Hype Cycle for Digital Commerce, 2023

Published 17 July 2023 - ID G00790636 - 110 min read

By Analyst(s): Sandy Shen

Initiatives: Digital Commerce and CRM Sales Technologies

As organizations face economic pressures, digital commerce remains an important component of their digital strategy that supports growth while keeping costs down. This Hype Cycle will help application leaders assess a wide range of commerce technologies to support their commerce-related investments.

Analysis

What You Need to Know

As economic pressures mount, organizations are increasingly focusing on cost efficiency but are not letting go of their growth objectives. About half of the technologies on the Hype Cycle this year are distributed between the peak and the trough.

Composability is a strong theme this year, not only for the core digital commerce platform, but also ecosystem applications, such as DXP and product configurators. Digitally advanced organizations proactively choose composable applications, while others adopt these technologies incrementally, starting with fewer modules at lower costs.

With the fast adoption of generative AI, vendors are increasing their investment in the technology and exploring how it can improve the performance of their offerings. Potential areas to watch include product content generation and enrichment, catalog mapping, search and product discovery, customer segmentation, product recommendation, conversational interface, and machine commerce.

The Hype Cycle

Compared with 2022, technologies are more distributed between the peak and the trough. Some technologies have advanced significantly in the past year:

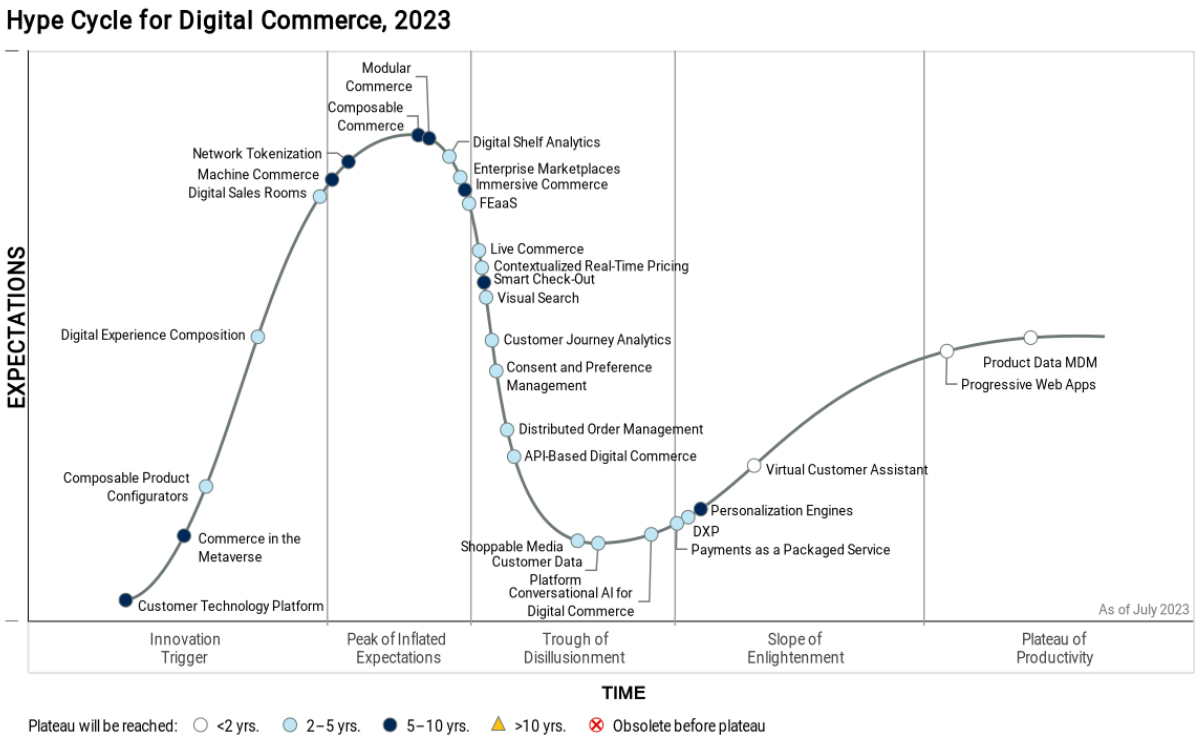
- Payment as a packaged service moved from the peak to start climbing to the slope, as its value is obvious to payment vendors and software vendors that acted quickly to launch the service.

- Frontend as a service (FEaaS) moved out of the trigger and now is toward the end of the peak. The technology has been around for fewer than five years, but its space is being squeezed between new technologies, such as digital experience composition (DXC) and similar offerings from commerce vendors.
- DXC debuted on the Hype Cycle last year. While this technology remains in the trigger, it has moved halfway toward the peak, as it offers business-user tooling that helps improve productivity. Commerce vendors are either building out their own solutions or partnering with emerging DXC players.
- Contextualized real-time pricing and customer journey analytics both moved out of the peak and are descending toward the trough due to organizations' increasing focus on unified commerce and personalized experience, especially in the B2C space.

Two technologies debut on this year's Hype Cycle:

- Composable product configurators enable complex goods and services to be sold via any sales channel, including self-service and seller-assisted.
- Network tokenization is an end-to-end payment processing technology that offers merchants higher acceptance rates and reduced costs.

Figure 1: Hype Cycle for Digital Commerce, 2023



The Priority Matrix

Digital sales rooms and conversational AI for digital commerce will have transformational effects during the next two to five years. Digital sales rooms allow B2B organizations to improve sales productivity when using the digital channel, while leveraging existing sales and service teams. Conversational AI for digital commerce has limitations in understanding user context, but these issues can potentially be addressed by fine tuning LLMs, such as ChatGPT, driving conversational AI for digital commerce toward the plateau.

Machine commerce will mature in five to 10 years, and can benefit from generative AI, as people are getting more comfortable with AI-enabled purchase decisions.

Both modular commerce and composable commerce will substantiate in five to 10 years. Organizations with advanced technical skills can compose their unique experience, and vendors are making their solutions more business-user friendly by embedding third-party applications. Other organizations can also benefit from a modular solution that is more frequently updated by the vendor and enables faster speed to market and cost-effectiveness when using fewer modules.

Product data MDM and virtual customer assistant will have high benefits within the next two years, as they are approaching the plateau. These technologies are relatively mature, with proven business value and many vendors to choose from.

Table 1: Priority Matrix for Digital Commerce, 2023

(Enlarged table in Appendix)

Benefit	Years to Mainstream Adoption			
↓	Less Than 2 Years ↓	2 - 5 Years ↓	5 - 10 Years ↓	More Than 10 Years ↓
Transformational		API-Based Digital Commerce Conversational AI for Digital Commerce Digital Sales Rooms Smart Check-Out	Composable Commerce Customer Technology Platform Machine Commerce Modular Commerce	
High	Product Data MDM Virtual Customer Assistant	Composable Product Configurators Customer Journey Analytics Digital Experience Composition Digital Shelf Analytics Distributed Order Management DXP Enterprise Marketplaces FEaaS Payments as a Packaged Service	Commerce in the Metaverse Contextualized Real-Time Pricing Immersive Commerce Network Tokenization Personalization Engines	
Moderate	Progressive Web Apps	Consent and Preference Management Customer Data Platform Live Commerce Shoppable Media Visual Search		
Low				

Source: Gartner (July 2023)

Off the Hype Cycle

Technologies that were renamed or dropped from the Hype Cycle include:

- Visual configuration and digital wallets have both matured and moved off the Hype Cycle.

On the Rise

Customer Technology Platform

Analysis By: Gene Alvarez, Andrew Gianni, Saul Brand, Mike Lowndes

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Embryonic

Definition:

The customer technology platform (CTP) is the integration of all customer-facing technology and applications into a platform. This platform aligns the customer's "outside in" view of the organization's customer experience with the "inside out" delivery of the organization's CX vision, strategy and technology. This platform enables an organization to support a holistic and complete view of the customer experience that benefits both the customer and the organization.

Why This Is Important

The customer technology platform is created by using business capabilities and technology reference models. These models will enable organizations to:

- Build a bridge from their CX CORE objectives to the delivery of their CRM strategy.
- Determine which systems need to work with each other to support the delivery of the organization's CX and CRM strategy in order to create positive customer sentiment.
- Determine how to make improvements to their CRM systems in order to move the organization toward a CTP platform.

Business Impact

Digitalization of the customer experience has exposed process gaps and disconnected customer-facing processes to customers. This is due to CRM applications that were implemented solely to automate individual processes. Application leaders need to address these gaps by viewing CRM applications in the context of CX-centric application strategy that goes beyond CRM. Using a CTP approach to CRM applications can resolve these customer-facing gaps and lead to improved customer experiences.

Drivers

- Delivery of positive customer experience as a part of digital transformation is a key differentiator for any organization.
- Digital transformation of customer-facing processes has exposed disconnected CRM applications, leaving the customer to be the coordinator of their experience across an organization's points of interaction (POIs). Examples of POIs are call centers, chatbots, websites, mobile applications, stores and branches.
- Organizations seeking to scale their customer experience capabilities are using more customer-facing technologies and applications. These organizations want to provide a relevant and integrated customer experience that is intelligently coordinated across all POIs.
- Organizations seeking to provide integrated experiences such as "campaign to contract" know they need to integrate applications (such as campaign management, lead management, salesforce automation and configure, price and quote) to enable intelligent coordinated experiences across all POIs.

Obstacles

- Major investments in CRM applications that are already live and operational in organizations are making it hard to integrate CRM applications into great customer experiences.
- It can be difficult to determine how to integrate CRM applications with the organization's entire IT portfolio.
- Investment in strategic vendor relationships has made the integration of many CRM applications a requirement that vendors must support. However, organizations may not be able to wait until then, due to a need to improve their customer experiences today.
- Customer dissatisfaction or frustration can come from organizational inertia. Customers are exposed to new ways of doing things from competitors or organizations in other industries, and they view the organization as behind in helping customers with their "job to be done." This organizational inertia can come from a variety of sources, such as a mindset that change is a risk rather than a tool that can be used to improve the customer's experience.

User Recommendations

- Use Gartner's CX CORE approach to first build the organization's business capability model. This model will determine what business capabilities are needed to support the integration of an organization's business model and its operating model.
- Avoid misalignment of CRM applications and technology and the organization's business model (for example, using self-check-out in a luxury store environment). This approach will ensure that the organization's CRM applications and technology are properly aligned with its CX objectives.
- Use an architecture that includes business capability and technical reference models to identify which key CRM applications and other technology needs to be intelligently coordinated within the CTP to deliver the right customer experience.
- Use an architecture that includes business capability and technical reference models to determine what needs to be changed when the organization faces a customer experience disruption in its market from competitors.
- Use a CX-CORE-driven approach to design customer experiences. Couple this with using a CTP architectural approach to ensure that all CRM applications and technology are aligned to the organization's CX objectives.

Gartner Recommended Reading

Enable Great Customer Experiences Using Gartner's Customer Experience CORE Model

Drive Your Customer Experience With a CTP Reference Architecture Model

Improve CX With a Customer Technology Platform Reference Architecture Model

Video: How to Build Your Customer Technology Model

Quick Answer: How to Get Started With the CTP Reference Architecture Model for CX CORE

Commerce in the Metaverse

Analysis By: Marty Resnick

Benefit Rating: High

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Definition:

A metaverse is a collective virtual 3D shared space, created by the convergence of virtually enhanced physical and digital reality. A metaverse is persistent, providing enhanced immersive experiences. Commerce in the metaverse leverages new virtual experiences and an economy for prospective customers, enabling them to make and act on buying decisions as part of their participation in emerging metaverses while opening up new opportunities for digital products, such as non-fungible tokens (NFTs).

Why This Is Important

Prospective customers will be able to participate in this virtual economy in ways that support their buying decisions and open up avenues for new immersive experiences. Commerce in the metaverse can provide unique opportunities for selling complex physical products while opening up new opportunities for digital products, such as NFTs.

Business Impact

Emerging metaverse solutions will enable new markets and economic models. Examples include building businesses around artificial scarcity with virtual possessions, NFTs and virtual property. Despite this, the new features and functionalities enabled by the metaverse will require and inspire new ways to not only compete and monetize virtual products and services but also to acquire physical (real-world) goods.

Drivers

People can enhance and/or augment their lives in digital and physical realities. This will enable new commerce opportunities including:

- Buying and selling digital land and constructing virtual homes.
- Shopping in virtual malls.
- Buying and selling digital art, collectibles and assets (NFTs).
- Use of digital humans for customer service, sales and other branding and interaction opportunities.

Other drivers include:

- The evolving shopping and purchasing behaviors and increase in demand for virtual engagement, both B2B and B2C, are driving the adoption of immersive commerce as part of an overall commerce strategy.
- Virtual economies, if developed along with aspects of Web3 could bring new transaction paradigms such as blockchain, to the mainstream.
- The emergent metaverse is offering new opportunities for immersive commerce.

Obstacles

- Participation in emergent metaverses are fluctuating and volatile, so experimentation with various metaverse platforms will be required as part of commerce in metaverse strategy.
- While technology plays a key role in achieving a mature metaverse, another challenge involves establishing user-centric guidelines for ethics and governance covering different aspects of the metaverse. This must include topics like privacy, data sovereignty, acceptable terms of use, accountability, identity and legal protections.
- Companies need to be selective and strategic about new business models unique to the metaverse — what to sell (may create new products?) and how to sell it (so it brings in new revenue streams).
- Providing a unified customer experience may be challenging in the short term with metaverse technologies.

User Recommendations

- The adoption of metaverse technologies is nascent and fragmented. Be careful when investing in a specific metaverse, as it is too early to determine which investments have long-term viability.
- Articulate customer value by identifying use cases specific to each emergent metaverse solution.
- Utilize the metaverse ecosystem to bolster commerce through existing assets such as product catalogs, visual search, web content management (WCM), promotions, personalization, configure, price and quote (CPQ), and workflows to maximize both business and customer benefits.
- Bring in subject matter experts to help you get started. Form or join an innovation lab, and allow developers to work alongside experts to bring key technologies into your portfolio of skills.
- Follow emergent and advanced metaverse solutions to track new opportunities in immersive commerce.
- Explore new opportunities and experiences for commerce in the metaverse provided by the upcoming computing augmented reality (AR) glasses market.

Composable Product Configurators

Analysis By: Mark Lewis

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

A product configurator supports the definition and ordering of complex products with customer-selectable options and features; rules that govern the choices available; and one or more dynamic, intuitive end-user experiences for selecting those options and features. A composable product configurator must be available for stand-alone purchase without other components of a quoting/ordering solution.

Why This Is Important

Composable product configurators enable vendors to increase total sales and margins by increasing the proportion of sales performed via the self-service channel. They ensure consistency across all sales channels.

Business Impact

Deploying a composable product configurator improves win rates and average order values, reduces the cost of samples and order rework, and enables selling through all channels. Gartner expects composable product configuration to become the dominant approach for selling complex goods and services via all sales channels over the next five years. These products will be offered by both traditional configure, price and quote (CPQ) players that have unbundled their technology, and new entrants that create a modular product from the outset.

Drivers

- B2B buyers and sellers want to conduct more business through the self-service digital commerce channel because it is more convenient for buyers and less expensive for sellers. To increase the volume and value of business conducted online, it is necessary to support selling more complex goods and services.

