

CREATE A DESIGN COMMUNITY

Pip Jamieson on how The Dots helps build diverse teams

RECOGNISE IMAGES

Apply image recognition with the Google Vision API

AVOID AGILE FAILS

Sidestep these common pitfalls in the process

The voice of **web design**

net.

Issue 316 : March 2019 : net.creativebloq.com

*DESIGN SYSTEMS

GET YOUR DESIGN ORGANISED

Learn to combine design principles, brand identity and components

50

TOP DEV TOOLS

2019

- HTML, CSS and JavaScript
- Frameworks and libraries
- Build tools
- Testing and data

REFINE YOUR CONTENT DESIGN

Why scannability is a UX must-have



ISSUE 316

BASH BUGS AND MINIMISE ERRORS

Catch and treat component failures



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*WELCOME

EDITOR'S NOTE

 Voicing the old adage 'a craftsperson is only as good as their tools' is likely to prove divisive in development circles. After all, we've all seen powerful tools like React used to produce terrible bug-ridden products; equally there are some amazingly creative sites out there fashioned solely with a lick of CSS and a whole lot of skill. But it is true that experienced hands can work some web wonders when they add new libraries, languages and APIs to their toolkits.

With this in mind, we've pulled together our list of the hottest new dev tools in 2019. Whether you're looking to find out about the latest frameworks,

track down new testing utilities, master new ways of handling media or sniff out new JavaScript tools, we've got a whole host of instruments to add more punch to web projects.

And we've got a chance to get hands-on with some powerful kit as well. Richard Mattka shows how you can deploy Google's Cloud Vision API to do everything from screening sensitive media to distinguishing dalmatians from dachshunds. Elsewhere, Ben Read is here to give you a crash course in using React to publish bespoke error messages and capture bugs in components.

Enjoy the issue!

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MATTKA



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BROWN



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CONTENTS

Issue 316: March 2019 : net.creativebloq.com



▶ FEED

SIDE PROJECT 13

Kezie Todd gets meta and discusses her quest to produce 12 monthly side projects

CLIENTS FROM HELL 14

The latest in our series of nightmare clients

BEYOND PIXELS 15

Richard Carter explains how building with LEGO provides a release from the screen

▶ VOICES

PREVENT AGILE FAILS 20

Jonathan McElhatton explores how you can ensure your agile development stays limber

ESSAY 22

Given devs can often access intimate data, **Adam Alton** asks if this leaves us exposed

Q&A 33

Jason Grigsby reveals how he's helping to drive the web forward

BIG QUESTION 34

Our experts on the sites and companies they feel are really pushing the envelope

BECOME TOOL-AGNOSTIC 36

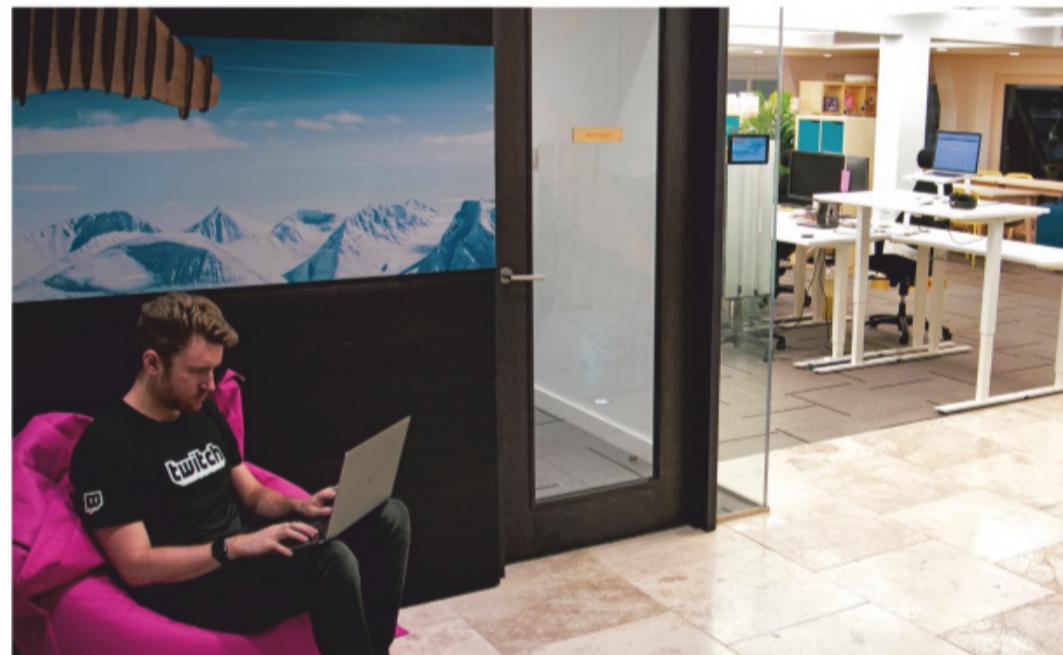
Clementine Brown extols the benefits of being more adaptable in the tools you use



*FEED

WORKSPACE 16

▶ **Matt Walters** on how stag heads and summit-styled meeting rooms help the ecommerce agency stay ahead of the herd



* VOICES

INTERVIEW 26

▶ We catch up with The Dots founder **Pip Jamieson** to learn what's made it so successful and how it builds diverse teams



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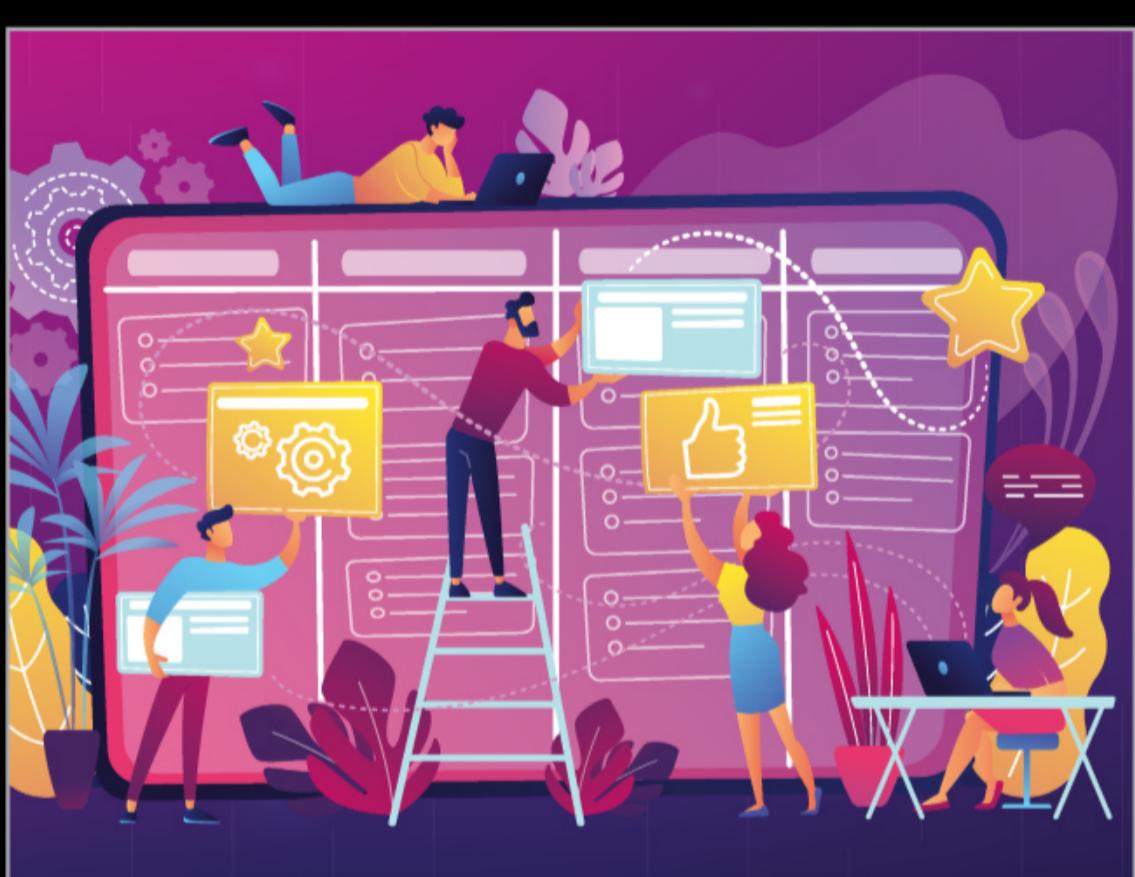


*REGULAR

GALLERY

40

> Mark Billen runs down his favourite websites of the month, including Christmas Experiments' festive WebGL advent event

**> FEATURES****50 TOP DEV TOOLS 2019** 60

Louis Lazaris brings you a fresh batch of 50 tools you'll want to consider for your projects in 2019

GET YOUR DESIGN ORGANISED 68

Ana Nicolau shows you how digital design paved the way for design systems and how best to use them



*PROJECT

IDENTIFY IMAGES WITH GOOGLE'S CLOUD VISION 76

> Richard Mattka delves into AI, focusing on how you can use Google's Cloud Vision API to harness image recognition

**> REGULARS****EXCHANGE**

08

Mark Hope, Lee Fasciani and Syd Lawrence share expert advice and tips

> SHOWCASE**DESIGN CHALLENGE**

46

Designers go against the stream with their designs for an innovative online TV service

PROFILE

50

Inktrap talks moving from sites to design systems and why it loves a good old sprint

HOW WE BUILT

56

How **Yoyo** enlivened dry finance for JP Morgan with eye-catching particle effects

> PROJECTS**BASH BUGS AND MINIMISE ERRORS IN REACT**

82

Ben Read on catching the cause of failures

CREATE ACCESSIBLE FORMS

86

Jonathan Speek guides you through how to design forms with accessibility in mind

DESIGN FOR SCANNABILITY

88

Daniel Schwarz talks content design and why scannability is becoming a must-have

BUILD A BLOG APP WITH VUE.JS

92

Simone Cuomo shows us how to create a fully featured Vue.js blog app

EXCHANGE

Send your questions to netmag@futurenet.com

Practical
advice from
industry experts

THIS MONTH FEATURING...

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*QUESTION OF THE MONTH

Is open source a sustainable business model? In fact, should it be one at all?

Benjamin Read, Hatfield, UK

MH: In the past 10 years we've seen open source go from challenger solution to default position. Most customers and prospects are now asking for a reason not to go open source, rather than reasons to choose it. It really isn't a hard sell anymore.

The benefits of open source are now widely appreciated, with CTOs and CIOs seeking greater flexibility, freedom from vendor lock-in and faster innovation through community and organisation contributions. Security is also less of a concern, with many open-source operating models identifying and closing security holes faster than proprietary. In fact, most large enterprises (once fiercely proprietary) have massively shifted strategy towards open source, including Microsoft and IBM.

One of our key technology partners, Acquia, is a prime example of how open-source software is thriving. Strategically, it's now a leader in the WCMS space, innovating through a mix of open-source software, PaaS and proprietary software services

provided with enterprise-level SLAs. It means agencies like Access can provide solutions and services to a wide range of clients.

More than 100 open source programs, a library of knowledge resources, Developer Advocates ready to help, and a global community of developers. What in the world will you create?
Search for code, content and community...
AI Analytics Node.js Blockchain Containers All technologies

IBM is just one of many big enterprises that has now pivoted towards open source

UI design

FAMILIAR BUT DIFFERENT

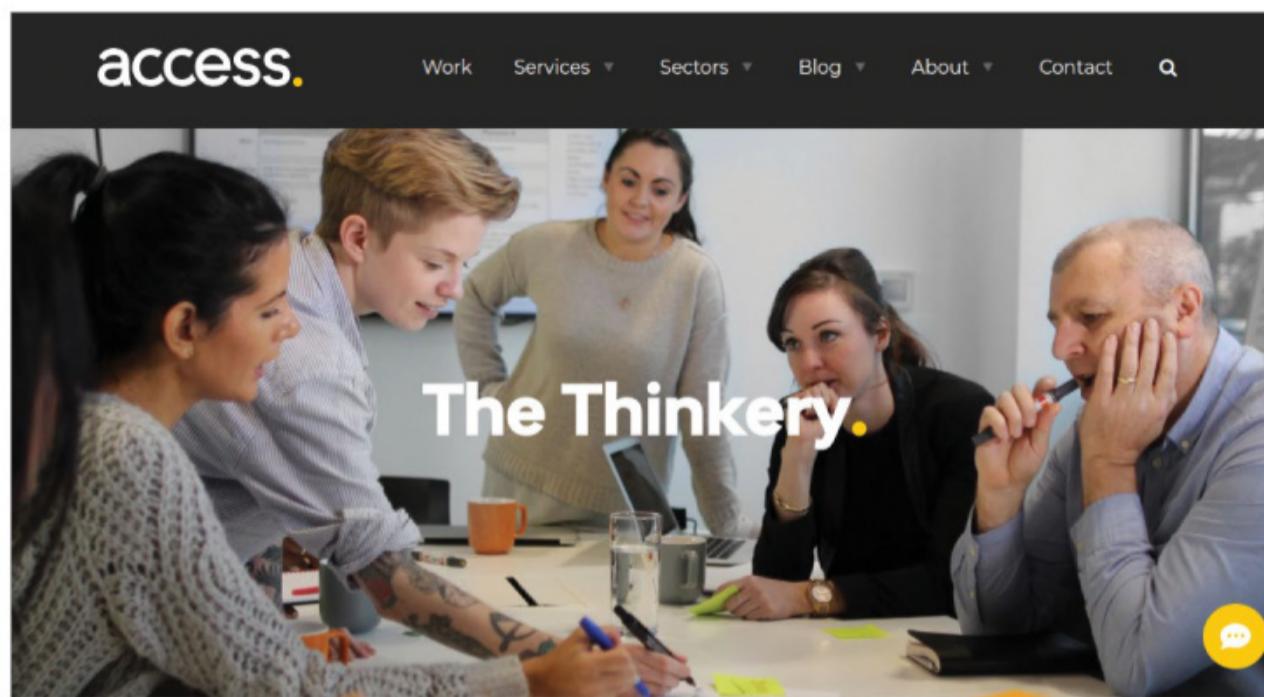
When a UI looks familiar, it boosts usability. But how do you balance that with the desire for clients to make their interfaces stand out and look different?

Keiko Takahashi, Vancouver, Canada

LF: We now interact with dozens of digital products and services throughout

our day and it's easy to see why common UX and UI patterns have emerged to support ease of use and accessibility across generations. But the sheer volume of digital products means brands do indeed need a point of difference.

When balancing client ambition to move beyond the status quo with the benefits of UX conventions,



access.

Work Services Sectors Blog About Contact

The Thinkery.

Interpreting customer data effectively is no small feat, so Access has launched a separate team for it

usability should be paramount. And to create brand difference and unique experiences, we at Territory Projects believe in combining the rigour of brand development and digital design with human-centred design approaches and the latest technology, adding rich visual and intuitive interaction elements, sometimes inspired by sci-fi worlds.

In this way we can create a memorable product that strengthens the relationship between user and brand.

Business

PLAY NICE WITH OTHERS

We're all naturally competitive, so what's the best way to stop that ruining multi-agency collaborations?

Tanya H, Cornwall, UK

MH: For the client or commissioning agency, my advice would be as follows. Appoint a lead agency and be clear about their remit and your expectations. Be clear about each agency's role and responsibility and make sure everyone knows why the others are involved and the value they will (be expected to) bring. Communicate clearly and often. Elect a lead from each agency as a single point of escalation. On larger digital projects, expect scheduled updates and frequent reviews. Be a good client – treat each agency with respect. And finally, choose your agencies carefully. Avoid a 'vanity' appointment if you're serious about effectiveness and quality.

For the agency lead, don't allow ego or perceived competition to ruin a good and (potentially) rewarding long-term relationship. Communicate with your team: make them aware of their role and responsibility and the importance of helping the client achieve their goals. And don't be afraid to have difficult conversations with a client. If an agency isn't delivering and putting the whole project at risk, have that conversation – but do it professionally.

Business

THE ULTIMATE EXPERIENCE

How important is it these days for web designers to provide customers with a personalised experience?

Josh Brimble, Peterborough, UK

MH: For me, customer experience is more than what happens on a website. Designers can get a greater understanding of customer experience from looking outside of their immediate role to understand behaviour.

The best customer experiences originate from businesses that understand their customers, their needs and how and when to interact.

This ongoing quest for a deeper understanding is what led Access to launch The Thinkery – our standalone insight and strategic planning service that supports our wider team in interpreting the vast quantity of customer data that exists today.

3 SIMPLE STEPS

What are the different ways to use chatbots?

Ian Lewis, Canberra, Australia

SL: There are many ways but here are three that spring to mind.

Modify the site



I've seen some cool uses of bots on websites where using the bot modifies the website itself. This seems like a 'cool' example, although I'm not sure if it's the simplest form of information retrieval.

Replace the site



There are a few web-based solutions that replace a site with a bot. Personally, though, I don't think that's the correct approach. Conversational UI isn't the best form of UI in most contexts.

Hybrid approach



If I have a question for a company, I just want to ask that specific question and that's where having a bot on a website is super useful. Especially if you have a hybrid approach, where a person can jump in as well to offer support. You can then build the bot up over time based on the questions people ask.

COOL STUFF WE LEARNED THIS MONTH

GOOGLE IS SHUTTING DOWN ALLO

+ Google is killing off its Allo cross-platform messaging service. The app, which first arrived in September 2016 and has features like one-tap smart replies, Google Assistant support and the ability to share search results in conversations, will be shut down next March.

<https://netm.ag/2UXHA4I>

BIRCHBOX'S NEW WEB DESIGN 'DRIVING COMMERCIAL BENEFITS'

+ The newly designed Birchbox website has led to a 21 per cent increase in shop revenue per session and a 20 per cent hike in shop revenues per customer, according to the beauty subscription box company. The site overhaul is part of the US-based business's wider plans to expand in the UK.

<https://bit.ly/2RA8wJ3>

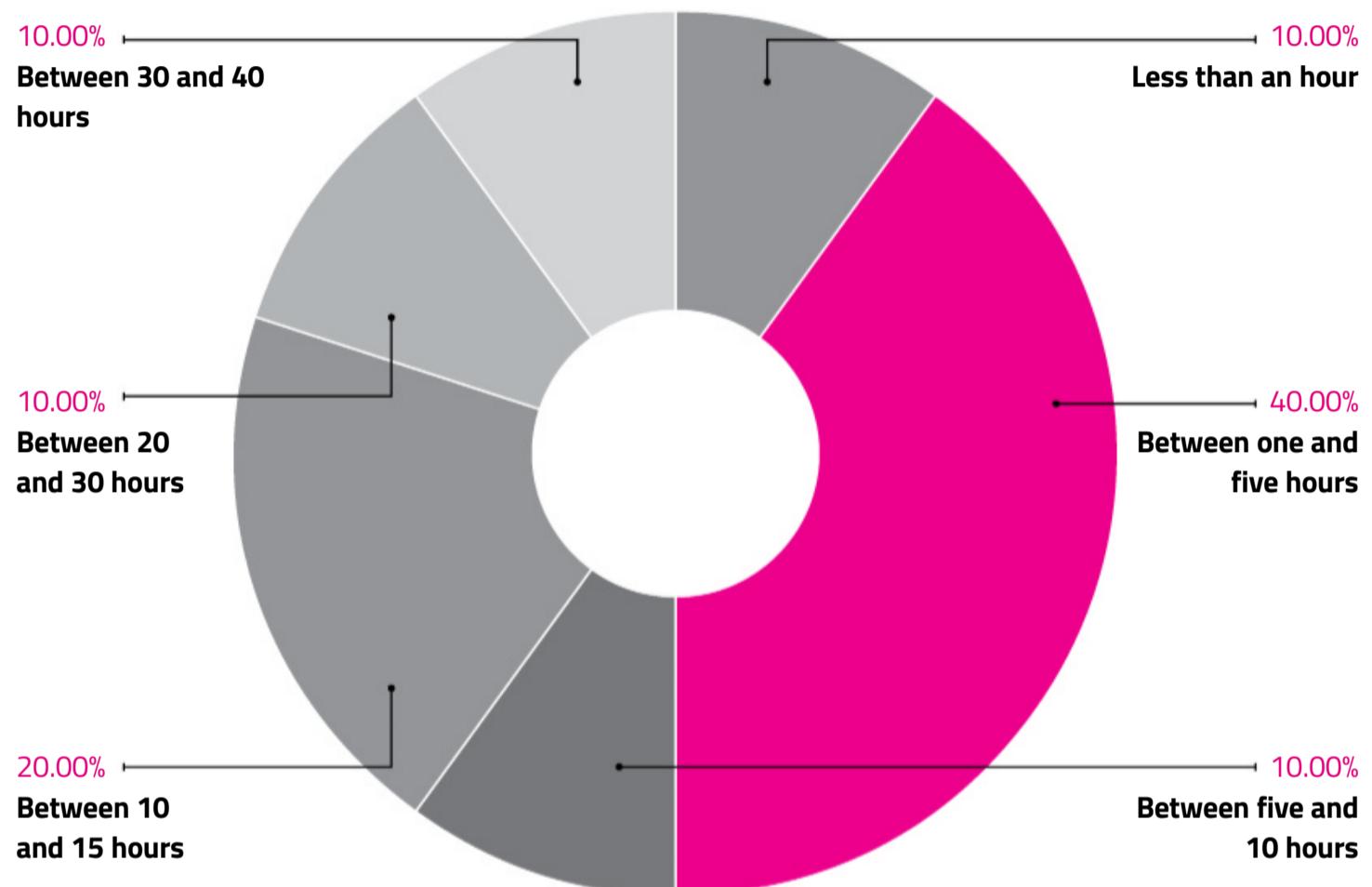
PANTONE ANNOUNCES COLOUR OF THE YEAR

+ Pantone's annual quest to dominate the 'and finally...' portion of the pre-festive news has kicked off, with the announcement of its Colour of the Year for 2019. The official selection is Living Coral, or specifically 16-1546. Pantone's announcement always sets the colour agenda for the following 12 months.

<https://netm.ag/2A700dL>

*THE POLL

HOW MUCH TIME A WEEK DO YOU DEVOTE TO SIDE PROJECTS?



From our timeline

How will – or has – Brexit come to affect you professionally?



I had intention to settle in as UK is the sole country in EU honoring ages old Ankara agreement allowing hassle-free visa for businesspeople, which will no longer take place after Brexit.

@sotaroraiste



A huge reason for being a digital nomad is the inflated costs of living in the UK. Restriction of free movement makes working and travelling much harder.

@_LeonBrown

@mrdanielschwarz



More uncertainty is good for contractors in the short term. Work still needs to be done, but companies will not want to commit to long-term hiring of new employees – hence making contractors a more attractive option for their immediate work.

@nataliedeweerd



We won't know until after it hits. Anything else is guesswork. Unfortunately the government has never explained the realities

@jezmck

– that said, I don't believe they know the realities either.

@1stevengrant



My husband is Dutch, so we may end up having to do paperwork to prove he was here before the referendum and prove he's working and earning X amount.

@nataliedeweerd



It's the impact on my (large) employer and the customers. Likely to reduce overall turnover and profit, hence little chance of pay rises, and though I personally am not at great risk of being made redundant, others may be.

@jezmck

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FEED

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THIS MONTH FEATURING...

CLIENTS FROM HELL 14

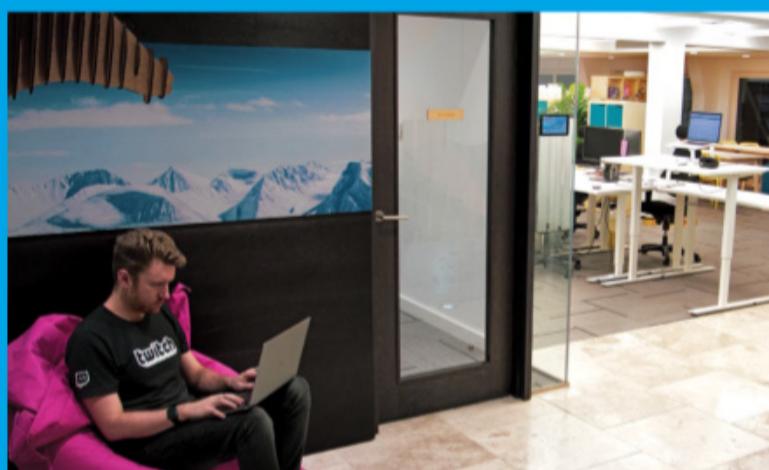
This month a web developer clashes with a client's net naivety when setting up their email



BEYOND PIXELS

Richard Carter explains how his LEGO brick hobby provides a release from staring at screens for a career

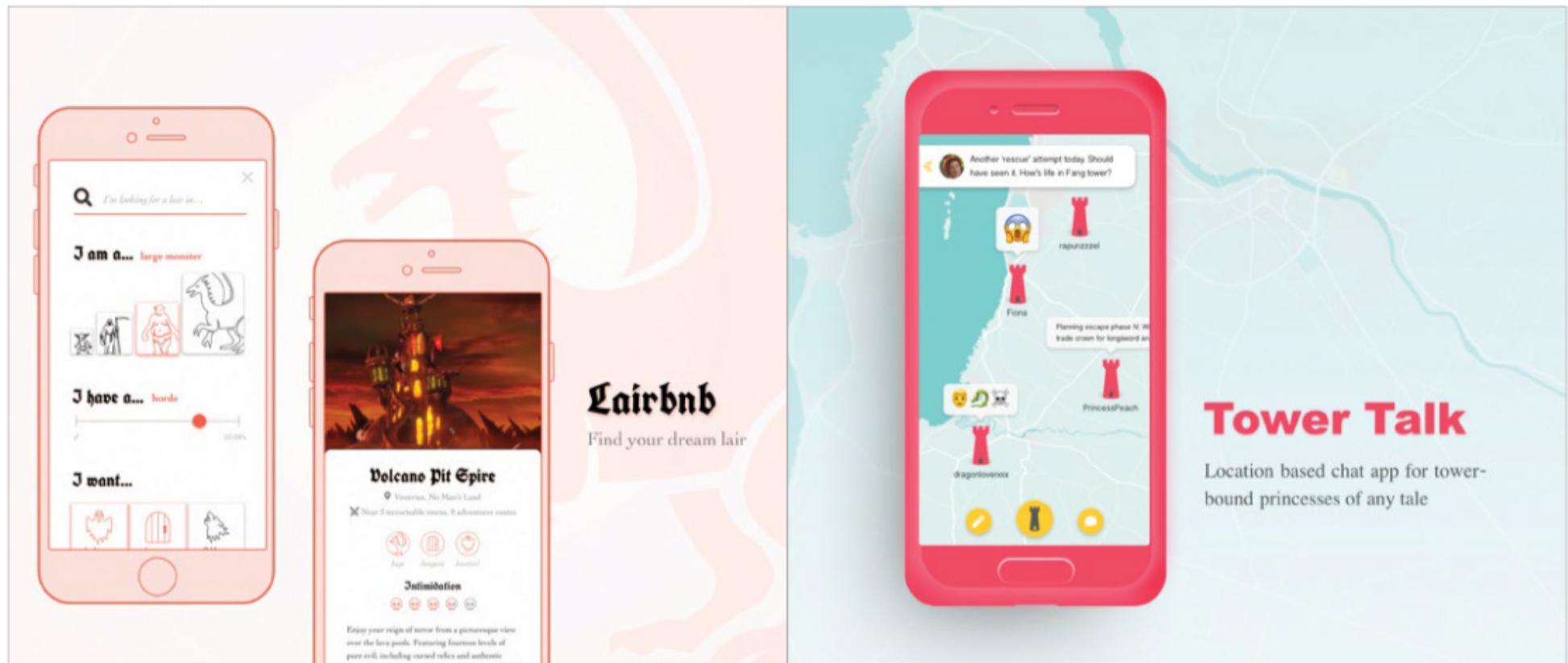
15



WORKSPACE

Matt Walters on how stag heads and summit-styled meeting rooms help Vaimo stay ahead of the herd

16



THE SIDE PROJECT PROJECT

Kezie Todd on producing 12 monthly side projects

* SIDE PROJECT OF THE MONTH



KEZIE TODD

job: Maker of stories, monsters and designs with personality hailing from Northern Ireland and just about everywhere in between.

w: <https://kez.ie>

t: @SaysKez

Tell us what The Side Project Project is.

The Side Project Project is a year-long commitment to 'just do it'. One side project a month for 12 months, it is the opportunity to go wild while gaining new skills. The episodic format means I'm not locked in. Each month is an iteration for the overarching project and I can pivot based on what works and what doesn't. The only rules are that there's just one month per project and I have to share it all – even if it fails spectacularly.

Why did you create it?

Mostly as an outlet for pent-up ideas, to challenge myself and as a learning experiment. On my hard drive is a long list of projects that once upon a time produced a day's worth of excitement but never any work. Either it wasn't the right idea or was for 'when I have time'. I wanted to act upon ideas instead of just dreaming about them. To get to that I needed to develop a balance between work, life and passion projects but also prove to myself that a side project doesn't have to be a viable startup to be valuable.

What were you hoping to achieve?

On the small scale my goal was to explore a completely new challenge each month but the Side

Project Project is something more than that. The overarching project is ultimately about synthesising learnings from experiments across the diverse landscape of design. Each month, I record and share things I learned on the side project and applied at work that month and vice versa. It's fascinating to consciously draw out this cross pollination and see how seemingly disparate pieces of work can inform and improve each other.

What technologies were used in building it?

In the first four months I've experimented with front-end development, Cinema 4D, laser cutting, 3D printing, Unity, vinyl prints and am currently playing with no-software-allowed animation. That is part of the appeal of the project for me. Been meaning to learn that new tool or skill? Take a month and do it! There's nothing to lose.

How has it been received?

So far the reaction has been nothing but positive. Sometimes I feel we can be afraid to 'waste' time on projects perceived as noncommercial or impractical. All I can say is that more opportunities have sprung up as a result of my last four months of crazy side projects than the past year.

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

My plan is to create a website collecting the 12 projects in one place as a reflection on a year of experiments, failures, learnings and fun. This could become a springboard to launch a #12in12 challenge, hopefully inspiring others to start acting upon their ideas, no matter how crazy they may seem. ■



* HOW TO

MAKE WEBSITES MORE MOBILE FRIENDLY

Being mobile friendly has long been a key factor in how Google ranks searches, so we asked @netmag's followers what techniques they used to maximise mobile responsiveness.

LAYOUT STRUCTURE

Being clever with design structure is one way @petebarr makes his work more mobile friendly. "Focus on using breakpoints for the content rather than device sizes to maintain layout structures," he says. "Utilise Flexbox and Grid where you can: these can also help in reducing the number of breakpoints required as they are inherently responsive."

MOBILE THINKING

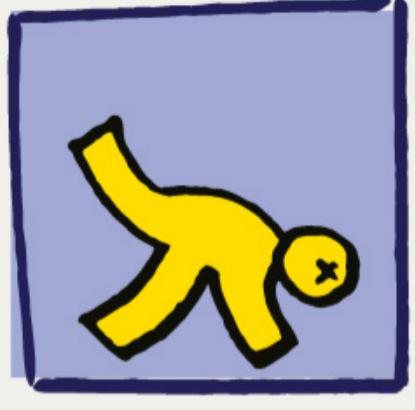
@chrisjcoan recommends basing your design around mobile working from the get-go. He says: "I write all my CSS with a mobile-first approach. This ensures consistency across the vast array of devices available to consumers." @tomhermans agrees: "Start mobile first. Design in the browser. Use a modular, atomic approach. Type, colour, spacing first. Mq for bigger vp."

PAGE WEIGHT

Ensuring pages load quicker is one of the keys to making things easier for a mobile to process and display, says @alainavirginia: "I focus on reducing page weight because fast-loading pages and economical use of data are equally important to a great visual experience."



