

# Hype Cycle for Life Science Commercial Operations, 2023

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Initiatives: [Healthcare and Life Science Digital Optimization and Modernization](#); [Healthcare and Life Science Digital Transformation and Innovation](#)

Life science organizations strive to balance innovation and operational value delivery. This Hype Cycle provides CIOs with strategic input by tracking maturity levels and adoption rates of key technologies to guide commercialization planning and investments.

## More on This Topic

This is part of an in-depth collection of research. See the collection:

- [2023 Hype Cycles: Deglobalization, AI at the Cusp and Operational Sustainability](#)

## Analysis

### What You Need to Know

Life science organizations (that is, pharmaceutical, biotechnology and medical device organizations [LSOs]) are prioritizing business growth, experience and operational excellence as top enterprise goals (see [2023 CIO and Technology Executive Agenda: A Life Science Perspective](#)). Going forward, LSOs will need to evolve their commercial capabilities to navigate a confluence of forces ([2023 Life Science Business Drivers of Technology Decisions](#)). These include:

- **Digital delivery:** Changing healthcare provider (HCP) expectations, with many finding digital information delivery to be more effective and preferable.
- **Personalization:** Shifting away from the traditional sales-rep-based model to a more agile approach that includes more digital touchpoints and delivering seamless experiences across the entire customer journey.
- **Market access:** Heightened pressure from governments, payers and health systems to demonstrate therapeutic value and health outcomes.
- **Patient engagement:** Empowered patients seeking greater control over their health through digital products and services.
- **Data and analytics:** Scaling of data and analytics initiatives that accelerate strategic and tactical decision making.

This Hype Cycle will help CIOs lean into technological and business change with emerging capabilities that enable the enterprise adaptability necessary to respond to uncertainty and change. Because the path forward is uncertain, CIOs will need to develop a technology strategy that is adaptable, scalable and resilient in order to meet new business requirements on demand (see [Innovation Insight for Digital Life Science Platforms](#)). Organizations will differentiate by integrating technologies in this Hype Cycle within their own ecosystem to optimize and transform their go-to-market strategies.

## The Hype Cycle

LSOs have realized the importance of providing an exceptional customer experience (CX) at every touchpoint, with CX becoming a key differentiator. At the same time, artificial intelligence (AI) and machine learning technologies are being used to automate and optimize many aspects of sales and marketing, journey orchestration to customer service chatbots, predictive analytics and more. The sudden public emergence of large language models in late 2022 has tremendous long-term potential for LSOs. While the transformative use cases, such as content generation, will require the highest levels of safety, there are numerous near-term opportunities for data summarization and content management.

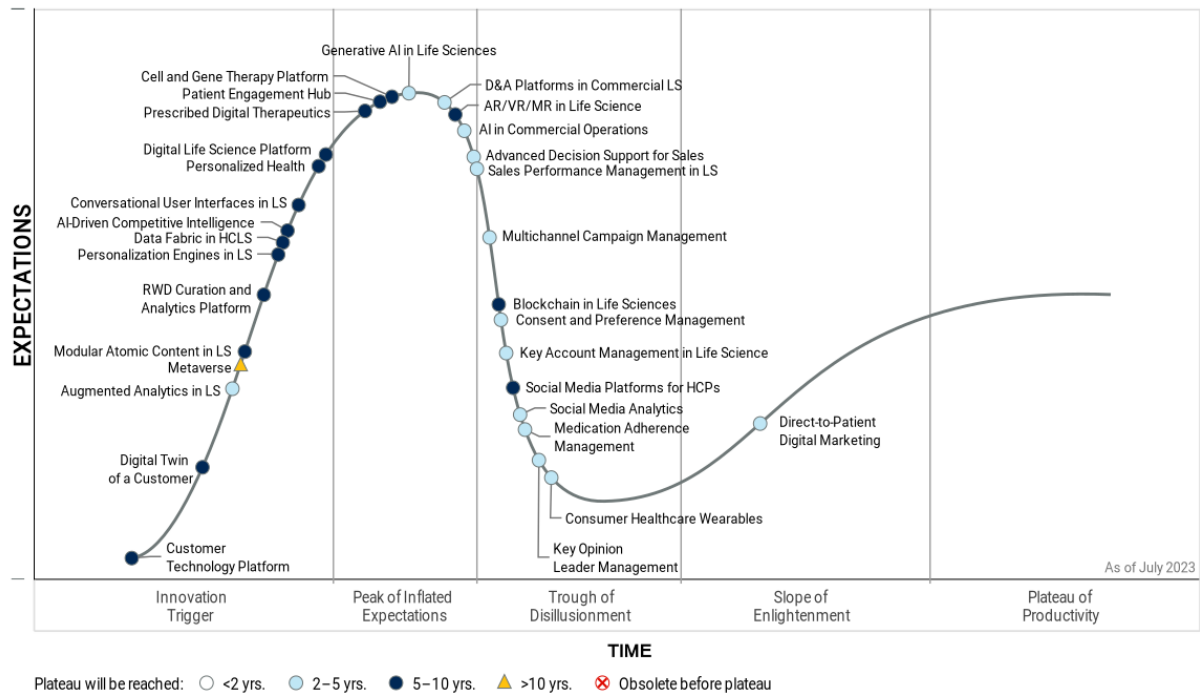
As a result, technologies supporting these trends saw an immediate increase in adoption and continue to progress at an accelerated pace on the Hype Cycle curve. This year, we have added six more technologies: customer technology platform, digital twin of a customer, modular atomic content in LS, metaverse, data fabric in HCLS and generative AI in life sciences.

This research will help you and your executive peers to evaluate and prioritize technologies to align with your organization's future vision and enterprise goals. By selecting the right technologies, timing and approaches, you can better meet the needs of your patients and healthcare providers while advancing digitization and analytics initiatives.

This Hype Cycle is part of a family of four life-science-focused Hype Cycles. The three other companion Hype Cycles include [Hype Cycle for Life Science Discovery Research, 2023](#), [Hype Cycle for Life Science Clinical Development, 2023](#) and [Hype Cycle for Life Science Manufacturing, Quality and Supply Chain, 2023](#). The combination of the four is required to take a comprehensive view of the emerging technologies across the entire life science value chain.

Figure 1: Hype Cycle for Life Science Commercial Operations, 2023

### Hype Cycle for Life Science Commercial Operations, 2023



Gartner

## The Priority Matrix

The Priority Matrix is a summary companion to the Hype Cycle graphic. Using data from the benefit rating and time-to-plateau values for each technology, it plots the answers to two key questions: How much value will be delivered with a technology, and when will it be mature enough to deliver that value?

Technologies and approaches that leverage advanced analytics and AI for driving commercialization strategies will have a significant impact on LSOs. We expect digital life science platforms to be mainstream in the next five to 10 years, enabling them to nimbly adapt their business and operating models in response to external disruption and change in business strategy. Likewise, we expect prescribed digital therapeutics to be mainstream in the next five to 10 years, forcing life science commercial operations to implement new technologies for patient engagement, value measurement and pricing.

Technologies and approaches focused on optimizing business processes are enabling LSOs to drive the operational efficiency and effectiveness improvements needed today. Multiple innovations will enter mainstream adoption in the next two to five years, including life science key account management and direct-to-patient digital marketing.

**Table 1: Priority Matrix for Life Science Commercial Operations, 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		AI in Commercial Operations Generative AI in Life Sciences	Blockchain in Life Sciences Customer Technology Platform Data Fabric in HCLS Digital Life Science Platform Modular Atomic Content in LS Personalization Engines in LS Personalized Health Prescribed Digital Therapeutics RWD Curation and Analytics Platform	Metaverse
High		Advanced Decision Support for Sales Augmented Analytics in LS D&A Platforms in Commercial LS Key Account Management in Life Science Key Opinion Leader Management Sales Performance Management in LS	AI-Driven Competitive Intelligence Cell and Gene Therapy Platform Conversational User Interfaces in LS Digital Twin of a Customer	
Moderate		Consent and Preference Management Consumer Healthcare Wearables Direct-to-Patient Digital Marketing Medication Adherence Management Multichannel Campaign Management Social Media Analytics	AR/VR/MR in Life Science Patient Engagement Hub Social Media Platforms for HCPs	
Low				

Source: Gartner (July 2023)

## Off the Hype Cycle

We introduced six technology innovations this year:

- Customer technology platform
- Digital twin of a customer
- Modular atomic content in LS
- Metaverse
- Data fabric in HCLS

- Generative AI in life sciences

We graduated the following technology:

- Data lake

We renamed the following technologies:

- Chatbots in life sciences became conversational user interfaces in LS
- Commercial D&A platform became D&A platforms in LS
- Life science sales performance management became sales performance management in LS
- Physician social media became social media platforms for HCPs

The following technologies have been removed from this Hype Cycle due to their limited focus on LS commercial operations and/or low adoption rates within the LS commercial operations domain:

- Revenue engagement platforms
- Voice-driven sales apps

## 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](#)

## Digital Twin of a Customer

Analysis By: Lizzy Foo Kune

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

**Maturity:** Embryonic

**Definition:**

A digital twin of a customer (DToC) is a dynamic virtual representation of a customer that simulates and learns to emulate and anticipate behavior. Customers can be individuals, personas, groups of people or machines. DToC gives marketers a flexible approach to anticipating a customer's state of mind.

**Why This Is Important**

DToCs help data-rich organizations better understand their customers and anticipate their behavior. They increase operational efficiency and provide a personalized, curated service to customers, many of whose buying habits have changed during a period of upheaval. A DToC can be used to modify and enhance the customer experience (CX) and support new digitization efforts, products, services and opportunities. It can be an engine of transformation and disruption.

**Business Impact**

DToCs simulate how a customer will respond, given a specific set of ecosystem parameters, conditions and control or input signals. They're similar to digital twins of a *product*, which enable organizations to anticipate how a physical product will perform or will need to be maintained in different conditions. DToCs help organizations selling products or services provide customers with better experiences, which results in increased revenue and lasting customer relationships.

## Drivers

- Journey orchestration — New methods engage and anticipate a customer's journey more effectively. DToCs can help by simulating and optimizing how specific cohorts will respond before the journey is built in a campaign workflow.
- Emerging AI techniques — Organizations can define and observe new journey use cases, limiting the need for active customer data collection or live testing. The rapid acceleration of interest in generative AI solutions brings more complex solutions incrementally closer to realization.
- Operational efficiency — Slow-growing marketing budgets force marketers to do more with the same, or a smaller, budget. DToCs could limit waste, reducing the costs of imprecise marketing or misaligned products, and reducing time that would be spent on testing underperforming journey interventions.
- Product and experience development — New data-driven business models could emerge as marketers find new ways to serve and capture customers in a privacy-constrained environment.

## Obstacles

- Privacy and cyber-risk concerns may lengthen the time it takes DToCs to mature, and may increase legal and regulatory risk.
- It's challenging for organizations to embark on customer data ethics initiatives, which are essential to the success of DToC projects. Sixty percent of respondents to Gartner's 2021 Customer Data Survey found it difficult to work "cross-functionally to comply with privacy and security standards around customer data."
- Organizations need competency in machine learning algorithms and will likely need additional staff with data science skills to build or manage DToCs.
- Consumer perceptions and attitudes may form a backlash against brands if terminology, data and use cases aren't handled with care. Some consumer segments, already concerned about algorithmic bias, may come to believe that data or AI used in DToCs increases discriminatory practices or marginalization. Unless paired with data ethics, DToC tools and techniques may increase risks to brand reputation and performance.

## User Recommendations

- Start by running a pilot and comparing results with and without a DToC over an adequate period using statistically significant data, whether you choose to build or buy a DToC. Establish benchmarks for your pilot to better develop and scale DToC.
- Define the benefits to customers and establish trust. Explain how they can control or cancel data usage.
- Integrate DToCs with marketing technology systems for maximum utility. The technology behind digital twins has focused on organizations and products. A customer focus is only just emerging, and the lack of clear KPIs and other measures of success limits the potential use of DToCs.
- Identify use cases for which DToCs could help deliver a better CX, and for which suitable data is available, by examining customer journeys and failure points.
- Establish a trust center to house privacy and security documentation, as well as documented expectations. Incorporate suggestions from a customer advisory panel to avoid risk.

## Sample Vendors

Absolutdata; Arrayworks; Fetch.ai; Salesforce; Tanjo

## Gartner Recommended Reading

[Quick Answer: Is a Digital Twin of a Customer the Future of a 360-Degree View of the Customer?](#)

[Video: How Digital Twins of Customers Improve CX](#)

[A Digital Twin of a Customer Predicts the Best Customer Experience](#)

[CRM Strategists: Use a Digital Twin to Model Customer Behaviors and Evolve From Simple ML Modeling](#)

[Maverick Research: The Disappearing Business Case for Customer Data](#)

## Augmented Analytics in LS

Analysis By: Animesh Gandhi, Rita Sallam, David Pidsley

Benefit Rating: High

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

**Definition:**

Augmented analytics in life science uses AI to automate analytics workflows in platforms, contextualizing UIs with automated insights, generative storytelling explanations and collaborative exploration. Driven by ML and generative AI, it enables natural language queries and personalized analytics catalogs. It democratizes advanced analytics with augmented data ingestion, preparation, analytics content and DSML model development. It also curbs human biases and accelerates insights for diverse users.

**Why This Is Important**

Augmented analytics in life science (LS) represents a next-generation approach to deriving value from data by enabling business users, such as field teams and home office users, to pinpoint trends, change drivers and data correlations to increase business effectiveness. In contrast, traditional platforms focus on reports and dashboards for information delivery and require manual effort to identify patterns as well as share insights with others.

**Business Impact**

Augmented analytics impacts LS organizations by:

- Augmented analytics is transforming how and where business users interact with analytics content as it has become a core component of most analytics, business intelligence (BI) and data science platforms.
- Insights from advanced analytics that were once available only to skilled individuals and specialists are now in the hands of business users and operational analysts. These augmented consumers are driving new sources of business value.

## Drivers

- Interest in modernizing data intelligence capabilities, especially for the field and home-office business users, is accelerating as LS organizations seek to replace legacy tools and approaches. With traditional approaches, LS business users often struggle to identify anomalies, correlations, underlying trends and change drivers from static dashboards or Microsoft Excel reports that provide limited insights and interactivity with data.
- With the explosion of generative AI, augmented analytics in LS is receiving heightened attention. Gartner expects more LS-specific vendors to incorporate large language models (LLMs) like ChatGPT, allowing business users to create data stories delivered in their business context. This type of user experience will reduce the use of predefined dashboards for monitoring and analysis and accelerate the adoption of augmented analytics.
- LS organizations increasingly want to analyze large, more complex and varied datasets combining data from across commercial operations as well as purchased data from external sources. With an increasing number of variables to explore, it is practically impossible for business users to test their hypotheses through a conventional, interactive analytics workflow, and to determine whether their findings are relevant, significant and actionable.
- The core technology of augmented analytics is approaching mainstream adoption in industries like financial services. However, adoption currently lags substantially in LS use cases because of a risk-averse culture that is used to deploying technology once it has been established and LS-specific vendor solutions are available. Augmented analytics in LS will continue to rise on the Innovation Trigger slope. However, we project it to be at least two to five years away from reaching the Plateau of Productivity.

## Obstacles

- **Trust in autogenerated models and insights.** LS organizations must ensure that the augmented approach is transparent and auditable for accuracy and bias and that there is a process to review and certify the analysis created.
- **Training and rapidly evolving skills needs.** Obtaining desired skill sets and data literacy standards is a never-ending challenge, and LS leaders need broad and diverse training for multiple personas.
- **User appeal and adoption.** Using augmented analytics not only to support new and less expert analytic users but also to shorten the time to insight for more expert users.
- **Ecosystem.** It will be critical to build an ecosystem that includes not only tools but also data, people and processes to support the use of augmented analytics.

## User Recommendations

- Evaluate and experiment with augmented analytics capabilities of analytics and business intelligence (A&BI) platforms. Examine how their growing portfolio of technologies can automate insights generation for your specific use cases. For example, LS-focused vendors are rapidly maturing common use cases, such as field reporting.
- Engage a variety of business users, citizen data scientists and data scientists in the evaluation of augmented analytics tools to align desired expectations/user experiences to the capabilities offered. As a part of compiling a business case, identify the personas that will benefit most from augmented analytics capabilities.
- Focus on explainability as a key feature to build trust in autogenerated models. Create learning opportunities for those who wish to learn more about the theory and inner workings of augmented analytics solutions.