- Benefits of product configuration include: increased customer satisfaction and margin by shifting sales from assisted channels to the self-service channel; increased average order value by suggesting the best options and add-ons; improved win rates by producing a proposal more quickly; lower rework costs; lower return rates; and improved customer satisfaction by eliminating miscommunication between the customer and the vendor.

- 3D visual configuration reduces the cost of building samples.

- Virtual photography reduces the cost of creating high-quality 2D product images for online and offline catalogs.

- Composable product configurators reduce the time to train a sales representative or reseller on the details of products and offers.

- Composable product configurators reduce the number of questions and inquiries from dealers.

Obstacles

- Most CPQ applications are monolithic and do not support plugging in an external, composable configurator.
- Most digital commerce platforms do not support product configuration natively. Customization is often required to integrate a composable product configurator.
- Most configurators were created for assisted sales channels. Unassisted channels require greater attention to simplicity and discoverability of the UI. Select a tool that supports pixel-perfect layout of the configuration UIs, rich media to guide the user and skinning to make the UI blend seamlessly into the self-service website.
- 3D visual configuration/virtual photography requires an organization to invest in creating 3D visual assets to represent its product portfolio. These can be based on engineering computer-aided design (CAD) drawings, but must be simplified to improve end-user response times and augmented to capture materials, colors and textures.

User Recommendations

- Purchase product configuration software that supports all sales channels.
- Implement product configuration software with a customer-first mindset. This involves simplifying product offerings and making the configuration of those offerings intuitive for a naive self-service user. You can expose additional capabilities to trained sales people, who will also appreciate a discoverable, intuitive user experience.
- Deploy 3D visualization whenever the final look or spatial geometry of the product is important (e.g., an automobile or a sofa).

Sample Vendors

3D Cloud by Marxent; 3D Source; Artifi Labs; CDS Visual; Epicor CPQ; Expivi; Logik.io; London Dynamics; ShapeDiver; Threekit

Gartner Recommended Reading

Market Guide for Composable Product Configurators

Digital Experience Composition

Analysis By: John Field, Mike Lowndes

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

DXC is emerging to handle experience composition in a "headless," decoupled, composable world. Extending from front end as a service (FEaaS) or "visual page builders," DXC allows developers to set up digital experience UIs and hand them to business users for day-to-day management in no-code environments. DXCs provide API connectivity to headless services such as CMS, search or commerce. Some established vendors in markets such as DXP and CMS are extending to or pivoting to this model.

Why This Is Important

There is a shift away from monolithic apps that deliver wide functionality but come with precloud software architecture, which remains hard to update, release, adapt and scale. There is also a shift away from megavendor "suite plays" providing very wide feature sets, not all of which may be class-leading. Digital experience composition (DXC) is a step toward composability, providing a packaged business capability (PBC) for business users and developers to compose digital experiences.

Business Impact

Fast innovation and adaptation are needed to respond to digital business ambition. DXC combines the ability to safely innovate total experiences both for business and development users, while relying on and retaining the integrity of the decoupled underlying apps. DXC platforms are not the same as digital experience platforms (DXPs). DXC is a component (PBC) of a DXP that enables organizations to compose experiences in a no-code and low-code environment. It also enables an environment where no there is no lock-in to a single technology or vendor.

Drivers

- Until now, a composable approach to DXP required significant development and architectural expertise, and often resulted in business users being unable to manage the digital experience directly in a way they were used to in a close-coupled or "head-on" solution.

- Front end as a service (FEaaS) has commoditized the codebases and runtimes for presentation layers. Its focus is on the front-end developer and DevOps, accelerating the development of single-page applications (SPAs) and progressive web apps (PWAs). However, FEaaS lacks the business tooling for no-code management for resulting front ends.
- Experience builders (or, for web-focused use cases, page builders) provide business users with the ability to control the layout and composition of web content and functionality from multiple underlying systems. This is typically via a drag-and-drop or what-you-see-is-what-you-get (WYSIWYG) UI, with the ability to configure component behaviors.
- As front-end delivery remains code-heavy, there is a need for low-code and no-code platforms to package these capabilities and make them easier to consume. DXC contains a templating engine and/or integration into design systems, providing an integrated development environment for developers to create and orchestrate experiences.
- An API integration mediation layer between multiple technologies powers the digital experience. This enables the connection and transformation of relevant assets (such as content, products and images) or interactions (such as forms, search, access control and basket) from their source system to a unified digital experience. This can also be used to orchestrate between components. Vendors differentiate by maintaining productized, prebuilt connectors to leading vendors in core DX segments.

Obstacles

- DXC adoption is predominantly among digitally mature organizations. IT leaders must be confident they have the developer and architectural skills available to build and maintain the overall solution.
- DXC is not required for simple, mainstream needs where packaged, head-on solutions such as web content management (WCM) or B2C digital commerce offer a good fit. The pendulum may also swing back to the “suite play” as vendors decompose their monoliths.
- B2B implementations can be particularly complex due to the requirement for deeper integration with multiple internal systems, and more complex management UIs and workflows.
- This emerging market is very fast moving with a high likelihood of future disruption, and there is some overlap with multiexperience development platforms (MXDPs) and low-code application platforms (LCAPs).

User Recommendations

- Check your digital maturity. UI decoupling and integration means that tools, design and implementation skills can vary greatly from your current setup. IT leaders must have the expertise and resources available to implement the new architecture.
- Review your current stack. If you currently have a “traditional” WCM solution, DXP or commerce platform, work with your vendor to understand their roadmap and future licensing implications. Depending on their approach, you may have a timeline enforced to be ready for composability.
- Do not consider composable digital experiences from a purely technical or architectural perspective. DXC enables businesses to implement “headless,” API-first experiences with full consideration for business users, ensuring they have a UI that enables them, with the level of control required, to meet the needs of their customers.
- Avoid a composable approach when operational simplicity is a higher priority than architectural flexibility, agility and site performance.

Sample Vendors

Amplience; Builder.io; Contentful; Contentstack; Crownpeak; Deity; Magnolia; Shogun; Stackbit; Uniform

Gartner Recommended Reading

Innovation Insight for Digital Experience Composition

Digital Sales Rooms

Analysis By: Varun Agarwal, Melissa Hilbert

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Digital sales rooms (DSRs) are a persistent microsite privately formed for a supplier and buying group to collaborate digitally throughout the customer journey. Due to virtual selling, DSRs streamline how a buying group interacts with a supplier for better CX. Key capabilities of DSRs include internal/external collaboration, bidirectional content sharing, embedded video conferencing, buyer engagement analytics, sentiment and emotion analysis, and links to digital commerce platforms.

Why This Is Important

Hybrid work is a permanent shift that heavily affects complex B2B buying and selling processes. To mitigate the surge in daily activity buyers face, DSRs provide a primary interface for synchronous and asynchronous digital interactions. DSRs support initial sales and customer retention by turning into a collaborative platform. Suppliers and buying groups continue to work together on DSRs to achieve better customer experience and lifetime value.

Business Impact

Organizations with B2B selling models often tend to lose a lot of information among multiple communication channels. Missing information results in substandard decisions. DSRs provide the following inherent advantages:

- Improve visibility into the buyer stakeholders' engagement with materials.
- Accelerate pipeline conversion rates at key stages in a buying process.
- Improve forecast accuracy with improved insight into buyer engagement.

- Improve win rates with tailored and focused buyer-centric collaboration.

Drivers

- Buyers increasingly prefer to engage digitally, and they want control to choose how and when they interact with suppliers.
- DSRs provide a secure way to share and collaborate digitally and provide continued value after the sales.
- DSRs provide a natural reduction in noise experienced by a buyer through consolidating the number of digital channels a buyer needs to use to interact with a supplier.
- B2B organizations that have moved to, or are just beginning to, make moves toward virtual selling require a scalable DSR solution.

Obstacles

- The market is in its early stages and only a few vendors offer full DSR capabilities.
- DSRs might not be required for transactional or short-cycle sales processes.
- Evidence of complex contract negotiations within a DSR is yet to be evidenced.
- Tighter budgets will require DRSs to prove revenue growth which may be difficult if the DSR does not have full capabilities.

User Recommendations

- Evaluate the DSRs functionalities offered by best-of-breed solutions, and those offered by revenue enablement and sales force automation platform vendors.
- Prioritize the following capabilities depending on your organization's needs: bidirectional content sharing between buyer and seller; embedded or native online video conferencing and recording; buyer engagement analytics for interactions within the DSR; conversational intelligence for sellers and buyers; conversational transcripts for online meetings; emotion analysis to support context; buyer and seller collaboration and personalization using a persistent microsite; e-signature capabilities for signing agreements and contracts; complex contract negotiation via integration with systems such as configure, price and quote; embedded or integrated digital commerce platform; automated CRM logging of activity and analysis.

- Create a business methodology with DSRs to support your B2B customers throughout their life cycle.

Sample Vendors

Allego; Dealhub.io; GetAccept; JourneyDXP; Omedym; Oracle; Pitcher AG; Seismic; Showpad

Gartner Recommended Reading

Use Digital Sales Rooms to Improve the Digital Buying Experience

Market Guide for Sales Enablement Platforms

At the Peak

Machine Commerce

Analysis By: Sandy Shen

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Machine commerce automates purchases via IoT-enabled machines on behalf of human customers. The service either takes requests from the customer directly or predicts demand using rules, analytics and artificial intelligence.

Why This Is Important

Machine commerce increases customer retention by making on-demand and recurring purchases effortless, thus increasing revenue and customer lifetime value. As generative AI gets wider adoption, organizations will be dealing with machine customers in the format of AI agents that buy on behalf of their human owners. Machine commerce is the storefront to serve those machine customers.

Business Impact

Machine commerce increases customer satisfaction, loyalty and lifetime value by enabling effortless purchases. Common use cases include autoreplenishment and predictive maintenance. Organizations can capture incremental revenue from these machine customers, as more will be acting on behalf of their human customers.

Drivers

- Customer retention is becoming paramount as customer loyalty is drifting. Increasing customer value through low-effort buying experience, and increasing customer confidence through automated and guaranteed product/service delivery, is critical to customer retention.
- Organizations want to ensure customers can secure supplies when the supply chain is becoming unpredictable, and lock in cost savings through long-term contracts. Customers can also get personalized product curations through services that focus on personalized value propositions.

- Leading organizations already offer machine commerce. Examples include HP Instant Ink that orders ink supplies based on the actual consumption; some Tesla models can order spare parts and schedule maintenance appointments; and Amazon Dash Replenishment allows home appliances to order supplies.
- AI agents are becoming a realistic scenario and digital commerce is among the first places where they will play a significant role. Organizations want to set up machine commerce platforms to serve a large number of machine customers that make purchases and service requests on behalf of their owners.

Obstacles

- Organizations have not identified use cases beyond common ones, such as replenishment and maintenance, that can offer good value for customers.
- Organizations will use a combination of rules, analytics and AI to accurately predict customer needs for various use cases. Current technologies cannot yet accurately predict nonroutine customer needs with high accuracy, or have not been proven suitable for commerce transactions (e.g., generative AI).
- Organizations often limit the product selection for autoreplenishment to their own, limiting customers' choices. Some organizations do not allow customers to use the unused replenishment once the subscription goes out of effect.
- It takes time to define a good value proposition and customer experience (CX) for the product offering, and for customers to trust the machine enough to delegate decisions.
- Organizations also need to find the right balance between automation and human control to support a compelling CX.

User Recommendations

- Identify products and services, and use cases that are suited for machine commerce. Start with autoreplenishment and/or predictive maintenance when applicable.
- Use customer journey maps to understand friction points and tasks that can be automated, to guide your design of the value proposition of machine commerce. For example, machines can detect malfunctions, automate service requests, track asset locations, monitor medication compliance and alert refills. Offer reasonable prices and rich product ranges beyond those of your own to give customers a wide range of selections.

- Use a combination of rule engines and AI to more accurately predict customer needs. Provide mechanisms for customers to take control when needed, to increase their confidence when using the offering.
- Investigate and experiment with technologies such as IoT, generative AI, advanced analytics and bot interfaces, and acquire skills in-house or from partners to implement machine commerce.

Sample Vendors

Amazon; Caterpillar Inc.; Google; HP Inc.; Siemens; Significant Gravitas; Tesla

Gartner Recommended Reading

Why Machine Customers May Be Better Than Human Customers

Infographic: A Day In Your Life in a World of Machine Customers

CIOs Can Maximize Product Lifetime Value by Embracing Machine Customers

Maverick Research: Turn the Consumer Bot Uprising to Your Advantage

Network Tokenization

Analysis By: Dayna Radbill

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Network tokenization is an end-to-end security process for major network-branded credit and debit cards. It provides many potential advantages to traditional gateway, processor or acquirer tokenization. With network tokenization, the token is issued by the issuing bank or the card network. This allows the token to process all the way through to the issuer, rather than being converted to a primary account number (PAN) as an untokenized card number, before being sent on to the network.

Why This Is Important

Network tokenization was initially used primarily to facilitate pass-through wallets, where the tokenized card number is stored on the secure element of the physical device. The gateway, processor and acquirer vary depending on the merchant the consumer is doing business with. Recently, network tokens have become available to merchants, who can benefit from higher acceptance rates, better portability, lower fraud and reduced costs, driving adoption especially among enterprise merchants.

Business Impact

Any stakeholder concerned with total cost of ownership (TCO) for payments and facilitating commerce transactions should explore network tokenization because:

- Some networks offer **reduced interchange rates** for merchants using network tokens, which optimizes TCO.
- **Acceptance rates** are one of the most critical payment KPIs that digital commerce merchants manage toward. The difference in price between vendors may be only a few basis points; much less than the potential loss of turning away good sales.

Drivers

- **Token portability:** Merchants can switch to a new credit card payment vendor more easily when identified as a token requestor. Tokens are often proprietary to the current payment vendor(s) and changing vendors involves a complex process. The current tokens are matched to actual sensitive card data, which is shared with a new provider. Obtaining new, proprietary tokens from the new vendor requires merchants to match the new token value to the old ones, and then perform data migration within all impacted internal systems to replace the old token with the new. In order for the network token to be truly portable, the merchant must be identified as the token requestor.

- **Payment Card Industry Data Security Standard (PCI DSS) compliance:** Tokenization is the primary best practice for simplifying merchant PCI DSS compliance. Network tokens can overcome absent cooperation between a merchant's current and future payment vendors. Doing so avoids the resulting complexity, which may include a requirement for the merchant to handle the sensitive credit card data that they worked so hard to keep out of their systems. This could impact the merchant's PCI DSS compliance status.

- **Higher acceptance rates:** Network tokenization increases issuer trust in the transaction, resulting in more successful authorizations from the issuing bank and fewer false declines. This not only protects merchant revenue that could have been reduced due to lost sales, but also improves the customer experience, leading to more repeat revenue.

- **Reduced fraud:** The issuer and/or network involvement in token issuance allows the issuing bank's fraud detection algorithms to have access to more data about the transaction, such as the network token only being valid for a particular merchant or acquirer processor. This allows the issuing bank to approve more good transactions.

