Speed and Agility: Using Modern Technologies to Rebuild Digital Experiences

TechCrunch **+** HumanMade

"We wanted our redesign to be ambitious, and it was critical for us to choose a development partner who could deliver it without compromising on our aspirations."

Nicole Wilke
Head of Product, TechCrunch

CONTENTS

01 PROJECT OVERVIEW

TechCrunch approached Human Made to capitalise on advancements with the WordPress REST API and build out a headless architecture on managed WordPress hosting.

TechCrunch

Founded in 2005, TechCrunch is the leader in online publishing in the tech and startup space. They are one of the most renowned publications in the technology and startup industry with an unparalleled insight into the nuances of Silicon Valley and its impact on the wider technology ecosystem. They are leaders in breaking technology news, averaging approximately 40 million monthly visits and amassing huge influence through their renowned TechCrunch Disrupt events.
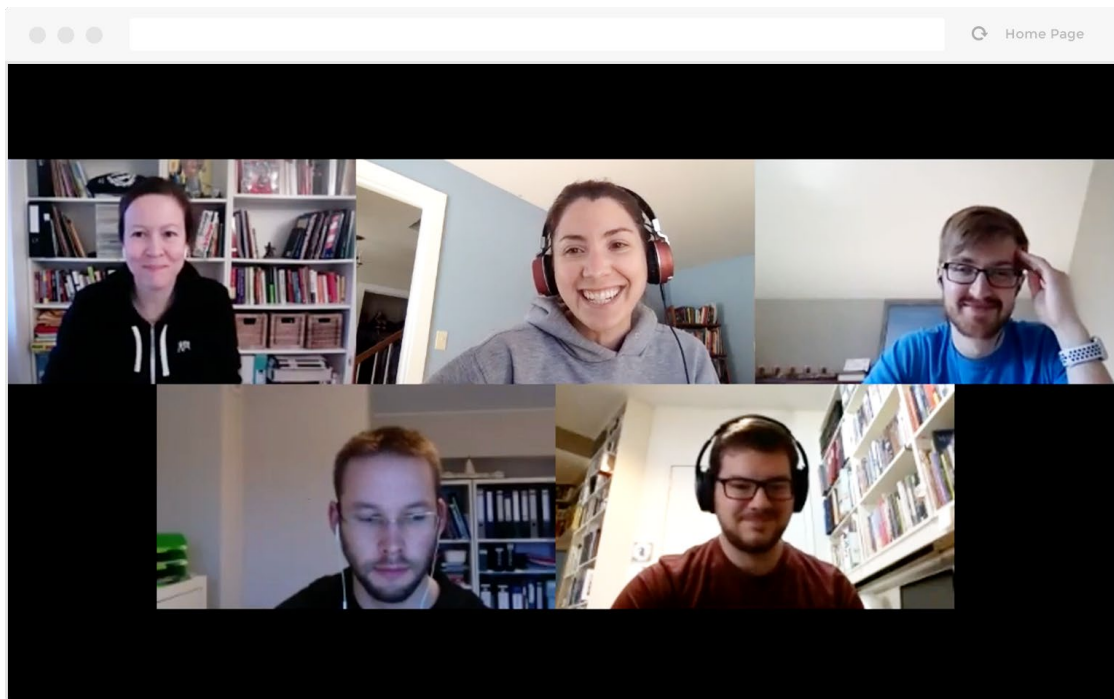
TechCrunch approached Human Made to collaborate on a redesign project and help them achieve their goals of a better performing, more streamlined CMS. Already familiar with the advantages of WordPress, Head of Product, Nicole Wilke, chose to accomplish this by capitalising on advancements with the WordPress REST API to build out a headless architecture on managed WordPress hosting.

Over the course of our engagement with TechCrunch, we approached this project with an architecture-first philosophy. We **refined the existing codebase to support a headless architecture, delivered a streamlined editorial experience, and collaborated with WordPress.com VIP** to create an environment that could be effectively hosted on VIP Go.

"

"We wanted our redesign to be ambitious, and it was critical for us to choose a development partner who could deliver it without compromising on our aspirations. Our design focused on fluid and interesting interactions over bold visual statements, heavily influenced by our decision to use the WP REST API with a JavaScript frontend. As such, it made sense to choose a partner that brought expertise in that realm, which Human Made certainly did."

— **Nicole Wilke**,
    Head of Product at TechCrunch

TECHCRUNCH PROJECT TEAM

- Fränk Klein
- Mike Selander
- Robert O'Rourke
- K. Adam White

- Joe Hoyle
- Ryan McCue
- Libby Barker
- Samuel Sidler

WHITE PAPER CONTRIBUTORS

Editorial: Nevena Tomovic, Libby Barker, Ana Silva
Design: Barbara Marcantonio

02 DECENTRALISED PUBLISHING: EMPOWERING EDITORIAL

The decentralised publishing model gives TechCrunch the flexibility to evolve and grow.

As leaders in the technology publishing industry, TechCrunch wanted to find a modern solution that would empower their editorial team, and give them more freedom and flexibility in their daily workflows.