## Sample Vendors

Arria NLG; Axtria; Tellius; ThoughtSpot; WhizAI

## Gartner Recommended Reading

[2023 CIO and Technology Executive Agenda: A Life Science Perspective](#)

[Market Guide for Augmented Analytics](#)

## Magic Quadrant for Analytics and Business Intelligence Platforms

## Critical Capabilities for Analytics and Business Intelligence Platforms

## Top Trends in Data and Analytics, 2023

### Metaverse

Analysis By: Marty Resnick, Matt Cain, Tuong Nguyen

**Benefit Rating:** Transformational

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

#### Definition:

Gartner defines a metaverse as 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. Gartner expects that a complete metaverse will be device-independent, and will not be owned by a single vendor: It will have a virtual economy of itself, possibly enabled by digital currencies and non-fungible tokens (NFTs).

#### Why This Is Important

A metaverse is the next level of interaction in the virtual and physical worlds. It will allow people to replicate or enhance their physical activities. This could happen either by transporting or extending physical activities to a virtual world or by transforming the physical one. Although the goal of a metaverse is to combine many of these activities, there are currently many emerging metaverses with limited functionality.

#### Business Impact

Enterprises can expand and enhance their current businesses in unprecedented ways, opening up innovative opportunities. The following are examples of opportunities that metaverse offers to enterprises:

- Spatial computing (e.g., real-time shopping recommendations)
- Gaming (e.g., collaborative “serious games” for training)
- Digital humans (e.g., customer service representatives)



- Virtual spaces (e.g., live virtual events)
- Shared experiences (e.g., immersive meetings)
- Tokenized assets (e.g., NFTs)

## Drivers

There are three drivers for the metaverse:

- **Transport:** The ability to “go and immerse oneself” in a virtual world. That world may be a 3D simulation and/or in virtual reality.
- **Transform:** Bringing digital to the physical world. This allows the user to have access to real-time information, collaboration and experiences in the physical world.
- **Transact:** The economic foundation of the metaverse through the use of cryptocurrency, NFTs and blockchain.

Some of the main activities for the metaverse that will require one or more of these drivers are:

- **Collaboration:** Encouraging collaboration and participation from a diverse group of stakeholders, wherever they may be located.
- **Engagement:** Employees and customers are often disengaged. The metaverse facilitates a feeling of presence (“being there”) as if the participants were in-person, turning their focus to the task at hand with less distraction.
- **Connectedness:** Metaverse enables us to connect in a more immersive way with shops, work environments, schools and communities of interest – regardless of where or if they exist in the physical world.

Ultimately, people desire to enhance and/or augment their lives in digital and physical realities.

## Obstacles

- The adoption of metaverse technologies is nascent and fragmented. Furthermore, this is a time of learning, exploring and preparing for a metaverse with limited implementation. The financial and reputational risks of early investments are not fully known, and caution is advised.
- Current manifestations of metaverses are siloed, app-based, noninteroperable experiences that do not satisfy the decentralized and interoperable vision of the metaverse. This current, walled-garden approach also strongly limits users' control of experiences.
- 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.

## User Recommendations

- Task a specialized innovation team and/or vendors to look for opportunities where metaverse technologies could optimize digital business, or create new products and services.
- Identify metaverse-inspired opportunities by evaluating current high-value use cases vis-a-vis your product or service (internally and externally). Focus on ways the metaverse can enhance an experience and can accomplish engagements the physical world may find impossible.
- Be careful when investing in a specific metaverse, as it is still too early to determine which investments will be viable in the long term.
- Remember that the metaverse is an evolutionary stage. Similar to the shift from the original web to Web 2.0 and to Web3, it does not indicate a formal change in the nature of the web, or in this case, digital interactions and digitization in general, but describes a general change that will happen over time.

## Sample Vendors

Animoca Brands (The Sandbox); Decentraland; Linden Lab; Meta; Microsoft; NVIDIA; Roblox

## Gartner Recommended Reading

[Emerging Tech: Top Enabling Technologies for Metaverse](#)

[Top Strategic Technology Trends for 2023: Metaverse](#)

[Building a Digital Future: The Metaverse](#)

[Infographic: Impact Map of the Metaverse](#)

[Emerging Tech Impact Radar – The Metaverse](#)

## Modular Atomic Content in LS

Analysis By: Animesh Gandhi

**Benefit Rating:** Transformational

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

### Definition:

Modular atomic content (MAC) in life science (LS) consists of technologies and processes for producing content, such as imagery and copy, by reconceptualizing a unit of content into smaller building blocks or atoms. MAC approach promotes content reuse and personalization by assembling different permissible combinations of content atoms to create videos, emails, webpages, and other marketing assets. MAC tools expedite regulatory-compliant content production, governance, approval and distribution.

### Why This Is Important

Adopting MAC advances LS goals to deliver personalized experiences to their customers (such as healthcare providers, patients, payers and health systems). Furthermore, LS customers increasingly prefer to engage through digital channels and demand personalized content. This requires a recalibration of LS organizations' (LSOs') current content production processes toward MAC approaches and away from tools developed for supporting full-form media, which are costly and inefficient to produce.

### Business Impact

The value of MAC is demonstrated across multiple areas, which helps to:

- Foster data-driven culture for content planning and ideation.
- Improve content development efficiency through reuse.
- Support customer-centric initiatives, ensuring that relevant content can be delivered at the most impactful moments in the customer journey.
- Facilitate agile content development in response to changing customer needs.
- Streamline translation/localization efforts, while maintaining compliance to local regulations.

## Drivers

- LSOs realize that they must invest in and transform their content production processes, in order to achieve their strategic goal of becoming more customer-centric.
- Legacy content production and review processes rely on siloed teams, fragmented processes, and disjointed workflows designed for traditional, full-form content. This results in lengthy production and regulatory review cycles. In contrast, MAC approaches promote content reuse, reducing production costs and timelines, and improving content quality.
- Current content production tools and repositories that LSO business teams and content producers utilize are inefficient, loosely coupled, and require significant manual steps. This leads to longer timelines and higher costs due to manual, error-prone steps.
- MAC complements LSOs' urgency to create personalized, regulatory-compliant content.
- The excitement around generative AI, and its applicability in content development and approval, is quickly gaining traction for commercial applications in other industries. Applying such technology to create content "atoms" will be more feasible than to create full-form content.
- LSOs will leverage MAC to improve business agility and scalability as they seek to engage their customers on fast-moving digital channels.
- Vendors continue to invest in tools as more end-user clients start to pilot and deploy MAC approaches. This, in turn, leads to a growth spiral with higher vendor investments and end-user adoption.
- MAC enters the Hype Cycle this year at the Innovation Trigger phase, with five to 10 years before reaching the plateau. We rate this transformational for its ability to improve experience and engagement in LS.

## Obstacles

- Shifting to the MAC approach is a multiyear journey that requires changes to processes, governance structures and organizational skills across multiple departments, requiring sustained executive commitment and investment.
- Migrating existing full-form content requires it to be recreated and reapproved to fit into a MAC framework, which can be cost-prohibitive for mature and late-stage brands. Furthermore, many launch brands prefer to utilize traditional content development approaches to minimize launch risks.
- MAC requires streamlined, automated processes and an integrated technology ecosystem to create, tag, store, approve, and distribute the content effectively. Current vendor solutions have not yet matured to the point where they can provide an all encompassing end-to-end solution.
- Many brand teams rely on external agency partners, who remain unconvinced about the benefits of modularization and highlight concerns that such an approach might limit their creative designs.

## User Recommendations

- Transform your content marketing and management capabilities by rallying your CEO, chief marketing officer and brand leaders, and citing the need to operationalize omnichannel engagements. Focus on personalization and digital engagement as an immediate competitive differentiator for your organization.
- Initiate a redesign of your content production and operational processes by assembling a fusion team that is tasked with mapping current processes, and identifying internal handoffs and pain points that need to be addressed as part of the go-forward strategy.
- Address culture and mindset challenges head-on by embracing and leading a change management program. The program should account for ensuring alignment across internal and external stakeholders, the training and support needed to achieve desired outcomes, and performance monitoring to measure progress.

## Sample Vendors

Aprimo; Hyntelo; Indegene; SecureCHEK AI; Veeva Systems; Viseven; Vodori; Xpediant Digital

## Gartner Recommended Reading

[Change Organizational Mindsets to Succeed With Modular Content in Commercial Life Sciences](#)

[Quick Answer: How Life Science CIOs Can Revitalize Content IT Systems to Deliver Modular Content](#)

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

[What Should I Know About Content Marketing Platforms?](#)

## RWD Curation and Analytics Platform

Analysis By: Animesh Gandhi

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

### Definition:

This technology combines real-world data (RWD), such as electronic health records (EHR), medical and prescription claims, disease and patient registries, lab results, imaging and other sources, to provide a longitudinal view of a patient journey. The platform prepares data for delivery to downstream consumption platforms, applications and analytics. It automates the ingestion and linking of data from permissioned sources, manages identity, compliance and security.

### Why This Is Important

This technology captures the entire breadth of encounters between patients and the healthcare system by breaking down traditional healthcare data silos, while preserving the confidentiality of individual patients. This level of visibility enables life science organizations (LSOs) to refine their commercial processes that target provider engagement and education initiatives, optimize sales and marketing resources and identify patient cohorts that may benefit from their therapeutic.

## Business Impact

Real-world data (RWD) curation and analytics platforms, and the data and advanced analytics services they offer, are becoming critical components of the digital architecture of LSOs. These platforms enable LSOs to generate actionable insights that inform prelaunch and postlaunch commercial activities, including competitive benchmarking, market sizing and surveillance, patient identification, segmentation and profiling, sales and marketing effectiveness and value-based contracting.

## Drivers

- The depth and breadth of available RWD data sources continues to grow, requiring LSOs to use RWD curation platforms to transform health data into normalized datasets for commercial decision making.
- Due to advances in RWD curation and analytics platform capabilities that integrate and link deeply fragmented data landscapes, LSOs can now use a variety of different datasets, such as labs and EHRs in addition to claims data to support a growing set of commercial use cases. Example use cases include supporting early-stage planning, understanding treatment patterns and clinical journeys and segmentation and targeting and marketing execution.
- Vendors continue to add analytics business applications on their platforms, enabling business users to derive unique insights without custom coding or complex data analysis. For example, automated alerts when a potential new patient is identified or maybe ready to switch therapies.
- For smaller life science organizations, the scarcity of talent, especially in data engineering and data science, has driven a search for more automated ways to prepare analytic-ready datasets.
- Many vendors utilize an open approach to patient deidentification technology, enabling LSOs to compliantly blend internal and external datasets, providing a more enriched view of the patient journey while adhering to privacy regulations.
- Vendors are bringing innovative approaches to data access, such as offering flexible licensing models that ease the data acquisition cost burden by allowing LSOs to precisely define their target patient cohort and procure information for only those patients.
- For these reasons, we are advancing this profile toward the Peak of Inflated Expectations. We expect mainstream adoption within five to 10 years.



## Obstacles

- LSOs rely on external consulting agencies due to the lack of internally skilled resources with experience and expertise on RWD datasets. This limitation also hinders rapid identification and validation of new use cases where RWD can be readily applied.
- The largest RWD platform vendors focus on the U.S. market, omitting other major markets, such as Asia and Europe, due to privacy concerns and fragmented data landscape — causing a restrictive data marketplace and lack of RWD sources.
- Integration of RWD insights requires reengineering of processes and analytical methodologies that were purpose-built for traditional outlet and retail level datasets.
- While usage of RWD datasets has grown, many global regulatory bodies have not issued real-world evidence methodology guidelines and standards.
- Poor understanding of data protection regulations and a dearth of mature approaches to manage patient consent and tokenize anonymized data, has led to a slow start in LSOs adopting new RWD solutions.

## User Recommendations

- Collaborate with your business peers to identify use cases and requirements by mapping out the patient and provider journeys and document the types of real-world information you'll need to support your therapeutic areas. Assess which RWD platform vendors can deliver the insights your organization seeks, based on the depth and breadth of integrated data within the platform.
- Proactively assess your organization's data infrastructure required to support the four V's (volume, variety, velocity and veracity) of RWD analytics over the next three to five years. Evaluate building versus licensing options for such an infrastructure as part of your RWD platform selection process.
- Identify new data, analytics and technology skills needed for rapid experimentation and scaling of RWD use cases. Champion multidisciplinary fusion teams that blend technology, analytics and business domain expertise that can accelerate time to achieving outcomes.

## Sample Vendors

Clarify Health; Clarivate; HealthVerity; IQVIA; Komodo Health; Optum; Prognos Health; PurpleLab; Symphony Health; Veeva Systems

## Gartner Recommended Reading

[Healthcare and Life Science Business Driver: Medical Technology Innovation](#)

[Life Science CIOs: Reinvigorate Your D&A Capabilities With a Modern Commercial Intelligence Platform](#)

[2023 Life Science Business Drivers of Technology Decisions](#)

[Healthcare and Life Science CIO's Genomics Series: Part 1 — Understanding the Business Value of Omics Data](#)

## AI-Driven Competitive Intelligence

Analysis By: Animesh Gandhi

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Embryonic

### Definition:

AI-driven competitive intelligence (AICI) tools enable organizations to capture information from both publicly available and privately licensed sources. These tools track, capture and analyze information through the use of advanced AI technologies, such as ML, NLP and deep learning, to provide deeper trends and competitive guidance for making informed business and strategic decisions.

### Why This Is Important

AICI tools enable life science organizations (LSOs) to make better-informed strategic decisions, gain deeper insights on market dynamics and uncover sources of competitive advantages through collection and analysis of information not previously possible with traditional analytic methods. The data can be further translated to make decisions such as optimization of approaches for new and existing drugs and treatments, investing in innovations and commercializing new treatments.

## Business Impact

Competitive intelligence (CI) lays the foundation for robust strategic product planning. This helps manage opportunities and risks in face of uncertainty throughout the life science value chain. Thus, AICI can help prioritize drug pipelines, inform drug launch strategies and identify business development opportunities because of its ability to include a wider variety and volume of data previously not possible with standard analytics.

## Drivers

- Ongoing technological advancements are raising the interest of LSO CIOs to capitalize on technologies such as AI to gain an edge in the market. AICI tool-based competitive intelligence helps organizations improve market positioning and capitalize on market innovation by discovering new insights from existing and nontraditional data sources.
- The democratization of advanced information processing frameworks and application development platforms has enabled LSOs' data science and IT teams to prioritize data-driven use cases, such as AICI tools, that can provide their organization a competitive advantage.
- Overload of data available such as social media, academic journals, trial data, patent filings, etc., to identify relevant information about competition accurately.

In addition to drivers above, business leaders seek industry insights to inform their business strategies and facilitate scenario planning exercises, particularly in uncertain times. Example use cases include:

- Assisting in analyzing R&D synergies between partner companies to understand operational metrics and risks.
- Providing early-warning signals on competitive drug development and predicting market entry by tracking information on public portals and industry-specific databases covering R&D and other drug-based developments.
- Identifying promising licensing candidates as part of corporate business development efforts that meet their criteria, such as mechanisms of actions, intellectual property portfolio and company news.

- Assessing market dynamics and environment in preparation for a product launch, taking into account in-market product characteristics, dosing and efficacy parameters, and any other definable characteristics important to therapy choice.
- For these reasons, we advance this technology toward the Peak of Inflated Expectations and expect it to reach the Plateau of Productivity in five to 10 years.

## Obstacles

- LSOs still have information and process silos that limit the real-time orchestration of CI across their organizations.
- LSOs contract with consulting agencies to gather market insights. These insights are often delivered in proprietary formats that cannot be easily integrated into AICI tools, limiting tracking and distribution of the research.
- LSOs face challenges in CI processes and tools, including distributing information across close-ended portals deployed within departmental silos, functionality gaps in existing tools and poor management of online sources.
- LSOs develop narrow CI tools that satisfy limited use cases and do not allocate resources for ongoing enhancements and maintenance. Over time these tools add to the organizationals' technical debt.

## User Recommendations

- Work closely with business teams to uncover CI requirements. Ask key questions essential to determining your organization's current state and desired state for CI capabilities. These questions help in formalizing a plan related to your CI vision, which further aids in determining the key technologies or tools required to complete that vision.
- Identify the key sources of information (first and third party) that your AI tools will ethically mine for information. Identify whether both primary and secondary data sources need to be incorporated to gather insights aligned with your vision.
- Evaluate AICI tools' capability to produce actionable intelligence for end users and the skills required by your team to successfully deliver them. Look at information delivery mechanisms, including corporate and departmental portals, email, newsletters, mobile apps and APIs to support integration to business applications and workflow tools.