Disconnected



Please help!



POP FLOP

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

* CLIENTS FROM HELL



I was trying to set up a pop3 email account for a client. I sent the login details with clear instructions about how to put them into an email client.

Client: It's not working. When I put the email address and password you provided into AOL, it says the login details are wrong.

Me: You can't use these details on any email site. Did you look at the instructions I sent you?

Client: I tried but when I put the address into Google it brings me to a site instead of my email.

After prying, I realised the client copied and pasted the mail server address from the email and entered it into the browser address bar.

Me: Okay, that's not what I said. Take a look at the instructions – it breaks down how to do this with pictures. It should work on any email client software but I recommend either Outlook, Thunderbird or Apple Mail. Here are links to all three of those – choose one.

Client: Okay, I'll try.

Moments later:

Client: I'm trying but Office 365 says it emailed

an authorisation code to the email address but I can't access it to read the code. Can you access the email and tell me the code?

It's clear they've tried to sign up for Office 365 to get Outlook using their new email address rather than an existing one, even though I gave clear instructions not to.

Me: Tell you what – here's the address so you can get it yourself. Go to www.[xxxxxx], enter the email address and password, then you can access it and finish setting up Outlook.

Client: That doesn't work! Why can't you help?

After lots of back and forth I found out he was trying to input his AOL login details into the webmail address I'd just sent him. Eventually I just set up an email forwarder that would automatically send any email to his AOL address. He did not appreciate my extra effort.

The AOL account should have been a warning!

CLIENTS FROM HELL

clientsfromhell.net

LEGO

Richard Carter explains how his LEGO brick hobby provides a release from staring at screens for a career

* BEYOND PIXELS

I have been a fan of LEGO since I was four or five and at 31 I've still not grown out of it! I'm lucky enough to have my own 'LEGO room' at home, which contains most of my collection of LEGO sets and custom models I've built over the years. Many of the models are built in to a city landscape, with city centre, suburbs and rural settings allowing a variety of building styles and inspiration. The collection and the LEGO city is an eternal work in progress – there's always something I could build or rebuild – so I don't often get bored with it.

LEGO building provides a feeling of zen for me – I find it relaxing to build. LEGO's tactile nature is a large part of the appeal: it's stimulating to use my hands to create something physical, rather than on a screen. It can also provide a mental challenge – working out how to replicate a texture or shape or how to manipulate LEGO bricks to achieve the model you want to create.

I have a bowl of LEGO parts in my office too: if I'm stuck on an issue, I find a quick rustle of bricks usually provides the break I need to solve it and aids my focus. Clients have also started playing during meetings, so it's catching on!

The LEGO hobby has a great social side as well. I'm a member of my local LEGO User Group, where

Adult Fans of LEGO (AFOLs) meet monthly to share their latest models and there are exhibitions around the country where AFOLs come together to provide a display of their latest models for the public. I'm even planning to go to a fan weekend in Portugal again later in the year – meeting other LEGO fans from across the world made for a great weekend!

These LEGO exhibitions usually provide a good incentive to build bigger and better than previous years and I'm a member of a few different collaborative groups who build large displays from LEGO. Just like web design, having colleagues who are passionate and talented working alongside you is a big plus and makes the hobby all the more enjoyable.

Having the LEGO hobby as a creative release has been great for me; I attribute a lot of my wellbeing to having a hobby I can become so involved in, as well as providing a never-ending circle of new friends around the country! ■

PROFILE *



Carter is founder of web design agency Peacock Carter and runs WordPress North East meetups in Newcastle upon Tyne.



STUFF I LIKE



LEON BROWN

Web developer

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CODE ANYWHERE

Embrace the advantages of using the cloud as an IDE, and write and execute your code in a test environment from anywhere. This is great tool for pair programming and development even from remote locations.

<https://codeanywhere.com>

TUMULT HYPE

Manually creating advanced HTML5 animation is time-consuming and difficult. Tumult Hype solves this by providing a visual interface to quickly and easily define your animations. It also enables you to incorporate your own JavaScript code to its animations.

<https://tumult.com/hype/>

METHOD DRAW

An easy-to-use SVG image editor for creating resizable images for responsive design. Images are editable and can be combined with CSS and JavaScript to become interactive. Use this tool to become more productive with digital creative projects.

<https://editor.method.ac>



VAIMO

Matt Walters on how stag heads and summit-styled meeting rooms help the ecommerce agency stay ahead of the herd

* WORKSPACE

Established in 2008, Vaimo is a global leader when it comes to delivering award-winning digital storefronts, omnichannel solutions and mobile applications. Our UK office is based in the City of London's financial district, home to the Bank of England and The Stock Exchange and is gradually being dwarfed by the ongoing developments nearby. In fact, it is becoming reminiscent of *Batteries Not Included*.

Given our Swedish origin, we uphold many popular traditions of the region, including our annual Midsommar-themed parties, Fika and Kanelbullens Dag (which is Cinnamon Bun Day) and, in my case, desperately trying to memorise the lyrics to Helan Går (a Swedish drinking song).

Our neighbourhood reindeer [1] overlooks the reception area and is the first to be decorated with anything seasonal. Tinsel, flowers or faux cobwebs: you name it, he'll wear it better than anyone!

Each meeting room bears the Sámi name of a mountain among the Scandes or 'Skandinaviska fjällkedjan'. [2] The only exception to this rule is our red telephone box, which was a short-lived endeavour due to the incredibly strong odour of its paintwork that, while inside, was almost enough to make you hallucinate!

Hackathons play a significant role in promoting innovation, personal development and also teamwork. Our Google Calendar meeting room displays [3] are a prime example from one of our

more recent internal projects (not to mention countless disputes over exactly who it was that reserved the room first).

When our notorious British weather is 'behaving', the roof terrace [4] quickly becomes the preferred breakout area of choice, the main stage of our social events and occasionally a makeshift kitchen for those wishing to put their Ainsley Harriott culinary skills (sometimes even irrespective of weather) to the test.

With just shy of 50 ecommerce experts (and hiring), our workspace is comprised of two open-plan areas, one considerably more placid in nature than the other. Having previously perched myself in both spaces, I have since discovered a particularly sweet spot in 'no man's land' looking out towards the Lloyd's building and 20 Fenchurch Street, where I find myself better focused. ■

PROFILE
Walters is a technical lead and front-end developer at Vaimo (<https://www.vaimo.co.uk>) who has a passion for e-sports, music and photography.

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JANUARY SALE

VOICES

Opinions, thoughts & advice



ESSAY

22

By necessity, developers will sometimes have access to our most intimate data – **Adam Alton** asks: does this leave us overexposed?



INTERVIEW

26

The Dots founder **Pip Jamieson** reveals what has made it so successful and how it helps businesses build diverse teams



Q&A

33

We catch up with the co-founder of Cloud Four, **Jason Grigsby**, to discover how he's helping to push the web forward

★ AGILE DEVELOPMENT

PREVENT AGILE PROJECTS FAILING

Jonathan McElhatton explores how you can ensure your agile development stays nimble



Agile is no longer the preserve of startups and software development companies; it's mainstream and a subject familiar to the CEOs of multinational companies. But the promise of improved speed to market and lower costs isn't always realised, as it's supplanted either by the speedy launch of substandard products or a costly cycle of constant rework. Agile must be the bad guy!

I would argue that misinterpretation of the word agile and misapplication of agile principles in the delivery of design projects is driving unjust negative PR; a few small tweaks can lead to significantly improved outcomes for you, your business and your clients.

BREAKING DOWN AGILE

Use of the word 'agile' increased dramatically from 1994, consistent with the gaining popularity of agile software development methods and the 2001

publishing of the Manifesto for Agile Software Development. While it's easy to become consumed by the technicalities of the many methodologies, agile doesn't need to be complicated nor should it be taken too prescriptively. I believe it helps to think of agile more philosophically. Agile, put simply, means to move quickly and nimbly with ease and grace.

WHERE DOES IT GO WRONG?

In my experience, agile projects fail not because of a huge blunder or technical flaw but rather an early failure to set expectations. I believe there are three expectations, tied to the Manifesto, that should be clear during the sales process and reset early in the project life cycle.

The first is the concept of the minimum viable product (MVP). Do your clients understand that focus will not be on delivering the full product but on delivering a product to market as quickly as possible? If not, your delivery will not meet client expectations and your agile project will fail. We do this because we believe that seeing an early version of a product live in its natural environment enables us to learn more about developing that product. It's important we don't see this as a failure to deliver a quality product, a typical concern of practitioners and account managers alike, but rather a method of delivering the right product as quickly and cost-effectively as possible.

The second is the importance of planning and prioritisation and the client's role in it. A misunderstanding of agile is that it is something fluffy and unstructured, where anything goes. However, in order to get a product to market quickly, clients need to understand that the product doesn't need to be all-singing-all-dancing; instead a product owner should identify only the key features required to hook early customers and validate the core value proposition. It is the job of those selling and delivering agile projects to help clients understand that compromise is a friend not a foe and make the prioritisation of features, through sprint planning and backlog refinement sessions, feel like an exciting endeavour, not a limiting exercise.



The third is helping your clients understand they don't know what they want. How can a single product owner know, with confidence, every detail about the product they think their customers want? They can't – and that's the beauty of agile. Let us not waste time trying to define the perfect solution; instead we should be inviting real customers, through focused design research, into the process of defining product requirements iteratively over time.

TWEAK YOUR WAY TO SUCCESS

Failing to set expectations is undermining the success of projects, leading to an understandable but unjust condemnation of agile methodologies. I recommend a number of tweaks to improve the success rate of your agile projects.

To sales folk, ensure a practitioner with experience of agile projects is involved throughout the sales process. Your clients must understand the values and principles of agile when buying a project. They may not be able to commit to the expectations

we have of them and, as such, agile may not be the best way to go. Better to find this out before contracts are signed and delivery teams are underway.

To practitioners, embrace the kind of relationship with your clients that agile projects demand. Forget being a supplier and embrace the partnership. Co-locate with your clients, bring them into your meetings and ceremonies, be prepared to challenge them and, metaphorically, spoon-feed them where necessary. If expectations have been set correctly during the sales process, your clients will welcome this level of engagement and the closeness you form with your client should become a rewarding learning experience for you too.

Finally, if your agency is new to agile, hire an agile coach. Failed projects cost a lot more than hiring a professional consultant for three to six months. ■

PROFILE *
McElhatton is programme director at Foolproof, the digital transformation and design agency.
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A vertical column of binary digits (0s and 1s) runs along the left edge of the page, serving as a decorative border.

* HANDLING DATA

SHOULD DEVS GET HANDS ON WITH OUR DATA?

Illustration by Kym Winters

By necessity, developers will sometimes have access to our most intimate data – but does this leave us overexposed? Adam Alton looks at what happens behind the buttons

Many companies have systems for handling their customer data that are built so employees can only access the data they're supposed to. For example, an insurance company call-centre system might only allow the staff to see some parts of a customer's account information and not others, depending on whether they work in claims or sales. Such systems often store a log of which staff have accessed a customer's data and when, so if a member of staff does something they shouldn't, the snooping is at least recorded. But no matter how restrictive or robust these systems are, they always have a flaw: someone has to build them.

This is not unique to software. If companies kept their customer data on paper locked in a vault, someone would still have to build the vault. But the process of building software presents two problems. The first is how do we know what's been built? Creating software is a highly specialised skill; it's often the case that someone managing the creation of a piece of software doesn't have the skills to do the 'construction' work themselves. That in itself has many interesting consequences but the most pertinent issue here is if someone doesn't understand the work being done, how are they going to

check that the software being produced actually does what it's meant to?

The obvious answer is to test it.

Let's suppose we've commissioned some software for an insurance company call centre. We might have a requirement that if the system administrator has set one of the staff accounts as a claims handler, when that staff member logs in they cannot see how much any of the customers paid as their annual premium. We can set up some dummy accounts and customers and we can test that. And we can repeat the process for every requirement we have.

But that's not a complete test. What if there's a bug in the software that means it reveals all the policy premiums to the claims handlers on a Tuesday? (I've seen real bugs that sound less plausible than this.) What if the programmers were malicious and added something so it emails them a copy of all the customer credit card details annually on 31 July? How are we going to test that the software does not do these things? There are only two ways to check the software doesn't do anything it shouldn't. The first is to spend from now until the universe grows cold thinking up every possible ►

- permutation of things it could do and testing against every single one. The other way is to simply read the code.

This is a universal truth about software. The only way to know what it does and doesn't do is to read the code. So, the people who ultimately hold the power are the people with the code. And, as Spider-Man's uncle said, with great power comes a great deal of bug fixing. Which leads us to the second problem of writing software for sensitive data: how can developers monitor, debug and fix that system, if they don't give themselves access to the data?

Back to the insurance company call centre system. A well-organised development team will typically have at least two versions of that system: one live system with real data and another that contains similar but fake data. This is used to road test the latest version of the software each time developers make changes or improvements, so if a new version of the software catastrophically breaks things that destruction doesn't get as far as the real users or their data.

But, as we've already established, testing software is hard. We can only test for the things we expect to happen or not happen and that list is essentially infinite. Plus, the real data will contain things that don't exist in the

least of these is the open-source community, which is underpinned by the idea that although you shouldn't trust a stranger, if you allow all the strangers to keep an eye on each other, collectively you can trust they keep each other in check. Open-source software is shared, collaborated on and collectively scrutinised. This has brought us (among countless others) Firefox, the Linux operating system and Home Assistant, which enables people to set up their own home automation and security system without having to entrust their sensitive data to a third-party company.

This principle of trust through transparency also underpins bitcoin and other blockchain technologies. Rather than a traditional bank, where the transaction ledger is kept behind locked doors, bitcoin is effectively a sophisticated digital bank where the ledger of transactions is made tamper-proof by the virtue of the fact that everyone can see it.

Another initiative to counteract this problem has come from internet creator Tim Berners-Lee. He recently launched a project called Solid, which aims to create a new system of web applications where all data that passes through them is under the control of the users.

Ultimately, none of these will take off without enough engagement from users. But users are slowly getting

“The people who hold the power are the people with the code. And, as Spider-Man’s uncle said, with great power comes a great deal of bug fixing”

test data, so the list of infinite possibilities gets multiplied. No matter how good the testing strategy is, sooner or later there'll either be a bug that makes it through to the live system and breaks some data or the live system will encounter a problem that the test system never exhibited because that problem only occurs with a certain piece of real-world data.

And when one of those scenarios happens, some poor developer is going to have to roll up their sleeves, open up the metaphorical manhole cover and dive into the live database to either fix or diagnose that problem. Even when the developers are entirely competent and not malicious, they're still likely to end up looking at real customer data. So despite building a software system that has incredibly strict user access controls, the people who control the software always need to retain the ability to circumvent those controls in order to see what's going on if something goes wrong.

So are we destined to become enslaved to developers? It seems unlikely. No one understands this problem more than developers themselves and, as a result, there are many initiatives to counteract this problem. Not

wise, if not to these new technologies, then at least to the perils of the existing ones. There were a huge number of high-profile data breach cases in 2018, including HSBC and British Airways, plus the controversy around Cambridge Analytica's use of data. All this has helped educate users that what companies say they are doing with data and what actually happens to that data are not always the same thing.

We are learning that what happens to our data is controlled not at the point of processing but at the point we give it away. Companies are learning that pretending to look after our data is not fooling anyone. As technology is ever-changing, the battle to make it ethical is ongoing but if the current outlook is telling us anything it's that the answer to the question 'who controls our data?' needs to be considered at all times. ■



PROFILE
*

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DEDICATED HARDWARE: UNLEASHED IN THE CLOUD

Combining cutting-edge hardware with cloud technology offers a server solution that's both powerful and scalable

Without servers, the internet as we know it couldn't exist. But these machines have a lot to live up to, with expectations of maximum availability, minimum downtime and near-flawless performance. Thankfully, the latest generation of server hardware is now being combined with innovations in cloud infrastructure to provide exceptional reliability, while also enabling highly flexible approaches to server hosting in a wide variety of scenarios.

Running 24/7, dealing with large numbers of simultaneous users and routinely handling sensitive data, servers face greater demands than desktop machines. When these pressures prove too much for consumer-grade technology, high availability requires enterprise-level hardware.

Specialised processors, such as Intel's Xeon family, offer more cores and bigger cache sizes than desktop CPUs, as well as support for very large quotas of ECC RAM. With models featuring the latest generation of Intel Xeon Scalable processors, Fasthosts Dedicated Servers deliver the performance and reliability demanded by mission-critical applications. The newest storage technologies also bring major advantages to server use cases, with NVMe drives accessing data up to six times faster than standard SSDs. In database-driven applications such as online shops with content-rich product details, the NVMe storage on Fasthosts Dedicated Servers ensure a smooth and responsive customer experience.

Obviously, hardware is a vital factor in server performance but it's not the whole story. With individual servers often

working as nodes in a cluster, connectivity and the underlying platform make all the difference. Fasthosts enables single-tenant servers to combine with virtual machines to create hybrid setups – 'virtual data centres' that provide custom configurations for specialised applications. An ecommerce platform, for example, could use load-balanced VMs to manage website traffic and dedicated hardware to handle customer details. Fasthosts' servers also benefit from the performance and security of UK data centres and with unlimited bandwidth, there are never any worries about exceeding data caps.

These innovations clearly offer advantages – but are they cost-effective? The good news is that the flexibility of the Fasthosts platform also extends to pricing. Dedicated Servers can be provisioned in just eight minutes, shut down at any time and costs are tracked on a per-hour basis. This flexibility enables custom configurations: if demand is seasonal, VMs can handle normal traffic levels and be augmented with dedicated hardware when heavy processing is required. For intensive tasks like image rendering and big-data processing, the option to run dedicated hardware in short bursts is highly beneficial.

Server applications can be extremely demanding, both on the machines and the wider infrastructure. But by taking cutting-edge hardware and combining it with innovative cloud-based technologies, the Fasthosts platform enables Dedicated Servers to work harder and smarter. For server customers, the result is a better experience for end-users and a more successful online presence.



INFO

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Pip Jamieson

Words by Oliver Lindberg
Photographer Adrienne Pitts

Creative networking platform The Dots is a prime example of an ethical tech company. We caught up with founder **Pip Jamieson** to learn what has made it so successful and how it helps businesses build diverse teams

▶ Previously, The Dots – dubbed ‘the next LinkedIn’ by Forbes – removed the ability for companies to search the platform for talent based on where people went to university. Now the London-based startup has gone a step further and launched a bias blocker tool. Recruiters can toggle it on to hide personal data (such as name, photo and educational background) from profiles, so people are judged solely on their skills and the quality of their work.

“It came about because one of our clients, AKQA, who have a blind recruitment policy in place, sent us a photo of how they were using Post-It notes to obscure the images of candidates,” explains Pip Jamieson, founder and CEO of The Dots. “They did that so they wouldn’t bias their hiring decision. It was a bit of a eureka moment for us.”

Helping companies build diverse teams is at the heart of The Dots, which has attracted over 300,000 members since Jamieson launched it from her houseboat

in 2014. A remarkable 68 per cent of the community is female, 31 per cent BAME and 16 per cent LGBT. In contrast to LinkedIn, which is dominated by male white-collar workers, The Dots caters for what Jamieson calls “no-collar professionals” – essentially creators, freelancers and entrepreneurs who adopt non-linear careers.

“While I was at MTV, I noticed a very different way of working had started to emerge,” Jamieson recalls. “Traditionally, people would spend five, 10 or 15 years in one job and work their way up a career ladder. It was very CV-based. But at MTV people were increasingly freelancing, working project by project and they all seemed to have side hustles going on. Some had their own startup on the side. It was a more fluid way of working.”

Jamieson also noticed a mindset shift in the creative industries. Unlike previous generations, people were valuing flexibility and purpose as much as pay, so Jamieson decided to create a professional

networking alternative to help creatives progress in their careers and find inspiration and work.

Projects, not individual profiles, take centre stage on The Dots. When you post a new project, you can tag the full team. “It’s a recognition that creativity is a team sport,” Jamieson explains. “You could have a rock-star product designer but if you don’t have a full team around that person bringing the idea to life, it’s never going to happen. We’re like a living Wiki of projects and the teams behind them.”

Also, while job titles are a major focus on LinkedIn, The Dots has taken a much more skills-based approach. “Job titles are so meaningless these days,” Jamieson points out. “Companies have different names for the same job and the skills are the same. On The Dots you can call yourself anything and then we data match. Every time you post a project, you can add new skills, which is also a recognition that there’s an increasingly ‘slashy’ environment. You can be a UX/UI designer but you can also be an entrepreneur and a photographer.”

At MTV, Jamieson also saw how homogenous teams can be dangerous for creativity. Roles weren’t being advertised simply because too many people would apply. “So we were calling on our little black book,” Jamieson remembers. “We were asking for recommendations of friends of friends but that meant we started building up a homogenous workforce. Everyone went to similar universities, had similar backgrounds and lived in a similar neighbourhood. But creativity is about drawing on diverse experiences and coming up with creative ideas and solutions. If we’re all the same, essentially we all think the same.”

To illustrate the effect unconscious bias can have on products, Jamieson emphasises that all the new health apps that came out a while ago featured nothing to help women monitor their menstrual cycle, as they had been designed by primarily male teams. And when The Dots recently researched how people search websites, they found that men prefer free text search, while women are more likely to prefer some form of signposting (like a drop-down menu).





"If you don't have diverse teams, you unconsciously build products for yourself," Jamieson explains. "That's why it's so important, especially in technology, to build teams that reflect society as a whole, so we counteract the biases each of us have."

The Dots, therefore, doesn't just do a lot of work to redress the gender balance. Diversity also incorporates ethnicity, LGBT, disability, neurodiversity (dyslexia, dyspraxia, ADHD, autism, etc) and socio-economic movement – hence the bias blocker. Initially, The Dots skewed slightly towards a more male audience, which prompted Jamieson to implement a curation rule.

"We have humans go through the profiles and projects being uploaded and choose the ones to feature, boosting them in the algorithm," Jamieson clarifies. "For example, over 50 per cent of the people on our curation page have to be women and 30 per cent BAME. When we introduced that, the demographic of sign-ups changed overnight. People want to see themselves."

To celebrate and highlight people's differences, The Dots also does diversity

takeovers. For Black History Month, for instance, the platform only featured black talent and projects created by black talent. Jamieson herself is very vocal about her dyslexia, which she grew to see as an advantage or 'superpower' even, and often points out that 40 per cent of self-made millionaires are dyslexic. Her email signature says "delightfully dyslexic,

"There's an increasingly 'slashy' environment. You can be a UX/UI designer but you can also be a photographer"

excuse typos!" because she wants people to know about her limitations. But she also wants to lead by example and raise awareness that dyslexics tend to have high levels of perseverance, intuition, creativity and empathy, in the process aiming to help other people feel empowered about being neurodiverse.

More than 10,000 clients, including the BBC, Burberry, Google and the Tate, now

use The Dots to connect with potential hires. Championing diverse talent and helping companies make unbiased hiring decisions are significant steps towards building inclusive teams. But Jamieson argues that it doesn't just factor in at the recruitment stage. Diverse teams also reduce churn. According to research from Creative Equals, employees are 45 per cent happier and 48 per cent more likely to stay in a business if teams are diverse.

"Getting diverse talent in is one thing," Jamieson advises, "but in order to retain this talent, you also have to make sure you create an environment where they can feel comfortable and really flourish. You get the best out of people if they can bring their whole selves to work. A really important layer is understanding that people are different and have different needs. If you're increasing the amount of people with autism in your business, for example, they might not like an open-plan office."

While the company culture is undeniably important, Jamieson recommends hiring for values fit, not culture fit. "I speak to a lot of founders who say they've got to hire for culture fit. ►

A photograph of a woman with blonde hair and glasses, wearing a striped shirt and dark pants, sitting in the bow of a green wooden boat. She is smiling and looking towards the right. The boat is on a body of water with mountains in the background.

"It may sound airy-fairy but I found happiness is related to performance. A happy team is a productive team"



► However, vetting people on if you like them and if you'd want to go to the pub or hang out with them leads to homogenous thinking. You'd hire people like you. Values fit is much deeper. If people don't share your company's values, that's where things start going wrong. Any bad hiring mistake I've made in the past was due to a values misfit."

Consequently, every candidate is interviewed by committee (following Google's recruitment process) to alleviate the risk of a managers' unconscious biases. Then Jamieson personally vets candidates for The Dots' six core values before progressing on to the next stage, like a tech test if it's an engineering role. The values include diversity, collaboration and positivity. "And I don't mean positivity for positivity sake," Jamieson stresses. "It's about ensuring that I'm hiring a team that's focused on solutions and not problems."

The onboarding process includes an induction with Jamieson to explain the importance of diversity and introduce new hires to its multiple layers. The whole

company is built around the power of teams and how teams form an intrinsic part of the creative process. To work out if she's built a truly inclusive environment, Jamieson aspires to a key result of 10 out of 10 happiness for her team. "It may sound a bit airy-fairy," she laughs. "But I found that happiness is intrinsically related to performance. A happy team is a productive team. We're currently averaging at about 8.2, which is great, because it gives me a really good barometer on problems."

To measure it, Jamieson sends around an anonymous survey every quarter and asks three questions: how can we improve the product to make you happier, how can we improve the office and what would you do as CEO? Recently, as the business scaled, the overriding feedback was that people felt disconnected and didn't know what everyone was doing anymore. Now every Friday each team presents what they're up to and every quarter people move desks to sit next to different colleagues. In the next survey the problem had vanished.

So what's up next for The Dots? In 2019, its focus will be on London. "It's the biggest creative cluster in the world," Jamieson says. "Over 3 million people work in that cluster. All the creative sectors – tech, film, fashion, advertising, architecture and the arts – are in one city."

As 51 per cent of The Dots' community is based outside of London, also on the cards are developing a playbook for international expansion and a more sophisticated approach to data, so the team is exploring machine learning and how they can better serve up people and content to the community. And then it's time to raise another round of funding. One thing's for sure though: while many of LinkedIn's white-collar workers face automation, there is no algorithm for creativity. "There are three things machines don't do very well," Jamieson points out. "They don't have common sense, they don't have empathy and they can't mimic that human capability to be creative. And that's the community we look after: the more fluid, more creative workforce of the future." ■

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* Q&A

JASON GRIGSBY

The co-founder of Cloud Four reveals how he's helping to push the web forward



INFO

job: Co-founder, Cloud Four and author of *Progressive Web Apps*.

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Could you briefly introduce yourself to anyone who doesn't know you?

I'm a co-founder of Cloud Four, a small web consultancy located in lovely Portland, Oregon. We're a bit different in that we consider our primary mission is to push the web forward. Sharing what we learn is a primary reason why the company exists and we tend to work with clients who want to get something done and learn at the same time.

What's the story behind your new book?

I had a potential client who was interested in a progressive web app. He asked me to send him some articles to read but when I looked, everything I found was written for developers. I started writing articles that I wished had existed. When Alex Russell, one of the two people who coined the phrase 'progressive web apps' pinned a tweet about one of my articles (it's still his pinned tweet), I realised that I might have stumbled onto something that people needed.

There are a number of books about PWAs. What's different about yours and why should people buy it?
The biggest difference is that the other books are written primarily for JavaScript developers. They're

great at teaching people how to write a service worker but they don't spend a lot of time talking about why and what you might want a progressive web app for. Because the definition of PWAs is amorphous, the rest of the team is left struggling to figure out what it means for them.

So I wrote a book for the whole team to help them decide what their PWA should do and how the decisions they make impact the overall scope of their effort. It's easy to make a simple decision and for it to have major ramifications. For example, declaring your app should be fullscreen is a single line in a manifest file, but going fullscreen means you have to implement a back button, sharing, printing or any other feature the browser provides that users no longer have access to.

This is the book you want everyone on the team to read to get on the same page about what your PWA should do. Then you pick up Jeremy Keith's book on service workers or one of the other PWA books to learn the code.

As you see it, what are the main challenges facing the mobile community in 2019?

Performance. It's the same challenge we've faced since the earliest days of mobile. Mobile devices have inconsistent and higher latency networks, slower CPUs and less RAM. We spend too much time on our fast devices and don't realise that even in so-called developed countries, there are many people on mid-tier or lower Android devices.

To make matters worse, the performance bottlenecks have shifted. It used to be that we were struggling to make pages render more quickly. Now it is common that web pages render quickly but aren't usable because JavaScript is processing and preventing users from interacting with the page.

In general, what's exciting you most in the field of web design right now?

Browsers have advanced so much in the last couple of years but I don't think there is a single example of a website taking full advantage of everything that is currently possible. We can have websites that load nearly instantaneously, use animations to provide a smooth and fluid user experience, where people can login using their face and buy products using their fingerprint. We have access to the camera, the gyroscope, even the ambient light sensor in some cases.

We have more tools than ever to build compelling user experiences and we've barely scratched the surface of what's possible. I can't wait to see what people design and build when they realise what browsers can do these days. ■

★ INNOVATIVE SITES

WHO'S PUSHING THE BOUNDARIES OF THE NET?

Which websites and companies are really pushing the envelope?
Our seven experts share their picks



ADRIAN WONG

Senior designer, This Place
thisplace.com

 The internet is a playground for our imagination. By seamlessly combining different technologies, a demo by Little Workshop (a digital workshop based in Paris) asks users to experience music in a new light (<https://netm.ag/2Q05W1y>). Interactive, synchronised and randomly generated, Track immerses the user in a unique, endless environment. It's exciting to explore such a beautiful mix of art and code where technical complexity gives rise to something so simple and playful. Check it out for yourself.



MATT WIGGINS

**Partner and director of interactive,
Legwork Studio**
www.legworkstudio.com

 I like thenewmobileworkforce.com, which Citrix and Red Bull use to explain how the software company is helping Aston Martin Red Bull Racing at the track. Having been a Flash developer, I often wondered when we would see an immersive experience like this in a modern format. The site is responsive and rich in every way. They illustrate high-performance, precision engineering perfectly with animation, video and transitions that are device sensor-aware on mobile.



ROCHELLE DANCEL

**Experience design strategist
at Randomly**
www.rochelledancel.com

 Parts of the internet that regularly affect our lives are becoming more regulated – for better and worse. Regulations put in place for the benefit of people, rather than companies, are often difficult to grapple with. So I think one of the things that pushes the web forward are independent projects that try to make it easier for people to fully benefit from new regulations. A great example by Made Abroad's Rafa Prada is Opt Out (opt-out.eu), which helps people take advantage of GDPR protections. You can search for an organisation or request their details, then fill in one of Opt Out's templates and send it off to the organisation to request your data is erased.



MIKE BRONDBJERG

Designer, developer and artist

www.kultur.design

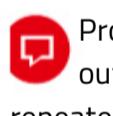
 Kepler.gl is an open-source geospatial analysis tool for large-scale data sets and it's amazing. This web application from Uber is an astounding piece of engineering that's also beautiful. Using WebGL, it is taking (some) geospatial data analysis away from heavyweight server solutions and moving it into the front-end to create fast, interactive data visualisation. To paraphrase Uber's own docs: "Kepler.gl allows technical and non-technical audiences to visualise a large amount of location data in your browser."



NICK MCNEILL

Interactive director, The Brandon Agency

www.thebrandongroup.com

 Progressive interfaces are one of my favourite things (I've made a career out of them). But after seeing everything done and, now, some stuff repeated, it's time for the interface to get out of the way. My favourite examples of websites I've seen lately have a simple interface and let the content shine through. I think we're going to see the internet heading more in this 'content is king' direction. A perfect example that I saw recently is *oatthegoat.co.nz*. Minimal interface, yet maximum coolness by blending well-crafted animation with simple interactivity to tell a captivating story.