To achieve this, one of our primary aims was to create a simplified editorial experience for non-technical teams, resulting in a publishing platform that could be used and enjoyed by TechCrunch's publishers. To build that successfully we created a decentralised publishing model, that both supports the editorial team and gives users the best possible online experience.

The decentralised publishing model implements a headless WordPress CMS and a React frontend, giving TechCrunch the ability to quickly evolve their design to meet new business needs, and keeping them at the forefront of publishing.

This is made possible because the frontend is not embedded as part of the CMS. An additional advantage to separating the frontend from the CMS is that editorial teams can become confident using one tool — in this case, WordPress — regardless of the changes that might occur with subsequent redesigns of the frontend. This not only enables editorial to feel empowered using their platform; it also prevents the necessary delays with onboarding people to a new system every time a change occurs.

Improving Page Performance & User Experience with a Single-Page React Application

A single-page React application creates exciting new ways of improving the user experience. TechCrunch wanted to leverage this, alongside the headless CMS approach, to create a user journey akin to a native app experience.

From the start of the project, TechCrunch established a desire to improve page performance and load times as a critical business need. This inspired us to load the application and stylesheets from WordPress, shortening the perceived and actual loading time of each page and improving user experience overall. We used the stylesheets from WordPress and delivered JSON encoded data from the server, enabling it to render on the frontend without needing to request this data repeatedly. We were also able to further extend the create React app tool with WordPress specific customisations. This allowed developers to create the scaffolding for developing a WordPress theme or plugin, leveraging React with a single command.

Optimising Frontend Data Management

Having improved the actual and perceived load time by working with the stylesheets from WordPress, the next challenge was to further leverage the flexibility of a decoupled frontend, and identify a strategy to optimise data management.

To do this we leaned on Redux, a centralised data repository. Redux stores all data used by the frontend app. React components subscribe to the store, and update automatically, keeping the store up-to-date with any modified data. Data updates are then transferred to the Redux store via requests from the WordPress REST API.

Using React on the frontend to display data required us to repeatedly write the same boilerplate code to retrieve data from WordPress. To introduce greater efficiency and ease of use, we were inspired to create Repress, a Redux Library for the WordPress REST API. This enables developers to retrieve data from the REST API, and add it to the store with just a few lines. Unlike many other React libraries for WordPress, Repress

can be added to an existing store, allowing progressive adoption; and can even be combined with other methods of retrieving data from the WordPress REST API. Repress not only facilitates the process of retrieving data from WordPress, it also introduces a higher order component to interface with React, making it easy to add data management to presentational React components.

The Repress Library is one of many Human Made React tools for WordPress. Read more about React tools we've built in this post by WordPress REST API co-lead, Ryan McCue.

Democratic Publishing: Headless CMS on Traditional WordPress Hosting

Whilst the frontend is taken over by React, the backend remains on WordPress; and one of our first technical challenges was making sure that we could implement a decoupled frontend on VIP Go hosting. VIP Go uses GitHub to manage deploys to the development and production environments.

The challenge here was ensuring that files in specific branches on GitHub wouldn't be overwritten in certain cases, and eliminating any manual work needed to resolve merge conflicts. To resolve this we created VIP Go Builder, which adds a build process that only has to deploy the master-build branch, and all merged changes are live on the production website. Our partnership and collaboration with WordPress.com VIP has allowed us to positively contribute towards VIP Go, and we are thrilled that WordPress.com VIP has adopted VIP Go Builder.

By introducing the single-page React app, enabling more efficient data management, and utilising WordPress for the backend, we created a decentralised publishing experience. This gives editors and writers autonomy over content, and enables each team to write, edit, and experiment with their CMS, without needing to burden the technical in-house team.

03 A NEW FRAMEWORK FOR USER ENGAGEMENT AND EXPERIENCE

Improving visibility and engagement with transformational digital storytelling.

Establishing a decentralised publishing infrastructure gave way to a whole new framework to improve user engagement and experience on TechCrunch.

Right from the beginning, the team at TechCrunch approached us with a specification for each feature, and together we built out tailored solutions.

For TechCrunch's website to best accommodate its users we needed to find a solution that allowed them to smoothly switch between articles on the homepage without losing their place on the site.
We were also eager to simplify the user experience for their popular events pages, enabling users to easily find information on various events. We approached this with a focus on transforming storytelling across video and text, and making stories more accessible and readable to their audiences.