## Sample Vendors

Contify; Comintelli; DataZymes; Factiva; InfoDesk; Proactive Worldwide; Two Labs

## Gartner Recommended Reading

[Quick Answer: Life Science Competitive Intelligence Tools](#)

[2023 Life Science Business Drivers of Technology Decisions](#)

[Emerging Technologies: Emergence Cycle for Artificial Intelligence](#)

[Infographic: Artificial Intelligence Use-Case Prism for Life Science Manufacturers](#)

## Data Fabric in HCLS

Analysis By: Gregg Pessin

**Benefit Rating:** Transformational

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

### Definition:

A data fabric is a design framework for attaining flexible, reusable and automated data integration pipelines, services and semantics. It supports a broad spectrum of operational and analytics use cases on various platforms. Data fabric design provides the necessary data access capabilities for the composable healthcare enterprise.

### Why This Is Important

Due to uncertainty and constantly changing market conditions, healthcare organizations need to be able to create and recompose business and clinical capabilities more quickly. Composable architecture is the solution to this requirement, and data fabric is the foundation of that architecture. Data fabrics will significantly reduce or eliminate manual data integration tasks and augment (in some cases, completely automate) data integration design and delivery.

## Business Impact

Data fabric solves the healthcare industry's data problem. The sector has disparate data sources across care delivery, payer and life science enterprises. These isolated data sources hinder the timely, full-value delivery of enterprise-level information insights. Data fabric improves data access velocity, improving decision making. It offers an opportunity to eliminate manual data integration tasks significantly and automate data integration design and delivery.

## Drivers

- The healthcare industry is in the midst of a digital transformation, which at its core requires composable enterprise architectures for success. Data fabric is a crucial enabler of composability. Adoption is low currently, but the hype is creating more interest as the healthcare industry begins to apply composable concepts to their application solution sets.
- Most organizations will find that they already have some of the base components of a data fabric, creating a solid foundation to begin the journey.
- Data science as a practice is maturing in healthcare, motivated by the need to expose more value from data. At the same time, new independent data sources with higher complexity drive the need for better data access solutions.
- Data fabric offers an alternative approach to traditional interoperability requirements. The data integration, interfacing and interoperability issues that plague the industry have another solution option with data fabric.
- New technologies that support the data fabric solution set are becoming generally available, including knowledge graphs, active metadata management and semantics management.

## Obstacles

- Healthcare industry organizations lack enough high-quality data to train the machine learning (ML) required to activate metadata and enable a fabric.
- Lack of metadata in the early stages of data management initiatives — especially for on-premises deployments — will put initial pilots at risk of failure.
- Healthcare data returned from data fabric stacks must consider the privacy of the data-owning patient. In gathering the healthcare information, the data fabric technology layers must each comply with local regulations such as Health Insurance Portability and Accountability Act (HIPAA) and General Data Protection Regulation (GDPR).
- In addition to privacy, patient/member/consumer/citizen consent for access to their healthcare data is gaining momentum and shifting in complexity as granular consent gains traction. Data fabric capabilities must include honoring individual consent approvals to the data element level.

## User Recommendations

- Assemble a fusion team of D&A practitioners, IT engineers and business users completing significant, manual data preparation for their projects. The CIO will find the right automation opportunities and gather the right team by finding personnel that experience the mundane task involved in delivering value from data.
- Task this newly formed team to identify where the data resources do not meet business or clinical requirements. The team should look for key technology solutions where users find accessing and using the associated data difficult.
- Develop KPIs that align with business outcomes, and capture performance before and after the pilot. Examples include correlating patient length of stay, delays due to an EHR availability outage, payer overpayment due to 30+ days, delay in access to paid claims data, or delayed clinical trial progress due to IT system inefficiencies.

## Sample Vendors

Cambridge Semantics; Cinchy; CluedIn; Denodo; IBM; Informatica; Semantic Web Company; Stardog; Talend

## Gartner Recommended Reading

[Quick Answer: What Is Data Fabric Design?](#)

### Personalization Engines in LS

Analysis By: Animesh Gandhi

**Benefit Rating:** Transformational

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

#### Definition:

Personalization engines (PEs) in life science (LS) apply context about individual users and their circumstances to enable relevant, individualized interactions between a company and its audiences. LS organizations' (LSOs') audience includes healthcare providers (HCPs), health systems and payers. PEs combine technology and processes and use insight based on unique audience preferences, interests and consent to deliver targeted experiences that build brand loyalty and drive business growth.

#### Why This Is Important

How HCPs engage with LSOs has changed markedly over the past several years. LSOs continue to shift toward customer-centric engagement strategies by enabling virtual and digital interaction channels in addition to traditional face-to-face sales rep interactions. Personalization is an urgent concern for LSOs because, without this fundamental change, they risk losing competitive advantage, brand loyalty and mind share to more agile and innovative marketing competitors.

#### Business Impact

PEs are integral to LSOs' personalization strategy, enabling them to orchestrate seamless journeys between personal and nonpersonal channels based on an individual HCP's preferences and behaviors. They also offer a discrete ability to optimize targeting and segmentation, content development, usage and resource allocation. These use cases enable LSOs to build mind share that lead to business growth.



## Drivers

- LSOs seek to differentiate their brands, especially in crowded therapeutic areas, by delivering experiences and content that are unique to customers' individual needs and drive brand awareness and loyalty.
- LS-specific vendors continue to accelerate development of advanced AI/ML and journey mapping capabilities that enable new information to be incorporated rapidly into the decision process. This enables LSOs to rapidly refine and generate target segments, prioritize content development and optimize marketing resources allocations instead of waiting for the next planning cycle.
- HCP expectations have changed, with many finding digital information delivery more effective and increasingly preferable. LSOs are reacting by continuously refining their investment mix between in-person, virtual and digital interactions.
- Adoption of digital touchpoints, outside of email campaigns, continues to accelerate. Examples include HCP-focused text and video, and voice-based conversational platforms that provide on-demand information access to busy HCPs.
- LSOs seek to integrate other digital assets, such as HCP medical information portals, brand websites and mobile and social media channels as part of a connected engagement strategy. This ensures their brands are present, relevant and adding value to HCPs' decision journey.
- As LSOs continue to adapt to the new commercial operating environment and build new ways to deeply and meaningfully engage with their customers, personalization has become a key strategic component. For these reasons, we are advancing this profile toward the midpoint to Peak of Inflated Expectations, and expect it to reach the Plateau of Productivity in five to 10 years.

## Obstacles

- While the customer experience (CX) is a stated priority, LSOs are taking only incremental steps to establish a holistic customer-centric strategy. Many Gartner clients report the top-down approach with strategic planning continues to occur at brand level and leaves execution to individual functional groups, leading to siloed end-user experiences.
- While PEs are not a new technology, cross-industry PE vendors fail to grasp the industry business model, regulatory requirements and data complexities that must be addressed.
- Industry-specific PEs' tools are harder to implement and operate, as they lack the advanced features commonly available in cross-industry PE tools, such as native ability to collect user feedback without custom integrations for survey design, execution and data collection.
- PEs 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 comparisons.

## User Recommendations

- Develop a personalization strategy by documenting the entire value chain touchpoints with your target HCPs and examining how data and technology can enable personalization across key interaction points.
- Identify use cases in personalized marketing communications, CX and sales enablement by collaborating with your executive peers.
- Build a personalization roadmap of prioritized use cases tied to your organization's goals. PEs are integral to delivering a connected, contextual experience and content to your customers by leveraging data, advanced analytics and cross-channel orchestration.
- Assess your technology stack and architecture to identify gaps against your defined strategy. Maturity of industry-specific PE tools varies, so allocate ample time for piloting and experimentation to prove results and justify budgets.

## Sample Vendors

Aktana; Axtia; Exeevo; IQVIA; SAS; Trinity Life Sciences; ZS

## Gartner Recommended Reading

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

[Infographic: How to Start Building Dynamic Personas for Life Sciences](#)

[Infographic: Top Priorities, Technologies and Challenges in Life Sciences in 2023](#)

[How Life Science CIOs Can Build a Data-Driven Enterprise Foundation With Commercial MDM](#)

[Life Science CIOs: Reinvigorate Your D&A Capabilities With a Modern Commercial Intelligence Platform](#)

## Conversational User Interfaces in LS

Analysis By: Animesh Gandhi

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

### Definition:

Conversational user interfaces (CUI) in life science (LS) are human-computer interfaces that enable natural language interaction for the purpose of fulfilling a request, such as providing on-demand access to medical information. LS-specific CUI tools understand medical-specific terminology and facilitate regulatory compliance requirements. CUIs span chatbots to more advanced virtual assistants. Recent advances in large language models (LLMs) have increased demand for more advanced support.

### Why This Is Important

LS organizations aspire to meet the demands of healthcare professionals (HCPs), patients and other stakeholders who seek medical information and expect it to be available on demand. The in-person-centric engagement model struggles to keep up with ever-growing requests for information. Consequently, AI-powered CUIs, which can automate answering healthcare-related questions, hold much allure as a way to scale such needs cost-effectively and compliantly.

## Business Impact

CUIs' greatest impact is in scaling a compliant, on-demand, digital-first engagement model in LS while addressing customer needs and freeing medical science liaisons (MSLs), patient support specialists and other roles to focus on higher-value work. Even when CUIs cannot address the question, they streamline the request process by collecting relevant information and efficiently routing questions to those who can help, while enabling systematic tracking of demand and topics of interest.

## Drivers

- The underlying technology supporting CUIs, such as chatbots, built on top of conversational AI platforms has matured significantly in the last few years. Vendors are expanding their capabilities to support a broader range of roles, such as field representatives and MSLs and use cases beyond medical information-service chatbots and toward broader enterprise automation.
- Vendors are updating their roadmaps to include LLM-enabled capabilities to support established use cases, such as medical knowledge search and retrieval that are based on document ingestion.
- As demand for new digital touchpoints grows, LS organizations are implementing chatbot capabilities to improve engagement opportunities with customers. Beyond text, voice is emerging as a primary modality of interaction between users and CUIs.
- As LLM capabilities mature, the accuracy and effectiveness of CUIs will also increase, accelerating adoption. Already CUIs tools are providing valuable patient insights and increasing efficiency in healthcare and research settings.
- Increasingly, LS organizations are expanding use cases beyond information retrieval, such as using CUIs with sales representatives to provide faster access to internal information and reduce the need to traverse multiple systems.
- Industry-specific solutions are expanding capabilities to address concerns about potentially miscommunicating information, detecting an adverse event as part of patient interaction and ensuring security and privacy. As industry-specific solutions emerge that address these challenges, compliance, marketing and patient support teams are becoming more accepting of this technology. As a result, this technology is advancing toward Peak of Inflated Expectations and is expected to reach mainstream adoption within five to 10 years.

## Obstacles

- CUIs need to have awareness of the user type that they are communicating with, whether an HCP or patient, due to the nature and purpose of the information that they can communicate. In many cases, an HCP requesting information needs to be authenticated, adding friction to the user experience.
- Most organizations lack codified answers, question-and-answer collections or taxonomies required to power CUIs. Information shared by CUIs needs to be reviewed by medical, legal and regulatory (MLR) teams to ensure that responses adhere to regulatory standards.
- CUIs must be capable of monitoring, analyzing and distinguishing user responses mentioning certain keywords or conditions that may imply an adverse event.
- Due to the highly regulated nature of the medical information dispensed by CUIs, the use of generative AI and LLMs will require significant development and validation to ensure accuracy of response, delaying the deployment of these more advanced and interactive capabilities.

## User Recommendations

- Collaborate with marketing, patient support and compliance leaders to identify use cases that can be deployed quickly to address specific customer needs, such as supporting medical information inquiries for HCPs.
- Focus on a narrow range of questions where CUIs can perform well, allowing you to establish organizational trust with the usage of such technology. Develop a longer-term strategy to amass sufficient data to train future systems with appropriate MLR oversight.
- Ensure that a plan is in place to support ongoing improvements of CUIs as a product, with the necessary organization and product manager roles in place to continue maturing of this technology.
- Address each region's linguistic and cultural nuances by ensuring that response generation modules support any needed dialects and that answer translations are supervised by native subject matter experts.

## Sample Vendors

Amazon; Google; Kore.ai; Orbita; P360; Real Chemistry (ConversationHEALTH); Sprinklr; Sensely; Yellow.ai

## Gartner Recommended Reading

[Magic Quadrant for Enterprise Conversational AI Platforms](#)

[Selecting Conversational AI Solutions for Chatbot and Virtual Assistant Initiatives](#)

[Emerging Tech Roundup: ChatGPT Hype Fuels Urgency for Advancing Conversational AI and Generative AI](#)

[Prioritize Chatbot Application to Meet Current and Future Self-Service Demand](#)

[Risks to Know and Mitigate Before Deploying Chatbots](#)

## Digital Life Science Platform

Analysis By: Michael Shanler

**Benefit Rating:** Transformational

**Market Penetration:** Less than 1% of target audience

**Maturity:** Emerging

### Definition:

A digital life science platform (DLSP) is an architectural approach that enables companies to nimbly adapt their business and operating model, in response to external disruption and change in business strategy. The DLSP sources and integrates functionality from internal and ecosystem partners to create packaged business capabilities (PBCs). Nontechnical and IT staff can use PBCs to compose new experiences.

### Why This Is Important

Life science (LS) organizations realize the limitations of monolithic ERP-centric or heavily customized or niche business application portfolios. The siloed nature of current architectures has stifled innovation and slowed digital transformation. Business users are exhausted by feeble attempts at interoperability by vendors, resulting in an excessive total cost of ownership (TCO) and fragmented user experiences.

### Business Impact

The DLSP supports the following capabilities:

- Digital consumer and patient engagement for personalized experiences for drug regimens, device usage and therapies, using plug-and-play capabilities from external ecosystem players.
- Decentralized, digital clinical trials.
- Advanced health analytics, using tools that leverage data sources from R&D, precision medicine and real-world evidence.
- Digital laboratory research connected across multiple scientific and experimental disciplines, like chemistry and biology.

## Drivers

- Business users want to transform the business. They want to enable a “composable” life science enterprise that leverages technologies to solve increasingly complex therapeutic issues. The composed experience will be realized through business-user-focused application experiences that are independent of the underlying set of commercial off-the-shelf (COTS) or legacy monolithic applications.
- Clients want a more effective means of bringing together different domains (e.g., clinical and AI subject matter experts [SMEs]) to provide a focus for democratized innovation among a range of stakeholders (see [Fusion Teams: A Proven Model for Digital Delivery](#)).
- The DLSP approaches are removing critical technological barriers to digital innovation and transformation (see [Best Practices for Reimagining Your Life Science Company as a Digital Business Technology Platform](#)).
- Organizations are starting to deliver business outcomes by delivering PBCs. These are application building blocks that have been purchased or developed internally or with third parties.
- Many clients and vendors are adopting a platform strategy as the primary vehicle for digital business transformation.
- As this is a relatively new concept, it is still in the Innovation Trigger phase of the Hype Cycle.

## Obstacles

- This is an architectural approach that ultimately needs to be enabled by the end user. However, many end users want “holistic solutions” provided by vendors, which do not exist yet.
- Vendors often posture as having a platform. However, they think more in terms of software, and not architectural approaches, which creates confusion. End users, working with vendors, will need to provide a means of rapidly producing composable digital products and services from different sources (not just their marketplace or product offerings).
- DLSP requires vision and alignment with the business and IT, and may involve functional leads to help drive requirements. Since this is a big departure from application-centric thinking, we expect delays in design and essential partner selections.
- As the approach reaches peak hype, clients will inevitably be underwhelmed by either the vendor’s capabilities or their aspirations not meeting reality.

## User Recommendations

- Align digital and IT strategy with existing business strategy through the power of people from business and IT backgrounds in the form of digital fusion teams (see [IT-Business “Fusion” Teams and How They Can Deliver Innovation](#)).
- Evaluate vendor solutions on their compatibility with the composable architecture that is emerging. Take appropriate actions on vendor and key technology sourcing across the current and future enterprise application portfolio (see [Healthcare and Life Science Business Driver: Medical Technology Innovation](#)).
- Drive technology and data architecture decisions, and organizational models that redefine the relationship between the business and IT. Plan to modernize legacy applications toward the PBC model.
- Verify the attributes of “composability” when assessing new vendor capabilities or solution offerings, and when renewing contracts with incumbent vendors. Explore strategic relations with hyperscale solution providers and channel partners.

## Sample Vendors

Amazon; Google; IBM; Microsoft; Oracle, Salesforce; SAP; Veeva Systems



## Gartner Recommended Reading

[Innovation Insight for Digital Life Science Platforms](#)

[Democratizing Digital Delivery in Healthcare and Life Sciences](#)

[Healthcare and Life Science Business Driver: Strategic Technology Change](#)

[Quick Answer: What Should Life Science CIOs Know About Data Fabrics?](#)

[Quick Answer: What Are Packaged Business Capabilities in Healthcare and Life Sciences?](#)

## Personalized Health

Analysis By: Amanda Dall'Occhio

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

### Definition:

Personalized health improves an individual's health by predicting the likelihood of future illness and recommending actions or interventions to promote health and disease prevention. It analyzes a wide range of data, including clinical, genetics, lifestyle, behaviors, biometrics, genomics and social determinants of health. Personalized health employs technological advances in "omics" medicine and consumer data capture to identify individuals' optimal health pathways.