Obstacles

- **Different major card networks** have different standards, rules and formats for network tokenization. Merchants must depend on their payment vendor(s) to manage this complexity. In many cases, it involves combined solutions that marry both an acquirer processor token and a network token for the same transaction.
- **The payment vendor combined solutions** are likely to dilute the merchant portability opportunity, as the data stored at the merchant site may be the proprietary vendor token only. In this case, the merchant can still enjoy the benefits of reduced cost and fraud and increased acceptance, but if portability is the primary driver, merchants need to carefully vet this.
- **Vendor availability** as not all payment vendors have network token capabilities, or if they do, they may not yet cover all networks or geographies. This could result in a complex phased-migration plan that requires oversight for many months or even years.

User Recommendations

- Investigate any potential new or current digital commerce payment vendor(s) to determine whether they support network tokenization.
- Determine how vendors can support your token portability goals, whether through a combined or a stand-alone solution. Also, assess if the merchant will be named as the token requestor.
- Evaluate vendor strategies to estimate the impact on your current acceptance rate and your TCO for payment processing.
- Create a business case evaluating the uplift in acceptance rate and reduction in TCO.
- Work with your payment fraud prevention teams to determine how network tokenization adoption will impact their processes and success metrics.
- Create a roadmap for implementing network tokens, in whole or in part, within the next five years.

Sample Vendors

FIS (Worldpay); Fiserv; Mastercard; Stripe; Visa

Gartner Recommended Reading

Market Guide for Digital Commerce Payment Vendors

12 Key Questions to Ask When Selecting a Digital Commerce Payment Vendor

Composable Commerce

Analysis By: Jason Daigler, Sandy Shen, Mike Lowndes

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Composable commerce is an architectural approach to digital commerce whereby applications are constructed with packaged business capabilities (PBCs). It requires loosely coupled back-end application capabilities, which are used to compose new commerce functionality and custom experiences. This approach contrasts with a platform-centric approach, in which monolithic commerce platforms are deployed to manage most aspects of the commerce customer experience.

Why This Is Important

Digital commerce solutions must be flexible and nimble to respond quickly to changing customer expectations. Companies must respond quickly with new products, processes, delivery methods and customer experiences. Composable commerce enables solution changes to be made, deployment to production environments, and achieve scaling more flexibly, whereas a monolithic platform includes many tightly coupled components that are not changed in every release.

Business Impact

Composable commerce will provide:

- Benefits to digital commerce teams that want a more flexible architecture.
- Greater ability to move quickly in response to customer demand.
- Less reliance on large version upgrades.

- Business user tools to help replace capabilities when new vendors emerge, expand into new channels more easily, and develop more innovative solutions.
- Proactive and experimental innovation that's faster and more efficient than direct software engineering.

Drivers

- Many of the individual components of full digital commerce solutions — such as personalization engines, commerce search and content management applications — have been around for several years and have been sold and integrated independently. Therefore, the concept of using best-of-breed, individual applications to construct commerce experiences is not new.
- Modular commerce takes this concept a step further by offering granular functional components within the core commerce offering. Composable commerce is a further evolution in which business users may construct commerce experiences using low-code tools.
- Most companies are increasing investments in digital commerce, often in response to global events. Increased investment often leads to the need for best-of-breed modules — easy integration of those modules is enabled by composable approaches.

Moves toward composable commerce are often driven by:

- The desire for better business-IT alignment when adopting product management best practices. With composable commerce, fusion teams share common goals and metrics.
- The need to enable fusion teams to work on and deploy individual commerce components without impacting other components. These teams will then be able to move more quickly in order to respond to market trends and act more autonomously. They will control their own roadmaps, based on their own expertise in the module they are responsible for, and deploy their changes to production environments according to their own schedule.
- The desire to move away from inflexible, slow-to-update and monolithic digital commerce platforms.

- The need to adopt a modular approach that provides more flexibility to a digital commerce technology stack by allowing companies to swap out functionality with best-of-breed modules from a different vendor, or a solution that they develop themselves.
- The opportunity to consolidate software investments through reuse by reducing redundancy of functionality across applications and departments.

Obstacles

- Confusion abounds in the digital commerce market as vendors use terms like “headless,” “microservices” and “API first.” Many companies struggle to determine if the solutions they are purchasing are as modular and flexible as the vendors claim.
- Companies with smaller development teams or fewer solution integration resources may be more comfortable with a larger commerce suite with a single business user administration console.
- Adopters of composable commerce need digital maturity: strong architectural, process, integration and API orchestration skills, and governance to be successful.
- Composable commerce is still in the early stages of evolution and adoption. User-friendly integration tools, such as low-code application platforms, will need to emerge before it can become mainstream. Unless standards emerge for specific application areas, vendors will need to work together to ensure interoperability.

User Recommendations

Companies considering composable commerce should:

- Evaluate their commerce technology stack and identify inflexible, tightly coupled components that could benefit from composable commerce. Advance toward composable commerce in small increments, ensuring the presence of governance at each step before proceeding further.
- Assess their own maturity. Succeeding with composable commerce requires a digitally mature perspective that embraces processes such as digital product management, fusion teams and DevOps.
- Work with the individual product teams responsible for functional areas of digital commerce to build the business case for composable commerce.

- Plan for integration complexity. Low-code or no-code integration tools are nascent between PBCs for commerce, especially if PBCs come from different vendors. Resources to build and maintain integrations over time will be required. Give preference to application vendors that deliver well-articulated business-modular applications.

Sample Vendors

Broadleaf Commerce; commercetools; Elastic Path Software; fabric; Infosys Equinox; Kibo Commerce; Spryker Systems; Virto Commerce; VTEX

Gartner Recommended Reading

Innovation Insight for Digital Experience Composition

Quick Answer: What Are the Steps to Prepare for Composable Commerce?

Quick Answer: What Does It Mean to Be 'Composable'?

Composable Commerce Must Be Adopted for the Future of Applications

Quick Answer: Who's Who in the Life Cycle of Composable Applications?

Modular Commerce

Analysis By: Aditya Vasudevan

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Modular commerce takes API-based (headless) commerce further by breaking down the functional modules in the core commerce platform to improve flexibility and agility. In this approach, functional modules are often separate packaged business capabilities that are mostly within the same vendor platform, have their own APIs and data model, and can be independently deployed and scaled.

Why This Is Important

The architecture for many digital commerce platforms is changing from its original monolithic form into a more componentized and API-oriented form. Modular commerce deconstructs a typical core commerce platform to increase agility and decrease interdependencies during deployment processes. The granularity of the modules is defined by business needs, and must balance development flexibility and agility with governance, complexity and costs.

Business Impact

A modular commerce approach will provide:

- Ultimate flexibility across various customer journey touchpoints
- Product-driven experiences
- Business agility and innovation
- Diverse experiences led by business units
- Speed to market for new features.
- Lower development costs as new features can be added more quickly
- Business and IT alignment to help achieve common goals

Drivers

- A modular architecture is the next step beyond API-based (headless) commerce on the path to composability.
- Organizations that have adopted, or are in the process of adopting, an API-based digital commerce approach could consider a product-driven solution rather than a platform-driven one. This will enable them to innovate and scale crucial capabilities independently without impacting other capabilities.
- Modular commerce improves organizational agility by “productizing” capabilities for organizations focused on innovation and growth that want to avoid being bound by platform constraints. For example, by speeding up the innovation cycle, it can help business users keen to enhance specific experiences and capabilities.
- Modular commerce reduces dependencies across a commerce platform as the architecture enables each capability to be delivered, maintained, upgraded or replaced separately.

Obstacles

- Data dependencies exist across these capabilities since they are mostly served by the same platform. A single-vendor modular approach tends to be a walled-garden approach, which makes it harder to replace modules with third-party alternatives.
- A more complex architecture requires a high level of digital maturity (but less than for a composable solution) from the business and entails longer initial implementation times.
- Insufficient availability may occur for specific technical skills (such as in API integration and DevOps) or business skills (such as in digital product management).
- Maintenance will be required for multiple applications supporting these modules. This involves heavy dependence on mature DevOps processes, which are needed to make this approach truly agile.

User Recommendations

- Ensure that, despite the headless architecture, the tools used maintain business user control over the UI and the customer journey.
- Educate senior management about the benefits of modular architecture and obtain their commitment to move to such an architecture.
- Select commerce platforms that use a modular architecture and/or review the roadmap of your existing commerce platform to help ensure that essential modules are deconstructed in an acceptable time frame.
- Establish DevOps and agile development practices to ensure timely delivery against the roadmap.

Sample Vendors

commercetools; Elastic Path; fabric; Kibo; Spryker; VTEX

Gartner Recommended Reading

Choose the Right Digital Commerce Platform Architecture

What Are the Differences Between Modular and Composable Commerce Architectures?

Digital Shelf Analytics

Analysis By: Jason Daigler

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Digital shelf analytics applications provide brands and manufacturers with data from the third-party digital channels where their products are sold, such as online marketplaces and retailers' digital commerce sites. These applications either scrape websites or consume data from APIs to improve governance of product listings or monitor performance metrics used for optimizing product discovery and conversion.

Why This Is Important

Companies must sell in the optimal mix of channels to reach their ideal customers. This channel mix continues to evolve as consumer behaviors evolve and companies learn which channels provide the best results. DSA applications help ensure and improve the quality of online product listings so sellers can make better decisions about their channel mix, protect their brand images, monitor inventory and optimize listings for maximum findability and conversion rates.

Business Impact

DSA applications allow brands and manufacturers to:

- Gain visibility to product content on the digital shelf
- Improve search results positioning
- Improve responsiveness to ratings and reviews
- Monitor minimum advertised price (MAP) violations
- Highlight inventory issues, even at local store levels
- Automate actions to update product listings
- Integrate with other applications such as product information management (PIM) systems to provide a holistic product experience management (PXM) system

Drivers

- Online sellers continue to leverage an increasing number of channels to reach their customers, and customers continue to demonstrate a preference for online buying.
- Brands and manufacturers often lack comprehensive oversight of their products' performance on the digital shelf, which increases the difficulty of making decisions about their chosen channel and product mix.
- Many companies that were manually monitoring their digital shelves quickly realized their homegrown solutions, which often involved recording information in offline sources such as spreadsheets, were not scalable as their channel mix increased.
- While it is most heavily used by consumer packaged goods (CPG) companies, DSA remains a viable option for any consumer goods company that leverages digital channels it doesn't own, such as marketplaces, retailers' digital commerce sites and social channels.
- For retailers that do not sell on other retailer sites and sell less frequently on marketplaces, data and insight from DSA applications will primarily emanate from social channels or other locations where the retailers syndicate their products. Retailers can benefit from competitive pricing insight and promotional information. They can also track new product additions from competitors and identify internal assortment gaps as well as competitors' assortment gaps.
- Some DSA applications also provide competitive pricing information. As digital commerce grows and more marketplaces emerge, brands will experience increased pricing pressure. Leveraging DSA applications will help them ensure they are pricing products correctly.
- Preventing items from going out of stock and understanding inventory challenges has become a critical priority for many companies.

Obstacles

- Brands must ensure their DSA vendor has added any new or required channels to the application.
- DSA applications are not beneficial without strong processes, technologies and integration with other systems. Brands must develop a process of gaining insights using a DSA application, identifying changes to make, implementing those changes in a PIM or other system, then resyndicating or publishing content to channels. They can then “close the loop” by using the DSA application to ensure the changes appear.
- Even with strong “closed loop” processes, the amount of required optimizations can be overwhelming as product portfolios and channels expand. Automation is needed for simple changes, yet many vendors do not have strong automation functionality, or integrations aren’t adequate to achieve automation.
- For retailers with physical stores, there is one digital shelf per store, especially for inventory. This increases the data sources and the amount of data returned, making analysis cumbersome.

User Recommendations

- Identify all channels where products are currently sold and the data available for defining the performance of the products in those channels.
- Use DSA applications to not only monitor performance of the company’s products on digital shelves but also develop competitive insights about other companies’ products.
- Manage the end-to-end product content life cycle by developing a closed loop process whereby the DSA applications uncover insight and then product teams make changes in other systems, such as digital commerce, marketing and merchandising, to optimize performance. This may require strict offline processes for making changes in multiple systems; tight integration between the DSA application and other systems such as PIM, PXM and DAM applications; or selecting a vendor that offers a closed loop system.
- After a closed loop system is in place, invest in automation, whereby changes are made in internal systems and automatically pushed to external commerce sites without human intervention.

Sample Vendors

Amber Engine; Ascential; CommerceIQ; DataWeave; inriver; PriceSpider; Publicis Groupe (Profitero); Salsify; Stackline; Syndigo

Gartner Recommended Reading

Market Guide for Digital Shelf Analytics

Scaling Digital Commerce Requires Product Content Life Cycle Optimization

Market Guide for Product Information Management Solutions

Enterprise Marketplaces

Analysis By: Jason Daigler, Sandy Shen

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Enterprise marketplaces are digital channels operated by B2B or B2C sellers that invite third-party sellers to sell directly to end customers. Marketplace operation applications provide the technology to enable enterprise marketplaces by allowing operators to manage seller onboarding, product catalogs, order routing and management, and seller compliance with marketplace policies.

Why This Is Important

Enterprise marketplaces offer such benefits as richer assortment, improved customer experience (CX) and resilient supply chain. They also enable companies to shift their business models from direct digital commerce (where they sell directly to end customers) to a platform business (where they facilitate transactions between sellers and buyers). As marketplaces grow, marketplace operators can transition to digital business by owning the digital ecosystem and creating digital revenue.

Business Impact

Enterprise marketplaces offer benefits for different types of organizations:

- Companies with a large number of partners, such as retailers and distributors, have been early adopters, aiming to expand assortments with geographically dispersed suppliers, mitigate supply chain risk and digitize seller onboarding.
- Companies with repeat buyers, especially in B2B, can create a “one-stop shop” for their customers, thereby improving the CX and growing revenue.

Drivers

Enterprise marketplaces have seen increased interest in recent years, as many organizations hastened to launch or expand digital commerce presences. Other factors and potential benefits that have also driven companies to invest in enterprise marketplaces include:

- Marketplace operators benefit from enriched product offerings, expanded assortments and the ability to test new products via third-party sellers before offering products as a first-party seller. Organizations using dropshippers can move nonstrategic items (those with lower sales that are not a core part of the operator’s offering) to the marketplace to improve the performance of the core business.
- Collecting commissions or fees from the sale of third-party products helps operators transition to a digital business model, which helps them mitigate inventory risk from future disruptions or from reduced demand for their first-party products.
- Business buyers benefit from reduced procurement costs from obtaining multiple different products, in multiple different categories, from a single marketplace. This creates more loyal buyers, who are less likely to shop around for competitive products.
- Sellers benefit when marketplaces are well-known and offer significant traffic, which the sellers would not be able to easily generate on their own.
- Lower prices, due to pricing competition from multiple sellers offering similar or identical products, creates increased buyer satisfaction.
- The primary applications used to create enterprise marketplaces — marketplace operation applications — have grown in prevalence and functionality during the past year. Several digital commerce platform vendors are adding marketplace functionality to their offerings. Some vendors are also adding a network of suppliers they offer to marketplace operators to more rapidly and easily scale their enterprise marketplace. Marketplace operators can now more easily mix marketplace and dropshipping models to improve profitability.