ARJEN VAN DEN AKKER

Director of product marketing, SDL

www.sdl.com

 An outstanding website that blends marketing, support and sales content is DAF Trucks. Built on SDL technologies, *daf.co.uk* is a one-stop-shop for DAF's global network of dealerships, giving the customer access to everything they need. This includes sales support information and the ability to check and order parts directly from the manufacturer. One big highlight is the Configurator feature, which pulls mechanical manufacturing data into an interactive 3D representation, enabling the customers to see, design and configure literally every technical or cosmetic detail on a truck.



ANNA DAHLSTROM

UX designer, speaker and coach

annadahlstrom.com

 One of the words our 15-month old daughter knows is 'Google' because every day we speak to Google Home. It's making me think about what the web will be when she's older and how some of the challenges we're facing – privacy, data ownership, hate and (fake) news – will be solved. Some of the most interesting things I'm seeing involve recent projects founded by Tim Berners-Lee: The Web Foundation (webfoundation.org) and Solid (solid.mit.edu), which are pushing for a better and different web.

RESOURCES

5 SENSATIONAL WEBSITES TO BE INSPIRED BY

<https://netm.ag/2DX14k>

 To give you a taste of how web designers are finding creative ways to make the web more enjoyable, Christina King rounds up five sensational sites that are shaking up the status quo, as well as proving to be informative.

WHAT IS DISRUPTIVE INNOVATION?

<https://netm.ag/2zY3oI0>

 This small but perfect blog post from Studio 72 in Australia, introduces the disruptive innovation business model. It then demonstrates how the theory works in practice, with reference to two divergent case studies: Netflix and a Melbourne-based dry cleaners.

ARE BRUTALIST SITES THE WEB'S PUNK ROCK MOMENT?

<https://netm.ag/2BdXe2Q>

 The web brutalism movement is throwing out work that's inventive, exciting and challenging. Jim McCauley chats to some of its leading practitioners, looks at its origins, its purpose and how it's changing web design.



*SKILLS

BECOME TOOL-AGNOSTIC

While you may have go-to tools you prefer to use, **Clementine Brown** outlines the benefits of being a little more adaptable

> We live in a world that's dynamic, with a tech ecosystem that's moving at a blistering pace and, as a result, digital designers have found themselves using many tools to achieve different objectives. These include wireframing, prototyping, systemising, demoing, style guide-ing, workflow-ing, handover-ing and, of course, designing. We are always willing to adopt different tools for different scenarios – but shouldn't we be willing to do the same in each of those categories?

KEEP AN OPEN MIND

While I've referred to being agnostic in the title of this piece, I'm not convinced it's the right word. Its basic meaning is being unwilling to commit to an opinion about something – and when it comes to design

tools, I find myself with plenty of opinions that I'm more than willing to commit to. Even though I'm well into my 30s, it usually goes something like the playground game Marry / Kiss / Kill. I certainly have favourites I'd be happy to use every day, some I'm interested in and would warm those dark winter evenings getting to know and a few I wouldn't miss if the data centre that held their source code accidentally burnt to the ground. But what I'm really talking about here is perhaps less agnosticism and more open-mindedness; the recognition that, as yet, (while all digital designers may dream about it) there is no one-tool-fits-all utopia.

ADAPT TO CLIENTS' TOOLS

I understand that tool fatigue is a very real thing, especially with the speed at which

new design solutions are released to market. Zeplin, Frontify, Avocode, zeroheight, Figma, Trunk, Whimsical, Atomic, Flint, Webflow, Marvel, Affinity, Overflow... and I haven't even got to Adobe XD or Sketch yet. And, as a result, the necessity of being able to flex and learn and adapt your tool choice to the specific environment you might actually find yourself working in is also a very real thing.

It might be fun to list out all the things that are 'wrong' with a tool that you'd like to kill but if you're on a team where it's already in use, then it's alienating and a waste of time (although that's not to say that if you believe you can be a catalyst for real change that you should stop fighting the good fight). For example, if you're a consultant or a contractor (and to some extent a freelancer), your job will be broken down into projects, mostly working in the client's environment and often (as big corps like to sign big contracts with other big corps) with the clients' chosen toolset. So going into that situation showing knowledge of and willingness to use different software (eg Photoshop, even though your tool of choice is always Sketch) is definitely a plus. You can hate it but at least you can still be an efficient member of the team.

A TOOL FOR EVERY TASK

Being able to use a bunch of tools at a reasonable level doesn't reduce the quality of your output. If you use 30 tools, several of them will not be that great. But after using them for a few tasks, you'll learn what you need that tool to do and that what you wanted the tool to do turns out to be something you don't actually need. Having that knowledge and being able to apply it to the question of which to choose in the context of your working situation, is the feedback loop that will improve your workflow and help build the quality of your outputs.

The moral of the story is we should be trying to grow our mastery with a few tools that work wonderfully for us, know our way around a handful of others and learn to think with as many as possible. ■

PROFILE
Brown is product designer at Red Badger, a company dedicated to helping others improve their business.

w: <https://red-badger.com>



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GALLERY

Sensational design and superb development



The screenshot shows the Sea Harvest website. At the top left is a logo of two fish. The top right features a red vertical bar containing a portrait of Mark Billen, his bio, and social links. The main header "GALLERY" is large and bold at the top. Below it, the Sea Harvest logo and "FRESH SEAFOOD MARKET" are displayed. A navigation bar with links for "ABOUT", "PRODUCTS", "CONTACT", and "ORDER" is present. The central feature is a large, detailed illustration of a salmon. To the left of the fish is the text "FROM SEA TO PLATE". Below the fish is a quote: "The latest harvest has yielded deliciously fresh seafood perfect for devouring on its own or as part of a scrumptious recipe. Here's a seasonal favourite...". To the right is a section titled "FIND US" with a compass rose icon, listing market locations and opening times.

* JQUERY, ES6 JAVASCRIPT, FLEX

SEA HARVEST

<https://www.seaharvest.net.au>

For those not au fait with fishy global business, Sea Harvest is a fresh seafood merchant located in Canberra, Australia. Hailing from Belconnen and Fyshwick's fresh food markets, this new site promises a wide variety of products folded in newspaper. Designed by local agency ED, the team boasts previous with a similarly distinctive effort for another Canberra client keen to sell fresh fish.

"Originally inspired by the wrapping of fish in newspaper, we created a newspaper pattern that was used in multiple touch-points of the brand identity," ED explains. "This opened the floodgates to all kinds of interesting ideas that help build upon the Sea Harvest brand and keep the user engaged and entertained."

Charming additions around this metaphor include word search puzzles, mock adverts and even a Garfield cartoon strip. Front-end effects are applied with subtlety to add blue rollover highlights plus colourisation on hover to bring a little more life to blog-style article images. Portrait and Pressura Mono fonts provide fitting typography throughout, including a 'click and collect' form found in the order section that never misses a beat in terms of styling continuity.

“When it came to expressing the brand [digitally], we thought: ‘why not make the site a newspaper?’”

CAM TIDY, DESIGNER, ED



* JQUERY, READY MAG, FREESOUND

I TYPE NY

<https://i-type-ny.groznov.co>

Whether it's controlling parallax backgrounds and floating page elements or triggering an assortment of UI effects, one of the most enduring trends in web design is scroll-based animation.

This wonderfully inventive website reflects this by combining it not with images but text, flat colour and Freesound sound samples. Put simply, I TYPE NY chronicles a trip to New York City across ten viewports, moving from aircraft ride through to sundown from a skyscraper. It has no real purpose beyond its existence, granted, but it serves as a reminder of how powerful economic storytelling is in any medium. By reimagining skyscrapers or iconic modes of transport like NYC's subway as tight sequences of moving typography, a narrative is achieved that defines the web itself. Words remain so pervasive in our modern digital environment and there's real creative gold to be plundered by creators who recognise and celebrate that fact.

The site is created by GROZNOV, the collaborative cross-disciplinary design company headed by Constantin Groznov, who evidently concurs with this sentiment. Pay a visit to the collective's polished portfolio at groznov.co and you'll see the very same ribbons of horizontally shifting text employed with equal aplomb.



“This is a one-man project that was conceived as an exercise in interactive storytelling – I call it scrollytelling”

CONSTANTIN GROZNOV, ART DIRECTOR, GROZNOV



* WEBGL, JQUERY, GSAP

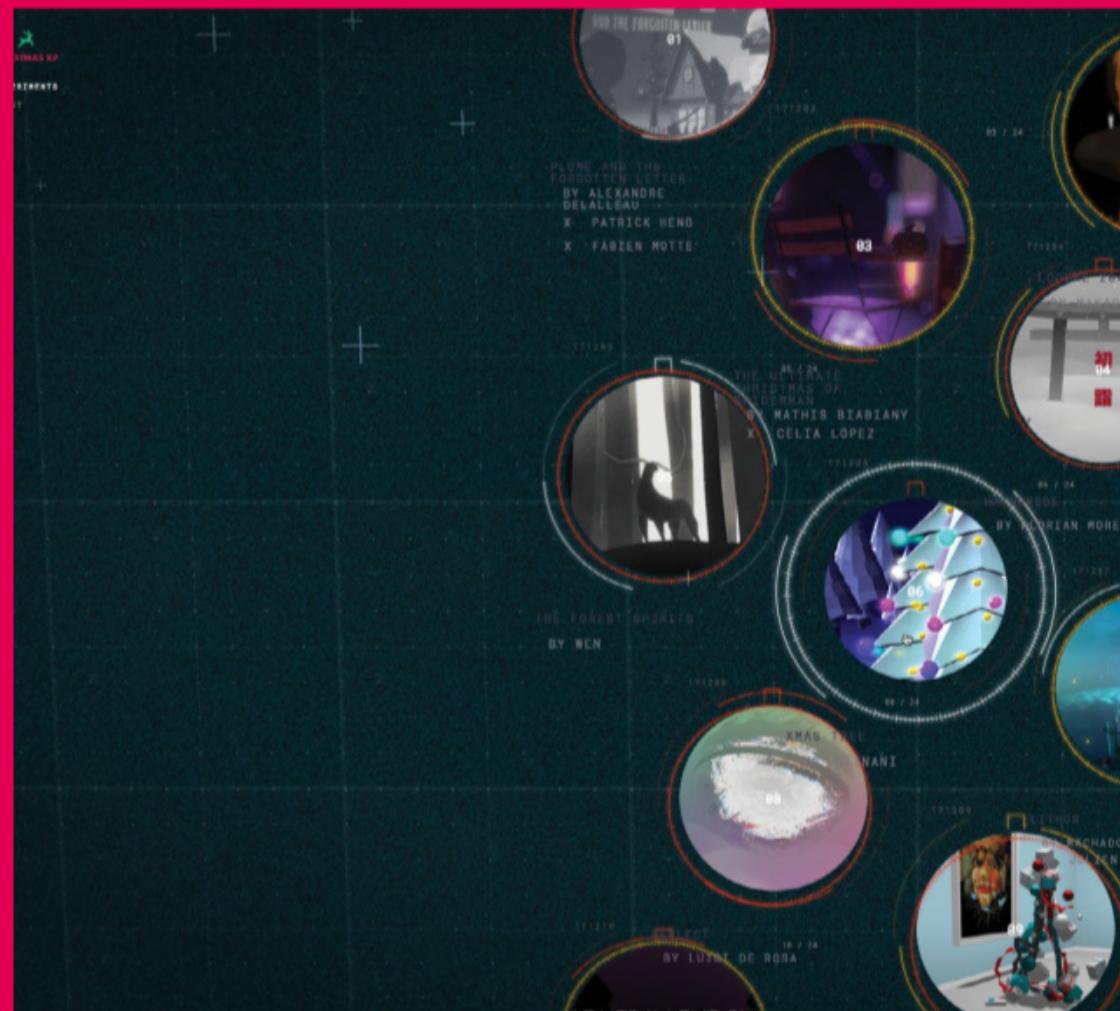
CHRISTMAS EXPERIMENTS

<https://christmasexperiments.com>

Christmas XP – or rather Christmas Experiments – is an unashamedly seasonal site selection for festive fans. That's because the site was actually a digital advent calendar for December 2018, featuring 24 new WebGL experiments that were launched each day leading up to the holiday.

Inviting fascinating creative commentaries on what the spirit of Christmas means, the wholly independent project directed by David Ronai boasts an incredible array of the world's most exciting digital artists. Quite clearly made with love, contributions come from talent such as Alexandre Delalleau, Mathias Biabiany and Lars Berg. The latter's Happy Shopper for example, uses awesome 3D animation and physics work to humanise a haphazard bundle of baubles, tinsel and gifts. Waltzing around a Giuseppe Arcimboldo exhibition space to lounge music, the swaggering decorations ultimately collapse into a forlorn pile, while Dalalleau's Plume serves up a dreamy interactive mission to deliver a seven-year-old girl's letter to Santa.

It's all very open to interpretation and that's the point, with the project serving as fertile ground for highlighting newcomers and top web creatives alike. Started in 2012 and building in participant support each year thereafter, Christmas XP is an advent event not to be missed.





★ REACTJS, GSAP, SVG

CURSOMIZER

<https://cursomizer.com>

> This intriguing project provides an inventive celebration of early computing, encouraging modern designers to play and test ideas. A direct reference to the customisation of the mouse cursor, CURSOMIZER invites visitors to replace the default system pointer with something more radical.

Comprising four key graphical properties that define shape, colour, size and visual effects, edits are previewed instantly and offer a surprising number of combinations to create truly unique options. Going beyond the basic style options, you'll find some nice motion, hover and click effects such as tail, jellyfish or blast.

Final selections are then summarised for testing or tweaks, while a URL is thoughtfully generated for sharing your custom cursor with peers.

Created by Moscow agency KRIKDESIGN and directly influenced by the work of GUI-pioneer Douglas Engelbart, the design team intend this to be a useful web application for prototyping. "Now it is not necessary for a web designer or an interface developer to involve a programmer in the process in order to customise the cursor of a future site. They can do it by themselves and demonstrate their idea in the test section, where everything is very simple and illustrative."

"The aim of the CURSOMIZER [site] is to create a useful and convenient tool for web developers. That is our mission"

KONSTANTIN ORALKIN, TEAM LEADER AND CREATIVE DIRECTOR, KRIKDESIGN

* JQUERY, GSAP, YOUTUBE

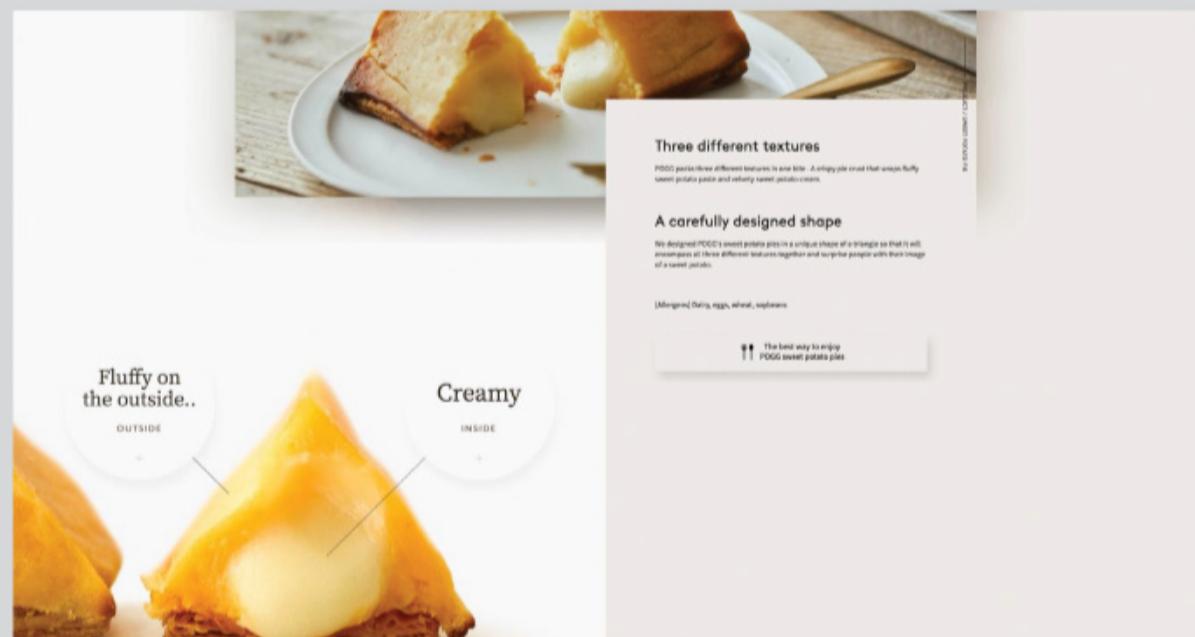
POGG

<https://pogg-sweetpotatopie.com/en>

Way back in the 1990s the surprise toy sensation was a game based on collectable milk bottle caps. Pogs, which were followed by Tazos, were all the rage. This URL has absolutely no connection to that.

POGG, from Bake Inc, is in fact a sweet potato pie brand operating out of three snack kiosks in Tokyo, selling triangular treats and ice cream. Quite simply, the product looks delicious and this site does a sumptuous job of conveying a real sense of texture. A clean white template is cut through by POGG's palette of pinks, creams and golds, beautifully complementing a stack of food hero shots to drool for.

Designed by Kenichi Tanaka at the Super Crowds Inc agency from Tokyo, the front-end engineering work is also credited to Miki Sumino and Yuma Iwakata. The trio profess to combine "contradictory values" to juxtapose a tangible magazine-like structure with softer interactive touches, contrasting the static with the dynamic. Sackers Gothic and Noto Sans CJK fonts provide a fitting style for header and paragraph copy, while YouTube video clips nestle seamlessly within a floating fluid grid oozing with creamy class.



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THIS MONTH FEATURING...



PROFILE

50

We speak to Inktrap, a studio that's graduated from websites to apps to design systems and loves nothing more than a design sprint



HOW WE BUILT

56

The team from Yoyo reveal how they enlivened a dry financial subject with an interactive timeline and particle effects for JP Morgan

DESIGN CHALLENGE

This month...

ONLINE TV CHANNEL

* PROFILES



CHRISTINE BERRY

Berry is lead UX designer at COOK in Tunbridge Wells, UK

w: christineberry.co.uk t: @_christinemooore



TOMAŽ VOLK

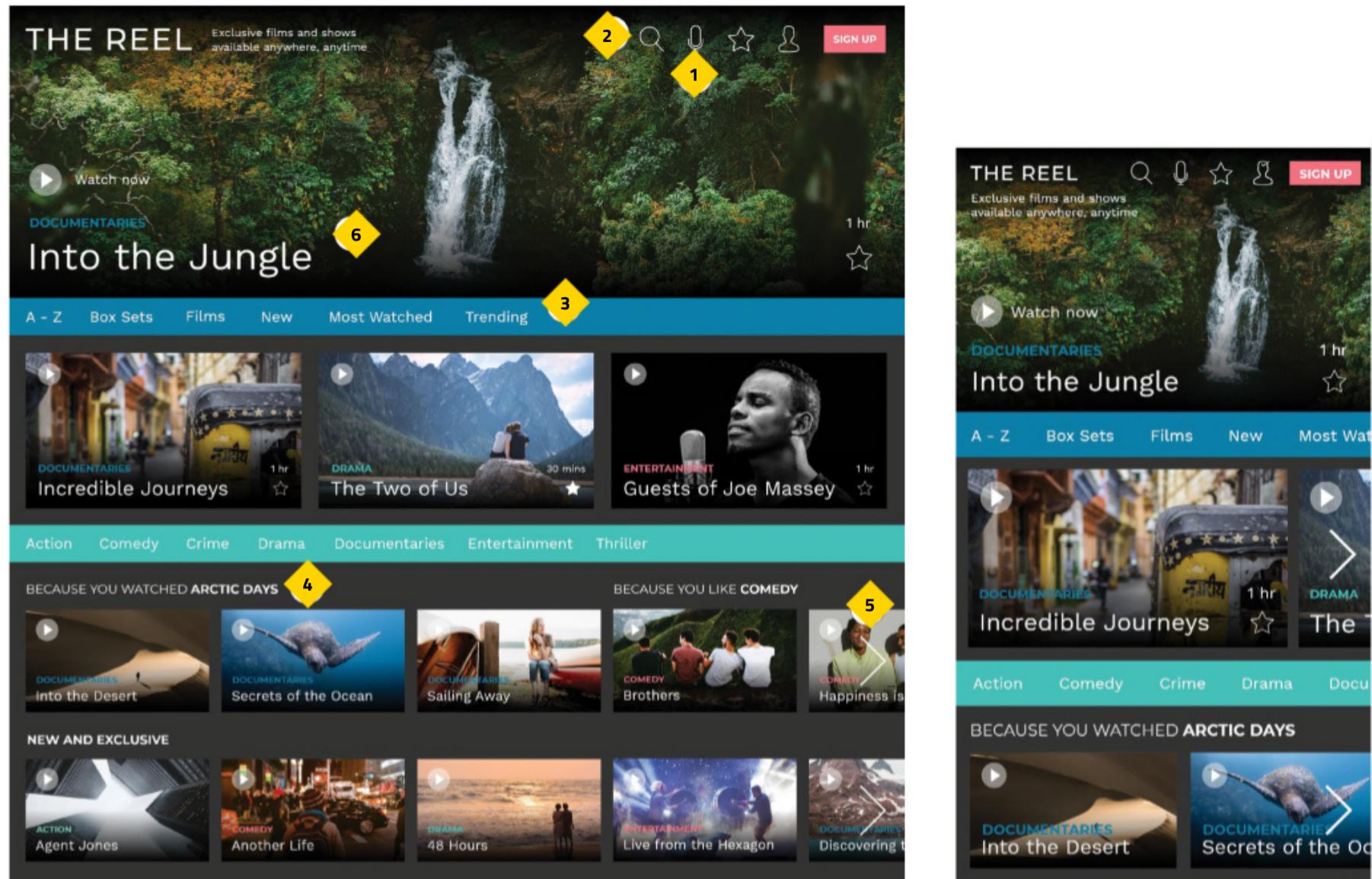
Volk is visual and interactive designer at Akeo in Los Angeles, United States

w: akeo.com



BRIEF

This month we would like you to design a new online TV channel that is trying to break into the market. The focus will be on exclusive content and shows, with mobile as the primary method of watching. It's vital to make the user experience as easy as possible. Could voice search play a role?



* CHRISTINE BERRY

THE REEL

Website for exclusive films and shows, using personalisation and a sleek user experience to engage viewers

> The Reel is a new online TV channel, so the website needs to create an instant impact. This is achieved with a clean UI and beautiful photography of the shows available. The goal is to encourage visitors to watch shows as soon as possible, so content is front and centre.

The website was designed mobile first, with swipeable video sections and navigations to access further content. Shows are categorised for sleek browsing and to highlight to new visitors what's available.

Nothing is hidden behind a traditional hamburger menu so browsing is easy and the design is the same across desktop, tablet and mobile, creating a consistent experience.

Voice search is built using the HTML5 Web Speech API. When selected, JavaScript checks if the browser supports speech recognition and asks for permission to use the microphone. When the user has finished speaking, the search results page opens.

CLOSE UP

(1) Voice search is included so users can access content quickly from devices, keeping the brand aligned with the latest tech and offering the online experience users have come to expect. **(2)** Icons give quick access to search, voice search, favourites and my account sections. Using consistent iconography across the website makes browsing enjoyable and actions clear. **(3)** Primary and secondary navigations make browsing easy and fast but also help showcase what sort of content is available, which is important for a new brand to the market. **(4)** Personalised content helps users decide what to watch next and tailors the experience to them, keeping them engaged and likely to return. **(5)** Swipeable content sections load more shows. Offering the same experience on desktop and mobile keeps consistency between devices. **(6)** Visual hierarchy of content enables The Reel to showcase new shows and films to grab the user's attention. It also makes the website visually impactful with large photography.

MY MONTH

What have you been working on/doing this month?

Building a proof of concept prototype for a voice assistant to shop online and give meal plan and recipe ideas. Designing branded posters for the office and a new careers section for the COOK website.

Which two websites have you visited for inspiration?

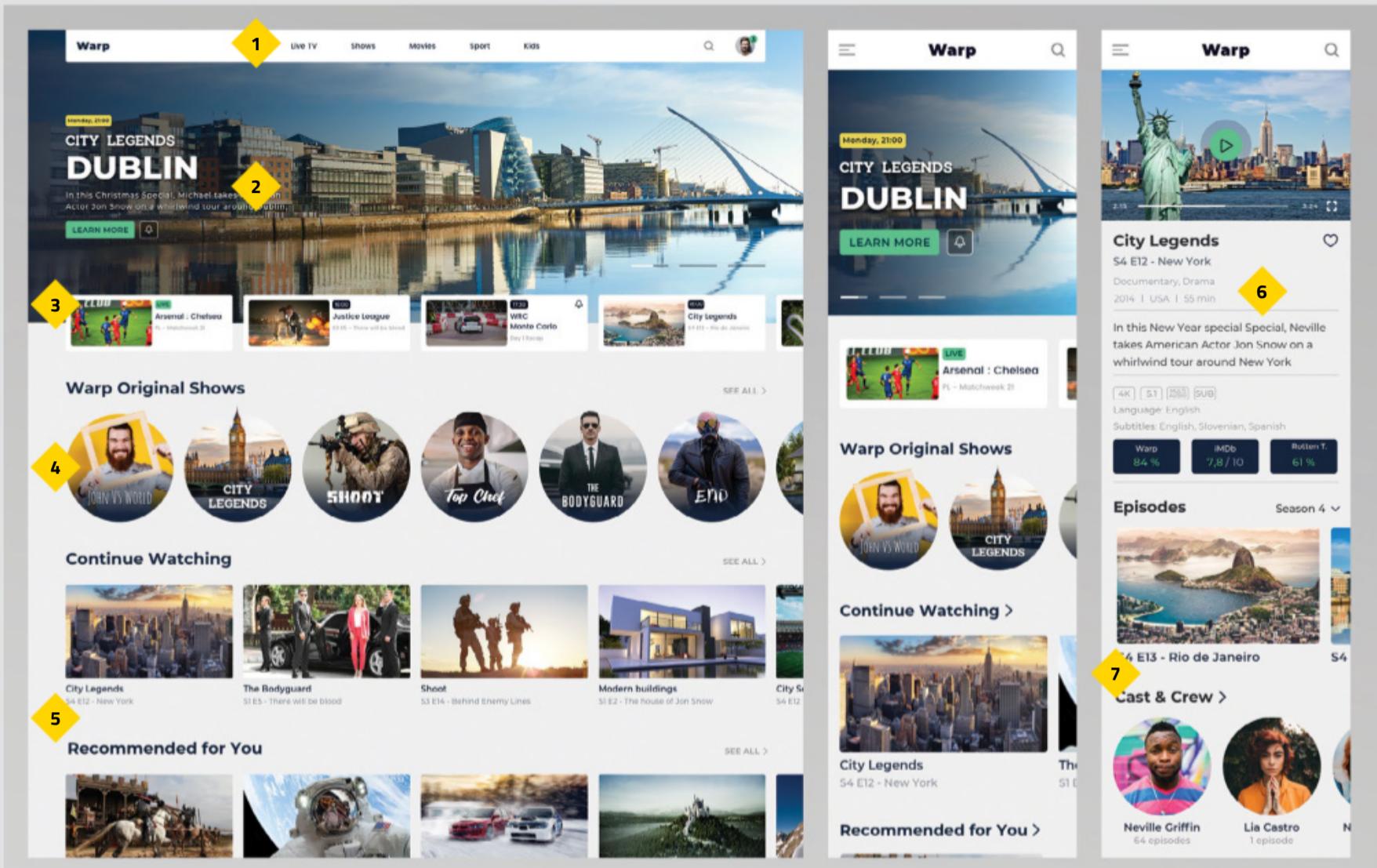
CSS Design Awards and YouTube for video display design.

What have you been watching?

The Holiday, Wonder and Grace & Frankie.

What have you been listening to?

Thrive Global podcast with Arianna Huffington.



* TOMAŽ VOLK

WARP TV

Multiscreen freemium TV channel that appeals to a wide audience



What have you been working on/doing this month?

Working on a project for leading telecommunication company in Slovenia.

Which two websites have you visited for inspiration?

CSS Design Awards, Dribbble and Medium (I recommend reading *Designing for Television* by Molly Lafferty).

What have you been watching?

Altered Carbon and *Narcos*.

What have you been listening to?

Hans Zimmer

Essentials playlist.

Warp TV is a brand-new TV channel delivering a variety of genres: from live sports events and blockbuster movies to original content (movies and shows). One of the main advantages is a multi-access experience, so the user can watch Warp TV on a television without subscribing or pay a small monthly fee to access all content anywhere and anytime.

Warp TV is personalised and constantly learns from the user what content they like, to then recommend more content they might like. The user can easily switch between categories, such as movies, shows, sport and kids, as well as quickly access live TV.

The whole UI was kept clean, with the combination of a few vibrant colours used to highlight important information such as availability of TV content. The chosen font is Montserrat, which has really good readability, even at smaller font sizes.

CLOSE UP

(1) The user can easily navigate through the main sections and quickly access profile, notification or search. (2) Header consists of a few different slides that are tailored to the user's interests. They can access more about the show or set a reminder, which will be triggered 15 minutes before content starts or when content is available online. (3) A quick overview of the TV schedule means the user can navigate through past and future events. (4) The listings section, which introduces the TV channel's original shows. With 3D effects on the photo, the main character or topic is highlighted. (5) Listing sections are tailored to the taste of the user. It shows them where they left watching content or recommends content they may like. (6) The user can see all important content information at first glance. (7) The user can explore all episodes of the show's cast and crew, as well as similar content directly from the current content detail screen.

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INFO

Location: London, United Kingdom

Established: 2013

Team size: Six

Expertise: Digital product design, UX/UI design, front-end development, design sprints

Clients: Zeidler, Harley Therapy, Farillio, TRX, EveryStay, Virgin Holidays



*PROFILE

INKTRAP

inktrap.co.uk

We speak to a London studio that's graduated from websites through apps to design systems and that loves nothing more than a good design sprint

> Founded in 2013 by Brunel University graduates Sam Lester and James Keal, Inktrap (inktrap.co.uk) is a London-based design studio that prides itself on making beautiful, practical and impactful digital products, from initial concept to front-end development. Over the past five years, it's shifted its focus from websites to apps and on to design systems for the web, picking up a strong client roster and growing from a two-person team to a staff of six, a number that's set to increase soon.

Let's meet the team – comprising Sam Lester, co-founder; James Keal, co-founder; Rachel Brockbank, digital product designer; Liz Hamburger, digital product designer; and Joe Thom, front-end developer – to find out more.

Hi there! Could you tell us a bit about Inktrap and how it came together?

SL: Hello! James and I started the company over five years ago, during our final year at Brunel University. We were essentially freelancing together at the start – my previous agency experience and James' strong design process seemed to be a good match.

We started off doing marketing websites but soon got into apps. This led to us working with a bunch of different tech startups to help design and build their web or app MVPs. We learnt a lot really quickly as we were doing a bit of everything, from simple prototypes and ►

marketing sites to full design and build of apps and back-end systems.

A few years ago we decided to shift our focus away from app development to creating design systems for the web. This has allowed us to do more of what we truly enjoy – designing interfaces and implementing them in the browser.

Tell us a bit about your studio principles.

SL: We've always been pretty clear about wanting to run the business in a way that focuses on the user and product, not just what the client asks us to do.

One of our defining moments came in our first six months. We were short on new business and things were looking pretty bleak but we were sent a brief for an app project. We read through it and realised that what the client had asked for didn't make sense for the product.