### Why This Is Important

Early research has demonstrated personalized health's potential for revolutionizing the health industry by identifying patient-specific health risks early on, leading to disease prevention. The strategic end goal of personalized health is to create a healthcare system for wellness care — instead of sick care — by enabling early detection of illness or disease and preventing its progression using personalized treatment options.

## Business Impact

Personalized health breakthroughs will eventually operationally and technologically disrupt the healthcare ecosystem and organizations' business models. The shift from curative to preventive care with personalized health interventions will become the new gold standard in medicine. It will aim to prevent illnesses before they happen through wellness and prevention efforts, and ultimately increase lifespans, decrease the incidence of lifestyle diseases and reduce chronic illness.

## Drivers

- Personalized health implies that the business model of today's healthcare organization, which relies on repair care episodes, needs to alleviate the skyrocketing care cost and revenue risk of relying on ill patients. Advancement in personalized health promises to shift care delivery from curative to preventive by monitoring individuals' health, identifying risks and performing wellness and preventive interventions, radically changing primary and secondary care as we know it today.
- As healthcare shifts from fee-for-service to value-based care models, personalized health can support providers in identifying as many (some otherwise hidden) opportunities as possible to hone course of care and, ultimately, improve health outcomes.
- With advancements in machine learning and artificial intelligence (AI) capabilities, personalized health can assemble and provide an aggregated view of patients' health, including all relevant clinical and social determinants of health data points.
- With an influx of new regulations on interoperability globally, healthcare organizations can integrate, analyze and act on multiple datasets. These will enable direct connections to physicians, care workers, genetic counselors and other professionals and patients.

## Obstacles

- Although evidence is mounting, it will take years to develop the technologies required to capture personalized health data elements, standardize their recording and analysis, and create evidence-based health pathways at scale. It will take even longer to develop AI-enabled insights from all the data required for each person.
- While advances in interoperability enable more collaborative approaches, current innovation networks are siloed with too much competition and insufficient collaboration for personalized medicine to succeed. It will take time to create public policy and develop reimbursement models that link the value of preventive interventions to successfully eliminate a condition that may develop over 50 years later.
- Personalized health depends on patient behavioral changes that can be difficult to achieve.
- Personalized health will continue to rise on the Innovation Trigger slope. However, we project it to be at least five to 10 years from reaching the Plateau of Productivity.

## User Recommendations

- Track the leading adoption indicators for personalized health. These include decreases in the cost of sequencing and companion testing, reductions in the cost of treatment, and increasing rates of reimbursement for treatment.
- Find opportunities to leverage developing organizational competence in responding to genomic and biomarker analysis as well as consumer engagement to amass the data and analytics capabilities required for personalized health initiatives.
- Keep personalized health concepts on your growth strategy and roadmap as they establish population health management and invest in precision medicine platforms. Take the long view in capturing more data than less, positioning the organization for its use in research or AI-driven initiatives to see personalized health business opportunities.

## Sample Vendors

2bPrecise; DNAnexus; Molecular You; Orion Health; Philips; Precision Digital Health; Syapse

## Gartner Recommended Reading

[Population Health Management Framework for Healthcare Provider CIOs](#)



## At the Peak

### Prescribed Digital Therapeutics

Analysis By: Animesh Gandhi

**Benefit Rating:** Transformational

**Market Penetration:** Less than 1% of target audience

**Maturity:** Emerging

#### Definition:

Like Digital Therapeutics (DTx), Prescribed DTx (PDTx) are evidence-based, software-driven therapies that require a provider's prescription. PDTx optimizes health outcomes by delivering a clinical mechanism of action independently or in conjunction with other treatments. PDTx are distinguished from digital health technologies, as their creators must conduct randomized clinical trials to demonstrate safety and efficacy to earn regulatory approval (such as FDA, EMA, MHRA) for all marketing claims.

#### Why This Is Important

PDTx has the potential to redefine personalized medicine, enable new revenue streams and launch new partner models for life science organizations. These therapeutic interventions will, in many cases, provide an interactive way of administering therapy, improve medical adherence or tailor experiences based on cognitive as well as biological markers. PDTx will also increase access to clinically validated therapies given their frictionless, software-only distribution model.

#### Business Impact

Utilizing PDTx will result in better efficacy for therapies, improved safety signaling, increased medical adherence and a positive impact on revenue, especially as companies explore payment models based on health value outcomes. In addition, PDTx will generate tremendous amounts of real-world data and pave the way to value-based outcomes. For these reasons, we rate the benefits of PDTx as transformational.

#### Drivers

- As the use of digital technologies continues to accelerate, digital interventions provide patients with an opportunity to participate more actively to manage their disease and offer greater awareness of their health progress.

- PDTx are able to fulfill unmet medical needs that traditional drug-based therapies cannot, such as Akili Interactive's ADHD treatment targeted for middle-childhood patients.
- Germany's Digitale Gesundheitsanwendungen (DiGA) framework standardizes the prescription and reimbursement pathways across the country's healthcare ecosystem and has already led to several dozen reimbursed PDTx available in the market. Other European countries, such as Belgium and France, are adopting similar frameworks. In the U.S., recent legislation was introduced (U.S. Access to Prescription Digital Therapeutics Act of 2022) to provide Medicare coverage and reimbursement for PDTx.
- Usage of real-world evidence — insights generated from real-world data (RWD) — continues to expand for gaining market access by enabling decision makers to understand the patient journey in actual practice. PDTx are well-positioned to capture real-world performance data and use it to affirm its regulatory status and support product evolution.
- Life science organizations continue to formulate partnerships with digital therapeutics developers, seeking to take advantage of the platform's unique value proposition. Examples include improving medical adherence as an adjunct therapy, enabling a new level of patient activation and engagement and capturing RWD.
- As the path to reimbursement becomes clearer, we observe accelerated interest in prescribed digital therapeutics, with a number of life science organizations establishing digital health initiatives and continued investments in the digital therapeutics category. We therefore advance this technology toward the Peak of Inflated Expectations. We anticipate that it will reach mainstream adoption within the latter half of a five- to 10-year period.

## Obstacles

- The bankruptcy of Pear Therapeutics, an early PDT pioneer, reaffirms the need for establishing viable reimbursement pathways in the U.S. It also highlights that PDT manufacturers must focus on patient engagement to drive adoption, and not just medical evidence generation.
- The success of PDTx depends on identifying the right commercial model and partners that have aligned incentives, cultural fit, defined expectations and open communications.

- Reimbursement pathways are evolving at an anemic rate in different markets, with pathways remaining hazy due to the absence of standardized frameworks and varying evidence requirements due to autonomous regional payers.
- Healthcare professional (HCP) acceptance is crucial to ensure wide-scale adoption of PDTx. Challenges include integrating PDT into HCPs, prescribing and clinical review workflows, and educating HCPs on PDT technology.

## User Recommendations

- Partner with executive peers to formulate a digital therapeutic strategy by aligning your digital therapeutic go-to-market strategy as either a stand-alone or adjunct therapy with defined treatment outcomes and patient experiences.
- Assemble a team with capabilities for PDT prowess while addressing needs of clinical sciences, regulatory, data sciences and commercialization expertise.
- Determine how your organization is viewed as a partner and the level of your digital partnerability by looking outside-in at your current approaches that may be holding back more sustainable partnerships.
- Seek partnerships with technology vendors that have the capabilities to develop and scale the technologies needed for digital therapeutic deployment. This includes partnering with data health platforms that enable HCPs to compare, prescribe and monitor PDTx within their EHR workflows.

## Sample Vendors

Amalgam; Aptar; Biofourmis; BrightInsight; DarioHealth; Dawn Health; Huma; Orthogonal; Twill; Welldoc

## Gartner Recommended Reading

[2023 Life Science Business Drivers of Technology Decisions](#)

[Healthcare and Life Science Business Driver: Medical Technology Innovation](#)

[Innovation Insight for Digital Life Science Platforms](#)

[Tool: Life Science CIO's Executive Presentation for Building the Composable "Digital Therapeutech"](#)

## Cell and Gene Therapy Platform

Analysis By: Reuben Harwood, Maria Nieradka, Michael Shanler

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

### Definition:

Cell and gene therapy (CGT) platforms are systems designed to help collect, analyze and prepare biological samples as therapies for patients. The American Society of Gene & Cell Therapy defines gene therapy as the use of genetic material to manipulate a patient's cells for the treatment of an inherited or acquired disease. Cell therapy is defined as the infusion or transplantation of whole cells into a patient for the treatment of an inherited or acquired disease.

### Why This Is Important

Spurred on by the successful approval of new CGT products, life science companies are investing heavily in new platforms that support R&D. While research organizations have put experimental cellular therapies into practice for decades, solutions managing the end-to-end process did not exist until recently. Most CGT is supported using heavily customized supply chain and logistics software. A handful of vendors have developed configurable solutions that simplify the support and delivery of CGT.

### Business Impact

Currently, most CGT operations are fairly manual and have complex and inefficient process steps that threaten the quality of delivery. Business teams are searching for marketed solutions that can meet timing, logistics and quality requirements. CGT solutions can automate many of these steps from a process and delivery perspective. They can also facilitate clinical trials and logistics and patient/subject/physician and manufacturer communications.



## Drivers

- CGT is becoming a more centralized strategy at many pharmaceutical companies, augmenting traditional drug portfolios. Personalized medicines, individualized therapeutics and more targeted approaches to therapies are trends that are driving new business models and creating this market.
- There are currently 28 FDA-approved cell and gene therapies. The number of regulatory approvals is likely to rise significantly in the near future as more than 1,500 clinical trials for CGTs are currently registered in ClinicalTrials.gov. These cover a wide range of disease categories, such as oncology, rare diseases, regenerative medicine and others.
- The approval of the first CRISPR gene-editing therapy (from Vertex and CRISPR Therapeutics) may occur in 2023. If commercially successful, it will bring added momentum to the field of gene editing.
- The demand for CGT clinical trials has accelerated, making CGT platforms that match the therapy area essential to streamlining trials and getting commercial products to the market.
- The data associated with CGT increasingly has broader uses across the business throughout the product life cycle, from R&D and commercial areas to specialized manufacturing and supply chain operations. Those requirements are becoming more acute for organizations supporting a “personalized medicine” approach, where markets consist of individuals. Once patient, manufacturing, operations and clinical data policies are updated, CGT systems will be even more scalable for supporting different kinds of CGT research and medicine programs.

## Obstacles

- High inflation has slowed the development of cell and gene therapies, with reduced investment in R&D and higher production and transport costs.
- Life science companies and other research institutes can expect adoption challenges due to the complex nature of these therapies. Solutions must support several different types of models: allogeneic (the donor is different than the recipient), autologous (the donor and patient are the same) and variations of stem cell and T-cell therapies.
- In each of these cases, clients have unique needs and wildly different interventions and touchpoints they must orchestrate among R&D staff, healthcare professionals, lab technicians and supply chain personnel. This will cause complexity in vendor selection and system design, delaying adoption.
- Given its early stage of adoption, we position this technology in the Innovation Trigger phase with plateau achieved in five to 10 years.

## User Recommendations

- Ascertain from leadership (such as the chief science officer) if CGT platforms will be necessary to support your business strategy. Focus on the touchpoints between CGT and major systems, such as ERP, manufacturing execution systems, electronic batch records, quality management systems and patient and healthcare-facing systems.
- Evaluate whether the newly established vendors can provide the capabilities you need versus building a custom solution.
- Work closely with product leaders to understand the commercial challenges (such as high price per therapeutics), including payer contracts that may affect architecture- and CGT-related information communication.
- Ensure extensive process, clinical and IT system validation is performed by the software provider's organizations and that those vendors properly support CGT processes. Work with quality teams to verify that governance and policies are in place to maintain vigilant compliance and that patient privacy is protected.

## Sample Vendors

Autolomous; Be The Match BioTherapies; CellPort Software; Cytiva; FarmaTrust; Hypertrust Patient Data Care; IDBS; L7 Informatics; Tenthpin; TrakCel

## Gartner Recommended Reading

[How Technology Can Support the Next Phase of Commercial-Scale Cell and Gene Therapies](#)

[Life Science CIO's Strategy for Delivering Cell and Gene Therapy Capabilities](#)

[Prioritize Patients in Supply Chain Design for Cell and Gene Therapies](#)

## Patient Engagement Hub

Analysis By: Animesh Gandhi

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

### Definition:

The life science patient engagement hub (PEH) is a technology that integrates multiple patient engagement touchpoints to improve patients' experience and clinical outcomes from prediagnosis through ongoing care management. A PEH includes proactive and reactive communication, enables personalized engagement with patients across all interaction touchpoints and orchestrates interactions across organizational patient programs.

### Why This Is Important

Life science organizations (LSOs) seek to directly engage patients to increase their awareness about their available products, assist in ensuring access to therapy and provide disease education. Specialty therapies require deeper engagement with patients to improve initiation and compliance to prescribed treatments. Furthermore, empowered patients seek greater control of their treatment journey and the growing availability of digital health technologies present new engagement opportunities.

## Business Impact

LSOs have traditionally focused on “beyond the pill” initiatives (value-added services that address stakeholder needs) to engage patients and reinforce medical adherence. However, LSOs are realizing that a broader definition is required to address the needs of modern complex therapies. LSOs have sketched patient journey maps and developed ambitious plans that call for interventions at key moments of that journey. PEH enables operationalization of those plans at scale.

## Drivers

- Costs of operating traditional financial-assistance programs have ballooned, forcing many LSOs to enforce stricter eligibility verifications. As a result, many LSOs have focused on developing more holistic “around the patient” programs that engage patients from therapy initiation and ensure they stay on their prescribed treatment program.
- LSOs seek to have a deeper engagement with patients and to differentiate their therapeutic drugs or devices. As such, they look to integrate their various services, such as patient support programs, medical adherence applications, education portals and companion applications, as part of a connected journey experience.
- Business leaders are demanding the following capabilities from their PEH: facilitate communications to raise brand awareness of products on the market; provide training and education to improve initiation and compliance to prescribed treatments; manage patient adherence, and collect and analyze data to monitor patients’ conditions through integrated medical devices and digital therapeutics; gather and analyze real-world data (RWD) that demonstrates product value and streamlines development of new treatments and services; and orchestrate precision medicine delivery programs that leverage digital therapeutics, symptom management applications, biosensors, medtech devices and so on for improving clinical outcomes.
- Notable moves have been made by cross-industry vendors to position themselves as fulfilling large components of the PEH architecture. This means healthcare-specific data models, journey orchestration, regulatory compliance, security requirements and analytic services.
- We expect this trend to accelerate as LSOs without PEH initiatives start building business cases and planning for pilots. As a result, we position PEH moving toward the Peak of Inflated Expectations and anticipate mainstream adoption in five to 10 years.

## Obstacles

- The alignment of patient engagement (or patient support) functions varies with LSOs, ranging from centralized corporate functions to a subsidiary of a brand or market access function. Siloed approaches to patient engagement by each brand hinder companies' ability to deploy enterprise PEH solutions.
- Expedient implementation and scaling of PSPs (e.g., benefits verification, prior authorization and reimbursement support) is an attractive value proposition to many brands. In contrast, PEH requires significant planning and implementation effort before value can be fully realized.
- Some LSOs are still cautious due to guidance/restrictions from internal compliance teams on expanding traditional PSPs because they may be viewed as taking advantage to gain preferential treatment for their products, potentially violating the Anti-Kickback Statute and False Claims Act.

## User Recommendations

- Assess the needs of patients by mapping their clinical journey and identifying key moments of engagement and interventions. Use this information to design an ideal patient experience and journey specific to your therapeutic areas. For example, patients with neurological disorders typically require greater human-based social support rather than automated interventions.
- Identify additional use cases for PEH across your commercial organization by actively engaging with brand, patient engagement and compliance leaders. Start with targeted therapeutic areas to run "proof of concepts," using lessons from early trials to scale over time.
- Address privacy, ethical and compliance concerns by enabling robust discussion and debate with compliance, brand and patient engagement leaders. Develop policies and processes that deal with issues of patient engagement, consent, privacy, data ownership, retention and secondary use.

