

Hype Cycle for Consumer Engagement and Experience in Healthcare and Life Sciences, 2023

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

Here, we track the technology and technology-related ideas that will have the greatest impact on consumer engagement and experience in healthcare and life sciences. We provide CIOs in healthcare and life sciences with the holistic view of consumer engagement they need for strategic decision making.

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

In this Hype Cycle, we identify, describe and analyze the technologies that will have the greatest impact on consumer engagement and experience in healthcare and life sciences (HCLS). This research offers a unique outlook, because it positions the technologies from the perspective of the consumer, instead of using traditional analysis by industry subsector or technology solution space. Although broad, the consistent advance of technology innovations on the 2023 Hype Cycle is being observed, and we continue to see poor engagement outcomes across stakeholders in HCLS.

Given the rise of novel competitors, increasing consumer expectations and the need to engage consumers digitally, HCLS organizations looking to remain viable must accelerate investment in total experience (TX) to bridge the experience siloes eroding their consumer engagement outcomes. As a result, the 2023 Hype Cycle has been refined to include only the most essential technologies that CIOs need to follow, with artificial intelligence (AI) technologies, such as large language models (LLMs), playing a larger role.

The Hype Cycle

Consumer trust is at an all-time low in HCLS. Although trust is complex, the key drivers of this decline are affordability and access to care; political polarization and misinformation; and the burnout of clinicians, employees and patients. ¹ Clinician burnout is at an all-time high. It has become too difficult to manage large, complex patient panels in clumsy legacy electronic health records systems (EHRs). With the rise of digital medicine and virtual care, clinicians are facing volumes of patient messages and digital workloads that are unsustainable, forcing work during nonwork hours. Solving consumer engagement and experience requires us to refine the clinician-facing technologies by taking a minimalistic approach to digital design and user experience (UX). ²

The risk of failing in consumer and TX HCLS has never been greater; however, the opportunity to get it right is equally great. With advances in digital intervention technologies (e.g., consumer wearables) and AI (e.g., virtual health assistants and LLMs), CIOs have an opportunity to solve pressing issues of consumer trust and employee burnout.

Five key themes emerge in this Hype Cycle:

- **TX is the essential driving force for consumer experience (CX) in HCLS.** TX redefines the boundaries of relationships between patients, providers and members to improve clinical care and outcomes and deliver business value. TX technologies refine processes of engagement and activation throughout a consumer journey with health and wellness activities in a way that considers the employee, user and multiexperience needs for all stakeholders.
- **Data, analytics and AI enable personalization.** Invest in personalization initiatives that allow you to generate insights and empathy as one strategy to build or restore consumer trust. As a result, we introduce the following technologies: data fabric in HCLS and large language models in HCLS, while advancing emotion AI in HCLS.

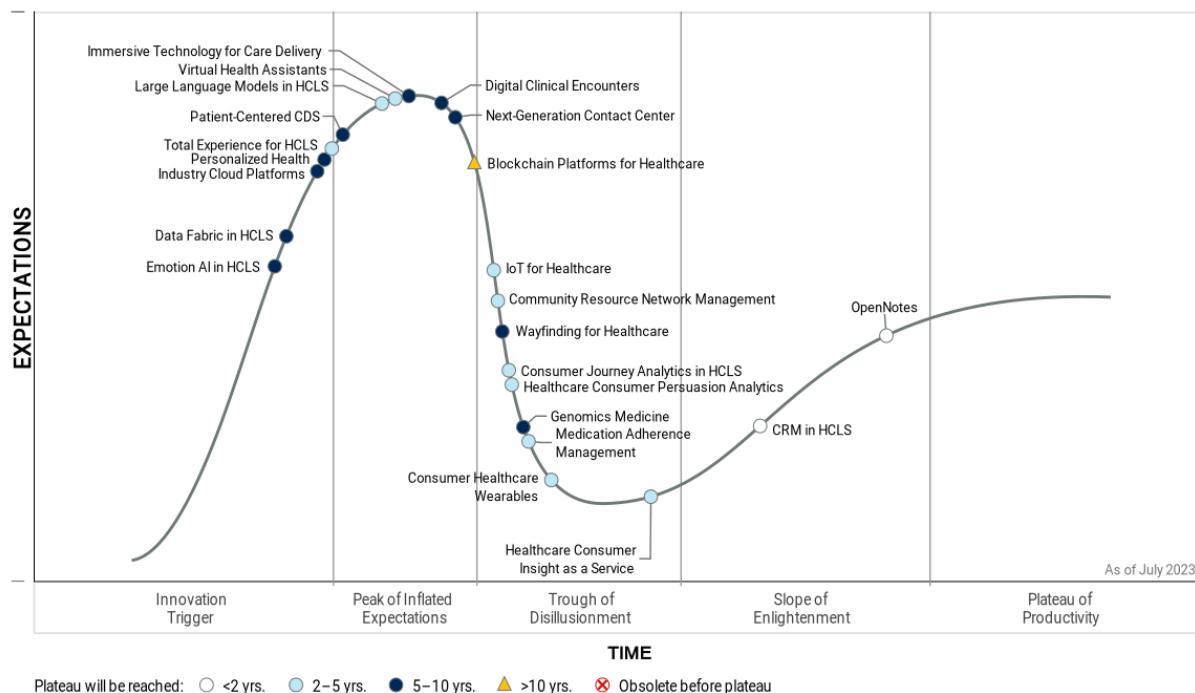
- **Composability takes center stage with experience orchestration technologies and capabilities.** HCLS organizations have struggled to advance the capabilities of their siloed, legacy systems of record – e.g., EHRs, Core Administrative Processing Solution (CAPS), laboratory information management system (LIMS) or remote infrastructure management (RIM) – to deliver on experience initiatives. However, with the maturation of CRM for HCLS and increasing interest in and adoption of TX in HCLS, leaders are slowly adapting their enterprise architectures and ways of working to support this foundational trend.
- **LLMs appeared suddenly, but transformational value is a long game.** The break-out capabilities of LLMs in late 2022 and deft marketing by Open.AI and Microsoft propelled it to debut on this Hype Cycle in 2023, already at the Peak of Inflated Expectations. There is tremendous potential for this technology, and numerous opportunities for tactical, near-term value. However, the transformative use cases that will require the highest levels of safety and ethical development are likely to be five or more years away from mainstream adoption.
- **Signals favor a larger role for the hyperscalers and industry cloud platforms.** Hyperscalers have been incrementally building their HCLS industry cloud capabilities, hoping to reach a minimum level of vertical-specific capabilities required to attract and retain the lucrative cloud services business from HCLS organizations. The hype around LLMs in 2023, including the willingness to pay on a transaction basis (that is, cents per 1,000 tokens) for AI/ML services is a breakthrough for this consumption model in HCLS. To this end, the industry cloud platforms technology has been added to this year's Hype Cycle.

