



Laying the technical foundation for a modern storefront.

Explore the evolution of commerce and the emerging approaches to build a successful storefront.



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The evolution of commerce.

The rise of the digital economy reflects how quickly customer behaviors shift. They want engaging digital experiences that offer a seamless, personalized shopper journey. But they also want consistently fresh experiences that meet their evolving needs. While it's up to businesses to address those digital expectations, building the right experiences can be a challenge. Regardless of business maturity, building a strong ecommerce foundation is the first step. From there, additional talent and resources allow businesses to create more complex experiences—and even become leaders by building innovative technology.

“As digital technology becomes the catalyst of modern business, companies are realizing that it is not a commodity but a differentiator,” says Errol Denger, director of strategy and product management at Adobe. “They are therefore making investments to deploy digital technologies in a way that enables them to establish a strategic advantage in the marketplace.” Simply delivering product pages is no longer enough. B2C customers are met with a wealth of digital choice, and businesses are responding by creating engaging experiences that build brand loyalty. In other contexts, B2B businesses are experiencing some of the same challenges. They now need to add B2C features—like product recommendations and intelligent search—to their B2B websites to adjust to shifts in consumerization. Regardless of the customer, businesses need to tap into emerging technologies—and they need a platform that can support the kinds of experiences that are pushing the digital economy forward.



Hyper competition brings innovation.

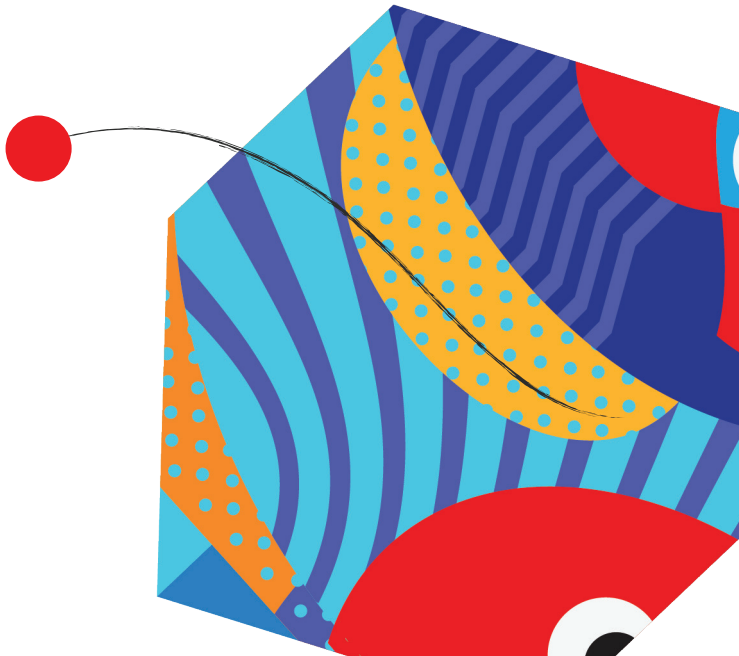
While the COVID-19 pandemic originally provided a major push for online channels, the agility that was necessary for businesses to reach their customers has remained. According to the *Adobe Digital Economy Index*, the past year has pushed organizations to accelerate the pace of their customer experience efforts. To make the most of opportunities within the digital economy, organizations need the right technology, processes, and team agility that will enable them to change as customer needs and behaviors shift. This hypercompetitive commerce market means the businesses that are adapting quickly to major technology shifts are also driving innovations in ecommerce.

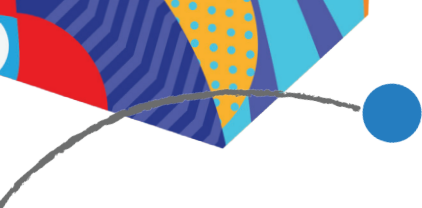
Businesses need to ensure they offer customers rich and intelligent experiences seamlessly across all channels. But to do this, they need the right ecommerce platform—one that's able to scale rapidly with rising demand, adapt quickly to ever-changing business requirements, and keep up with new innovations. In Forrester's report, senior analyst Emily Pfeiffer says, "The once all-in-one solution has grown up to meet new requirements, and it's not just for smaller businesses anymore. The new, mature systems are flexible, inexpensive, rapid, and easy (FIRE)—especially compared with their legacy counterparts." With shopping behaviors constantly changing, businesses that are able to deliver innovative commerce experiences will see the greatest value.