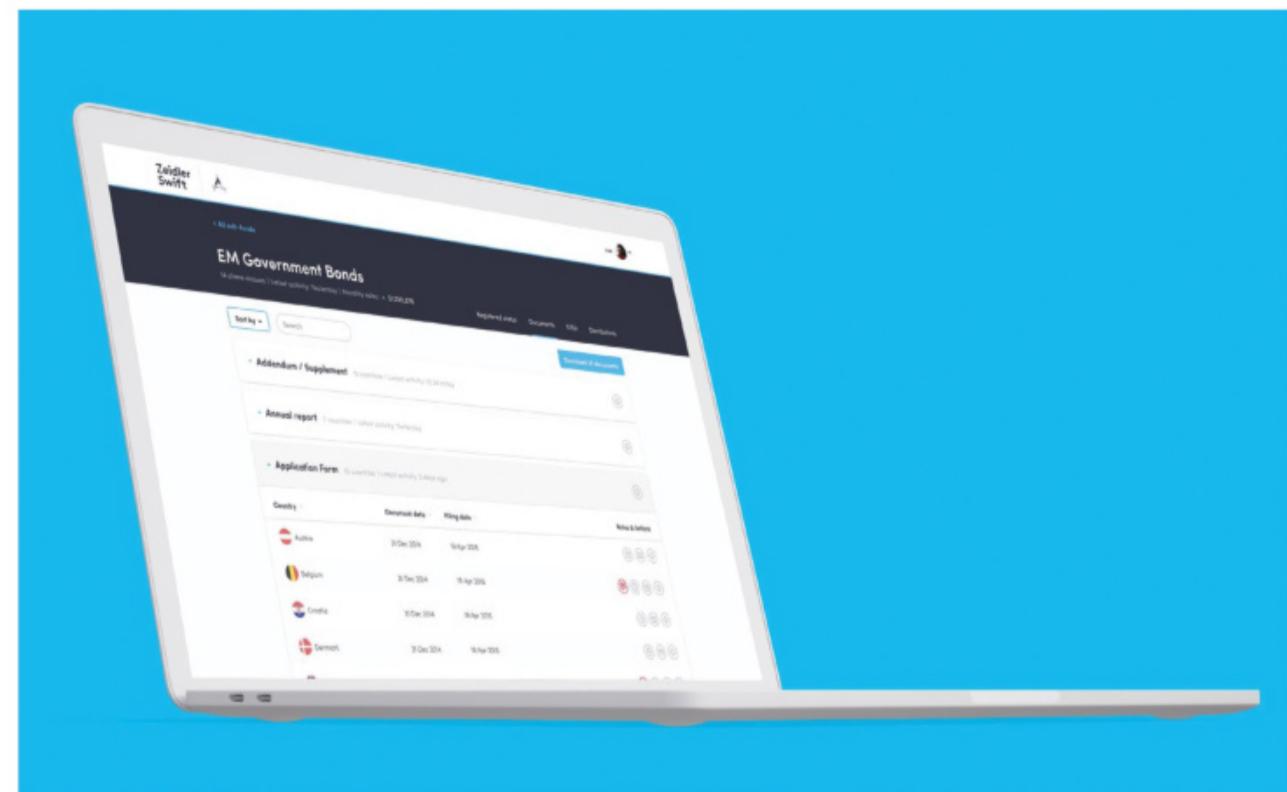
The choice we had was to do the work as it was requested or pitch something totally different that would be much better for the product and the client. The odds were against us that the client would like our approach and not landing the project would likely mean the end of the business. We decided to stick to our principles and the project ended up being our first app design and build. It was featured on the App Store and in national newspapers, kickstarting our work with tech startups.

We strive to be the studio that clients choose when they want the best for their users, not just someone to use Sketch for them. Over the past few years we've also expanded and solidified our principles and put them in pride-of-place on our website (inktrap.co.uk/studio) so new clients can see what we're all about.

Design sprints are a big part of your process. What makes them work for you?

JK: We love design sprints! They've been a core part of our design process for years now and we've used them to solve all kinds of problems.

We find them particularly useful with new clients as we can quickly get a deep understanding of their product. It's also really efficient as the client is there for all the key parts of the process. They feel more connected to the project and we



The digital service platform for Zeidler, which enables its clients to register and manage investment funds more easily and get access to information to help them make decisions

can also walk them through our thinking, so they can understand why decisions were made and their implications. This builds up trust at an early stage and allows us to forge the long-term relationships that make design systems work for an organisation.

What would you say is your USP?

SL: Weirdly, it's probably the things that we don't do. By not getting too involved in marketing or back-end development we can be much more focused on UX/UI design and front-end. It also means we can fit really well into startups and especially corporates, where design needs to be less constrained but back-end development can be done in-house.

We also have the advantages that come with being a smaller studio, primarily that we work directly with our clients. The person who did the work talks to the client about it – this tends to be pretty refreshing for clients who have moved from a larger agency.

Your newsletter, Minimum Viable Publication, has been going for over 100 issues. Could you tell us about that?

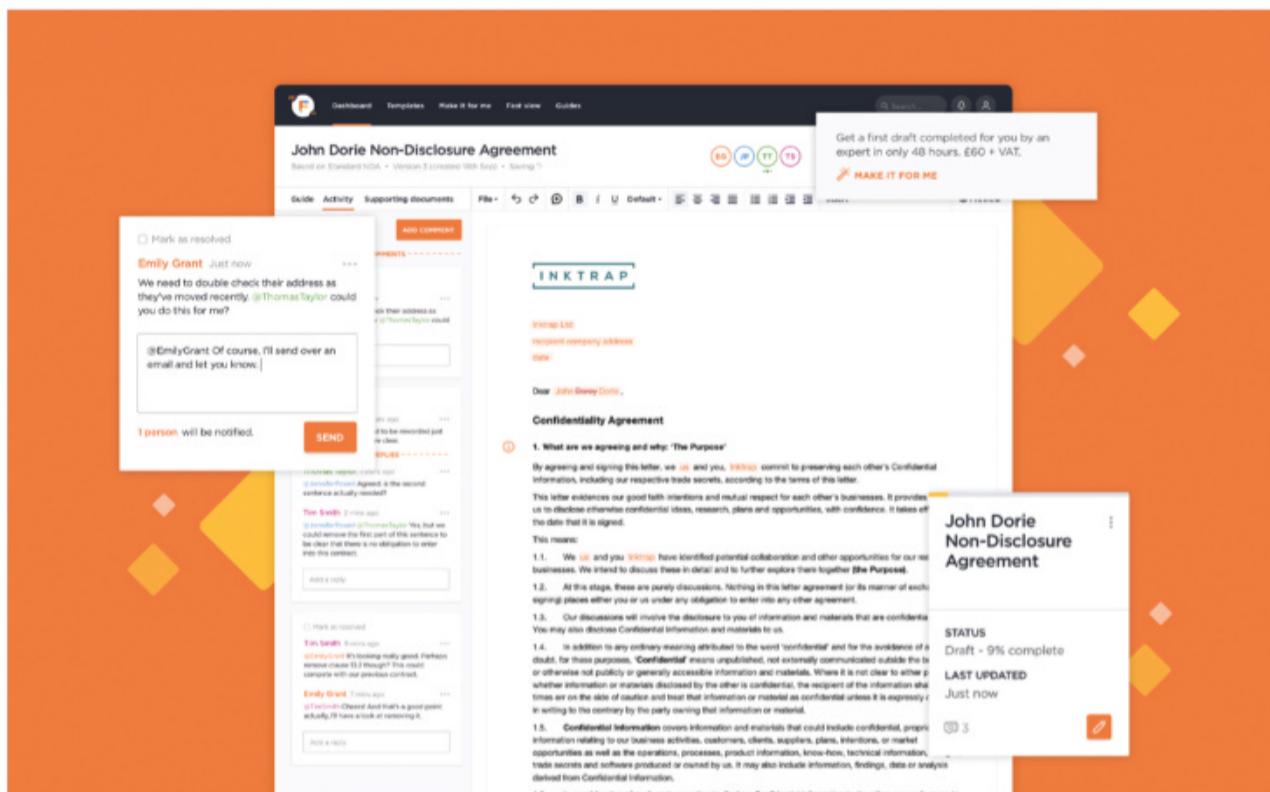
RB: Everyone in the studio shares interesting articles and tools we've found on the internet over Slack and we

thought perhaps other people might find what we collect interesting too. Our email goes out once a week on a Tuesday and it covers everything including design, development, articles, tools, websites and industry news. It's a nice way to share stuff in one place that we think is cool, interesting and funny.

Farillio (www.farill.io) provides legal guides, templates and advice to small businesses. What were the challenges in turning this idea into a working product?

JK: The document editor was probably the most challenging aspect as it includes quite a lot of functionality beyond allowing the user to edit the document, including things like inline comments, document revisions and digital signing. Legal documents have a reputation for being expensive and complex (two things that Farillio is rapidly changing) so it was important that the experience wasn't too overwhelming but still included the necessary features. The interface we came up with was also challenging to develop but we broke it up into different components to make it easier.

We've worked regularly with Farillio for over a year now, helping to improve and expand the product alongside their



The document editor of Farillio, a company focused on providing guides, templates and advice to small businesses

in-house development team. Great products are normally the result of a lot of iteration, so it's been brilliant to have the opportunity to keep working on the product after the initial design and build was completed. Farillio recently completed an investment round to help take the product to the next level so the product has a really bright future.

You designed a web app for Harley Therapy to help therapists manage their schedules. Talk us through the process.

LH: We've worked on a few different projects for Harley Therapy (harleytherapy.com) but the scheduling app was the first. It helps therapists manage their schedule by adapting to different situations like when a client doesn't show up, needs to skip a week or change their regular booking.

We used our tried-and-tested design sprint format to deliver a prototype of the product. During the sprint we were able to test our ideas with a therapist, which helped us identify some brief moments between appointments when they could complete quick interactions to keep everything up-to-date. We then designed and tested a core user flow that could handle the different booking scenarios in just a few taps.

Since then we've also helped design the site for the client side of the product, where people can find a great therapist and then book an appointment online. This has had brilliant feedback and has won a few different awards, including one for Best Healthcare Website.

For Zeidler you've designed and built multiple products in a single system. What did that involve?

SL: Zeidler (zeidlerlegalservices.com) is our favourite kind of client; a traditional business (in this case a law firm) that's not afraid to reinvent its processes to utilise technology more effectively. We initially worked with them on a quick prototype but this turned into a long-term partnership where we've designed multiple products for their digital service platform, Zeidler Swift.

JT: We knew early on they were aiming for a suite of products so we built each product with that in mind, eventually creating a modular design system that works across the whole platform, even when the back-end technology is different. For example, one of their products was particularly content-heavy so we integrated Craft CMS while keeping the design and front-end consistent with the rest of the system.



*SPOTLIGHT



RACHEL BROCKBANK

Digital product designer

What's on your desktop?
A bit of greenery with a plant and a succulent, a stack of design books – *Sprint* by Jake Knapp is my favourite.

What is on the walls?
Illustrated postcards, sketches from our latest design session and our massive whiteboard with the name of this week's 'Earl of Sandwich' (the person who is deciding the sandwich filling on Friday).

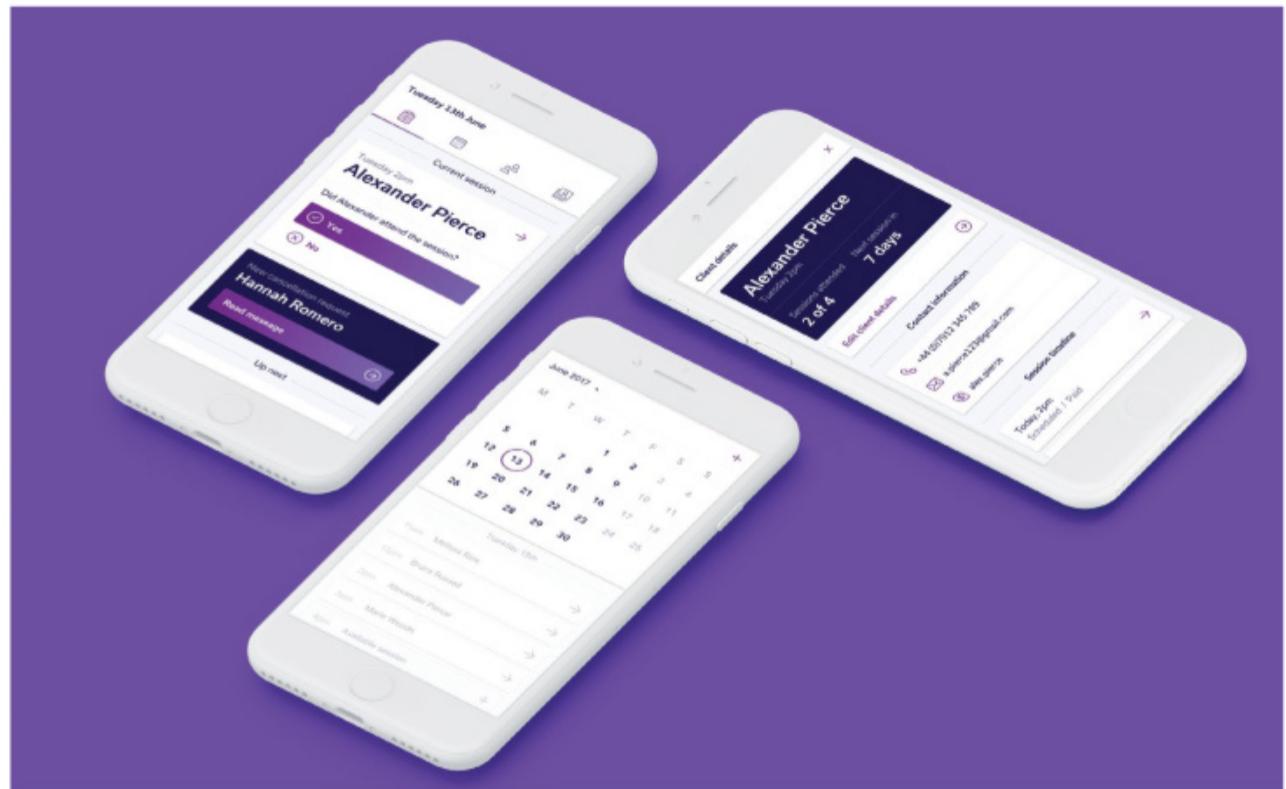
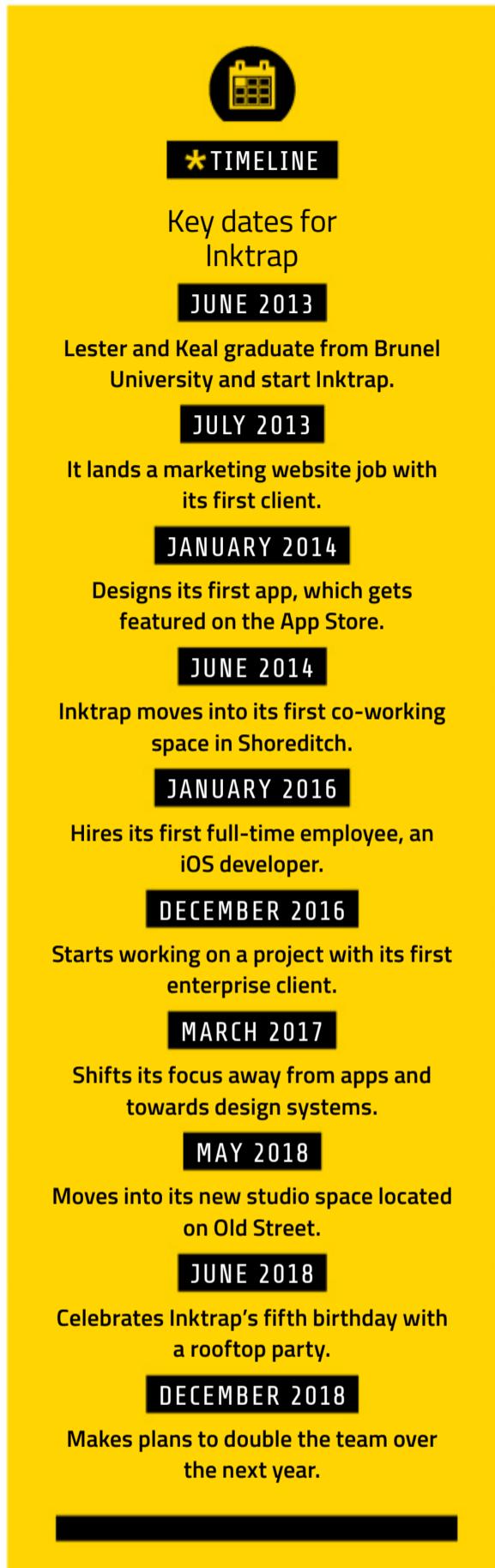
What will you do for lunch?
If the weather's good we will head down to Whitecross Food Market and come back to the studio to eat together.

What hours do you work?
We have flexible time around core hours of 11am to 5pm – I normally work from 10am until 6.30pm. We never do any unpaid overtime so we always have our evenings and weekends free.

What else do you do in the office?
Listen to our 'Inktunes' playlist, catch up on what everyone did at the weekend and make delicious sandwiches together (on Fridays!).

How often do you all hang out?
We usually have a few beers on a Friday afternoon in the studio but we make sure to set aside a couple of nights a month to properly get out and do something fun!

Describe your office culture in three words
Enthusiastic, friendly, close-knit.



The work for Harley Therapy involved creating a marketplace platform that helps connect people with the right therapist for their needs

► Most recently we've been working with them to design and build a chatbot that can answer legal questions and connect the user with a human if they need more information. It's the first time we've worked on a conversational UI so there's been a bit of a learning curve but we're really happy with the way it's developed.

Which tools and technologies do you rely on most?

LH: Our go-to tools at the start of every project are our whiteboard and markers. By starting away from the computer we can be distraction-free and get into a problem-solving mindset more easily.

Once we've got the outline of the product, we'll jump into Sketch to create higher fidelity wireframes and then to design the interface. Almost everything we design eventually gets exported to InVision so we can test the product as an interactive prototype.

JT: For the front-end build, we generally use Twig, Sass and ES6, all compiled with Gulp. For more complex projects, where we're building directly against an API, we lean on JavaScript frameworks like React, Gatsby and Node. We're also big fans of Craft CMS for creating marketing sites and simple products. Aside from the off-the-shelf frameworks, we've

created some of our own tools, like Baseline (our project boilerplate) and Glyph (our design systems product).

As an expanding company, what sort of posts do you find hardest to fill?

SL: Mid/senior front-end development positions tend to be the most difficult, partly because of how broad the field has become. For some, front-end now means 'React Developer' but we're looking for much more than just JavaScript, including a deep knowledge of CSS and understanding of things like semantic markup and accessibility.

And what kind of people do you tend to look for?

RB: People who are enthusiastic and really care about the work they're doing. We all have a passion for making products that are both nice to look at and simple to use and that's important in our process. We're also a really collaborative team, so someone who can communicate their decisions both to the rest of the team and to our clients would fit in well.
SL: For developers it also helps if they've got a nice website that they've built themselves. The first thing I do when a new candidate applies is go to their website and inspect the code! ■

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38
PAGES OF
TUTORIALS
INSIDE

NEWSSTAND FOR IOS www.bit.ly/3dworld-app
PRINT www.myfavouritemagazines.co.uk/3dwsubs

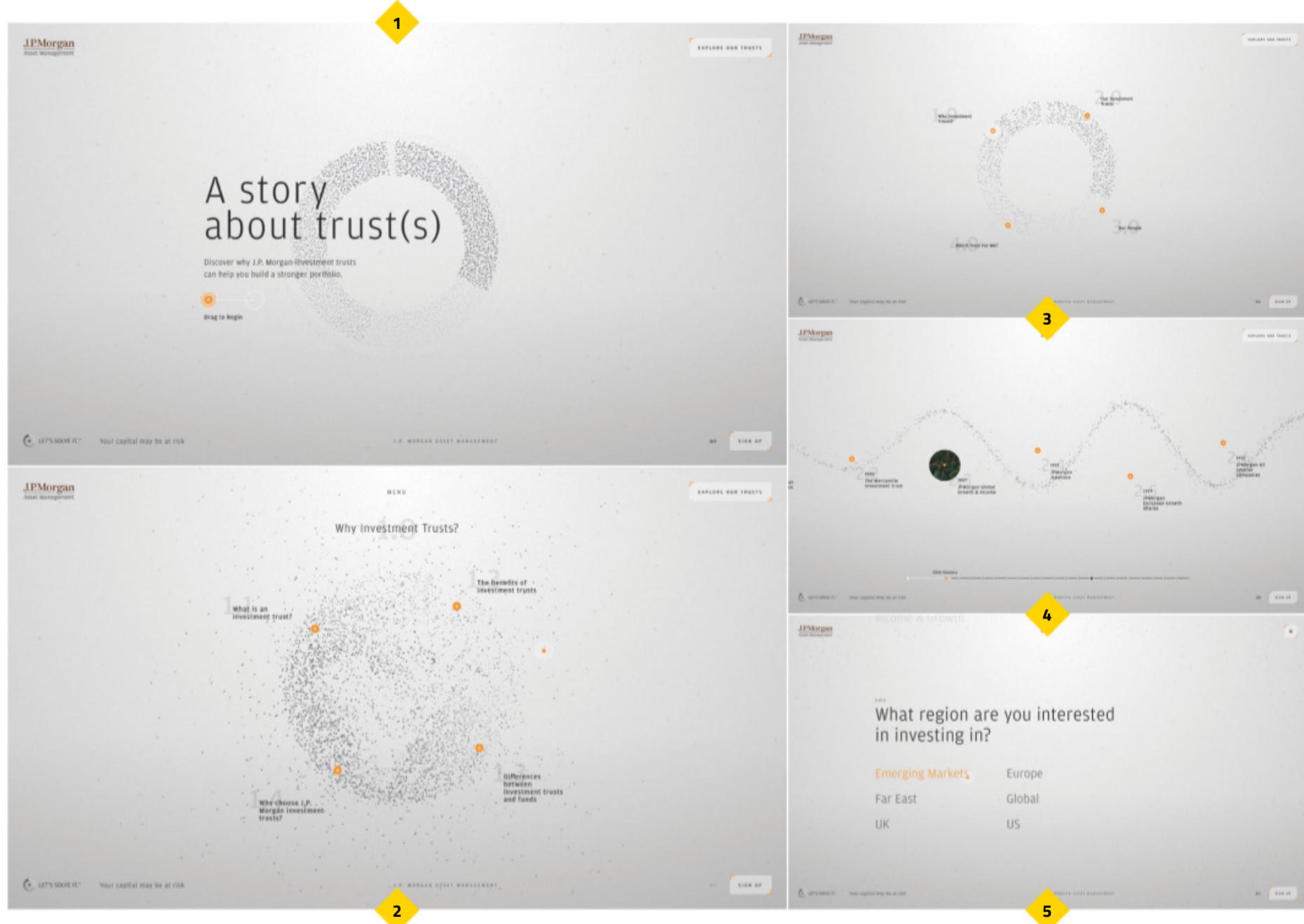
Issue 244 on sale now



★ HOW WE BUILT

A STORY ABOUT TRUSTS

The team from Yoyo explain how they enlivened a dry financial subject with an interactive timeline and eye-catching particle effects



BRIEF

In need of a site that enabled UK investors to explore its products in an interesting and interactive way, JP Morgan brought in Yoyo to create a slick and seamless online experience to showcase its trust to dazzling effect

CLOSE UP

(1) From the moment the user lands on the homepage, they are taken on a journey where they can explore JP Morgan's investment products. **(2)** The main site is split into four sections. Each content element on the main nav screen is positioned on a portfolio wheel. As each section is introduced, particles form together to reflect a relevant image based on the section choice. **(3)** The inspiration for the particles came from the idea of spreading investments and then reforming to create

a sense of collaborative working. **(4)** Our Investment Trusts is the key exploration section. Laid out as a timeline, each year is introduced as an image of a key event for that year. The user can scroll or jump to a year, enabling them to read about the investment trust launched at that time. **(5)** Which Trust For Me? is an interactive questionnaire that takes the user through a selection path where, after answering questions, the best investment trust options are displayed.

MATT SAGE



Sage is lead designer at Yoyo. It was his responsibility to direct the site design for the A Story About Trusts project.

w: www.yoyodesign.com

MATINA ZOULIA



Zoulia is head of client partnerships at Yoyo. Zoulia managed the full project team through brief to delivery.

w: www.yoyodesign.com

MIKE MASEY



Masey is a developer at Yoyo. He is responsible for looking after all of the technical implementation and site build.

w: www.yoyodesign.com

> A site showcasing investment trusts might not seem like the most exciting brief but that didn't stop Yoyo (yoyodesign.com) pulling out all the stops for its client, JP Morgan (jpmorgan.com). With A Story About Investment Trusts (astoryabouttrusts.co.uk), Yoyo enlivens the dry world of finance with a simple but slick site that makes the most of animation, audio and video to engage visitor interest. We spoke to the team to find out the rest of the story.

JP Morgan is an existing client of yours. Can you tell us about your previous work with the company?

MZ: We have had quite a diverse range of projects in the past three years. Previous work included a set of brand and UX digital guidelines, the creation of internal tools that allowed regional teams to publish insights without needing access to the central CRM and the development of multiple websites.

What was the brief for this site?

MZ: 2018 was a landmark year for investment trusts; quite a few had reached 150 years. The client wanted to showcase its range of trusts, longevity and ability to weather market storms.

The focus of its solution was the trusts and their history, as well as education about investment trusts. Additionally, the solution needed to have an interactive timeline with the trusts and the ability to host videos and give an overview of regions, trusts and investment principles.

You've already created UX guidelines for JP Morgan. Did this make your UX process more straightforward?

MS: Yes. Having created the guidelines, we already knew and understood the brand, which gave us a really good starting point to work from. This was especially helpful when we started looking at the UI of the project, as we already knew the typographic and design rules that we needed to adhere to.

Talk us through some of the site's main design features.

MS: We wanted to create something engaging and interactive, which allowed users to immerse themselves in JP Morgan's products. Creating a navigation feature that morphed and changed based on the user's selection path kept the user's attention and allowed them to move from page to page effortlessly. The particle effect was another key feature across the whole site that was developed for users to interact and engage with.

The particle effects on the main page are certainly impressive. How did you implement them?

MM: It starts off with a fixed number of particles arranged in a randomised grid pattern. Then, depending on the state of the page, we retrieve an image and break it down into its raw byte data. Using that, we loop through the particles and assign each one a position, size and alpha relating to a pixel in the image.

The movement is then handled with a variety of lerp methods applied to each particle, which also allows us to move



*TIMELINE

Key dates in the A Story About Trusts

DECEMBER 2017

Yoyo interrogates client brief.

JANUARY 2018

The discovery workshop kicks off and a client/agency brainstorming session commences.

JANUARY 2018

Yoyo develops a selection of creative concepts and presents them to the client project team.

FEBRUARY 2018

Prototype is created and demonstrated to the client project team. They love it!

MARCH 2018

Website development sprints kick off.

APRIL 2018

Rapid user testing takes place on large display screens and also on mobile and tablet devices.

MAY 2018

Extensive testing and iteration period.

JUNE 2018

The website launches ahead of a key client conference.

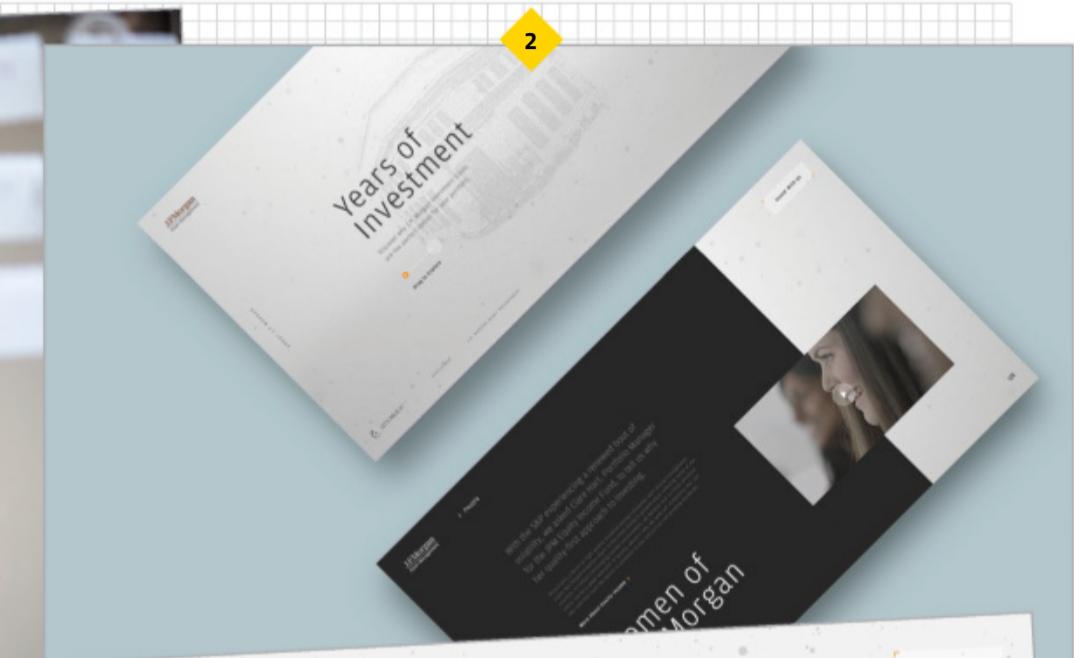


Above Having already devised a set of UX digital guidelines for JP Morgan, Yoyo knew what to do



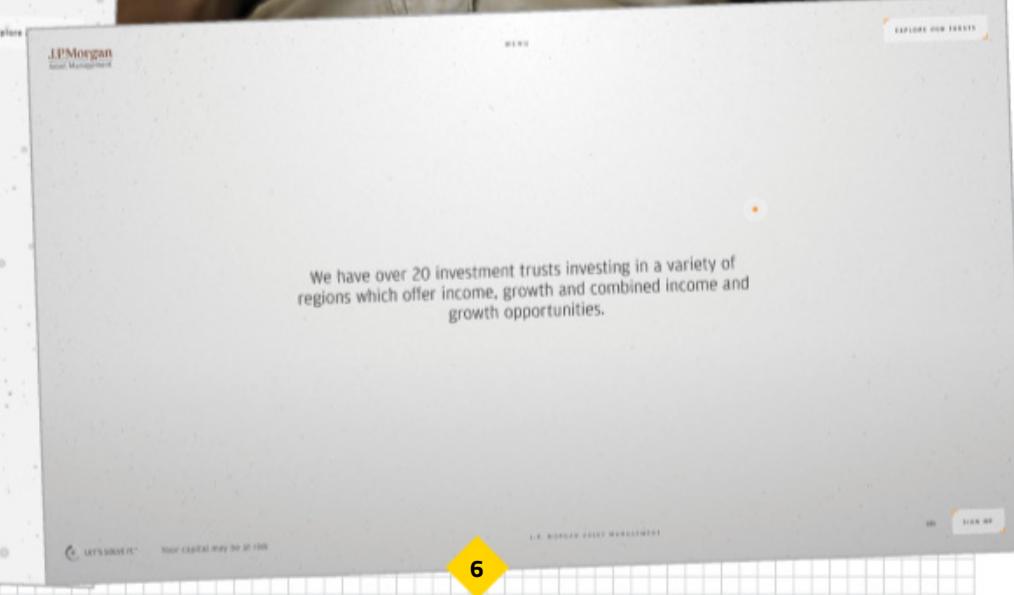
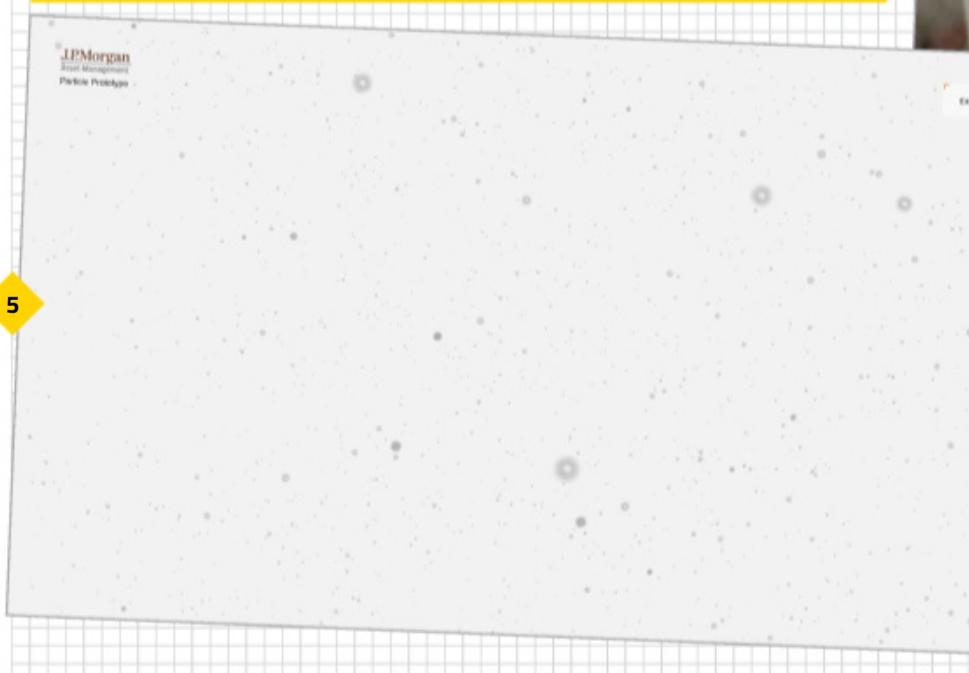
SHOWCASE

How we built



*EVOLUTION

(1) Yoyo and JP Morgan had an interactive discovery and brainstorming session to interrogate the brief and collect insight. (2) The client was presented with two different concepts that met the brief's requirements and displayed the interactivity and engagement desired. (3) A rapid prototype was created to test the new technology and enable the client to understand fully the interactivity that was being presented. (4) Website music was then selected. The mix between old instrumental and classical music and use of modern, interactive sounds complemented the company's established, yet modern and innovative culture. (5) Full internal testing was conducted to ensure the particles were behaving as expected on different devices and large screens. (6) The website was finally launched and presented at a large-scale JP Morgan event where employees proudly demoed the site and saw instant customer engagement.