Three innovations have been added to the Hype Cycle:

- Data fabric in HCLS
- Industry cloud platforms
- Large language models in HCLS

Figure 1: Hype Cycle for Consumer Engagement and Experience in Healthcare and Life Sciences, 2023

Hype Cycle for Consumer Engagement and Experience in Healthcare and Life Sciences, 2023



Gartner

The Priority Matrix

The Priority Matrix is a companion to the Hype Cycle graphic. It maps an innovation's benefit to its time to maturity. The graphic is generated from the benefit rating and the time to plateau values for each Hype Cycle entry. The Priority Matrix answers two key questions:

- How much value will be delivered with a technology?
- When will it be mature enough to deliver that value?

Consumer engagement is a transformational trend in HCLS. Although the Priority Matrix shows individual technologies that are transformative, we believe the HCLS industry's transformation will manifest itself through the systemic integration of consumer engagement into all HCLS IT initiatives.

Table 1: Priority Matrix for Consumer Engagement and Experience in Healthcare and Life Sciences, 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		Community Resource Network Management IoT for Healthcare Large Language Models in HCLS Total Experience for HCLS	Data Fabric in HCLS Digital Clinical Encounters Emotion AI in HCLS Genomics Medicine Industry Cloud Platforms Personalized Health	Blockchain Platforms for Healthcare
High	CRM in HCLS	Consumer Journey Analytics in HCLS Healthcare Consumer Persuasion Analytics Virtual Health Assistants	Next-Generation Contact Center Patient-Centered CDS	
Moderate	OpenNotes	Consumer Healthcare Wearables Healthcare Consumer Insight as a Service Medication Adherence Management	Immersive Technology for Care Delivery Wayfinding for Healthcare	
Low				

Source: Gartner (July 2023)

Off the Hype Cycle

In 2023, four technology innovations have reached maturity and graduated from the Hype Cycle:

- Chatbots
- Next-generation interactive patient care
- On-demand virtual visits
- Patient self-scheduling

Two innovations have been renamed:

- “Automated patient decision aids” has been renamed “patient-centered CDS.”

- “Precision health” is now “personalized health.”

Two technologies are no longer being tracked on this Hype Cycle:

- MXDP, which continues to be tracked on the [Hype Cycle for User Experience, 2023](#)
- DXP, which continues to be tracked on the [Hype Cycle for User Experience, 2023](#); [Hype Cycle for Digital Commerce, 2023](#) and [Hype Cycle for Digital Government Services, 2023](#)

On the Rise

Emotion AI in HCLS

Analysis By: Laura Craft

Benefit Rating: Transformational

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Definition:

Emotion artificial intelligence (AI) technologies (also called affective computing) use AI techniques to analyze the emotional state of a user via computer vision, audio/voice input, sensors and/or software logic. It can initiate responses by performing specific, personalized actions to fit the healthcare consumer's mood or sense the patient's emotional state and needs.

Why This Is Important

Healthcare and life science organizations must build empathy with consumers — such as patients, members and providers — to create trusted, personalized interactions and relationships. Current data and analytics technologies do not allow for easy collection and coding of the feelings, wants, needs, beliefs and preferences that underlie empathetic engagement. Emotion AI bridges that gap. It allows human-machine interfaces to detect and respond to sentiments in different contexts.