According to Gartner, these businesses also need to have the right talent and resources to build those experiences. In their report, the authors discuss technical skills becoming more prevalent in business units and business insights becoming more developed

in IT. Businesses that increase collaboration across technical and business units will be best equipped to increase revenue while driving costs down.

“We’re transitioning from a world with a rigid monolithic web application to a set of services that enable companies to serve every channel and optimally assemble components based on business needs,” says Denger. Keeping the FIRE requirements in mind, businesses need to consider the different approaches to building an ecommerce platform as they react to the shift from traditional commerce to an experience-based strategy.





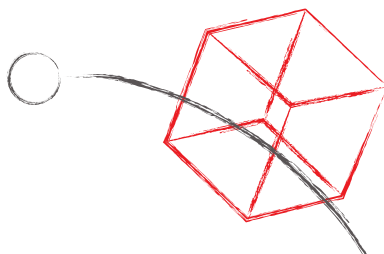
Defining the approaches.

The way businesses sell online is rapidly changing. And with these changes comes a variety of approaches to building your digital storefront. As with any rapid innovation, the differences between each approach are not always easy to pin down—and some gather excitement that can cloud judgment on which option is right for businesses of varying sizes.

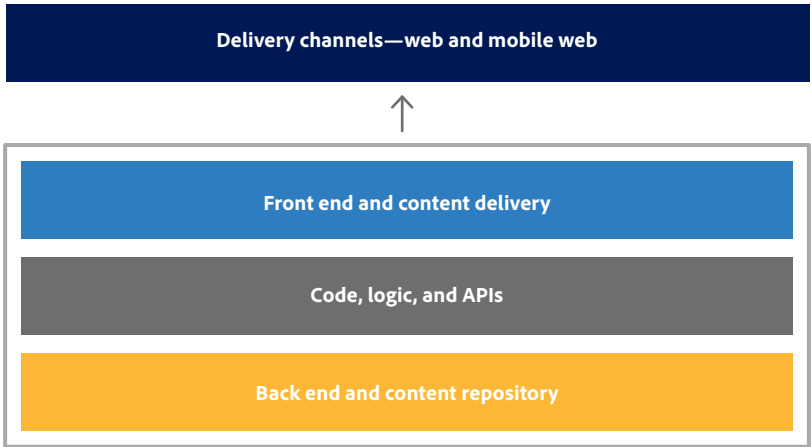
Before deciding which ecommerce approach fits your business needs, explore existing options and what makes each unique:

Monolithic

A monolithic ecommerce platform is a single application that is built all at once. It's comprised of a single package of code that informs the full functionality of the platform—including the customer-facing user interface and all back-end services. This is the traditional approach to architecting an ecommerce platform and launching a digital store.



Components of a monolithic approach:



Advantages

- Low cost to build and maintain due to tightly coupled structure
- Requires relatively less technical skills to manage
- Easily launched with prebuilt features and out-of-the-box functionality

Disadvantages

- Challenging to customize for variety of touchpoints
- Lacks flexibility
- Slow and cumbersome to build new features, unless offered by service provider
- Unable to mix and match services to build impactful experiences and capitalize on market opportunities
- Adopting new capabilities requires upgrades to the entire platform

Monolithic platforms are best for small and mid-sized businesses (SMBs) that are just starting out with ecommerce and don't need custom applications. This approach is also best for businesses that don't have access to the technical skills or budget to build and maintain microservices.

“ As a monolith is growing, it becomes difficult to manage because there is a lot that goes into releasing a new version of the software. The bigger a business's ecommerce software is, the more resources they will need to spend on the release versus the amount that could have been spent building the feature set on its own.

Nishant Kapoor

Director of Product Management, Adobe Commerce

Microservices

Digital stores built using microservices are broken down into different applications or purpose-built independent services like search, product catalog, media assets, pricing, and promotions. These services can all be integrated together or distributed across the organization. Each application operates independently, allowing changes to be made to just one service—such as the customer-facing storefront UI element—without disrupting the other services.

The architecture for microservices is divisible—there is always a smaller unit that features can be broken down into. For example, microservices for one business might mean having cart and checkout features as one microservice that runs independently of other commerce services. Another business might divide their cart, promotions, payments, checkout, promotions, and shipping each into individual microservices.