Obstacles

- Creating an enterprise marketplace is a fundamental business model change that requires support from the highest levels of the organization. Marketplace operators will need to serve both end customers and third-party sellers.
- Successful marketplaces benefit from a flywheel effect of more buyers, sellers, sales and data generated by the marketplace. Hence, operators must successfully recruit sellers and provide the data and tools they need to be successful.
- Integration with existing applications is critical for success, including the digital commerce platform, product information management (PIM) systems and order management systems (OMS).
- Enterprise marketplaces can introduce ethical dilemmas, in which marketplace operators must decide how products are positioned, what data is used and which products they source directly and sell themselves. Third-party products should be treated consistently in processes related to customer service, loyalty, returns and logistics.

User Recommendations

- Organize strategic planning sessions early in the process to craft the strategy and get buy-in from top management and functional leaders. Evaluate product categories to see whether they can be augmented by third-party sellers, rather than adding totally new categories that are inconsistent with the core business.
- Ensure consistent CX in the marketplace, regardless of who's selling a product. Product specifications, ratings and reviews processes, loyalty and rewards programs, shipping/returns policies and processes, and customer service processes should be consistent.
- Define win-win monetization models for operators and sellers. Operator revenue can come from listing, sign-up, membership, transaction, and payment processing fees and value-added services (e.g., fulfillment, advertising and advanced analytics).
- Companies lacking third-party supplier networks should consider vendors offering supplier networks that can help with initial marketplace scaling efforts.

Sample Vendors

AppDirect; IZBERG; Marketplacer; Mirakl; Octopia; Oro; Salesforce; Spryker; Virtualstock; VTEX

Gartner Recommended Reading

Market Guide for Marketplace Operation Applications

11 Imperatives When Building an Enterprise Marketplace

Create Enterprise Marketplaces to Accelerate Digital Business

3 Emerging Trends in Marketplace Operation Applications to Counteract Inflation

Immersive Commerce

Analysis By: Marty Resnick

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Immersive commerce blends the physical and digital worlds by using advanced digital technologies, such as augmented reality (AR) and virtual reality (VR), to enhance the customer experience (CX). The goal of immersive commerce is solving customer problems, improving product understanding, easing the purchase process and forming brand loyalty by building emotional engagement.

Why This Is Important

Immersive commerce visualizations and interactions improve prospective customers' ability to self-serve, rather than conduct lengthy sales calls and demos as part of a purchase decision. VR can provide an interactive 3D representation of complex products and contextualized environments. AR is used to show the look and feel of a product to the customer or in a physical environment.

Business Impact

Industries such as retail, consumer packaged goods, travel, automobile and real estate have been early adopters. VR can enhance the decision-making process by showing how the final product/destination looks to customers before they invest. AR provides use cases that are less immersive, but more readily available, with the use of mobile phones. When integrated into digital commerce platforms, immersive technologies can be powerful in engaging and converting customers, and driving revenue.

Drivers

- Digital audiences are embracing new ways to conduct activities previously served by a commerce storefront.
- For complex products that require configuration, customers are now able to view products in 2D and 3D, using configurators. Simple 360-degree video provides compelling emotional experiences of products.
- The evolving shopping and purchasing behaviors, both B2B and B2C, are driving the adoption of immersive commerce as part of an overall commerce strategy.
- Virtual economies, if developed along with aspects of Web 3.0, could bring new paradigms of transactions, such as nonfungible tokens (NFTs), to the mainstream.
- The emergent metaverse is offering new opportunities for immersive commerce, and might bring down the cost of participation in VR/AR environments.

Obstacles

- Immersive content is expensive to create, and typically will be provided by vendors, not by in-house capabilities.
- The costs of content creation and overall immersive experience remain high.
- Accessibility challenges may be prevalent in immersive experiences.
- The consumer devices and acceptance of these new types of transactions may hinder adoption.

User Recommendations

- Treat AR and VR as different technologies that solve different problems.
- Integrate AR/VR with the digital commerce ecosystem to leverage such assets as product catalogs; visual search; web content management (WCM); promotions; personalization; and configure, price and quote (CPQ).
- Follow emergent and advanced metaverse solutions to track new opportunities in immersive commerce.
- Take advantage of the upcoming spatial computing AR glasses market, which will provide new opportunities and experiences for immersive commerce.

Gartner Recommended Reading

Top Strategic Technology Trends for 2023: Metaverse

Building a Digital Future: The Metaverse

Top Unified Retail Commerce Execution Trends for CIOs 2023

Predicts 2023: Immersive Stores Are a Critical Focal Point for Retail Profitability

FEaaS

Analysis By: Mike Lowndes

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Front end as a service (FEaaS) is the provision of presentation layers, orchestration, operation and infrastructure for browser-based digital experiences as a service. Vendors are cloud-based and rely on clients' content management, digital commerce and other APIs to power digital experiences.

Why This Is Important

FEaaS has emerged within the last five years, and most FEaaS vendors are startups. Responsive and adaptive design for websites has now evolved into single-page applications (SPAs), progressive web apps (PWAs) and accelerated mobile pages (AMPs). FEaaS providers abstract the provision of these technologies and also provide a managed cloud runtime for their operation.

Business Impact

Client-side front ends significantly improve performance for web apps, especially on low bandwidths. They improve customer experience regardless of display or viewport size, providing more “applike” experiences, especially via mobile devices. They eliminate the need to invest in fully native apps published via a vendor’s app store, while enabling hybrid apps to run off predominantly the same codebase. FEaaS commoditizes delivery and runtime, previously requiring hosting contracts and DevOps.

Drivers

- Businesses require complex and interactive customer journeys, such as those for digital commerce or customer portals, but may be limited by digital commerce platform or digital experience platform (DXP) constraints for the management of front ends. These constraints can be overcome by FEaaS.
- The shift to using SPAs, PWAs, AMPs and Jamstack to deliver digital experiences has caused a front-end skills shortage and potential bottlenecks for initiatives. FEaaS providers enable businesses to scale front-end operations by providing central, shared development and maintenance resources and runtime environments.
- The cost to maintain a skilled in-house team to meet modern presentation and related DevOps demands is high. FEaaS aims to reduce (not completely remove) this dependency.
- FEaaS vendors provide cloud-hosting solutions and associated edge acceleration, usually via partnership with a content delivery network (CDN) provider. This can reduce in-house resource requirements or separate contracts for deployment.

Obstacles

- Decoupled front ends can result in day-to-day presentation management, (traditionally in the hands of business users using “head on” solutions), becoming a developer responsibility unless careful technology choices are made. FEaaS solutions do not provide business user tooling. FEaaS is now more focused on the delivery of front end tools and runtimes. The need to provide no-code tooling for business users and low code environments for developers has led to the emergence of digital experience composition (DXC).
- Digital commerce and DXP vendors are developing or acquiring FEaaS capabilities.
- FEaaS represents a lock-in risk, being the single point through which digital services are made available. If requirements change significantly, there is a risk that existing vendor capabilities will become inadequate.
- Capabilities provided in this space overlap with capabilities of some multiexperience development platforms (MXDP) and low-code application platforms (LCAPs) and these may converge.

User Recommendations

- Utilize FEaaS if you need a decoupled front-end, browser-based experience (such as an SPA or PWA) for desktop and mobile experiences, but do not want the overhead of managing a large front-end team and/or the associated DevOps and cloud-hosting capabilities.
- Do not use FEaaS for purely content-focused websites, as the impact is less transformational. Use it where the business wishes to compose complex customer journeys across several “web apps,” including digital commerce, customer portals, booking engines, communications and social platforms, forums and so on. Take advantage of the mobile-first approach and integration with native device capabilities.
- Evaluate FEaaS applications that are offered by your commerce platform vendor and those with a prebuilt integration.

Sample Vendors

Netlify; React Storefront; Vercel; Vue Storefront

Gartner Recommended Reading

Composable Commerce Must Be Adopted for the Future of Applications

Adopt a Composable DXP Strategy to Future-Proof Your Tech Stack

Quick Answer: What Are the Steps to Prepare for Composable Commerce?

Sliding into the Trough

Live Commerce

Analysis By: Sandy Shen

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Live commerce uses live video to demonstrate products and interact with shoppers to encourage purchases and increase retention. The livestreaming function can be integrated into commerce platforms, or offered by online marketplaces and social networks with purchase redirects or on-site check-out functions.

Why This Is Important

Live commerce is a technique to increase brand awareness, help product discovery and drive digital sales. China is the leading market where live commerce is a table stake in B2C commerce. Markets such as Japan, South Korea and Southeast Asia also see growing momentum. The rest of the world is experimenting with live commerce in both one-to-many and one-to-one formats to increase brand influence and improve customer engagement. It will take them more trial-and-error to find the path to success.

Business Impact

Live commerce in the one-to-many format can increase brand awareness, product exposure and site traffic. The one-to-one format can drive sales and customer retention. Live commerce sessions hosted by influencers can negatively impact profitability or brand image as products promoted often carry deep discounts. Organizations that have mastered live commerce can acquire customers and increase their lifetime value through retention and repurchases.

Drivers

- Live commerce is a novel way of digital marketing that can attract and engage customers with live demos and real-time interactions.
- One-to-one interactions offer personalized shopping and service experience, leading to better customer satisfaction, higher conversion and increased order value.

- Livestreaming is easy to set up technically as there are a number of SaaS solutions supporting quick setups, as well as online marketplaces and social networks offering the function that can be set up by business users.
- Live commerce is more convenient to set up than TV shopping, and doesn't have slot constraints on a particular platform.
- Live commerce leverages staff resources and merchandising setups in physical locations to increase employee productivity.
- Revenue attribution is easier than other digital marketing mechanisms as live commerce directly contributes to traffic generation and sales revenue.

Obstacles

- One-to-many sessions don't always appeal to viewers who may have a particular preference for the scene setup or host style, and can easily tune away if the show doesn't pique their interest in the first 60 seconds.
- Influencer-hosted sessions tend to have a negative margin impact as products are often sold at steep discounts to drive viewership and to meet the influencer's sales commitment.
- Organizations haven't established effective mechanisms to retain shoppers from the initial purchase as they are mostly attracted by the promotional price. They need analytics to dynamically adapt to the viewer sentiment during the show, and must identify next best actions (NBAs) for retargeting and follow-ups to increase conversion and retention after the show.
- Staff need to be trained and incentivized to deliver effective interactions during the live session. Detailed planning beforehand is required to ensure the session can support the brand positioning and business goals.

User Recommendations

- Identify use cases where livestreaming can add value, such as brand marketing, presales consultancy and after-sales service. Identify channels where you want to host live sessions, including branded websites/apps, online marketplaces, livestreaming platforms and social networks.

- Set up cross-functional collaboration. Marketing should prepare scripts, curate products, monitor audience sentiment and identify NBAs. Supply chain should ensure adequate supplies and transparent return processes. IT should test the system to ensure smooth content and show delivery and handover between the live session and check-out process.
- Employ customer analytics tools to ensure positive sentiment during the show, and encourage repeat purchases after the show. Provide training and align incentives for employees to effectively engage customers and offer compelling service.
- Set up dedicated space in physical locations for live commerce to facilitate merchandising and product demonstration.

Sample Vendors

Bambuser; Emplifi; Immerss; Klarna; Powerfront; Radicalbit; Salesfloor; Tulip; Whisbi

Gartner Recommended Reading

Decode the Social Commerce Ecosystem to Execute Effectively

Design Social Commerce Features That Convince Consumers to Buy

Contextualized Real-Time Pricing

Analysis By: Jonathan Kutner, Robert Hetu

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Contextualized real-time pricing (CRTP) refers to the ability to manage and adjust item pricing for customers in real time, across all touchpoints, leveraging the customer's mobile device. Item pricing can be influenced by a wide variety of considerations including competitive pricing, promotional cadence, customer loyalty and, potentially, based on real-time supply and demand of an item.

Why This Is Important

CRTP connects physical and digital pricing for customers. Pricing in digital channels can be easily changed multiple times, and customers are increasingly aware of the different prices across touchpoints. Changing in-store pricing rapidly can cause confusion and frustration for customers and create labor issues for associates. These conflicting needs are driving large retailers to manage pricing strategies consistently across all touchpoints through customer mobile devices.

Business Impact

CRTP provides the immediate relevance that customers expect while enabling multichannel retailers to maintain the appropriate competitive stance. Moreover, by personalizing prices, retailers can target discounts toward their best customers, evaluate the market basket and effectively save margin. Further, moving payment transactions to the smart check-out process via the customer's mobile app eases the workload and complexity of execution for in-store associates.

Drivers

- Executing frequent price changes in store is complex and costly, requiring electronic shelf labels, frequent point-of-sale updates and synchronization to back-end applications.
- Using the customer's mobile device for real-time pricing is the most practical solution for ensuring they obtain the best individualized price.
- CRTP means retailers can make pricing and promotions personalized and relevant, addressing consumers' needs, such as saving money, nutrition, local products, and environmentally friendly products.
- Technology solution providers' application capabilities are maturing and can now support the functionality of CRTP down to the individual customer.
- A seismic shift within retailing means customers, not products, are at the center of merchandising processes. Retailers must now elevate the role of the customer, and this includes personalized pricing and promotions.
- Immersive in-store experiences curated for customers and delivered through a unified retail commerce ecosystem will lead to personalized products, experiences, pricing and promotions.
- Multichannel retailers must strive to entice their customers back to the store — the most profitable channel — by offering a world-class, engaging experience as well as personalized pricing and promotions.
- Product margins continue to be affected by unstable and costly supply chains. To optimize margin, CRTP can boost products and marketing messages to drive customers to the store.
- The emergence of generative artificial intelligence (AI) will further enhance the capability for personalized product offers, based on individual consumer profiles for individual shoppers, offering personalized and relevant discounts from historical data.
- CRTP is progressing into the Trough of Disillusionment, as the complexity of implementation is appreciated and the requirement to execute vital preceding stages within pricing is crucial before reaching maturity toward CRTP. Therefore, CRTP progresses on the five- to 10-year path to the plateau.

Obstacles

- The majority of retailers still have siloed processes for pricing and are not ready for implementation.
- CRTP is linked to progress of smart check-out technology, which is still in the trough.
- Difficulty in ensuring correct prices in real time across technology platforms and touchpoints will impede implementation of CRTP.
- Customers are not accepting volatile pricing on products such as groceries.
- Limitations of in-store networks and weak cellular signals hinder the ability to exploit data in real time.
- Legacy enterprise resource planning platforms and older point-of-sale systems cannot handle personalized offers for millions of customers.
- Retailers must profile the orchestration of customer data gathered from loyalty schemes or digital channels.
- Many retailers require digitalization of core AI merchandising processes such as unified price, promotion and markdown optimization (UPPMO) before any implementation of CRTP.

User Recommendations

- Analyze and profile customer behavior through orchestration of data gathered from loyalty schemes, digital channels and social media.
- Develop a unified retail commerce pricing strategy driven by customer behavior hierarchies.
- Implement a unified retail commerce platform, enabling consistent base pricing across all touchpoints.
- Link mobile applications to loyalty and check-out processes to enable pricing adjustments in real time and encourage shopper loyalty.
- Implement algorithmic retailing to ensure the retailer's entire organization is operating at peak effectiveness throughout all pricing processes.
- Integrate marketing, merchandising, supply chain and store operations processes to provide consistent cross-touchpoint execution for customers.
- Formulate a roadmap of essential UPPMO capabilities to support pricing functionality down to the individual customers, with realistic implementation time frames that will enable a successful adoption of CRTP.