- ▶ them out of the way of the mouse using some raycasting.

Can you tell us what technologies are used to run the site?

MM: The content on the site, including the particle images, are all handled by the Umbraco CMS. In terms of the front-end, we used three.js for the WebGL animations and audio alongside some pjax for managing page transitions and creating the SPA feel.

All of the image-to-particle conversion logic is done client side in the JavaScript using a canvas element. We also make use of some nice ES6 features, such as the Intersection Observer API for triggering animations on the article pages. There is some integration with the Brightcove video player in there, too.

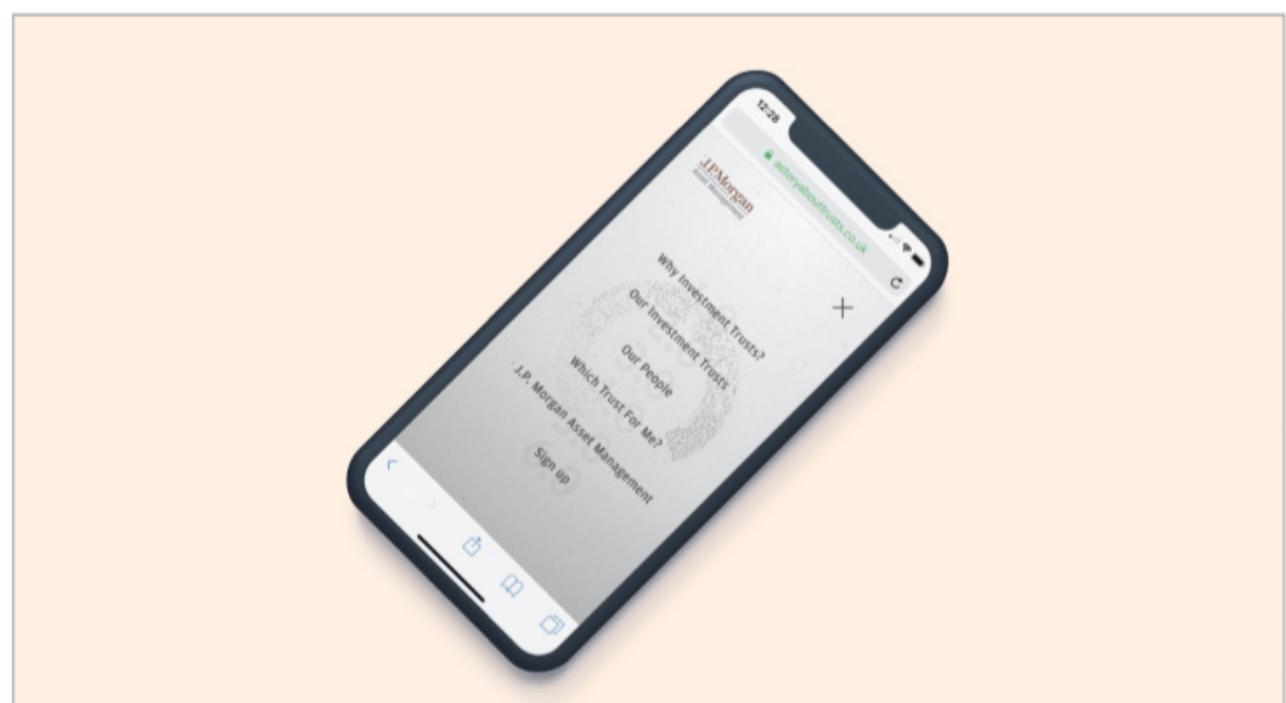
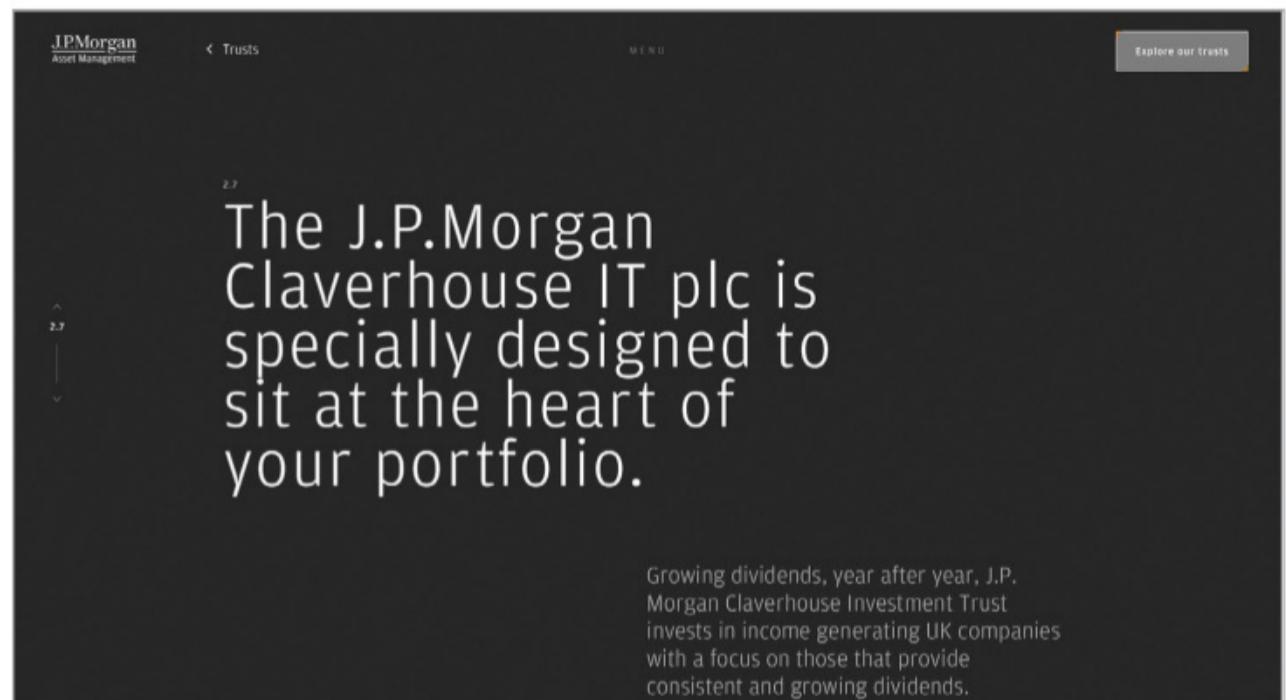
How did you go about ensuring cross-platform performance?

MM: We build all of our sites with responsiveness in mind and do a lot of testing. We have a standard set of browsers and devices that we build for but one of the big parts of the brief was that it had to work on this huge touch-screen display at their events. So alongside all of the usual testing that we do, we also got hold of one of those displays and the computer that would be used at the event. This really helped us to track down some odd bugs and performance issues.

What did your testing process involve?

MZ: We created different user journeys based on expected outcomes and then we set off to ‘break’ the site. A tricky challenge for us was getting the cursor to follow the user faithfully around the screen, especially when it came to the timeline page. The hot points were being left behind or merging to the investment trusts screens. So we realised that we had to redo the underlying mechanism for the dots.

MM: The fix involved rewriting a lot of the pjax state logic. We also picked up on some nasty performance issues with the mouse interactions, which required some throttling of the raycaster inside the render loop among other things.



Top The new site had to educate users about JP Morgan's investment products

Above The main menu for mobile is clean and simple, clearly listing the different sections

Did you learn any useful lessons during this build?

MZ: The prototype – which was aimed at showcasing the concept to the client – was created using a different technology to what was used for the end product. In retrospect, we learnt that using the intended technology would have highlighted some of issues uncovered earlier and could have saved some time.

Now that the site's live, what sort of feedback have you received?

MZ: The feedback has been extremely positive and, within a few months of launch, the site was awarded Website Of

The Day by CSS Design Awards. Our main aim was to create an educational site that was engaging yet accessible for the end user and overwhelming client feedback and testimonials suggest the site has surpassed expectations.

Statistically, using the main site as a benchmark, we have seen a big increase in time spent on the site with the average engagement time being 24 minutes. Pages viewed per session have increased by 33 per cent and female user engagement has also risen by 12 per cent. We continue to measure and report on the website and have already begun work on the next venture. ■

50

TOP DEV TOOLS

2019

- Having gone through the front-end development scene with a fine-tooth comb, **Louis Lazaris** brings you a fresh batch of 50 tools you'll want to consider for your projects in 2019

BUILD TOOLS

PARCEL

Blazing fast, zero configuration web application bundler



If it's minimal configuration you are looking for, Parcel is perfect.

Parcel

<https://parceljs.org/>

1

A beautifully fast, multi-featured, web application bundler that requires minimal configuration and has become incredibly popular in a relatively short amount of time. The fact that this tool requires such little configuration makes it an attractive option for those that are new to build tools.

Critters

<https://github.com/GoogleChromeLabs/critters>

2

A webpack plugin to inline the critical CSS of your app and then lazy-load the rest. Fast and lightweight because it doesn't use a headless browser to render content.

Sucrase

<https://sucrase.io/>

3

An alternative to Babel (the popular ES6+ compiler) that focuses on non-standard language extensions such as TypeScript, JSX and Flow. This means that compiling is 20x faster than Babel. You can give this one a test run online before deciding whether to commit to using it in your project.

Webpack Config Tool

<https://webpack.jakoblind.no/>

4

Web tool and CLI to create a personalised and optimised webpack config.js file. Although it doesn't yet support advanced options like code splitting, the existing features will build your file based on industry

best practices for reducing webpack bundle size.

JSUI

<https://github.com/kitze/JSUI>

5

This UI toolkit is for anyone wanting to organise, create and manage JavaScript projects. Enables you to generate new apps, search apps and project files, apply plugins and gives you a project dashboard.

PWA Universal Builder

<https://pwa.cafe/>

6

A framework-agnostic and feature-rich CLI tool for kicking off your progressive web apps. Quickly

scaffold new projects with your preferred view library and toolkit and then get it all started with specific best practices and optimisations built in.

VuePress

<https://vuepress.vuejs.org/>

7

A simplicity-first, static-site generator composed of two parts: a minimalistic static-site generator with a Vue-powered theming system and plugin API; and a default theme optimised for writing technical documentation. Each page generated by VuePress has its own pre-rendered static HTML, which provides great loading performance and it is SEO-friendly.



AUTHOR

LOUIS LAZARIS

Lazaris is an author, speaker and front-end developer. He curates the weekly newsletter Web Tools Weekly (<https://webtoolsweekly.com/>) and has been involved in the web development industry since 2000.

w: impressivewebs.com
t: @impressivewebs

PWA

UNIVERSAL BUILDER

```
./node_modules/pwa-util
? Which Framework would you like to use? - React
? Select features needed for your project: - CSS Preprocessor, Router, Service Worker
? Which CSS preprocessor? - Styles
? Which Router? - React Router
? Which Service Worker library? - Use arrow-keys. Return to submit.
> None
Done
Detailed options:
  * PWA Util
  * PWA
  * PWA Router
  * PWA Service Worker
```

PWA
Universal
Builder helps you
begin your PWAs
with some universal
best practices
baked in.

FRAMEWORKS AND LIBRARIES

PWA Starter Kit

<https://pwa-starter-kit.polymer-project.org/>

- 8 From the Polymer team, this is a set of starter templates for generating full-featured progressive web apps using web components. The components are responsive, fast loading, and easy to customise.

PaperCSS

<https://www.getpapercss.com/>

- 9 Touting itself as being "the less formal CSS framework", the components feature a relaxed, hand-drawn look.

boardgame.io

<https://boardgame.io/>

- 10 This game engine for turn-based games uses JavaScript. You don't even have to worry about any code for networks or handling databases – just begin with a function to explain what happens as a result of a specific move. This function then converts to a working game.

The logo for PaperCSS features the word "PAPERCSS" in a large, bold, sans-serif font. Below it, the tagline "THE LESS FORMAL CSS FRAMEWORK" is written in a smaller, all-caps sans-serif font. At the bottom of the logo are four rectangular buttons with rounded corners: "Get PaperCSS", "Documentation", "About", and "Github".

Stimulus

<https://stimulusjs.org/>

- 11 A JavaScript framework for your existing HTML. Stimulus doesn't render your HTML but augments it by connecting elements to JavaScript objects automatically.

Sapper

<https://sapper.svelte.technology/>

- 12 A framework for building high-performance universal web apps, powered by Svelte (a UI framework that made last year's list). To create pages, you need to add files to the

PaperCSS is a unique CSS framework with components that feature a fun, hand-drawn look.

src/routes directory. Each page is a Svelte component and these components become JavaScript modules that are super fast.

Reakit

<https://reakit.io/>

- 13 Accessibility is a major reason for trying this tool out, because all of the components comply with the WAI-ARIA specification. Each component follows the Single Element Pattern, meaning you can enjoy the same consistency that is possible from native HTML elements and components can be leveraged to make something new.

Evergreen

<https://evergreen.segment.com/>

- 14 A flexible React UI framework for building enterprise-grade web applications. Contains a set of polished React components that include layout components, buttons, form elements, an autocomplete widget, file picker and lots more.

Evergreen is a React framework with a slew of component options designed for building impressive web applications.

CSS Grid generators

One type of tool not included in the main body of this feature is a CSS Grid generator. This is usually a one-page site that lets you build a grid layout visually and spits out W3C Grid Layout Module code. Many such tools have appeared and they really are useful, especially if you're not an expert with the syntax. Here are a few options:

LAYOUTIT! CSS GRID GENERATOR

<https://www.layoutit.com/grid>
Interactively select your grid areas, use buttons to add columns and rows, name your grid areas and save as a shareable permalink.

CSSGR.ID

<https://cssgr.id/>
This tool by Dan Netherton includes similar features as the previous tool and also enables you to add Lorem Ipsum text.

CSS GRID TEMPLATE BUILDER

<https://codepen.io/anthonydugois/full/RpYBmy/>
This CodePen demo by Anthony Dugois is quite a unique option because it enables you to build the grid layout primarily using a string that you edit and then drop into your CSS as a value for the grid-template-areas property.

CSS GRIDISH

<https://github.com/IBM/css-gridish>
This project from the IBM team takes design specs of your product's grid and builds out several resources for your team to use, including a Sketch file with artboards and grid/layout settings, CSS/SCSS code using CSS Grid with a CSS flexbox fallback and also a Chrome extension.

CSS GRID LAYOUT GENERATOR

<https://css-grid-layout-generator.pw/>
A new one by Dmitrii Bykov that takes a little getting used to but there's a one-minute screencast to help get you started.

HTML AND CSS TOOLS

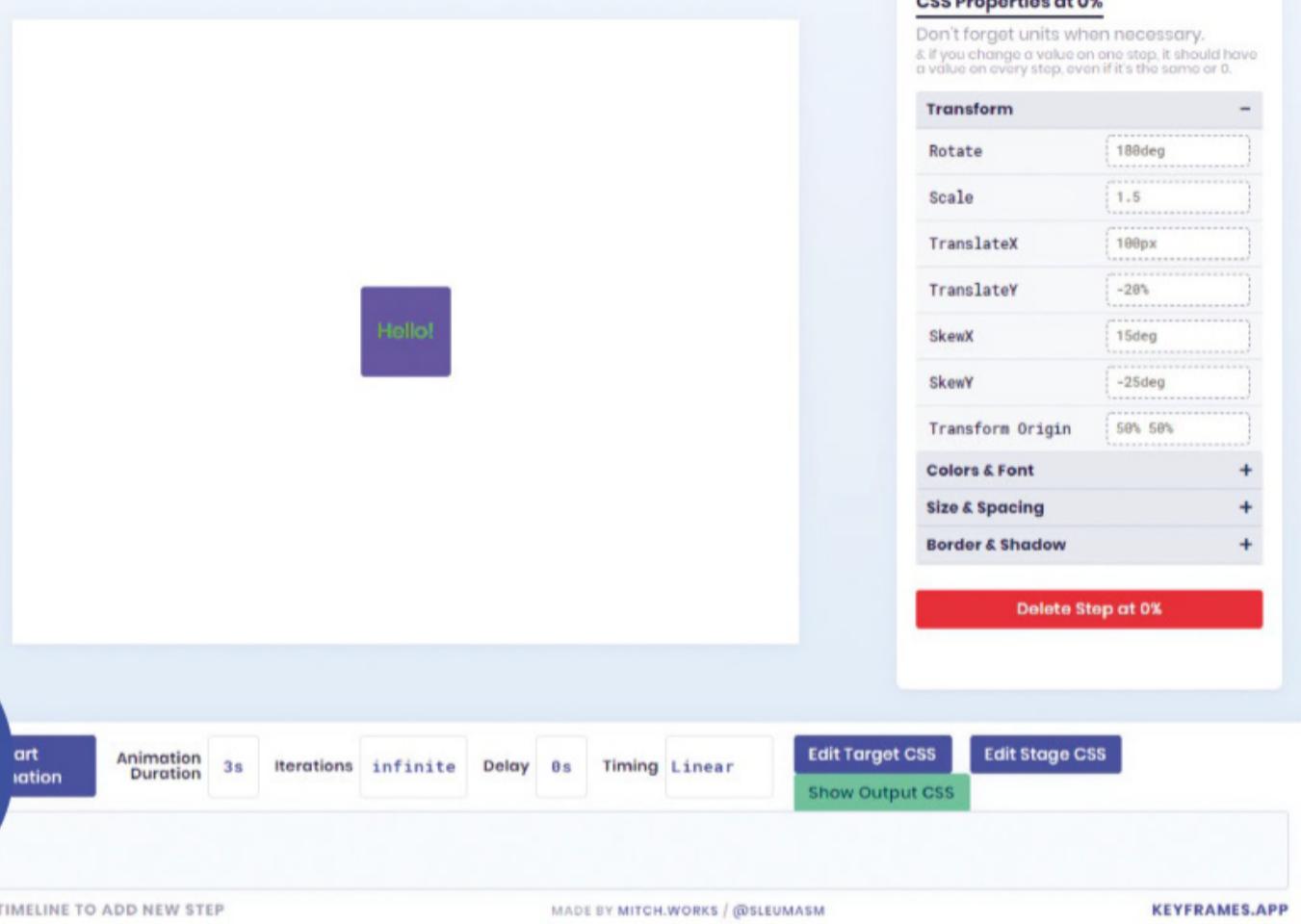
Keyframes.app

<https://keyframes.app/>

15

A simple tool to create CSS animations, available as a Chrome extension or web editor. It uses a timeline setup, which enables you to create and view your animations from the one place. No more flitting between browser and editor.

Keyframes.app is a Chrome extension and web editor that enables you to create and edit CSS animations inside your browser.



Emotion

<https://emotion.sh/>

16

A CSS-in-JS library that promises users a high level of performance and flexibility. It manages to steer clear of CSS specificity problems by using predictable composition and it takes no time at all to style apps using the string or object styles.

modern-normalize

<https://github.com/sindresorhus/modern-normalize>

17

A modern alternative to Normalize.css (the popular CSS reset) that's smaller and targeted mainly at the latest versions of modern browsers.

layerJS

<https://layerjs.org/>

18

A straightforward open-source library for creating UX patterns such as menus, sliders, lightboxes,

parallax effects, page-swipes and zoom effects in pure HTML. The result is intuitive, visually intense, mobile app-like experiences to use on the web.

CSS Blocks

<https://css-blocks.com/>

19

An incredibly fast CSS solution for design systems or app components. You create the CSS using components, which adhere to stylesheets inspired by some of the best in the business, including CSS Modules, BEM and Atomic CSS.

Basin

<https://usebasin.com/>

20

Basin is a simple form back-end solution for designers and developers. It saves development time so you can start collecting form submissions and tracking conversions without having to get involved with any back-end coding.

{cssBlocks}

One CSS File Per Component

Tiny Runtime (~500b)

Project-Wide Optimization

Dead Code Elimination

Scoped Styles

Blazing Fast Stylesheets

Build Time CSS Errors

Object Oriented Inheritance

CSS Blocks is a component-oriented CSS system that compiles to high-performance stylesheets, inspired by methodologies like BEM and Atomic CSS.

Mustard UI

<https://mustard-ui.com/>

21

This starter, open-source CSS framework includes styles for a flexbox-based 12-column grid, along with attractive progress bars, buttons, form elements, pricing tables, cards and more. It also produces nice, small file sizes.

“Enterprise is a framework for building enterprise-grade web applications”

JAVASCRIPT TOOLS

ScrollHint

<https://appleple.github.io/scroll-hint/>

22

A neat little utility that adds a visual 'scrollable' pointer graphic to indicate that a section of the page is able to be scrolled or swiped horizontally. Great for mobile apps with horizontal scrolling sections.

ScrollHint

A JavaScript library to suggest that the elements are scrollable horizontally, with the pointer icon.

[Download](#)

[GitHub](#)



ScrollHint adds a pointer graphic to scrollable elements, which helps alert the user that an area can be scrolled or swiped.

ToastUI Editor

<https://github.com/nhnent/tui.editor>

23

An extensible WYSIWYG editor that features GitHub-flavoured Markdown along with extensions for creating attractive bar graphs and UML-based diagrams.

FilePond

<https://pqina.nl/filepond/>

24

A JavaScript library designed to add a file upload component to your app. Images are optimised to help ensure faster uploads and the overall user experience is a joy.

Dinero.js

<https://sarahdayan.github.io/dinero.js/>

25

Use this library to work with monetary values in

JavaScript featuring an immutable and chainable API, global settings, extended formatting and rounding options and currency conversion.

Swup

<https://github.com/gmrchk/swup>

26

A beginner-friendly page transition library that works around CSS transitions. Use the events to perform actions such as running JavaScript, instigating analytics or closing sidebars. If JavaScript-based animations are your thing, there is an optional JavaScript extension.

Selection.js

<https://simonwep.github.io/selection/>

27

This library enables your UI to include desktop-like selections. For example,

you can click-and-drag multiple items to select a group of objects on the page or use Cmd/Ctrl-click for non-adjacent selections of groups of elements.

Glider.js

<https://nickpiscitelli.github.io/Glider.js/>

28

According to the website, this is a "blazingly fast, crazy small, fully responsive, mobile-friendly, dependency-free, native carousel/

slider with paging controls". Includes a 3D-like perspective view and works great on mobile and desktop using drag/swipe to cycle through the items.

ScrollOut

<https://scroll-out.github.io/>

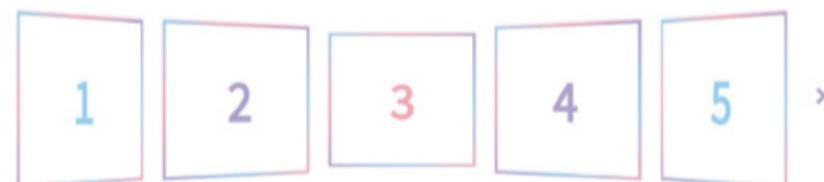
29

Apply this to pick up on any changes in a user's scroll for reveal and parallax effects. Animate elements with JavaScript callbacks, CSS selectors or CSS variables.

Glider.js is a vanilla JavaScript carousel/slider plugin with various useful and unique features and great performance.

Perspective View

(themeable CSS)



```
new Glider(document.querySelector('.glider'), {
  slidesToShow: 5,
  slidesToScroll: 1,
  draggable: true,
  dots: '.dots',
  arrows: {
    prev: '.glider-prev',
    next: '.glider-next'
  }
});
```

Images are optimised to help ensure faster uploads and the overall user experience is a joy

“ ”

More about state management

A tool listed in this feature, **Unstated** (<https://unstated.io/>), is one of many state management libraries for React. Even if you've yet to delve into a library like React, the concept of state might still be familiar. But it's not React-specific – it's generally a feature associated with single page apps (SPA).

In fact, if you've written JavaScript without a library, you've probably done some level of state management whether you realised it or not. If the concept is new to you, consider a web form as an example. The form can be in various 'states', including:

- Empty (ie not filled in)
- Partially filled in
- Completely filled in but erroneously so
- Completely filled in and valid
- Submitted

Other items that might be concerned with state include buttons (pressed vs not pressed), or video players (playing, paused, stopped, etc). Pretty much anything on a page can have varying states.

React and similar libraries already have state solutions built in but helper libraries exist to ease the complexity of managing state. A state management library makes it easier to handle the various states that your components are in so you don't have to deal with loads of code splitting, nested conditionals and so forth. Because SPAs can be so complex in terms of what state an app is in, a state management solution can help.

In addition to Unstated, other state helpers include:

- Redux <https://redux.js.org/>
- MobX <https://mobx.js.org/>
- Undux <https://undux.org/>
- Vuex <https://vuex.vuejs.org/>

MEDIA TOOLS



Orion Icon Library

<https://orioniconlibrary.com/>

30 A massive set of more than 6,000 stunning SVG icons available as line, solid, colour and flat colour style. There are two plans to choose from: Free and Pro. The Pro plan doesn't require any attribution, gives you access to over 2,000 new icons and provides library management options.

Frappe Charts

<https://frappe.io/charts>

31

Delve into these simple, SVG charts that have no dependencies and are inspired by GitHub. Create line graphs, bar charts, pie charts and more, with hover effects for displaying information.

SVGator

<https://www.svgator.com/>

32

An online SVG animation tool with a user-friendly interface. Enables you to import SVG, view and edit the code and use animation presets to animate before exporting a single ready-to-use SVG file.

ApexCharts

<https://apexcharts.com/>

33

Use ApexCharts to create responsive, interactive, high-performance JavaScript charts to represent your data. Features annotations and animations, all built and customised using a simple API.

MapKit JS

<https://developer.apple.com/maps/mapkitjs/>

34

If you need to include a map on a web page, you may as well make it interactive. This JavaScript library from Apple lets you do exactly that, in addition to using annotations and overlays. The service comes with a free daily limit of 250,000 map views and 25,000 service calls.

Img2

<https://github.com/RevillWeb/img-2>

35

A JavaScript utility that automatically pre-caches images to improve page

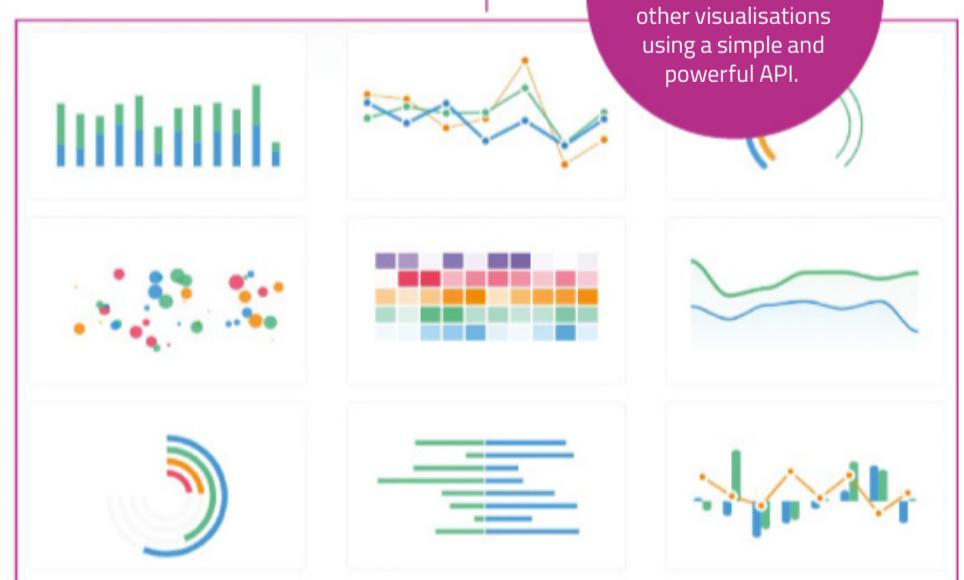
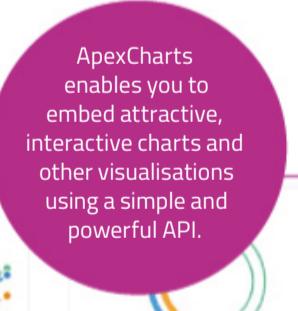
performance. Just swap out your elements with <img-2>/img-2> and the utility does the caching work for you.