Components of a microservices-based approach:

Delivery channels—web, apps, IoT, POS, PWA, SPA, AR/VR, and so on

Custom front end (or ends)

APIs

Back end and content repository

Advantages

- Can combine best-of-breed services from various vendors to maintain operational excellence
- Highly customizable with freedom to build unique user experiences
- Each service runs independently, allowing for changes without impacting other services
- Each service can be scaled independently depending on business needs

Disadvantages

- Requires a high level of technical skills to build and operate both the infrastructure and organizational processes
- Costly to maintain multiple, disparate microservices
- Can accumulate technical debt without a mature IT organization or agency
- Often lack unified business user tooling, especially if services are delivered by different vendors

Microservices are best for large or mature commerce companies looking for a hyper-customized ecommerce platform. These businesses have the budget, organizational maturity, and resources to build and operate across a variety of microservices.

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If done right, microservices-based systems provide independent scalability for the individual business functions. If a business's order processing is through the roof because they've just run a new promotion, they're able to scale that up without having to affect the entire rest of their site.

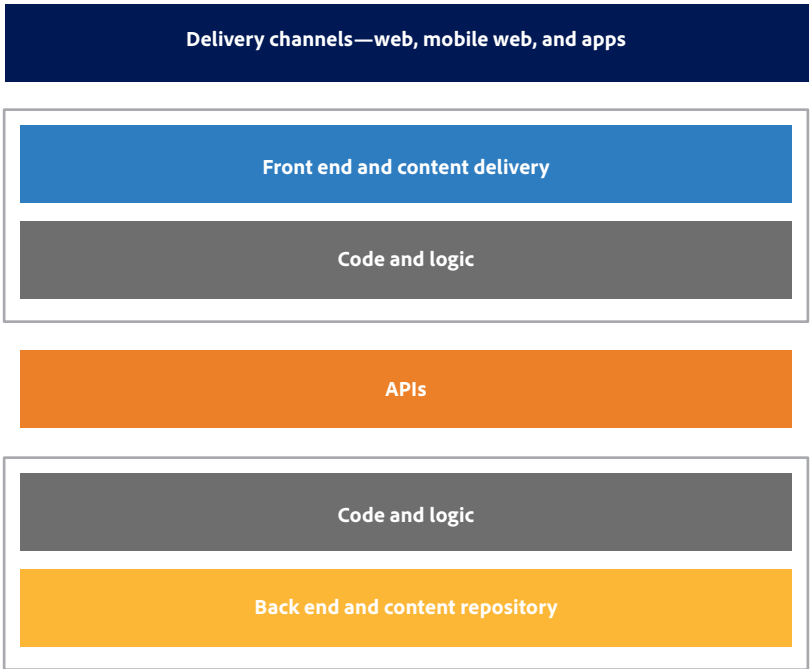
Ryan Rozich

Director of Product Management, Adobe

Composable

Composable, or modular, is a developmental approach to architecting an ecommerce platform. It includes selecting best-of-breed commerce components—like APIs and microservices—from a single or multiple vendors and combining them into customer applications built for specific business needs. Collections of these composable microservices are often referred to as packaged business capabilities (PBCs), and together these PBCs make up a unified composable commerce platform.

Components of a composable approach:



Advantages

- Gives development teams immense flexibility to make changes and build new features without impacting the rest of the platform
- Allows businesses to freely implement the features that will best serve their needs
- Reduces operational costs by only paying for needed features

Disadvantages

- Can be costly as more microservices or PBCs are added
- Highly technical resources needed to build and maintain the platform
- Too many microservices distributed across various vendors can significantly extend implementation times and cost

Composable is best for mature commerce organizations looking to become industry leaders. These businesses can innovate quickly and build fresh, creative experiences, driven by either in-house IT organizations or a trusted agency. They have both the budget and technical expertise and resources to build and maintain a customized, flexible platform.

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Vendors are never going to be able to provide everything for every business. There are always going to be point solutions that solve specific needs. With composable commerce, businesses can find services to solve those problems and then stitch them together.