## Sample Vendors

Accenture; Courier Health; EXEEVO; Human Care Systems; IQVIA; Komodo Health; Medocity; Microsoft; Salesforce; ZS

## Gartner Recommended Reading

[Predicts 2023: Digital Transformation of Healthcare Beckons New Era for Life Sciences](#)

[Healthcare and Life Science Business Driver: Total Experience Transformation](#)

[Infographic: How to Start Building Dynamic Personas for Life Sciences](#)

[2023 CIO and Technology Executive Agenda: A Life Science Perspective](#)

## **Generative AI in Life Sciences**

**Analysis By:** Michael Shanler

**Benefit Rating:** Transformational

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Adolescent

### **Definition:**

Generative AI can generate new derived versions of content, strategies, designs and methods by learning from large repositories of original source content. Generative AI has profound business impacts, including on content discovery, creation, authenticity and regulations, automation of human work, and customer and employee experiences. In the life science industry, generative AI can be applied for a wide range of scientific, medical and commercial purposes.

### **Why This Is Important**

Generative AI exploration is accelerating, thanks to the popularity of Stability AI (Stable Diffusion), Midjourney, ChatGPT and other applications leveraging large language models (LLMs). Today, life science organizations are aggressively experimenting with generative AI to help tune AI for images, videos, audio, molecular- and engineering-based formats. Use cases include identifying new drug targets, improving clinical site selection, monitoring drug reactions and accelerating marketing content development.

### **Business Impact**

Most technology products and services will incorporate some form of generative AI capabilities in the next 12 months, in turn, leading to their democratization. Generative AI will progress rapidly, especially in the area of scientific discovery and technology commercialization. The technology will have broad impacts for the entire organization, including education and training for appropriate use; updates to security and governance; and skills investments.

## Drivers

- ChatGPT is a very hyped technology and the number of technology proofs of concept have escalated.
- Life science industry's interest in generative AI is rapidly growing. Engagements with analysts are significantly up to explore capabilities and vendors. Enterprises are examining generative AI as employee-facing tools for assembling information and creating reports that aggregate information from financial, HR, learning management and project management functions.
- In life science commercial operations, the technology is being explored for publication summarization in medical affairs as well as generating market performance insights for sales and marketing business users.
- Generative AI is already speeding up the drug discovery process. This includes creating research article drafts, aggregating research intelligence, identifying novel targets and predicting novel drug-like chemical structures, and generating validation reports,
- Generative pretrained transformer (GPT) enables non-native English speakers to be included in collaborations across the scientific community.
- Clinical and regulatory leaders are exploring the technology to improve site selection, develop enrollment, recruitment and retention reports, aggregate clinical intelligence findings, and create clinical summaries.
- Manufacturing, quality and supply chain staff are using the technology for creating SOPs for recipe and formulation, developing procedures for laboratory workflows, and assembling regulatory information.
- Generative AI will disrupt "low code" and "no code" software programming. Combined with development automation techniques, it can automate 30% to 40% of programmers' work. This is highly attractive across the life science value chain, especially with informatics and analytics applications teams due to prevalence of "high code" technology and heavily customized legacy systems.
- We are introducing this technology at the peak, and expect it to reach a plateau in two to five years.

## Obstacles

- A wide range of new regulations on generative AI are emerging globally. For instance, in 2023, a [call to pause giant AI experiments](#) (Future of Life Institute) for six months was signed by many AI and technology dignitaries.
- The risk of generative AI creating incorrect scientific assumptions or recommendations that put patients at risk is causing pause at many organizations.
- Corporate policy on use of generative AI, especially those leveraging public models and applications, is driving “fit for purpose” rubrics while updating and educating staff on intellectual property, trust and privacy issues.
- The black-box nature and a lack of experience with a full AI life cycle for proprietary systems might preclude the use of generative AI for critical use cases where there are high barriers to explainability or validation.
- The validation requirements, such as GxP can challenge use of the tool in operations and decision making, as regulatory guidance on AI validation remains unclear.
- Some vendors will use generative AI terminology for trying to sell subpar “generative AI” solutions.

## User Recommendations

- Accelerate clear and effective internal communications by ensuring business, clinical and technology leaders have a common set of definitions for key terms in generative AI and a foundational understanding of how LLMs, such as GPT, work.
- Establish a technology leader as the enterprise subject matter expert on generative AI technology by allocating time for this individual to digest industry updates as they unfold, create guidance and communications for leadership, and oversee experimentation and learning across the broader organization.
- Identify initial use cases where you can improve your solutions with generative AI by relying on purchased capabilities or partnering with specialists. Consult vendor roadmaps to avoid developing similar solutions in-house.
- Ensure your vendor partnerships are positioning their products and services to maximize the value and manage the risk by making generative AI a regular point of discussion.



## Sample Vendors

Amazon; Atomwise; Google; Huma.AI; insitro; Microsoft; OpenAI; Schrödinger; Stability AI; Tencent

## Gartner Recommended Reading

[Innovation Insight for Generative AI](#)

[Emerging Tech Roundup: ChatGPT Hype Fuels Urgency for Advancing Conversational AI and Generative AI](#)

[Emerging Tech: Generative AI Needs Focus on Accuracy and Veracity to Ensure Widespread B2B Adoption](#)

[Glossary of Terms for Generative AI and Large Language Models](#)

## D&A Platforms in Commercial LS

Analysis By: Animesh Gandhi

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

### Definition:

Commercial life science (LS) data and analytics (D&A) platforms bring modern approaches to existing processes, expanding upon legacy data repository solutions and data science laboratories by integrating them under a logical data warehouse architecture. They automate ingestion and processing of common LS data sources, such as CRM, specialty pharmacy, claims data and third-party syndicated sources, as well as enabling commercial analytics point solutions.

### Why This Is Important

Commercial D&A platforms streamline data management processes with robust capabilities for data ingestion, data quality tracking and data governance on a prebuilt commercial operations data model. These platforms give business users and data scientists more control by enabling data access through advanced capabilities (such as an interactive information portal, an analytical workbench and a data science laboratory).

## Business Impact

The primary drivers of commercial operations' adoption of D&A platforms include the challenges and opportunities in customer journey orchestration, sales and marketing effectiveness, market access insights and commercial analytics. Furthermore, these platforms eliminate point solutions and functional data silos, accelerate insights generation and reduce operational costs through centralized data management capabilities.

## Drivers

- LS commercial teams are experiencing exponential growth in new data, ranging from deidentified real-world datasets to digital touchpoints. Efficiently blending these datasets with traditional data has become paramount for commercial success.
- Digital transformation remains a top priority for LS leaders and requires a robust D&A foundation to scale customer engagement programs, improve field performance and negotiate favorable market access.
- Commercial teams are seeking to scale AI, including generative AI, in areas such as personalized healthcare provider and patient engagement, and dynamic customer targeting. These platforms support scaling such initiatives by incorporating AI engineering capabilities.
- Modern commercial D&A platforms provide an opportunity for LS organizations to supplement legacy data warehouses with data lake technology. New D&A tools enable more seamless and transparent links between sales, marketing and other groups.
- LS organizations seek to significantly improve upon traditional market research and data analysis techniques for product launch planning by using advanced analytics and machine learning to gain predictive and prescriptive insights.
- Commercial analytics leaders frequently struggle with getting data science projects into production. A commercial D&A platform promises to unify the exploratory and production environments, thus mitigating these issues.
- IT leaders have only recently begun to build out or license commercial D&A platforms in the last few years. As a result, we place them just past the Peak of Inflated Expectations phase of the Hype Cycle. We anticipate these solutions will reach mainstream adoption within five years.

## Obstacles

- Commercial operations departmental leaders choose analytics platforms that excel at use cases within their business function, such as sales or marketing enablement. This creates multiple stacks of solutions based on solving specific departmental use cases, such as field suggestions, rather than employing a unified integrated approach.
- An individual point solutions approach creates an environment where business unit leaders exert control over how their departmental data is integrated, shared and governed. For example, many vendor solutions expect commercial teams to export data to vendors' cloud environments for insight generation rather than operating on a centralized, enterprisewide D&A repository.
- Poorly performing legacy systems, caused in part by hard-coded business rules, lack agility to rapidly adapt to business changes, such as responding to the launch of a competitor drug. This has led to business stakeholders' hesitance to support investing in newer platforms.

## User Recommendations

- Upgrade your analytics architecture with commercial D&A platforms as the landscape of vendors, capabilities and business needs rapidly evolves. Create a working blueprint of your analytics ecosystem that guides your response to the mounting demands for data and insight.
- Assess your blueprint against verticalized solutions specifically designed for LS commercial operations or rapidly evolving horizontal solutions that can be easily contextualized to meet your requirements.
- Identify business use cases that will yield strategic ROI for the platform. Start by collaborating with your business peers. For example, use your platform to optimize sales and marketing resources; provide targeted, personalized customer engagement; and assess predeal and postdeal analytics.
- Evaluate required talent by conducting skills and capacity assessments, and recalibrating/reskilling as needed.
- Review governance and operational processes to make sure they are still relevant and optimal.

## Sample Vendors

Axtria; CustomerInsights.ai; Dassault Systèmes; DataKitchen; DataZymes; IQVIA; RxDataScience; Trinity Life Sciences; Veeva Systems; ZS

## Gartner Recommended Reading

[Infographic: Top Priorities, Technologies and Challenges in Life Sciences in 2023](#)

[Quick Answer: What Should Life Science CIOs Know About Data Fabrics?](#)

[Life Science CIOs: Reinvigorate Your D&A Capabilities With a Modern Commercial Intelligence Platform](#)

[Infographic: Artificial Intelligence Use-Case Prism for Life Science Manufacturers](#)

## AR/VR/MR in Life Science

Analysis By: Michael Shanler

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

### Definition:

Augmented reality (AR), virtual reality (VR) and mixed reality (MR) in life science are technologies that create immersive experiences for consumers, patients and employees. Within life science organizations, these applications span a range of business functions, including R&D, quality, manufacturing, therapy, field service and commercial.

### Why This Is Important

AR/VR/MR technologies are rising in prominence as life science business users look to create more immersive experiences, improve collaboration and digitalize operations. These technologies allow for new ways to engage individuals, assets and information. Gartner expects increased applications and sophistication in a range of application areas that can help design and deliver better products, improve compliance in regulated processes, and assist with the creation of better user experiences.

## Business Impact

AR/VR/MR will have the following business impacts:

- AR increases throughput, collaboration, quality, compliance and insights in the areas of labs, inventory, storeroom, diagnostics, and stockroom logistics and planning.
- VR is commonly used for molecular design, physician education, and manufacturing and facility design.
- While AR and VR are more mature technologies, MR is still evolving. It doesn't have as many clear business benefits beyond the current, more narrow applications — like logistics, robotic surgery, field service and sales enablement.

## Drivers

- As health models evolve and new devices are coming online, organizations are funding more proof of concepts (POCs) for remote, digital and clinical experiences. This is driving adoption of AR, VR and MR.
- The popularity of immersive experiences as digital work tools has increased due to the effects of work-at-home policies. Most organizations have continued these staff engagement strategies now that digital workplace strategies have become the norm in many organizations.
- Consumer technologies have advanced to the point where AR and VR headsets are at manageable price points. Hardware usability and battery life are now amenable for mainstream consumption.
- New applications are being elevated and old ones are being reimaged. For example, apps for cancer lesions and skin health have existed on smartphones for over a decade for in-person doctor visits. Today, data collection — via in-person AR glasses capabilities — is being combined with remote cancer lesion detection using apps.
- VR gear has been adapted into molecular modeling simulation for R&D engineers and scientific groups.
- VR is in used for molecular modeling, optimizing facilities, physician training and patient education. It is also being used in clinical therapies, such as cognitive behavioral exposure therapy, PTSD, depression and dysmorphia, stroke, attention deficit, and autism spectrum disorders.
- MR is being piloted by numerous companies in medical devices (such as robotic surgical instruments), in sales enablement for socially distanced medical devices sales reps, and in field service engineering on analytical equipment. It is currently in limited use in plant operations and warehouses, where engineers make virtual changes to substrates (bodies, tissues, software and hardware), with automation updating the changes in reality.
- Based on this broad range of early implementations and excitement about the technology, we position this technology at the peak.

## Obstacles

- Many life science teams are piloting the technology in vacuums, without a clear vision, resulting in failed attempts to move beyond POCs.
- Many vendors offer AR/VR/MR capabilities, but only a few can really support compliance and regulatory needs in the life science market.
- Most AR/VR/MR vendors don't have specific life science capabilities and need to be educated on electronic protected health information (ePHI), Health Insurance Portability and Accountability Act (HIPAA), good x practice (GxP) and validation activities. Life science firms can't quickly adopt the technology due to limited applications and form factors, along with few vendors that deeply understand the life science domain.
- Creating and maintaining regulatory-approved content, especially for VR use cases in promotional settings, is costly.
- Hardware design for wearable devices has improved, but they are still not easily applied into life science environments. For e.g., many AR/VR headset users report fatigue and some report nausea.
- We don't expect MR to show broad value until applications, hardware and informatics mature.

## User Recommendations

- Evaluate with business peers the business justification for offering an AR/VR/MR capability either by building, buying or partnering.
- Review adjacent industry spaces to see where the innovations are delivering value. Specifically, life science clients have a lot to learn about how to pilot and scale AR/VR/MR from aerospace and defense, retail, and healthcare providers.
- Factor in extra staff resources and time in project plans to educate vendors on your specific compliance issues, like ePHI, HIPAA, GxP and life-science-specific validation. This is especially the case when dealing with "platform vendors" that do not have life science applications or consulting practices.

## Sample Vendors

Apprentice; EON Reality; FundamentalVR; Goodly Innovations; Nanome; NNIT; PIXACORE; SightCall; Simplifier; SimuLyve International

## Gartner Recommended Reading

[Emerging Tech: Impact of Metaverse on Edge Devices and Infrastructure](#)

[Emerging Tech Impact Radar: Display Technologies](#)

[Quick Answer: What Are the 5 Essential Attributes of an Emerging Metaverse in Manufacturing?](#)

[Market Guide for Corporate Learning Technologies](#)

[Your Lab of the Future Strategy Must Enable Life Sciences Digitalization](#)

## AI in Commercial Operations

Analysis By: Animesh Gandhi

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

### Definition:

Artificial intelligence (AI) in commercial operations represents the use of the many AI disciplines to optimize aspects of life science (LS) organizations' commercial activities. This umbrella profile covers machine learning (ML), deep learning (DL), natural language processing (NLP), generative AI, and other AI techniques to create efficiencies and increase business impact with commercial operations functions, such as segmentation and targeting.

### Why This Is Important

Investment in data and advanced analytics continues to be a top priority for LS commercial operations teams. Business users seek to use AI-based advanced analytics capabilities to generate effective and timely insights that will allow them to assess and optimize brand performance and identify new opportunities for revenue growth. As early-adopter LS organizations start to achieve desired outcomes with their AI investments, competitive pressure is mounting.



## Business Impact

AI in commercial operations assists LS commercial teams in planning and implementing their strategic vision to grow revenue, improve operational effectiveness, enhance user experiences and support patient engagement through intelligent platforms. Established use cases include decision support for sales, orchestration of next-best engagement journeys, patient identification and marketing mix optimization that leads to business growth and improved patient outcomes.

## Drivers

- LS market leaders have demonstrated the feasibility and business value of AI, especially in narrow-scope use cases such as decision support for sales, chatbots and sentiment analytics.
- Interest in large language models and generative AI is accelerating, including in LS. The technology offers near-term use cases that promise to optimize internal efficiency, as well as longer-term use cases, such as content generation.
- Technology and service providers have started to productize AI solutions, enabling their clients to realize the benefits of AI technology without high project costs and risks of internal development.
- Advancing and expanding data science initiatives, better algorithms and more cost-effective cloud-based computing power has led to greater experimentation by AI practitioners.
- Maturing use cases, such as AI-enabled analytics in identifying patients through real-world datasets — which is especially valuable for rare and ultra-rare treatment therapies — have led to measurable ROI for many organizations.
- Applying ML in operations automates, streamlines and enhances the quality of business processes that were previously manual and time-intensive, driving interest and investment. For example, medical legal regulatory (MLR) reviews can be automated by autolinking the safety and efficacy claims back to the scientific evidence that supports them through a well-trained ML model.
- The growth in vendors supporting AI capabilities and number of use cases being deployed within LS commercial operations functions indicate an increase in AI technology adoption. As a result, we have moved this entry past the Peak of Inflated Expectations, and it will achieve mainstream adoption within five years.