Increasing Reader Engagement: Creating the Homepage River Experience

One of the most visited tech news outlets, TechCrunch publishes over 1,000 articles monthly. To improve the visibility of articles over time, TechCrunch proposed a homepage reading experience that would allow readers to immerse themselves in a "river" of content.
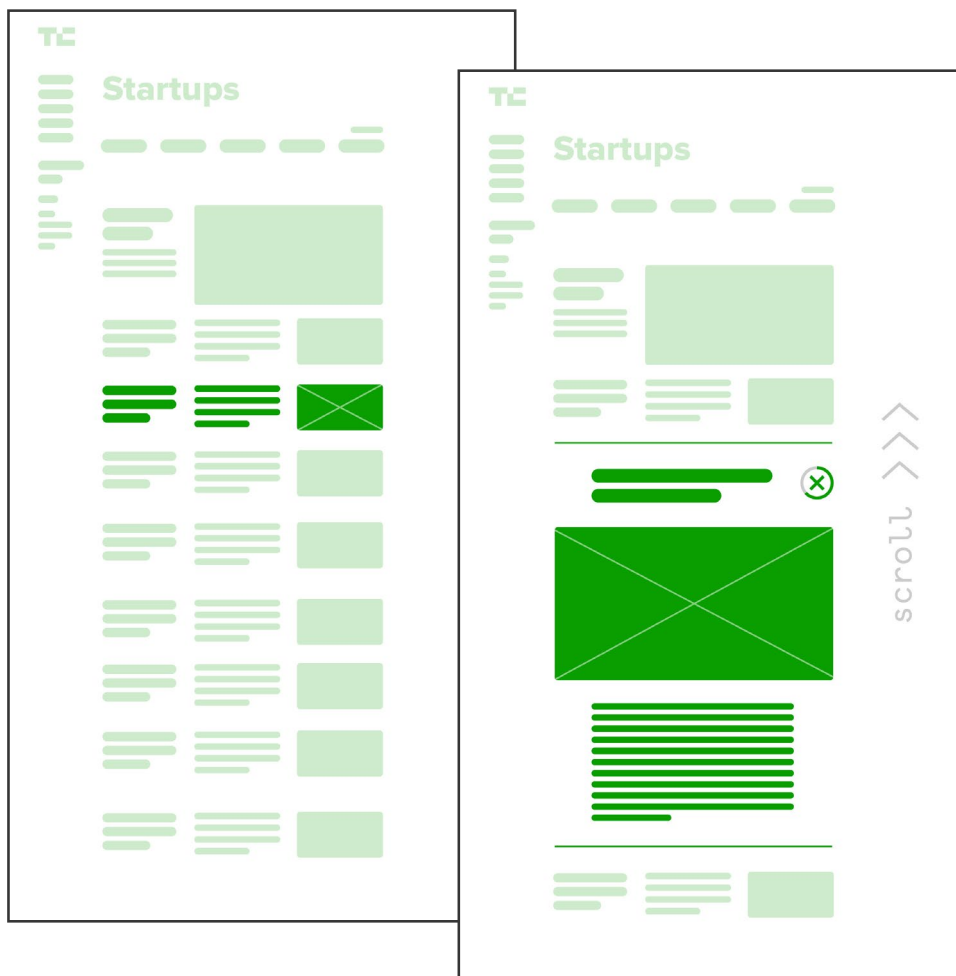
This is achieved in a series of steps:

1. A reader opens an article on the homepage
2. Once selected, the article expands inside the 'river' of content on the homepage

3. A progress indicator provides a wayfinding tool to demonstrate their progress on the article
4. Once a reader scrolls to the end of the article, the article snaps shut
5. Once closed, the reader instantly returns to the homepage river of content

This feature presented a technical challenge around how users could access an article shared on social media, and how TechCrunch tracked the data on each article using their analytics tools. To better track user behaviour and serve ads, we needed to track single article views.

