Innovation Insight for API-Based Digital Commerce

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Supporting Key Initiative is Digital Commerce Technologies

API-based or "headless" commerce can power modern multichannel transactions for innovative businesses looking for flexible solutions. Application leaders responsible for digital commerce technologies should use this research to determine whether this model fits their digital business ambitions.

Overview

Key Findings

- Some companies seeking to innovate are moving beyond the inflexible and architecturally closed "monolithic" commerce applications of yore, toward experience-led or API-based platforms that allow more refined control over the user interface and overall digital customer experience.
- The need to deliver relevant, multichannel experiences demands more agility and innovation in digital commerce solutions.
- The increasing reach of digital into the physical context of the customer — for example, in stores and cars, and with Internet of Things (IoT) devices — means that transactional customer experiences must perform seamlessly across these platforms.
- As digital business platforms emerge, commerce remains a core component, and APIs are the point of integration with wider platforms.

Recommendations

Application leaders responsible for digital commerce technologies should:

- Gauge the relevance of an API-based commerce approach for your organization by understanding the main approaches to digital commerce platform architecture, and how they fit with your business goals.
- Understand your digital IT and business maturity before committing to an API-based commerce platform.
- Use API-based commerce capabilities as modular services within an API-oriented architecture to gain the maximum benefit.
- Employ API-based commerce capabilities to enable new digital business models and novel customer journeys, or to enhance existing platforms with poor or no commerce functions.

Strategic Planning Assumption

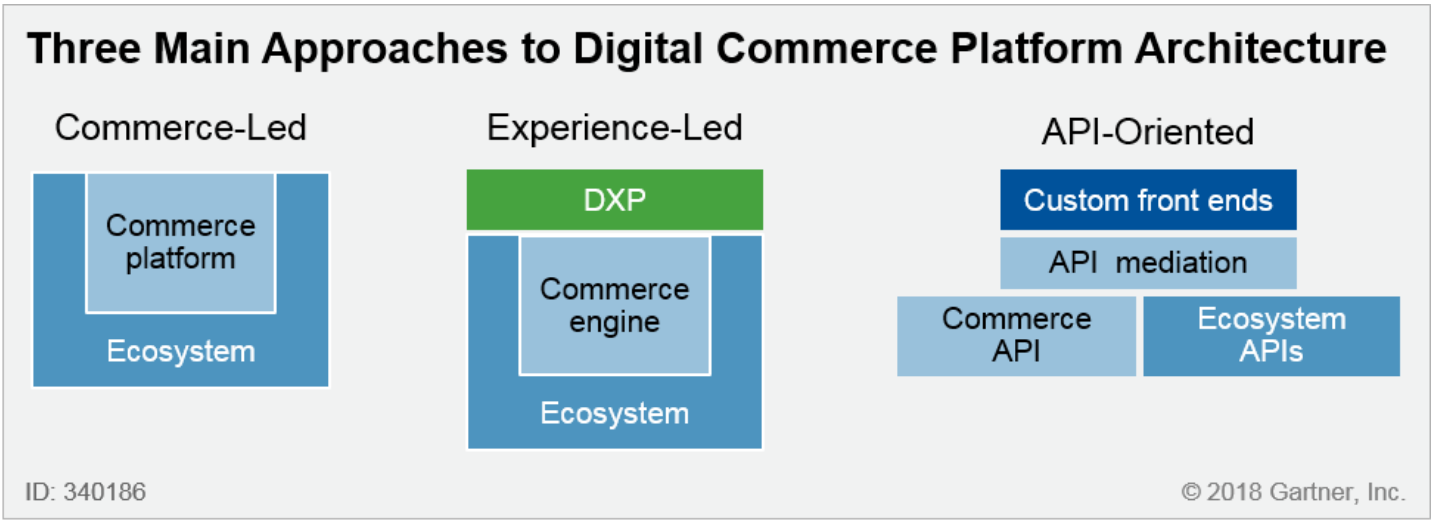
By 2022, 10% of organizations doing digital commerce will build that existing commerce business into a platform business, to transform themselves into digital businesses, and 60% of those will employ an open ecosystem to scale up the growth.