## Obstacles

- As hype around AI continues to increase, many LS CIOs highlight challenges to rapidly extending AI prototypes beyond their initial use cases and scaling pilot projects up to global operations.
- As AI techniques in the field grow more established, clients are also learning that AI requires sophisticated governance, processes, culture and data science teams to execute — capabilities most companies must build first.
- Vendors continue to liberally use AI in their marketing material when it is often only a repackaging of more traditional computational approaches, statistical models or rule-based algorithms. This undermines confidence in AI-enabled solutions and discourages investments.
- The black-box nature of certain AI techniques like DL poses accountability issues, especially in the regulated industry of life science, in which tight guardrails and audit trails of marketing activities matter.

## User Recommendations

- Define an AI strategy to guide the commercial organization's understanding of AI and to shape the strategic opportunities enabled by effective AI deployment by collaborating with business leaders to align and develop an enterprise AI approach. This will require patience and persistence to identify the appropriate strategic use cases, manage stakeholder expectations about the maturity of the technology and build trust by delivering business value.
- Ensure successful scaling of AI capabilities by aligning specific technologies and required datasets to expected business outcomes, and draw a connection between a proposed investment and expected business value. Ensure your AI deployment strategy matches your organizational culture and internal capabilities.
- Demonstrate the value of AI by ensuring all initiatives include a measurement framework to assess quality, efficiency, scalability and quantifiable business outcome.

## Sample Vendors

Axtria; Beghou Consulting; Clarivate; Indegene; IntegriChain; IQVIA; OKRA.ai; Trinity Life Sciences; ZS

## Gartner Recommended Reading

[Infographic: Artificial Intelligence Use-Case Prism for Life Science Manufacturers](#)

[Infographic: Top Priorities, Technologies and Challenges in Life Sciences in 2023](#)

[Quick Answer: What Should Life Science CIOs Know About Data Fabrics?](#)

[Life Science CIOs: Reinvigorate Your D&A Capabilities With a Modern Commercial Intelligence Platform](#)

[Emerging Tech Roundup: ChatGPT Hype Fuels Urgency for Advancing Conversational AI and Generative AI](#)

## Advanced Decision Support for Sales

Analysis By: Animesh Gandhi

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

### Definition:

Advanced decision support for sales (ADSS) tools apply predictive and prescriptive machine learning (ML) algorithms to interpret data, identifying best-possible actions that will meet the objectives of both brand teams and their customers. Life science organizations use these tools to guide their sales representatives in achieving consistent operational excellence and goal attainment by providing personalized and actionable insights.

### Why This Is Important

Life science organizations aim for better sales execution by delivering the right message to the right healthcare provider (HCP) at the right time. Unfortunately, sales reps are inundated with static, backward-looking data scattered across reports and dashboards, requiring them to data mine for insights, such as brand switching. Furthermore, relevant insights lag significantly behind market development and are rarely delivered at the point of execution.

## Business Impact

ADSS tools enables life science organizations to:

- Identify the optimal frequency to visit HCPs to deliver the most appropriate message based on HCPs' preferences.
- Assist with diagnosing key performance issues and developing tactics for remediation.
- Learn from and institutionalize best practices from top-performing sales reps, helping newer and underperforming sales reps improve their performance.

## Drivers

- Life science sales operations leaders demand advanced sales analytics capabilities to improve effectiveness and efficiency of their sales force. These capabilities include data driven assistance with precall planning, recommendations on optimal content to present and summaries of market events personalized to each sales rep.
- ADSS tools are rapidly improving the type and quality of guidance delivered to sales reps due to their improved predictive and prescriptive models built on ML techniques.
- Changing HCP engagement preferences, from face-to-face to digital, requires that limited in-person interactions are maximized. ADSS tools enable organizations to derive greater ROI from existing investments in people and technology.
- CRM vendors have made ADSS tools part of their core capability and have established an API interface to interoperate with external ADSS engines.
- Gartner expects ADSS capabilities to increasingly become foundational because CRM technology always gravitates toward higher levels of automation to improve sales effectiveness.
- Adoption of ADSS technology continues to accelerate, moving it past the Peak of Inflated Expectations, and we expect it to reach the Plateau of Productivity within five years.

## Obstacles

- Sales rep adoption of ADSS remains a challenge for many life science organizations. The black box nature of AI-generated recommendation raises questions from sales reps who are often more aware of local dynamics within their territories and of their HCP targets.
- Many ADSS tools require life science organizations to replicate nearly most of their sales and marketing commercial data to the vendors' data environment using their standardized interfaces. This introduces process inefficiency, data duplication, cost overhead and increased cycle time before insights are delivered to sales reps.
- Some vendors continue to liberally use AI in their marketing material, when it often is only a repackaging of more traditional computational approaches, statistical models or rule-based algorithms.
- Existing tools have not yet matured to the level where they can be completely operated by end users without ongoing vendor support.

## User Recommendations

- Enhance sales force effectiveness by identifying and prioritizing use cases, such as augmented decision making, intelligent planning and process automation, enabling sales reps to deliver high-value, tailored interactions with HCPs.
- Evaluate vendors for the depth and breadth of their products by focusing on platform modularity and ability to incorporate custom, brand-specific business rules and AI models, ability to influence sales rep behavior change, and integration within sales reps' workflow.
- Ensure successful technology adoption and customer engagement by collaborating with business stakeholders to define KPIs that measure both sales force and HCP engagement gaps and progress.
- Match your implementation approach to your overall AI strategy and choose whether to build or buy AI solutions. Include your organizational capabilities and AI maturity in your assessment of the benefits and challenges of a preferred approach.

## Sample Vendors

Aktana; Axtia; Hyntelo; IQVIA; OKRA; Trinity Life Sciences; TrueBlue; ZS

## Gartner Recommended Reading

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

[Infographic: Artificial Intelligence Use-Case Prism for Life Science Manufacturers](#)

[Build a Hard-Times Resilient Sales Technology Stack](#)

[Life Science Manufacturer CIO Top Actions for 2023](#)

[2023 CIO and Technology Executive Agenda: A Life Science Perspective](#)

## Sales Performance Management in LS

Analysis By: Animesh Gandhi

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

### Definition:

Sales performance management (SPM) in LS is a suite of operational and analytical tools that automate and unite sales planning and operational sales processes. It improves sales execution and operational efficiency. Capabilities include targeting and call planning, territory planning and optimization, alignment and roster management, and incentive compensation, along with additional capabilities, such as advanced analytics.

### Why This Is Important

Life science organizations invest in transactional CRM systems that provide basic account management, sales execution and reporting capabilities. But many have not deployed sales effectiveness tools that optimize their CRM and sales force investments. SPM tools enable efficient and effective execution of key sales operations processes — from sales force planning and deployment, to incentive compensation and reporting. This helps to meet the growing demands of a complex selling environment.

## Business Impact

By adopting SPM tools, organizations aim to increase operational efficiency and decrease sales execution costs. Benefits include:

- Measurable reduction in the cycle time of sales operation processes.
- Increase in data accuracy and timeliness due to API-based integration with HR, MDM, and other sales enablement systems.
- Improved collaboration between sales reps and home office users due to streamlined workflows.
- Reduction in IT service-desk interactions due to fewer field inquiries and disputes.

## Drivers

- Adoption of SPM platforms continues to increase as life science organizations seek tools to streamline their sales operation processes through automation, intuitive workflows, advanced analytics and cloud-based connectivity.
- Launching new life science drugs and devices has grown more complex with increasing influence of integrated delivery networks and continued decline in access to healthcare providers (HCPs). In response, life science organizations aim to deploy data-driven tools to enable understanding relationships in complex delivery networks, provide insights on HCP preferences, and support agile sales planning and execution.
- Life science vendors have increasingly integrated their solutions and life-science-specific CRM platforms. This enables higher efficiency for planning and execution, and reduces manual effort on sales representatives.
- Other capabilities include providing access to sales data and reports, collaborating on feedback, and motivating through transparent incentive compensation dashboards.
- SPM tools continue to mature, expanding functionality for field-force alignments, performance management, incentives and field activation. Some vendors in this space provide additional capabilities, such as scenario modeling to analyze the impact of territory design, or integration with enterprise systems through APIs to maintain data accuracy (i.e., HR systems to source new and terminated employees).

## Obstacles

- While SPM vendors have integrated “back office” functions with CRM through API and file-based integration, they require end users to utilize their own proprietary user interface, instead of providing a seamless integration with CRM platforms. This requires field users to utilize multiple applications to accomplish their activities.
- Life science organizations are hesitant to move away from custom homegrown systems and email-based manual processes, even though they are time-consuming and error-prone. For example, some companies still execute their sales planning process by distributing Excel-based worksheets through email that take weeks to complete.
- Vendors are just beginning to address the issue of making administration experiences easier and not just automating the process.
- Given the evolving role of sales representatives and in-person engagement model recalibration, we place this innovation just past the Peak of Inflated Expectations.

## User Recommendations

- Identify must-have use cases for SPM across your organization by actively engaging with marketing, sales and analytics leaders. Start with areas that enable your organization to gain new operational efficiency and effectiveness, improve sales planning and execution, and respond with agility due to business changes.
- Evaluate vendors based on the depth and breadth of their products by using a scorecard to compare the vendors’ ability to meet your requirements. Focus on requirements such as seamless integration with home office and field workflows, ability to incorporate brand-specific business rules and emerging AI models without extensive customizations, and interoperability with commercial and enterprise systems.
- Reduce manual efforts of data integration by evaluating vendor’s out-of-the-box capabilities to support integration with upstream and downstream systems.

## Sample Vendors

Axtria; Beghou Consulting; Cognizant; IQVIA; ODAIA Intelligence; P360; Tegra Analytics; Veeva Systems; Xcellen; ZS

## Gartner Recommended Reading

[Market Guide for Sales Performance Management](#)



[Toolkit: Sales Performance Management RFP](#)

[Market Guide for CRM in Life Sciences](#)

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

## Sliding into the Trough

### Multichannel Campaign Management

Analysis By: Animesh Gandhi

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

#### Definition:

Multichannel campaign management (MCM) tools enable life science organizations (LSOs) to optimize promotional and educational messaging with their customers, such as healthcare providers (HCPs), pharmacies and payers. MCM tools and processes orchestrate communications across digital channels, such as email, mobile, social, paid media and websites. Campaigns can be used for promotions, building brand reputation, disseminating medical information, generating revenue or building relationships.

#### Why This Is Important

Life science marketers' usage of MCM tools continues to increase as they seek to improve engagement with their customers, who increasingly prefer digital channels to receive scientific and promotional information. Furthermore, LSOs' motivation for adopting MCM tools comes from their need to improve digital marketing measurement and time to market, ensure compliance with regulatory requirements, and personalize customer journeys.

#### Business Impact

Life science marketers use MCM tools to both acquire new customers and target existing ones, and build relationships through nonpersonal touchpoints, all the while helping unify customer data and deepen customer insights. MCM tools help deliver personalized campaigns at scale, aligned to customer, channel and timing preferences. MCM also serves as the marketing system of record, streamlines and automates marketing processes, and enables campaign execution and measurement.

#### Drivers

- HCPs' engagement preferences have evolved, with many preferring to receive information through digital channels due to its on-demand availability and efficiency in consuming content.

- LSOs require increased agility to adapt to rapidly changing customer expectations for personalized experiences and disruptive forces shaping their business. To deal with this uncertainty, LSOs look to create modular digital content, analytics and real-time decisioning capabilities in MCM tools to connect customers with the right message on their preferred digital channel.
- The number of digital channels (websites, social, video, mobile, chat, etc.) that marketers can leverage to reach their target customers continues to grow. MCM tools enable marketers to determine an optimal channel mix, based on their brand, target audience and available budget.
- LSOs seek greater efficiency in their marketing spends by leveraging their marketing capabilities and assets on a global scale. MCM tools appeal to marketing teams because they build a consistent digital customer profile, perform customer segmentation and seamlessly improve the targeting of messages in campaigns orchestrated across a growing number of digital touchpoints.
- Given the investment focus on digital engagement, and LSOs' desire to unify personal and nonpersonal customer touchpoints, MCM has advanced beyond the Peak of Inflated Expectations. We believe these solutions will achieve mainstream adoption in two to five years.

## Obstacles

- LSOs are structured along brands instead of customers, leading organizations to brand-specific solutions. Clients report challenges with establishing an enterprise-level MCM program across brands and regions, due to a slow-moving industry culture and change barriers impeding progress.
- Accelerating demand for unified real-time customer journey orchestration, across personal and nonpersonal touchpoints, is causing friction in the market as other technologies (including personalization engines) compete with MCM tools.
- The utilization of MCM tools is slow due to the complexities of creating modular digital content at scale.
- Other reasons for slow adoption are life science product marketing regulations, alignment issues among stakeholders, propensity to rely on external partners and the difficulty of quantifying the benefits of coordinated activities.

## User Recommendations

- Align IT and business strategies by mapping enterprise architecture to company business culture and organizational style, to optimize technology platforms and deliver value.
- Lead digital discussions with business peers by leveraging best practices and examples from industries (such as retail, social media and consumer) that are more mature with digital engagement to accelerate digital transformation.
- Drive change into your organization by collaborating with business functional leaders to continuously analyze customer satisfaction and customer experience against your current brand perception.
- Build a customer 360 platform to support analytics and channel optimization, by leveraging master data management tools to capture the needs and preferences of your customers.

## Sample Vendors

Adobe; Indegene; Oracle; Salesforce; SAS

## Gartner Recommended Reading

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

[Market Guide for CRM in Life Sciences](#)

[Critical Capabilities for Multichannel Marketing Hubs](#)

## Blockchain in Life Sciences

Analysis By: Michael Shanler

**Benefit Rating:** Transformational

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Definition:**

Blockchain platforms provide the foundation to create and run blockchain solutions and decentralized networks. This includes support for distributed ledgers, decentralized consensus, tokenization and smart contracts. They enable the creation of blockchain solutions that provide immutability, transparency, decentralized contract execution, and tokenization of physical or digital assets. In life science (LS), blockchain can facilitate the secure exchange of health and LS manufacturer information.

**Why This Is Important**

Primary applications of blockchain technologies in the LS industry include anti-counterfeiting (serialization), genomic and/or clinical data sharing, revenue management and materials transfer. It is a popular strategy topic with Gartner clients, especially as blockchain-based topics run rampant in the mainstream media and organizations attempt to transform operations. Although blockchain is still hyped across many industries, the LS industry continues to be slower than others to develop use cases into production.

**Business Impact**

The impacts of blockchain in LS are:

- Blockchain and distributed-ledger concepts hold the promise of transforming LS industry operating models. Transformations are just beginning with projects such as PharmaLedger, Zuellig Pharma Holdings and MSD, and are largely unproven at scale.
- LS organizations want to reach new customers, extend relationships with supply chain partners, improve quality and create more complete links between events.
- Executives want to move the boundaries of traditional LS businesses including enabling direct-to-consumer models.

## Drivers

- The number of active blockchain projects within the LS industry grew from 2020 to 2023. For example, Merck & Co. and Novartis are running very public supply-chain POCs. Gartner clients report a rise in blockchain to support platform-centric ecosystems including projects such as PharmaLedger. See [Supply Chain Executive Report: Realizing the True Potential of Ecosystem Partnerships](#).
- Industry consortia have been active as well with 12 pharmaceutical companies joining PharmaLedger, an EU blockchain consortium.
- Some clients are exploring concepts where blockchain would streamline clinical trials and extended regulatory filings, exchange genomic information, manage intellectual property generation, handle payments to drug distributors, and conduct health record and exchange transactions.
- Blockchains are supporting technology architectures and digital interoperability for transitioning toward more tailored medicines, patient-centricity and virtuous cycles of data centered in and around cradle-to-grave product life cycle management.

## Obstacles

- LS industry stakeholders are learning that blockchain-based models are difficult to scale due to disagreements on the degree of centralization and channels.
- Most industry professionals have still not settled on the right type of governance to drive the necessary innovation, collaboration and cultural shifts.
- Digital maturity, legacy infrastructure and siloed work practices could limit value realization for blockchain discovery or readiness to deploy.
- Today, there are few vendors, IT consultant firms and sponsor organizations that have a deep LScapability and that understand blockchain models and underlying technologies.
- There are only a few successes with scaling blockchain pilots for track and trace, verification services and wholesalers, much of which is driven by regulations such as the Drug Supply Chain Security Act (DSCSA) via stakeholder-led models.
- Blockchain was extremely hyped a few years ago, but many clients now realize the limitations and challenges. For this reason, this technology is positioned on the trough.

## User Recommendations

- Assess the impact of change across the LS sector. The terminology surrounding blockchain is also in flux. This uncertainty masks the potential ability to meet business use cases.
- Identify how the term “blockchain” is being applied, both internally and by providers, to better understand the return on capital employed, especially compared to (or augmented with) existing, proven technologies.
- Proactively learn the differences between the four implementation options as part of your organization’s strategic planning efforts, especially as they relate to specific business use cases and operational risk assessments.
- Assign resources to track the evolution of blockchain across industries, such as consensus mechanism development, sidechains and distributed ledger.
- Develop knowledge around vendor solutions’ evolution, especially through formal stakeholder-led models addressing critical requirements, compliance mandates and the success of resulting proofs of concept (POCs).

