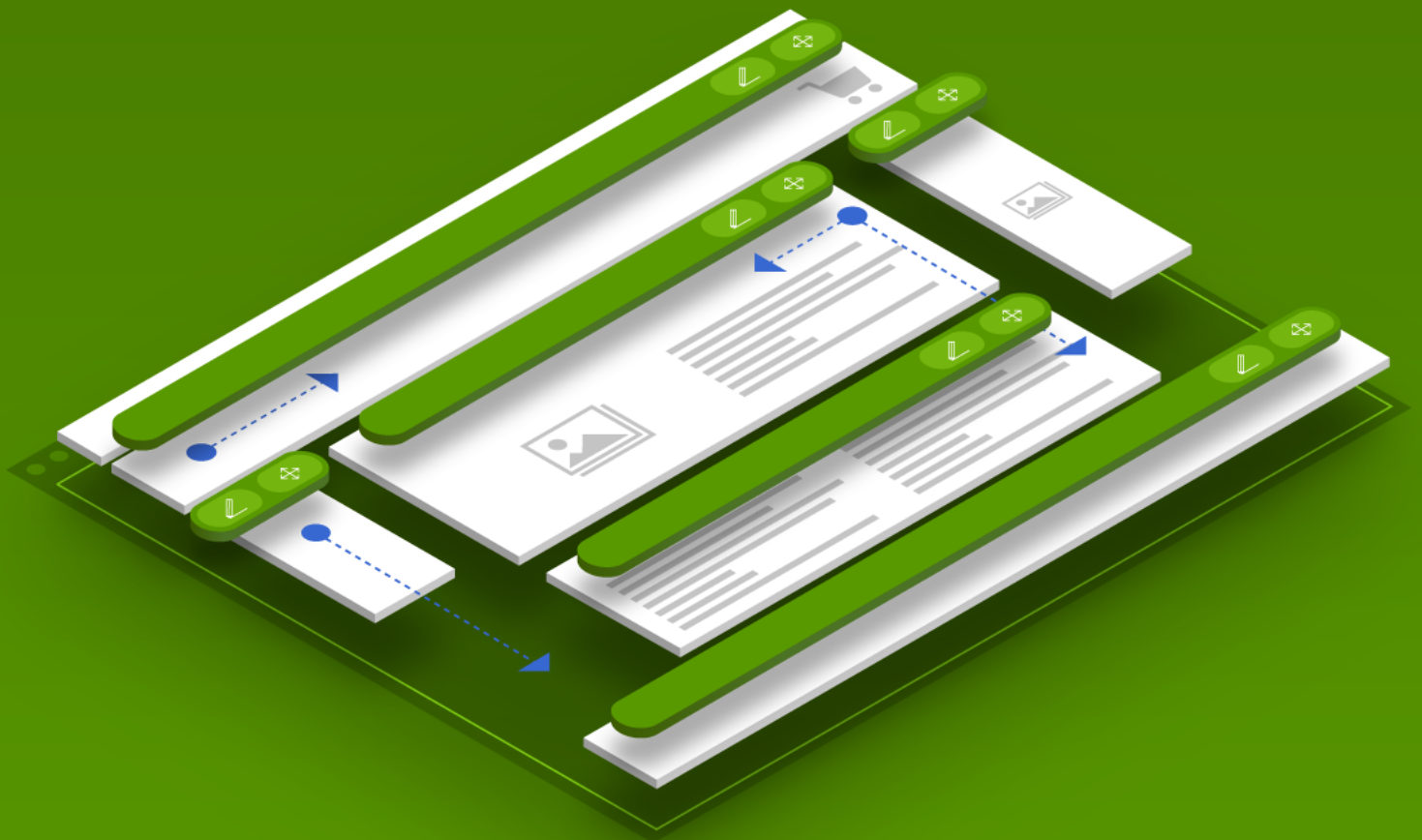


Single Page Applications:

The Go-to Guide for Marketers & Business Decision Makers



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A technical topic explained for non-technical users. Here's what a Single Page Application is, what it isn't, and how you can use them to enhance your customer experience.



Today, consumers expect more than just an omnichannel experience.

