



Personalizing Shopping Experiences with Headless Commerce

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ABSTRACT

E-Commerce is a rapidly changing landscape with numerous advantages. In this article we will discuss challenges that business may face and explain how these can be addressed using headless commerce solutions. You might already have a strong content management system behind your online sales portal or maybe you want to improve on the content strategy even further thus making it difficult to buy into traditional e-commerce platform which will not fully integrate with the existing content infrastructure.

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1. Introduction

The swiftly changing digital landscape has put the customer in control and more and more customers expect a smooth touch, eating content and purchasing anywhere anytime, through any device or channel. However, it is important to note that amid these traditional e-commerce platforms making use of them has become hard for most businesses. To build an online store you either had an ecommerce platform manage everything from content to storefront or used a content platform while adding the functionality of e-commerce and hoped it would do all what you needed. Designs are limiting and content functionality is limited for marketing teams that were using an e-commerce platform to run their storefront content and design. Conversely, those who elect to use an Ecommerce plugin on top of their existing CMS will discover that such plugins lack significantly in terms of capability, functionality yet they require extra plugins just for basic tools.

Headless Commerce takes the opposite approach - prioritizing finding the systems that best fit your business needs without compromise and preparing your digital teams for success. The modern, cloud-native, API-first headless architecture makes it possible for marketers to take control of their content and apply it across multiple channels and the front end.

A headless commerce platform will give you a powerful, flexible and secure backend e-commerce system that can be easily updated and is built to be integrated with current systems (like a CMS). Lay on top of this the fact of a decoupled front-end system (integrating content delivery systems such as) so that marketers and other content creators have full control over how their work looks.

To stay relevant, many companies turn to headless architecture. Headless decouples the digital front end from back end, allowing businesses freedom to build to their own specifications. Seventy-seven percent of firms with the headless architecture they recognized that it gives them increased agility in making changes to their digital storefront faster. Companies with no head architecture is more likely to expand rapidly in us channels (77%) than headless companies (54%). [7]

We can define content management systems CMS as systems as platforms, which can handle content, like text, images and videos as the structure and design of web pages. Through these systems it is ensured content delivery flexibility. Headless CMS focuses on managing and storing content without specifying how it appears on devices or platforms. Headless systems also ensure interaction with different frontends; developers can create customized user interfaces (frontends), distribute content to channels such as websites, mobile apps or IoT devices, segregation of content logic from visual presentation.

In the realm of website management headless CMS deals with organizing and presenting content whereas headless commerce is dedicated to enhancing e commerce features and the overall shopping journey. Both approaches embrace the idea of "headless" by detaching the end, from the back end albeit in areas. In a headless setup an e commerce platform can leverage a Headless CMS for content control and a Headless Commerce system for retail functions. This setup allows for adaptability, in content management and shopping interactions.

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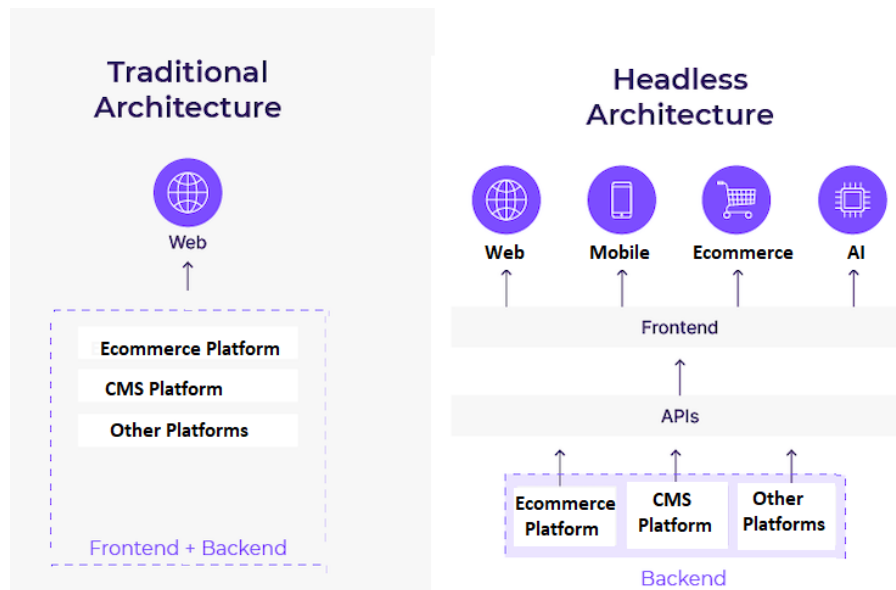


Figure 1. Traditional architecture vs. Headless Architecture

Headless E-commerce can be called an architecture that splits head (a visual interface and all user actions) from the backend which includes all the logistics management, order processing and databases. This means that retailers can set up their e-commerce website more quickly and change the site layout according to their needs. The meaning of "headless" is the absence of a conventional front-end interface which gives a marketer freedom in customizing capabilities and multiple content presentation channels according to his demands not being constrained by a regularized interface.