Lozad.js

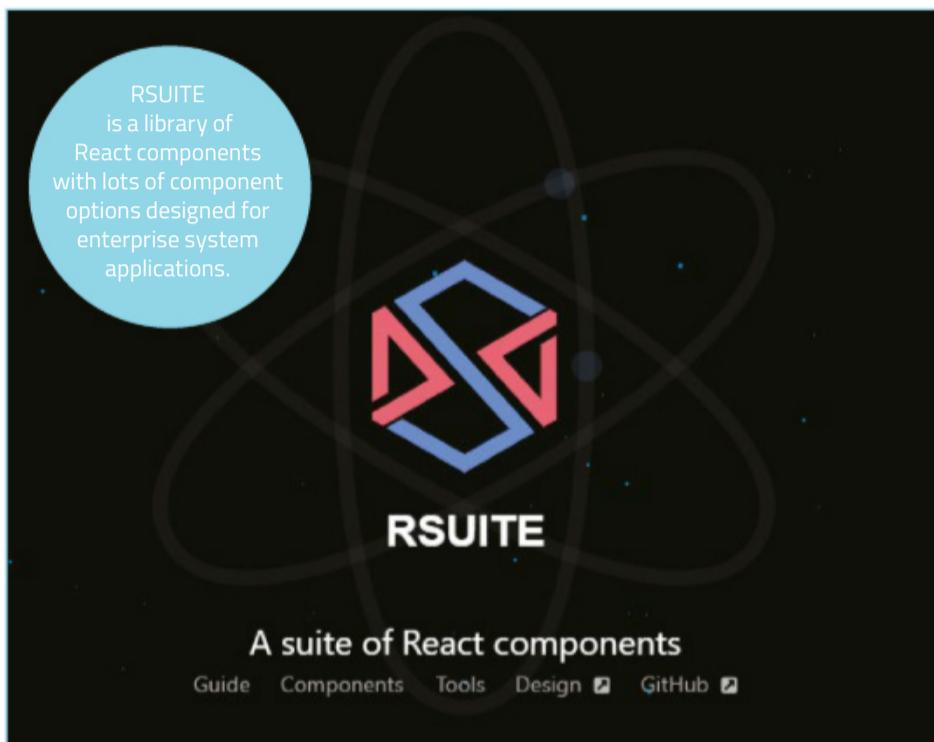
<https://github.com/ApoorvSaxena/lozad.js>

36

A fast, light and configurable, vanilla JavaScript lazy loader with no dependencies that uses the IntersectionObserver API, for lazy loading images, iframes, ads, videos or any other element.



REACT TOOLS



RSUITE

<https://rsuitejs.com/>

Get your hands on this library of React components for enterprise system products. This impressive suite includes a large number of components with rich interactions, such as modals, alerts, popovers, drawers, progress bars, form elements, data display and lots more.

37

Pagedraw

<https://pagedraw.io/>

38 A WYSIWYG live-collaboration editor that generates code for your presentational Angular/React components. With Pagedraw, you can draw React components as usual but the big difference is they can be used as if they were manually coded.

react-smooth-dnd

<https://github.com/kutlugsahin/react-smooth-dnd>

39 We all appreciate the importance of keeping libraries in an organised state. This sortable library for React offers various options for different drag-and-drop scenarios.

Unstated

<https://unstated.io/>

40 As covered in the box out in this feature, there are many state management libraries for React. Unstated aims to differentiate itself through its ease of use. With Unstated, you build on top of the patterns set out by React components and context. No intense architecture needed.

Reach Router

<https://reach.tech/router>

41 One of the more recent and popular routing solutions for React with many features. This one is touted as a next-generation routing option with out-of-the-box accessibility.

SVGR

<https://www.smooth-code.com/open-source/svgr/>

42 Turn SVGs into React components by means of a CLI or as a webpack, rollup or Parcel plugin. You can try it out using an online playground that

instantly converts editable SVG code to React.

React Spreadsheet Grid

<https://denisraslov.github.io/grid/>

43 This Excel-like grid component for React features cell editing, high-performance scroll and resizable columns. The grid can be controlled via mouse or keyboard, similar to a native spreadsheet app.

React Spreadsheet Grid enables you to embed a keyboard-friendly Excel-like editable spreadsheet component in your React app.

React Spreadsheet Grid

Excel-like grid component for React with custom cell editors, p

Photo	First name	Last name	Username	Position	Contract	Location
	adam	olsen	bigbear393	System Architect	Full-time	16993. aabo
	derrick	berry	heavyfish392	Content Manager	Freelance	K37 0ZP, chi
	sabino	monteiro	silverfrog970	Frontend Developer	Freelance	57577. eean
	alex	blanchard	browndog172	Backend Developer	Freelance	90412. nime
	gordon	foster	lazygoose479	Manager	Part-time	41370. el ca
	howard	alvarez	silverbird153	Frontend Developer	Part-time	Y3T 9E.G. ye
	kelya	rey	beautifulpeacock...	Manager	Part-time	17346. toulou
	jayden	silva	purplefish421	Frontend Developer	Part-time	36213. ranch

Resources

WEB TOOLS WEEKLY

<https://webtoolsweekly.com/>

This author's weekly newsletter features a quick coding tip followed by a list of tools covering many of the same categories from this feature and lots more. One of the most popular categories is 'Productivity Tools', which you might find useful.

CHANGELOG NIGHTLY

<http://changelog.com/nightly>
This is a daily email that lists the most starred GitHub repos. If you'd prefer, you can also subscribe to an editorialised weekly update instead (<http://changelog.com/weekly>).

ECHO JS

<https://www.echojs.com/>

A JavaScript news feed with voting and commenting in the style of Reddit and Hacker News. Being a JavaScript-only source, you'll get to enjoy lots of news, new JS utilities, libraries and more.

SHOW HN

<https://news.ycombinator.com/show>

The most popular place for programmers and developers to submit and get feedback on their projects and tools. You'll find lots of new and unique things here, including tools for front-end development.

“ webhint scours through your code to make sure it follows best practices ”

TESTING & DATA TOOLS

webhint

<https://webhint.io/>

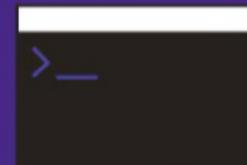
44 A linting tool available as a CLI or, if you're not sure what to check for, as an online scanner. When put to work, webhint scours through your code to make sure it follows best practices and also hits the right spot in terms of accessibility, speed, etc.

Use webhint to improve your website

webhint is a linting tool that will help you with your site's accessibility, speed, security and more, by checking your code for best practices and common errors. Use the online scanner or the CLI to start checking your site for errors.



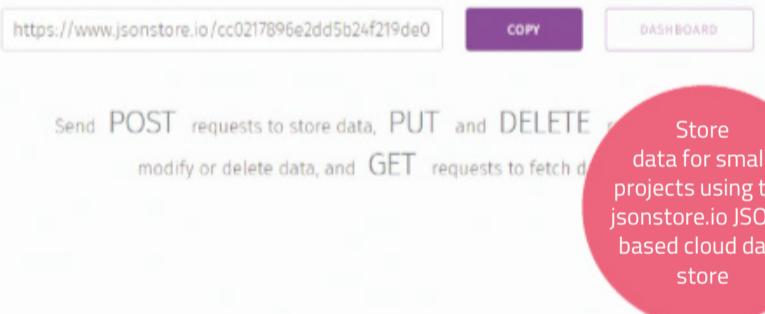
[TRY THE ONLINE SCANNER](#)



[GET STARTED WITH THE CLI](#)

webhint is a linting tool available as an online scanner or CLI that can help improve aspects like your site's accessibility, speed and security.

This Is Your Endpoint



Airtap

<https://github.com/airtap/airtap>

45 Quickly test your JavaScript in more than 800 browsers. Airtap stands out from other cross-browser testers because you can run the different browsers without installing them locally.

mkcert

<https://github.com/FiloSottile/mkcert>

46 If you require SSL in a local development environment, this simple tool can whip up locally trusted SSL certificates using whatever names you'd like.

Puppeteer Recorder

<https://checklyhq.com/puppeteer-recorder>

47 A Chrome extension that records browser interactions such as clicks, typing and form interactions, before creating a script for Puppeteer (the popular headless Chrome testing API). You also have a chance to edit the generated code using the configuration options.

jsonstore.io

<https://www.jsonstore.io/>

48 Web service that offers a free, secure and JSON-based cloud data store for small projects. Go to the site, copy the generated URL and start sending HTTP requests to communicate with your data store.

Initab

<http://initab.com/>

49 Not getting on with Chrome's new tab page? Not a problem – replace it with a set of useful tools tailored to your programming needs. We're talking GitHub/GitLab activity, Gists, Stack Overflow, a scratchpad for notes and more.

LambdaTest

<https://www.lambdatest.com/>

50 If you're going to test your websites and web apps, you may as well do it properly. This useful tool runs your public or locally hosted creations on over 2,000 mobile and desktop browsers that are running real operating systems. What's more, the built-in debugging tools take care of any issues in real time.

That's all for this year's roundup of tools! While it can be fun to reinvent the wheel with raw code, it's even more fun to push something to production quickly and efficiently. These tools should help you to do just that.

After considering this list, we hope you're better informed of what's been added to the tools landscape over the past 12 months or so, whether you're deciding on a framework, something specific for your build or

testing process, a React component or anything else. Whatever the case, this list should be a good starting point to help you solve some of the specific problems you face as a front-end or full-stack developer. ■

FEATURES

Get your design organised



Get your design organised

GET YOUR DESIGN ORGANISED

Ana Nicolau shows you how digital design's journey paved the way for design systems, what they're for and how best to use them



AUTHOR

ANA NICOLAU

Nicolau is a creative director in design. Having worked in advertising, client-side and startups, she has a good understanding of the positive impact of having a design presence at C-level.

w: www.ananicolau.com
t: @and_says_

Digital design has been navigating uncharted waters for about 20 years, since the advent of mainstream internet. In the 1990s, any aspect of 'design' was in full control of the programmer – black backgrounds, bright web-safe colours in a highly pixelated 8 x 8 font, infamous vintage gradients that are now making a comeback and ASCII character drawings that made anything look cool.

At the time, concerns about web layout, information architecture and user experience were secondary – or even tertiary – in relation to content. The more that could be dumped on a web page, the better. Whatever information you couldn't include on the landing page would be signalled by hyperlinks to drive the user to additional pages – who can forget those long, heavy text lists of rainbow coloured, underlined hyperlinks? In some cases, there was a certain attention given to navigation but only by absolute logical need. Navigational

FEATURES

Get your design organised

- consistency between pages was another matter. Early days.

When designers joined the web revolution, it was like a whole new world had been unveiled. Suddenly, content didn't have to be static. You could not only hyperlink it by absolute meaning but also create an interrelation of meanings with other types of content within the same environment.

Hyperlinks could be a full line of copy or just a couple of words, without any particular hierarchy. The groundbreaking innovation was that hyperlinks enabled the creation of more complex journeys – you could now tell a story. These were the early stages of what we now call user journeys, where web designers defined how and when the user would see and interact with content.

Going into the 2000s, technology developed rapidly and with it arrived a myriad of new devices, mediums and channels. As a relatively and recently acknowledged discipline, digital design had been limited to react in response to technical developments. Until then, it was merely adapting while playing catch-up with technology rather than evolving and help defining it.

Suddenly, what was previously a new, fascinating world was becoming a limitless reality. Designers now had not only to worry about multiple screen resolutions but also endless device types. Questions of adaptive layout, hidden content on smaller screens and readability – just to name a few – came front and centre. With the complexity of new challenges and opportunities, design became a key element of web build. Aspects like information architecture, user journeys and overall user experience now complemented purpose, functionality and branding. Elements of cognitive science slowly but surely came into full play when designing a website.

By the time touch-screen smartphones hit the mainstream market, companies started taking mobile design more seriously. Mobile web access, faster network speeds, higher image resolution and developments in secure online payments became highly persuasive arguments for companies to invest in

additional touch points, rather than just sticking to a desktop experience.

In the early days of ecommerce, brands with the most economic foresight started developing dedicated mobile websites, leading other industries to follow. Market confidence grew and with it further investment in tech and design, which eventually led to the groundbreaking development of responsive web design – a term coined by Ethan Marcotte in 2010.

This approach was a complete game changer. It introduced a new way of coding that allowed for fluid grids and control of content display across any screen resolution regardless of device via media queries. A true innovation that put designers in control, it instantly elevated the quality of the output while allowing the focus and time to be spent on optimising a 360-degree user experience.

It's easy to see how digital design as a discipline became more focused on execution back then. It had been intimately tied in with build since its infancy, having to compromise on the process of design thinking and problem-solving more often than not, due to the medium's technical limitations.

During this monumental leap forward, what was meant to be an exception ended up becoming the rule. Though executional knowledge thrived during the last decade, it also meant a reversed process took root as a standard workflow: 'do first, think later'. This was a consequence of clients interpreting time to think as money wasted and thus something that had a negative impact on their own product development.

Many have learned the hard way but it pays well to let designers do their job properly from the start. You need to let them analyse and understand the client's problem and pain points first, then – and only then – propose a solution that works and delivers the desired outcome. It's called a process for a reason – when essential steps are missed for the sake of a speedy delivery, it means foundational elements have been forcibly ignored and the chances of a successful output are reduced exponentially.

Concurrently, as design tools matured into web development, it became easier



“
When designers joined the web revolution, it was like a new world had been unveiled
”

MATERIAL DESIGN

- Material System
- Introduction
- Material studies

Material Foundation

- Foundation overview
- Environment
- Layout
- Navigation
- Color

Interaction

Communication

Design

Create intuitive and beautiful products with Material Design

GUIDELINES

Material Theming

Learn how to customize Material Design's brand and style through elements like color, typography, and layout.

Get your design organised

ARTICLES **EVENTS** **TOPICS** **WRITE FOR US**

A LIST APART

Responsive Web Design

by Ethan Marcotte · May 25, 2010

Published in CSS, Layout & Grids, Mobile/Multidevice, Responsive Design, Interaction Design

"The control which designers know in the print medium, and often desire in the web medium, is simply a function of the limitation of the printed page. We should embrace the fact that the web doesn't have the same constraints, and"

Opposite page ifindit.com is a late 1990s search engine that's a real graphic gem and still live today

Above Ethan Marcotte's Responsive Web Design article in 2010 was a groundbreaking memo

th Material Design.

to change the look and feel of your UI, expressing or, shape, typography, and iconography.

Above Google's Material UI – the design system that's changing product development with its in-depth graphic exploration and open source code

Interview

Daniel Harvey

Head of product design and brand at The Dots (<https://the-dots.com>)
t: @dancharvey

What are the biggest challenges when building a design system?

Team members will have different opinions on what is a component, what should be a component and even what the word means. Design systems can't just be a tool for designers. They only have value when they're helping the whole product team be more efficient.

What piece of advice would you give for developing a design system?

Get the whole team involved and test everything with your community. Misconceptions and misunderstandings will erode trust in your design system.

What has been the biggest lesson learnt in developing The Dots?

We're a two-sided marketplace. On one hand, we have a community of hundreds of thousands of brilliant creatives sharing projects they've made. On the other, we have thousands of brands looking to hire the best creators. It's easy to assume you can design for one without taking the other into account. Testing big new features with both sides is important.

What design features are you most proud of at The Dots?

Everything we do is about making the creative industry more open and inclusive. One way we do that is with our 'get credit' feature. With it, you can credit the whole team who brought a project to life. Often juniors and freelancers are passed over in award entries. Get Credit recognises everyone for their work, which leads to more opportunities.

net march 2019 71

FEATURES

Get your design organised

The screenshot shows the Figma interface. On the left, there's a dark sidebar with the Figma logo at the top, followed by sections for 'Turn Ideas Into Products Faster' and 'Design, prototype, and gather feedback all in one place with Figma.' Below this are buttons for 'Try Figma for Free' and 'Available online; on Windows, Mac or Linux.' The main workspace displays a mobile application prototype. At the top, there's a navigation bar with 'Features', 'Pricing', 'Careers', 'Blog', 'Sign In', and a green 'Sign up' button. Below the navigation is a 'Team Library (100)' section. The prototype itself has three cards: one black card with a profile picture and '1 day' text, and two yellow/orange cards labeled 'Recording Rain' and 'Recording Sound' with wavy lines representing audio. A red circular button with a white square icon is located at the bottom right of the prototype area.

Left Figma is a prototyping platform that's raising the bar

► What is a design system?

A design system is a single source of truth that designers and developers create, reference and develop together. It's a matrix of rules comprised of a library of symbols – fonts, icons, colours, shapes, grids, animations, tone of voice or more – that carry different meanings, determined by their function and hierarchical relevance. It's essentially a living organism made of elements that evolve from fulfilling pre-existing requirements to newly defined ones as the product grows in complexity. These elements are translated into development-ready components that can be picked up and used immediately in a live environment.

Who defines a design system?

Designers and developers work closely together with an agile approach to establish the rules of a design system. Designers define all aspects of visual communication – UI, branding and user experience – while working with developers to transform those properties into coded components, by iterating them consistently until they perform

technically and stylistically in a self-contained manner.

Why have a design system?

Though a design system is a foundational requirement for any digital products that scale, at its core are principles that apply to any design work. The most important aspect is to put in place a set of rules that, when repeated over and over again, will consistently return the same principles.

In the same way responsive design is considered a modular approach in terms of how blocks of content behave on a web page in different viewports, a design system follows an atomic approach by addressing each particular element that defines the properties of a component.

The purpose of setting up a system is having a library of tried and tested components that can be reused consistently and expected to perform each time on all product dimensions – style, branding, behaviour, function and delivery. The biggest advantage of a design system is to be able to prototype efficiently and iterate both design and code symbiotically in a journey towards a high-quality product.

“
Designers and
developers
work together
to establish the
rules of a
design system
”



How do I develop a design system?

First, you need to have a clear idea of the product you are developing. Here are a few essential questions to consider:

1. What does it do?

- What is the purpose of your product?
- What are the requirements for this product?
- What sort of functionality will the product need in order to perform?

2. Who is it for?

- Who is the audience for this product?
- Does the user have any particular quirks that might affect how the product is received?
- Why will the user engage with this product? What makes it unique?
- Is the user familiar with similar products?
- Is the product responding to an identified need or creating a new one?
- Does it address accessibility?

3. Where will it live?

- Is this product a website? A web app? An app? Other?
- Is it device agnostic?
- Should it deliver the same experience cross-platform or focus on particular micro-experiences within specific contexts?

The purpose of a design system is to reduce complexity in development, by addressing known concerns as well as identifying new ones during the conception stage. It's important to define the product mapping early on in the process, as it will help recognise potential hold-ups that can be avoided at the prototyping stage.

Secondly, you'll need to assess the best approach. If you're working on a new product, you'll likely start with an MVP (minimum viable product), where the attention will be on validating functionality and learning users' feedback. In those cases, it makes sense to use existing UI kits from established platforms, such as Google's Material UI (<https://material.io/design/>) or Apple's UI kit (<https://developer.apple.com/design/>).

If you're past the MVP stage or creating a whole design system from scratch, your product mapping – which should include key aspects such as information architecture, a sitemap and user journeys – will inform you which basic functionality needs to be addressed first.

For example, if your product is an ecommerce app, what elements do you need to have throughout the user journey to perform a purchase – from the homepage through to product page, checkout and order confirmation? Is it vertical or horizontal navigation? What do CTAs look like: are they icons, text only, have a coloured background? What image ratios are you considering: portrait, square, landscape? By addressing each element's properties by hierarchical functionality, you'll be able to lay solid foundations for progressive UI releases, thus building a consistently reliable system.

Thirdly, developing a product should always be an inclusive process that depends on all parties involved: designers, developers, product owner, client and users. Together, these individuals create an ecosystem, a testing ground that will shape the design system throughout the journey to the end product delivery.

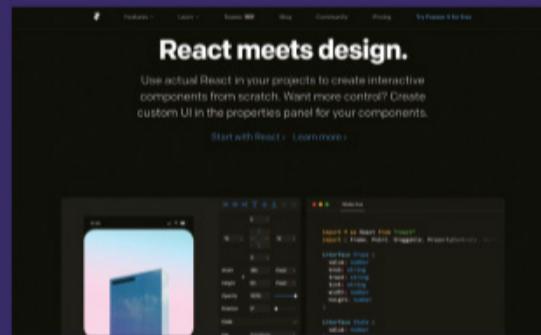
As progress needs to be shared and, sometimes, worked on in real time, it's important to choose the tools that best fit your workflow. Thankfully, we're fairly spoilt for choice.

There are currently platforms that cater for slightly different file-sharing goals. Sketch is considered a design standard (www.sketchapp.com/); Adobe XD is gaining strides with its latest release (www.adobe.com/uk/products/xd.html); InVision is a solid platform as well as a valuable design resource (www.invisionapp.com) and Figma is breaking ground by bringing together desired features (www.figma.com). Plus, if you're one of those designers who enjoys writing code in order to push your work, you'll love Framer X (<https://framer.com>). Need an extra hand? Check out Design+Code (<https://designcode.io/>), one of the best learning resources out there.

Developing a design system is a collaborative approach that relies on principles of teamwork and transparency. It's a commitment between teams willing to make mistakes and learn from them, discover new ways of doing things, innovate together and, all-in-all, just get a kick for a job well done because the product works and exceeds expectations. Which is the best feeling in the world. ■

Resources

Really good designers are defined by the quality of their thinking, amazing work is defined by the tools they use



FRAMER X

<https://framer.com/>

Framer X is the prototyping tool designers have been dreaming of. Framer X is to React what Dreamweaver was to HTML and CSS – the perfect marriage between design and code, for curious designers and creative developers.

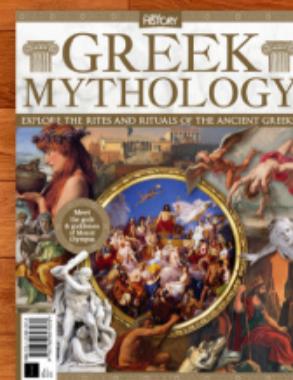
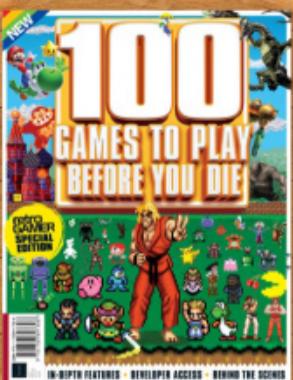


DESIGN+CODE

<https://designcode.io/>

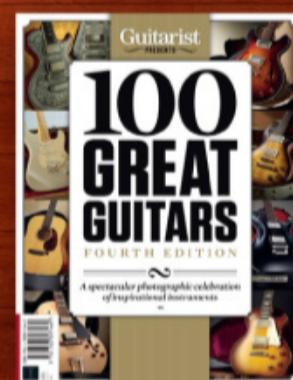
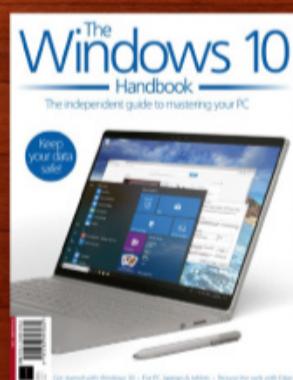
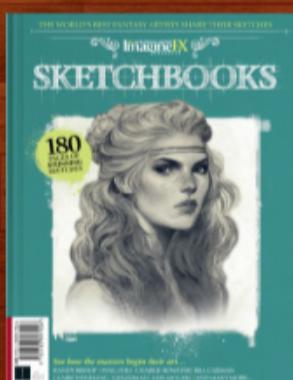
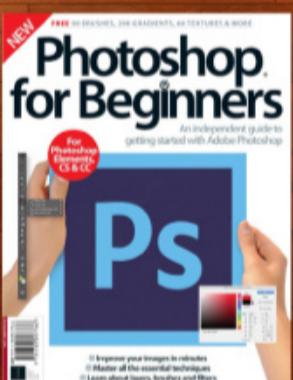
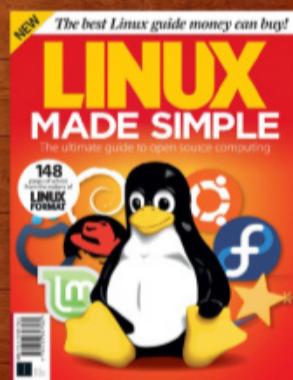
Design+Code is the place to learn if you're a designer looking to prototype in code. Meng To's courses will take you end-to-end and you'll have something to show for it. It's the knowledge base you'll want to bookmark – from one designer to another.





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PROJECTS

Tips, tricks
& techniques

THIS MONTH FEATURING...



76

IDENTIFY IMAGES WITH GOOGLE'S CLOUD VISION

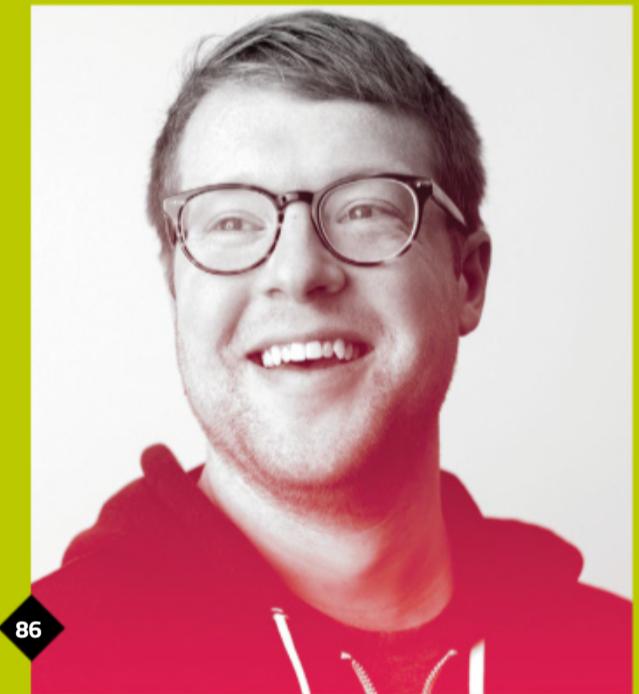
76

The screenshot shows a browser window with the Sentry.io interface. The URL is https://sentry.io/ben-read/test/issues/813812447?query=is%3Aunresolved. The main content displays an error titled 'TypeError' from a file named 'poll.js' in 'scripts/views.js'. The error message is 'Object [object Object] has no method 'updateFrom''. Below the error details, there's a 'Details' section showing an event ID (e27fc0c109f042838136137bed1de75e), timestamp (Dec 19, 2018 3:29:48 AM UTC), browser (Chrome Version: 65.0.3325), and OS (Mac OS X Version: 10.13.4). There are also sections for 'TAGS', 'MESSAGE', 'EXCEPTION', and 'App Only', 'Full', 'Raw' buttons.

82

BASH BUGS AND MINIMISE ERRORS IN REACT

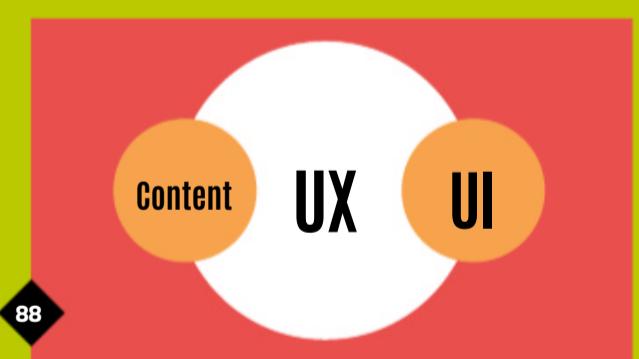
82



86

CREATE ACCESSIBLE FORMS

86



88

DESIGN FOR SCANNABILITY

88

The screenshot shows a dark-themed blog application. On the left is a sidebar with navigation links like 'Dashboard', 'Posts', 'Comments', 'Users', 'Categories', 'Tags', 'Media', 'Settings', and 'Help'. On the right, there's a list of three posts: 'My first post', 'My second post', and 'My third post'. Each post has a small preview image, the title, and a link to 'View post'.

92

BUILD A BLOG APP WITH VUE.JS

92



ABOUT THE AUTHOR

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t: @synergyseeker

job: Interactive director,
designer, developerareas of expertise:
Shaders, VFX, WebGL

* GOOGLE'S CLOUD VISION API

IDENTIFY IMAGES WITH GOOGLE'S CLOUD VISION

Richard Mattka delves into the field of artificial intelligence, focusing on how you can use Google's Cloud Vision API to harness image recognition

Machine learning. Deep learning. Natural language processing. Computer vision. Automation. Voice recognition. You've probably heard all these and many other terms recently, all under the umbrella of artificial intelligence. In fact, the field is growing so rapidly, it's becoming increasingly difficult to nail down a definitive definition. AI is becoming part of nearly every aspect of our lives, from ecommerce and search engines to unlocking your phone.

Your websites and apps can leverage APIs to tap directly into the power of AI. Without having to 'train' AI agents, you can take advantage of massive quantities of data already analysed. Google, Amazon, IBM and many others have created endpoints for developers to hook into and start using AI right away.

On the front-end, you can connect voice commands, chatbot interfaces or reactive WebGL creative elements. On the back-end, databases use intelligent algorithms to maximise speed and analysis. APIs can provide a layer of abstraction from

a wide range of AI functions, from predictions to collective training.

COMPUTER VISION

Computer vision is the study and creation of artificial systems that extract information from images. It can also encompass the mechanical system of vision itself. In terms of recognition, it is the process of analysing and determining the content of an image or series of images (including video). This could include medical scans, photos, 360-degree video and virtually any kind of imagery you can imagine.

AI-powered computer vision can:

- Identify, label and categorise content
- Detect faces and emotions
- Recognise headwear such as glasses and hats
- Identify landmarks, buildings and structures
- Assess pixel-level information such as colour data, quality and resolution
- Recognise popular logos

- Identify and read text
- Identify potentially inappropriate images

COMPUTER VISION WITH GOOGLE'S CLOUD VISION API

There are lots of choices for Vision APIs but we'll be using Google's Cloud Vision API. Google hosts many AI APIs, including natural language processing, voice recognition, deep learning and vision.

The Cloud Vision API enables your sites and apps to understand what is in an image. It will classify the content into categories, labelling everything it sees. It also provides a confidence score, so you know how likely it is that what it believes is in an image actually appears there. You could use this to interact intelligently regarding camera input in AR or video apps. You could create tools to assist those who are visually impaired. You could create assistants to help identify buildings or landmarks for tourists. The possibilities are endless.

STEP 1: SET UP A CLOUD PROJECT

If you've used Google's APIs before, some of these first steps will be familiar. As with other Google services, you'll need to set up a cloud project. Go to the Google Cloud Platform console (<https://console.cloud.google.com/>) and create a new project or select an existing one. Like most of Google's services, the Cloud Vision API is free to use until you start making lots of API requests. You may need to enter billing info when you activate the API but this is not charged at a low volume of requests and you can remove the services after you're done testing.

STEP 2: ENABLE THE CLOUD VISION API

Browse the API library and select the Cloud Vision API for your project. If you can't find it, go here: <https://console.cloud.google.com/apis/library>

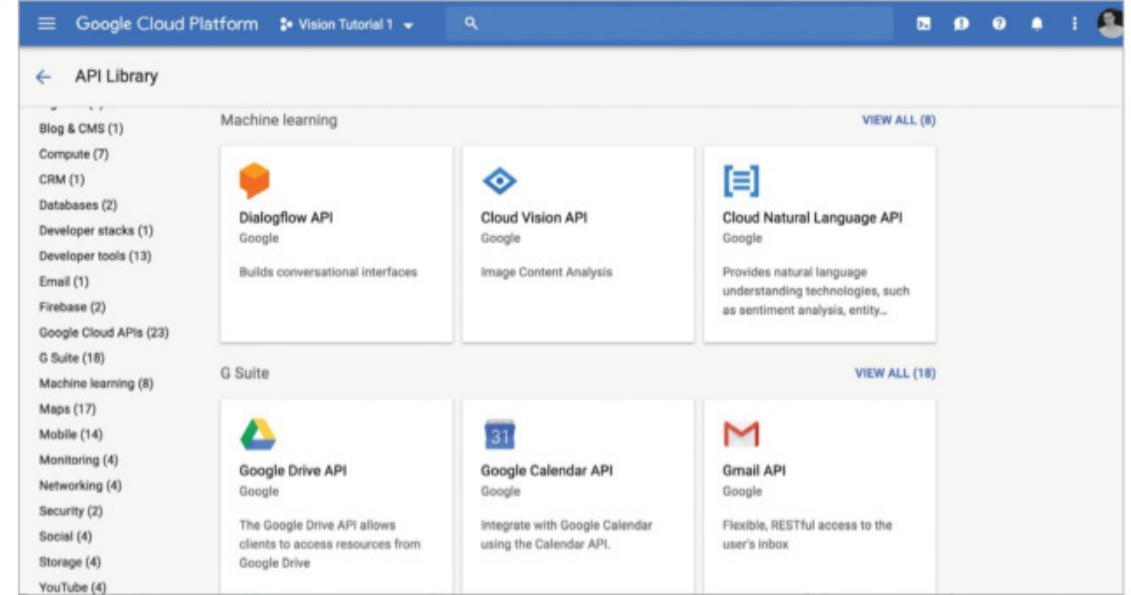
Once enabled you should see a little green check and the message 'API Enabled' beside it.