Cutting-edge applications and websites from the likes of Netflix and LinkedIn have shaped the expectations of consumers, end-users, and even employees. For brands operating in either the B2C or B2B landscape, that means your digital experience needs to match those expectations—or else, your digital experience runs the risk of being cast aside as slow, clunky, and dated.

Brands attempt to build new experiences on new channels using headless technology only to find that their marketers are more restricted than ever before.

But don't just take our word for it.

According to Jason Spero, Vice President, Performance Media at Google, [57% of customers](#) won't recommend a business with a poorly designed website. Google also released guidelines [specifying that](#) the recommended page load time on either web or mobile should be under 3 seconds.

In other words, strong design and speed both matter.

The broad adoption of headless content management systems has certainly helped bridge the gap between digital leaders and those striving to keep up. By going headless, companies have been able to speed up time to market, slash content delivery speeds, and build lightweight frontends and static websites. But as many brands are starting to realize, none of that is enough to truly compete.

Typically, brands attempt to build new experiences on new channels using basic headless technology only to find that their marketers are more restricted than ever before, and their developers—despite having more technical freedom—now have to babysit the marketing team with ongoing maintenance. A classic example of this is when a company makes the decision to launch a Single Page Application (SPA).

Single Page Applications: The Marketer-friendly Explanation

A [single page application](#) is a web-based app that pre-loads within the end-users web browser.

Because the entire application loads preemptively, there's no need to constantly reload the page, or any page elements, when the end-user interacts with it. Clicking a button to open up a list of comments under a video, for instance, becomes much faster and smoother. Similarly, scrolling down the page to reveal more information can be done more seamlessly.

LinkedIn is a popular example of a single page application in action.

Go ahead and load LinkedIn in your browser, and pay attention to how the newsfeed in particular works. Clicking like buttons, leaving comments, and scrolling down the page all happens almost instantaneously. That's the power of a well-designed, pre-loaded, single page application.

SPAs can be built with industry-leading frameworks such as React, Angular, and Vue. For the backend, companies typically use a [headless CMS](#), making their SPA part of their existing line of customer experience channels.



What Marketers Need to Know About SPAs

Industry-leading brands may be rolling out single page applications, but does that mean companies with smaller budgets should prioritize this particular digital experience? Here's what marketers and business stakeholders need to know.

Single Page Application Benefits

- 1. A Faster User Experience:** As we've already mentioned, speed matters—and outside of perhaps a static site, which we will discuss later, it doesn't get much faster than an SPA. That's because the application itself is pre-loaded in totality once the user opens the application.
- 2. Fewer Server Resources:** The SPA loads within the browser one time. When a user makes a request by clicking a button, for instance, the server returns the data requested in a format like JSON, rather than the entire page's HTML markup each time. That means fewer server resources are needed, opening up new ways for your company to spend its budget.
- 3. Easier for IT to Fix, Modify, and Update:** Want to give your website or application a facelift? Or, have you noticed an error? Single page applications are inherently easier to fix because developers don't need to read through thousands of lines of server-side code. Instead, developers can debug SPAs by examining the JavaScript code rendered in the browser.
- 4. Easier to Launch New Web & Mobile Experiences Again and Again:** Want to launch a batch of applications? Or, are you looking to release new websites or apps in line with upcoming events? SPAs are easy to replicate, even in different forms, as developers can use much of the same code to transition from an SPA to a mobile app.

Do You Need a Single Page Application?

Single page applications are best for highly dynamic web experiences. In other words, an experience where you want the end-user to click, comment, engage and interact with the application.

Here's when an SPA makes sense:

- You want to launch a social network, online community, intranet, collaboration environment, or something with many moving parts and lots of dynamic content.
- You'll have lots of different content to display, which will change daily, weekly, or monthly—or dynamically as the user engages with the application.
- You want to provide an app-like experience with lots of buttons to click and content to display, and you want it all to happen quickly and seamlessly.

And here's when an SPA doesn't fit the bill:

- You want to launch a blog, brochure, or a website with content that rarely changes.
- You need to SEO your website or application: SPAs are Javascript-based, and therefore not very search engine-friendly by default, although it is not impossible to optimize an SPA for search engines using frameworks such as Next.js and Nuxt.js.
- Your website or application is for informational purposes: If you're only planning to use your SPA to convey information, like restaurant menus or holiday destination imagery, a static site may be more suitable.