2. The headless commerce technology

The headless commerce technology has been gaining popularity and acceptance from the merchants and developers who attribute this trend to the benefits it brings with the rising changes in the e-commerce ecosystem. Here are some reasons that make headless commerce attractive [6]:

There are some reasons that make headless commerce attractive:

- **Flexibility in User Experience (Frontend)** - However, developing headless systems facilitates a creation of customized interfaces corresponding to different devices (i.e. desktop, smartphone, IoT, etc.). It expands the range of options you can implement and experiment with so you can precisely fine-tune each user's journey.
- **Diversification of Sales Channels:** This headless approach lets retailers to show products, sell goods and do the marketing for products via various channels like: web sites, mobile apps, voice assistants, in-store displays and so on. This creates an additional possibility of consumer appearance in various contexts as well.
- **Accelerating Development:** Developers can work together independently on client side and server, making the process much more mediated and quicker. Changes made on the frontend don't affect the backend performance and changes made at the back are not visible to users. It is thus easy to adapt and add new functionality and release them when needed.
- **Scalability and Performance:** Furthermore, keeping the frontend and backend apart helps in efficient usage of resources and a display of wares increases the performance rate. A scaleless distribution system that can work well with traffic and easily identify it as it grows is also an added advantage.
- **Adaptability to New Devices and Technologies:** The integration of emerging devices, a consequence of the progressive technological advancements made, is entailed in headless commerce and into this seamlessly amalgamates without incurring a major upheaval of the existing structure.
- **Freedom to Select Technologies:** Traders are the utmost decision makers and have the prerogative to select the best software to implement the whole system. They pick front and back interfaces based on their personal intent. This encompasses the fact that they are at liberty offering the most suitable modern technology and gifts for their client's need in specific.
- **Advanced Customization of User Experience:** It becomes possible to jettison a stereotyped frontend that once prevented merchants from customizing user experience the way they want, which introduces factors such as individual preferences, user segments, and behavior.

Because decoupled and headless CMSs are getting a lot of attention, they are content management systems like WordPress, Drupal, etc. which offers decoupled versions. They offer extensions and plugins that decouple them from their front ends. It might come as a surprise that many things handled by most decoupled CMSs will be missing by completely decoupling the front-end from WordPress or Drupal, so you have to manage them yourself, for example site preview, translations, SEO functionality, security and any updates, upgrades or API changes provided by the plugin or extension and so on. A true headless CMS is built from the ground up to be an API receiving CMS, not a traditional CMS with APIs attached using extensions or plug-ins, so it can be called a decoupled or headless CMS.

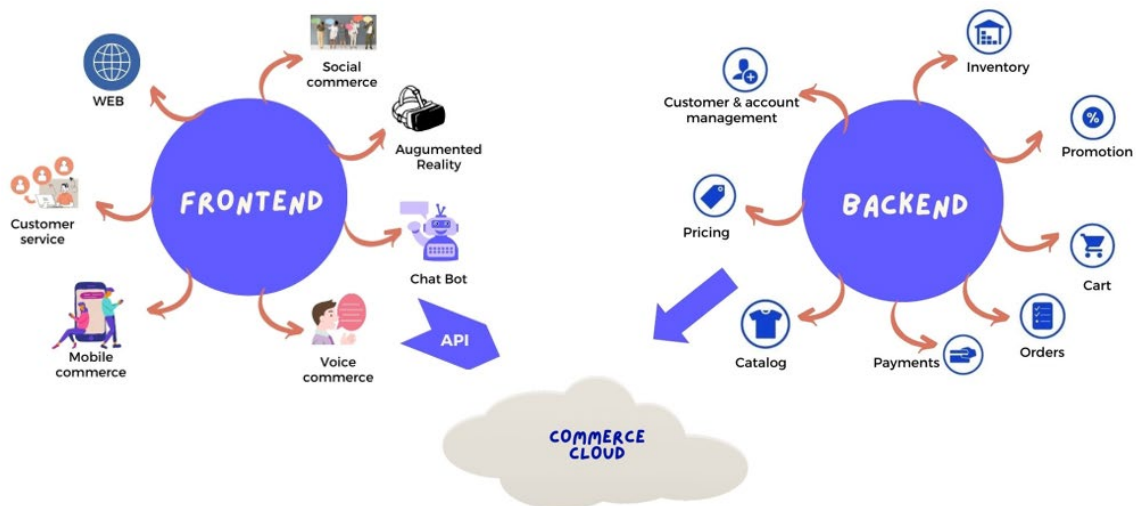


Figure 2. Headless Architecture

The two-way communication between the firm and the back-end team is a basic feature in software architecture that the people shouldn't neglect. In a headless context, where the front and back ends are disconnected, interaction is done by either calling or getting data within the APIs. Here's how this process happens: Here's how this process happens:

