CORRA

A Deep Dive Into Headless Commerce

HEADLESS / PWA WHITEPAPER

INTRODUCTION

Until recently, future-proofing your ecommerce site meant crossing your fingers and hoping that your chosen platform vendor would evolve their software fast enough to keep up with ever changing consumer expectations– without stranding you on an old and heavily customized legacy system.

Thankfully, that paradigm can now be laid to rest. By decoupling your front end from your back end and going headless, you can evolve the user experience you provide your customers quickly and flexibly, all while maintaining the integrity of the business-critical functionality of your back-end systems.

Headless commerce allows merchants to think and act like modern software companies– continually pushing out and evaluating new customer experiences across every channel and device.

Future proof omnichannel commerce is finally possible with solutions that bring the potential for checkout to every touchpoint– the ones we know about today, such as in store, desktop, mobile, and social; the ones that are growing in importance as we speak, such as voice-assisted shopping; and the ones that are looming on the horizon such as self-driving cars, and augmented/virtual reality.

Best of all, businesses don't have to be on the bleeding edge to take advantage of the myriad of benefits headless enables: today's modern ecommerce platforms all provide headless solutions that mainstream merchants can migrate to now.

SUMMARY

In this whitepaper, you'll learn what headless commerce means, what benefits it delivers and why the time to make the move is now. Many of today's most effective shopping experiences such as those delivered by Lancome and Casper are already powered by headless systems. With microservice-based platforms already making headway in the market, there is no turning back (more on that below). Merchants who fail to make the switch will be left behind by more nimble competitors. That is why Corra is aggressively investing our own resources in becoming the leading agency for headless commerce on behalf of our clients.

WHAT WE WILL COVER

- What headless commerce is and how this API-driven approach works
- The value of implementing headless for your commerce business
- Why a headless approach delivers 'future-proof' omnichannel capabilities
- How PWAs (Progressive Web Apps) go hand-in-hand with headless solutions
- How other brands have implemented headless PWAs

About the author

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Michael Harvey oversees the agency's technology and digital strategy teams. Michael has been with Corra for the past 10 years in various capacities as Chief of Operations and now Chief Strategy Officer. His 20+ year career has spanned marketing, branding, strategy, product development, operations, and technology for startups to large-scale companies like Microsoft and IBM.

WHY GO HEADLESS?

As you know, consumer demands are evolving at an increasingly rapid pace with no letup in sight. As Gen Z comes of “consumer age” (their purchasing power already represents 31% of the total U.S. income) merchants feel increasing pressure to provide the latest and greatest customer experiences. Until recently, only two types of merchants could keep up: digitally native brands that never had to worry about stores and legacy ERP systems in the first place and merchants with large capital budgets and internal development teams who could continually invest in evolving their (often homegrown) systems. It has been self evident that a traditional “off the shelf” ecommerce platform with a tightly coupled front and back end simply cannot keep pace with all of the expectations that a diverse universe of merchants must satisfy.

WHAT IS HEADLESS COMMERCE?

It seems the term "headless" can be susceptible to confusion. A much more evocative description would be its opposite: “multi-headed.” At the most basic level, a software system can be divided into two major components: front end or head that delivers the user interface a customer interacts with (for example, a Product Detail Page inside a browser or on a mobile app). And a back end that encapsulates and executes all of the business logic to actually make something happen (for example, fulfilling an order or processing a return).

Therefore, when we use the term “headless,” we are actually referring to the back end. But a back end with no head is basically useless. The simplest head would be a dumb green screen terminal for data entry. Incredibly, such systems are still in use today. The next time you’re checking in for a flight or into a hotel, crane your neck to view the screen the agent is working with and more often than not, you will see an interface that hasn’t changed since the 70’s.

So, when we describe a system as “headless,” what we really mean is that the front end and the back end are decoupled and communicate with each other in a very particular way, specifically, via an API or Application Programming Interface. APIs have been around almost since the start of digital computing. They have really come into their own, however, in the past decade rising to prominence alongside other major technology trends such as cloud computing and smartphones.

WHAT IS AN API?