Single Page Apps (SPAs) & Progressive Web Apps (PWAs)

A PWA can be a type of Single Page Application, although it doesn't have to be. Companies often use the same technologies (frontend Javascript and a headless CMS) to build Progressive Web Applications, abbreviated as PWAs. A PWA aims to mimic native mobile application functionalities like push notifications and offline availability, in the browser.

PWAs use something called service workers to load information even faster than SPAs, mimicking a mobile application even more closely.

For an application to be considered a PWA, [Google has laid out](#) some basic requirements:

- Start fast, remain fast
- Works in any browser
- Provides a custom offline page (or better yet, an offline experience)
- Is installable (like a good old native mobile app)
- Can be discovered through search

Single Page Applications & Accelerated Mobile Pages (AMPs)

Mixing up SPA and Accelerated Mobile Pages (AMPs) is another common mistake.

Introduced to the world by Google, an AMP is an open source HTML framework designed to load static content as quickly as possible on mobile devices. All non-vital JavaScript and CSS is stripped away, and images are loaded on the page only when they are about to become visible to the user. With a focus on quick-loading content, AMPs are ideal for static websites and pages like news articles, emails, and ads.

Unlike SPAs, AMPs are not ideal for dynamic content applications or interactive experiences.

Is a Single Page Application a One-pager?

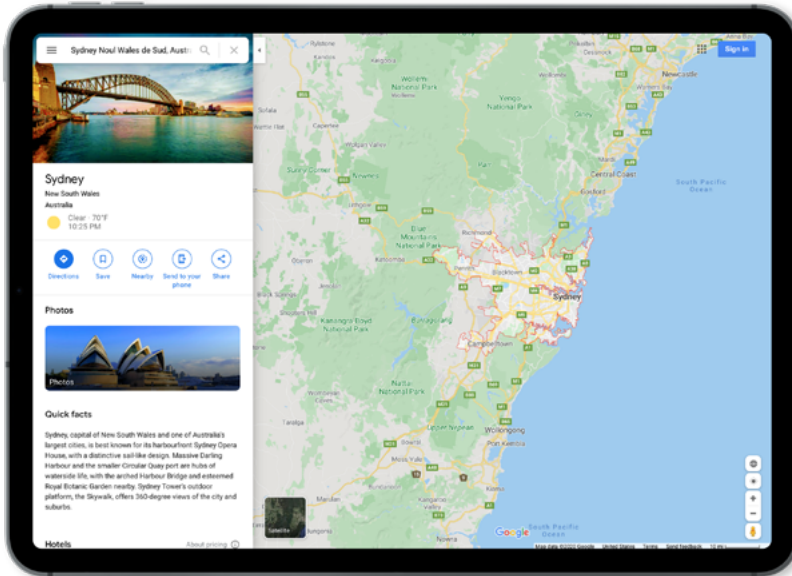
Don't confuse SPAs with one-pager style websites and apps. While there is an overlap between the two (i.e, you can have a one-pager style SPA), it's also very possible to have multiple pages on a single page application.

Routing between pages in a SPA is simulated through something called client-side routing. The different pages are once again pre-loaded with the initial load, and are thus much faster to appear when a user requests it. Often, developers use much of the same code across different pages, making transitions even smoother.



Single Page Applications in Action

To understand the type of functionality an SPA can give your brand, along with speed, let's take a look at two single page application examples.



Google Maps

Head over to maps.google.com, and you'll find yourself clicking around towns, cities, and their coffee shops, at high speeds. You can click through locations, reviews, addresses, and much more without the entire page having to reload or direct you somewhere else. It all loads in the same page, giving you a seamless experience.



Twitter

Twitter is another prime example. When you log into twitter from your web browser, you'll be served an app-like experience where you can interact and click multiple buttons, open new tabs, leave comments, and like Tweets without reloading anything. You can also scroll down the news feed or an account's home feed continuously without reloading the entire page.

