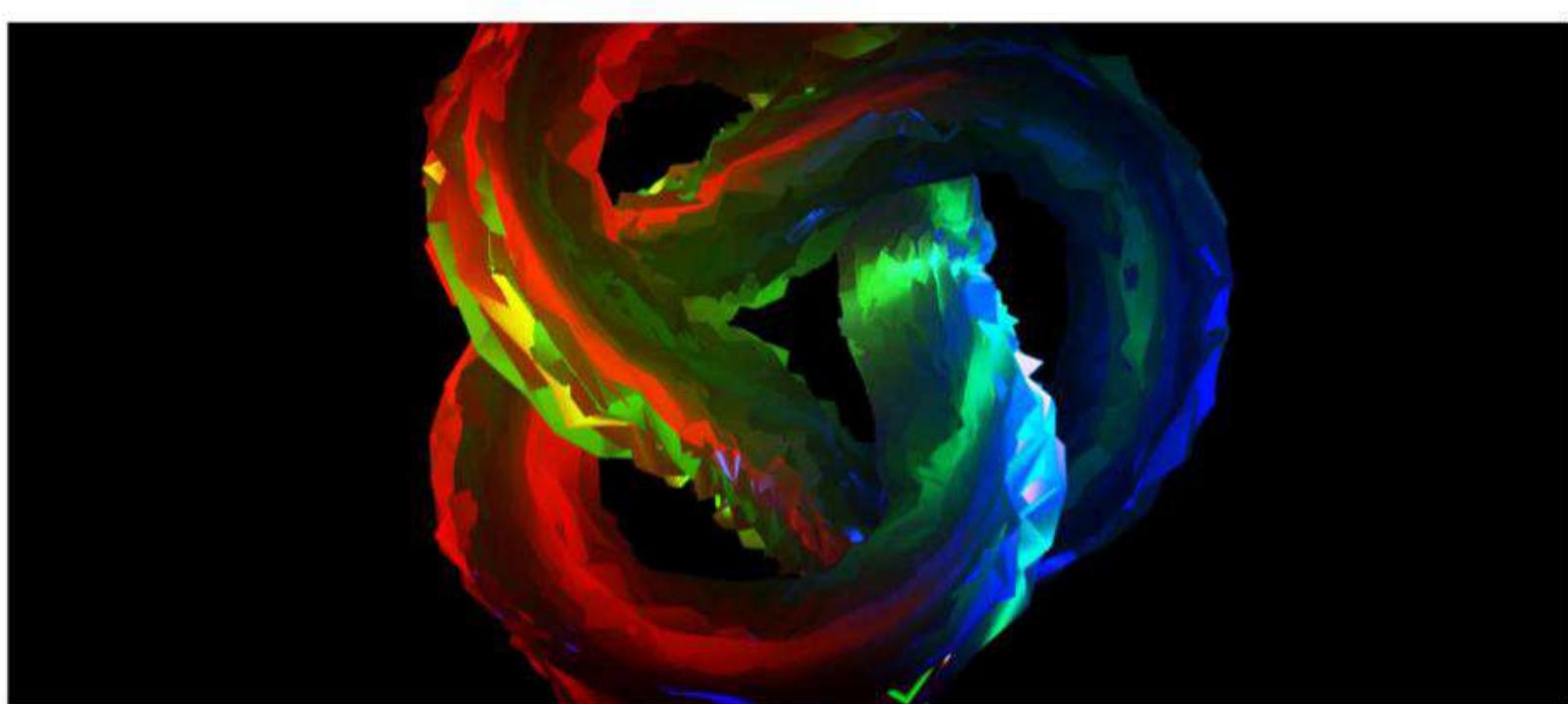
*



ABOUT THE AUTHOR

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designer, developerareas of expertise:
Shaders, VFX, WebGL

* THREE.JS

DISPLACE VERTICES WITH SHADERS IN THREE.JS

Richard Mattka continues to explore shader programming in this tutorial focused on how to use vertex shaders to manipulate object vertices in 3D

 Graphic shaders enable a wide range of effects by working directly with the graphics hardware of devices. They are highly efficient, executing on the GPU. They are powerful for web and game development because they run in real-time, without needing to pre-render, which means they are reactive and potentially interactive.