In short, an API functions as a shared, public lexicon that any software system can use to communicate with another software system without knowing anything about how that other system actually works. To correctly populate the information on a Product Detail Page, for example, an ecommerce front end only needs to know what API to call to the back end to get all of the information related to a "Product." As long as the front end agrees to communicate with the back end via the API, it doesn't have to know anything about what goes on inside the back end, no matter how complex. In fact, because the front end is completely decoupled from the back end, the entire back-end system could be modified or even replaced without breaking functionality on the front end, as long as the new system provided the same APIs. This lack of lock-in is one of the major advantages of headless architectures.

In practice, however, because they typically encode business critical rules and operations, back ends tend to change slowly and incrementally. Unfortunately, this has meant that tightly coupled front ends have also had to change slowly and incrementally. Yes, it's nice that your customer wants to buy online and pick up instore, but unless the back-end system is capable of supporting that, enabling such a feature on the front end simply won't work and your IT department may simply shoot the idea down.

The result has been frustration in all quarters: frustration for platform vendors because it is not humanly possible to implement every use case to satisfy every customer no matter how many developers they employ; frustration for IT because marketers and merchandisers want to innovate and iterate rapidly without regard for the problems this creates on the back end; frustration for marketers and merchandisers because IT can't or won't deliver new capabilities fast enough for fear of breaking their systems; and frustration for customers who want a seamless shopping experience across all touchpoints including the ones that haven't even been invented yet.

By decoupling the head from the back end, marketers and merchandisers can control and go wild with the front end without fear of breaking the back end. And remember that bit about how "headless" is really a misnomer and what we should be talking about is multiple heads? A single back end can support an arbitrary number and type of heads: desktop, mobile, voice assistants, Instagram feeds, magic mirrors, empowered associate, kiosks, autonomous vehicles, vending machines (yes, vending machines!), you name it.

Thus, the real power of a headless approach to digital commerce comes in allowing each component of the system to evolve at its own pace: the back end slowly, incrementally, and conservatively; the front end(s) quickly and dynamically in response to customer expectations. In fact, the back end and front end can even scale independently, allowing you to add compute power only where and when it is needed rather than across the board for an entire system.

Image Source: https://corra.com/news/headlesscommerce/

Traditional Commerce Headless Commerce

APIS AND GRAPHQL

Theoretically, any system that has a complete API can be deployed in a headless manner. In practice, however, a set of best practices have emerged over the past few years or so to make deploying a headless ecommerce system practical for everyday merchants– not just those with huge IT departments and budgets, or those starting out as digitally native brands.

A headless commerce architecture isn't just for the bleeding-edge anymore, it's mainstream. It's for any merchant wanting to keep up with customer expectations, deliver innovative shopping experiences, and experiment early and often with proliferating touchpoints.

Both Magento and Shopify, two of the fastest growing modern ecommerce platforms and the ones Corra works most closely with have invested heavily in equipping their systems with complete APIs enabling true headless commerce. In fact, a headless architecture is so powerful that platform vendors such as Magento and Shopify are using their own APIs within their own platforms. Rather than having their "out-of-the-box" UI communicate with their own back end via database queries, these platform vendors are rearchitecting their systems to use the same API calls internally that a third party or custom developed external front end would use.

There are several established ways for a software vendor to implement a web service API. Common ones include REST, JSON, SOAP, even good old XML. What they all have in common is that they provide a well-defined vocabulary for querying a back-end system. Without an API, a developer has to construct a database query from scratch. A good developer can make these queries very efficient; a bad developer can make them very slow and difficult to debug. But what happens when the platform vendor changes their database schema in order to enable that new functionality their customers demand? Often, even the best-coded queries break. In contrast, disciplined platform vendors make sure that their APIs remain backward-compatible. If a given front end was coded to "Get Product" using the correct API syntax, then you can be confident that that API call will continue to work as intended.