Analysis

Digital commerce platforms originally developed out of "shopping cart" code integrations, extending to packaged software providing services like product catalogs, search, customer login and preferences, payment service provider integrations, and basic order management. As they matured, the "e-commerce shop" became a dominant web application platform for B2C companies and, more recently, manufacturers and distributers providing B2B commerce. However, continued rapid change, especially in analytics and marketing technology, found these platforms to be lagging in flexibility and innovation, and the digital commerce ecosystem developed around them (see Leverage the Digital Commerce Platform Ecosystem to Optimize IT Decisions (https://www.gartner.com/document/3755263)).

The growth of digital marketing sophistication and the understanding of the differentiation that a focus on customer experience can bring, encourages businesses to use more experience-led approaches, including taking back control of the user interface (UI) and creating novel customer journeys. This is usually achieved either via using a separate web content management (WCM) system or digital experience platform (DXP), or creating a custom presentation layer. At the same time, application architecture has moved toward a model whereby back-end functionality is increasingly delivered via APIs, which may be externally sourced through the so-called "API economy." This includes the market for API-based "headless" commerce services; some vendors have pivoted to this model or created new platforms from scratch. In parallel, mature incumbent platforms needed to begin supporting native mobile apps and in-store platforms such as kiosks, mobile point of sale (mPOS) or sales support. More sophisticated businesses chafed at the lack of flexibility in traditional commerce platforms regarding integration with these new touchpoints and integration with marketing content. Thus, mature vendors have also created APIs layered over the existing platforms. These drivers have led to three primary approaches to commerce architecture: commerce-led, experience-led and API-oriented (see Figure 1). API-based commerce platforms focus on delivering to the latter two approaches.

Figure 1. The Three Main Approaches to Digital Commerce Platform Architecture



Source: Gartner (February 2018)

Definition

API-based digital commerce platforms are software solutions that deliver digital commerce functionality primarily via APIs. This functionality includes but is not limited to:

- Product search
- Product information
- Pricing management
- Customer account management
- Shopping basket
- Payment workflow
- Payment service provider integration
- Transaction and order processing

These capabilities are increasingly deployed via a cloud-based, componentized, service-oriented architecture, and decouple the business logic, transactional and data aspects of digital commerce from the presentation layer.

Description

Commerce functions consumed via API is a core capability of some digital commerce platforms, mostly sold as SaaS. These platforms may not provide a tightly integrated presentation layer "storefront," and instead are built for integration into external interfaces and systems. External systems include WCM systems, DXPs, API mediation products or custom front-end presentation layers. By building the UI using client-side frameworks such as Angular and React with thin server-side application orchestration tiers, API-

oriented architecture lends itself to the use of pluggable services — for front-end and back-end services required for modern digital commerce such as inventory, product information management (PIM), WCM, personalization, analytics and commerce engines. These functions can be your own internally developed solutions, or come from best-of-breed vendors. An API-oriented architecture also reduces the need for large investments in "full-stack" monolithic commerce platforms, as only the components required need to be utilized.