In previous articles, you learned what shaders are, how to get them into your 3D Web code and created many of your own. You learned about post-processing, animations, cool effects and blurs and more. This tutorial continues by showing you how to manipulate the vertices of 3D objects using the vertex shader. Combined with fragment shaders you'll gain some cool effects you can use right away.

SETUP A BASIC HTML PAGE

For your vertex displacement project, start by setting up the basic HTML page. This tutorial will use Three.js to handle drawing to the HTML canvas. Add a reference to the Three.js library. You can download Three.js library here: github.com/mrdoob/three.js

```
<!DOCTYPE html>
<html lang="en">
<head>
  <script src="three.min.js"></script>
  <style>
    html, body { margin: 0; padding: 0; }
    canvas { width: 100%; height: 100%; }
  </style>
</head>
<body>
  <script>
    // main code here
  </script>
</body>
</html>
```

ADD VERTEX AND FRAGMENT SHADERS

You can load shaders in different ways. This inline technique is great for simple prototypes and quick tests. You can also load shaders from external files to keep your code organised. Add these tags in the `<head>` of your html to hold your shader code.

```
<script id="vertexShader" type="x-shader/x-vertex">
</script>
<script id="fragmentShader" type="x-shader/x-
fragment">
</script>
```

CREATE AN INITIAL VERTEX SHADER

Add a simple vertex shader to your code now. This will pass through the position data to the fragment shader. You will come back to this shader shortly to manipulate the geometry of your object. For now, though, add this vertex shader code between your vertex shader script tags:

```
varying vec2 vUv;
void main() {
    vUv = uv;
    gl_Position = projectionMatrix *
modelViewMatrix * vec4(position, 1.0 );
}
```

CREATE A FRAGMENT SHADER

Next, copy and paste your favourite shader between the fragment shader tags you created. You can use the one provided here or your own.

There are a few things to adjust when migrating code from external sources. First, be sure references to `FragCoord` are updated to `gl_FragCoord` and `FragColor` to `gl_FragColor` to match up to Three.js's internal references. If you use functions for loading textures such as `texture` it needs to use the supported `texture2D`. Some code may use variables (uniforms) such as `iGlobalTime` instead of `iTime` or `resolution` instead of `iResolution`. Make sure those are consistent in your shader code and the uniforms you'll set up later. Last, make sure you update the `mainImage` function declaration to use the simpler form `main` with no parameters.

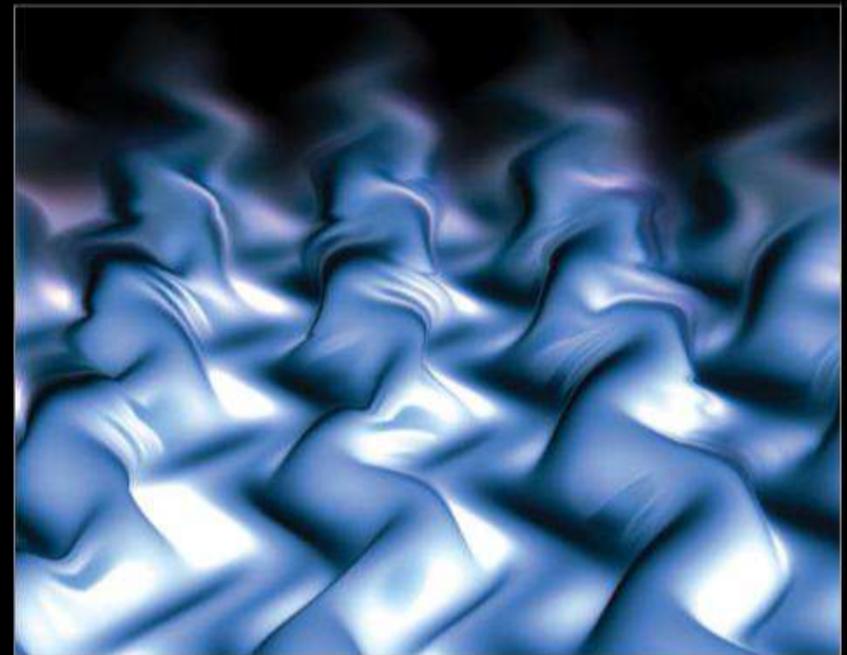
Your fragment shader code between the shader's script tags, should look like this now, if you want to use this sample one:

```
uniform float iTime;
uniform vec2 iResolution;
varying vec2 vUv;
void main(){
    vec2 uv = vUv; // from our vertex shader
    vec2 p = (2. * uv - 1.); // centre
    float d=.01; // intensity
    vec3 col; // colour
    float l = length(p*.5);
    float t = iTime*.2; // adjust speed
    for(int i=0;i<=6;i++){
        uv+=p/l*(cos(l - t));
        col[i]=d/length(mod(uv,1.0)-.5);
```



★ SHADERS

WHAT ARE 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.