It is completely possible to implement a fully headless solution using nothing but a given platform vendor's APIs. In fact, almost all of the headless commerce implementations to date have been constructed in just that way. However, there is an even more efficient way to go headless by using what we might call an API to the API. GraphQL has emerged as the standard for making commerce front ends work with a back-end system. A traditional REST API is a huge improvement over a custom database query. However, it can be inefficient. "Get Product" will generally return everything there is to know about a product: images, prices, descriptions, configurations, stock levels, etc. What if all a given Product Detail Page needs, however, is the "Product Description?" By using GraphQL, a developer can trim the front-end call to the bare bones: "Get Product Description." That is all the front-end developer needs to know to be confident that the right product description will be displayed in the right place and at the right time on the PDP. Modern ecommerce vendors such as Magento and Shopify provide complete GraphQL coverage for their full APIs.

You might wonder whether these various layers create inefficiency or slowness in the system. Quite the opposite is true. The fact that the platform vendors themselves are using their own APIs as they upgrade their systems is proof of how efficient a well conformed API can be. And GraphQL, with its streamlined data model greatly reduces network traffic and the speed with which queries execute.

Monolithic Ecommerce (pre-2019)

From a computing perspective, the benefits of a well-designed headless architecture should be clear by now. Before turning to the substantial business advantages such a system confers, let's take a moment to contrast headless systems with the traditional approach taken by software vendors until relatively recently, what we now term "monolithic" systems in which the head is firmly attached to the body.

IN A MONOLITH, CUSTOMIZATIONS TO THE FRONT END CAN BREAK THE BACK END AND VICE VERSA.

A tightly coupled front and back end makes it difficult to effect change in one without simultaneously modifying the other. Any new front-end functionality may well require custom back end functionality. And even if a new capability in the front end leverages preexisting or latent back-end functionality, the whole system needs to be tested to ensure no unexpected bugs have been inadvertently introduced. Often, rolling out new functionality requires bringing the entire system down for a maintenance window, a nerve-wracking experience for anyone who has experienced this (usually middle of the night) drill. With a headless architecture,development can occur in parallel and asynchronously. Changes to the back end that provide new integration points to the warehouse management system, can be made independently of the new video slider functionality added to the home page.

MONOLITHS CAN CREATE INTERNAL CONFLICT AMONGST STAKEHOLDERS.

Many organization's development, marketing, and design teams operate in silos. When customers didn't expect more than a basic shopping experience and didn't mind that transactions in one channel lived in a different universe than transactions in another, siloed teams weren't detrimental to sales. Today, shoppers want a unified shopping experience and aren't sympathetic to the internal challenges that merchants face in trying to deliver them. A headless architecture doesn't magically make the different priorities of Business and IT go away. Rather, it allows each internal stakeholder group to focus on its area of expertise and move at the pace that makes sense for it. When everyone can hold up their end of the mutual goal to provide a seamless shopping experience to customers, internal teams actually become more cohesive, collaborative, and high-functioning.

MONOLITHIC SYSTEMS GENERATE FRAGMENTED CUSTOMER EXPERIENCES.

We all know the drill: marketing has a promotion that they want to try; the design team is sure an interface tweak will increase conversion; merchandising wants to personalize the shopping experience based on weather conditions in a particular shopper's area and almost all of these endeavors are dependent on a developer. In the best case scenario, the commerce system has some kind of CMS (Content Management System) that a non-technical user can operate, but with only limited flexibility. The result is a fragmented customer experience (CX), particularly for any interaction that crosses devices and/or channels. It has been demonstrated time and time again that jarring customer experiences damage brand loyalty, convert at lower rates, or lose customers altogether. When marketing and creatives have the freedom and tools to innovate and experiment, they're able to garner the rich insights that lead to higher conversions and more satisfied customers. Accelerated growth and profitability are the inevitable results.

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Your mission is to create seamless and engaging experiences that drive revenue and loyalty. Your brand’s most powerful distinction will be creative expression, physically and digitally, and the emotional response it stirs.

JOE CICMAN Senior Analyst, Forrester

MONOLITHS ARE TRAPPED INSIDE THE DEVICES THAT EXISTED WHEN THEY WERE DEVELOPED.

Forward-looking merchants should be able to sell to their consumers anywhere and anytime. It’s hard to recall the time before smartphones saturated the market. But when it became clear that customers wanted to shop on their mobile devices, the industry struggled for several years to deliver acceptable solutions. Eventually, mobile apps gave merchants with powerful brand loyalty a way to engage their customers. While everyone else redesigned their ecommerce sites to be responsive. Nevertheless, conversions on mobile devices still lag far behind in store or desktop shopping sessions.

