



WHITEPAPER

Adobe Experience Manager for Fueling Experiences—Everywhere.

Executive Summary

As customer behavior continues to evolve, brands and marketers must drive brand engagement or face irrelevance. The need to engage with the omnichannel customer, build custom interfaces, deliver experiences for connected devices, adopt new interaction modes, and deploy new developer technologies is raising a debate over whether investments in content management systems (CMS) will pay off.

Adobe Experience Manager serves as a hybrid headless CMS, with the option to build front-end presentation within the tool. It gives marketers the ability to manage and optimize content for their core channels like web and mobile without any external dependencies and enables IT and developer teams to access and reuse the content for emerging channels and custom interfaces.

Marketers have to balance the ability to efficiently author, manage, personalize, and measure experiences with the desire to create extremely customized experiences that could require high-cost technical resources to manage and measure the experience. For such scenarios, we at Adobe recommend a hybrid approach that can quickly create great experiences, is easy to manage, is context optimized, is scalable as the business grows, and allows content reuse for highly customized experiences at a lower cost. Experience Manager allows business users and IT developers to author channel-optimized contextual experiences along with a headless content repository for any end point.

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Challenge: Explosion of channels and expectations.

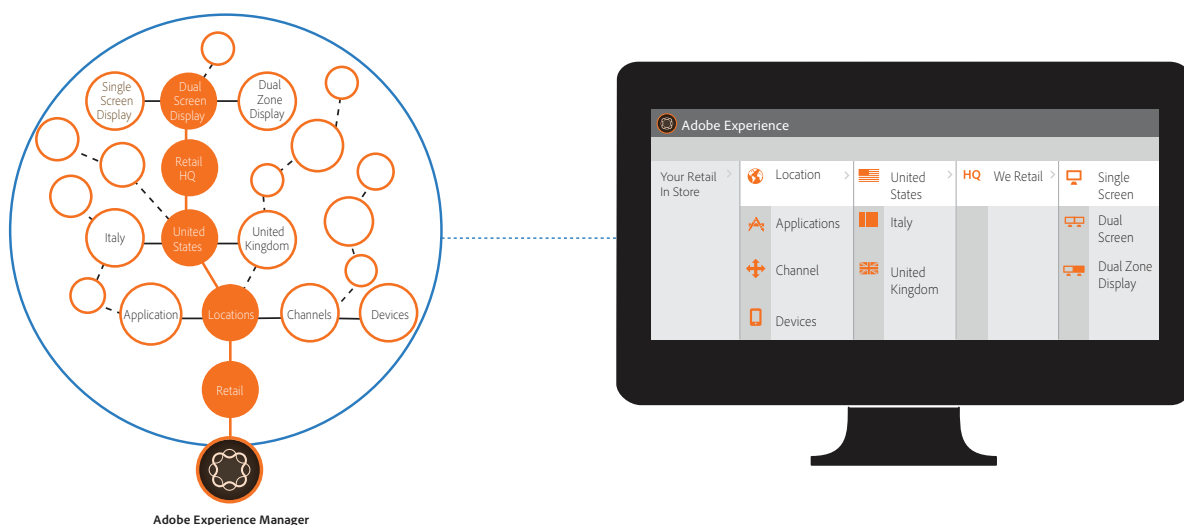
According to Gartner, 14.2 billion connected things were expected to be in use in 2020, and Gartner forecasts that the total will reach 25 billion by 2021.¹ Every day, 5.5 million new smart things are getting connected. With this explosion in connected devices, marketers are tasked to adopt new technologies, manage multiple CMSs, and deliver in a new medium to stay connected with their customers. The omnichannel customer demands a connected experience, and more than ever before, the consumer expects a great brand experience on every device and channel.

Furthermore, with the influx of new developer-friendly technologies (like JavaScript frameworks), IT teams can create more customized front ends that use content decoupled from its presentation layer. This means that developers control experience authoring and composition by reusing core content for their front-end experiments. This process demands that a CMS be able to power multiple channels and experiences. It requires either a decoupled or a “headless” CMS—content separated from the presentation logic.