"Our premise was that reading an article should feel enjoyable, and that it should be frictionless and fun to get more context surrounding whatever you're consuming, whenever you want it."
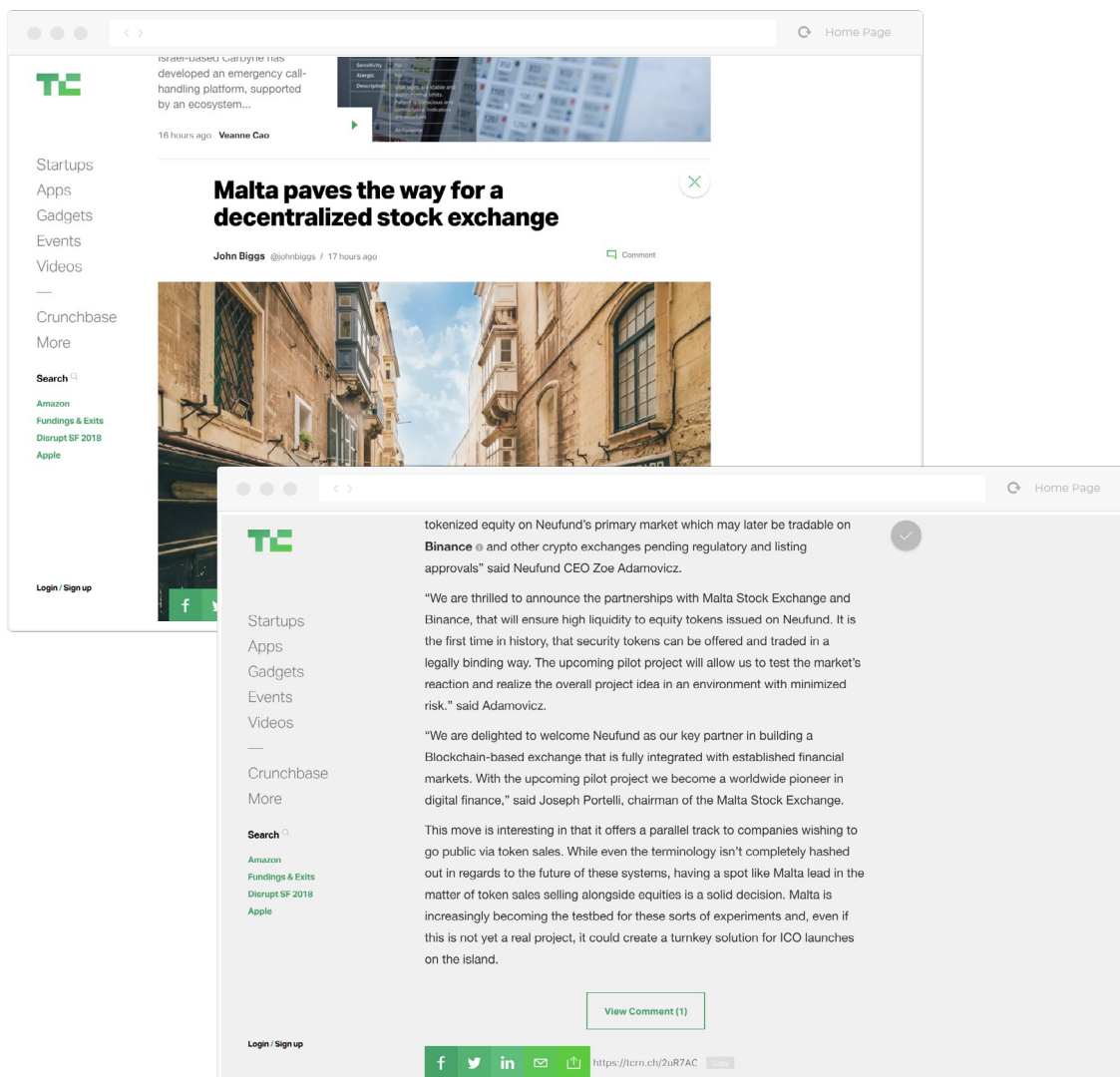
Nicole Wilke
Head of Product, TechCrunch

TechCrunch did not have a single article view, so we needed to make accommodations for ensuring data was available regardless of whether the reader had discovered an article on the homepage, or from an outside source. As advertising is fundamental to TechCrunch's business model, this was a critical feature in the project.

The homepage river feature not only enabled TechCrunch to bring visibility to more articles over a longer space of time, it also encourages better engagement on homepage articles as well as offering a more sophisticated experience for the reader moving between articles.

Below:
TechCrunch's river experience in action. *The indicator reflects the progress through an article and starts to fade to grey once completed. The article then snaps shut and is shown as 'read'.*

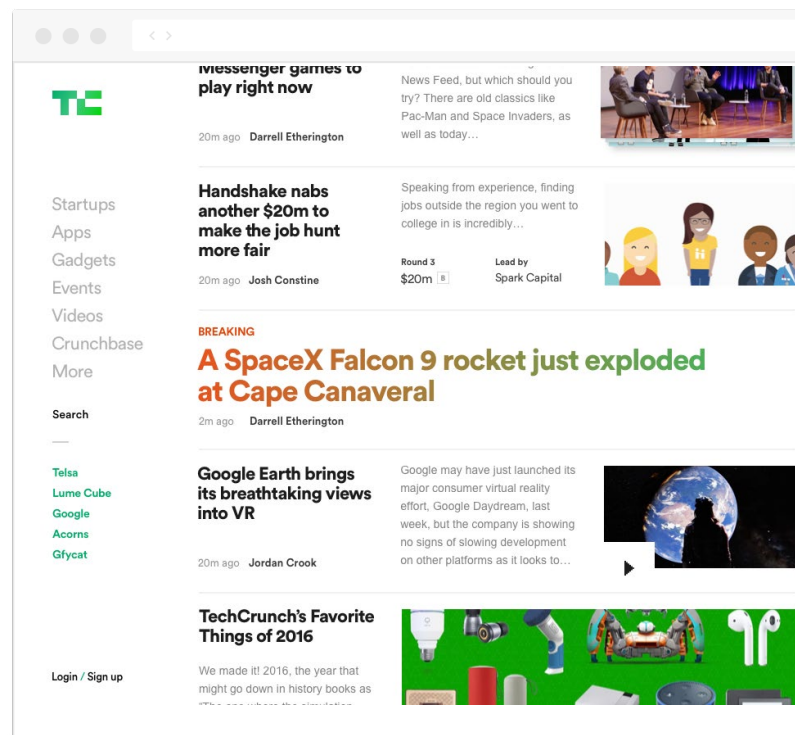# Transformative Storytelling: Breaking News & Developing Stories

Storytelling is what TechCrunch editors and journalists do best. With this redesign, we wanted to provide opportunities for them to optimise this experience via the CMS. That meant highlighting the latest news stories, and finding a way to group related stories easily.