Sample Vendors

DemandTec; dunnhumby; Eversight; Oliver Wyman; Oracle; Retail Express

Gartner Recommended Reading

Market Guide for Retail Unified Price, Promotion and Markdown Optimization Applications — Long Life Cycle

Market Guide for Retail Unified Price, Promotion and Markdown Optimization Applications — Short Life Cycle

Infographic: The Retail Store of Tomorrow

Infographic: Artificial Intelligence Use-Case Prism for Long Life Cycle Retail

Infographic: Artificial Intelligence Use-Case Prism for Short Life Cycle Retail

Smart Check-Out

Analysis By: Max Hammond, Sandeep Unni

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Smart check-out technology solutions are provided through the convergence of different combinations of digital technologies, including computer vision and AI. Sensor fusion, typically through the use of weighted shelves or scales, is combined in some solutions. Lidar-based solutions can also be used to replace cameras and video. Smart check-out technology solutions eliminate the need for customers to go through the traditional physical check-out lane.

Why This Is Important

Smart check-out implementations continue as retailers strive to offer customers a quick and convenient experience. Implementations are still predominantly in the small format food, grocery and convenience segments, with increasing interest in sporting arenas and travel retail. Furthermore, the tightening of labor markets and the difficulty in attracting and retaining store associates have created a new use and pressing case.

Business Impact

Smart check-out is a rising technology that can drive operational efficiency through real-time intelligence, enabling retailers to optimize their workforce through automation as well as improve their customers' journeys through ambient self-service. Retailers benefit from the data generated by tracking customers, identifying shopping behaviors and capturing individual preferences. This data can be used for greater personalization and recommendations.

Drivers

- Customer expectations for greater convenience and speed while shopping has steadily driven new smart check-out technology implementations.
- The continued tightening of the labor market and high labor costs have raised awareness for automating mundane store-based tasks and as a result, smart check-out has gained significant attention.
- New attention and investment have been given to the digitalization of store technology investments as retailers have been forced to refocus on connecting stores to their entire ecosystem and develop an immersive experience for customers and associates.
- Furthermore, retailer interest in smart check-out technology integrated within a shopping cart, basket or at the register has grown further in the last 12 months, viewed as a cheaper alternative to entire store concepts.
- The real-time insights captured through advanced computer vision and sensor fusion can help retailers improve actionable decisions in several operational areas, including merchandising, inventory management, customer service, and loss prevention. The adoption of generative AI has the potential to accelerate this over the next 12 months.
- These real-time insights will allow retailers to react more quickly and act preemptively as they have data to anticipate customer needs and preferences.
- Hybrid solutions, which have started to emerge within the market, including solutions supporting traditional registers and self-check-out terminals as a part of the smart check-out implementation, are further aiding adoption.
- Customer expectations for greater convenience and speed while shopping has steadily driven new implementations, moving smart check-out forward past the Peak of Inflated Expectations. We expect this profile to continue steadily forward over the next 12 months as retailers continue to define their approach and execute the strategy.

Obstacles

- Amazon's recent announcement of numerous Just Walk Out store closures has contributed to a slowdown in smart check-out implementations across the entire store in 2023.
- Regardless of the smart check-out model, challenges remain around scalability and high implementation costs.
- Computer vision and sensor fusion technology for smart check-out remain largely unproven in supporting large-scale formats. The typical store format size is roughly between 2,500 to 6,000 square feet or less.
- The sale of age-restricted items will require associate assistance for approval, such as alcohol, tobacco, or medicines. Additionally, associates may be needed to remove security tags.
- As a result, smart check-out has moved past the peak and is in the early stages of heading toward the trough. However, smart check-out is likely to reach the Plateau of Productivity within the next two to five years due to the rapid increase of other implementation forms, such as at the till or in the shopping cart.

User Recommendations

- Select implementations based on a thorough assessment of customer expectations, the physical store portfolio, store formats, product ranges and assortments as well as the competition.
- Leverage smart check-out to provide an enhanced ambient customer experience, making sure to offer hybrid alternatives, including the use of mixed-mode payments for check-out to meet customer expectations.
- Extract the maximum benefits from computer vision, not just for smart check-out but also for gaining greater insight at the store level. This will drive more operational efficiency as well as improve revenue.
- Reallocate and retrain cashier associates for other tasks, such as shelf replenishment, that could add incremental value to optimize human labor and improve operational efficiency.
- Evaluate the physical store communication infrastructure requirements to consider shifting self-check-out processing to the edge for uninterrupted customer experiences.

Sample Vendors

AiFi; Amazon Web Services (AWS); GK Software; Mashgin; Supersmart; Toshiba Global Commerce Solutions

Gartner Recommended Reading

Market Guide for Retail Smart Check-Out Solutions

Top Unified Retail Commerce Execution Trends for CIOs 2023

Infographic: The Retail Store of Tomorrow

Visual Search

Analysis By: Aditya Vasudevan

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Visual search for digital commerce helps customers find products with relevant visual attributes, typically via the use of computer vision, natural language processing and machine learning technologies. Solutions analyze catalogs to understand taxonomy and product attributes in addition to the visual features, and can support search via text, image or video, and sometimes via the use of filters to narrow product choices.

Why This Is Important

Visual search can improve conversion rates, average order value and customer engagement by presenting products with relevant visual attributes. The solution is popular in B2C retail sectors such as fashion, sports, beauty, furniture and home improvement. However, there is a growing need within B2B specifically for OEM use cases.

Business Impact

Visual search enhances customer experience:

- Improves search relevance and product discovery
- Supports innovative experiences such as “shop the look” and shoppable video

- Personalizes search results and product recommendations based on customer preferences, historic purchases and profile

Visual search improves productivity and data quality:

- Reduces manual efforts in catalog management with automated tagging
- Standardizes and enriches product data, and ensures better data compliance

Drivers

- The pandemic has accelerated customer adoption of digital technologies, and engagement using visual elements is more effective than using text-only ones.
- Visual search performs detailed visual feature analysis of products to provide more relevant results than text-only analysis of product descriptions. This is important in verticals such as fashion, beauty, home improvement and OEMs, where presenting the right results of visually similar and complementary/replacement products improves conversion.
- Visual search technology is maturing, with some solutions in the market showing proven performance as measured by business metrics.
- Most vendors offer SaaS solutions, making it easier to switch when better-suited technologies are available.

Obstacles

- Few digital commerce platform vendors offer visual search natively. Clients have to procure the services of specialized search providers that meet their use cases.
- While some search and product discovery vendors have visual search, it is usually an add-on with limited capability. Businesses that want to differentiate are still seeking specialized solutions.
- Unlike text-based search, generic visual search capabilities won't deliver desired results for commerce use cases unless the machine learning underlying the technology is trained on the specific product domain.
- Vendors have different capabilities for tag management, search, merchandising and configuration tools, and have different expertise for verticals. Organizations face a steep learning curve to understand how the technology works and select the right vendor.

User Recommendations

- Define functional requirements for your verticals and products, and for specific features such as visual filters, image hot spot, "shop the look" or shoppable media.
- Combine visual search with browse (e.g., product finders) and other modalities such as voice, image and text to maximize the value of the technology.
- Investigate vendor capabilities in terms of tag management, search relevance, visual product finders and configuration options. Understand whether they support additional functions such as personalization, product recommendations and analytics.

Sample Vendors

Clarifai; Fast Simon; Google Cloud; Partium.io; Pixyle.ai; Syte; Vue.ai

Gartner Recommended Reading

Improve Product Revenue by Implementing the Right Visual Search Solution

Customer Journey Analytics

Analysis By: Matt Wakeman

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Customer journey analytics (CJA) tracks and analyzes customers' and prospects' interactions with an organization across multiple channels. It aims to provide a holistic view of customer experience by covering all the channels used by customers. CJA includes channels with human interaction (e.g., a call center) and those that are fully automated (a website). It also includes physical channels (a retail store), and those that provide customer assistance (live chat and co-browsing).

Why This Is Important

Consumers expect personalized, customer-centric engagement and marketers need to deliver it — challenging marketing strategies that take a business-centric approach to the customer experience. Moreover, customer activity across channels is increasing, so tools that integrate cross-channel customer behavior using CJA enable companies to identify opportunities to improve customer experience.

Business Impact

CJA is a strategic priority for a variety of internal roles in several different industries, as leaders strive to gain a better understanding of the customer journey across all phases — buying, ownership and advocacy. In many cases, marketers will be able to leverage CJA features in their existing martech stack rather than add a stand-alone vendor.

Drivers

- CJA is a strategic priority for multiple roles, as marketing, sales and service leaders strive to gain a better understanding of customers' complete journeys and touchpoints across channels and functions.
- CJA can improve marketers' personalization tactics by measuring each phase of a journey to optimize the entire journey for the customer (or customer segment) context and intent.
- CJA access is accelerating as more applications begin to add elements of journey analysis into existing tools, such as customer data platforms, personalization engines, customer analytics applications and multichannel marketing hubs.

Obstacles

- Marketers are challenged to access, analyze and activate their companies' customer data — from web activity to call center engagement. Gartner surveys show that on average, companies use nine channels for marketing, 2.9 for digital commerce and 5.4 for customer service. The greater the number of siloed customer channels or data sources, the more challenging to deliver comprehensive CJA.
- Digital data deprecation has accelerated, with changes to platforms (Apple) and regulations (across North America and Western Europe). While marketers must address regulatory and consumer concerns, this trend creates a journey analytics gap for anonymous audiences, due to the increasing challenge of linking anonymous digital activity across sessions and devices. Those challenges are larger for certain go-to-market models (primarily indirect sales models, e.g., B2B2C).

User Recommendations

- Acknowledge that valuable insights come from understanding the combination of channels used by customers, not by understanding customer (or segment) behavior within a single channel.
- Evaluate your existing technology stack to see if you're already paying for an application with journey analysis capabilities — because journey analysis functionality is often embedded into other systems.
- Avoid measuring outcomes with channel-specific key performance indicators (KPIs) (that ignore customer activities in other channels, such as single-channel conversion rates or cost per acquisition. Channel-specific KPIs can be useful diagnostic indicators for prioritizing optimizations.
- Start with customer identification and journey mapping across only two to three channels, where the journey benefits the customer and organization (high impact) and the data are both available and valuable (high feasibility).

Sample Vendors

Adobe; Cerebri AI; Splunk; Teradata

Gartner Recommended Reading

Market Guide for Web, Product and Digital Experience Analytics

What Marketers Need to Know About Customer Journey Analytics

Consent and Preference Management

Analysis By: Tia Smart

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Consent and preference management platforms consolidate end-user choices regarding how their personal data should be handled. Choices are synchronized across legacy, active and incoming repositories, both on-premises and in the cloud. The intent is to extend visibility and control to digital visitors, allowing them to determine and change how much of their data to expose, to whom and for what purpose. This also empowers marketers to respect customers' choices with a minimum of manual overhead.

Why This Is Important

Protections for personal data collected digitally continue to expand across the globe as more countries and U.S. states consider legislation similar to or stronger than GDPR, CCPA, CPRA and CPA. Technologies and organizations must quickly adapt to the global transformation. Consent and preference management platforms (CPMPs) empower organizations to comply with new laws, preserve and extend essential capabilities, and demonstrate to customers and stakeholders that they care about privacy.

Business Impact

- As new legislation is introduced worldwide, organizations must use CPMPs to demonstrate to consumers that they value their privacy and are in compliance to avoid costly violations and consumer mistrust.
- Protecting your organization from compliance violations while maintaining the ability to utilize customer data for business purposes can be technically and operationally challenging. CPMPs help to address these issues.

Drivers

- **New laws and variations in legislation.** With additional countries and regions seeking to implement their own consumer privacy laws, tracking laws in each country and region is a tedious but integral task to ensure compliance. CPMPs address specific requirements, such as auditing websites, enforcing consent choices and making data available for subject rights requests.
- **Reliance on first-party data.** The shift to an increased dependence on first-party data instead of third-party cookies forces organizations to reevaluate the enterprise's data structure. Managing consent and preference choices throughout the ever-convoluted enterprisewide structures takes time, and some CPMPs try to solve this. CPMPs' importance is ever more apparent in countries like the U.S., where implicit consent is still allowed in most states. Organizations need to take a state-by-state approach or risk messing up direct marketing opportunities available to them.
- **Societal norms and consumer expectations.** Consumers now expect to have control over their personal data as well as transparency from organizations on how it is used. However, consent flow banners and dialogues can significantly downgrade user experience, driving the need for better design solutions enabled by certain CPMPs.

Obstacles

- **Ever-changing global laws and best practices.** With regions and countries implementing their own data privacy legislations, organizations must adapt to each one to remain in compliance. CPMPs tend to oversell their ability to make managing consent options simple, often downplaying the complexity of managing an organization's internal and external databases.
- **Lack of UX design support.** Forcing too many privacy choices on consumers degrades UX and leads to high opt-out and abandonment rates. Yet, having too few choices limits the ability to tailor experiences. To strike the right balance requires cross-functional, collaborative activities across the organization.
- **Complex technology architectures.** Digital transformation acceleration efforts propelled organizations to rethink how technology solutions work together and how data flows throughout the ecosystem. Adopters need to factor in the number of connections — both native and customized (e.g., APIs, ETL) — that are needed to effectively use a CPMP.

User Recommendations

- Prioritize consent management policies and initiatives as a critical priority for all functions. Establish a cross-functional customer data and privacy council to review and update policies and processes for the enterprise to follow.
- Avoid “dark patterns” or deceptive language for consent dialogues that attempt to influence users’ choices (see the FTC’s Press Release).
- Use a “telescoping” approach to disclosures and preference dialogues that allow users to go as deep as they choose into specific details. Offer consistent, easy access to preference settings that can be viewed and changed on demand to ensure that you are undertaking a privacy-by-default approach.
- Compare and assess CPMP offerings against your organization’s highest-priority data privacy protection and integration requirements and internal costs.
- Develop a CPMP where the market cannot effectively connect and integrate with legacy internal tools.
- Take a modular approach to adoption and avoid excessively broad project scopes. Anticipate sufficient time to resolve unforeseen complications in these projects.

Sample Vendors

BigID; Didomi; Ketch; OneTrust; PossibleNOW; Syrenis; TrustArc

Gartner Recommended Reading

Market Guide for Consent and Preference Management

Market Guide for Consent and Preference Management for Marketers

Distributed Order Management

Analysis By: Max Hammond, Tom Enright, Sandeep Unni

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Definition:

Distributed order management (DOM) orchestrates and optimizes the customer order fulfillment process to deliver targeted service levels for fill rate, ensure accuracy of orders, and provide on-time, cost-effective order fulfillment.

Why This Is Important

Consumer expectations have accelerated for free or low-cost flexible fulfillment options, and such options are now an essential competitive requirement. Retailers with complex fulfillment networks and a wide variety of fulfillment services require DOM systems to optimize fulfillment performance, reduce cost and maximize the use of all available inventory. DOM enables them to fulfill customer orders as accurately and as efficiently as possible, from wherever inventory is available.

Business Impact

DOM enables retailers to efficiently handle the complexity of unified retail commerce customer order management and fulfillment, including multiple fulfillment types in a single order as well as changes during the fulfillment process. It is used to improve order orchestration and fill rates, optimize order collection lead times, shorten cycle times, reduce buffer stock, optimize shipping on delivery and leverage new fulfillment strategies to provide a cost-optimized unified retail commerce experience.