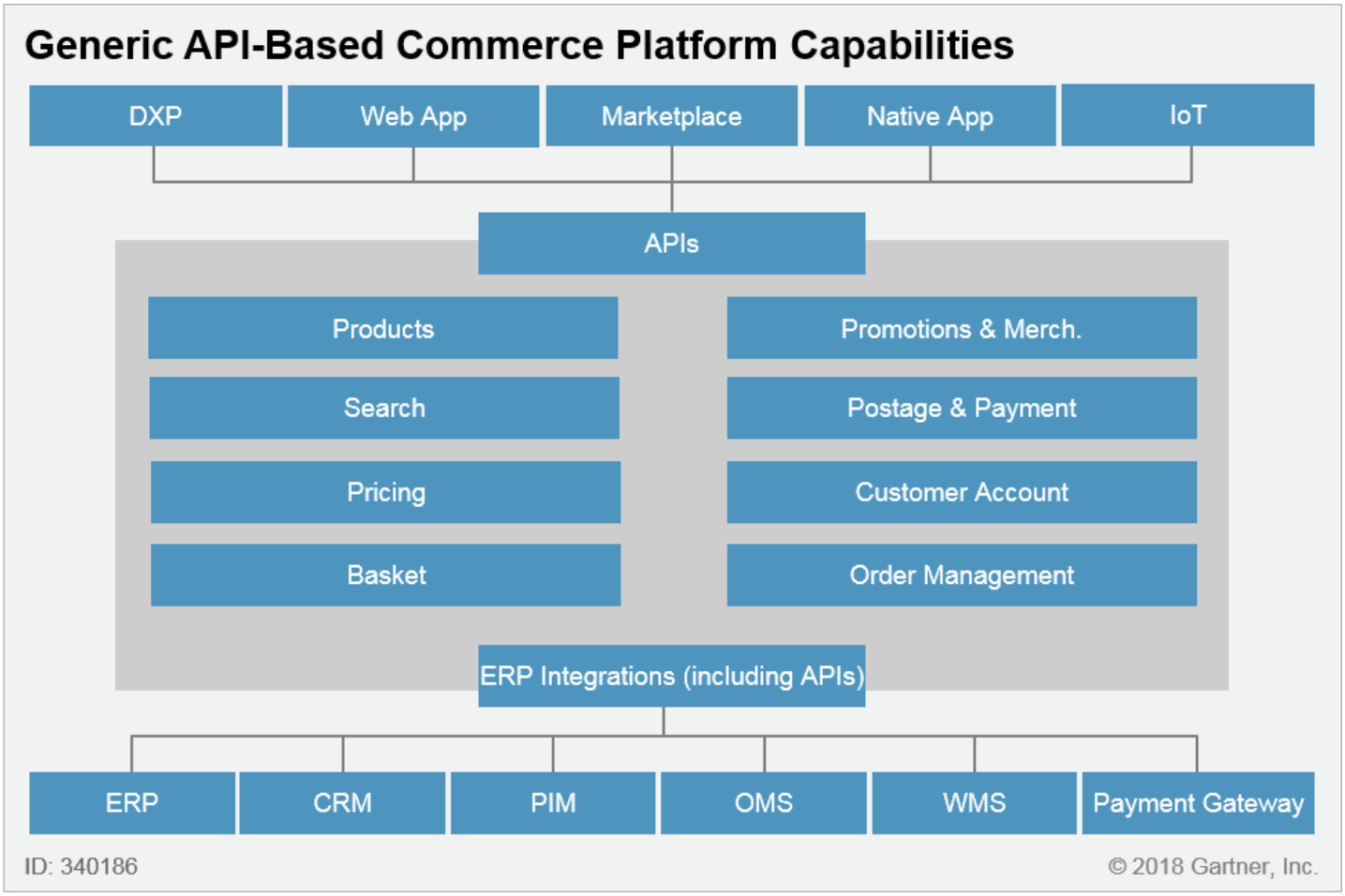
Integrating commerce functions via APIs is not new but is gaining momentum due to several factors:

- The recognition of the digital experience as a key differentiator (for example, from a plain vanilla "e-commerce" site)
- The emergence of DXPs that provide a single, consistent customer experience presentation layer to a business (bringing together commerce, content and marketing functions) regardless of interface/touchpoint
- Companies wishing to add commerce capabilities to an existing WCM-based catalog, without replatforming, or building a new DXP around a WCM/portal product and integrating digital commerce services into that application
- A shift for brands and others who wish to develop and maintain their own presentation layers (via front-end frameworks and rich, client-side applications) and thin server-side tiers such as Node.js and API gateways
- The realization that future digital business platform innovation will rely on the flexibility and control provided by API-oriented architectures
- The growing expense and complexity of some leading commerce platforms, when only a subset of capability is required for a given use: meaning customers buying more functionally than is needed

What Capabilities Are in API-Based Platforms?

Figure 2 shows a generic API-based platform. All core functions are exposed as APIs. If the architecture underlying these is microservice-based, each functional API may be available independently, which also enables service payment on a consumption basis. Few vendors have moved to this "API economy model" as yet, however. In general, the core functions align with those found in monolithic commerce applications.