STEP 3: CREATE A SERVICE ACCOUNT

Next you'll need to set up a service account. Think of the API as a web service you're creating. Since we are going to set up usage like a typical service, this is the best practice. It also works best with authentication flow. If you are having trouble finding the page to add it, go to: <https://console.cloud.google.com/iam-admin/serviceaccounts>

STEP 4: DOWNLOAD PRIVATE KEY

Once you have a project with the API enabled and a service account, you can download your private key as a JSON file. Take note of the location of the file, so you can use it in the next steps.



Above Browse the API library and then enable the Cloud Vision API

If you have any problems with the first few steps there is a quick start guide that helps and ends with the download of the JSON key. You can find that here: <https://cloud.google.com/vision/docs/quickstart>

STEP 5: SET ENVIRONMENT VARIABLE

You need to set the `GOOGLE_APPLICATION_CREDENTIALS` environmental variable, so it can be accessed by our API calls. This points to the JSON file you just downloaded and saves you having to type the path every time. Open a new terminal window and use the `export` command like so:

```
export GOOGLE_APPLICATION_CREDENTIALS="/Users/[username]/Downloads/[file name].json"
```

Replace the `[username]` with your username. Be sure the path to the place you stored the private key file is correct. Replace the `[file name]` with your private key file and use the path to your file.

On Windows, you can do the same thing via the command line, like this:

```
$env:GOOGLE_APPLICATION_CREDENTIALS="C:\Users\[username]\Downloads\[FILE_NAME].json"
```

Note: If you close your terminal or console window, you may need to run that again to set the variable again. We'll add this into our PHP code shortly as well, so you don't have to worry about it again.

STEP 6: MAKE A CALL TO THE API

Now you're ready to dig into the Cloud Vision API. You'll use curl to do quick tests of the API. You can also use this method from your code as well.

The curl requests can be made in most languages, whether that's PHP, Python or Node. This way you can make the calls direct in command line or assign the result to a variable in the language of your



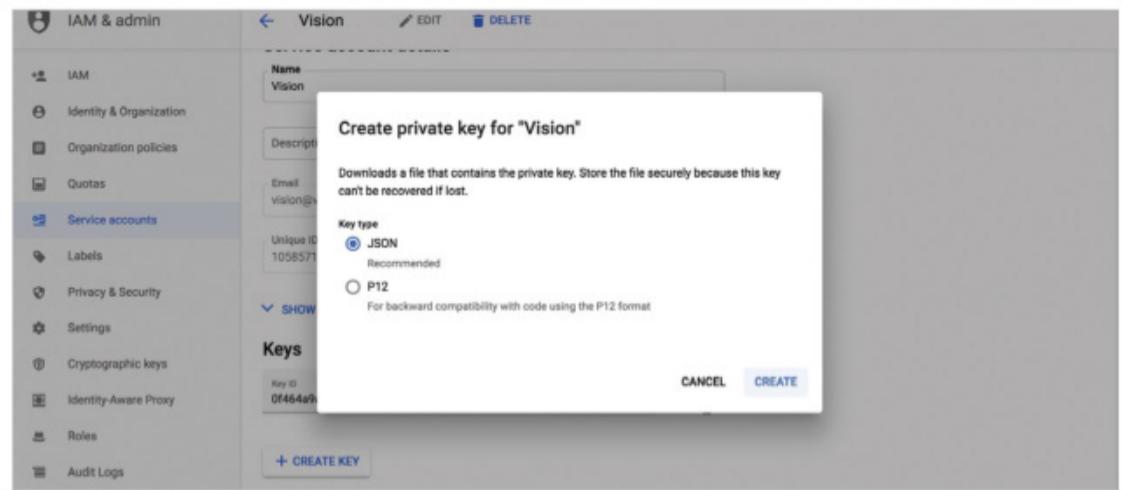
PROJECTS

Google's Cloud Vision API

- choice. If you need some quick tips on using curl check out this link: <https://curl.haxx.se/> Create a simple JSON file to hold the details of the request. Call it `google_vision.json`. Store it local to where you want to run the terminal commands from.

```
{  
  "requests": [  
    {  
      "image": {  
        "source": {  
          "imageUri":  
            "https://upload.wikimedia.org/wikipedia/  
            commons/9/93/Golden_Retriever_  
            Carlos_%2810581910556%29.jpg"  
        }  
      },  
      "features": [  
        {"type": "TYPE_UNSPECIFIED",  
         "maxResults": 50  
        },  
        {  
          "type": "LANDMARK_DETECTION",  
          "maxResults": 50  
        },  
        {  
          "type": "FACE_DETECTION",  
          "maxResults": 50  
        },  
        {  
          "type": "LABEL_DETECTION",  
          "maxResults": 50  
        },  
        {  
          "type": "TEXT_DETECTION",  
          "maxResults": 50  
        },  
        {  
          "type": "SAFE_SEARCH_DETECTION",  
          "maxResults": 50  
        },  
        {  
          "type": "IMAGE_PROPERTIES",  
          "maxResults": 50  
        }  
      ]  
    ]  
  ]  
}
```

In the above code, you've indicated an image to analyse, as well as specific API features to use, including face detection and landmark detection. `SAFE_SEARCH_DETECTION` is great for knowing if the image is safe and in what category it belongs to, such



Above Get your private key for the service account

as adult content or violent. `IMAGE_PROPERTIES` tells you about colours and pixel-level details.

To execute the curl command, in your terminal or command line interface, enter the following.

```
curl -X POST -H "Authorization: Bearer $(gcloud auth application-default print-access-token)" -H "Content-Type: application/json; charset=utf-8" --data-binary @google_vision.json "https://vision.googleapis.com/v1/images:annotate" > results
```

By using the `> results` syntax, you'll have the results stored in a new file called `results` for you. You indicated the URL to the API (`"https://vision.googleapis.com/v1/images:annotate"`) and included your JSON data to POST to it.

You may get prompted the first time you use this to activate the API or allow access. Answer yes or Y to that prompt and it should return the JSON.

If you open the `results` file, you'll get JSON data results from the Vision API request. Here's a snippet:

```
{  
  "responses": [  
    {  
      "labelAnnotations": [  
        {  
          "mid": "/m/0bt9lr",  
          "description": "dog",  
          "score": 0.982986,  
          "topicality": 0.982986  
        },  
        {  
          "mid": "/m/01t032",  
          "description": "golden retriever",  
          "score": 0.952482,  
          "topicality": 0.952482  
        },  
        {  
          ...  
        }  
      ]  
    }  
  ]  
}
```

You see some very useful results right away. Under the `labelAnnotations` node, you can see a 98 per cent

match that the image contains a “dog” and a 95 per cent match that it contains a “golden retriever”! The AI already identified the content of the image and other detail, including a “snout” and the fact it is likely a “sporting dog”.

This required no training on your part because of the already-trained Google Vision AI system. Scanning through the results, you’ll see everything from recommended crop regions – for auto-cropping images to subjects – to incredible detail of what is in the images, including colours and content. Try it out with other images to see how powerful the API is.

You can continue using this method to test out the calls we’ll use. You can also set up a local SDK in a language you prefer and integrate it into your app.

STEP 7: INSTALL CLIENT LIBRARY

Next you will make a simple web-based app to show how to integrate the API into your projects.

There are a number of SDKs available in a variety of languages to make integration easy. You’ll use the PHP SDK for this next section. If you wish to tweak the code that follows into a different language, there is a great resource of SDKs here: <https://cloud.google.com/vision/docs/libraries>

Start by making sure you have a project folder set up on your local or remote server. If you don’t have it already, get Composer and install it to your project folder. Optionally, you may have Composer already installed globally and that is fine too.

Run the following Composer command to install the vendor files for the Cloud Vision SDK.

```
php -r "copy('https://getcomposer.org/installer', 'composer-setup.php');"
php -r "if (hash_file('sha384', 'composer-setup.php') ===
'93b54496392c0627746 70ac18b134c3b3a95e5a5e5c8
f1a9f115f203b75bf9a129d5daa8ba6a13e2cc8a1da080
6388a8') { echo 'Installer verified'; } else { echo 'Installer
corrupt'; unlink('composer-setup.php'); } echo PHP_EOL;"
```

```
php composer-setup.php
php -r "unlink('composer-setup.php');"
```

```
php composer.phar require google/cloud-vision
```

Composer makes a vendor folder in your project folder and installs all the dependencies for you. If you get stuck setting this up and want to use PHP, you can check out this installing Composer resource: <https://getcomposer.org/>

STEP 8: CREATE A NEW FILE

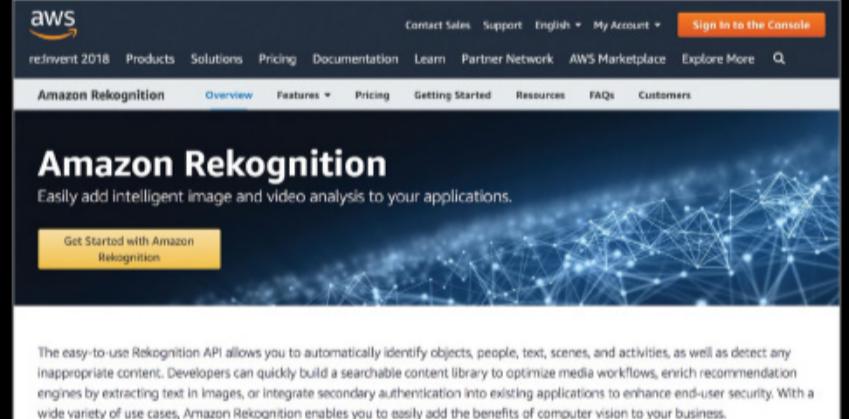
Create a new PHP file in your project folder. Set it up however you like but include a simple HTML form to upload images for quick testing. Here’s an example PHP file with the form included:

★ RESOURCES

COMPUTER VISION APIs



Whether you need to analyse an image or make predictions based on data sets, AI APIs can help you get it done. It's a good idea to integrate these computer vision AI resources into your projects, in addition to the Google Cloud Vision API that we used in this tutorial.

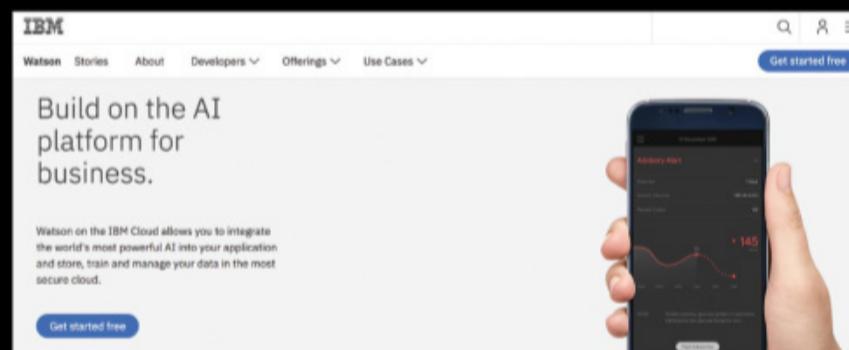


Amazon Rekognition
Easily add intelligent image and video analysis to your applications.
[Get Started with Amazon Rekognition](#)

The easy-to-use Rekognition API allows you to automatically identify objects, people, text, scenes, and activities, as well as detect any inappropriate content. Developers can quickly build a searchable content library to optimize media workflows, enrich recommendation engines by extracting text in images, or integrate secondary authentication into existing applications to enhance end-user security. With a wide variety of use cases, Amazon Rekognition enables you to easily add the benefits of computer vision to your business.

Rekognition by Amazon
<https://aws.amazon.com/rekognition/>

This API enables you to automatically identify objects, people, text, scenes and activities. It can also help identify inappropriate content quickly.



Watson AI
Build on the AI platform for business.
Watson on the IBM Cloud allows you to integrate the world's most powerful AI into your application and store, train and manage your data in the most secure cloud.
[Get started free](#)

Watson AI
<https://www.ibm.com/watson/developer/>

You can tap into one of the most powerful AI systems in the world via API endpoints. Data mining, predictions and computer vision are all possible.

Disciplines of AI

Despite the ever-changing definitions of AI, there are several identifiable objectives or disciplines within AI. Some applications are but are not limited to:

- Knowledge reasoning
- Machine learning
- Natural language processing
- Computer vision
- Speech recognition
- Robotics
- Virtual reality
- Data mining

★ IN-DEPTH

WHAT IS AI?

+ AI is an integral part of our world, embedded in nearly every technology we have. AI is in the Google searches we run, the voice commands we give Alexa and the map directions we follow. It's part of ordering our morning coffee and in the navigation system in our cars. Our AI-powered phones, which are never out of reach, have become an extension of our physical selves, our very identity. AI holds the promise of making almost everything we do easier and vastly improving our world.

Communication, transportation, scientific discovery, medical research, service industries: all are enhanced by AI. It performs a wide range of activities including game theory, electronic trading, robotic automation and exploring the vastness of space.

Artificial intelligence (AI) is defined as a machine-based intelligence, as opposed to the biological-based intelligence of humans and animals. AI refers to machines performing functions of cognition (of the mind) in fields such as learning, planning and solving problems.

As a technologist, it's critical that you learn as much as you can about how to leverage these technologies and integrate them into your work.



Computer vision can detect not only faces and features but also emotion

“The `faceDetection` function returns emotion data as well as location information of where in the image the faces are”

```
> <!DOCTYPE html>
<html>
<head>
    <title>net - Computer Vision Tutorial</title>
</head>
<body>
    <form action="index.php" enctype="multipart/form-data" method="post">
        <h1>Select image </h1>
        <input type="file" name="file"><br/><br />
        <input type="submit" value="Upload Image" name="submit"> <br/>
    </form>
    <div class="results">
        <?php
            // php code goes here //
            if(!isset($_POST['submit'])) { die(); }
        ?>
    </div>
</body>
</html>
```

The code includes a basic HTML file with a form and a placeholder for PHP code. The code starts checking for the existence of the image, submitted from the form. If it's not submitted yet, it does nothing.

STEP 9: STORE THE IMAGE

If you'd prefer to point to images online or on your system, skip this step. If you'd like to process images you select, add this code to save the image selected.

```
// save image
$filepath = $_FILES["file"]["name"];
if(move_uploaded_file($_FILES["file"]["tmp_name"],
$filepath)) {
    echo "<p><img src=\"$filepath\" style='width:400px; height:auto;' /></p>";
} else {
    echo "Error !!";
}
```

STEP 10: ADD ENVIRONMENT VARIABLE

You need to set the `GOOGLE_APPLICATION_CREDENTIALS` variable for it to authenticate. In PHP we use the `putenv` command to set an environment variable. Add this code next in your PHP code:

```
putenv('GOOGLE_APPLICATION_CREDENTIALS=/Users/richardmattka/Downloads/Vision Tutorial 1-0f464a9a0f7b.json');
```

Replace the path and file name to your JSON private key file.

STEP 11: INCLUDE THE LIBRARY

Add the library and initialise the `LanguageClient` class in your code. Add this code next:

```
require __DIR__ . '/vendor/autoload.php';
use Google\Cloud\Vision\V1\ImageAnnotatorClient;
projectId = 'vision-tutorial-1';
$imageAnnotator = new ImageAnnotatorClient([
    'projectId' => $projectId
]);
```

Start by requiring the vendor autoload. This is similar in Python or Node when you require your dependencies. Import the `ImageAnnotatorClient` next, to make use of the class. Define your `projectId`. If you aren't sure what this is, look it up in your Google Cloud Project console. Finally, create a new `ImageAnnotatorClient` object using your `projectId` and assign it to the `$imageAnnotator` variable.

STEP 12: ANALYSE IMAGE CONTENT

Start submitting the image to the API for analysis. You'll display the result as JSON to the screen for now but in practice you could assess the results and use them any way you wish.

Add the following to submit the image to the API.

```
$image = file_get_contents($filepath);
$response = $imageAnnotator->labelDetection($image);
$labels = $response->getLabelAnnotations();

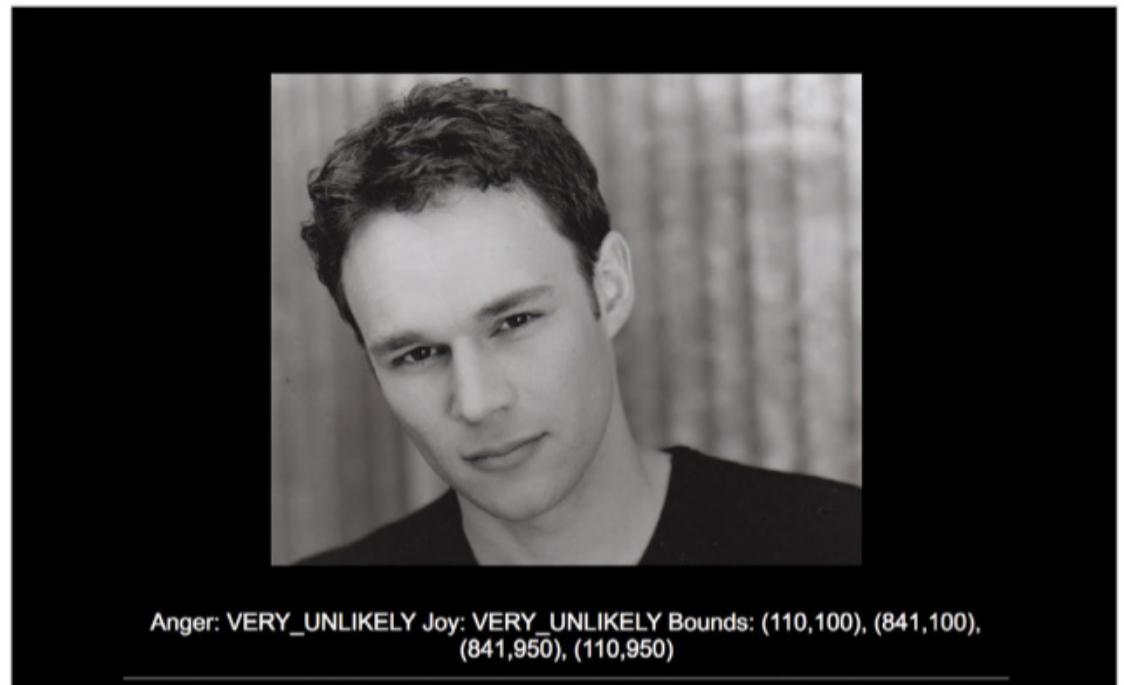
foreach($labels as $label){
    echo "<div class='result'>";
    $result = $label->getDescription();
    echo $result . " (" . $label->getScore() . ")";
    echo "</div>";
}
```

This submits the content from the submitted form to the `imageAnnotator` endpoint and stores the result in the `$response` variable. It specifies the `labelDetection` feature. You can also use `faceDetection`, `logoDetection`, `textDetection` and many other functions. For a full list, check out: <https://netm.ag/2AChWK7>

Next, iterate over the list of labels. This is just an example to show how to use it: you could process it and react to the results however you need.

STEP 13: DETECT FACES

Another quick example of how powerful the API is lies in the `faceDetection` function. This will return emotion data as well as location information of where in the image the faces are. Try out this code to see how it works.



```
$response = $imageAnnotator->faceDetection($image);
$faces = $response->getFaceAnnotations();

$likelihoodName = ['UNKNOWN', 'VERY_UNLIKELY',
'UNLIKELY',
'POSSIBLE', 'LIKELY', 'VERY_LIKELY'];
//var_dump($labels);

foreach($faces as $face){
    echo "<div class='result'>";
    $anger = $face->getAngerLikelihood();
    printf("Anger: %s" . PHP_EOL,
$likelihoodName[$anger]);
    $joy = $face->getJoyLikelihood();
    printf("Joy: %s" . PHP_EOL, $likelihoodName[$joy]);
    $vertices = $face->getBoundingPoly()->getVertices();
    $bounds = [];
    foreach ($vertices as $vertex) {
        $bounds[] = sprintf('(%d,%d)', $vertex->getX(), $vertex->getY());
    }
    print('Bounds: ' . join(', ', $bounds) . PHP_EOL);
    echo "</div>";
}
```

You start out by using the `faceDetection` function of the `Annotator` and pass in the image like the previous example. Then you get the `faceAnnotations`. You use an array of response weights in more common language, so you can see the likelihood of certain emotions. Following this, you iterate the response like before. You check for two of several possible emotions, anger and joy, returning the results of those. This will also give you the corners of the bounding boxes that define each face found. ■

Above Using the `faceDetection` function of the Vision API, you can find the emotions and bounding boxes of faces in the image



ABOUT THE AUTHOR

BEN READ

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The screenshot shows a Sentry.io dashboard for a project named 'test'. A yellow banner at the top says 'You're almost there! Start capturing errors with just a few lines of code.' Below it, an error report for 'TEST-1' is displayed. The error message is 'TypeError poll(..../sentry/scripts/views.js) Object [object Object] has no method 'updateFrom''. The event details show it was captured on Dec 19, 2018, at 3:29:48 AM UTC. The stack trace includes entries for 'sentry@example.com' (ID: 1), 'Chrome Version: 65.0.3325', and 'Mac OS X Version: 10.13.4'. The tags section lists browser: Chrome 65.0.3325, browser.name: Chrome, level: error, os: Mac OS X 10.13.4, os.name: Mac OS X, url: http://example.com/foo, and user: id:1. The message field contains the text 'This is an example JavaScript exception'. On the right side, there's a sidebar with sections for Ownership Rules, All Environments (LAST 24 HOURS), LAST 30 DAYS, FIRST SEEN (When: 2 minutes ago, Dec 19, 2018 3:29:48 AM UTC, Release: not configured), and LAST SEEN (When: 2 minutes ago, Dec 19, 2018 3:29:48 AM UTC, Release: not configured).

* ERROR BOUNDARY API

BASH BUGS AND MINIMISE ERRORS IN REACT

Ben Read explains how you can use React's Error Boundary API to deliver tailored error messages and capture the cause of failures in components

We've all experienced it. Whether it's by forgetting to close a function, misspelling a variable or just plain old doing something wrong – if we've spent any time developing, specifically with JavaScript, we've seen the white screen of death. Nothing renders to the screen and the only way of investigating the issue we caused is by opening the console and looking at the stack trace.

But what if that error occurs in production? Or worse still, on someone else's machine? If this is happening, you might be losing a large segment of potential customers, not to mention the fact that you have absolutely no insight into the nature of the error, so debugging and fixing it becomes a very difficult challenge indeed.

In this tutorial, we're going to dive into React's Error Boundary API to see how it can be used effectively to stop the app from crashing, provide a fallback and capture data for analysis later.

GET STARTED

To save this tutorial from being too long, I've included the code on GitHub at <https://github.com/endymion1818/netmag-react-error-reporting>. It's a basic create-react-app setup with axios hooked up to get some data from the Star Wars API. However, there's a deliberately placed issue in the `render()` method that's causing the app to crash.

To see this code in action, download or clone the repo. Open this directory in your terminal and install

dependencies by running `npm i`. You can run the app in development mode by typing `npm start`. It's time to take a closer look at what's happening here.

ERROR BOUNDARY API

The Error Boundary API enables us to create a component that wraps around our whole app, an individual component or both. Then, if anything in that component fails, we can define an error message – or a replacement UI component – to appear instead of our broken one.

We're going to create a new file, `ErrorBoundary.js` and add some code there. This does the following:

- Initiates a `state` object so that we can decide what to do if there is an exception
- Sets up some built-in React functions we have access to that will help us do something when an error occurs

```
export default class ErrorBoundary extends React.Component {
  constructor(props) {
    super(props)
    this.state = { hasError: false }
  }
  getDerivedStateFromError(error) {
    return { hasError: true }
  }
  componentDidCatch(error, errorInfo) {
  }
  // continued below ...
}
```

Next, let's provide our fallback UI component:

```
// ... continued from above
render() {
  const { children } = this.props
  if (this.state.hasError) {
    return (
      <div>
        <h2>Something went wrong with our app!</h2>
        <p>We're aware of the problem and we're working
        hard to fix it.</p>
        <p>In the meantime, you can reach us by phone or
        email.</p>
      </div>
    )
  }
  return children
}
```

Now let's import that into our form and wrap it around the rest of the component: `import ErrorBoundary` ►

★ IN-DEPTH

BEWARE OF NON-STANDARD ERROR REPORTING

 It may not surprise you to know that the way browsers report errors differs across the various rendering engines and implementations. Sometimes the `errorObject` object isn't defined, so you'll likely get some errors that aren't helpful. Most will show you a really handy amount of detail, down to the exact line of code where the error occurred. But don't expect the same level of reporting from every browser. This doesn't just apply to Internet Explorer either. Safari only recently introduced some better error reporting practices. There's a comprehensive table on Sentry's blog to identify the inconsistencies, as well as implementing a workaround: <https://blog.sentry.io/2016/01/04/client-javascript-reporting-window-onerror.html#browser-compatibility>

★ SYNTAX

ERRORS OR EXCEPTIONS?

 You may have come across situations where your application fail was termed an 'exception' instead of an error. The reason for this is that they're not errors insofar as a problem with the language; instead they're exceptional results from the way that language has been used. This means the problem has originated with something that is not driven by pure logic... in essence you or I. Therefore they are exceptional results driven by the way humans have applied the language.

"If anything in that component fails, we can define an error message – or a replacement UI component – to appear instead"

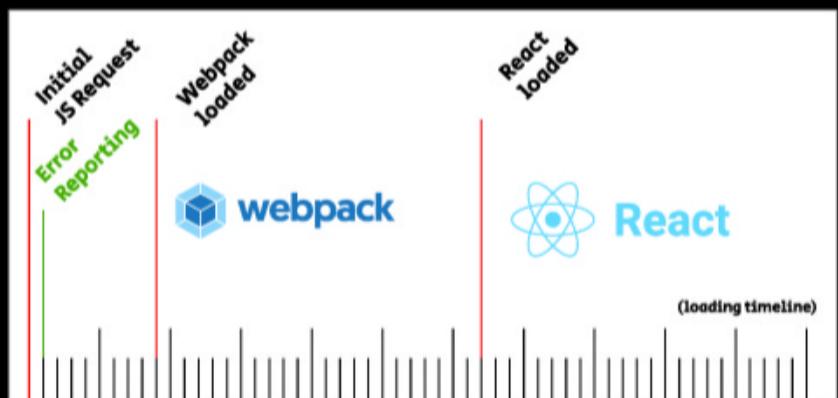
REACT TESTING CAVEATS

 Catching and reporting errors in the way described in this article does have one caveat: the Error Boundary API is only capable of capturing errors that happen in your app. So errors could occur before your app is loaded that aren't captured.

Sentry specifically mentions this in its document, stating that the error reporting tool should be initialised as soon as possible in your application.

On some projects this is harder to achieve than others without some serious hacking about. During projects with server-side-rendering, I've been able to write the script into Helmet. That way, the error can be captured using the `window.onerror` browser API instead of the React built-in API that we're discussing in the article:

```
import * as Sentry from "@sentry/browser"
// ...
<Helmet
  <script type="text/javascript">{`  
  Sentry.init({  
    dsn: "your-dsn-here"  
  })  
  window.onerror = Sentry.withScope(scope => {  
    Object.keys(errorInfo).forEach(key => {  
      scope.setExtra(key, errorInfo[key])  
    })  
    Sentry.captureException(error)  
  })  
}  
`</script>  
>  
--
```



Error reporting should start as soon as possible, outside your application – before Webpack loads – to ensure you capture as many errors as possible

- ▶ from './ErrorBoundary'. If an exception occurs in that component, the visitor will now see this message instead. You can trigger it on your machine easily by leaving a tag unclosed or doing something else you know would ordinarily break your app.

The great thing about this functionality is you can choose how to use it wrap your entire app or individual components. On a recent project, I set up two: one around the app and another around a component using data from an API that contained an error message specific to that component.

But how do we capture what has caused our error so we can fix it?

GRAB, BAG AND TAG

This is where a logging service comes in. Now, inside the `componentDidCatch()` method of our `ErrorBoundary` component, we can send the exception data to a third-party service.

For enterprise-level applications, I've enjoyed using Splunk. Splunk is built for more than error reporting and I've seen people use it as a conversion

“Sentry enables you to categorise, monitor, collect and track issues”

metric tool as well. Splunk's strength is in the vast volumes of data it can collect. It also enables you to visualise your data in charts so you can track trends and analyse data more easily.

However, for smaller applications Splunk might be overkill. I've recently been introduced to Sentry, which offers a simpler set of tools that enable you to categorise, monitor, collect and track your issues.

Sentry (<https://sentry.io/for/javascript/>) has a free tier for developers and is easy to get started with.

ERROR REPORTING WITH SENTRY

Now, let's assume – even though you've tested your app thoroughly – you suspect errors are happening in production. Or perhaps you want to make sure there aren't any. Let's add Sentry to this project.

```
npm install @sentry/browser
```

This gets the Sentry package, which we can now import into our ErrorBoundary and initialise with our credentials to enable Sentry to receive our errors:

```
import * as Sentry from "@sentry/browser"  
Sentry.init({
```

Sentry supports these JavaScript libraries

- React
- ANGULAR
- ember
- Vue.js
- BACKBONE.JS

```
dsn: "your-dsn-here"
})
```

Then update the `componentDidCatch()` function with:

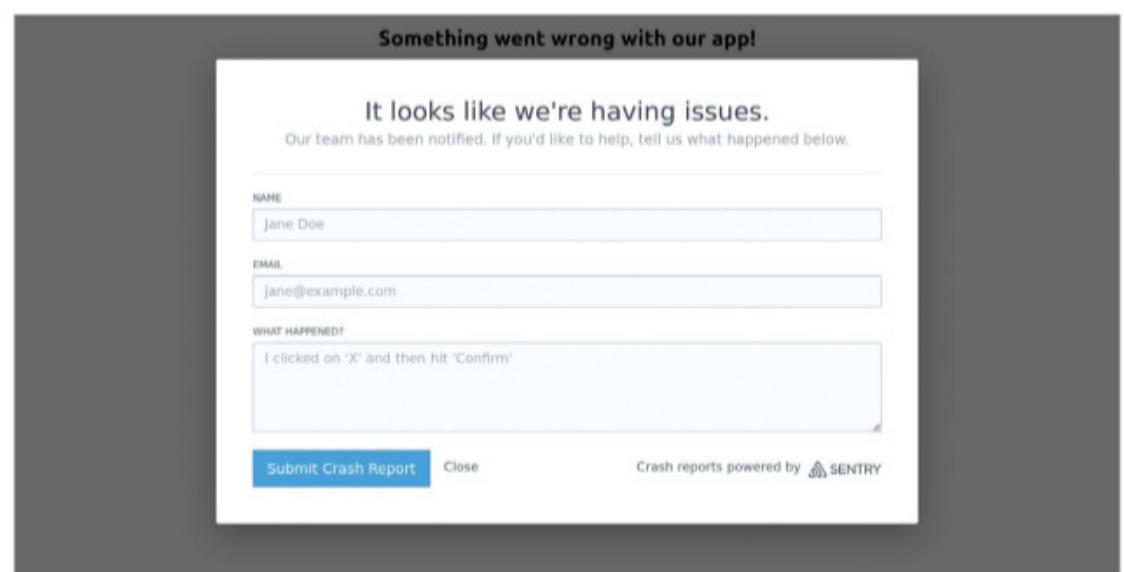
```
componentDidCatch(error, errorInfo) {
  Sentry.withScope(scope => {
    Object.keys(errorInfo).forEach(key => {
      scope.setExtra(key, errorInfo[key])
    })
    Sentry.captureException(error)
  })
}
```

Now each time an error occurs, the data will be sent to Sentry and you can receive an email alert!