Finally, the marketing organization is expected to nimbly deliver on their cross-channel campaigns, with the need to quickly set up and operate in near real-time speeds. With 10 times more content needed per channel², marketers have to quickly source, reuse, and deliver great content for that particular interaction. A traditional, CMS can hinder developers by forcing them to follow languages, patterns, standards, and rules set by the CMS. This coupling can restrict flexibility, increase code complexity, and reduce maintainability.

Modern brands are grappling with how they can support this explosion of connected things with rich services and content at scale. A key concern is how they can deliver experiences to customers in a way that ultimately drives demand and builds loyalty and do so at an accelerating pace.

Figure 1. In the era of IoT, a myriad of devices needs to request content from the CMS.



Digital experience management.

The challenges placed on IT and business teams require companies to take a different approach to the CMS and its supporting services. Developer-centric organizations have revived a concept from decades ago, the “headless CMS” or “Content as a Service.” A headless CMS is a content management system that doesn’t have a user interface or presentation/rendering layer and delivers “raw” content to various channels or rendering engines via APIs in the form of JSON (JavaScript Object Notation). The “head” of a CMS system refers to the presentation tier/front end. “Content as a Service” follows this same principle of a content hub that acts as a service to content consumption end points.

While the headless-only CMS does provide some benefits with content reuse, those may be offset by the challenges that teams face by creating every end point from the ground up, thus increasing total cost of ownership and time to market. Marketers and business leaders considering the headless-only CMS approach should evaluate the viability of the solution in light of the following challenges:

- › **Content authoring:** Composing, previewing, and publishing content in a business user-friendly environment as opposed to scheduling changes in complex developer tools. Who owns the customer experience: the author on the marketing team or the developer on the IT team?
- › **Content management:** How design and layout changes will be managed across organizations. How fast you can make changes, and how long it will take to test, Q/A, and publish. Can the content author test experiences? Do authors have to learn, adopt, and hire additional resources to manage developer tools?
- › **Personalization:** Does one size fit all? How you will create personalization logic for each and every end point. How you will add more experiences as new customer segments come up. Who is responsible for A/B testing? Can it scale to the nth degree with machine learning algorithms?
- › **Analytics:** Will you be able to measure all experiences and interactions? Will you have multichannel attribution models to understand the impact of each engagement across channels?
- › **Total cost of ownership:** What the true cost is of multiple CMS, for example, resources needed to manage experiences, time it takes to manage changes, limitations within each CMS, and cost of execution delays.
- › **Security:** Whether the data and content will be secure if you use public APIs. Who is managing the security and access controls of the entire system?

Solution: Omnichannel experience management.

Adobe Experience Manager is architected to solve this paradigm and addresses the gaps in the headless-only CMS approach. With the hybrid approach offered by Experience Manager, business and IT have the freedom to fully express themselves and build for constantly changing consumer expectations. Marketing organizations can create and manage fully context-optimized experiences that they can easily scale across products, services, organizations, and geographies without any technical dependencies. Developer teams can reuse content and access it in a headless way to create custom front ends with the tools of their choice. Only the hybrid CMS approach addresses the entire complex spectrum of needs that brands have in the modern world, supporting sophisticated, personalized experience management and headless content management.



Hybrid is the new headless: Although 'headless content management' has become something of a buzzword, global organizations are increasingly seeking systems that are not only purely headless but that can also provide head-on and head-optional capabilities from the same platform.