We already know we’re living in a mobile-first era, that’s old news– yet many older ecommerce systems still struggle to deliver shopping experiences that satisfy (let alone delight) their customers. Traditional monolithic systems remain mobile-second. In fact, they’re vending-machine second, self-driving car second, smart mirror-second, and so on. These traditional systems simply can’t keep up with the shoppable moments of today, let alone those of tomorrow. The good news is, there is a solution: Progressive Web Apps (we’ll discuss PWAs and why they make a perfect match with headless systems in more detail below.)

The Business Value of Headless Commerce

A headless architecture, as explained above, is a relatively simple concept: the front-end UI is decoupled from the back end and the two systems communicate via an API.

While the concept is simple, the implications are profound for today's omnichannel merchants. Whereas in the past, the responsibility for keeping up with customer expectations resided with the platform vendors, today it resides with the merchant and their partners.

This means that merchants need to think and act like modern, agile, web-based software companies: they need to experiment, analyze, and strive for a cadence of incremental innovation rather than forklift upgrades.

The shopping experience merchants offer their customers should also be considered to be their 'product' as much as the goods they ultimately deliver to those customers. We can't all be Amazon, but we can be inspired by their example: depending on which source you believe, Amazon pushes a new front end out the door every few seconds. The only way they can do this is because they've completely decoupled their front end from their back end. In fact, it was this way of doing things that led directly to Amazon Web Services. Most people think of Amazon as an ecommerce company with a computing business on the side. Given that "AWS" drives over 50% of its profits, it would be more accurate to think of Amazon as a technology company with an ecommerce business on the side.

The only possible way for merchants to embrace these practices is by running their commerce operations on a headless system. More accurately, we should say “systems,” plural. Merchants no longer need to be bound by the limitations of a single platform. There’s no need to put all of their “eggs” in one platform vendor’s basket. They can use a best-of-breed ecommerce system to manage digital transactions, a flexible CMS to manage content and merchandise their site, and a bomb-proof ERP to keep finances and logistics straight. This in turn takes the pressure off of the software platforms, allowing them to focus on essential attributes such as performance, scalability, and security. While it will take some time for all the kinks to be worked out, software providers are building microservices that run in the cloud and can be stitched together to deliver best in class customer experiences.

This shared responsibility amongst software vendors, merchants, and their partners (such as Corra) represents a significant change in what have been generally stable relationships for the past several decades. Which can seem daunting at first glance. But it is the only way that merchants can meet their customers at the time and place of their choosing, the only way they can future-proof their business and deliver content anywhere and everywhere on both current and future devices. No one can predict what the next shoppable moment will be, or what touchpoint will make it possible. But implementing a headless digital commerce system can ensure you and your brand will be there when it materializes.

As for Corra, we fully anticipate that we’ll be designing interfaces for both smart mirrors and smart cars and advising our clients on how to derive maximum value from them.

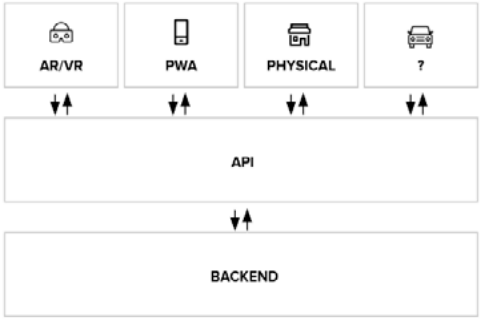

Image Source: https://www.corra.com/

TO APP OR NOT TO APP

If a headless architecture represents an ideal marriage of the two major components of any software system (the front end and back end), Progressive Web Apps represent the ideal marriage of the two major device paradigms of our time: desktop and mobile.

Despite enormous innovation in technology, the desktop interface has remained stable for over 30 years– you look at a screen and type on a keyboard and click on a mouse to interact with it. The smartphone (only 10 years old!) and its mobile paradigm represented a seismic shift to desktop computing. Rather than diminishing, the mobile shockwave has only grown in strength. Today, "mobile" really means activity that takes place on any digital device that is not hardwired to a traditional desktop: phones, tablets, POS, in store kiosks, smart-home devices, smart tags on clothing, VR, AR, car screens, etc.