Business Impact

Improve patient engagement, satisfaction and outcomes throughout broad use cases such as:

- Improved understanding of emotional reactions to treatments
- Assisting in the diagnosis of mental illness
- Supporting autonomous living of the elderly
- Triageing patients in a waiting room by detecting and responding to their pain and discomfort levels
- Real-time analysis of voice conversations and emotion detection in contact centers

- Enhanced empathy and emotional responses from automated consumer and patient facing tools

Drivers

- As more healthcare and life sciences (HCLS) organizations are competing on consumer experience, they will leverage emotion AI to improve organizational and product empathy that addresses the feelings, wants, needs, beliefs and preferences of consumers.
- The strongest adoption of emotion AI is Improving operational efficiencies in contact centers. Voice-based emotion analysis is supporting multiple use cases such as real-time analysis of voice conversations, emotion detection in chat conversations and emotional chatbots.
- HCLS organizations require data on emotions and emotional states for the system to act more empathetically. This is particularly important as vendors incorporate advanced capabilities like generative AI to improve workflows and engagement.
- Emotional responses and empathy are a critical element in consumer/patient adoption and use of virtual health assistants/avatars.
- As the metaverse unfolds, virtual beings will play an important role in evolving business models — and the entire ecosystem of this new digital world — and will require the ability to understand human emotions and convey empathy.
- Generative AI, such as large language models like ChatGPT, are being embedded into consumer-facing technologies and stand to support increased adoption of emotion AI.
- Clinical burnout is one of the biggest industry pain points. Emotion AI has the potential to help reduce clinician burnout by assisting clinicians in understanding patients' behavioral responses more precisely and improving clinician/patient interactions.

Obstacles

- Privacy concerns are the main obstacle to rapid adoption. Healthcare consumers may not be comfortable having their emotions monitored in a private home environment via listening devices like virtual assistants. Research environments, such as product testing, have the advantage that the emotion AI is used for this specific purpose and users (product testers) are fully aware their emotions are being captured to improve usability or other features.
- Bias and model accuracy is a concern, especially when using facial expression analysis. Models must be trained in a range of geographies to detect the differing nuances present due to different cultural backgrounds.
- Consistency across modalities is variable. Certain emotions can be better detected with one technology mode than with another. For instance, “irony” can be detected using voice-based analysis, while this is close to impossible to detect with facial expression analysis.
- Identifying and processing human emotion is currently a gray area, especially in the EU. The EU Commission has started an initiative to review the ethical aspects of AI technologies, and emotion AI will certainly be part of this debate.

Analyst Notes:

This technology advances slightly this year to the midpoint between Innovation Trigger and Peak Hype. There is still considerable time to maturity. We rate this technology for its ability to improve experience and engagement.

Example of vendors demonstrating the use of emotion AI:

- Twill is using emotion AI in mental healthcare to learn about one’s health needs and personalize care.
- LUCID uses an AI recommendation system to suggest music based on the patients’ mental state.

User Recommendations

- Review a vendor’s capabilities and reference cases carefully in the selection process. As the market is immature, most vendors are focused on two or three use cases in narrow specialties or market segments.

- Partner with your clinical, business and operational leaders to assess and prioritize the potential use cases and inform vendor selection.
- Appoint responsibility for data privacy in your organization — a chief data privacy officer or equivalent.
- Work with your vendor on change management to avoid user backlash due to sensitive data being collected.

Sample Vendors

Affectiva; Authenticx; Behavioral Signals; Cogito; Intelligent Voice; Opsis; Sensely; Sensi.ai; Symanto; Uniphore

Gartner Recommended Reading

[Competitive Landscape: Emotion AI Technologies](#)

[Emerging Technologies: Emotion AI in the Workplace](#)

[Competitive Landscape: Customer Analytics](#)

[Tool: Vendor Identification for Natural Language Technologies](#)

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

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?](#)

Data and Analytics Essentials: How to Define, Build and Operationalize a Data Fabric

Industry Cloud Platforms

Analysis By: Gregor Petri

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Definition:

Industry cloud platforms address industry-relevant business outcomes by combining underlying SaaS, PaaS and IaaS services into a whole product offering with composable capabilities. These typically include an industry data fabric, a library of packaged business capabilities, composition tools and other platform innovations. IT leaders can use the composability of these platforms to gain the adaptability and agility their industries need to respond to accelerating disruption.

Why This Is Important

Cloud, software and service providers are launching industry cloud platforms (ICP) by combining SaaS, PaaS and IaaS offerings with industry-specific functionality and composable capabilities to create more compelling propositions for mainstream customers. Emerging industry cloud platforms are leveraging innovative approaches such as composable packaged business capabilities (PBCs), PBC marketplaces, data grids and fusion teams to accommodate faster change and platform adaptability.

Business Impact

Broader cloud adoption within enterprises requires more whole-product business solutions that enable defined industry scenarios and process models, rather than technology-oriented solutions that enterprises have to largely configure and integrate themselves. ICPs enable enterprises to adopt more holistic cloud strategies that span across established cloud service categories such as SaaS, PaaS and IaaS.

Drivers

- As the complexities of both business and technology continue to increase, enterprises are looking for more outcome-based engagements with their cloud providers. However, such outcomes must be flexible enough to be able to adapt to the changing circumstances.
- To be relevant and be able to resonate with enterprise audiences, such outcomes must be business relevant, specific, measurable and tangible — a goal that is easier achieved when approached in a specific industry context.
- Industry cloud platforms can create value for enterprises by bringing traditionally separately purchased solutions together in a composable and modular way. This simplifies the sourcing, implementation and integration process.
- Currently, industry cloud platforms are being initiated and created by various technology providers. In addition, we see some enterprises considering creating — often in collaboration with a technology provider — a dedicated industry cloud platform as the basis for a more autonomous industry ecosystem.
- Enterprises can gain business value from industry clouds through shared best practices; vertically specialized go-to-market and implementation teams; compliance of the infrastructure platform with industry-specific regulations.
- Value can also be gained through analytical capabilities to integrally mine the data from existing and new applications; industry-specific add-on functionality in front- and back-office enterprise applications; combined with collections of composable building blocks available from industry cloud marketplaces.
- Providers are on a pathway to creating whole-product offerings that cater directly to the established needs of vertical industry enterprises.