Mick MacComascaigh

Research vice president and co-author of the WCM Magic Quadrant, Gartner



Experience Manager helps companies meet omnichannel demands by leveraging a decoupled architecture that separates:

- › Core content management that is channel and presentation agnostic
- › Context-specific presentation authoring and management
- › Content and experience delivery optimization

Adobe Experience Manager is a Leader in both the Forrester Wave for Web Content Management and the Gartner Magic Quadrant for Web Content Management. Adobe is also a leader in the Forrester Wave for Digital Experience Platforms. With thousands of brands using Experience Manager, we at Adobe have seen and thought through the challenges faced by companies that need to accelerate innovation to keep pace with digital disruption. We understand the flexibility needed in a content management and delivery solution to support the wide range of digital experiences that customers demand.

The Experience Manager hybrid CMS allows brands to:

- › Source the best content—across brand creative teams, or imported from existing repositories
- › Manage content in an omnichannel manner so it can easily flow into any end point, be it a mobile app, IoT device, in-venue screen, single page application (SPA), or service
- › Compose experiences that adapt and become personalized with easy-to-use tools and guidance from AI/machine learning
- › Enable headless content to quickly flow to the growing number of content-hungry connections

Headless CMS doesn't fulfill the needs of a high-velocity, modern, experience-led business. With headless-only CMS, businesses can quickly run into issues with asset management, access control and security, workflow management for authoring and publishing, versioning, translations, personalization logic, and experience authoring and previewing. Adobe Experience Manager has always offered APIs to deliver Content as a Service, and it gives IT developers and business users the ability to address the goals of headless, while solving the challenges of headless-only CMS.

Content that fuels digital experiences.

Since its inception, Experience Manager has been built to address the needs of IT and marketing in designing, managing, and delivering great digital experiences. These groups need agility and speed to support the latest consumer expectations. In the past, those expectations centered on

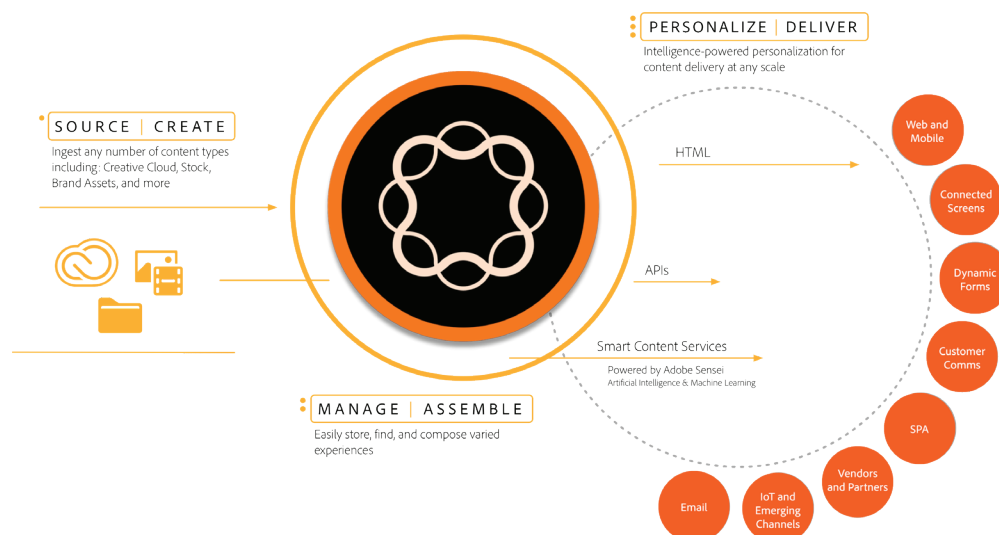
a website that looked great, no matter the screen size—desktop or mobile—and enabled users to interact in meaningful ways. Today, these demands are greatly amplified, in terms of increased speed and range of touchpoints beyond mobile, which include social media, IoT, SPAs, and in-venue screens.

With Experience Manager, marketers can author and define an experience, while giving developers the flexibility to reuse channel-agnostic assets and experiences to create custom applications.