Drivers

- To meet today's consumer shopping demands, many retailers have to increase fulfillment complexity in order to improve consumer experience.
- Physical stores are increasingly diversifying to become local fulfillment hubs. DOM can reduce the cost of fulfilling e-commerce demand.
- Retailers are expressing growing interest in DOM systems to handle order fulfillment complexity, stemming from their expansion of shopping services to consumers.
- Increased competition from pure-play digital retailers and last mile startups has heightened customers' expectations for convenient, immediate, and free or low-cost fulfillment.
- DOM continues to evolve to support more retail use cases such as managing back orders, returns, preorders, and split and partial shipments, and is increasingly being used for marketplace order fulfillment.
- Pure-play online retailers operating fulfillment from multiple network nodes are increasingly seeing benefits from the use of DOM systems. These networks can include 3PL warehouses or, often, automated DCs and microfulfillment centers that carry merchandise for a specific geographic location.
- The number of retailers with annual revenue of less than $500 million that are licensing DOM systems has grown significantly. The volume of agreements by retailers of this size is unprecedented and illustrates a significant shift away from the recent past when DOMs were considered only viable for large retailers.
- Customer expectations for fast and flexible fulfillment are driving the need to widen the ecosystem of DOM vendors on the market.
- This innovation is moving forward due to sustained levels of hype and increased implementations over the last year or so.

Obstacles

- Due to the complexity of DOM, integration presents a challenge to retailers when implementing the technology into their existing systems environment and architecture, such as inventory sources and ERP integration.
- For the DOM system to be effective, it's imperative that the inventory data is accurate across the retail network, including the physical store. This can be challenging for retailers that classify inventory into different pools across channels and don't have an efficient store inventory management process and platform. However, the adoption of generative AI has the potential to analyze demand patterns, lead times, and other factors to determine the optimal inventory levels.
- The increasing array of solutions addressing store-based fulfillment is a fragmented market representing DOM vendors, store inventory management vendors, point solutions and so on. This is adding to market confusion and adoption inertia.
- As stores diversify their operations and incorporate localized fulfillment, retailers may need to further develop or increase their labor portfolio as well as fulfillment execution costs.

User Recommendations

- Create process maps for the multiple permutations and combinations of ways a transaction can be ordered and fulfilled, considering both business and consumer processes.
- Determine your need for a DOM application by assessing the complexity of your current and planned consumer order fulfillment service portfolio against the capabilities of existing systems, such as ERP, to manage this complexity.
- Identify current integration points between DOM and other applications involved in supporting the order fulfillment process. Ensure there is no conflict between other applications or platforms that may include this capability, including POS embedded in unified commerce platforms.
- Rethink your workforce strategy for fulfillment execution, including the human workforce, third-party workers and automation.
- Evaluate adjacent technologies that can support fulfillment activities, like RFID, smart shelf, mixed reality, microfulfillment and smart robots.

Sample Vendors

Blue Yonder; Fluent Commerce; Kibo Commerce; IBM; Manhattan Associates; OneStock

Gartner Recommended Reading

Market Guide for Retail Distributed Order Management Systems

Best Practices for Selecting Retail Distributed Order Management Systems

Infographic: The Retail Store of Tomorrow

Quick Answer: What Is Unified Retail Commerce, and Why Does It Matter?

API-Based Digital Commerce

Analysis By: Aditya Vasudevan

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

API-based digital commerce (also commonly known in the market as “headless” digital commerce) is the use of APIs to decouple front ends from core commerce services and to integrate commerce capabilities within any touchpoint where selling is required.

Why This Is Important

The proliferation of touchpoints requires a multichannel, multiexperience approach to applications. This, in turn, requires the decoupling of the presentation layer from commerce services that an API-based approach offers. Some vendors provide API-based commerce platforms, while others retain a native storefront but also provide full APIs for headless operation, known as “head optional.”

Business Impact

Decoupling the front end is a step toward a modern, modular commerce architecture that provides business flexibility and IT agility. As commerce journeys become multiexperience, this is an enabler for delivering consistent experiences across all touchpoints. The storefronts must be delivered independently of the commerce application, via a digital experience platform (DXP) or custom front end. Although being API-enabled does provide ultimate flexibility, it requires digital maturity to succeed.

Drivers

API-based digital commerce adoption is driven by:

- Midsize to large organizations, that are looking to move up in the digitally mature scale. It has become the standard approach for the delivery of experiences by the enterprise, even if the underlying application remains monolithic.
- Recognition of the quality of digital experience as a key differentiator across multiple touchpoints (for example, native mobile apps, marketplaces, social platforms, in-store experiences, the Internet of Things, wearables, smart homes and vehicles).
- Maturity of front-end frameworks, single-page application (SPA) and progressive web application (PWA) as the dominant “next generation” of client-side, JavaScript-based presentation and the emergence of digital experience platforms (DXPs) requires digital commerce platforms to be fully API-enabled.
- Growth in DXPs supporting “experience-driven commerce.”
- Commerce as an enabling part of a wider digital business technology platform.
- Pace of innovation in digital commerce driving more flexible, modular architectures.
- Expense and complexity of some leading “monolithic” commerce platforms, when a more agile, flexible subset of capability is desired.

Obstacles

API-based digital commerce improves business agility. However:

- The “headless” buzz has caused some disillusionment among those expecting it to be easy to achieve. Despite this, it is rapidly moving toward mainstream acceptance.

- Commerce experiences can be more complex to implement than single-vendor “full stack” solutions due to increased emphasis on integration efforts and governance of the decoupled front-end technology.
- A key challenge is ensuring business users retain no-code control over the storefront(s). This adds complexity to implementations and the business UIs required to support presentations and processes.
- Most vendors’ native commerce platform storefronts are shifting from server-side “themes” or template engines toward client-side SPA/PWA. Thus, some of the benefits of API-based digital commerce are becoming available from almost all vendors. But having an API is not the same as being “API first,” and not all the benefits of this new approach have yet to be realized.

User Recommendations

Pursue API-based commerce if you think it may fit your requirements, specifically if you:

- Want to retain granular control over multiexperiences, including by deploying a DXP, building via a multiexperience development platform (MXDP), or developing a SPA/PWA presentation tier.
- Are looking to support multiple digital and physical channels equally from the same business logic, and to support cross-channel continuity of experience.
- Already have (or are looking to implement) a DXP to provide a more consistent customer experience across commerce, brand and other digital properties.
- Have a large, inflexible, legacy, monolithic, full-stack commerce application that cannot be replaced in a single step, and want to migrate to a modular architecture.

Sample Vendors

BigCommerce; commercetools; Elastic Path Software; fabric; Infosys Equinox; Kibo Commerce; Shopify Plus; Spryker Systems; Virto Commerce; VTEX

Gartner Recommended Reading

Magic Quadrant for Digital Experience Platforms

Choose the Right Digital Commerce Platform Architecture

Quick Answer: What Does a Technology Reference Model for Digital Commerce Look Like?

Defining the Digital Experience Platform

Shoppable Media

Analysis By: Matt Moorut

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Shoppable media refers to prerecorded interactive images, videos and other media formats, which enable an online path to purchase when a user clicks an object that is showcasing merchandise. Object examples include a “shop” button overlaid on an image or video displaying products. Various digital shoppable media formats are available and viewable via both mobile and desktop, with notable momentum visible in social media apps.

Why This Is Important

Customers expect to shop and buy when and how they want, seeking a seamless purchase experience. Shoppable media is a merchandising technique that empowers brands to close the gap between product inspiration and direct purchases, reducing friction in a customer’s current context. For example, if consumers are interested in purchasing a dress featured in a streamed TV show, they could click or tap on it directly through the video rather than switching to a retailer app or website.

Business Impact

Shoppable media provides a bridge between promotional content and commerce, often reducing the number of steps required for customers to make a purchase. By streamlining purchase journeys, shoppable media can increase direct-to-customer engagements, provide near-real-time insight on campaign performance, reduce drop-outs, and increase revenue. It can also provide further impact on business operations and technology, as these require change to support the commerce channel.

Drivers

- Consumer preference for online shopping continues to grow. According to the 2022 Gartner Consumer Values and Lifestyle Surveys, 24% of U.S. consumers said they prefer making all clothing, shoes and accessory purchases they can online.
- Major retailers and media companies are investing in shoppable media to expand customer reach and monetize the traffic. For instance, in mid-2022, Walmart partnered with Roku to enable TV streamers to purchase featured products fulfilled by the retailer directly on their streaming platform. An example of shoppable media innovation can be seen from NBCUniversal, which is partnering with KERV Interactive to leverage AI to surface relevant products within its “Must ShopTV” product. This is being used on its streaming service, Peacock.
- The shoppable media market is maturing, as multiple digital commerce technology providers fill different use cases. For instance, PriceSpider and Shoppable offer where-to-buy and universal check-out technology, respectively, while Amplience and Bazaarvoice (Curalate) help brands manage shoppable content in social media.
- Sales in the U.S. still lag behind China. This encourages analysts to forecast strong growth in shoppable media, as best practices from Taobao Live flow through to large, international players.

Obstacles

- **Low consumer adoption:** Social commerce is still nascent in North America and Europe relative to China. Low consumer adoption of social commerce means that marketers prioritize other investments.
- **Margin erosion:** Seller fees or commissions paid to platforms providing direct check-out experiences can pressure profit margins. Brands that sell high-margin products are in a better position to offset those fees. Those with low margins may find more profit by using media to drive traffic to brand-owned product landing pages and check-out experiences.
- **Lack of control of surroundings:** The placement of media on third-party platforms, such as TikTok, exposes brands to more risk from surrounding assets, such as objectionable or inflammatory content.
- **Limited use cases:** Shoppable media is better suited for impulse purchases than high-consideration goods. As such, beauty, fashion, housewares and consumer packaged goods brands can benefit more than other industries.

User Recommendations

- Pilot content formats and platforms that provide a more engaging view of products than traditional digital storefronts. Options include shoppable ads, social media posts, video streaming platforms and enriched content assets.
- Partner with customer experience leaders to assess the impact of broadening the range of commerce channels to the brand experience. Work with finance and sales teams to assess the potential impact to margin performance, given the rising costs of execution.
- Establish what execution resources are necessary for a seamless commerce execution, using shoppable media formats.
- Assess the overlap of your target audience with captive audiences on streaming services to ascertain campaign objectives and sales targets.

Sample Vendors

Bazaarvoice; ChannelSight; Firework; KERV Interactive; NBCUniversal; PriceSpider; Roku; SmartCommerce; talkshoplive

Gartner Recommended Reading

Design Social Commerce Features That Convince Consumers to Buy

Decode the Social Commerce Ecosystem to Execute Effectively

Infographic: 7 Key Trends in Digital Commerce

Digital Commerce Maturity Model for Marketing

Understand How Shoppers Use Digital Tools to Combat Higher Prices

Customer Data Platform

Analysis By: Rachel Smith

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Definition:

A customer data platform (CDP) is a software application that supports marketing and customer experience use cases by unifying a company's customer data from marketing and other channels. CDPs optimize the timing and targeting of messages, offers and customer engagement activities, and enable the analysis of individual-level customer behavior over time.

Why This Is Important

Making use of customer data is hard — respondents to the 2023 Gartner CMO Spend and Strategy Survey identified customer experience (CX) management and customer analytics as their top two capability gaps in meeting 2023 business goals. However, getting it right results in improved customer experiences, marketing performance, scale and efficiency. Marketers turn to CDPs to gain control of data management and orchestration as multichannel journey orchestration, data privacy and first-party data grow more complex.

Business Impact

CDPs address marketing use cases like segmentation, profile unification and predictive modeling. Use cases have grown into other functions like CX and enterprise data and analytics (D&A). CDPs first served retail, travel and hospitality industries, but have expanded into regulated industries like healthcare and financial services. Interest from B2B organizations grows, though features specific to B2B (for example, proprietary intent or firmographic data and predictive lead scoring) remain on the back burner for vendors.

Drivers

- More roles in marketing and adjacent functions need unified, real-time data to operate efficiently and deliver value. Since CDPs developed as a "hub," routing data through the martech stack, they enable marketers to coordinate a growing number of data-driven use cases, from identity resolution to messaging. CDPs' utility makes them a strategic purchase for many brands, anchoring initiatives from 360-degree customer views to personalization.
- Hype related to first-party data fuels interest in CDPs as organizations face impacts from ID deprecation and privacy regulations. CDPs are often positioned as a transition option to evolve marketing's data strategy away from third-party cookies and toward first-party data. However, this is only a piece of the martech puzzle. Organizations expecting a fluid connection between first-party identifiers and the adtech world will find CDPs an incomplete solution to prospecting use cases.
- High demand for CDPs to support personalization and orchestration pushed vendors to introduce workflows beyond integration and segmentation. Popular use cases beyond data collection and integration vary, including prediction, activation and identity resolution.
- The past year saw continued market diversification. The 2022 Gartner Marketing and Communications Technology Survey saw a slight increase in the use of marketing cloud CDPs and a decline in smart hub CDPs. As such, market focus has shifted away from the smart hub style of building orchestration capabilities within the CDP, and toward managing profiles that can be leveraged by other technology in a marketing cloud suite.
- The emerging trend of building a "composable" CDP architecture is inspiring new vendors to compete. They bring a vision of activating an organization's existing enterprise data warehouse (EDW) as a CDP instead of buying an out-of-the-box CDP. This allows prospective buyers to purchase components of CDP functionality from different vendors (for example, a vendor for data collection vs. storage vs. activation).

Obstacles

- **Complex process to select a CDP.** Prospective buyers' lack of detailed use cases and clarity on technology dependencies exacerbate the problem. Use cases positioned by vendors can be far-reaching, such as compensating for the loss of third-party cookies through IDR and clean rooms.
- **Overlapping martech:** CDP capabilities remain variable due to an expanding feature set and overlap with other technology. For example, it's hard to differentiate between a smart hub CDP vs. an MMH offering CDP features. There's also confusion around CDP vs. MDM.
- **Technical skills:** Successful CDP utilization is correlated with having the technical skills to operate and integrate the technology. IT is increasingly involved, and upskilling marketers is paramount.
- **Concerns of CDP bloat:** Common data overages sneak up to increase CDP cost. Further, the potential for CDPs to become another data silo has complicated the CDP business case and conversations between marketing and IT regarding deployment strategy.

User Recommendations

- Collaborate with stakeholders to develop use cases for unified customer data in the context of your marketing, sales, service and digital commerce outcomes. Identify points of friction and opportunities in first-party data collection, customer analytics, personalization and CX.
- Clarify points of integration and potential redundancy in your technology stack. Audit your technology landscape to identify adjacencies where capabilities overlap (for example, personalization engines, multichannel marketing hubs and marketing automation platforms).
- Use proof-of-concept pilots to validate delivery on promised capabilities, as well as the usability and effectiveness of the offering.
- Scrutinize your existing multichannel marketing hub and personalization vendors' roadmaps to see if any existing features achieve the capabilities of a CDP, or if they plan to introduce such features.
- Work across business and IT functions in selecting and deploying a new CDP, or maximizing the use of existing technology.