Obstacles

- Industry clouds are at risk of following the same path as classic government and community clouds where providers created difficult to support or slightly outdated copies of the original cloud with specific functionality.
- Industry cloud platforms can be overwhelming in terms of the wide breadth of functionality they potentially cover. Customers and providers must therefore be disciplined and not burn precious resources on fixing/replacing things that are not broken.
- Implementing an industry cloud platform must be approached as adding an exoskeleton, bringing new and improved capabilities rather than a vital organ transplant, replacing or repairing functionality that was already present.
- To reach their full potential, industry clouds will need to evolve into something best described as ecosystem clouds. Enterprises can leverage these ecosystems by participating in shared (business) processes, such as procurement, distribution, payment procession, and maybe even R&D and innovation.

User Recommendations

- Target ICPs to complement the existing application portfolio like an exoskeleton by introducing new capabilities that add significant value, rather than as full-scale replacements of largely already existing functionality with more up-to-date technology.
- Start building composability skills by engaging business technologists and fusion teams to create enterprisewide understanding and support for the ICP journey.
- Formulate rules for when to deploy ICP capabilities as a productive platform for optimization and modernization by improving existing processes, and when to actively recompose them for more differentiating transformation and innovation initiatives.

Sample Vendors

Amazon Web Services (AWS); Google; IBM; Infor; Microsoft; Oracle; Salesforce

Gartner Recommended Reading

[Top Strategic Technology Trends for 2023: Industry Cloud Platforms](#)

[Presentation: Industry Cloud Platform Adoption by Vertical Industry](#)

Analyzing Industry Cloud Offerings From CIPS Providers

Providers of Cloud Managed Services: Use Composable Industry Platforms to Productize Your Offerings

Changes and Emerging Needs Product Managers Must Address in the CIPS Market

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](#)

[Innovation Insight for Digital Health Platform](#)

Total Experience for HCLS

Analysis By: Kate McCarthy, Jason Wong, Faith Adams

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Total experience (TX) is a strategy that creates superior shared experiences by weaving customer experience (CX), employee experience (EX), multiexperience (MX) and user experience (UX) disciplines. The goal is to drive greater customer and employee confidence, satisfaction, loyalty and advocacy using digital and nondigital techniques. In healthcare and life sciences (HCLS), TX is an important tool that can be used to address industry pressures, such as patient, member and clinician experience.

Why This Is Important

Mobile, virtual and distributed customer and employee interactions have accelerated, yet patient and clinician satisfaction remain low. TX gives HCLS organizations a way to move beyond an app or portal to use technology and interactions to enhance, empower and embolden customers and employees. To confront industry challenges, HCLS leaders must evaluate the intersections between these experiences and increase both customer and employee confidence and value.

Business Impact

TX is designed to drive customer and employee lifetime value, a calculation based on the longevity of the relationship and value it brings to the organization. A lack of engagement contributes to challenges, such as poor clinical outcomes, health inequity and clinician burnout. TX enables HCLS organizations to reduce employee turnover, which has financial repercussions like:

- Loss of institutional knowledge and productivity
- Impact to team morale and load management
- Cost of recruiting and onboarding new talent

Drivers

- Technology advancements allow greater opportunities to connect across multiple platforms with multiple ways of engagement, such as with voice, gestures and through immersive experiences.
- Edge devices with cloud-based applications have proliferated, providing more opportunity to connect and understand employees, customers and the technology data points at a higher level.
- Initial investments can be scaled to add external ecosystem partners to increase their long-term value.
- AI can be applied to see how other similar consumer issues were resolved and offer solutions to rectify them. Machine learning can recognize gaps and refine the process or notify a developer to address the issue. Recurring patterns or orders can be used to identify how to improve products and services, such as personalization.
- Legacy systems are pervasive and fail to deliver on consumer, employee, user and digital engagement needs. For example, electronic health records (EHRs) are the leading cause of burnout, according to a review of 37 studies on clinician burnout, published in *Studies in Health Technology and Informatics*.
- HCLS experience is wrought with friction for users, and modernization efforts have failed to improve this and often adds complexity to the user experience by introducing additional systems, logins and experiences that are not orchestrated for seamlessness.
- TX helps bring empathy to experience by allowing organizations to know their stakeholders and meet them with the tools, language and in the places that reflect an understanding of their feelings, wants, needs, beliefs and preferences.
- Health equity is a top concern that requires the ability to address diverse user requirements and preferences. TX can improve personalization and consumer insights.
- Clinical decision support is often hampered by a lack of insights at point of care. TX can improve clinical decision support by making insights accessible and actionable across touchpoints and workflows that are valued to customers and employees.