Managing and Optimizing Content For SPAs (and Beyond)

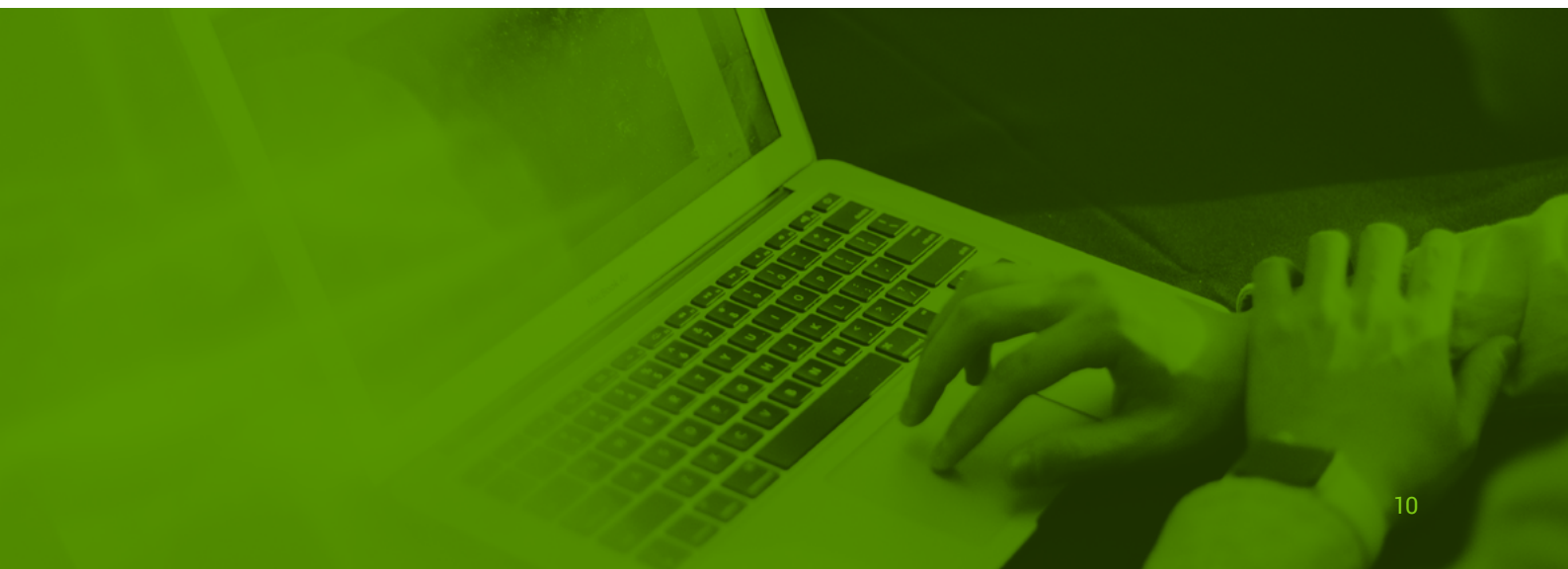
Single page applications are trending across industries. However, frontend technology and consumer preferences evolve quickly. SPAs are in today, but they may be outdated by 2030.

So, what's the solution?

Channels, devices, and front-end technologies come and go—but it's a brand's content that will always need to be preserved and distributed as far and as wide as possible.

Marketers and stakeholders need to keep one thing in mind: channels, devices, and frontend technologies come and go—but it's a brand's content that will always need to be preserved and distributed as far and as wide as possible. And that's something that will remain constant throughout the technological fluctuations we've all come to know and love.

Hence, investing in a headless CMS continues to be the safest bet against the changing digital landscape, whether you're preparing for an SPA launch this year, or whatever comes our way by next year.



SPAs and Content Editing

The Challenge SPAs may be an excellent customer experience boost, but, as previously mentioned, many brands are sacrificing the agility of their marketers when they launch SPAs—particularly when using basic headless content management systems.

Content editing in particular in this environment is difficult, as content authors can't freely choose or edit page layouts easily, nor can they preview the content they're writing

The Solution With a hybrid headless CMS, developers retain their freedom of framework choice, while marketers get their familiar tools back, enabling them to preview content in context, drag-and-drop page elements, duplicate content or pages easily, and so forth.

SPAs and SEO

The Challenge SPAs are not inherently friendly to search engines. This is firstly due to being Javascript-based, which is difficult for search engines to crawl by default. Plus, SPAs don't have individual URLs for different areas or pages of the application.

The Solution Search engine optimizing a single page application can be done, it just needs a little more elbow grease. Here are some best SPA SEO practices.