- **APIs:** APIs they are sets of rules and protocols that provide communication possibility between software applications. These features define the set of the functionality and clear instructions in regard to the operations that the software (frontend) can make to access and work with the application (backend).
- **Communication Protocol HTTP/HTTPS:** In the majority of applications the way that the frontend begins conversing with the backend is via the HTTP (Hypertext Transfer Protocol) or HTTPS (HTTP Secure) protocol. Requests are made from frontend to backend and from backend to frontend, and the protocol is used to transmit both. Both happen through this protocol.
- **HTTP methods GET, POST, PUT, DELETE, etc.:** APIs expose various tasks such as GET to get some data, POST to send data to the server, PUT to update data, DELETE to delete data etc from the backend. The frontend is using these methods as tools to interact with the backend.
- **Data Formats: JSON, XML, etc.:** Data mostly are transmitted between frontend and backend using standardized formats such as JSON (JavaScript Object Notation) and XML (eXtensible Markup Language) where and how the designer chooses such formats to specify how the data is structured. These formats make a lot of the data clear and unambiguous due to their formatted nature.
- **Authentication and Authorization -** In case of the need for security and controlled supply of resources, tools such as authentication and authorization, including JWT tokens (JSON Web Token) or session management systems, come in handy.
- **Browser Security Policies:** The Same-Origin Security rule impinges restrictions that an Internet application run in the browser be able to do a request to different domains. CORS (Cross-Origin Resource Sharing) facilitates cross-origin communications by prepended HTTP headers that are marked as allowing or outlawing access to the resources on other domains.

A great number of headless e-commerce platforms have been already built or designed from the ground up that take full advantage of the headless commerce. Here are some of them:

- **Commerce Layer** gives you an API based commerce solution without dependance of frontend on product catalogs management, orders and payment processing.

- Vue Storefront is an open-source and headless e-commerce platform built on Vue.js and widely adopted by retailers around the world. It ensures that you can do it swiftly irrespective of whether you want a robust, sophisticated and/or customized online store.
- Contentful a leading headless CMS, can be smoothly incorporated in headless eCommerce tech stacks. It accommodates content and resource management and makes APIs to connect portals as well.
- BigCommerce provides built-in headless commerce support, which enables the integration of data models and application programming interfaces across multiple channels or applications. Through this creation of the middle layer, the frontend is no longer coupled with the backend, hence both ends can customize their interface using frameworks such as React or Vue.
- Magento (Adobe Commerce) breaks with the traditional customization practice by the GraphQL or REST APIs. It allows creating unique frontend design and utilizing all the essentially power of plenty given e-commerce functionality.
- Shopify Plus is headless commerce feature supported by Shopify, which enables developers to build the frontends with technologies like React or Vue, while at the same time the backend will be managed by Shopify.
- Front-Commerce is adaptive, friction-free headless commerce specially designed for Magento. It gives a modular and expressible frontend and it thus preserves for Magento the important attributes of power.
- Kentico Content is one of the content management platforms that provides you an option of headless architecture which means that you can create, manage, deliver content and get it accessed via APIs. It comes to be naturally linked with a number of shopping software

Suppose we have a store for the mobile phone and we would like to use a headless commerce technology (without involving a developer). On the other hand, this is a knowledge consuming process which requires programming skills and I try to explain a simplified example that can help you to get started the process. When it comes implementing the full merit-oriented system customized to the requirements, get in touch with a developer.

Step 1: Setting up CMS for headless commerce can be an exciting yet challenging task.

- However, whether or not a headless commerce-supporting theme works for you, you can go for something simple and diversified.
- In order to do this, you will need to install and enable a headless commerce plugin, such as WP GraphQL or WooCommerce REST API, for instance.
- Enable API permissions for data access of product information, orders, and other relevant information.

Step 2: Develop the Headless prototype.

- Pick a framework to work with either React or Vue.js as the technology architecture for the headless frontend.
- Create a frontend project, just as you would do for the task of hacking a simple website using the tool of your choice (eg. create-react-app for React).
- Work with the WordPress API to retrieve the needed data at the frontend.
- Implement text style and component hierarchy or user interface the way it is desired.

Step 3: Implement e-commerce Mall and make it functional.

- Define a function that takes an item in the cart, a flag for a product that has been ordered, and a method of payment to be used in the backend.
- Use the APIs of WordPress and WooCommerce for any e-commerce operations. Create an AI-powered bot that can communicate with customers on a website or mobile application. The bot should be able to understand and respond to the customer's inquiries, provide support, and even conduct transactions. This framework could be implemented using WooCommerce or specific e-commerce APIs.
- Implement integration with payment gateways and payments services processing systems.