Obstacles

- Concept: HCLS lags other industries both in digital ability and stakeholder engagement initiatives. While TX is a necessary tool to resolve engagement challenges, it is an early stage concept that will meet friction from siloed business units.
- Ownership: CX and EX are typically owned by independent stakeholders without consideration for each other, and neither domain tends to have influence over UX.
- Inertia: Many organizations are mired in the status quo with more pressing challenges, such as supply chain management and clinician burnout, which could benefit from TX, but instead are addressed by legacy thinking and workstreams that maintain silos.
- Technology: HCLS organizations struggle to modernize digital experiences. This environment prevents them from achieving richer MX customer and employee journeys across multiple devices with multiple touchpoints and modalities.
- As a result of these obstacles, we position this profile near the Peak of Inflated Expectations with maturity in two to five years.

User Recommendations

- Form a TX fusion team that crosses activity silos by engaging with CX, EX, UX and MX leaders or centers of excellence throughout your organization. Use intersecting performance plans (such as objectives and key results), to incentivize interteam cooperation.
- Start small by applying TX to a single customer and employee journey, to be built upon further in the future. Engage cross-functional stakeholders by conducting workshops to determine how TX strategy can transform their roles and make the organization more agile. Use TX strategy to determine future-state business capabilities, which, in turn, will drive targeted business outcomes. This plan should include customer and employee journey mapping.
- Create personas to better understand the emotional and functional needs of the person for whom you are designing the TX and the challenges for obtaining them.
- Apply TX to close the strategy to execution gap by finding important business opportunities that were held back by their siloed CX, EX, UX or MX efforts.

Sample Vendors

Adobe; Deloitte; Genesys; InMoment; Medallia; Microsoft; Qualtrics; Salesforce; UserZoom

Gartner Recommended Reading

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

[What Are Healthcare Organizations Looking For in a Total Experience Solution?](#)

[Quick Answer: How Do I Get Started With Total Experience?](#)

[Tool: Total Experience Scoping Guide](#)

[Case Study: Connect Customer and Employee Journeys to Deliver Superior Experiences \(The LEGO Group\)](#)

At the Peak

Patient-Centered CDS

Analysis By: Veronica Walk

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Patient-centered (PC) clinical decision support (CDS) directly engages with the patient or caregiver to deliver evidence-based CDS, focusing on meaningful and achievable personal health goals and outcomes for the individual patient. These solutions empower the patient to actively participate as a member of their care team, enable shared decision making between the patient and provider, and equip the patient to achieve their highest level of health.

Why This Is Important

PC CDS is an important, yet largely missing component of CDS. Most CDS technologies are focused on supporting clinician decision making at the point of care. Clinicians can recommend and prescribe the best evidence-based treatments, but ultimately, the patient must accept and adhere to these recommendations to achieve their highest level of health. PC CDS can advance the goals of value-based care and health equity by engaging patients as active members of their care team.

Business Impact

Healthcare providers and payers can use PC CDS to:

- Increase patient and caregiver knowledge about their conditions and choices, and provide personalized, actionable guidance.
- Increase patient satisfaction and loyalty by incorporating patients' values and preferences in their healthcare decisions.
- Advance value-based care by facilitating shared decision making, increasing the likelihood of adherence to treatment plans and enabling providers to intervene or adjust plans as needed.

Drivers

- As healthcare continues to shift toward value-based care, it is essential to engage the patient in their clinical decision making and care planning tailored to their personal goals, abilities and preferences.
- Advancing health equity will require an increased focus on individual patient's preferences, values and other key considerations, such as social determinants of health (SDOH), when making clinical decisions and recommendations. PC CDS can help ensure these patient-centric factors are considered alongside evidence-based medicine.
- Shared decision making in healthcare has been shown to improve patient satisfaction and outcomes, and remains a key objective of patient-centered care initiatives. PC CDS can facilitate shared decision making by providing patients and caregivers with personalized guidance and recommendations to understand their conditions and choices.
- The proliferation and adoption of consumer health devices and tools, such as smartwatches and self-triage tools, drive increased patient engagement and ownership of their health data and decisions, facilitating progress toward patient-directed care and openness to PC CDS.
- Government-led initiatives and regulations drive patient access and ownership of their health data, which is critical to improve patient-directed and shared decision making.
- This year, we have updated this technology profile to replace and encompass the former profile, automated patient decision aids (APDAs). PC CDS follows a similar trajectory with a higher benefit rating.

Obstacles

- Paternalistic culture in medicine remains a barrier to empowering patients as decision makers in their care.
- Patients and providers are skeptical of PC CDS, especially solutions leveraging advanced capabilities such as artificial intelligence and machine learning.
- As with clinician-facing CDS, PC CDS faces challenges with keeping current with evidence, and perhaps, with less oversight for direct-to-consumer solutions.

- Lack of integration with electronic health records (EHRs), patient engagement, care management and other clinical systems will impede adoption and perpetuate data silos.
- Healthcare providers are in the early stages of integrating patient-generated health data (PGHD) into their EHR and clinical workflows. PGHD will be an important component of PC CDS. Concerns over the quantity and quality of PGHD will slow adoption.
- Lack of data standards for PGHD, or adherence to existing data standards, will perpetuate data quality and interoperability challenges and impede scalability.

User Recommendations

- Work with clinical colleagues to identify potential pilot use cases for PC CDS, for example, chronic pain management, maternal medicine or perioperative care. Ensure PC CDS solutions fit into your overall patient engagement strategies and platforms, such as your digital front door.
- Ensure PC CDS meets the intent of patient centricity by involving patients in designing and deploying tools, and measuring success based on improved health outcomes and patient and clinician satisfaction.
- Increase clinician engagement and support for these solutions by integrating them within clinical workflows, such as the EHR.