Sample Vendors

ActionIQ; Adobe; BlueConic; Dun & Bradstreet; Redpoint Global; Salesforce; Tealium; Zeotap

Gartner Recommended Reading

Market Guide for Customer Data Platforms

A Guide to What Is — and Isn't — a Customer Data Platform

Power Up Your Customer Data Technology Stack

Toolkit: Use Case Library — Customer Data Platform, Personalization Engine and Multichannel Marketing Hub

Maverick Research: The Disappearing Business Case for Customer Data

Conversational AI for Digital Commerce

Analysis By: Mike Lowndes

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Conversational AI platforms for digital commerce use natural language interfaces such as voice and text chat, including messaging platforms, to enable people (and machines) to discover and purchase goods and services via a dialogue with a machine.

Why This Is Important

Conversational AI for digital commerce is a new UI to product discovery — that of conversational dialogue. Maturity remains low. "Conversational commerce" hype peaked in 2017 and faded due to the mixed success of first-gen solutions. Continued development was propelled by the acceptance of conversational UIs (CUI: Alexa, Siri, etc.). Improvements in semantic search technology and the emerging large language models (LLMs) herald a steep change in conversational AI.

Business Impact

Commerce should be available where your customers are, via the technology they use daily. This includes messaging platforms, social media, smartphones, wearables, smart home devices and connected vehicles. Interactions use embedded natural language interfaces — those of messaging apps and voice. For product discovery, dialogues hosted by these devices and by sellers' platforms need support via a CUI such as the emerging LLM chatbots may provide.

Drivers

- The utility and acceptance of CUIs has exceeded the friction of using them for many simple, linear tasks. Uptake of this technology in digital commerce product discovery remains slow but is set to change rapidly.
- In simple use cases such as service/food ordering and repurchase of known items, conversational user journeys already work well — for example, via social messaging platforms — and are being widely accepted via home devices and mobile apps.
- Semantic technology (NLT, vector spaces and use of knowledge graphs to understand a product domain and link it to customer behavior), statistical algorithms and deep learning trained on vast amounts of data are all improving natural language understanding of both query and catalog.
- The recent emergence of LLMs provides two drivers. There is an expectation that "chat" can answer questions in a human-like way and thus, solve search problems. In addition, LLMs could provide the missing dialogue management and context-understanding capabilities required to bring conversational commerce to the mainstream.

Obstacles

- Solutions for complex product discovery journeys via CUI remain rare, and reassessment has been cautious. The space has had residual “toxicity” due to the limited success of previous generations.
- Conversational AI remains a specialized capability that needs to be procured separately from a core digital commerce or experience platform. Extra investment only occurs when this becomes a critical use case.
- Text- or voice-only CUIs are very limited for product discovery journeys. “A picture is worth a thousand words” and product display is crucial to digital commerce customer journeys; conversational digital commerce will thus need to be multimodal for many use cases. This requires a new type of mixed dialogue-and-product-grid UI, and new UIs are difficult to establish.
- Semantic technologies supporting dialogue have been lacking. The emergence of LLMs and engines such as ChatGPT may provide the framework for managing such dialogue and parsing queries in a product discovery journey.

User Recommendations

- Investigate CUIs for use cases such as repurchase or limited ordering. Clearly communicate the limitations of a new platform to your customers to avoid frustration.
- Review leading digital commerce search and product discovery vendors if you are cautious about using a full CUI but want to investigate the emerging technology. These platforms are gaining NLP and intent detection capabilities, but remain query-response, not conversational. Many vendors are currently experimenting with LLMs and this technology should be watched closely.
- Several “virtual shopping assistant” vendors exist on the market today that are using conversational AI and/or semantic search, usually presenting as a “mashup” of chat and search results pages. Use POCs to determine whether this new type of UI would work for your customers.
- Ensure a seamless switching from CUI to customer support or traditional search and browse to reduce friction and frustration when conversational experiences don’t deliver.

Sample Vendors

Botfuel; EasyAsk; Haptik; Inbenta; Klevu; Senseforth.ai; Unbxd; Zoovu

Gartner Recommended Reading

How Large Language Models and Knowledge Graphs Can Transform Enterprise Search

Magic Quadrant for Enterprise Conversational AI Platforms

Choosing the Right Conversational AI Platform

ChatGPT Research Highlights

Climbing the Slope

DXP

Analysis By: John Field

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

A digital experience platform (DXP) is an integrated set of technologies designed to enable the composition, management, delivery and optimization of contextualized digital experiences across multiexperience customer journeys.

Why This Is Important

Organizations need a solution to enable the composition, management, delivery and optimization of contextualized digital experiences throughout multiexperience customer journeys. A DXP addresses these needs, creating digital experiences across a wide range of engagement scenarios, audiences, channels, devices and modes. The integrated nature of a DXP means faster time to market and lower deployment costs, as well as higher levels of customer and employee engagement and satisfaction.

Business Impact

Poor digital experiences, often delivered in silos, lead to customer and employee frustration. DXPs help enterprises deliver compelling digital experiences for consumers, employees, citizens and partners. They provide significant efficiencies in composition, management, delivery, contextualization and optimization of digital experiences throughout multiple touchpoints. DXPs face disruption from headless content management systems as priority for composability increases.

Drivers

- DXPs have the ability to bring multiple silos of engagement into a single seamless experience.
- There is a growing need to improve customer and employee experiences, and to establish a stronger competitive position.
- Multiexperience strategy adoption is leading to a total experience model.

- Organizations want the ability to scale and pivot as business needs/environments change — DXPs help them do that.
- Business agility, elasticity, flexibility, extensibility and faster time to market are all enabled by DXPs.
- DXPs embrace a composable user experience, supporting a composable business model.
- There is a need for an integration layer, supporting API, integration platform as a service (iPaaS) and other models.
- Many organizations want to manage content and digital experiences with minimal IT support.

Obstacles

- Lack of digital maturity
- Cost
- Conservative verticals or use cases with low DX aspirations
- Limited agility and complexity of deployment
- Rise in composing DXPs from multiple capabilities/vendors instead of buying a core solution
- Organizational inertia or resistance to change

User Recommendations

- Ensure a business-aligned and streamlined DXP strategy by focusing on business outcomes, along with governance, including key business and IT stakeholders.
- Create an architecture for DXP that best meets your vision by examining the current state, determining gaps in current functionality and assessing opportunities to employ innovations required to achieve the future vision.
- Create an internal roadmap based on desired outcomes, technology maturity, potential disruptors and risks for the next three to five years, keeping composable DXP and the ideal user experience in mind.

Sample Vendors

Acquia; Adobe; Bloomreach; Magnolia; Optimizely

Gartner Recommended Reading

Magic Quadrant for Digital Experience Platforms

Critical Capabilities for Digital Experience Platforms

Defining the Digital Experience Platform

Adopt a Composable DXP Strategy to Future-Proof Your Tech Stack

Payments as a Packaged Service

Analysis By: Dayna Radbill

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Payments as a packaged service (PaaPS) enables B2B businesses, such as commerce platforms and marketplaces, to offer payment processing services to their customers. This enables these "submerchants" to accept payments from their end customers. PaaPS products include two key components above and beyond normal merchant payment processing: automated onboarding of submerchants via APIs, and automated funds distribution management to submerchants, with related reporting.

Why This Is Important

PaaPS offerings remain popular as a way for commerce merchants and software companies to create new revenue streams and increase the cohesiveness of their existing solutions by adding payment capabilities. With adoption pioneered by digital wallets, gig-economy businesses, commerce and subscription platforms, PaaPS payments have become an attractive opportunity for any business that is well-positioned to connect buyers and sellers.

Business Impact

Offering payment processing services to customers is an elegant way to enhance an organization's overall value proposition while removing an unnecessary friction point. If businesses are your customers, enabling them to avoid a separate technology purchase decision and contract to maintain will likely be seen as a value-added service, for which they will be eager to award the business to you.

Drivers

- Many businesses, especially small and midsize businesses (SMBs), neither have nor desire to have payment expertise in-house. Enterprises that sell to these SMBs, such as marketplaces and platforms that are engaged in commerce software, recurring billing, gig economies and real estate, have all been early adopters.
- Established payment vendors, such as Stripe and Braintree (part of PayPal), have offered this functionality for years, and power the payment capabilities of software businesses like Shopify, Mindbody, Uber, Lyft and more. In recent years, vendors such as Adyen, CyberSource and WorldPay have extended their offerings to support PaaPs. We expect PaaPS to reach the Plateau of Productivity in two to five years, due to its market popularity and the advances to legacy payment infrastructure that enable ease of adoption.

Obstacles

- Even with the help of PaaPS payment technology partners, payments is a complex business requiring cross-functional expertise and resources. Some businesses aspire to be "payment facilitators," but may be challenged to understand what that consists of, and whether it is right for them.
- "Payment facilitator" is a card brand (Visa, Mastercard) distinction defining third-party agents that may sign a merchant acceptance contract on behalf of an acquirer and receive settlement of transactions from the acquirer on behalf of a sponsored merchant. Payment vendors such as PayPal, Klarna, Block and BlueSnap are registered as payment facilitators. However, B2B2C or even B2B2B businesses in nearly any vertical can participate in the PaaPS model, and share in the risk-reward equation of payments, without becoming a recognized payment facilitator in the eyes of the card brands.
- PaaPS is not a good fit for B2C businesses, as the value proposition is dependent on having businesses as customers.

User Recommendations

- Critically analyze the risk-reward equation for the organization by defining the use cases and customer value proposition to be supported and how this technology will accelerate or enhance that.
- Evaluate the technology implementation requirements and cost structure of the various available vendor solutions. Critically examine the “payment facilitator” distinction and whether it is important for the organization.
- Determine how much development investment the organization wishes to bear, if any, or if all or most of the technology can be outsourced to a third party.
- Evaluate and understand different pricing models for offering payments as part of the product. For example, as part of a bundled marketplace revenue share model versus offering it as a stand-alone service, competitive to other third-party options and priced distinctly based on its own value proposition.

Sample Vendors

Adyen; Finix Payments; Infinicept; PayPal; Stripe; Worldpay from FIS

Gartner Recommended Reading

Navigating the Digital Commerce Payment Market

Market Guide for Digital Commerce Payment Vendors

Personalization Engines

Analysis By: Alex De Fursac Gash

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Definition:

Personalization engines apply data and context on individual users to select, tailor and deliver recommendations and messaging such as content, offers and other interactions primarily through digital channels. Personalization engines are most commonly used to improve conversion, customer satisfaction, campaign performance or revenue in support of three use cases: marketing, digital commerce and customer service.

Why This Is Important

As brands increasingly rely on digital interactions, the importance of personalization — and the need to effectively manage and acquire customer data to deliver it — has surged. However, getting personalization right is tough and getting tougher, as concerns of data availability and customer privacy rise. The 2023 Gartner Multichannel Marketing Survey revealed that only 26% of organizations have achieved growth through new personalized experiences.

Business Impact

Personalization engines improve outcomes for marketing, digital commerce, merchandising and customer service experience efforts. They offer the ability to accelerate data collection, segmentation, experience testing, finding and recommending products and content, message targeting, as well as real-time triggering across channels and use cases.

Drivers

As per the 2023 Gartner Multichannel Marketing Survey, more than 80% of organizations say that they rely on personalization to build deeper customer relationships and deliver immediate value to customers. Personalization engines make both easier by:

- Improving data ingestion beyond customer behavioral data to support more diverse use cases. Data sources include customer context (location, local weather), brand context (inventory level, presence of local store), and predicted affinities. These data sources will grow in importance as they can facilitate personalization, even as regulatory, browser and device restrictions diminish the utility of cookie-based identifiers as sources for personalization data.
- Accelerating ROI through industry specificity. More vendors are offering industry-specific templates, AI models and reporting to help accelerate time to value and increase ease of use for marketers, thereby lifting ROI.

- Accelerating the deployment of new personalized experiences through templates. Many personalization engines offer channel- and use-case-based templates so users can set up new experiences without code and alleviate potential developer bottlenecks.
- Providing sophisticated AI out of the box. While there is often an additional fee, many providers offer built-in, customer-level predictions that can be used for triggering, segmentation or offer assignment.

Obstacles

- **Increased focus on first-party data:** Seventy-five percent of organizations say that third-party cookie deprecation (and the expected impact this will have on individual tracking and measurement) is increasing their focus on first-party data collection. This focus is also driven by the growing wave of customer concerns about data privacy and security.
- **Confusing technology landscape:** Personalization engines compete against marketing point solutions, multichannel marketing hubs, digital experience platforms and customer data platforms. This makes for a confusing set of options and difficult proof-of-concept (POC) comparisons when disparate vendors participate.
- **Low utilization of capabilities:** There is a legacy of underinvestment in training or process development in this market. Marketing technology leaders estimate they're only using 51% of the capabilities made available by their personalization engine solution.

User Recommendations

- Pilot personalization using existing resources (data, talent, technology, content) to prove results and justify budget. Use experimentation, including holdout testing, as an efficient and robust evaluation tool for these pilots.
- Audit your martech stack for gaps in analytics, segmentation, testing, real-time triggering and AI capabilities, to set personalization engine requirements. Develop use cases to clarify the vision for how personalization will improve customer, business and marketing outcomes.
- Identify and map sources of customer data, behavioral and contextual data, and business intelligence data (for example, inventory levels) to understand data integration needs.
- Allocate staff to personalization project management, testing, content creation, channel management, campaign planning and execution.
- Invest in training to increase personalization engine adoption and utilization. Evaluate vendor training resources and customer success teams to speed up instruction.

Sample Vendors

Adobe; Algonomy; Dynamic Yield; Insider; Salesforce; SAP (Emarsys)

Gartner Recommended Reading

What Digital Marketing Leaders Need to Know About Personalization

Use Tailored Help to Personalize Digital Commerce

Use Personalization to Maximize Digital Performance

Magic Quadrant for Personalization Engines

Critical Capabilities for Personalization Engines

Virtual Customer Assistant

Analysis By: Annette Jump

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

A virtual customer assistant (VCA) is an application that engages, delivers information and/or acts on behalf of an organization's customer. It consists of five elements: a conversational customer-facing user interface that receives and delivers inputs and outputs, a natural language processing engine, a dialogue manager, a search engine that traverses data repositories through enterprise integrations, and a machine learning capability.

Why This Is Important

VCAs are the most prevalent use case of VAs and are being adopted by many organizations to scale and automate customer-facing interactions. The adoption continues to expand, pushing some use cases into the mainstream adoption phase, but new use cases in healthcare, digital commerce or brand marketing are also emerging. Many of them are advanced VAs targeting specific domains, like sales or recruitment, with enhanced conversational capabilities and improved ability to understand user context.

Business Impact

A VCA is a special-purpose VA for customer service, sales or marketing goals and is now the first contact point to support high-volume interactions via digital engagement channels or within call centers. It can be a moderator of a social community, a guide on a mobile device to make a purchase or a chat to help open a bank account. Its top business value benefits to organizations are improving operational efficiency, reducing costs and enabling 24/7 support, while improving the customer experience. These are enabled by moving engagements to self-support channels with faster time to resolution. VCAs can also be used for proactive advice and engagement to build loyalty and customer satisfaction. VCAs will have a bigger impact on the automation of customer interactions in the next two years.