Browsing on mobile has surpassed desktop, yet only 34% of ecommerce sales in 2019 so far were made on a smartphone, according to eMarketer. It should be clear by now that the only practical way to distribute content including shopping capabilities to this burgeoning list of devices is via a headless commerce architecture.

But even with the right system architecture, the actual user experience delivered by the front end still has to be tailored to whatever device(s) a customer happens to be using at a given time. Until recently, most merchants could simply worry about two viewports: phones and tablets. One of Apple's great innovations and lasting legacies was the creation of their App Store. Unfortunately, apps turn out to be expensive to build and difficult to get users to install, let alone use. Content delivered via apps is virtually impossible to find unless a customer is actually already using the app. And Apps have to be approved by the operators of the app stores before being made available to the public.

This is not to say that apps don't have their place in commerce. If you have a highly differentiated brand with a loyal customer base, an app can be a great way to engage your audience and drive business. But for many (most?) merchants, investing in a full-fledged app simply does not make sense.

Until now, the “poor man’s” alternative to a standalone app was a responsively designed site. In short, a responsive site is designed and developed in such a way that it changes its look and feel and modes of interaction based on the device being used to access it. Responsive sites come with significant benefits: there is a single URL for all device types, the same content is available on all devices, that content is fully discoverable by search engines, and so forth. But many of the features that make native apps so optimal for mobile devices are impossible to replicate: icons on the home screen, incorporation of device hardware such as the camera into the UX, push notifications, and the like. Enter Progressive Web Apps.

WHAT ARE PROGRESSIVE WEB APPS?

Progressive Web Apps, or PWAs, warrant their very own whitepaper. At Corra, we’re confident that PWAs (Progressive Web Apps) represent the best way to build a modern website today. We see an undeniable synchronicity between headless architecture and PWAs – as do the major software vendors. Both Magento and Shopify continue to invest heavily in PWA capabilities for their platforms.

Strictly speaking, it is not necessary to build a headless commerce system as a PWA. As discussed at length above, headless simply means that the front end (or front ends) are decoupled from the back end via an API. In our opinion, however, it would be shortsighted not to implement any new commerce system as a PWA. In the very short term, while vendors and agencies are putting the finishing touches on their PWA solutions and skillsets, there might be a modest incremental cost to going with a PWA (just as there was in the early days of responsive design), but that cost will be quickly outweighed by the benefits conferred by a PWA solution. All of Corra’s projects that have kicked off recently are being implemented as progressive web apps.

Many people in the industry believe that PWAs are second-class apps. This is simply not the case. PWAs lack many of the disadvantages of traditional apps such as cost, separate code bases, opacity to search engines, fragmented customer experience, and de facto irrelevance. App fatigue is real and the average user interacts with only half-a-dozen apps in a week, and most of those are ones that came with the phone. By contrast, PWAs are your website.

This is a subtle but important point and bears repeating: when you build a PWA, you are actually building the single website that every customer uses and that runs on every device. The advantages are many and too long to enumerate here. But some of the notable advantages include: rich user experiences when the device is offline, a single URL, lightning-fast performance, push notifications, Apple/Android Pay, search engine discoverability, ability to use device-specific capabilities (such as the camera or GPS), ability to install an icon to the home screen, no need to list on an app store… the list goes on.

Because its back end is implemented in a headless fashion, the PWA front end(s) can be designed and developed to behave optimally on any device: you can talk to the app via Alexa, you can scan barcodes in the app on your phone, and you can interact with the site in all its glory on a large desktop monitor. And all of these multi-modal experiences can be stitched together into a coherent shopping journey with the actual transaction consummated wherever and whenever it most suits the consumer.

Looking FWRD?

Leveraging this future-proof technology, Corra is creating FWRD: a platform-agnostic PWA storefront that combines lightning-fast performance with a sophisticated front end crafted around the needs of lifestyle consumers.