- **Server Side Rendering:** With server side rendering, your SEO woes will be over even before they begin, as this enables Google to index and recognize pages within your SPA. Angular-based apps can leverage Angular Universal, Angular's native rendering service. React-based SPAs are also SEO friendly, as they can utilize 'render to string', allowing them to return HTML strings directly on the server.
- **SEO-friendly URLs:** Just like with a normal website, you'll want to give each page within your SPA a unique, easy-to-read URL slug.
- **Meta Data:** The following pieces of meta data should be rendered directly within the source code of the page; Page title, meta description, canonical tag, meta robots, and hreflang tags.

- **Internal Linking:** Your SPA's internal links should be embedded utilising link <a> tags as opposed to JavaScript onclick events. This helps enable search engine crawling.
- **XMLSitemaps:** to ensure search engines can gain access to your deeper, more obscure SPA pages, ensure that you publish an XML sitemap.
- **Error Pages:** Finally, don't neglect your error pages, all of which should return correct page header statuses in response to errors. So, a 404 header status should be returned if a user attempts to access a missing page, whereas a 500 status should be returned for a server error.

SPAs and Personalization

The Challenge A well-personalized digital experience shouldn't feel as if it's being laid over the top of a generic one. It should feel natural, as if the entire experience was hand-crafted for the consumer.

In other words, simply displaying your customer's name and location throughout the website or app is insufficient. You also need to display relevant content and respond to their actions with tailored messaging and options. This is difficult to do on a normal website, but even harder when it comes to SPAs, for the same reason SEO is difficult, but namely, because you cannot tailor the experience to the user's browser history, as SPAs have fewer pages that don't reload and serve new URLs.

The Solution With a contemporary CMS, you'll be able to personalize pages, as well as the components within those pages, depending on a visitor's browsing history. As mentioned, however, determining an SPA user's browsing history can be complex. One way around this, is to use URL fragments, which are small additions to the URL in the browser, whenever the user opens a new page, reads a blog post, or views a product, for instance.

These fragments are recognizable by modern CMS and personalization engines, allowing them to correctly personalize the customer experience based on browsing history.

The Magnolia Experience: Introducing the Visual SPA Editor

A number of enterprise companies have used Magnolia to build SPAs, and their initial experiences have shaped the way Magnolia CMS approaches SPA development. Here's everything you need to know about Magnolia's marketer-friendly Visual SPA Editor.

Why Content Authors Struggle with SPAs

Companies are increasingly adopting a headless approach to content management, and that means marketers are having to deal with purely headless CMSs, a tool that was never really designed with non-technical users in mind.

Now content authors can edit SPAs with a live preview directly in a page editor.

When it comes to launching and maintaining a single page application, content authors can only enter their content in forms. They don't get a visual page editor, nor do they get to preview their content as the end-user would see it. Ironically, with a basic headless CMS, a marketer's editing experience is worse than it was with a traditional, legacy CMS like WordPress.

Marketers and other authors cannot bring great content to the table in these environments. Their creative freedom has been taken away, and they're at the mercy of IT like never before. After all, developers need to be called in to make any structural or page changes, as marketers don't have the tools to handle it alone.

The end result is a worse customer experience and a terrible employee experience.

The Solution: Magnolia's Visual SPA Editor

To address those problems, there is a trend to empower authors with visual page editing in a headless context. This is often referred to as 'Hybrid Headless'.

With Magnolia CMS specifically, this hybrid experience has been extended to single page application development, giving editors:

- Familiar WYSIWYG editing powers
- Content previews
- Drag-and-Drop page component placement
- Copy and paste page components
- Codeless page layout editing
- Supports managing nested components
- Supports managing a tree of pages
- Meanwhile, developers can use any existing React component without modification.