Drivers

Two types of actors are driving adoption:

- **Business drivers** — Customer-experience-centric objectives from organizations to automate the resolution of basic client questions and interactions; the requirement to support business continuity and further control/reduce operational costs; proven productivity and efficiency gains in finance and telco verticals influencing greater adoption by others, such as retail, government, transportation and healthcare
- **Technology drivers** — Advancements in natural language technology (NLT) that enable enhanced conversational capabilities and an improved ability to understand user context and support multimodal capabilities; prebuilt connections with enterprise applications that support easier integration and deployment; demand for more natural, personalized interactions with customers that drive the use of voice in VCAs

Obstacles

There are still multiple challenges in adopting and deriving business value from VCAs:

- A lack of domain-specific knowledge or lack of integration with required internal enterprise applications and knowledge databases hinders time to value for organizations.
- The current generation of VCAs are often not developed optimally. Many won't reach the required customer satisfaction and engagement levels without domain-specific content and training models.
- Obstacles around organizational acceptance stem from unrealistic business expectations, unsuccessful previous VA deployments or low customer awareness about technology.
- Delivering quantifiable results around value and experience is a challenge. Many low-end VCAs deliver a poor user experience, create friction and do not deliver business benefits.

User Recommendations

- Design a proactive customer service strategy by understanding and focusing on the customers' needs, with a clear, valuable reason for the contact.
- Design for end-to-end customer journeys that are responsive to continuous changes in the customer relationship stages.
- Find the greatest-frequency, low-complexity customer conversations that constitute a complete call and that can be easily automated with a low risk of customer dissatisfaction.
- Build the business case to move VCAs and customer service from a cost center to a profit center to enable faster scaling.

Sample Vendors

[24]7.ai; Amelia; Artificial Solutions; boost.ai; DRUID; IBM; Kore.ai; OneReach.ai; Oracle; Yellow.ai

Gartner Recommended Reading

Emerging Technologies Round Up: Virtual Assistants Advance to Tackle Complex Knowledge Work

Emerging Technologies: Top Use Cases for Customer-Facing Advanced Virtual Assistants

Emerging Technologies: Top Use Cases for Advanced Virtual Assistants in Enterprise Operations

Emerging Technologies: Top Business Value Patterns in Advanced Virtual Assistant Adoption

Emerging Tech Impact Radar: Artificial Intelligence

Entering the Plateau

Progressive Web Apps

Analysis By: Nitish Tyagi

Benefit Rating: Moderate

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Progressive web apps (PWAs) bridge the gap between web and native app experiences without the need to install app binaries. PWAs deliver app-like features such as offline data access, push notifications and a home screen icon. They combine an app shell with service workers installed on desktops or mobile devices, which enable HTML, JavaScript, Cascading Style Sheets and web content to be cached and synchronized for better performance.

Why This Is Important

PWA-enabled web applications and sites deliver better performance and improve user engagement. They are also efficient in increasing conversion rates, advertising revenue and employee productivity. PWAs can be installed directly from a PWA-enabled website and can be shared through links and QR codes. Google and Microsoft allow PWAs to be listed on and deployed through Google Play and the Microsoft Store respectively; however, Apple does not allow this for its App Store.

Business Impact

- PWAs offer responsiveness (e.g., full screen, split screen), app-like experience, cross-platform compatibility.
- PWAs combine with service workers that enable the browser to support offline caching and background synchronization.
- PWAs can be changed and updated without the requirements to push revisions to an app store and force updates on users' devices.
- PWAs can be delivered by existing web development skills and teams, and typically at a fraction of the cost but with fewer capabilities than native apps.

Drivers

- Most leading desktop and mobile browsers have embraced PWAs. Browsers such as Apple's Safari, Google Chrome and Microsoft Edge enable developers to implement service workers (albeit not consistently across desktop versus mobile browsers and operating systems), so that websites can behave like apps.
- Since PWAs are based on web standards, many development tools and frameworks support the creation and enablement of websites as PWAs. These tools include web frameworks, like Ionic, to low-code development tools that generate PWA-enabled responsive web and single page applications.
- PWAs are slowly being adopted for consumer-facing websites as the next step beyond responsive web design. Also, Gartner observes that PWA support for specific employee-facing web apps, in lieu of native desktop or mobile apps, is also becoming an option for certain app use cases.

Obstacles

- PWAs are coming into the Plateau of Productivity, but still organizations aren't fully utilizing the capabilities of PWA. Apple continues to be slow in implementing key features, such as web push notifications and an installation prompt.
- According to the Web Almanac, about 1.71% of desktop sites and 1.63% of mobile sites use service workers features. This is expected to be lower than real-world percentage due to additional checks that Lighthouse takes into consideration.
- PWAs have fragmented browser support, and the limited access of mobile device capabilities from within the browser has forced application leaders to recognize that PWAs are inadequate for advanced mobile app use cases.
- The web user can easily access data stored in the web browser, which can expose organizations to security threats. Furthermore, PWAs don't support the additional security features of applying controls and safeguards using mobile and endpoint management tools integrations.

User Recommendations

- Apply PWA service workers now to improve performance and UX in browsers that support PWA. Don't disregard PWAs' value because the capabilities are not available to all users, but factor in the variance in UX across devices.

- Evaluate PWAs for employee-facing app use cases, such as extending employee portal functionality to a mobile-optimized interface. Utilize PWAs in digital commerce as a means of turning web users into mobile-first users by increasing engagement and conversion rates with high-value, frequent interactions and supporting offline browsing of product catalogs.
- Investigate the potential security limitations of PWAs in terms of securing data cached locally on devices that use default web security and encryption technologies, such as HTTPS.
- Utilize JavaScript tools, frameworks and platforms that provide support for PWA capabilities to speed up the process of implementing PWA capabilities in your web apps.

Gartner Recommended Reading

How to Make the Right Technology and Architecture Choices for Front-End Development

Market Guide for Multiexperience Development Platforms

Key Considerations When Building Web, Native or Hybrid Mobile Apps

Product Data MDM

Analysis By: Helen Grimster, Thornton Craig

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Master data management (MDM) of product data enables enterprises to ensure the uniformity, accuracy, stewardship, governance, semantic consistency and accountability of their master product data. The two use cases for master product data are supply-side MDM and sell-side MDM. Supply-side MDM onboards product master data from partners upstream in a supply chain. Sell-side MDM syndicates product master data to commerce channels and partners downstream in a supply chain.

Why This Is Important

Organizations want to scale their digital strategies and become data-driven, thus increasing requirements for end-to-end product data across a spectrum of business outcomes. In addition, emerging needs related to environment, social and governance (ESG) and compliance reporting are placing new demands on this technology. Product data MDM must operate as a “passport” to share critical product data across extended supply chains.

Business Impact

Product data MDM can provide multiple benefits to product-centric organizations, including:

- Better quality and availability of product master data, which are critical to any decision making that impacts risk, revenue, service and time to market
- Enhanced business agility — particularly in manufacturing, distribution, retail and healthcare — from a holistic and trusted enterprise view of product data
- Higher customer satisfaction from robust and consistent product information
- Support for enterprise and B2B ESG compliance reporting

Drivers

- Complying with regulations in industries such as medical device manufacturing and food processing
- Reducing time to market for new products and services to achieve a competitive advantage
- Increasing revenue through better upselling and cross-selling
- Opening alternative sales by enabling product data syndication to sell-side partners
- Achieving greater business agility to adapt to a crisis
- Improving product development processes, product innovation and digital product experiences through operational efficiencies and cost savings
- Supporting strategy and reporting for ESG and sustainability

Obstacles

- **Lack of consistent vendor presence:** Coverage is weaker outside North America and Europe.
- **Technology blinkers:** The prevailing pitfall is the instinct to treat MDM as a technology initiative in isolation. Technology alone won't solve a challenge that traverses people, process and technology.
- **Human factors:** Organizations that fail to proactively engage business stakeholders in scoping struggle to meet expectations of value and to establish an operational governance structure in service of MDM.
- **Goals:** MDM is still too often seen as an IT project. When MDM is a data or IT project that doesn't align to business outcomes, it fails.
- **Perceived complexity:** The MDM solutions market only recently shifted toward subscription pricing, cloud-based offerings and simpler products, which contribute to more approachable solutions and shorter deployment times.
- **Skills:** Successful MDM implementations require business acumen, technology and governance capabilities. Finding the right balance and availability of these skill sets remains problematic and is driving a need for third-party services as the norm.

User Recommendations

- Take a programmatic approach to product data MDM by using Gartner's MDM Operating Model (see Create a Master Data Roadmap With Gartner's MDM Maturity Model).
- Engage stakeholders by focusing on measurable business outcomes.
- Rightsize the MDM roadmap. A series of small deliveries will minimize cost, risk and failures, so think big, start small, and be prepared.
- Focus on governance, people and process, not technology. MDM is a technology-enabled business discipline; a technology-only approach leads to failure.
- Leverage third parties to fast-track your time to value.

Sample Vendors

Informatica; Pimcore; Precisely; Profisee; Stibo Systems; Syndigo; Viamedici

Gartner Recommended Reading

Quick Answer: Which Data Is Master Data?

3 Essentials for Starting and Supporting Master Data Management

Create a Master Data Roadmap With Gartner's MDM Maturity Model

Quick Answer: What Data and Analytics Leaders Need to Know About Digital Product Passports

Appendixes

See the previous Hype Cycle: Hype Cycle for Digital Commerce, 2022

Hype Cycle Phases, Benefit Ratings and Maturity Levels

Table 2: Hype Cycle Phases

(Enlarged table in Appendix)

Phase	Definition
Innovation Trigger	A breakthrough, public demonstration, product launch or other event generates significant media and industry interest.
Peak of Inflated Expectations	During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the innovation is pushed to its limits. The only enterprises that make money are conference organizers and content publishers.
Trough of Disillusionment	Because the innovation does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the innovation's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the innovation are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted, or is adopting, the technology as it enters this phase.
Years to Mainstream Adoption	The time required for the innovation to reach the Plateau of Productivity.

Source: Gartner (July 2023)

Table 3: Benefit Ratings

Benefit Rating ↓	*Definition* ↓
Transformational	Enables new ways of doing business across industries that will result in major shifts in industry dynamics
High	Enables new ways of performing horizontal or vertical processes that will result in significantly increased revenue or cost savings for an enterprise
Moderate	Provides incremental improvements to established processes that will result in increased revenue or cost savings for an enterprise
Low	Slightly improves processes (e.g., improved user experience) that will be difficult to translate into increased revenue or cost savings

Source: Gartner (July 2023)

Table 4: Maturity Levels

(Enlarged table in Appendix)

Maturity Levels	Status	Products/Vendors
Embryonic	In labs	None
Emerging	Commercialization by vendors Pilots and deployments by industry leaders	First generation High price Much customization
Adolescent	Maturing technology capabilities and process understanding Uptake beyond early adopters	Second generation Less customization
Early mainstream	Proven technology Vendors, technology and adoption rapidly evolving	Third generation More out-of-box methodologies
Mature mainstream	Robust technology Not much evolution in vendors or technology	Several dominant vendors
Legacy	Not appropriate for new developments Cost of migration constrains replacement	Maintenance revenue focus
Obsolete	Rarely used	Used/resale market only

Source: Gartner (July 2023)

Document Revision History

Hype Cycle for Digital Commerce, 2022 - 11 July 2022

Hype Cycle for Digital Commerce, 2021 - 13 July 2021

Hype Cycle for Digital Commerce, 2020 - 3 August 2020

Hype Cycle for Digital Commerce, 2019 - 5 August 2019

Hype Cycle for Digital Commerce, 2018 - 25 July 2018

Hype Cycle for Digital Commerce, 2017 - 31 July 2017

Hype Cycle for Digital Commerce, 2016 - 7 July 2016

Hype Cycle for Digital Commerce, 2015 - 27 July 2015

Hype Cycle for Digital Commerce, 2014 - 29 July 2014

Hype Cycle for E-Commerce, 2013 - 31 July 2013

Recommended by the Author

Some documents may not be available as part of your current Gartner subscription.

Understanding Gartner’s Hype Cycles

Tool: Create Your Own Hype Cycle With Gartner’s Hype Cycle Builder

Magic Quadrant for Digital Commerce

Composable Commerce Must Be Adopted for the Future of Applications

Digital Commerce — 20 Quick Fixes to Increase Revenue and Reduce Costs

Toolkit: The One-Page Digital Commerce Strategy

Predicts 2023: Digital Selling Excellence Protects the Bottom Line During Economic Uncertainty

Increase Organizational Composability by Reusing Composable Commerce Technologies

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Table 1: Priority Matrix for Digital Commerce, 2023

Benefit ↓	*Years to Mainstream Adoption*			
	Less Than 2 Years ↓	***2 - 5 Years*** ↓	***5 - 10 Years*** ↓	***More Than 10 Years*** ↓
Transformational		API-Based Digital Commerce Conversational AI for Digital Commerce Digital Sales Rooms Smart Check-Out	Composable Commerce Customer Technology Platform Machine Commerce Modular Commerce	
High	Product Data MDM Virtual Customer Assistant	Composable Product Configurators Customer Journey Analytics Digital Experience Composition Digital Shelf Analytics Distributed Order Management DXP Enterprise Marketplaces FEaaS Payments as a Packaged Service	Commerce in the Metaverse Contextualized Real-Time Pricing Immersive Commerce Network Tokenization Personalization Engines	

Benefit ↓	*Years to Mainstream Adoption*			
	Less Than 2 Years ↓	***2 - 5 Years*** ↓	***5 - 10 Years*** ↓	***More Than 10 Years*** ↓
Moderate	Progressive Web Apps	Consent and Preference Management Customer Data Platform Live Commerce Shoppable Media Visual Search		
Low				

Source: Gartner (July 2023)

Table 2: Hype Cycle Phases

Phase	*Definition*
Innovation Trigger	A breakthrough, public demonstration, product launch or other event generates significant media and industry interest.
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Trough of Disillusionment	Because the innovation does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the innovation's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the innovation are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted, or is adopting, the technology as it enters this phase.
Years to Mainstream Adoption	The time required for the innovation to reach the Plateau of Productivity.

Phase ↓	Definition ↓

Source: Gartner (July 2023)

Table 3: Benefit Ratings

Benefit Rating ↓	Definition ↓
Transformational	Enables new ways of doing business across industries that will result in major shifts in industry dynamics
High	Enables new ways of performing horizontal or vertical processes that will result in significantly increased revenue or cost savings for an enterprise
Moderate	Provides incremental improvements to established processes that will result in increased revenue or cost savings for an enterprise
Low	Slightly improves processes (e.g., improved user experience) that will be difficult to translate into increased revenue or cost savings

Source: Gartner (July 2023)

Table 4: Maturity Levels

Maturity Levels ↓	*Status* ↓	*Products/Vendors* ↓
Embryonic	In labs	None
Emerging	Commercialization by vendors Pilots and deployments by industry leaders	First generation High price Much customization
Adolescent	Maturing technology capabilities and process understanding Uptake beyond early adopters	Second generation Less customization
Early mainstream	Proven technology Vendors, technology and adoption rapidly evolving	Third generation More out-of-box methodologies
Mature mainstream	Robust technology Not much evolution in vendors or technology	Several dominant vendors
Legacy	Not appropriate for new developments Cost of migration constrains replacement	Maintenance revenue focus
Obsolete	Rarely used	Used/resale market only

Source: Gartner (July 2023)