Fragment shaders

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

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.

SYNTAX

THREE.JS

CORE ELEMENTS



Three.js is a powerful WebGL library for web apps and sites

+ 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.

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 and Shader. Materials are used to texture the faces of an object's geometry. Attributes include 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 pre-defined 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.

```

    }
    gl_FragColor=vec4(col/l,0.);
}

```

SETUP A BASIC 3D SCENE

You now need to add your JavaScript code to create a basic 3D scene. You'll add some global variables, create a scene, a camera and the renderer and add it to your web page. Add this code:

```

var camera, scene, renderer;
var uniforms, material, mesh;
var startTime = Date.now();
var clock = new THREE.Clock();
init();
function init() {
    //create a Three.js scene
    scene = new THREE.Scene();
    // add a camera
    camera = new THREE.PerspectiveCamera( 45,
    window.innerWidth / window.innerHeight, 1, 1000000 );
    camera.position.z = 4;
    // add the renderer
    renderer = new THREE.WebGLRenderer({antialias
    :true});
    renderer.setSize( window.innerWidth, window.
    innerHeight );
    document.body.appendChild( renderer.
    domElement );
}

```

CREATE A CUSTOM SHADER MATERIAL

Next, you need to create an JSON object to hold your uniform values that correspond to your fragment shader's uniforms. You've used `iTime` and `iResolution` in your shader, but if you modified your shader code be sure to include all the uniforms you wish to update. Declare the `ShaderMaterial` and assign your uniforms' JSON object and the two shaders you created previously, like this:

```

// set up uniforms
uniforms = {
    iTime: { type: "f", value: 10000.0 },
    iResolution: { type: "v2", value: new THREE.Vector2() }
};
uniforms.iResolution.value.x = window.innerWidth;
uniforms.iResolution.value.y = window.innerHeight;

// create custom shader material
material = new THREE.ShaderMaterial({
    uniforms: uniforms,
    vertexShader: document.getElementById(
    'vertexShader').textContent,
    fragmentShader: document.getElementById(

```

```
'fragmentShader' ).textContent,
    side: THREE.DoubleSide
});
```

MAKE A MESH WITH SHADER MATERIAL

Next, create a 3D mesh by combining the built-in Three.js `TorusKnotBufferGeometry` and the new material you created. Then add it to the scene. To do this add this code inside your `init` function:

```
// create object mesh
var geometry = new THREE.TorusKnotBufferGeometry(
.7,.2,100,100 );
var mesh = new THREE.Mesh( geometry, material );
scene.add(mesh);
```

CREATE A RENDER ANIMATION LOOP

To see the scene rendered by the camera, you need to render a frame. You need to call and create your animation loop. First, add the call to the animation function as the last line in your `init` function:

```
animate();
```

Then, create a new function for animation outside the `init` function like this:

```
function animate() {
    requestAnimationFrame( animate );
    render();
}
```

UPDATE SHADER UNIFORMS

Each frame you need to increment the uniform's `iTime` by the amount of time that passed since the last frame. This allows the shader to animate over time. You will use the `clock` class you declared previously to do this. Also add a little rotation to the object to see it moving over time. Add this new function:

```
function render() {
    uniforms.iTime.value += clock.getDelta();
    // rotate mesh
    mesh.rotation.y+=.01;
    mesh.rotation.x=-.01;
    renderer.render( scene, camera );
}
```

Running your code now, you can see your shader mapped nicely onto your object's mesh.

UPDATE THE VERTEX SHADER

Vertices define object geometry. There are the points of each edges intersection. You will manipulate these points using your shader code.

Try out this code below. Declare a new `vec3` for `newPosition` (`x,y,z`). You use the current Uniform value of position and multiply it by a value that will change with time (`iTime`). In this example you are using an `abs` and `sin` function to create a smooth easing in a positive direction. Try it out:

```
void main() {
    vUv = uv;
    vec3 newPosition = position *
abs(sin(iTime)*.5+1.0);
    gl_Position = projectionMatrix *
modelViewMatrix * vec4(newPosition, 1.0) ;
}
```

You can see the entire object is displaced evenly, giving the result of what is essentially scaling. This looks like it is simply moving closer and further away in Z space.