The image shows a screenshot of the Magnolia Visual SPA Editor interface. The main workspace displays a page layout for 'ABOUT MAGNOLIA TRAVELS'. The layout includes a header section with the title and a paragraph, followed by a 'Columns' section with a large image and a 'Text and image' component. A 'Component' sidebar on the right lists various actions like 'Preview page', 'Delete component', 'Edit component', 'Duplicate component', 'Change template', 'Move component', 'Cancel move', 'Copy component', and 'Paste component(s)'. The interface also features a top navigation bar with 'Pages' and 'About' tabs, a search bar, and a bottom status bar with 'English' and 'Published' indicators. Several green callout boxes with lines pointing to specific features are overlaid on the interface:

- Visual editing - authors work in context**: Points to the main workspace area.
- Creative control - choose the components you want, place them where you need**: Points to the 'Columns' section.
- Drag and drop components**: Points to the 'Component' sidebar.
- Copy and paste components**: Points to the 'Copy component' and 'Paste component(s)' options in the sidebar.
- See the interface in your own language**: Points to the 'English' dropdown in the bottom status bar.
- Preview the experience as end users see it**: Points to the 'Preview in live' button in the bottom status bar.

With the Visual SPA Editor from Magnolia, companies can combine all the benefits of basic headless with the content authoring powers that marketers already know and love. This frees developers from having to support marketers at every turn, and gives marketers the tools to create excellent content.

Basic headless is Pure Chaos

Magnolia sees content authoring features as an essential part of the employee and customer experience. This SPA-based hybrid headless approach has resonated with Magnolia clients in ways that a basic headless environment couldn't.

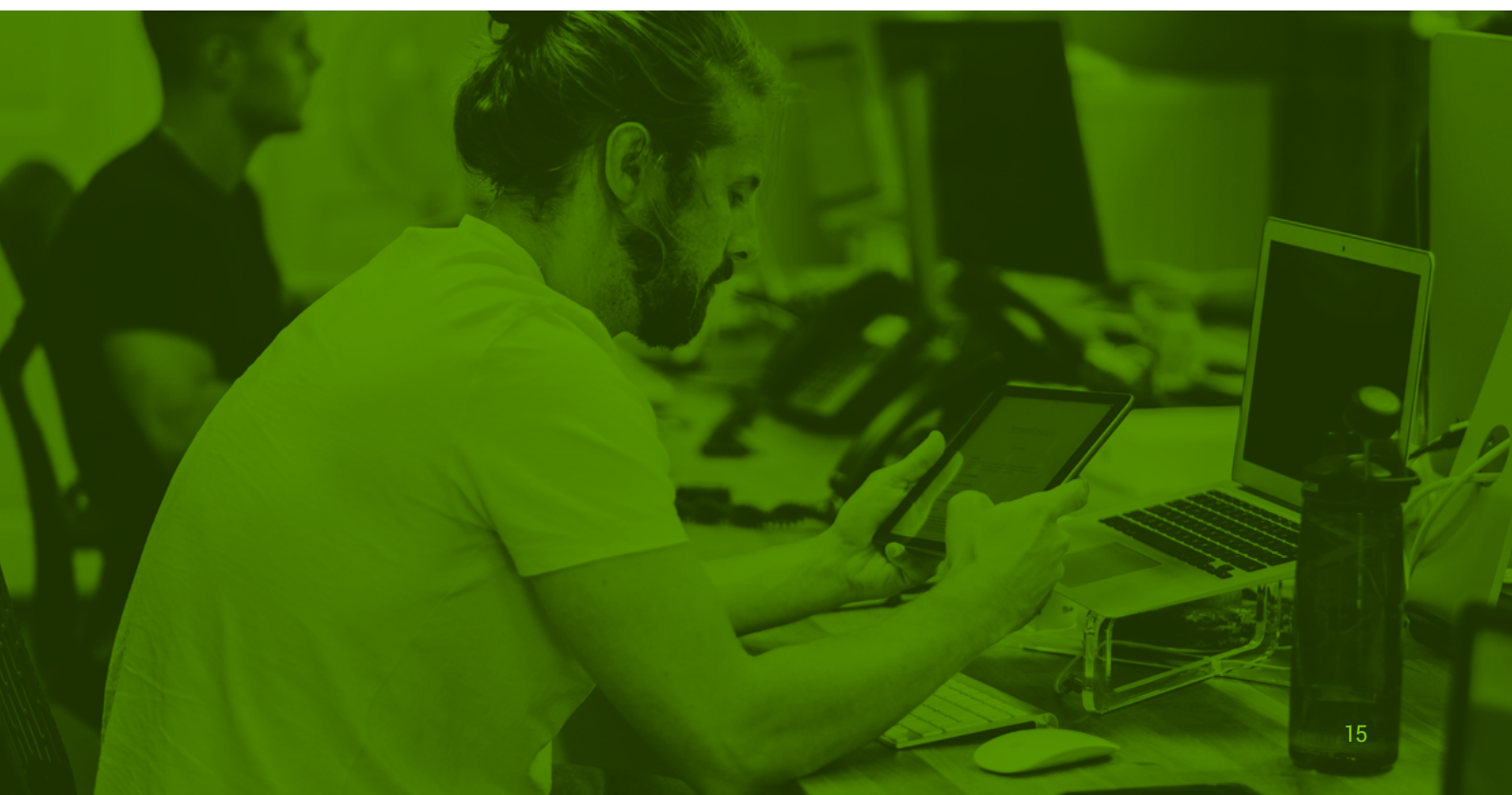
With a basic headless CMS, marketers were shackled and disconnected from the end-user experience. As a result, adoption across companies and departments suffered.