When a story breaks, the TechCrunch editors need to draw attention to it regardless of where a reader is on the site. To do this, the breaking news story feature aims to capture the reader's attention by being easily visible and distinct from all other content on the website.

Using the bold design from Work & Co, we introduced functionality that could be easily applied to a story by the editorial team in the CMS. Once applied, this functionality generated not only a unique display for the story, but widgets that would appear across the site to draw readers' attention.

The first widget is displayed prominently at the top of the homepage river, which teases the reader in with the headline and summary text. If the reader is viewing an individual article outside of the river experience, a banner appears at the bottom of the article.

*Below: **A breaking story** is highlighted with text size and colour in order to stand out from the other articles on the homepage.*
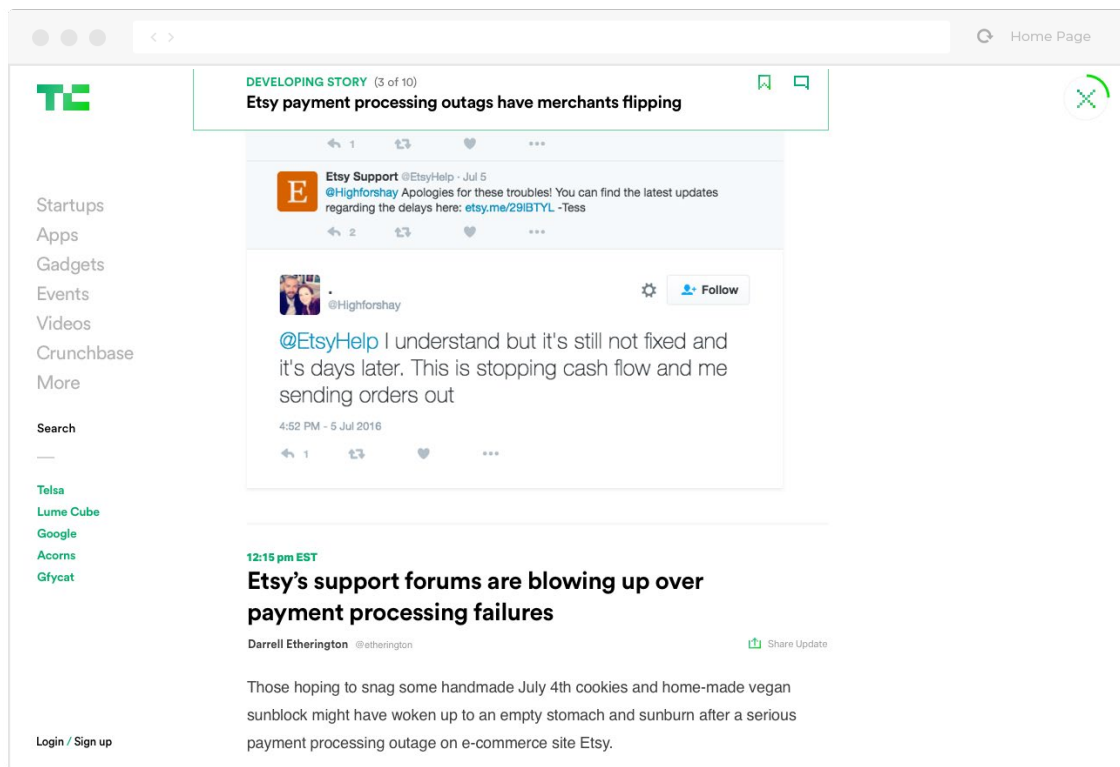

The second feature we focused on leveraged the CMS to allow TechCrunch's editorial team to break news stories in a flexible way. The developing story feature we delivered empowers editors to cluster related content as it emerges.

While each story can live independently, editors can assign their content to a group of related stories, either before or after publication.