SEE IT IN ACTION

Are you ready to see what we've been doing? To do that, we need to build our application and serve it somewhere – ideally this will be your local computer. This step involves installing a local JavaScript web server to your computer.

First, in your terminal, run `npm install --global sentry`. Next, from your project directory, run `npm build`.



This will build the production-ready app. Now we can serve this folder locally by running `serve -s build`. Open up a browser and visit `http://localhost:5000` and you should find you're able to see our beautiful error message!

Congratulations! You are no longer in the dark about your JavaScript errors. Now you can increase the usefulness of your app and improve your stability by not only providing a fallback state for your app but also by reporting and squashing all of your remaining bugs.

Top Sentry offers a simple set of tools that enables you to categorise, monitor, collect and track errors in your JavaScript

Above An example of an error form generated by Sentry when it finds something amiss



★ ACCESSIBILITY

CREATE ACCESSIBLE FORMS

Jonathan Speek talks you through the process of how to design forms with accessibility in mind

► Forms are an essential component of the web because they connect users to your business and help them accomplish what they came to your site or app for. That being said, you want to make sure that all of your users are able to use your forms without having to suffer a horrible experience. The goal is to make these key user interactions as frictionless as possible.

Although it's true that building forms can be a difficult task at times, making them moderately accessible isn't as complicated as you might think. There are often excuses thrown around like 'we don't have time to worry about accessibility' or 'we'll make it accessible later'. These excuses are often (if not always) invalid and you can help your team change this mindset.

Here are some questions you should consider when building forms:

- What difficulties might someone with visual impairments have using my form?
- Does the user have a clear indication of what data is expected for input?

- Is the form easy to use – will the users be able to understand it quickly?
- Am I able to use the keyboard in order to complete the form?

HOW TO GO ABOUT MAKING A BASIC SUBSCRIPTION FORM

I've given you some starter code to help you get ahead. We'll begin with this (<https://codepen.io/JonathanSpeek/pen/JwNMYK>) and eventually get to this (<https://codepen.io/JonathanSpeek/pen/KrEdxR>).

I've provided you with some basic styling and elements that would make up a simple subscription form but there's a lot we can do here to make this form more usable. With anything you create, using good semantic HTML will get you a long way.

Let's start by connecting the `<input>` elements to their respective `<label>`s. We do this by giving the `<input>` an `id` and using that as the `for` attribute for the `<label>`. We can use "name" and "email" for these and we've already done two things:

1. We've programmatically associated the label to the input. The benefit of this is that it will read the label to a screen reader user if that input is focused.
2. The user can now click on the label and the respective input will be focused, so users now have a larger target size.

Now that our inputs and labels are all wired up, we can define the HTML input types. These are really useful and a super easy way to give an excellent user experience. Adding the type attribute (you can read about the different types here: <https://codepen.io/JonathanSpeek/pen/JwNMYK>) will help the user auto-

“We’ve provided labels for visual and screen-reader users as well as styled focus states for keyboard users”

fill your form and will also provide a more suitable keyboard for mobile users. For our use case we can do `type="text"` for the name input and `type="email"` for the email input.

We also want our users to have a good idea of what type of data (and its formatting) we expect from them. Here it is pretty obvious but that isn't always the case. It's generally good practice to provide a label that's always viewable and a placeholder that communicates the expected input. This means not using the `placeholder` attribute as a visual label for inputs where the label is not viewable once a user begins typing. This has been a popular practice for a lot of developers and really needs to be put to bed once and for all. We can give a placeholder of “ex. Jane Doe” for the name and “ex. jane.doe@example.com” for the email.

Now we can get to work on the focus state styling. The default styling of focus states are different between the browsers and we can improve whatever the default styling might be in order to make it more user friendly. In our case here, we want the inputs to have a thick, coloured outline that matches up with the button.

```
form.html
1 <div class="centerThings">
2   <h1>Subscribe</h1>
3   <p>Sign up and get exclusive content delivered right to your inbox ■ You'll be so happy you did ■</p>
4   <form action="" method="post">
5     <label><span class="required">*</span>Name</label>
6     <input required>
7     <label><span class="required">*</span>Email</label>
8     <input required>
9     <button type="submit">Submit</button>
10    </form>
11  </div>
12
```

```
styles.scss
1 input {
2   // add this at the bottom of your input
3   &:focus {
4     outline: 3px solid #2E1B6B;
5     border-color: transparent;
6   }
7 }
```

Top While the form has some basic styling and elements, there is a lot we can do here to make this form more usable

Above Add your focus styles in your input selector

ADD FOCUS STYLES TO INPUT SELECTOR

Lastly, we need to add some focus styles around the button element. This is often overlooked but can really help keyboard-only users know where they are. We need to add this `&::moz-focus-innner` bit to get rid of some default styling in Firefox (you might want to save that snippet for future use).

Just like that, we have a basic subscription form you can be proud of and improve on. Because we've used good semantics, the form is accessible via keyboard only (try using the tab and spacebar/enter keys). The colours used for the button are a colour ratio of 11.51, meeting the AAA standards for WCAG (Web Content Accessibility Guidelines). We've provided labels for both visual users and screen-reader users, as well as styled focus states for our keyboard-using friends. Finally, notice that the font is set to 18px in the body. This makes our form much more readable (you should try to stay above 14px).

Designing and building with accessibility in mind takes practice but you'll be a better developer for it and help make the web a better place.

PROFILE
* *Speek is a designer, developer and musician. He's a developer at the Cognizant Accelerator and is into coffee, accessibility, design systems and front-end development.*



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Content

UX

UI

* CONTENT DESIGN

DESIGN CONTENT FOR SPEEDY SCANNABILITY

Daniel Schwarz talks about content design and why scannability is rapidly becoming a must-have for optimal user experience

► Websites and apps are mostly made up of content, so why is user experience design so heavily focused on getting the interfaces right? Think about it: when we scroll Facebook, read an article, check out the landing screen of a new app or service we're thinking of trying out, we absorb important snippets of information way more often than we interact using gestures.

In fact, when the user experience is crafted effectively, we remain hopeful that users aren't forced to interact any more than they need to. After all, users come for the information; they persevere with the interactions as a means to an end.

INFORMATION VS CONTENT

Information and content are not the same thing. Content is everything that isn't the user interface; however information is the snippets of said content

that actually hold value (ie they're useful or they have entertainment value but, most importantly, they're what the user was looking for). The biggest challenge with content today is being able to determine which snippets have value and which are cluttering up the screen. And why is this? Because users are impatient!

IMPATIENT USERS

Content today doesn't necessarily lack value; it's more that users are becoming increasingly impatient and refuse to allocate the time needed to properly sieve through the content and decipher the information they're looking for. We live in a world where we expect everything from food to TV to appear on demand.

On average, users spend approximately 15 seconds (<http://time.com/12933/what-you-think-you-know->

about-the-web-is-wrong/) on a screen trying to acquire the information they're looking for. Well-known heatmap and web analytics tool Crazy Egg dubs this the 15-second rule (<https://www.crazyegg.com/blog/why-users-leave-a-website/>). This amount of time may be higher if the content is engaging enough but it can also be lower depending on the type of app or website and various factors relating to the user experience – and when we factor in the time that it takes for the screen to load, this number can be even lower.

So let's discuss how we can improve the ease with which users can find information in our content – or its scannability.

SCANNABILITY

Scannability is how well users are able to read and understand a body of text holistically (this includes images as well). Neglecting to write user-first content can result in confusing, lengthy or over-the-top ramblings, making the vital information more like a needle in a haystack. However, while this should be our first priority, business objectives often cloud our judgement.

When companies set conversion targets, designers are forced to affix importance to the brand message and what's called persuasive writing, leaving vital snippets of information that can be crucial to a conversion by the wayside in favour of words that, without substance, are simply fluff.

This is why, when users are only willing to spend a certain amount of time reading, content should ideally be optimised for scannability.

RULE #1: LESS IS MORE

Although this goes without saying, the first rule of scannability is that less is more. The most effective way to improve it is to rethink or outright cut content that doesn't add much – or any – value. Most of the time, the same thing can be said in fewer words.

RULE #2: WRITE SIMPLE LANGUAGE

Next, there's the language itself. The W3C covers this in detail (<https://www.w3.org/WAI/tips/writing/>) and has dedicated recommendations on the subject in the WCAG 2.1 Web Content Accessibility Guidelines. These include writing short and clear sentences, avoiding unnecessarily complex words and the expansion of acronyms upon first use. In a nutshell, if the user struggles to understand the content, impatience or frustration will result in them hitting the back button.

When in doubt, try translating the content into another language and see how the meaning differs. If you find that some sections don't translate well,



★ DESIGN ESSENTIALS

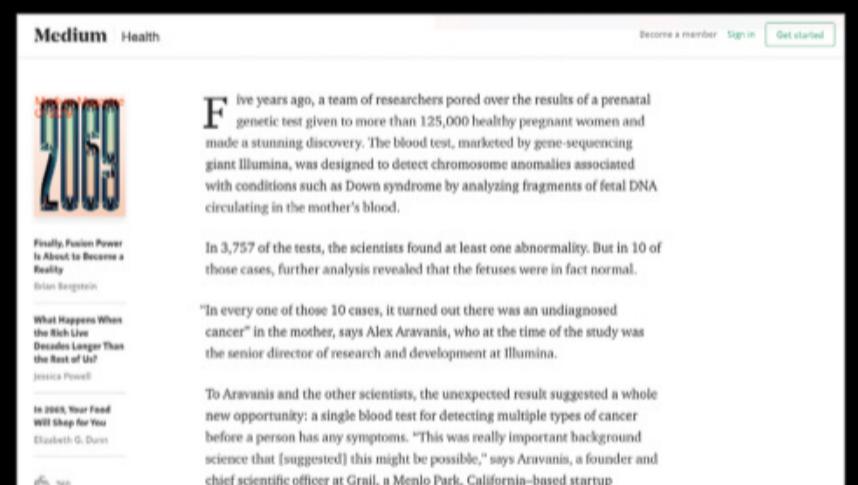
READABILITY FUNDAMENTALS

 Most of us know that the minimum font size is 16px (or the equivalent); after all, it's the web browser default. However, the WCAG 2.1 Web Content Accessibility Guidelines outline a couple of other requirements that many designers often overlook.

The line height of text is one of those requirements, where users with cognitive disabilities may have trouble tracking lines of text when the text is single-spaced. Specifying a spacing value between 1.5 and 2 means they can roll onto the new line easier. The WCAG also states that paragraph spacing should be 1.5x larger than the line spacing, for optimum readability. And finally, never, ever, justify text.

As a bonus, accessibility improvements aren't the slightest bit intrusive to users without accessibility conditions, so making these UX improvements is actually beneficial to everyone.

Making these small improvements to the readability and legibility of text-based content can significantly increase scannability, helping all users locate, read and understand content quickly and effectively.



Five years ago, a team of researchers pored over the results of a prenatal genetic test given to more than 125,000 healthy pregnant women and made a stunning discovery. The blood test, marketed by gene-sequencing giant Illumina, was designed to detect chromosome anomalies associated with conditions such as Down syndrome by analyzing fragments of fetal DNA circulating in the mother's blood.

In 3,757 of the tests, the scientists found at least one abnormality. But in 10 of those cases, further analysis revealed that the fetuses were in fact normal.

"In every one of those 10 cases, it turned out there was an undiagnosed cancer" in the mother, says Alex Aravanis, who at the time of the study was the senior director of research and development at Illumina.

To Aravanis and the other scientists, the unexpected result suggested a whole new opportunity: a single blood test for detecting multiple types of cancer before a person has any symptoms. "This was really important background science that [suggested] this might be possible," says Aravanis, a founder and chief scientific officer at Grail, a Menlo Park, California-based startup.

With perfect line height, paragraph spacing, content width and an optimal font size, Medium is a fine example of reading accessibility.

“If the user struggles to understand the content, impatience or frustration will result in them hitting the back button”

RESOURCES

SCANNABILITY TOOLS

+ As with all types of UX improvements, some trendy tools can help to speed things up! Here's a collection of the best heatmap and scrollmap tools (to help decipher where exactly users stop to look around), usability testing tools (to collect real feedback from real users about the quality of scannability) and a couple of other useful resources that can be quite handy when designing scannable, user-first content.

Heatmap/scrollmap tools:

- Hotjar
- Crazy Egg
- FullStory
- Inspectlet
- Tableau
- Heatmap
- SimpleHeatmaps
- ContentSquare

User/usability testing tools:

- Lookback
- UserTesting
- UserLook
- UsabilityHub
- Usabilla
- UserVoice

Other:

- OpenDyslexic and Dyslexie: two fonts designed to help dyslexic users read better.
- Google PageSpeed: optimise your first contentful paint metric.

Comparison
Unique letter shapes to help prevent confusion

	rn	m	MW	dpqb	l1IijJ
Verdana	rn	m	MW	dpqb	l1IijJ
OpenDyslexic3	rn	m	MW	dpqb	l1IijJ
OpenDyslexic	rn	m	MW	dpqb	l1IijJ
Times	rn	m	MW	dpqb	l1IijJ
Helvetica	rn	m	MW	dpqb	l1IijJ

OpenDyslexic is a font designed specifically to help dyslexic readers make fewer reading mistakes



- ▶ you may need to rethink how they're worded. All-in-all, simple words translate better.

RULE #3: MAKE CONTENT SUMMARISABLE

Language and length aside, much of scannability relies on how quickly and effectively we're able to summarise the content. How we summarise content differs depending on the context, however, so let's take a look at a couple of scenarios.

SUMMARISE NEWS ARTICLES

Have you ever read an article that was summarised so much that you didn't need to read it? Do you remember how refreshing it was to skip the fluff? Summarising the highlights in a text snippet or list can help readers digest the vital information, which is considerate because readers often read multiple news articles in quick succession.

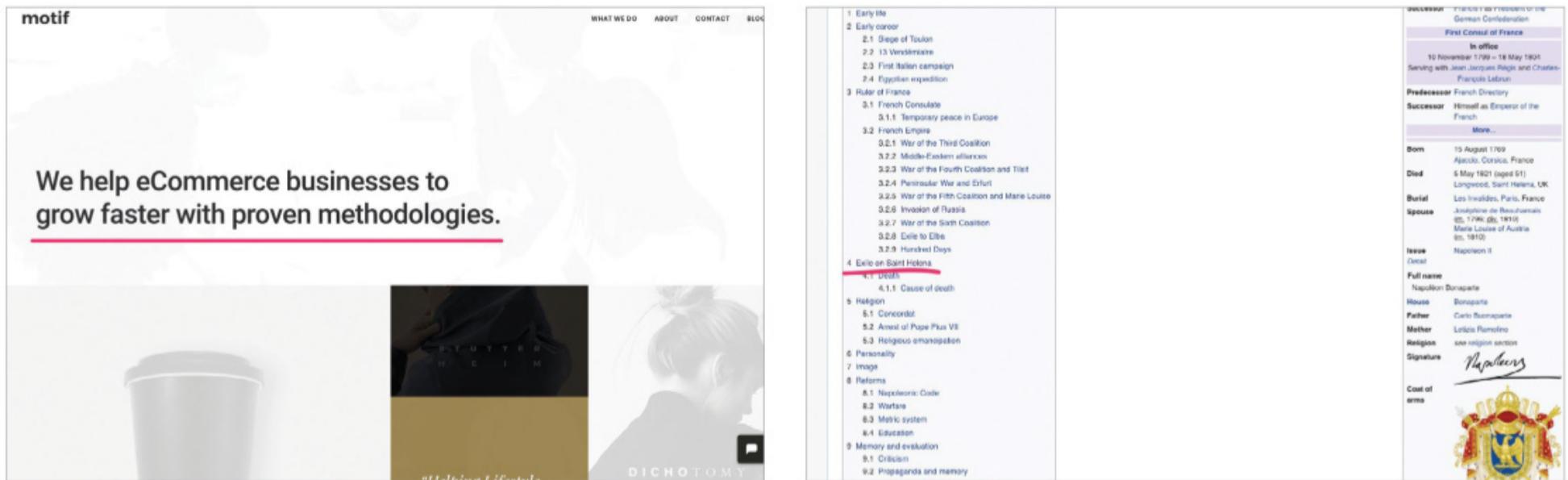
SUMMARISE YOUR BUSINESS

We can apply these same techniques to the famed hero header when explaining what it is that we, or our business, does. Businesses want their tag lines to be catchy but they often counterintuitively end up confusing users by including too many adjectives and not describing what it is the business actually does.

These tag lines (and the news snippets mentioned earlier) are critical for impatient users looking for a reason to stick around. They reside above-the-fold and are usually the first snippets of content that users see while the rest of the screen is rendering – we call this ‘first contentful paint’.

SUMMARISE USING LISTS

Hardly surprising but still worth a mention: lists are very easy to read because they use simple language while cutting out unnecessary words. We can use them in-content or to build tables of contents.



SUMMARISE USING HEADINGS

With longer bodies of content (like articles), headings are typically used to summarise the content that is to follow. Headings should convey a short, clear description of what the following body of content is about, helping readers dive directly into the sections of content they're keen to read.

If we make use of analytics tools like Crazy Egg, which have features like scroll maps, we can analyse where users stop to read. If we implemented this on an article, we'd notice that headings are often 'red,' indicating that users 'scan' them.

Scannability doesn't have to mean anti-conversion. In fact, optimising scannability can

“Summarising the highlights in a text snippet or list can help readers digest the vital information”

actually boost conversions. CTAs can be inserted near these red areas for maximum visibility!

RULE #4: INCREASE SCANNABILITY DURING LOADING

First contentful paint (<https://gtmetrix.com/blog/first-contentful-paint-explained/>) refers to the first snippet of content that appears on-screen; where scannability is concerned, this is the metric that matters in terms of loading times. We can test load speeds with Google's PageSpeed (<https://developers.google.com/speed/pagespeed/insights/>) but let's talk about the two ways in which we can increase scannability while other content is still loading.

Confirmation: news and hero summaries can't always convey the full value of what the content contains but they can confirm what the screen will be about once it has loaded – users are more likely to stick around with some reassurance that they're in the right place.

Preparation: let the user know exactly what the content contains and how they can fast-track to the specific information that they need. This can be a well-structured table of contents or even a small, contextual navigation. By the time the user is ready, the screen will likely be fully loaded.

RULE #5: CONFIRM THEORY WITH USABILITY TESTING

Usability testing can help confirm theories and reveal solutions. Let's run through some different types of usability testing that can be quite helpful when designing scannability.

FIVE-SECOND USABILITY TEST

A five-second usability test is good for determining whether or not users can recall something from memory. The test is suitable for figuring out how much users can 'scan' in a short space of time; for example, the 'explainer' telling what the company does and maybe even three reasons for why the user should convert.

SEARCH TERM TESTING

Search term testing is a test designed for long-form content such as articles, especially those that contribute heavily to conversion rates. It involves finding out the search terms that users are entering to land on the article in question – Google's Webmaster Tools (<https://www.google.com/webmasters/tools/>) can shed some light on this – then testing how quickly users are able to find the information related to their query. ■

Far left Look at the articles on news websites to get familiar with how to summarise content

Middle Ecommerce agency Motif uses clear language to describe what it does and how it does it while still making a bold statement

Right Wikipedia is one of the most well-known examples of long-form web content that uses a table of contents



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The screenshot shows the CodeSandbox interface. On the left, the file tree displays files like `build`, `config`, `src` (containing `assets`, `components`, `data`, `mixins`, and `App.vue`), and `main.js`. The `main.js` file content is:

```
// The Vue build version to load with the "import" command
// (runtime-only or standalone) has been set in webpack.base.conf with an alias.
import Vue from 'vue';
import App from './App';

Vue.config.productionTip = false;

/* eslint-disable no-new */
new Vue({
  el: '#app',
  components: { App },
  template: ''
});


```

On the right, a browser window shows the running application with three posts: "My first post", "My second post", and "My third post". Each post has a "Show full article", "Likes: 0", and "Toggle High Contrast" button.

* VUE.JS

BUILD A BLOG APP WITH VUE.JS

Simone Cuomo shows us how to create a fully featured Vue.js blog app

The JavaScript ecosystem has been changing for over a decade, meaning front-end developers have had to track new technologies. After testing JavaScript frameworks and libraries for over five years, I have found the one that works for me: Vue.js. In this tutorial, I will explain the basic structure of a Vue app. In addition, I am going to define components in detail and touch on more advanced features like mixins to create a simple blog app.

THE ADVANTAGES OF VUE.JS

The main selling point of Vue.js is how easy it is to learn, as it is written in plain HTML, CSS and JavaScript. The library is supported by a set of documentations (<https://vuejs.org/v2/guide/>) that is constantly updated. The size of the library is small compared to competitors. Moreover, its CLI 3.0 has been rewritten to be future-proof.

GET STARTED

To follow this tutorial, you just need an internet connection as all development is going to take place in CodeSandbox, a full-feature web code editor.

The link to the code can be found here: <https://codesandbox.io/s/w0912p4w2l>

Our app will include configuration files such as `package.json`, an `index.html` page that is the entry file of our app and an `src` folder that is the core of our application. The content of this folder is going to be explained throughout the tutorial.

COMPONENTS

Vue offers the ability to create components. These are custom elements used to encapsulate reusable code and can vary from a simple button to a full-featured page. A component consists of three main sections, `<template>`, `<script>` and `<style>`, which will be explored further on.

CREATING APP.VUE

We are going to start our app by creating an `App.vue` file that is our root. This component will enclose all our future components. The first component is going to be very simple, as it does not have any dynamic data but simply includes the three sections previously mentioned (template, script, style).

[View source files here!](#)

All the files you need for this tutorial can be found at <https://codesandbox.io/s/w0912p4w2l>

```
<template>
<div id="app">

</div>
</template>
<script>
export default {
  name: "App",
  components: {}
};
</script>
<style>
#app { //Normal css here }
</style>
```

ARTICLE.VUE

To create our blog application, we need articles. This involves creating a file called `article.vue` and storing it within a `components` folder. This component is going to be more complex, as it will include some basic Vue features that will enable it to be dynamic.

The first feature we are going to introduce is called a directive, the double curly braces, that will replace the title value with a dynamic property passed to the component. This is a specific token that is added within the HTML and used by the Vue library to modify the DOM to produce HTML.

```
<template>
<div class="article">

<h1>{{ title }}</h1>
<p>{{ value }}</p>
</div>
</template>
```

For the component to be dynamic, we need to be able to pass data to it. This can be achieved by declaring properties. A component also has access to its own private instance variable called `data`.

```
<script>
export default {
  props: {
    title: String,
    value: { type: String, required: true }
  },
  data() {
    return { likes: 0, showingSnippets: true };
  }
};
</script>
```

This component just needs some basic style to display properly.

To display our first article, we need to take three steps: include the file in `App.vue`, add it in the Vue instance and refer it as part of the template section:

```
<template>
<div id="app">

<articleContainer />
</div>
</template>
<script>
import ArticleContainer from "./components/Article";
export default {
  name: "App",
  components: { ArticleContainer } };
</script>
```

Unfortunately, running this code will produce an error, due to the fact we have not provided all properties that are set as required within the article component. To fix the issue we need to declare a `data` object and use a new directive called `v-bind` to pass the object to the article component.

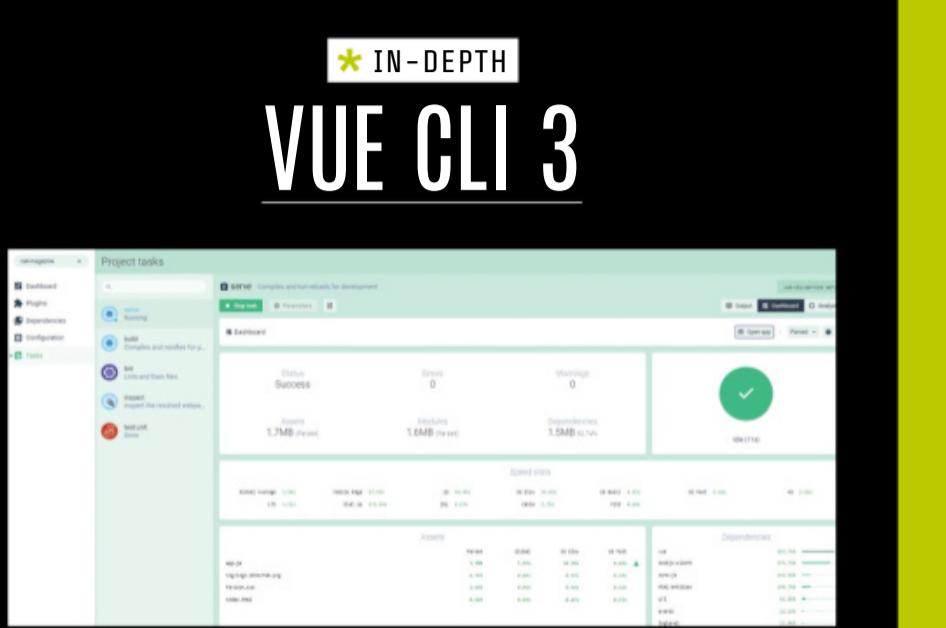
```
<template>
...
<ArticleContainer v-bind="post"/>...
</template>
<script>
...
name: "App",
data: function() {
  return { post: {
    title: "My first post",
    value: "Lorem ipsum dolor sit amet,...",
    img: ".//assets/logo.png" }
  };
},
...
</script>
```

COMPUTED PROPERTIES

To make our component more complex, we will introduce a new feature of the Vue API called `computed`. This is usually referred to as ‘computed properties’ as its value is converted into a real property. In order to show how computed properties work, we are going to enhance our component to support a snippets view and full article view.

```
<template>
<div class="article">

<h1>{{ title }}</h1>
<p v-if="showingSnippets">{{ snippets }}</p>
```



IN-DEPTH

VUE CLI 3

Part of Vue's growth in popularity has to be credited to the release of the new VUE CLI. This has been rewritten from the ground up, in order to fulfil the needs of the community and introduce great new features.

The main highlights are:

- The ability to add and remove plugins throughout the life cycle of the app.
- A simple-to-write plugin system that supports the creation of reusable features.
- An extensive list of available features: linting, unit test, end to end testing.
- An amazing new UI from which you can manage and monitor all your applications.

To get started with a CLI, you just need a latest version of node, a command line and a package manager (npm or Yarn).

To install the CLI globally, you're going to need to run the following command:

```
npm install -g @vue/cli
```

To create a new project, you just need to add the following line and answer a couple of questions. The CLI is going to provide you all the details you need to run your app and access your application.

```
vue create project-name
```

If you would like to create and run the project using the graphical user interface (extremely recommended), you then need to run the following command:

```
vue ui
```

A full set of documentation is available on the official Vue website: <https://cli.vuejs.org/>

```
> <p v-else>{{ value }}</p>
<button v-on:click="toggleArticle">{{ buttonText }}</button>
<button v-on:click="likes++">Likes: {{ likes }}</button>
</div>
</template>
<script>
export default {
  props: {
    title: String,
    value: { type: String, required: true },
    snippetsLength: { type: Number, required: false, default: 20 }
  },
  data() {
    return { likes: 0, showingSnippets: true };
  },
  computed: {
    snippets() {
      const fullArticle = this.value;
      const articleSnippets = fullArticle.substring(0, this.snippetsLength);
      return `${articleSnippets}...`;
    },
    buttonText() {
      return this.showingSnippets ? "Show full article" : "Show snippets";
    },
    methods: {
      toggleArticle() {
        this.showingSnippets = !this.showingSnippets;
      }
    }
  }
}
```

This example is providing a new directive `v-if` and `v-on`, which will automatically show or hide components, using a private variable called `showingSnippets`. The value of `snippets` is computed on the fly and will change if any of the properties it uses (`snippetsLength`, `fullArticle`) changes.

MAINCOMPONENT.VUE

The next step involves a new component that is going to be the body of our application, used to emulate an API call and introduce us to a new directive `v-for`. The Vue API provides access to a comprehensive list of hooks to load and trigger events at the right time (in our case mounted). These are out of the scope for this tutorial but details can be found here: <https://vuejs.org/v2/guide/instance.html#Lifecycle-Diagram>

```
<template>
<div id="MainContent">
<articleContainer v-for="(item, index) in Posts"
  :key="index" v-bind="item" />
```

```
</div>
</template>
<script>
import articleContainer from "./article.vue";
import FakePosts from "../data/posts.js";
export default {
  data: function() {
    return { Posts: [] };
  },
  methods: {
    fakeApiCall() {
      //here we are emulating the possibility to load the value
      //with an api
      this.Posts = FakePosts;
    },
    components: { articleContainer },
    mounted() {
      this.fakeApiCall();
    };
  }
}</script>
```

MIXINS

Another powerful feature of Vue.js is the mixins. These are reusable JS methods that expand the features of a specific component. Mixins have access to most of the Vue API (properties, data, methods). They are usually stored in a `mixins` folder, created within the SRC directory and, as mixins are purely JS, saved with a `.js` extension.

At first, the power of this feature may not be obvious. However, as you get familiar with Vue and its API, mixins will start to take shape and support your application. I have seen this feature used to define input validation, internationalisation and provide product functionality, such as file uploader.

The main difference between a normal component and a mixin is that the latter can be included and applied to any component. For example, you could add a file upload mixin to a button or an image and they will all have access to the new feature. We are going to build an accessibility mixin. This will provide a `toggleContrast` method that can be applied to any of our component.

```
export default {
  props: {
    lightTextColour: { type: String, default: "#252525" },
    lightBackgroundColour: { type: String, default: "#fff" },
    darkTextColour: { type: String, default: "#fff" },
    darkBackgroundColour: { type: String, default: "#252525" }
  },
  data() {
    return { isLight: true };
  },
  methods: {
```

```
  toggleHighContrast() {
    this.isLight = !this.isLight;
    if (this.isLight) {
      this.$el.style.backgroundColor = this.
        lightBackgroundColour;
      this.$el.style.color = this.lightTextColour;
    } else {
      this.$el.style.backgroundColor = this.
        darkBackgroundColour;
      this.$el.style.color = this.darkTextColour; }
  }
};
```

Now our code is defined, we can include it in any components and use its methods and properties as if they were defined in the actual component. Mixins could be properties driven, enabling them to offer it as soon as they are included in the component, or they may need some action to take effect (eg having to call a specific method).

To take full advantage of this feature, we need to make the following modification within our code:

```
<template>
<div class="article">
  ...
<button v-on:click="toggleHighContrast">Toggle High
  Contrast</button>
</div>
</template>

<script>
import Accessibility from "../mixins/Accessibility.js";
...
mixins: [Accessibility]
</script>
```

We can now toggle the contrast on the individual component using the new defined button. It is important to understand that even if no extra properties have been defined, our article component is actually able to accept `lightTextColour`, `darkTextColour`, `lightBackgroundColour` and `darkBackgroundColour`. These are defined within the accessibility mixin.

Our small prototype is now fully working and can be used as a reference for future projects.

CONCLUSION

Vue CLI and CodeSandbox enable you to create anything from a simple prototype to a full-size application. Also, its comprehensive documentation and vibrant community offers all you need to cover every aspect of your development life cycle. 

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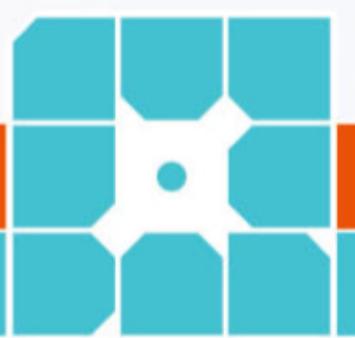


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