Step 4: The Test and Optimization.

If you have an online mobile phone store and are wondering whether or not headless commerce is right for your business, it's important to consider your store's specific requirements and the goals you want to achieve. Personalization in the context of a mobile phone store through headless commerce can bring many innovations and advantages. Here are some customization ideas and new features you can bring to your store:

- Custom Phone Configurators - Give customers the opportunity to customize their mobile phones through an online configurator. They can choose specifications like battery capacity, case color, storage capacity and more.
- Virtual Phone Setup Assistant - Implementing an interactive virtual assistant can assist customers in the phone setup process. This virtual assistant can guide users through choosing hardware specifications, software settings, and customizing features.
- 3D View of the Products - Use augmented reality (AR) technologies to provide customers with a 3D mobile viewing experience. This allows them to rotate, zoom in or out to examine the product in detail.

- Personalized Offers and Recommendations - Use data analytics algorithms to provide personalized offers and product recommendations based on customers' past purchasing behavior or stated preferences.
- Personalized After-Sales Services - Implement a customer portal that gives them access to personalized information about purchased devices, video tutorials, software updates and special offers.
- Integration with Smart Devices - If you sell smart accessories, integrate them with mobile devices to provide a connected user experience. For example, a smart light that syncs with phone notifications.
- Simplified and Personalized Checkout Process - Optimize the checkout process to make it as fast and convenient as possible. Implement one-click login and customized preferred payment methods for each customer.
- Gamification of the Shopping Experience - Add gamification elements to encourage customer loyalty. You can offer points for every purchase, weekly challenges or special promotions for loyal customers.
- Events and Exclusive Releases - Organize virtual events or exclusive launches for loyal customers. You can provide early access to certain products or special offers for community members.
- Interactive Content Sections - Create interactive sections on your site that offer video reviews, tutorials, producer interviews, or other forms of content that engage users and provide a richer experience.

Let's explore more specific customization ideas for a mobile phone store, in the context of a headless commerce environment:

- Advanced Phone Configurator: Implement an interactive visual configurator for customizing mobile phones. This could include options such as case color, hardware specifications, additional accessories and custom engraving.
- Personalized Offers for Accessories: Analyze customer purchase history and preferences to provide personalized offers for accessories. For example, if a customer frequently purchases Android phones, you can suggest compatible accessories.
- Video Reviews from Users: Allow users to upload video reviews of mobile phones they have purchased. This gives potential customers authentic insights and helps build trust in your products.
- Personalized Retargeting Campaigns: Use browsing data to create personalized retargeting campaigns. If a user has viewed a specific phone model, you can show specific ads for that product on various online platforms.
- Achievements and Badges - Give customers achievements and badges for different actions, such as placing their first order, completing a number of reviews, participating in special promotions, etc.
- Competitions and Games - Organize regular competitions or games with attractive prizes. For example, a monthly contest for the most creative custom phone design or an online game associated with your brand.
- Promotion of the Social Media Competition - Encourage customers to share their experience with your products on social media by holding contests. Those with the best posts or reviews can win prizes.
- Live Events and Video Broadcasts - Host live events on platforms like Instagram or Facebook where you showcase the latest phones, offer special prices and run interactive activities like polls or quizzes for prizes.
- Virtual Collection - Allow customers to virtually collect exclusive accessories or items by participating in certain promotions or purchases. Once they complete a collection, they receive special rewards.
- Game Feature Feedback and Reviews - Provide a review and feedback system that includes gamification elements, such as the ability to rate products as stars or emojis, and offer rewards for detailed feedback.
- Calendar of Gamified Events - Create a calendar of gamified events such as "Sales Week" or "Game Month" where customers can expect special offers and challenges.

3. Conclusion

Firms that adopt headless technology can gain more flexibility, agility and scalability. They will handle large orders and traffic so entrepreneurs can focus on insight-driven growth, data-driven decision making and personalizing user experiences. Additionally, businesses use a public API with more freedom to add, remove, or replace functionality to keep up with changing trends and customer preferences.

Headless e-Commerce breaks the traditional connection of the front-end and back-end systems by removing eCommerce platform dependencies. In a so called decouple model, the front-end part is designated to the user interface side where the backend, performs the implementation of both CRM and ERP functions, in accounting, production and inventory parts, connected via APIs (Application Programming Interfaces). In fact, an headless e-commerce involves separations between the backend framework and frontend interface. Hence, owners of a business will have the flexibility to tweak and fine-tune each component of their system individually, which means it is easy to execute updates as well as prioritize unique experiences offered to users.

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