On the homepage, this group of related stories is displayed as one entity. Below the headline of the group, each associated story is displayed along with publication time and teaser text. As new stories are added by editors, they are dynamically displayed in the river, capturing a developing story as it is happening. This ensures that readers are always viewing the most recent and up-to-date information on any news story at any given time.
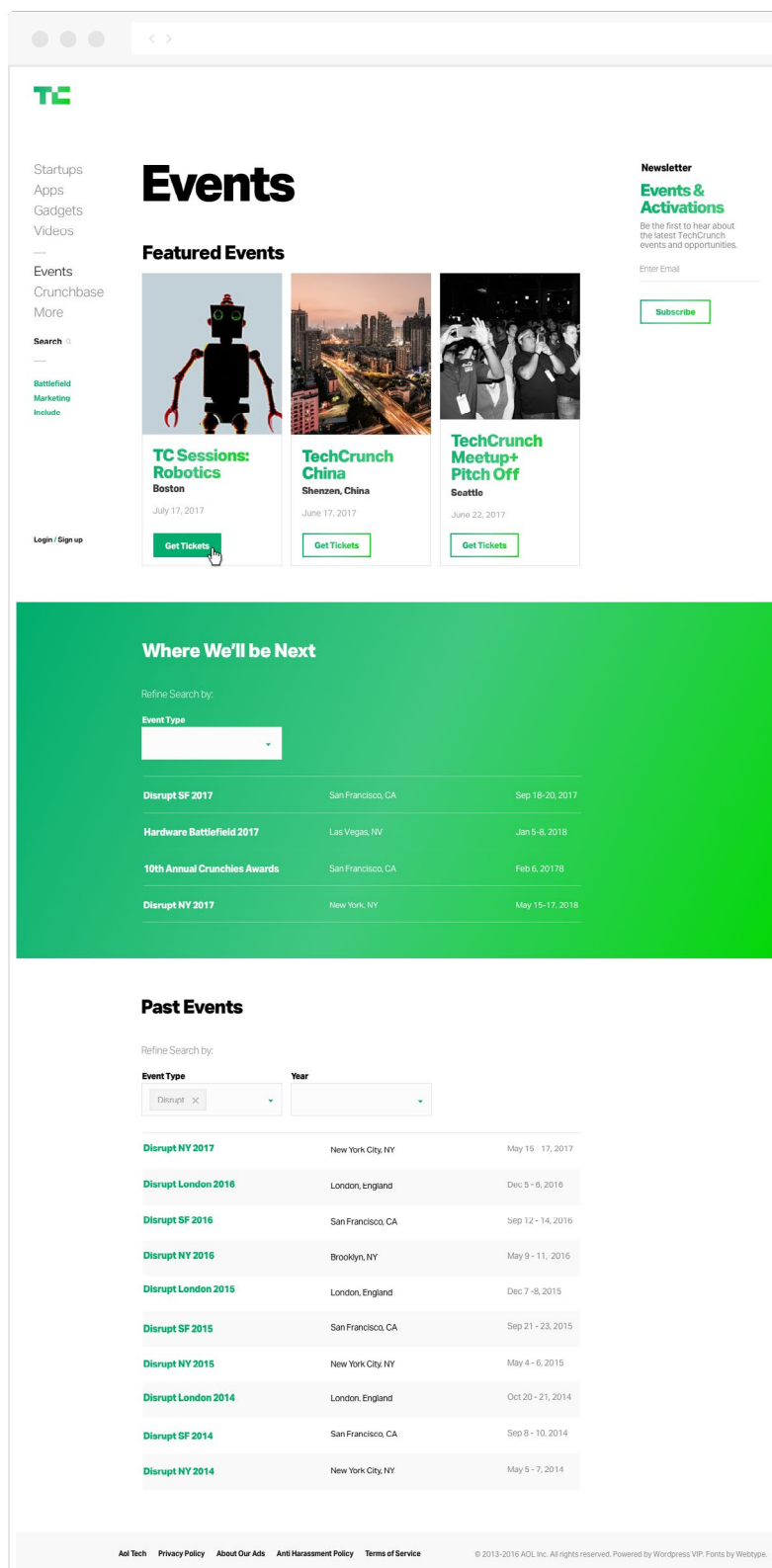

*Left: **A developing story***

Building Flexible Events Pages for TechCrunch Disrupt

TechCrunch's innovative events represent a critical component of their business model and, as such, required deep consideration with regard to content management and presentation.
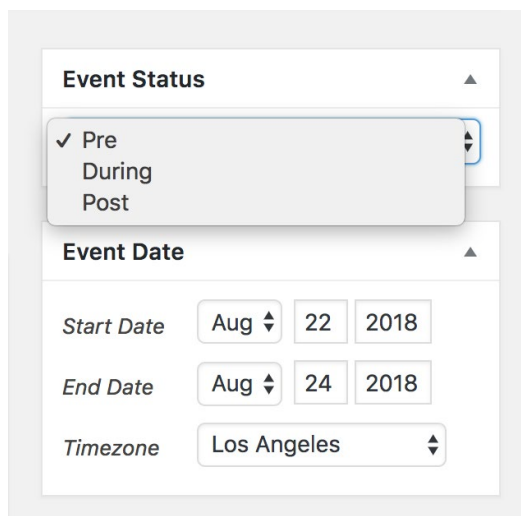
Events content varies significantly from event to event and is managed entirely by the TechCrunch events team. To allow for this level of editorial control, a page builder plugin was used to manage content on these pages. This presented two key challenges: the first was to ensure a streamlined process for managing content on these pages, which we achieved by creating a single page that could display multiple states (pre-event, during event, and post-event). The second was incorporating the flexibility of the page builder into the React app without compromising performance. Our team worked with TechCrunch to identify the underlying page builder architecture and the associated data requirements for each component. We then made best practice recommendations and modifications to this architecture to optimise it for use on the React app.

Above:
Events page

The end result is a thoughtfully architected product that allows for both editorial control and greater automation. TechCrunch's staff can modify an events page to display one of three states. Each of these has a unique design, and in two easy steps components such as the event livestream, video archive, and related articles are automatically populated by event-specific data.

We also incorporated functionality that supports the promotion of these events across the entire site. Using a checkbox, editors can easily select which events to promote over a set of widgets that are visible on the homepage, category pages, and on individual articles.