Patrick Toothaker

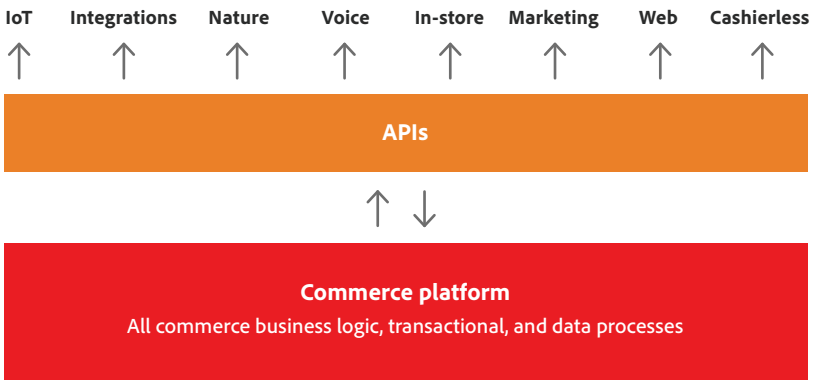
Senior Manager, Product Marketing, Adobe

Headless commerce

The headless commerce architecture uses an application programming interface (API) to deliver the digital shopping experience to the customer-facing storefront. It does this by decoupling the front-end presentation layer from the core application on the back end, which allows businesses to embed commerce functionality into various touchpoints. On the back end, the complex business logic and processes that interpret customer interactions and make the site run are taking place within the commerce engine.

Microservices-based and modular platforms are typically headless because these approaches are made up of decoupled services and features—though some monolithic platforms can also be deployed through a headless approach. Regardless of the platform, headless commerce functionalities can be embedded into one or more touchpoints and back end systems to translate information into the right experiences.

Components of a headless approach:



Advantages

- Opportunities to expand commerce functionality to new channels and touchpoints
- Opportunities to personalize and customize customer experiences and UI
- Ability to add best-of-breed features and capitalize on new market opportunities
- Ability to integrate third-party services
- Lower technology barrier than building a microservices-based or composable commerce platform

Disadvantages

- Requires talented engineers familiar with a storefront language like React to build APIs
- Slower time to market due to more coordination between design and technical implementation
- Higher technical debt if IT organization isn't mature
- Stage and preview limited or not available
- Often lacks tooling that gives marketers and merchandisers control over site content

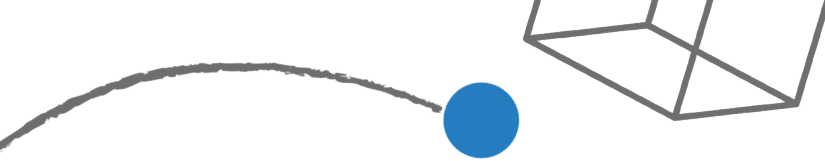
Headless commerce is best for any business looking to explore how to decompose their traditional monolithic platform. A headless platform is a small step in the direction toward composable commerce by decoupling the storefront interface layer from the back-end commerce engine. It allows businesses to adjust the customer experience by changing the storefront UI without needing to rebuild the back-end engine and processes.

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If businesses feel overwhelmed by microservices-based or composable commerce, they can start first by decoupling the front end from the back end and separating them using a headless approach. That way, businesses can be agile and change the storefront experience without interfering with the back end.

Patrick Toothaker

Senior Manager, Product Marketing, Adobe



Build versus buy.

Whether businesses opt for a microservices-based, composable, or monolithic approach, it's important to balance the value of what they gain out of the added cost and complexity of building ecommerce components from scratch.

"Some businesses have a robust, talented developer team who can handle large amounts of complexity and can stitch together multiple different systems on the back end. Others might find there are a couple of pieces they want to tie together, but at a certain point, the complexity starts to overwhelm the actual value businesses get out of building," says Toothaker.

Businesses looking to build an ecommerce platform need to consider the trade-offs of each strategy based on their available talent and resources.



Build

Building an application consists of coding the components from scratch. A business may stitch together only built applications or blend applications that have been built and bought when creating a composable platform. Emerging touchpoints— like voice commerce and augmented reality—are produced through build processes when these technologies are not yet available from vendors.

Advantages

- Can integrate a system based on unique business needs
- Able to create new and innovative features for specific use cases that differentiate the customer experience

Disadvantages

- Requires a high level of technical talent and resources to build and maintain custom applications or a custom platform
- Built applications add to the complexity of the engine

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Emerging touchpoints like voice commerce or augmented reality aren't components that commerce vendors are currently going to offer out of the box. Businesses that are looking for these cutting-edge features need to rely on their developer teams to build them.