DISPLACE USING NORMALS

In order to see your displacement acting on the geometry better, you need to also use the geometry's normal values. These are the vectors that point away from the object, perpendicular to the surface. Using this value you can make your object appear to shrink and grow. Try out this code when you define the `newPosition`:

```
vec3 newPosition = position +normal* (sin(iTime)*.2);
```

APPLY SOME NOISE

There are lots of great resources for noise, such as Ashima's collection (netm.ag/2LKRW6X). Using noise can create an organic, random feel to surface distortion. It can give a rippling look or something more explosive depending on the effect's intensity. For now, we'll create our own displacement effect using the following line for our `newPosition`:

```
vec3 newPosition = position +normal* sin(iTime*normal) *
.1 + normal*.1*sin(iTime) ;
```

ANIMATING NOISE AND DISPLACEMENT

Try out this last one to see a much more dynamic effect that animates the vertices, from nice and smooth, out to triangles.

```
vec3 newPosition = position +normal* sin(iTime*normal) *
abs(sin(iTime)*.5 * normal) / normal*abs(sin(iTime)) ;
```

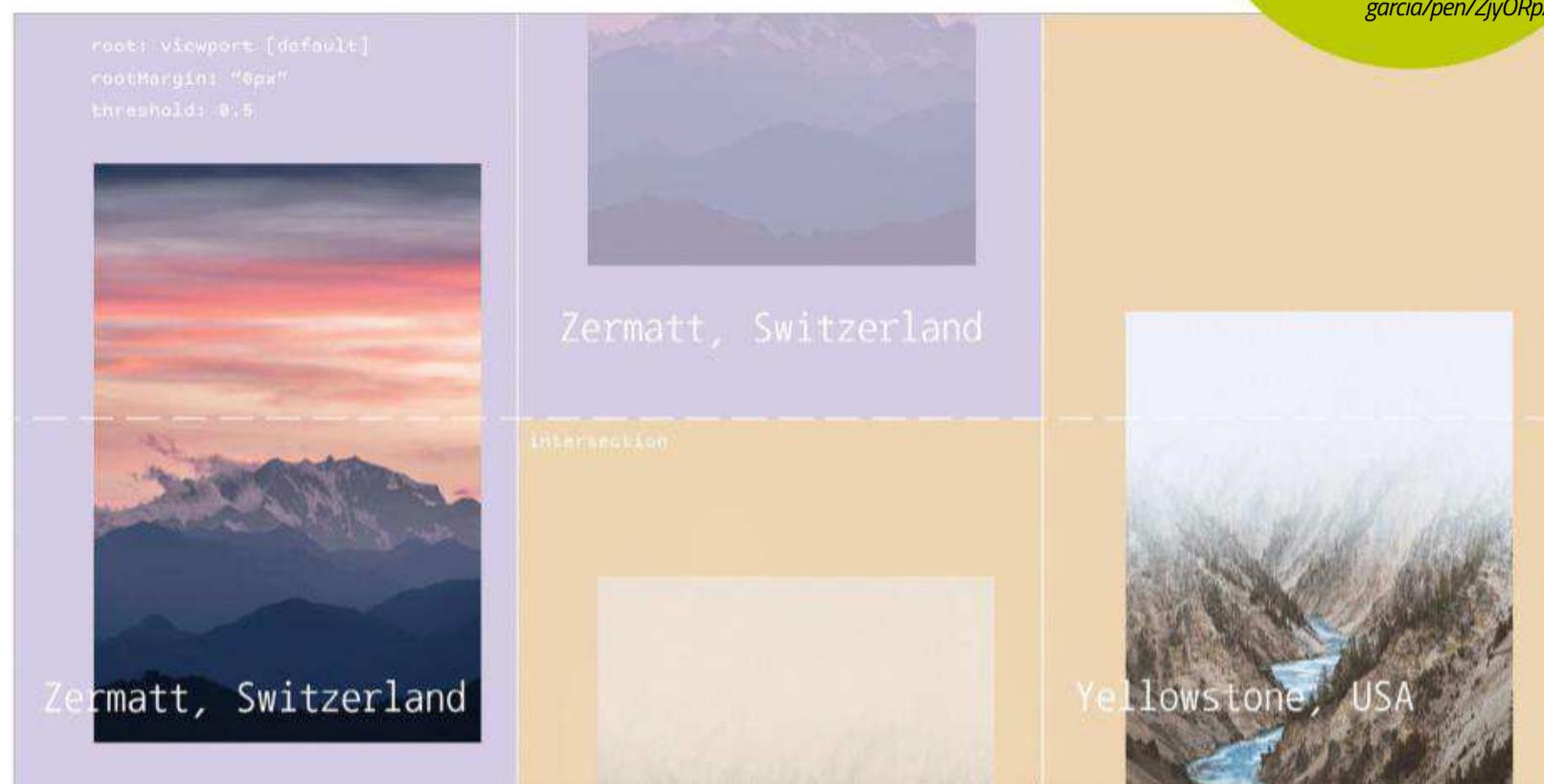
You now have the basics to start experimenting with your own FX. Try out some of those noise formulas or try out new values – it's often a process of trial and error to get the visual results you like. 