From the reader's perspective, this means having a single page that promotes the event, streams the live event, and becomes the central repository for all videos and articles related to the event once it's over.

04 PARTNERSHIP INTEGRATIONS FOR BUSINESS PRODUCTIVITY

Integrating the Crunchbase API with the React frontend.

Delivering a product that achieved behavioural parity with the existing site was a clear business requirement for TechCrunch.
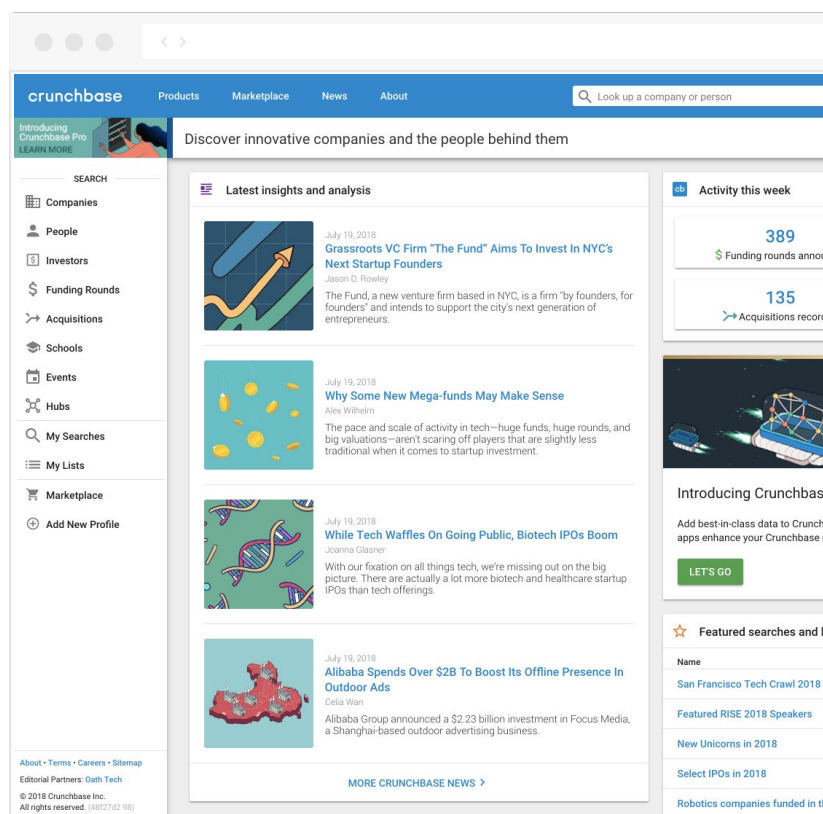
In order to accomplish this, we needed to incorporate certain integrations into our product that would sustain work being done with ads and analytics, and to support the partnership with Crunchbase.

Our team of engineers integrated the Crunchbase API with the React frontend to display detailed information on companies, investors, founders, and more, as hover cards within the articles.

Below:
Crunchbase,
TechCrunch's startup analysis tool.

Integrating Crunchbase's API with a React Frontend

Crunchbase is a startup analysis tool that helps readers discover innovative companies and the people behind them. It is a database of over 500,000 data points including startup information that stores funding news on startups, trending profiles, featured acquisitions, etc. TechCrunch incorporates this database into its articles as cross-promotional material for Crunchbase and to enhance the overall quality of the content.

05 A PUBLISHERS BREAD AND BUTTER: ADS AND ANALYTICS

Managing real time ad performance, and monitoring user analytics to grow engagement.

Ads and analytics are critical to the business model of any publication and we worked closely with the TechCrunch development and ads teams to ensure we were building a solution that would be effective from both technology and user experience perspectives.

In doing so, we faced a significant challenge in that React applications do not allow for the traditional page refreshes on which ads and analytics so often rely. We needed to devise a method to ensure that the required data was still available when tracking page views on a single-page reading experience.

Ads had to be loaded with custom tracking and targeting parameters, which depended on the context. It could be an article, a video, or a slideshow, to name just a few. For ads to be loaded onto a single page, we integrated them with the Redux library, to ensure

that the necessary configuration data was available before loading or refreshing an ad location.

Similarly, for analytics we turned to the Redux library to help us send custom parameters with page views. For analytics there were multiple trackers that needed to be implemented, so we created a single React router middleware to handle this, in turn making it easier to add custom third-party trackers — such as Google Analytics and Omniture — in a consistent way. The integration also handles support for tracking custom on-page events.

06 KNOWLEDGE TRANSFER: TECHNICAL COLLABORATION AND DOCUMENTATION

"Our developers had their hands in the project the whole time, which meant not only were we able to leverage our own internal resources to help get the project done, but that our developers were able to learn from Human Made's deep domain expertise along the way, making them well prepared to take the final product and run with it after we launched."
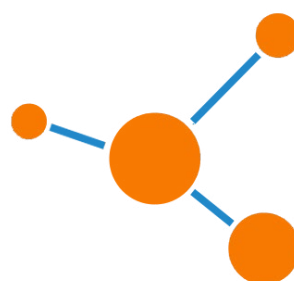
— **Nicole Wilke**
    Head of Product, TechCrunch

One of the most successful elements of this project was our long-term collaboration with the TechCrunch development team.