Emma Lockwood

Product Marketing Manager, Adobe

Buy

Buying applications consists of using out-of-the-box features that are created by a vendor. Businesses that are looking for simplified or standard applications may opt to buy and integrate them into a fully bought or blended composable platform.

Advantages

- Requires fewer technical skills to integrate, though still requires resources to maintain within a composable system

Disadvantages

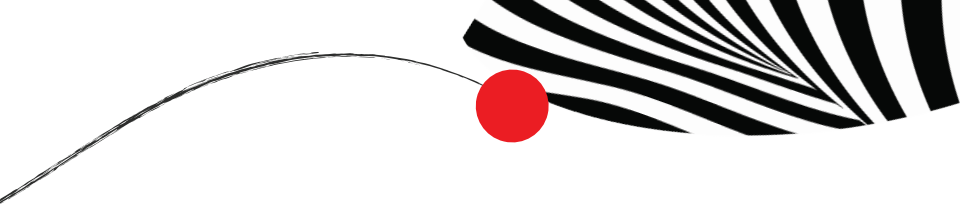
- Lends less control over features
- Can be difficult to find innovative packaged features
- Difficult to meet specific business needs as easily, even if proper resources are available

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It's easy for business to overbuy on functionalities within a headless ecommerce platform. Knowing what value new capabilities bring to a business can help avoid this.

Emma Lockwood

Product Marketing Manager, Adobe



The hybrid strategy.

The right ecommerce platform is not one-size-fits-all. Instead, platform approaches exist on an architectural spectrum. A monolithic platform is the most structured—but it requires substantially less IT expertise and fewer resources to build and maintain.

At the other end of the spectrum, completely microservices-based or composable approaches offer hyper-flexibility. But they also require extensive IT support and resources to create the innovative experiences they promise. Many businesses may go into an ecommerce technology evaluation with the goal of exploring one of these customizable approaches that made a buzz in the Gartner Hype Cycle.

While a full microservices-based approach may excite some businesses as the newest breakthrough technology, this approach can create a complex web of services that do not integrate or communicate easily with one another. As a result, complex maintenance and upgrades can accumulate technical debt and increase time to market. Disparate logins and user interfaces (UIs) can create a clunky, disjointed workflow for business users like marketers and merchandisers, ultimately wasting time and resources.

Most businesses need a platform that will support future growth. To keep pace with digital expectations, businesses need flexibility, fast time to market, and low total cost of ownership (TCO). Ecommerce technology decisions should be made based on how they will impact business objectives and set organizations up to respond to the future of ecommerce.

“Businesses need to understand the efficiencies and benefits of decoupling certain features,” says Toothaker. “But before they bring in composable or microservices-based features, it’s important to determine which core components make sense to have in more of a traditional, coupled architecture. Keep these out-of-the-box services at the center of the platform and then add modular features based on specific business needs.”

Most businesses will find the greatest value in building an ecommerce platform with a hybrid approach. With this kind of approach, a set of services is purchased and bundled from a single organization. Not only does the hybrid approach lower technical requirements and total cost of ownership (TCO), but it also reduces the need for complex integrations across services from different vendors. To keep risks low, businesses need to choose a vendor whose core services are flexible enough for API-led integrations and customization. That way, businesses can harness opportunities to quickly make changes in a headless system and build innovative services within the competitive ecommerce landscape.

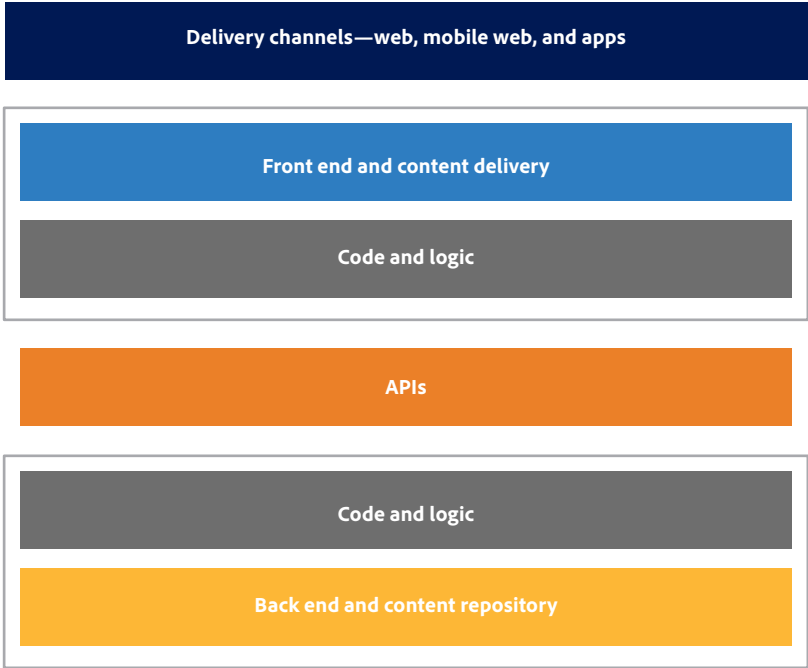
“By adding composable elements, the maintenance and the interconnectivity to grow are already built in,” says Tory Brunner, senior director of product marketing at Adobe. “It’s just a matter of adding the right pieces to the puzzle and leveraging the system’s functionality that already exists while being able to grow rapidly.”