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★ INTERSECTION OBSERVER API

ANIMATE ENERGETIC SCROLLING TRANSITIONS

Emmanuel Garcia walks you through the process of using the IntersectionObserver API to execute on-scroll animations and transitions

The IntersectionObserver API is a promising and exciting new web API that tackles one of the most common issues for web developers: detecting the visibility of elements when they come into view. This API helps simplify the problem by providing a more modern solution for detecting element intersections. IntersectionObserver has many use cases for implementing deferred functionality, including lazy loading images, as well as triggering animations and transitions.

According to specs, “The IntersectionObserver API provides a way to asynchronously observe changes in the intersection of a target element with an ancestor element or with a top-level document’s viewport.” This modern web API allows you to observe and trigger a callback function when an element is visible in the viewport or intersects with another element.

Some of the previous difficulties developers have had with implementing on-scroll animations

or transitions is the heavy reliance on resource-intensive scroll events to detect when an element appears in the viewport. With the amount of complex calculations needed to solve for this, you would ultimately have to lean on third-party libraries to get the job done.

This is where IntersectionObserver comes in. It allows you to easily register a callback that is executed when an element being observed intersects with another element or with the viewport.

In this tutorial, I will explain how to set up and configure an IntersectionObserver to observe multiple elements at once, as well as watch the callbacks to trigger some nifty animations once elements intersect with the viewport.

API SETUP

To use the IntersectionObserver API you simply need to create an IntersectionObserver instance and pass

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


All the files you need for this tutorial can be found at
https://codepen.io/eman_garcia/pen/ZjyORp/

element(s) to the `observe()` function. You can also pass a `config` object into the Observer's constructor to configure with the following:

- `root`: defines the root element used as 'capture frame' for intersection checking. This defaults to the viewport but can be any element.
- `rootMargin`: defines margin set around `root`. Supports same values as CSS margins. Extends or minimises intersection point.
- `threshold`: a value or array of values between 0 and 1. It corresponds to the ratio of visibility of an element, with 0 meaning completely out of view and 1 being 100 per cent in view.

`IntersectionObserver` is direction agnostic, so it will be triggered when an element enters and leaves 'capture frame'. In the case of multiple values, the intersection callback is triggered when each threshold value is met.

“This web API allows you to observe and trigger a callback function when an element is visible”

Here is a quick sample of what that code would look like:

```
let config = {
  root: null, // avoiding 'root' or setting it to 'null' sets it to default value: viewport
  rootMargin: '0px', // margin around root. Values are similar to CSS property. Values without units not allowed
  threshold: 0.5 // visible amount of item shown in relation to root. Can also be an array [0, .25, .5, 1]
};
let observer = new IntersectionObserver(entries => {
  ...
}, config);
observer.observe(element);
```

To observe multiple elements, you can use the same `IntersectionObserver` but you'll have to iterate through all of them and separately observe each element.

```
const sections = document.querySelectorAll('.section');
sections.forEach(section => {
  observer.observe(section);
});
```

TUTORIAL SETUP

In this tutorial we'll use the `IntersectionObserver` API to observe multiple elements at once and trigger various animations and transitions as each respective panel scrolls into view. We'll use CodePen for this tutorial, with a fairly straightforward HTML structure. Start by creating the initial container element where we will add our section panels.

```
<div class="container">
<div class="sections">
  <!-- section markup goes here -->
</div>
</div>
```

Each section contains an `img` element with photography taken from a specific location, as well as header text containing the image location name.

```
<div class="section" data-bgcolor="#C1A5A9">
  <h2 class="section--header">Kénitra, Morocco</h2>
  <div class="section--image"></div>
```

As you can see, this setup is pretty simple. One thing to note is that we use a custom data attribute called `data-bgcolor` for each panel in order to animate the body background colour as each section scrolls into view. We then pull in the data attribute to our `IntersectionObserver` callback function in order to execute this functionality.