Experience Manager Sites supports a broad set of experiences including:

- › Content delivered to point-of-sale and other store experiences, such as magic mirrors, electronic shelf labels, virtual shopping windows, and kiosks
- › Content delivered to off-site digital experiences: affiliate networks, partners, marketplaces, social networks, and so on

Figure 3. Adobe Experience Manager can deliver compelling digital context optimized experiences beyond owned, earned, and paid properties—web, mobile, IoT, SPAs—at scale needed to fuel the Experience Business.



- › Connected devices and associated apps—SPAs, progressive web apps, hybrid apps, or native apps
- › Targeted content fragments delivered to IoT apps in smart cities, smart homes, fleet updates, and so on
- › Content delivered to specialized wearables, such as smart watches, fitness trackers, and similar devices
- › Content delivered to call center agents, chatbots, and gaming platforms

For channel/context-specific delivery in Experience Manager, authoring capabilities and operational management tools enable entire experiences to be created for:

- › Web and mobile sites
(Experience Manager Sites)
- › In-venue screens
(Experience Manager Screens)
- › Dynamic forms and customer correspondence (Experience Manager Forms)

Leveraging these industry-leading applications results in significant operational efficiencies and more mature experiences that allow IT organizations to focus and accelerate innovation on emerging channels such as IoT.

Regardless of how it's used, one of the greatest benefits of Experience Manager to any organization is its ability to manage experiences from one central platform, significantly minimizing the complexities in the organization. Starting with one unified authoring environment, you get the benefit of being able to compose all your experiences in a user interface that is intuitive and powerful for both technical and business users.

To deliver digital experiences to everywhere customers expect you to be, an organization needs not only technology and architectures that support omnichannel experiences, but also a solution that allows functional teams across IT and business to work together easily. Experience Manager provides the support to help companies foster this partnership.

Business and IT: A partnership for delivering omnichannel experiences.

A complete digital experience management solution needs to offer more than just the architecture and capabilities that allow organizations to choose which services to leverage based on a specific content challenge. It must also include tools and resources in each area to make the experience easy to build and operate at scale.

Experience Manager is designed to foster collaboration between business and IT users and provide easy access to the solution, minimizing any bottlenecks. When a decoupled architecture is paired with useful tools for both IT developers and business users, full-value realization can be achieved.

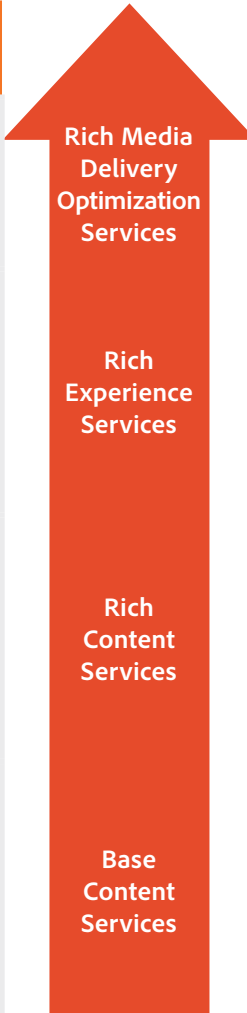
For LOB managers/marketers.

Experience Manager provides business users with in-context authoring and editing of web pages and experience fragments. Experience Fragments are, just as they sound, a smaller part of a larger customer experience that can include text, images and video. These fragments include

style and layout instructions for use across web pages and mobile apps to provide consistency. They can even be delivered to other end points using APIs (albeit not necessarily with the same style or layout). Once the master is updated, all the variations will instantly reflect those changes.

Adobe doesn't leave business users out of the process for channel-agnostic content meant for channels like IoT devices, SPAs or in-venue screens either. Raw content like images and videos that marketers place in the content repository are easily pulled out via an assets HTTP API for use by developers. Marketers can also create more structured content using Content Fragments (think of use cases like FAQs or speaker bios) and work with it in-context (easily creating, editing and previewing that content on their own). For SPAs, we provide a SPA Editor that allows business users to edit that content in-context and instantly update it (within the guardrails of governance policies set by the system admins of course). And if that wasn't enough flexibility, even the content that lives within a web page can be pulled out by developers for delivery anywhere!