## Sample Vendors

Bloqcube; Chronicled; EncrypGen; EY; Genecoin; Nebula Genomics; Schrocken; ServBlock; Tech Mahindra; Wipro

## Gartner Recommended Reading

[Guidance for Blockchain Solution Adoption](#)

[Power of the Profession Supply Chain Awards 2023: Global, Social and E2E Innovation Rise](#)

[The Future of the Supply Chain for Life Sciences — 2023 Report](#)

[Supply Chain Executive Report: Fostering a Digital Supply Chain Ecosystem](#)

[Gartner’s Top Strategic Predictions for 2023 and Beyond — Seizing Uncertainty](#)

## 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](#)

## Key Account Management in Life Science

Analysis By: Animesh Gandhi

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

**Definition:**

Life science key account management (KAM) tools enable life science organizations (LSOs) to plan and manage their relationships with strategically important customers, such as group practices, payers, clinics, hospitals, healthcare systems and governments. KAM tools enable a degree of collaboration, coordination and agility across traditional functional silos, such as medical and commercial field roles, to successfully execute strategies to gain market access.

**Why This Is Important**

With a higher concentration of total sales under systemic formulary management in healthcare, it is a competitive necessity for LSOs to manage healthcare organizations and systems with a coordinated, centralized account strategy that addresses multiple decision makers. KAM automates work commonly performed manually, providing resources with action plans. Embedded playbooks, data reports and dashboards, relationship maps and workflows enable LSOs to improve revenue growth and customer retention.

**Business Impact**

Governments, institutions and pharmacy benefits managers are LSOs' biggest customers and have a significant influence over what gets prescribed or recommended. Therefore, the impact of securing favored status and streamlined distribution through those entities is essential. KAM tools can directly affect market share because they align factual information assets from clinical and market studies into a business and clinical case necessary to secure access in a competitive marketplace.

**Drivers**

The increased focus on patient health outcomes and total cost of care has necessitated changes to health delivery models in many developed markets. These new models shift leverage and negotiation power toward health systems and payers, requiring LSOs to strengthen the depth and breadth of key account engagements. Examples of such model changes include:

- In the U.S. market, payers, pharmacy benefits managers and specialty pharmacies have combined into vertically integrated organizations.
- In a growing number of regions, physician networks have greater influence over prescribing decisions than the individual prescriber.
- There is a need to drive demand through hospitals, group practices and nontraditional influencers, such as payers and integrated provider networks.

- Merger and acquisition trends within healthcare have only accelerated, with many hospitals merging to form massive hospital systems and a number of independent physician practices being acquired by health systems.

Other drivers include the following:

- While KAM tools and capabilities have existed in other industries for many years, the life science industry demands an industry-specific approach due to its selling model and complex regulatory and compliance requirements. As such, investments in industry-specific tools and approaches continue to accelerate.
- The growth of high-cost drugs and increased political demand for drug price controls and transparency require deeper negotiation with payers and government entities to ensure coverage and reimbursement.
- With this renewed emphasis on key accounts management, Gartner is accelerating this innovation's Hype Cycle advancement to midway between the Peak of Inflated Expectations and the Trough of Disillusionment. We believe it will achieve mainstream adoption within the next two to five years.

## Obstacles

Across the industry:

- LSOs often use the same CRM tools developed to facilitate sales representatives' interactions with HCPs, and their suitability for KAM needs is lacking.
- Although existing CRM functionality provides value, vendors still struggle to scale the needed capabilities for cross-functional team-based workflows and user interface and predictive capabilities to inform decision making.

In addition, vendors must address credibility gaps, such as:

- Capturing key influencers and hierarchical relationships within an account to identify champions and convert blockers.
- Integrating third-party datasets for planning and analysis, but also enabling account managers to update local information or correct inaccurate information from external sources.

- Expanding from basic BI reports to more advanced predictive and prescriptive analytics that draw upon integrated data to provide insights at various geographical and access levels.

## User Recommendations

- Collaborate with commercial leaders to better gauge the maturity and consistency of current account management practices and tools.
- Educate end users on the different aspects of KAM tools, including KAM account planning with the ability to view and navigate complex hierarchical relationships, ability to integrate other internal and external sources and team selling capabilities to enable coordination across field teams.
- Partner with market access leaders to deliver highly personalized digital content to HCPs by blending multiple data sources. These can include medical claims and formulary coverage information that enable HCPs to understand the coverage level of your product for their patient base.

## Sample Vendors

Certara; Elandas; Exeevo; IQVIA; Pitcher; PRECISIONxtract; Prolifiq.ai; Veeva Systems; Wilmington Healthcare

## Gartner Recommended Reading

[Life Science Manufacturer CIO Top Actions for 2023](#)

[Optimize Group Purchasing Organization Relationships at Healthcare Providers to Increase Value](#)

[Healthcare Provider Supply Chain Organization Survey Shows Structure & Focus Changes to Come in 2023](#)

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

[Life Science CIOs: Reinvigorate Your D&A Capabilities With a Modern Commercial Intelligence Platform](#)

## Social Media Platforms for HCPs

**Analysis By:** Animesh Gandhi

**Benefit Rating:** Moderate

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Definition:**

Social media platforms (SMPs) for healthcare professionals (HCPs) provide forums for HCPs to share information about specific topics, much like any social media platform such as Facebook or Twitter. The differentiating factor is that HCPs' credentials are verified prior to granting access. SMPs enable their users to interact with peers to learn and exchange ideas, network with each other, crowdsource medical advice for complex conditions and use the platforms' productivity tools.

**Why This Is Important**

HCPs' participation in SMP continues to increase as the platforms introduce new features, content and productivity tools. SMPs help HCPs stay up to date on the latest medical information, connect with specialists for patient referrals and manage their professional profiles. For life science organizations, these platforms present an opportunity to engage HCPs through targeted educational and promotional campaigns as part of their digital engagement strategy.

**Business Impact**

SMP platforms support life science organizations in:

- Enabling life science marketers to engage with HCPs to communicate key messages as part of the overall journey plan and raise HCPs' brand awareness.
- Providing insights on HCPs' views about their brand — perception, questions and concerns.
- Understanding the connections, collaborations and lines of influence that exist within the HCP community.

**Drivers**

SMPs help life sciences organizations to:

- Enable life science marketers to engage with HCPs on a privacy-friendly platform catering to HCPs' needs. SMPs also enable marketers to gain HCPs' perspectives about their products based on their engagement patterns and content consumption.
- Provide user-friendly access to personalized medical content, similar to Facebook-like news feeds and LinkedIn Groups functionality. SMPs continue to grow in global reach, functionality and engagement offerings as HCP adoption of these platforms accelerates.
- Promote professional community engagement and provide HCPs an opportunity to discuss, interact and learn from peers.
- Advance academic research through the availability of peer-reviewed articles and access to medical journals.
- SMPs are still in the process of refining their revenue generation strategies and adding features that facilitate content partnerships with healthcare systems and life science organizations. Vendors' speed and agility to add such new features to attract content partnerships while balancing privacy and value for their users will be essential. For these reasons, we position SMPs in the Trough of Disillusionment as life science organizations assess ROI from these platforms.

## Obstacles

- End-user anonymity, limited information sharing and lack of API integration by SPMs have challenged life science marketers' ability to measure ROI from such investments.
- Many SMPs offer only HCP engagement methods for medical education purposes, thus limiting promotional opportunities.
- Implementation of an effective approach to social media engagement with the agreement of legal, regulatory, IT and commercial teams in a risk-averse culture impedes progress and inhibits flexibility and agility.
- HCP social media engagement may require payments to the social media site and may not comply with risk-averse internal compliance guidelines.

## User Recommendations

- Engage with brand leaders in the organization and conduct a review of product marketing plans to identify and budget for opportunities to leverage SMP for HCPs.
- Formulate a clear plan with commercial IT leaders and enterprise architects to integrate social media interactions with doctors into the customer's 360-degree platform.
- Connect early with legal and regulatory team members by arranging collaborative cross-functional discussions, and ensure promotional and educational efforts are compliant.
- Continue to monitor the U.S. Food and Drug Administration and other regulatory bodies to understand the regulatory guidance related to social media and promotional activities in the U.S. and globally.

## Sample Vendors

Among Doctors; DailyRounds; Docquity; Doximity; DXY; Figure 1; LinkedIn; Sermo; Student Doctor Network; The Rounds

## Gartner Recommended Reading

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

[Market Guide for Social Monitoring and Analytics](#)

[Market Guide for Social Marketing Management](#)

[Gartner's Guide to Mastering Social Marketing](#)

## Social Media Analytics

Analysis By: Animesh Gandhi

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent



**Definition:**

Social media analytics (SMA) tools collect, measure, analyze and interpret the results of digital interactions and engagements among people, topics, ideas and content in social communications. SMA tools provide a view into customers' needs, sentiments and behaviors.

**Why This Is Important**

Social media is embedded in the daily routines and lives of people globally, yielding unprecedented insights about customer preferences and receptivity to treatments. Life science brand marketers use SMA tools to understand customer sentiments about their company and brands in social media and gather insight to optimize marketing messages. Life-science-specific SMA tools also require specialized monitoring capabilities to screen for suspected reports of adverse reactions to a drug or product.

**Business Impact**

SMA tools provide a near-real-time measurement to marketers on the efficacy of their digital tactics and associated spending. Furthermore, they enable marketers to measure brand recall, brand preference and purchase intent, which have historically supplied proof points for brand advertising campaigns (in contrast with sales promotions). For example, these tools enable marketers to measure the impact of their patient advocacy campaigns.

## Drivers

- Investments in social marketing continue to grow as consumer engagement with life science brands on social media continues to increase and life sciences companies recalibrate their digital marketing strategies.
- The growing number of social media platforms, content mix and users presents a unique opportunity to life science companies to develop a deeper understanding of patient experience within their therapeutic area.
- As digital marketing leaders place more ambitious goals on the insights gathered via social monitoring and analytics, the demand for advanced analytics continues. Many vendors continue to advance their offerings from basic rule-based keyword searches to applying natural language processing (NLP) and machine learning (ML) to enhance sentiment analysis, analyze patterns across the customer journey and predict outcomes, and message effectiveness.
- SMA started with and continues to be based primarily on text analytics, but capabilities are rapidly evolving to include additional data sources such as images and videos. The broader and more diverse the data analyzed, the more potential value in the insights.
- We continue to advance this profile into the Trough of Disillusionment as the adoption of SMA increases and should reach mainstream adoption in two-to-five years.

## Obstacles

- Failure to detect adverse events on monitored social media channels poses operational, compliance and reputational risks to life science companies and has resulted in them taking a cautious approach to expanding their digital marketing programs.
- Social media platforms' evolving policies on content moderation and verification requirements have forced life science companies to reevaluate their social media strategies.
- While SMA remains an important measurement tool to understand customer perceptions, getting actionable data and insights remains a key challenge for measuring holistic social marketing effectiveness due to regulatory constraints and the generally risk-averse culture in life sciences.
- There continue to be limitations on data that social media data vendors can collect and access using APIs from Meta (which owns Facebook, Instagram and WhatsApp) and Twitter, due to controversies from past data misuses.

## User Recommendations

- Collaborate with business peers to identify white space in the competitive social media arena by utilizing SMA tools to pinpoint opportunities where competitors are not yet dominant.
- Examine opportunities to consolidate SMA tools across brands, business units and geographies by collaborating with business leaders to establish an enterprisewide SMA strategy. Ensure that the strategy is consistent with your organization's social media policy by proactively including compliance peers in the initial stages of strategy development.
- Establish pilot use cases for SMA by prioritizing use cases with long-term business value, such as precision targeting, brand and competitive tracking, and medical adherence.
- Choose tools with a broader social media strategy in mind by ensuring they are able to seamlessly integrate with your CRM and advanced analytics platforms.

## Sample Vendors

Cision; Ipsos Synthesio; IQVIA; Liquid Grids; LiveWorld; NetBase Quid; Northern Light Group; Sprinklr; Talkwalker

## Gartner Recommended Reading

[Market Guide for Social Monitoring and Analytics](#)

[Market Guide for Social Marketing Management](#)

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

[Infographic: Artificial Intelligence Use-Case Prism for Life Science Manufacturers](#)

## Medication Adherence Management

Analysis By: Veronica Walk

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

### Definition:

Medication adherence management systems are designed to monitor and support conformance with a prescribed medication regimen. These systems leverage various technologies, from patient portals and mobile apps to emerging technology, such as programmable pillboxes and RFID-tagged smart pills. These solutions monitor adherence, provide reminders and notify the patient, family members or caregivers if a patient has missed a dose.

### Why This Is Important

Medication adherence can improve therapeutic efficacy, prevent or control disease progression, improve patient outcomes, and reduce care costs. These solutions are especially valuable to pharmaceutical companies with significant investments in drug development that hinge on participant adherence in clinical trials. Healthcare providers and payers seeking to advance population health and value-based care can also benefit from these solutions.

### Business Impact

Healthcare and life sciences organizations can improve clinical trial and health outcomes for a variety of use cases, such as:

- Chronic condition management, where nonadherence can lead to disease progression or clinical deterioration requiring higher acuity, more costly care.
- Complex medication management, such as transplant patients where nonadherence can result in organ rejection.
- Nonadherence in clinical trials, which can lead to patient dropout or inaccuracies in trial data.

## Drivers

- Adoption of medication adherence management systems is expected to increase in alignment with the shift to value-based care, as medication nonadherence can negatively impact quality measures and outcomes, such as hospital readmissions.
- Medication adherence management vendors are expanding their solution offerings to identify and address other contributors to nonadherence, such as the inability to fill a prescription (for example, due to cost or transportation limitations) or undesirable side effects.
- Vendors are also expanding integrations with other clinical and business systems, such as electronic health records, customer relationship management, care management, and patient engagement solutions to enable continuity of care and seamless patient and provider experiences.
- As healthcare providers seek to expand their virtual care services and use cases, we expect organizations to adopt medication adherence management capabilities as part of their connected care pathways, especially for chronic and complex disease management.

## Obstacles

- Medication adherence management also requires an engaged care team to address and manage issues of nonadherence, which may warrant additional resources or paying for clinical services to support patients using these tools.
- The benefit-to-cost ratio of more advanced medication adherence technologies, such as ingestible smart pills, has been challenging to overcome, even for pharmaceutical companies. The proliferation of medication adherence apps, many available for free in the Apple App Store and Google Play app marketplaces, will make the value proposition for more complex solutions increasingly difficult.

## User Recommendations

- Evaluate medication adherence management solutions by partnering with your clinical colleagues to identify a pilot use case. Use pilot findings to inform lessons learned, technology and workflow improvement opportunities, and best practices for a larger rollout.
- Empower the care team to identify nonadherence and intervene with education or alternative therapy regimens by integrating adherence data into clinical workflows. Consider pursuing partnerships with community organizations with existing medication adherence programs that may address other aspects of medication adherence.
- Ensure medication adherence management is included in the trial process and technology approach for clinical trial scenarios, such as decentralized trials.
- Enhance the effectiveness of your digital-first patient engagement strategies by incorporating medication adherence management capabilities into your connected care pathways.

## Sample Vendors

AdhereHealth; AiCure; Cureatr; E PROCESS MED; EveryDose; Medisafe; Philips; Propeller Health; Scene

## Gartner Recommended Reading

[The Digital First Engagement Framework for Healthcare Delivery Organizations](#)

[Market Guide for Remote Patient Monitoring Solutions](#)

[Life Science CIOs: Map Your Pathway to Digital Trials](#)

## Key Opinion Leader Management

Analysis By: Animesh Gandhi

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

**Definition:**

Key opinion leader (KOL) management tools are used to identify, map, segment, engage and interact with individuals who are influential in shaping peer healthcare providers' (HCPs') views on therapies. KOLs may be physicians, epidemiologists or researchers with organizational, geographical or global influence. KOL systems are used by medical science liaisons (MSLs) for scientific engagement and by commercial teams for promotional marketing.

**Why This Is Important**

KOLs are external subject matter experts whose opinions and perspectives greatly influence how a particular disease state is managed. Effectively cultivating long-term relationships with KOLs provides life science organizations with a trusted and influential voice in the HCP community. KOL tools assist with identifying influential and rising KOLs, mapping their sphere of influence, facilitating tactical planning for engagement, and tracking and analyzing the effectiveness of engagements.