SASS + CSS VARIABLES

We use SASS (SCSS) as a preprocessor for this tutorial. You can easily set this in CodePen settings. Also, we'll add some CSS custom property variables to set some default styles, which can easily be reused throughout our SASS code.

CSS variables are pretty nifty as they are somewhat similar to SASS variables but you can also pull in these custom property values into JavaScript and update accordingly. I have also imported a Google font for this specific tutorial.

```
@import url('https://fonts.googleapis.com/css?family=Nanum+Gothic+Coding');

:root {
  --color-text: #fff;
  --color-bg: #ddd;
  --font-text: 'Nanum Gothic Coding', monospace;
  --font-size-text: 8vw;
}
```

► BODY STYLES

Here we use some of our CSS variables to set some global styles for text colour and background colour. We also add a CSS transition to the body element in order to animate and ease in the background colour when it switches on scroll.

```
body {
  min-height: 100vh;
  color: #000;
  color: var(--color-text);
  background-color: #fff;
  background: var(--color-bg);
  -webkit-font-smoothing: antialiased;
  -moz-osx-font-smoothing: grayscale;
  transition: background .3s;
}
```

SECTIONS

Each section div uses `vh` units to take up 100 per cent of the minimum height of the viewport. This is an easy way to make sure each panel has enough room to scroll through and allow images to display with its natural height.

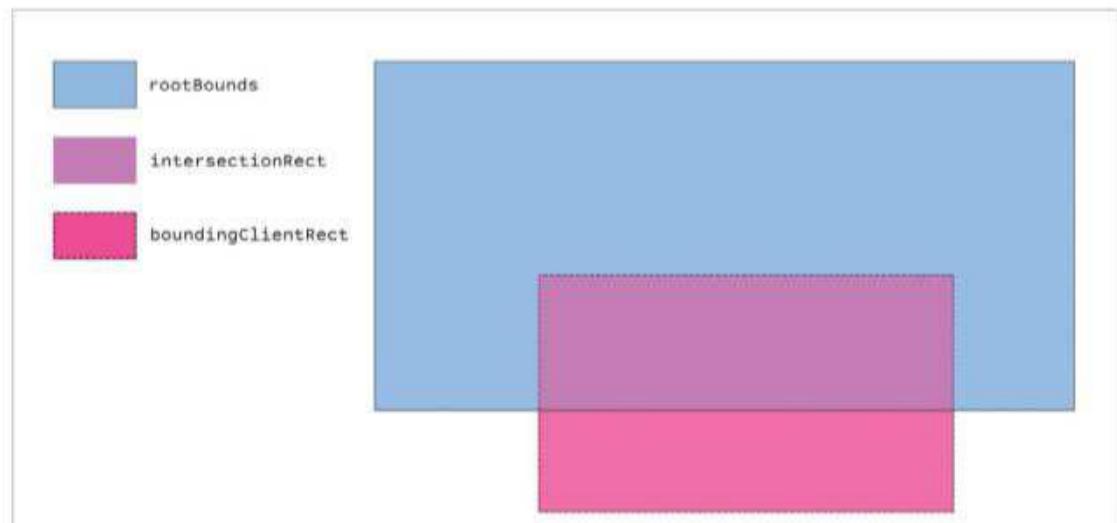
```
.section {
  position: relative;
  min-height: 100vh;
}
```

SECTION IMAGES

For the images, we align them to the right of each section and set them to `opacity: 0`. We also set a CSS transition for opacity so as to fade in/out the image as it scrolls into view using `IntersectionObserver`.

```
.section--image {
  display: block;
  position: relative;
  max-width: 100%;
  margin: 10vh 0 30vh auto;
```

Below Example of the bounding rectangles calculated by `IntersectionObserverEntry`. These calculations help to determine the `isIntersecting` property.



```
opacity: 0;
transition: opacity .3s;
.active & {
  opacity: 1;
}
img {
  display: block;
  position: relative;
  max-width: 90%;
  margin: 0 0 0 auto;
}
```

SECTION TEXT

The section location header has a couple of CSS variables in use for `font-size` and `font-family`. These can easily be changed by updating the global CSS variables we created earlier. The text is set to `position: fixed` in order to keep the element in the same position in the viewport as you scroll.