Figure 2. Generic API-Based Commerce Platform Capabilities



Source: Gartner (February 2018)

Core digital commerce capabilities include:

- Product information (at least SKU and search attributes) catalog (such as PIM integration)
- Search
- Pricing integration
- Inventory (product availability) integration
- Basket management and workflow
- Promotions and merchandising
- Price and offer management: promotions and discounts
- Postage/shipping/mailing rate calculation, tax integration (may come from third-party services)
- Payment service provider integration
- Customer account management (registration, login [authentication and access])
- Basic order processing/management

- ERP integration connectors (customer, order and transaction at a minimum)

More sophisticated platforms may include:

- Wish list management
- Recommendations and relevance (personalization integration)
- Gifting
- Store locator
- Scheduling tools (such as home delivery)
- Subscription management
- Buy online, pick up in store (BOPIS)/click and collect
- Loyalty (reward points)
- Split ordering/distributed order management (DOM) system (often a separate SKU)
- IoT interfaces (reorder-replenish)

API-based platforms will usually not include functions concerning wider digital customer experience management:

- Branding
- Content and navigation
- Search engine optimization (SEO)
- Landing pages
- Geotargeting
- Navigation
- Reviews and ratings
- Customer journey analytics and client-side personalization
- Integration with support services (chatbots, knowledge bases)

B2B functionality is more complex; for example, regarding product complexity, the customer entity and approval workflows (see "Embrace the Possibilities and Distinct Characteristics of B2B Digital Commerce for Optimal Results" (https://www.gartner.com/document/code/300186?ref=grbody&refval=3855704)).

Most API-based digital commerce platforms are less developed in this area, having originated in B2C. Some vendors are building capability in this space.

Benefits and Uses

Digital commerce continues to evolve rapidly, and the digital business landscape that it will operate within will have API orientation at its core. Future digital business platforms will require commerce capabilities. Gartner sees APIs as the universal enabler for these platforms and the business ecosystems they will support (see "From APIs to Ecosystems: API Economy Best Practices for Building a Digital Platform" (https://www.gartner.com/document/code/331662?ref=grbody&refval=3855704)). Within digital commerce itself, Gartner has introduced a vision for this evolution by terming it "commerce that comes to you" (see "Industry Vision: Commerce That Comes to You" (https://www.gartner.com/document/code/304025?ref=grbody&refval=3855704)). Digital commerce platforms with fully functioning commerce APIs are the only type ready to lead this evolution. Businesses wishing to innovate and become leaders in their sector are seeking to build flexible digital business platforms. This may require them to modularize legacy platforms to enable agile development for a bimodal world, using API mediation for connectivity. Building new platforms from modular services (such as mesh or microservices architectures) brings the required flexibility and API-based commerce services that are among the critical capabilities required for this approach. We expect that these capabilities will become more widely available as a set of discrete services that can be utilized independently (with an appropriate cost model), and that consuming these capabilities should no longer require a "whole platform" full-stack purchase or subscription. In essence, we are seeing the deconstruction of the "e-commerce platform." The wheel has turned full circle to the point of using a plug-in "shopping cart" again, but this time as a cloud SaaS service with more sophistication.

API-based digital commerce platforms have found early adopters among businesses selling digital goods and services, businesses that serve multiple channels with an extensive set of diverse touchpoints including physical, or have a unique business model that monolithic commerce application vendors cannot support without considerable customization. As commerce that comes to you evolves, touchpoints spread beyond the "storefront" toward the customer's context:

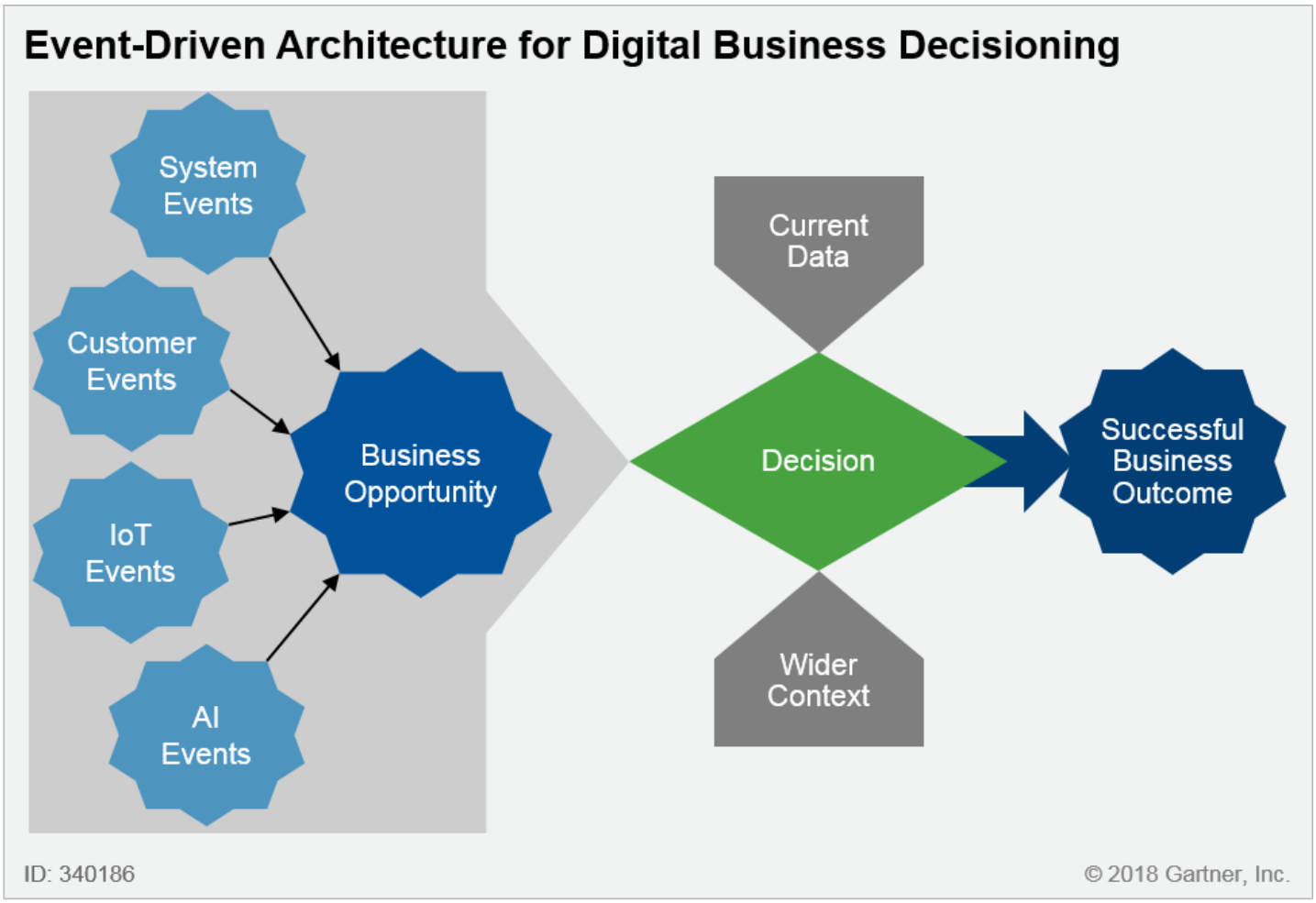
- Native mobile apps
- Digital marketplaces
- Social platforms
- In-store experiences (kiosks, magic mirrors, endless aisle)
- Emerging IoT and wearables
- Augmented reality (AR) and virtual reality (VR) immersive experiences
- In-app, in-game payments
- Smart homes and vehicles
- Conversational interfaces (phones, chatbots, digital home devices)

All these channels require a decoupling of presentation from functionality, logic and data that an API-based approach offers. Previously, many of these would have required a "full-stack" approach of their own, leading to silos of customer engagement that would ultimately limit the realization of business potential.