Sample Vendors

Abridge; EBSCO Information Services; Epic; Medical Brain; Wolters Kluwer

Gartner Recommended Reading

[Market Guide for Clinical Decision Support Solutions](#)

[Cleveland Clinic Abu Dhabi Improves Consumer Engagement Through a Digital Front Door](#)

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

Immersive Technology for Care Delivery

Analysis By: Sharon Hakkennes

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Immersive technology for care delivery is the application of virtual reality (VR), augmented reality (AR) and mixed reality (MR) technologies to create immersive clinical environments that convey a sense of real-world presence through the use of visual, auditory and haptic elements. Common applications include clinical diagnosis and treatment, education and training, and clinical event simulation (e.g., presurgical planning).

Why This Is Important

Immersive technologies are offering a new way in which healthcare providers can engage patients and clinicians. Creating immersive and interactive experiences enables the delivery of more personalized and effective care, increases patient understanding of their health and improves patient engagement in their care. These technologies are also transforming clinical education and training — enabling greater collaboration across distances and supporting skill practice in a controlled environment.

Business Impact

Immersive technologies are being applied in the healthcare domain to:

- Improve clinical outcomes as primary or complementary assessment and treatment approaches across a broad range of clinical conditions
- Increase patient engagement and reduce anxiety by preparing and educating patients about their clinical condition and treatment plan
- Increase effectiveness, reduce cost, improve accessibility and mitigate risk of clinical education and training

Drivers

- Ongoing technology advances are driving increased interest and enabling new use cases. For example, addressing issues of latency has enabled the evolution of live stereoscopic VR training in areas such as surgery and emergency medicine.
- The body of evidence supporting the effectiveness across clinical use cases (e.g., acute and chronic pain management, rehabilitation, patient education, and behavioral therapy) and in clinical education and training (e.g., surgical procedure training, empathy training) is expanding.
- Healthcare providers are prioritizing technology investments that align with their focus on designing and delivering optimal patient and clinician experiences. Immersive technologies are a part of this strategy, providing innovative ways to engage patients and clinicians.
- Hype surrounding the metaverse continues to drive industry-specific interest in foundational metaverse technologies, including immersive technologies.
- The number of vendors bringing healthcare-specific immersive technology solutions to the market is proliferating rapidly. These vendors are bringing new solutions to the market and expanding current solutions to support a broader range of use cases.

Obstacles

- High software, hardware, configuration and implementation costs and lack of dedicated reimbursement mechanisms hinder adoption.
- Patient and clinician attitudes, willingness to trial the technology and weariness of potential side effects (e.g., simulation sickness) can be barriers where the implementation is not coupled with strong clinician engagement, change management and training.
- Many solutions on the market are focused on a narrow set of use cases. As a result, healthcare providers are forced to invest in, and support, multiple solutions and enabling hardware to meet the growing number of applications across clinical care delivery, and education and training.
- There are numerous challenges to enable scaling the use of immersive technologies outside of the healthcare facility. This includes logistics to supply and return the required hardware, privacy and information security, and ensuring patients have the training and support to use the technology independently.

User Recommendations

- Engage with a broad range of clinical and business stakeholders across the organization to identify key use cases where immersive technologies can address clinical education and training challenges, and enhance patient experience and outcomes.
- Build trust and accelerate adoption by implementing comprehensive training programs to ensure patients and clinicians are confident in the independent use of the technology.
- Enable scaling of immersive technology initiatives across use cases by developing standards and resources to facilitate technology evaluation, establishment of clinical workflows, provision of logistical support (e.g., hardware cleaning) and measurement of benefits.
- Future-proof technology investments by prioritizing vendors that facilitate multiple use cases, are hardware agnostic and enable the cost-effective development of new content.

Sample Vendors

8chili; Augmedics; Fundamental Surgery; ImmersiveTouch; KindVR; Penumbra; Surgical Theater; Virtually Better; XRHealth

Gartner Recommended Reading

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

[Video: 2021 Eye on Innovation Awards in Healthcare and Life Sciences – Virtual Reality to Cultivate](#)

[Clinician Empathy \(Nationwide Children's Hospital\)](#)

[Advancing Digital Innovation in Clinical Education and Training](#)

Large Language Models in HCLS

Analysis By: Jeff Cribbs, Sharon Hakkennes, Michael Shanler

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Large language models (LLMs) in healthcare and life sciences (HCLS) are a type of foundation model trained on large volumes of unlabeled textual data. Applications can use LLMs to accomplish a wide range of tasks such as content generation, content summarization, search, code generation, language translation and conversational chat for HCLS industry applications.

Why This Is Important

LLMs have demonstrated surprising and significant capabilities across industries and are likely to be a standard feature of both personal and enterprise technology experiences in just a few years. Within HCLS, LLMs' achievements in demonstrating medical knowledge, engaging patient questions with empathy and insight, and parsing complex administrative scenarios have been remarkable. HCLS technology leaders have been tasked with planning a strategic response.

Business Impact

LLMs will first impact areas where they can be deployed with simple design patterns and areas with higher tolerance for error and correction. Early pilot examples include autogeneration of clinical trial intelligence reports, natural language interaction with business intelligence, ambient digital scribes and scientific literature search. Long term, LLMs have the potential to disrupt many critical functions — from research agents and office visit discharge notes to interoperability protocols.