An important deliverable for us was to ensure that, upon launch, TechCrunch's developers would be well-positioned to maintain and build on the newly developed website. This work began with an onsite workshop that helped introduce the teams and create a joint understanding of goals and timeline. The integrated working relationship was sustained throughout the course of the project.

REST API

We were also able to make use of previous open source tools we'd built and make use of our extensive experience building solutions for publishers: one example is our use of the [Restplain plugin](#). As TechCrunch uses a modified WordPress REST API, it also uses customised and modified endpoints. Managing various endpoints that use different schemas can be challenging and time consuming.

In order to prevent developers from having to search methods for extracting a specific piece of data from the REST API, we built Restplain, which adds a new `/api-docs/` endpoint to the site. Under this URL you can view the different endpoints, as well as their schemas in an easy-to-read format.

RESOURCES & FURTHER READING

Left:
Libby Barker and Mike Selander *present 'Press, Publish, React' at WordCamp Europe 2018. Belgrade, Serbia.*

Watch: Our very own Libby Barker and Mike Selander present the project in, 'Press, Publish, React' at WordCamp Europe 2018.
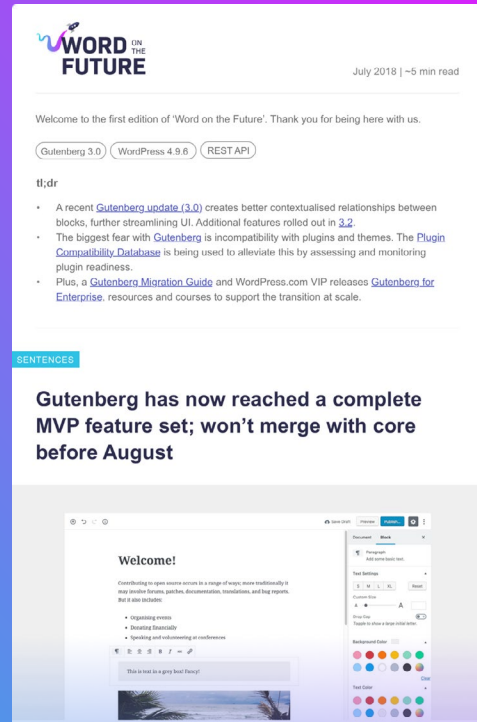
Read: In her own words, Nicole Wilke, Head of Product at TechCrunch announces the launch of the new TechCrunch and explains some of the thinking behind the final result.

Use: We've open sourced three React tools for WordPress. Find out why we've built them, how to use them, and why they're now free and open for anyone to use.

THE INDUSTRY NEWSLETTER FOR WORDPRESS

by *HumanMade*

Subscribe to get the latest

Word on the Future — The Inside Track on Enterprise WordPress

Stay informed about the future of digital experiences with our Enterprise Newsletter, 'Word on the Future'. Covering the inside track on Enterprise WordPress news with curated opinions and insights from those at the heart of the industry.

Subscribe at humanmade. com/newsletter to get:

✓ Curated opinions and insights on the latest WordPress news from some of the most respected professionals in the industry.

✓ Cut-to-the-chase stories you can consume in under 10 mins, direct to your inbox every month. Early access to white papers and documentation published by Human Made.

✓ Information to help you lead the future of your business, sourced from across the ecosystem with summaries highlighting news relevant to you.

Human Made

Human Made are a WordPress.com partner and one of the leading providers of large-scale, enterprise-ready, WordPress platforms and solutions. We're also some of the most active contributors to the WordPress project, and have been involved in developing the software since version 3.0. Our involvement in WordPress spans years of modifications and evolutions and we have seen dramatic changes to the way WordPress has been adopted across a range of industries and enterprises.

We're building powerful digital solutions for enterprise-clients and big publishers: delivering technically complex WordPress instances at scale and transforming the way people interact with some of the most popular websites in the world. We work with big names in publishing and in enterprise, including News UK, USA Today, PayPal, Fairfax Media, and Snopes.

Want to use the WordPress REST API in your project?

Contact Human Made for:

• **Enterprise-level Development**
• **Bespoke Training**
• **Strategy and Consultation**
• **Hosting**

Above:
The Human Made team *during a company retreat in Petritoli, Italy, in 2017.*

Talk to us about your next project.

We've been helping develop WordPress, and building some of the largest websites with it, since 2010. Get in touch with us to find out how we can help you build your future.

Ant Miller, Commercial Director
[ant@humanmade.com] [sales@humanmade.com]

DIRECTOR(S) OF CLIENT SERVICES:

/Americas

Sam Sidler
[samuel.sidler@humanmade.com]

/Europe, the Middle East, and Africa

John Bevan
[john.bevan@humanmade.com]

/Asia Pacific

Jon Ang
[jon.ang@humanmade.com]

Human Made