Figure 2. Adobe Experience Manager provides separate services for core content management, omnichannel and context-specific presentation authoring and management, and content delivery optimization.

Digital Experience Goals	Experience Manager Capabilities	Additional Differentiated Capabilities	
Optimize the delivery of rich media	Content Delivery Optimization: Dynamic Media & Video	Deliver dynamic images and interactive video optimized by channel, viewer context	 <div>Rich Media Delivery Optimization Services</div> <div>Rich Experience Services</div> <div>Rich Content Services</div> <div>Base Content Services</div>
Deliver experiences across channels where Experience Manager owns the presentation	Context-specific Presentation Authoring and management: Web Content Management, Dynamic Forms, Customer Correspondence, In-Venue Screens	Core set of fully customizable components and tools to make it easy for developers to introduce new functionality	
Enable business users to create and manage experiences where Experience Manager owns none or only part of the presentation	Omnichannel Experience Authoring & Management: Content Services Framework, Digital Asset Management	Full CRUD assets HTTP API Content Fragments Experience Fragments SPA Editor	
Access raw content	Core Content Management: APIs	Base Content Repository may be accessed or exported. Assets full CRUD HTTP API for access to content below the page level	

By providing content authors a way to author both channel-agnostic and channel-specific content in-context with self-serve editing and preview, marketers can work in tandem with developers release and update content in timely, relevant customer experiences.

For IT developers.

Experience Manager ensures developers have what they need to create high quality experiences without slowing them down. Assets below the page level such as Content Fragments, images, text, and video can be delivered as JSON using the full CRUD assets HTTP API for delivery anywhere. Additionally custom content can be pulled out using the Sling Model JSON Exporter. Content contained within an experience authored in-context as a page or an Experience Fragment can be delivered via APIs to any end point. All of our core components are customizable content APIs for JSON export, allowing for default or customized output. And finally, our SPA Editor supports in-context authoring of SPAs for business users while developers can create experiences using JavaScript frameworks like Angular or React.

All business user authoring and editing is performed within the guardrails of governance that include granular content access and customizable workflows that control processes like approvals and publishing.

Content delivery optimization.

Approaches to headless CMS often lack support for content optimization and measurement of the effectiveness of content against audience segments. Experience Manager offers several options that address these needs.

For IT developers.

Content delivery optimization spans multiple areas that IT needs to cover to deliver the best experiences, from scalable and flexible infrastructure to Experience Manager configurations that allow marketers to quickly select predefined content metrics or personalization rules.

When it comes to dynamic media services, Experience Manager can help organizations easily and continuously deliver interactive, shoppable mobile-ready, and personalized experiences. Dynamic media delivery optimization can be achieved by specifying a set of dynamic image renditions that are delivered on demand from a single URL. This includes built-in capabilities for configuring over 100 different commands for format, crop, effect, color, and quality, allowing for infinite options and combinations. For video delivery, you can get up and running quickly with an out-of-the-box HTML5 video player library that provides responsive video players and industry-leading mixed-media viewers for both video and image content. To create custom players, you can also use a supplied SDK.

With extensive APIs and prebuilt integrations with Adobe Target and Adobe Analytics, developers can quickly configure business rules, whether they apply to measurement, targeting, or optimization of content. From there, it's easy to extend and customize the integrations when business needs evolve or change. In a traditional headless scenario, however, personalization is greatly impacted, such as when content is separated from delivery, and a CMS may get inadequate information about visitors, making it unable to present personalized content.

For LOB managers/marketers.

Experience Manager provides a set of built-in capabilities for analytics, targeting, personalization, and optimization of digital experiences. The easy-to-use authoring environment supports in-place editing, drag-and-drop targeting rule composition from a rich library of web components, and intuitive controls for search engine optimization (SEO)—all from the same unified user interface.