Drivers

- The general release, explosive adoption and media attention given to ChatGPT — just one of many applications leveraging LLMs — has captured enormous mind share of healthcare business, clinical, and technology leaders alike. This has drawn significant strategic planning attention in 2023, though the real investment result is still to be seen.
- A steady cadence of healthcare technology vendors are announcing integration with LLMs.
- Large technology companies are making enormous investments in developing new LLMs and applying them to new application areas, demonstrating and broadcasting their achievements in a race to achieve a strong position in the LLM space. For example, Microsoft Health Bot is being integrated with Azure OpenAI services.
- Medical and healthcare policy research will drive deeper understanding of the risks and virtues of LLMs in healthcare use cases. As this emerges, HCLS organizations will gain comfort in embarking on more ambitious use cases.
- A pressing need to reduce the contribution of healthcare technology to worker (especially clinician) burn-out will drive investment in use cases like digital scribing and patient message responses.
- A tightening fiscal environment combined with structural changes in patient populations drive the need for increased efficiency of the workforce. This will drive long-term use cases like chat-based self-triage and navigation, and automated back-office functions.
- Initiatives focused on improving data literacy, analytics self-service and data-driven decision making will drive interest and investment in chat-based interfaces with business intelligence and analytics platforms, whether those are deployed within functional applications (EHR, ERP, claims processing) or enterprise analytics.

Obstacles

- Software vendors and consultants often use the GPT, LLM and generative AI terms interchangeably. This creates confusion about what the technologies actually are, the relationships between them, and what is realistically achievable with investments.
- There is widespread misunderstanding of the technology. This results in unproductive strategic discussions and reflexive governance decisions to restrict or prohibit use of LLM tools.
- Truly transformative use cases will require higher degrees of proven accuracy and safety than the 80% to 90% general performance LLMs demonstrate today. This last decile of improvement often reveals complicated fringe scenarios and engineering challenges that take many years to resolve.
- LLM outputs are not currently explainable — at least, not in the sense we are accustomed to in healthcare when we validate rule-based software, clinical protocols or efficacy studies. LLM use case adoption will be constrained by the need for transparency about decision making.
- There is significant uncertainty about the future regulatory environment for LLMs. Issues include intellectual property in LLM training datasets, privacy and confidentiality of enterprise data, and legal liability for content generated by the LLM.

Analysts' Notes: It is difficult to position a technology moving as quickly as LLMs in an annual publication. We take enterprise deployments of LLMs (largely via cloud APIs) as our numerator to arrive at the low end of 1% to 5% of HCLS organizations. We place LLMs at the peak of hype and predict a year of vendor integration announcements, regulatory starts and stops, and reality checks for the near-term value of today's LLMs. Next year, we are likely to see new, specific use cases emerging across the HCLS Hype Cycles.

User Recommendations

- Accelerate clear and effective internal communications by ensuring business, clinical and technology leadership teams have a common set of definitions for key terms in generative AI and a foundational understanding of how LLMs work, along with their risks.
- Establish a technology leader as the enterprise subject matter expert on generative AI by allocating time for this individual to digest industry updates as they unfold, create guidance and communications for leadership and governing experimentation and learning across the organization.
- Engage your patient populations directly by convening sessions with patient advisory groups to understand current utilization of ChatGPT, ascertain perceptions of the technology, observe first usage where possible and trial messaging for safe patient usage.
- Ensure your vendor partnerships are positioning their products and services to maximize the value and manage the risk presented by LLMs by making generative AI a regular point of discussion.

Innovation in Practice:

- Three health systems (UC San Diego Health, UW Health in Madison, Wisconsin, and Stanford Health Care) are piloting the use of GPT-4 to autogenerate responses to patient messages in the EHR. These draft responses are reviewed and revised as necessary by the clinician prior to sending.

Sample Vendors

Facebook; Google; Microsoft; NVIDIA; OpenAI; Palantir

Gartner Recommended Reading

[GPT-4 Impacts and Actions in Healthcare and Life Science](#)

[Board Briefing: Understanding ChatGPT, Other Large Language Models and Their Risks](#)

[Quick Answer: What Healthcare Provider CIOs Need to Know About LLM Applications Such as ChatGPT](#)

[AI Design Patterns for Large Language Models](#)

Virtual Health Assistants

Analysis By: Kate McCarthy

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Virtual health assistants (VHAs) are specialized conversational interfaces using artificial intelligence (AI) technologies that assist people or automate tasks. VHAs apply this technology to enable healthcare and life science consumers to digitally engage with their health and wellness. VHAs incorporate a broad range of use cases for digital encounters, including chronic condition management, medication compliance, triage and health and wellness routines.

Why This Is Important

Accelerated use of digital touchpoints continues across industries — particularly, virtual assistants. VHAs, which are specific to the complexities of health and wellness, have better context models and deeper integration with business applications and back-end systems compared with basic chatbots. They can help manage consumer engagement for chronic and acute condition management, wayfinding, clinical trials, medication therapy management, and health and wellness coaching.

Business Impact

VHAs are designed to help healthcare consumers improve health and wellness compliance and outcomes. They often initiate an interaction to remind the consumer to perform an activity — such as taking a glucose or blood pressure reading, recording weight, or taking medication. VHAs are a necessary touchpoint for healthcare and life science organizations seeking to improve digital consumer engagement strategies.