It's Not Just About Request-Based APIs

We are beginning to see the evolution of more real-time relationships between customers and sellers. This can be seen in behavioral personalization using real-time data to change product recommendations or display alternative product choices. As customers cross touchpoints in real time, commerce must keep up; for instance, by providing a persistent basket and up-to-the-moment customer profile. All of this is resulting in the emergence of event-driven architectures in digital platforms dealing with streaming data. Although at an early stage, real-time, event-driven functionality is becoming a part of commerce architecture — where the "database" is no longer king, but the event log is (see "Embrace Event-Driven Architecture With Responsive Decisions for Digital Business Solutions" (https://www.gartner.com/document/code/329513?ref=grbody&refval=3855704)). In this case, in-memory computing will become a core capability — most often in the cloud; for example, the Apache Kafka platform. Next-best actions are taken in real time based on the events that occur as part of the customer journey (see Figure 3). An API-based digital commerce platform alongside an event-driven architecture can understand where customers are and what they are engaging in, in real time regardless of touchpoint. This enables the overall platform to provide tailored, contextual offers and experiences (which can be paid for in real time, too).

Figure 3. Event-Driven Architecture for Digital Business Decisioning



AI = artificial intelligence

Source: Gartner (February 2018)

Risks

API-based platforms are the opposite, in terms of goals, of the offerings of end-to-end multitenant cloud commerce platform vendors. API-based platforms bring increased flexibility: They enable a business to build a digital business platform that is agile and modular, based on multiple services, eliminating the challenge of lower flexibility and customizability that can limit purely multitenant cloud commerce solutions. API-based digital commerce platforms do not compete directly with "turnkey" end-to-end or single-vendor enterprise commerce solutions, or packaged midtier solutions. Moreover, companies looking for a packaged, "out of the box" approach to digital commerce are unlikely to consider them. Primarily, API-based platforms work best where transactions need to be handled across a wide range of touchpoints, and not primarily via the traditional "product catalog" interface of more-packaged systems, or where novel user experiences drive commerce. Thus, they are not for everyone, and businesses may find simpler solutions for more mainstream use cases.

API-based commerce platforms do not stand alone and are part of an ecosystem of capability driving a modern digital business. As such, these systems have more moving parts than traditional single vendor platforms, and therefore require continual investment and technical governance. This approach calls for a development/delivery team to be in place, internally or via a partner. Each time services such as an API-based commerce service are upgraded or improvements are required, this team is responsible for delivery. Additionally, someone in the business (usually an architect) needs to understand the jigsaw of services in place, and the potential impacts of change.

The lack of adequate technical governance over an API-oriented architecture can risk business continuity (see the Evaluation Factors section). There is, of course, higher dependency on third-party providers that can cause disruption if the API is discontinued, or the version is deprecated and you must move to a newer version. Similarly, if the API does not meet its SLA, mitigation must be in place. API mediation can help to reduce the hard dependency on external third-party APIs.

Evaluation Factors

In evaluating whether API-based commerce is a good fit, businesses must look at their internal maturity as a digital organization. The technical complexity of the API-oriented approach can be challenging unless the appropriate skills, experience and governance are in place. Essentially, if your organization is low on the IT maturity score and has not yet embraced bimodal IT and product thinking, explore using a full-stack digital commerce platform. Consider the following types of factors as you evaluate an API-based commerce approach:

Organizational:

- Your IT maturity score
- Bimodal IT operations
- Pace-layered architectures
- Product thinking and product teams
- Agile development methodologies
- DevOps maturity

Organizations that are more mature in these areas will have an easier time adopting API-based commerce platforms. For more on how these work together to bring digital maturity, see "Design an Effective Organization for Digital Commerce." (https://www.gartner.com/document/code/319108?ref=grbody&refval=3855704)

Functional:

- Legacy platform that cannot be replaced in one step
- Number of customer touchpoints
- Complexity of business environment
- Complexity of digital products, brand offer and services
- Desired speed of innovation

To understand how these factors influence a digital commerce architecture decision. see "The Three Approaches to Digital Commerce Architecture and How to Choose Among Them." (https://www.gartner.com/document/code/319165?ref=grbody&refval=3855704)