Experience Manager Digital Asset Manager (DAM) and dynamic media solutions help brands create, manage, and deliver visual and dynamic content, such as photo galleries, images, and videos, to any device or screen. With dynamic

media services, brands can increase engagement and conversion by leveraging analytics and data to automatically deliver the right content at the right time or by generating personalized content on the fly—all from one master asset and through dynamic media URLs. Video delivery is automatically adapted to all screens via responsive video players and adaptive video streaming. Targeted experiences can then be optimized and fine-tuned based on the measurements and data points you specify.

Through integration with Adobe Target, Experience Manager also assists in experience optimization to perform real-time A/B testing, scheduled content delivery, continuous site improvement, and implementation of targeting rules. Via integration with Adobe Analytics, brands can get data-driven insights and measure how their content is performing, so that they can better optimize it. Features like content insights and activity maps help marketers quickly and efficiently visualize data and make better data-driven decisions. Artificial intelligence and machine learning capabilities powered by Adobe Sensei make possible features such as anomaly detection for critical usage insights and auto-allocation to surface best performing content to most users, maximizing conversion.

Adaptable architecture and approach.

As discussed, the Experience Manager architecture can adapt to the different patterns of services needed to optimally transform content into an engaging experience, from headless to full content management and experience delivery. In fact, most organizations will need a hybrid approach, making tradeoffs based on the nature of the channel and interactions. The good news is that Experience Manager can support the entire spectrum.

You can take advantage of different combinations of its digital experience management capabilities to adapt to a specific challenge:

- › Core content management that is channel and presentation agnostic
- › Context-specific presentation authoring and management
- › Content and experience delivery optimization

Experience Manager also provides the capabilities needed for a true business and IT partnership, from strategy to operations. After working with thousands of organizations on their needs, we at Adobe realize that there is no one-size-fits-all approach to every situation. Experience Manager adapts to these different needs so that technology is a catalyst, not a barrier to growth.

Finally, the area of omnichannel customer experiences is dynamic, exciting, and challenging. Beyond an adaptable architecture and approach, we have also invested in a set of additional resources to help with your organization's omnichannel efforts. Start with your business needs and strategy, and reach out to Adobe and its ecosystem of partners for guidance and an approach that will fit your needs today and well into the future.

Figure 4. Experience Manager resources and ecosystem to guide you through your business, organization and technology needs



Adobe can help.

With experience management solutions like Adobe Experience Manager, combined with analytics and targeting solutions like Adobe Analytics and Adobe Target, it's easier than ever to create, manage, and deliver experiences across the customer journey. You'll be empowered to streamline experience creation, eliminate technology silos, and continuously deliver personalized and relevant content. You'll also be able to use big data to effectively understand your customers' behaviors, and then target them with highly personalized experiences across all devices and digital and physical touchpoints—engaging them with a cohesive brand experience on whichever device or location they find you. To learn more, visit <https://www.adobe.com/marketing-cloud/customer-experience.html>.

Adobe Marketing Cloud gives you the most complete set of integrated digital marketing solutions available. It provides everything you need to organize, access, and personalize your marketing content. It gives you deep insights into what's working with your customers and the ability to consistently deliver the best experiences to every customer across every channel.

Adobe Experience Cloud empowers companies to use big data to effectively reach and engage customers and prospects with highly personalized marketing content across devices and digital touchpoints. Eight tightly integrated solutions offer marketers a complete set of marketing technologies that focus on analytics, web and app experience management, testing and targeting, advertising, audience management, video, social engagement, and campaign orchestration. The tie-in with Adobe Creative Cloud makes it easy to quickly activate creative assets across all marketing channels. Thousands of brands worldwide—including two-thirds of Fortune 50 companies—rely on Adobe Experience Cloud, with more than 30.4 trillion transactions a year. To learn more, visit <http://www.adobe.com/mt/experience-cloud.html>.

For more information:

www.adobe.com/go/aem

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2. IDC, "Proving the Value of Digital Asset Management," June 2015
3. Econsultancy, Digital Trends Briefing, 2017

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