Being completely headless, its architecture allows retailers to seamlessly attach the app-like front end to any backend system via APIs. To ensure even more agility, FWRD comes equipped with a proprietary library of UI components. This catalog was built using the latest front-end technologies, and offers dozens of features that can be smoothly implemented to convey your unique brand experience. Through FRWD, you can embrace the power of PWAs to increase your prominence among search rankings, improve site speed immensely, and convert mobile shoppers – even when they are browsing offline.

BRANDS GOING HEADLESS/PWA

Lancôme, the beauty brand owned by cosmetic industry giant, L'Oreal watched mobile traffic surpass desktop for the first time in 2016. Yet despite an increase in mobile visitors, their conversion rate on smartphones lagged. On desktop, 38% of shopping carts led to orders, compared to 15% on mobile devices.

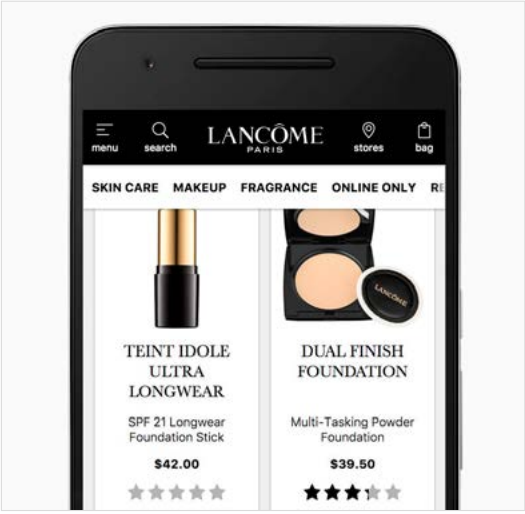

Image Source: https://developers.google.com/web/showcase/2017/lancome

The brand knew that building a native app would only appeal to their loyal and recurring customer base. They wanted a fast and compelling mobile experience, similar to what they would have achieved with a naitve app– but one that was accessible to everyone on the mobile web. Their PWA launch saw **a 17% increase in conversions, 53% increase in mobile sessions on iOS and 8% increase in conversion rates on recovered carts via push notifications.**

Pinterest's venture into PWA was led by their focus on international expansion; which ultimately pointed them to the mobile web. When they analyzed usage for unauthenticated mobile web users, they found their outdated and slow web experience only drove 1% of visitors to sign up, login or install their native app. Pinterest built their PWA using React, Redux and Webpack. **Their time spent is now up by 40%, user-generated ad revenue is up by 44% and core engagement is up by 66%.**

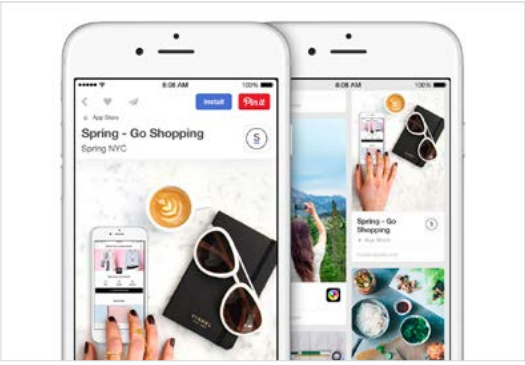

Image Source: www.pinterest.com/

NOW IS THE TIME

If you plan to launch a site in the next six months, consider a headless PWA.

Is headless commerce part of your roadmap? Whether you plan on implementing a headless solution this year or two years from now, reach out to Corra today. Our team is happy to provide strategic guidance and share our expertise. You can also read more about progressive web apps on our blog.

SPEAK WITH ONE OF CORRA'S ECOMMERCE SPECIALIST

CORRA

Corra is the global digital agency that experience-driven brands trust to accelerate their growth. Working at the intersection of business strategy and customer experience, we are known for our unmatched ability to deliver complex digital commerce solutions to leading lifestyle retailers.

Over the past 15+ years, we have concentrated our expertise on the Magento, SAP Commerce Cloud, and Shopify Plus platforms, building a reputation for our thorough approach to technology assessment. We pair business analysis and customer insights to drive early wins and tangible ROI. Then, we develop a 360° roadmap aimed at increasing brand loyalty and generating long-term growth for our clients.

With seven offices and headquarters in the key markets of New York, Los Angeles, and London, Corra is uniquely positioned to service global retailers with ambitious revenue goals.