Recommendations

- Gauge the relevance of an API-based commerce approach for your business by understanding the main approaches to digital commerce platform architecture (see "The Three Approaches to Digital Commerce Platform Architecture and How to Choose Among Them" (https://www.gartner.com/document/code/319165?ref=grbody&refval=3855704)).
- Understand your IT and digital business maturity before committing to an API-based commerce platform. For advice on how to do this, see "Design an Effective Organization for Digital Commerce." (https://www.gartner.com/document/code/319108?ref=grbody&refval=3855704)
- Use API-based commerce capabilities as modular services within an API-oriented architecture to gain maximum benefit. If all application services are considered as potential API services, the resulting platform can be more flexible.
- Employ API-based commerce capabilities to enable new digital business models and novel customer journeys, or to enhance existing platforms with poor or no commerce functions. API-based commerce capabilities can be "plugged in" to a content- or experience-oriented platform such as a WCM or DXP to provide commerce capabilities. Furthermore, new digital business models are emerging, and commerce is a core part of the digital business platforms that these require. APIs and API management are core to these emerging platforms (see "Mediated APIs: An Essential Application Architecture for Digital Business" (https://www.gartner.com/document/code/310378?ref=grbody&refval=3855704)).

Representative Providers

Note: These are representative, not comprehensive lists.

"Pure play" API-based vendors include:

- commercetools
- Elastic Path
- moltin
- Skava
- Storm Commerce

Full-stack commerce platforms with a comprehensive API tier include:

- Broadleaf Commerce

- Digital River
- Four51
- Insite Software
- Intershop
- Kibo
- Magento (2.0.x)
- SAP Hybris
- Symphony Commerce

Recommended by the Author

Hype Cycle for Digital Commerce, 2017 (https://www.gartner.com/document/code/313885?ref=ggrec&refval=3855704)

What's Hot in Digital Commerce in 2017 (https://www.gartner.com/document/code/313832?ref=ggrec&refval=3855704)

Leverage the Digital Commerce Technology Ecosystem to Optimize IT Decisions (https://www.gartner.com/document/code/329089?ref=ggrec&refval=3855704)

The Gartner Digital Commerce Vendor Guide, 2017 (https://www.gartner.com/document/code/326514?ref=ggrec&refval=3855704)

The Three Approaches to Digital Commerce Platform Architecture and How to Choose Among Them (https://www.gartner.com/document/code/319165?ref=ggrec&refval=3855704)

Industry Vision: Commerce That Comes to You (https://www.gartner.com/document/code/304025?ref=ggrec&refval=3855704)

Embrace Event-Driven Architecture With Responsive Decisions for Digital Business Solutions (https://www.gartner.com/document/code/329513?ref=ggrec&refval=3855704)

Scaling Digital Commerce Into a Digital Platform Business (https://www.gartner.com/document/code/341676?ref=ggrec&refval=3855704)

Mediated APIs: An Essential Application Architecture for Digital Business (https://www.gartner.com/document/code/310378?ref=ggrec&refval=3855704)

A Digital Business Technology Platform Is Fundamental to Scaling Digital Business (https://www.gartner.com/document/code/342253?ref=ggrec&refval=3855704)

Recommended For You

Building an Agile Application Architecture With Integrated Apps, APIs and Services (https://www.gartner.com/document/3870364?ref=ddrec&refval=3855704)

Toolkit: Storytelling Digital Innovation Decision Making to Influence and Persuade Business and IT Leaders of EA Advisory Role (https://www.gartner.com/document/3849077?ref=ddrec&refval=3855704)

Toolkit: Using New Metrics to Measure Innovation Effectiveness Will Drive Your Brand (https://www.gartner.com/document/3879771?ref=ddrec&refval=3855704)

Decision Point for API and Service Implementation Architecture (https://www.gartner.com/document/3879865?ref=ddrec&refval=3855704)

Toolkit: 2017 Eye on Innovation Award Initiatives in Financial Services (https://www.gartner.com/document/3869667?ref=ddrec&refval=3855704)