**Business Impact**

Life science organizations consult with KOLs in a number of areas, including:

- Inform clinical trial study design and assist in communicating study findings at conferences and through publications.
- Contextualize findings and provide disease-state education to their peers to build awareness of treatment options and encourage the adoption of new treatments.
- Enable access to healthcare provider communities and health systems where they carry significant influence.

## Drivers

- Usage of KOL management tools continues to accelerate as HCPs express stronger preferences for scientific and medical content delivered by medical peers, as opposed to promotional materials delivered by sales representatives.
- Medical device manufacturers have recently started to increase investments in medical affairs divisions and subsequently build relationships with medical device KOLs, furthering the growth of the KOL management tool market.
- Leading life science CRM solution vendors recognize the need for integrated KOL data and functionality, and have expanded their solutions to meet those requirements.
- Even though the medical side of the business doesn't think of itself as sales or marketing, it is indeed in the business of establishing and managing relationships. KOLs can drive a huge impact through the right therapeutically focused communication and medical education programs.
- Adoption of KOL management tools is increasing to satisfy a greater purview of compliance processes, guidance and regulations.
- Vendors are continuing to expand the usage of artificial intelligence technologies to identify KOLs and map their influence across geographies — globally, regionally and locally. This enhances their ability to provide depth (level of influence on peers) and breadth (number of peers that may be reached) of their influence network.
- There is an upward trend in a renewed emphasis on KOL engagement efficiency and strategic planning initiatives to modernize KOL management capabilities, as well as a rapidly expanding vendor landscape. Thus, this innovation is just beyond the midpoint between the Peak of Inflated Expectations and the Trough of Disillusionment, and KOL management tools are expected to achieve mainstream adoption within the next two to five years.



## Obstacles

- In many organizations, Microsoft Excel continues to be utilized as the system of record for maintaining a centralized list of preferred KOLs and managing the entire KOL management process, with business teams often reluctant to modernize. This leads to a reduction in internal collaboration and redundant manual efforts.
- Business leaders select tools that best meet their narrow scope and maintain required firewalls between departments, rather than selecting an enterprise tool capable of meeting broader requirements and maintaining compliance and firewalls across departments. This leads to multiple KOL management tools across brand therapeutic areas, and commercial and medical affairs functions, which, in turn, presents challenges with managing and tracking activity for the same KOL.
- Many vendors only address specific components of the KOL management process, requiring complex integrations, dealing with multiple user interfaces and significant implementation and operational costs.

## User Recommendations

- Standardize on a single solution in order to present a single face to the KOLs, reduce complexity in managing these tools and reduce costs through scale.
- Examine the vendor features and product roadmap — when purchasing a KOL tool — to determine how well they align with your business priorities that support MSLS’ engagement with HCPs. For example, the ability to integrate internal data sources and support for a “hybrid” engagement strategy, as some KOLs prefer virtual engagements.
- Evaluate KOL vendors by utilizing scorecards that measure their usage of advanced analytics capabilities, like natural language processing and machine learning, to optimize the identification and mapping of KOL influencer networks organized by size, depth and reputational expertise.
- Ensure success by integrating relevant KOL information with global transparency reporting tools to contribute to, and help satisfy, the greater purview of compliance processes, guidance and regulations.

## Sample Vendors

Aissel Technologies; Anju Software; Definitive Healthcare; H1; IQVIA (Pharmaspectra); Komodo Health; SteepRock; Veeva Systems; VMLY&R Health (System Analytic); Within3

## Gartner Recommended Reading

[Innovation Insight: Healthcare Stakeholder Engagement Platforms Align Operations With Business Outcomes](#)

[Innovation Insight for Aggregate Spend and Global Transparency Reporting](#)

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

[Life Science Manufacturer CIO Top Actions for 2023](#)

## Consumer Healthcare Wearables

Analysis By: Kate McCarthy, Mike Jones

**Benefit Rating:** Moderate

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Early mainstream

### Definition:

Consumer healthcare wearables are electronic devices that are designed to collect data on users' personal health and exercise activities. They provide consumers, clinicians, caregivers, insurers and researchers access to data and analytics that can facilitate preventive care, contribute to health, aid in managing ongoing illness and recovery, and support research.

### Why This Is Important

Consumer healthcare wearables provide the opportunity to use low-cost devices to engage healthcare consumers in a range of use cases, including remote patient monitoring, chronic condition management and research. As more consumers have obtained and regularly use these devices, they now contribute a rich data source to support care quality. These devices have enabled clinical surveillance of conditions, including cardiac disease and diabetes.

### Business Impact

Consumer healthcare wearables allow healthcare and life sciences organizations to:

- Deliver personalized consumer experiences by responding to data and device preferences.
- Monitor patient activity and risk factors at a lower cost than medical-grade technologies.
- Stay conveniently connected to their healthcare consumers.
- Improve symptom awareness, treatment adherence and overall health and wellness.

## Drivers

- Consumer healthcare wearables offer engaging user interfaces and experiences using behavioral nudges to help drive self-management and adherence to prescribed lifestyle regimens.
- Healthcare and life sciences organizations can leverage wearables to differentiate journeys for personas for healthcare consumer engagement.
- These devices are more affordable than medical-grade equipment and are increasing in sophistication and accuracy range of wearables available in this space. Wristband-style devices (e.g., Apple Watch, Fitbit, Garmin Connect and Samsung Galaxy Watches) for measuring exercise patterns and intensity have also introduced continuous heart rate monitoring.
- Consumer-grade blood pressure (BP) monitoring, pulse oximeters for measuring lung efficiency, sleep and brainwave monitoring, clothing that senses blood flow and respiratory rates and EKG are available on various devices.
- Data from wearables can be leveraged by providers, care managers and researchers to monitor responses to treatment regimens and activity and assist in quality engagement in virtual care.
- Gamification and rewards programs can be deployed to provide patients with an incentive to change behaviors and share their data.
- Wearables can assist in easing caregiver burden and facilitate caregiver engagement in care by sharing data and notifications, such as a high blood sugar alert on an Apple Watch for a parent with a child with Type 1 diabetes.
- Companies are combating long-standing device fragmentation challenges by building algorithms that are device agnostic, such as Philips partnership with the U.S. Department of Defense RATE wellness device.
- As a result of these drivers, we have advanced this technology down the Trough of Disillusionment with adoption maturity in two to five years.

## Obstacles

- Unlike medical-grade technologies, consumer healthcare wearables often lack published clinical evidence on efficacy.
- It is difficult to integrate wearables into legacy systems, such as EHRs.
- Clinicians are skeptical of the value of these devices in the clinical environment and the additional time required to review and interpret consumer wearable data.
- The market is very diverse, and many point solutions exist, which can lead to fragmentation of apps and devices.
- Consumers and healthcare and life sciences organizations alike have security and privacy concerns around sharing personal data.

## User Recommendations

- Prioritize an integration strategy that improves data capture and delivery of virtual care, care management, clinical trials, chronic disease management and activities of daily living.
- Evaluate device application and efficacy through peer-reviewed research, focusing on lifestyle, rehabilitation, patient engagement and caregiver support.
- Socialize the concept of the use of these devices in clinical practice through the chief medical informatics officer (CMIO) or chief nursing informatics officer (CNIO).
- Invest in a composable, digital architecture that supports experience and data orchestration across diverse touchpoints that includes healthcare CRM and multiexperience development platforms (MXDP).
- Consider a device-agnostic approach to wearables by prioritizing algorithms and platforms that can deploy on and ingest from an array of wearables.
- Assess privacy and security requirements to ensure compliant deployment and address consent, data locality and other requirements.

## Sample Vendors

Apple; Fitbit; Garmin; iHealth; Omron Healthcare; Oura; Samsung Electronics

## Gartner Recommended Reading

[Emerging Tech: Critical Insights on Smartwatch Evolution](#)



## Climbing the Slope

### Direct-to-Patient Digital Marketing

Analysis By: Animesh Gandhi

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

#### Definition:

Direct-to-patient (DTP) digital marketing technology and services enable a life science company to develop a direct relationship with the patients who either use its products or have diseases that the company targets with its medicines or devices. Marketing tactics and strategies can take many forms, such as controlled distribution programs, patient communities, mobile applications, wearables, educational websites and social media.

#### Why This Is Important

The goal of DTP programs and technologies, often referred to as “beyond-the-pill” solutions, is to establish meaningful engagement with patients to improve their health outcomes by providing education and motivation for therapy adherence. These programs also provide a tangible competitive advantage for their drug or device. Leading companies have developed programs that leverage common social media platforms to engage directly with patients and caregivers within the bounds of local regulations.

#### Business Impact

DTP programs create competitive advantage by:

- Improving patients’ adherence to therapy by using mobile apps with reminders, creating gamification experiences and integrating smart pill management solutions.
- Helping patients understand their medical conditions by providing educational guidance on managing their disease and encouraging healthier habits.
- Enhancing care coordination by alerting caregivers and other health stakeholders on key moments of required interventions.

#### Drivers

- As a prominent tactic in life science companies' overall brand strategy, DTP digital marketing aims to establish direct relationships with patients. This engagement is aimed at improving patient experience, medication adherence and compliance to therapy, ultimately leading to improved patient outcomes.
- Technology advancements allow greater opportunities to connect across multiple platforms with multiple modalities of engagement, such as voice, gestures, touchpoints and others. Life science companies are also utilizing advanced technologies, such as augmented reality, chatbots and voice assistants, to deepen their engagements with patients.
- "Connected" consumer devices, such as smartphones and smartwatches, have proliferated across all consumer segments, providing more opportunity to connect and understand the patient journey and identify moments of interventions.
- Leading companies are continuing to develop programs that leverage common social media platforms (like Facebook, Instagram and WeChat) to engage directly with patients and caregivers.
- The engagement approaches are starting to show consistent benefits regardless of the drug, device, illness or geographic location. These successes, in turn, create additional reasons for life science companies to accelerate their efforts.

## Obstacles

- DTP digital marketing — especially using social media — continues to face significant adoption hurdles due to diverse geographical and, sometimes, conflicting regulatory restrictions on how life science companies can engage with patients.
- Life science companies' risk-averse tendencies are an internal barrier to more aggressive adoption, even while these companies strive to be more patient-centric.
- CFOs will not always be able to directly tie revenue increases to any specific digital patient outreach campaign or method. While this clouds ROI calculations, the business value for a life science company can be compelling when patient engagement results in therapeutic value for the patient.
- Due to considerable trust barriers and difficult ROI, we see this technology is advancing toward the Plateau of Productivity.

## User Recommendations



- Strengthen patient engagement mobile app deployment and inventory by partnering with experienced mobile app development firms to deliver cross-therapeutic solutions regardless of brand, geographic region or business unit.
- Ensure success by engaging with brand, legal and regulatory teams early and frequently as initiatives and projects kick off.
- Prioritize development of communication plans and technology capabilities required to successfully engage with patients through their clinical journey.
- Ensure that patient information is not improperly released or breached by establishing robust privacy and security processes, and keeping security technologies current.
- Keep digital assets, such as mobile apps, updated and current with latest approved content by establishing agile governance methodology and leveraging technology verification methods to identify assets that need attention.

## Sample Vendors

EPAM; EVERSANA; HealthPrize; Klick Group; LinkedIn; MedTrix; Meta; Twitter

## Gartner Recommended Reading

[Top Tech Trend: Total Experience for Life Sciences](#)

[Innovation Insight for Consumer Experiences in Healthcare and Life Sciences](#)

[Infographic: How to Start Building Dynamic Personas for Life Sciences](#)

[Healthcare and Life Science Business Driver: Total Experience Transformation](#)

[Healthcare and Life Science Business Driver: Strategic Technology Change](#)

## Appendixes

See the previous Hype Cycle: [Hype Cycle for Life Science Commercial Operations, 2022](#)

## Hype Cycle Phases, Benefit Ratings and Maturity Levels

**Table 2: Hype Cycle Phases**

(Enlarged table in Appendix)

<b>Phase</b> ↓	<b>Definition</b> ↓
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 making 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

<b>Benefit Rating</b> ↓	<b>Definition</b> ↓
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 (for example, 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)

<b>Maturity Levels</b> ↓	<b>Status</b> ↓	<b>Products/Vendors</b> ↓
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 Life Science Commercial Operations, 2022 - 18 July 2022](#)

[Hype Cycle for Life Science Commercial Operations, 2021 - 14 July 2021](#)

[Hype Cycle for Life Science Commercial Operations, 2020 - 6 August 2020](#)

[Hype Cycle for Life Science Commercial Operations, 2019 - 3 August 2019](#)

[Hype Cycle for Life Sciences, 2018 - 25 July 2018](#)

[Hype Cycle for Life Sciences, 2017 - 12 July 2017](#)

[Hype Cycle for Life Sciences, 2016 - 25 July 2016](#)

[Hype Cycle for Life Sciences, 2015 - 27 July 2015](#)

[Hype Cycle for Life Sciences, 2014 - 30 July 2014](#)

[Hype Cycle for Life Sciences, 2013 - 31 July 2013](#)

[Hype Cycle for Life Sciences, 2012 - 30 July 2012](#)

[Hype Cycle for Life Sciences, 2011 - 28 July 2011](#)

### Recommended by the Author

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

[Create Your Own Hype Cycle With Gartner's Hype Cycle Builder 2021](#)

[Tool: Create Your Own Hype Cycle With Gartner's Hype Cycle Builder](#)

[2023 CIO and Technology Executive Agenda: A Life Science Perspective](#)

[2023 Life Science Business Drivers of Technology Decisions](#)

[Life Science Manufacturer CIO Top Actions for 2023](#)

[Infographic: Artificial Intelligence Use-Case Prism for Life Science Manufacturers](#)

[Life Science CIOs: Shape Your HCP Engagement Strategy Using Composable Business Architecture](#)

[Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)

[Innovation Insight for Digital Life Science Platforms](#)

[Predicts 2023: Digital Transformation of Healthcare Beckons New Era for Life Sciences](#)

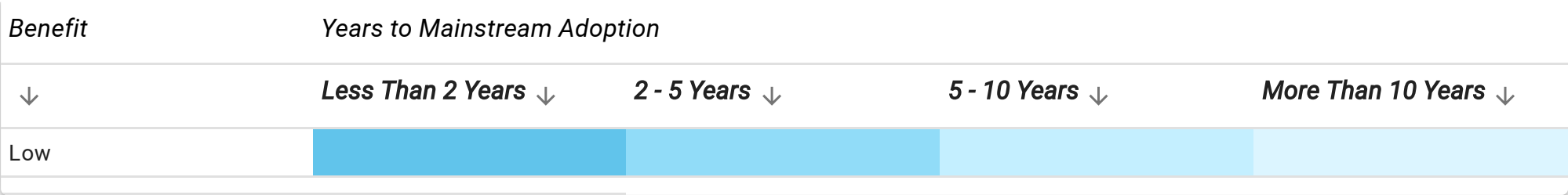
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Table 1: Priority Matrix for Life Science Commercial Operations, 2023

Benefit	Years to Mainstream Adoption			
↓	Less Than 2 Years ↓	2 - 5 Years ↓	5 - 10 Years ↓	More Than 10 Years ↓
Transformational		AI in Commercial Operations Generative AI in Life Sciences	Blockchain in Life Sciences Customer Technology Platform Data Fabric in HCLS Digital Life Science Platform Modular Atomic Content in LS Personalization Engines in LS Personalized Health Prescribed Digital Therapeutics RWD Curation and Analytics Platform	Metaverse

Benefit ↓	Years to Mainstream Adoption			
	Less Than 2 Years ↓	2 - 5 Years ↓	5 - 10 Years ↓	More Than 10 Years ↓
High		Advanced Decision Support for Sales Augmented Analytics in LS D&A Platforms in Commercial LS Key Account Management in Life Science Key Opinion Leader Management Sales Performance Management in LS	AI-Driven Competitive Intelligence Cell and Gene Therapy Platform Conversational User Interfaces in LS Digital Twin of a Customer	
Moderate		Consent and Preference Management Consumer Healthcare Wearables Direct-to-Patient Digital Marketing Medication Adherence Management Multichannel Campaign Management Social Media Analytics	AR/VR/MR in Life Science Patient Engagement Hub Social Media Platforms for HCPs	



Source: Gartner (July 2023)



Table 2: Hype Cycle Phases

Phase ↓	Definition ↓
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Phase ↓

Definition ↓

Source: Gartner (July 2023)

Table 3: Benefit Ratings

Benefit Rating ↓

Definition ↓

Transformational

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Low

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Source: Gartner (July 2023)

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<i><b>Maturity Levels</b></i> ↓	<i><b>Status</b></i> ↓	<i><b>Products/Vendors</b></i> ↓
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Source: Gartner (July 2023)