We also apply some relative length units for `padding` and `bottom` properties. `Vmax` units translate to a percentage of the width or height of the viewport, whichever is the larger dimension. For the animation, we use a sequence with keyframes to fade in the text and slide up at the same time.

```
.section--header {
  font-size: calc(var(--fontsize-text));
  font-family: var(--font-text);
  position: fixed;
  bottom: 5vmax;
  left: 0;
  padding-left: 5vmax;
  z-index: 1000;
  line-height: 1;
  font-weight: 300;
  opacity: 0;
  animation-duration: .65s;
  animation-fill-mode: both;
  .active & {
    animation-name: fadeInUp;
  }
}
```

The CSS animation is pretty straightforward as you are setting the opacity to 0 and using the `transform` property to move the element down to start. Once the animation sequence finishes, it will set `opacity` to 1 and reset `transform` to 0. This in turn creates a fluid CSS animation that takes `.65s` to complete.

```
@keyframes fadeInUp{
  0% {
    transform: translate3d(0,55%,0);
```

```
opacity:0;
transform:translate3d(0,55%,0)
} to {
  transform: translateZ(0);
  opacity:1;
  transform:translateZ(0)
}
}
```

JAVASCRIPT SETUP

For the final touch, we use the IntersectionObserver API outlined previously to detect when each section scrolls into view. We also set the threshold value to 0.5 so that observer will fire when 50 per cent of the element intersects with the viewport.

```
const sections = document.querySelectorAll('.section');
let config = {
  rootMargin: '0px',
  threshold: 0.5
}
```

“There are quite a few other use cases worth diving into, including lazy loading, as well as deferred loading”

```
};

let observer = new IntersectionObserver(entries => {
  entries.forEach(entry => {
    if (entry.isIntersecting) {
      intersectionHandler(entry);
    }
  });
}, config);
sections.forEach(section => {
  observer.observe(section);
});
```

By creating our IntersectionObserver instance we are able to access these entries through the callback function. This array of observed entry types are known as `IntersectionObserverEntry`.

Through this interface we are provided with three different rectangles that help determine an element's positioning and boundaries. This information is calculated asynchronously – a big boost for performance as we no longer have to calculate these types of values ourselves. The `IntersectionObserverEntry` interface also provides us with a handy property called `isIntersecting`. With this, we

IntersectionObserver ↗

API that can be used to understand the visibility and position of DOM elements relative to a containing element or to the top-level viewport. The position is delivered asynchronously and is useful for understanding the visibility of elements and implementing pre-loading and deferred loading of DOM content.



can determine when an element enters the ‘capture frame’ and then run our `intersectionHandler` function.

```
function intersectionHandler(entry) {
  const current = document.querySelector('.section.active');
  const next = entry.target;
  const header = next.querySelector(".section--header");
  if (current) {
    current.classList.remove('active');
  }
  if (next) {
    next.classList.add('active');
    document.body.style.setProperty("--color-bg", next.dataset.bgcolor);
  }
}
```

Within our handler function we are setting an `active` class to each current section that comes into view, which in turn activates our CSS animations and transitions that we declared earlier. By accessing and updating CSS variables in a clean and concise manner, we're also updating body background colour, which creates a simple but effective transition effect on the front end.

SUMMARY

The IntersectionObserver API is a straightforward tool for detecting element intersections in the viewport and has many performance benefits compared to older techniques relying on scroll events. There are also quite a few other use cases that are worth diving into, including lazy loading of images, as well as deferred loading to allow you to run certain functionality only when it's in view.