While this flexible architecture future-proofs commerce needs, having a single vendor delivers additional value through prebuilt integrations, shared services and support, ease of upgrades, and regular updates that occur seamlessly across the platform.

According to 451 Research, 63.1% of organizations are very interested in working with a single provider with a full suite offering for their ecommerce business.

For many, this option aligns most closely to the budget and resources they have available. “Most businesses don’t have the technical skills in house to operate a microservices-based or composable commerce platform,” says Toothaker. “It’s important to find the balance of unlocking agility and creating customized capabilities while not exceeding the costs to run the business.” As businesses build their ecommerce platforms, the advantages for both business and IT leaders are staggering.

Components of a hybrid approach:

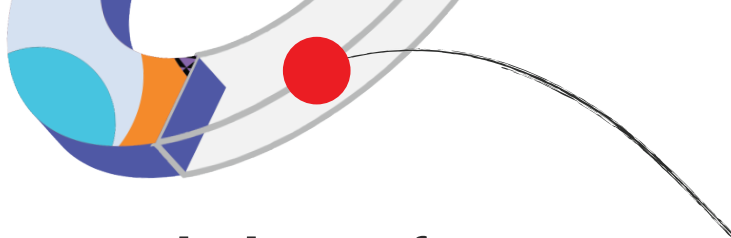


Advantages for business leaders

- Remain competitive by reacting quickly to customer, business, and market needs
- Maintain access to the testing and experimentation benefits of microservices without needing to re-platform
- Retain preintegrated business user-friendly tools to decrease reliance on developers and empower marketing and merchandising teams
- Maintain a shared dataset that enables consistency of experience across touchpoints and consolidated data management and reporting
- React quickly to changing customer preferences while introducing and experimenting with new digital capabilities to differentiate the business
- Maintain usability of the platform across internal teams at varying levels of digital maturity
- Operate efficiently across a common UX and UI using a single login and support organization

Advantages for IT leaders

- Update services more quickly and easily than with a monolithic approach
- Lower burden on IT than a full microservices-based approach due to prebuilt integrations
- Harness a single organization's support to resolve issues across service updates and releases
- Gain flexibility to make the right technology decisions that serve specific business needs with the ability to seamlessly integrate with the platform through APIs



Recommended core features.

Across composable and microservices-based approaches, businesses need to be equipped to create impactful digital experiences.

“It’s crucial to make every experience shoppable, and that’s the payoff that today’s commerce technologies provide,” says Brunner. Businesses looking to build a modern ecommerce platform need to consider a few core features.

Robust APIs to build out custom digital touchpoints

Microservices-based, composable, and hybrid approaches to ecommerce all allow businesses to have multiple APIs which all serve different applications. Businesses can use these APIs to quickly add new touchpoints to keep up with changing customer needs. But it’s not all about changing the storefront experience. A headless commerce platform allows businesses to change the back-end engine without disrupting the storefront experiences customers enjoy. No matter the changes—whether in customer interactions or technology innovations—having a robust layer of APIs lends businesses flexibility to keep up.

Advantages

- Enable delivery of complex experiences into multiple customers storefronts such as mobile, web, social, and in store
- Build new experiences quickly without disrupting the entire platform.