Furthermore, when the marketing team inevitably needs changes to the experience, because they cannot make changes themselves, development needs to start all over again, with new backend forms and templates. It's a slow turnaround, error-prone, and costly.

With the SPA Editor approach, the templates and components are flexible and dynamic. There is nothing further to develop. The marketing team can make the changes that they need, right when they want them.

The bottom line is, you can't impose a developer toolkit on non-technical users — it simply doesn't work.

With hybrid headless, Magnolia has bridged the frontend-backend divide. And perhaps more importantly, it has torn down the wall between marketers and end-users.



The Benefits of Magnolia's Visual SPA Editor

Need to convince your stakeholders of the hybrid headless approach? Here's what your company and your customers stand to gain.

For Business

- **Frontend Framework Agnostic:** Total freedom for developers to choose the cheapest, fastest tools and frameworks for every project. This makes maintenance easier, and reduces vendor lock-in.
- **All the Benefits of Headless:** Serve and replicate content across channels and devices, fast.
- **Lower Costs:** Empowering marketers with codeless environments reduces ongoing support, development, and maintenance costs.
- **Iterate Faster:** Nothing holds marketers back from launching new campaigns and reacting to the latest trends on Twitter.

For Marketers

- **Creative Freedom:** Regain creative control by choosing page components and layouts, and enter content where you want it. No more soulless form filling.
- **Live Content Previews:** Know exactly how the experience will look and feel, including videos, accordions and other interactive elements.
- **Free from IT:** No need to call IT every time you want to launch a new campaign or change a page's design.

For Developers

- **Technology Freedom:** Choose the technologies and frameworks (React, Angular, Vue) you love working with.
- **Retain Staff:** Use popular, easy-to-use technologies to retain talent for longer.
- **Develop Faster:** Designers and developers share one set of templates.
- **Develop Once:** By making the SPA editable, software development is only needed for the initial setup and bigger changes, not for every layout change.
- **Innovation:** You no longer have to babysit the marketing team. Now, your team has time to innovate.

“The Next Big Thing in Digital Experience”

Single page applications work in favour of everybody involved in the modern digital experience. Business leaders, marketers, developers, and of course, end users, all benefit from an SPA experience.

Here at Magnolia, we knew SPAs would change the course of digital experience history when customers came to us with speedy, lightweight, Magnolia-powered Single Page Applications.

“Customers and partners kept contacting us to show off their innovation projects where they drove their headless SPA with the Magnolia Page Editor. Once I could wrap my head around what they were actually doing, and the real problems it solved for people, I realized this was going to be the next big thing in digital experience.”

— Christopher Zimmermann, Product Manager at Magnolia.

While our industry-leading customers continue to innovate, our focus has been on streamlining the process of innovation with our visual SPA editor in particular, which enables developers to retain their technological freedom—while empowering marketers with the tools they know and love.

To learn more about Magnolia’s Visual SPA Editor and how it empowers both marketers and developers, request your [demo](#) now.



Magnolia is a leading digital experience software company. We help brands outsmart their competition through better customer experiences and faster DX projects. Get full headless flexibility and seamless workflows across best-of-breed digital experience stacks. Global leaders such as New York Times, JetBlue, Avis and Atlassian all rely on Magnolia for maximum reliability, high speed project implementation and exceptional omnichannel experiences.

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