IntersectionObserver also has decent support in modern browsers (<https://caniuse.com/#search=IntersectionObserver>) and there is a great polyfill available for other browsers that don't fully support it yet. (<https://github.com/w3c/IntersectionObserver/tree/master/polyfill>). ■

Below Now supported in Chrome, Firefox, Edge and Android browsers. For full support, there is a great polyfill available (<https://github.com/w3c/IntersectionObserver>)

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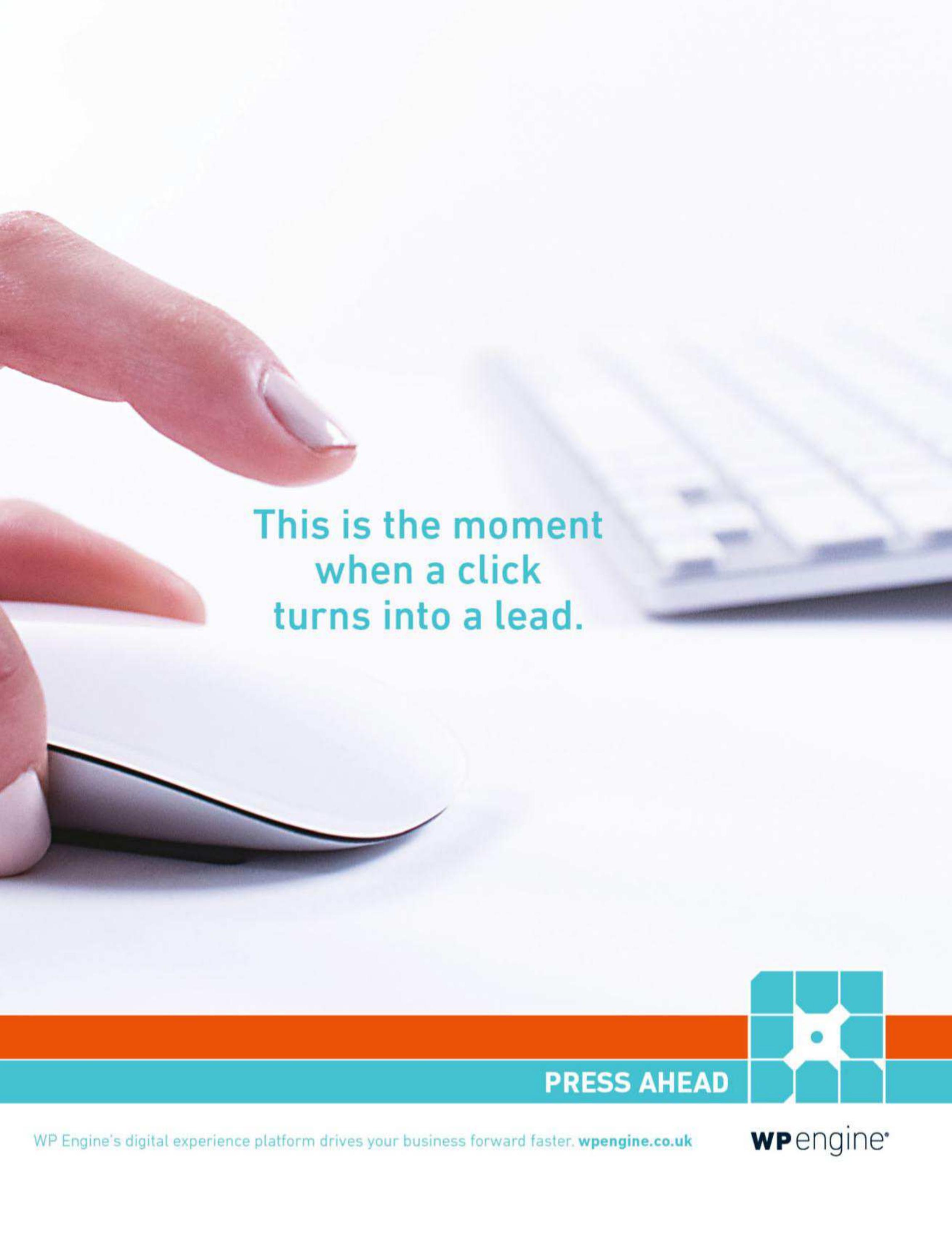
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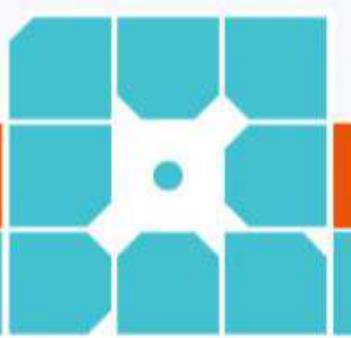
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