CUSTOMER SPOTLIGHT

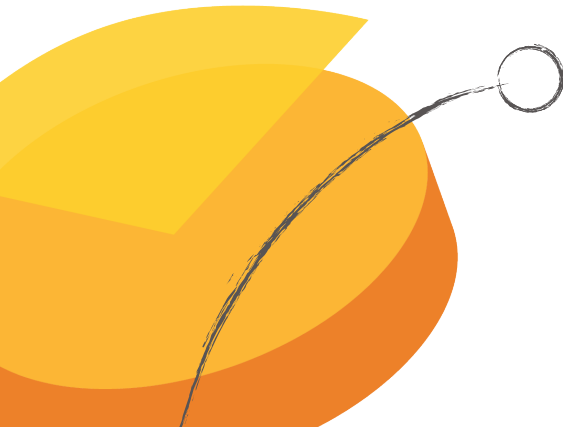


**FOOD SERVICE
DIRECT.com**

When FoodServiceDirect.com (FSD) saw a massive opportunity to expand its services to both B2C and B2B customers, the US-based food service distributor looked to modernize their ecommerce experiences. The company used a headless approach with Adobe Commerce to connect with the existing FSD commerce systems—like order management and product inventory—and quickly created a customized storefront experience for each proposed webstore.

- 40% growth in new customer acquisition
- 110% growth in repeat purchases
- 40% growth in B2B sales

Explore the story



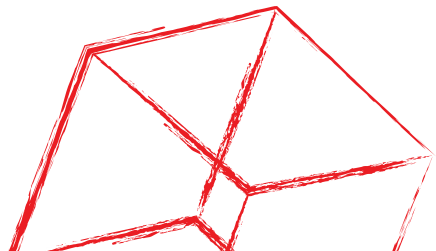
Decoupled storefronts with PWAs

A decoupled storefront is achieved by building an API to deliver a technologically simplified experience from the back-end commerce engine to the customer's interface. Progressive web applications (PWAs) deliver an experience to a mobile browser that is traditionally native to a mobile app.

Decoupled storefronts with PWAs add to the customer experience by creating a fast and engaging mobile experience that feels like a native mobile app. While shopping on the mobile browser, customers engage in a seamless buying journey—instead of having to stop to download a mobile app. Because of the way PWA interfaces and content are loaded, customers encounter experiences with shorter load times.

Key business benefits

- Gain flexibility to make changes in days or hours, instead of weeks or months, by not needing to rely on mobile app stores to push through updates.
- Deliver web experiences that were once only available on native mobile apps.
- Save time, money, and Save time and money by eliminating by eliminating the need to build and maintain a mobile app.



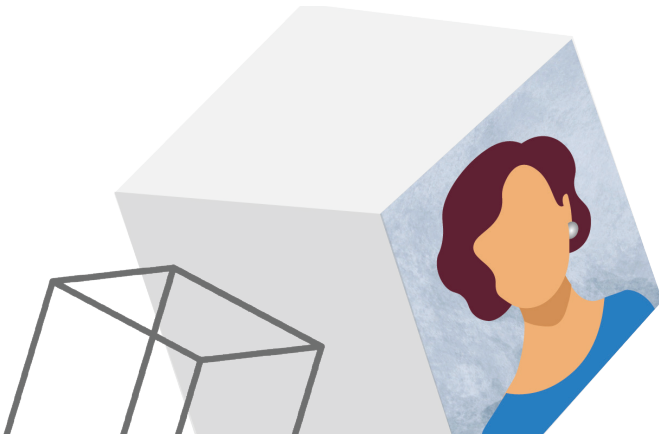
ELEMIS

LONDON

ELEMIS London wanted a technology-forward ecommerce platform that would match the cutting-edge science that goes into developing its skincare products. By building a PWA storefront on top of Adobe Commerce (formerly Magento), the innovative beauty brand created a snappy web experience that has streamlined the checkout journey and seamlessly boosted promotions and sampling programs that lead to customer engagement.

- 70% shift in traffic to mobile
- 2.5x faster site load speed
- 137% growth in mobile transactions
- 85% growth in mobile conversion rates

[Explore the story](#)



Compatibility with content systems.

Creating impactful digital ecommerce experiences take more than catalogs and product information. A headless content management system (CMS) works seamlessly with a headless commerce platform to provide the content that engages shoppers. Just as an API delivers commerce experiences, a headless CMS decouples content operations—like assets and personalization—from the storefront UI.

Pairing headless CMS and ecommerce platforms together therefore provides a unique advantage. “Increasingly, we are seeing content and commerce overlap,” says Ryan Rozich, director of product management at Adobe. “A customer experience needs to account for past shopping patterns and quickly present the right product information and content in an experience that feels tailored to the customer.”

APIs from each system work with a single storefront to pull exactly the right content from the right systems to deliver customers uniquely personalized experiences. For example, a product page can use APIs to pull engaging product videos from the CMS while pulling pricing and catalog data from the commerce platform.

Key business benefits

- Deliver personalized and dynamically localized customer experiences aligned with behaviors and expectations.
- Create commerce opportunities outside of product pages across the website.
- Deliver seamless experiences with unified content and commerce.
- Build dynamic storefronts without being confined to a single vendor’s interface.
- Easily optimize customer product searches across sites.

CUSTOMER SPOTLIGHT



With customers interacting globally, Helly Hansen needed an ecommerce platform that could seamlessly deliver localized products and content. By integrating its Adobe Commerce platform with Adobe Experience Manager, the Norwegian outdoor clothing brand now delivers product pages, manages content, and connects their loyalty program—all within a unified experience.

- 55 sites available in 7 language options, payment methods, and shipping rules
- 35,000 products supported by each site
- 40% growth in overall ecommerce revenue
- 20% growth in overall traffic
- 37% growth in mobile traffic

Explore the story



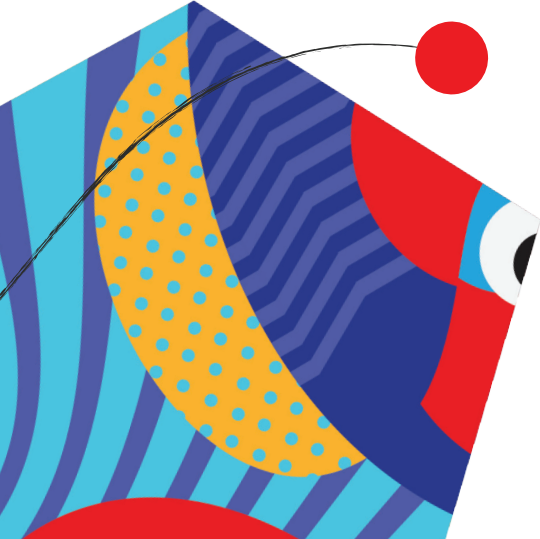


The road ahead.

The monolithic approach to commerce once served businesses well. For some, this traditional approach is still the best way to lay a commerce foundation. But with rapid innovation brought on by the digital economy, businesses now have access to specific technology features and capabilities to meet customer expectations. “Digital businesses that welcome the added power of many specialty providers who assemble around the new dual cores will opt for a curated suite built to their specific needs,” says Forrester in their report. “Those that prefer simplicity will demand the reinvented all-in-one solution, with its stringent requirements for a FIRE experience.” No matter the approach, the need for flexible, inexpensive, rapid, and easy technology is central to any ecommerce strategy.

The right approach for any business relies on budget, talent, and resources. But just as the future of ecommerce technology points to immense flexibility, so does a business's commerce strategy. “Understand that composable capabilities offer a starting point,” says Bruner. “Make a stake in the ground and expand rapidly while testing, learning, and using data. Learn from customer behaviors and plug-in composable capabilities that enhance the customer experience.” An approach that offers flexibility needs to be matched with a strategy that is willing to understand and react quickly to changing customer needs and behaviors.

As commerce continues to evolve, addressing the core capabilities of any platform will be critical. Businesses that take a hybrid approach have the added benefits of a strong foundation while gaining the flexibility to address business needs with specific additional services. "It's important to have the right capabilities, but businesses also need a unified business user experience," says Denger. With a hybrid platform, as businesses build or add custom capabilities within the platform, they can be directly integrated with existing unified workflows that allow teams to build seamless, personalized customer experiences.



Adobe Commerce

Adobe Commerce is the world's leading digital commerce solution for merchants and brands. With Adobe Commerce, you can build engaging shopping experiences for every type of customer—from B2B and B2C to B2B2C. It's built for enterprise on a scalable, open-source platform with unparalleled security, premium performance, and a low total cost of ownership. Businesses of all sizes can use it to reach customers wherever they are, across devices and marketplaces. It's more than a flexible shopping cart system. It's the building block for business growth.



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