Drivers

- VHAs have become an important mechanism to triage and interact with patients. They collect data and information and remotely monitor patients, often in command or virtual care monitoring centers. And they can trigger alerts and recommend actions and remote encounters with the appropriate clinician, if needed.
- Payers, providers, life science companies and employers purchase VHAs for use cases ranging across care navigation, virtual behavioral health, chronic disease management, wayfinding and clinical trials.
- VHAs are a strong means to improve patient adherence to care plans and outcomes, lower cost, reduce adverse or unplanned events and increase consumer satisfaction. For example, VHAs increase productivity and time to care for clinicians and improve recruitment and retention in clinical trials because of automation.
- VHAs also render real-time insights into consumers' vitals, activities, behaviors and attitudinal preferences for more immediate, personalized interventions. VHAs improve engagement and access to healthcare advice and guidance for condition or treatment management, and provide a more positive, people-literate, tactile consumer experience for many administrative and transactional tasks that are essential for medication and care plan compliance.
- As VHAs mature, they are increasingly able to initiate a conversation and pick up moods using sentiment analysis, which will be critical for consumer engagement.
- Generative AI, such as large language models like OpenAI (ChatGPT), stands to advance the capabilities of VHAs by improving empathy-based, natural language engagement.
- Due to the increased interest and adoption, we continue to advance this technology to the Peak of Inflated Expectations and continue the benefit rating as high. We expect this to be a rapidly maturing technology capability and project VHAs to reach the Plateau of Productivity in the next two to five years.

Obstacles

- Healthcare and life science organizations continue to lag other industries in digital maturity in consumer-facing capabilities. To overcome adoption barriers, leading organizations incorporate VHAs into their larger multiexperience consumer engagement strategies to yield the greatest value to the business and consumer.
- Data orchestration remains challenging across disparate systems. Leading organizations prioritize their data fabric to ensure employees, users and consumers have access to the right information at the right time to execute informed next best actions.

User Recommendations

- Design VHAs to be one touchpoint among many available to engage consumers, employees and users. Create personas and journey maps for key consumers and users to identify moments of friction that represent high-value use cases for VHAs.
- Engage clinicians actively in user testing and experience design to ensure usability and engagement.
- Counter any resistance by having a robust plan (with training and awareness), and assure your workforce that the technology is to augment their jobs, not take their jobs away.
- Monitor the direction of the electronic health record vendors and their intersection with the personal health record.
- Identify regional privacy regulations for countries when piloting on live patients. For example, find out how and where the apps collect, store and reuse data, as many of these will be cloud- and mobile-device-enabled.
- Evaluate VHAs' use and planned use of generative AI and assess related risks around protected health information (PHI) or intellectual property data sharing.

Sample Vendors

Amazon; Avaamo; Babylon; Cognizant; Medocity; Orbita; Pager; Sensely; Verint Systems

Gartner Recommended Reading

[Case Study: Automation With Intelligent Virtual Assistant \(Humana\)](#)

[Tool: Virtual Care Maturity Assessment](#)

Emerging Tech Roundup: ChatGPT Hype Fuels Urgency for Advancing Conversational AI and Generative AI

Emerging Technologies: Tech Innovators in Advanced Virtual Assistants

Digital Clinical Encounters

Analysis By: Sharon Hakkennes

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Digital clinical encounters are semiautomated patient interactions that include the use of clinical protocols, algorithms and artificial intelligence (AI) to facilitate history-taking, triage, diagnosis, prescribing and documentation. The encounter leverages the latest evidence-based clinical knowledge to reduce clinicians' direct involvement prior to their review of the captured and analyzed content for clinical oversight and action.

Why This Is Important

Epidemiological factors (such as an aging population and increasing burden of chronic disease), coupled with clinician shortages and burnout, have made access to primary and specialist care a major challenge currently facing the healthcare industry. Digital clinical encounters help address these issues by improving clinician efficiency through the automation of certain steps in the care delivery process.

Business Impact

Digital clinical encounter solutions are transformational systems that use automation to:

- Dramatically reduce the time taken by clinicians to gather and review patient information, confirm a diagnosis, select treatment options, and document the encounter.
- Direct patients to the right level of care, avoiding unnecessary emergency room visits.
- Increase both patient and clinician satisfaction.

- Improve access for more complex encounters and those that require in-person visits.

Drivers

- AI capabilities are evolving, and solutions are increasingly available. As the industry explores the potential applications of large language models (such as GPT-4) in healthcare, we expect interest in these solutions to rapidly increase over the coming 12 months.
- New vendor partnerships deliver seamless integration of digital clinical encounter solutions into broader virtual healthcare solution offerings.
- Clinician burnout is a global issue. Through automation of administration and documentation processes, digital clinical encounters address one of the leading causes of this burnout.
- Clinical staffing shortages are creating capacity issues across many health systems. By automating components of the clinical encounter, digital clinical encounter solutions increase clinician productivity and enable health systems to scale access to low-acuity care.
- Healthcare providers are facing ever-increasing market competition. Digital clinical encounter solutions can drive patient access, acquisition and retention by improving health system navigation and providing a convenient alternative for receiving care.
- Clinician and patient acceptance and adoption of virtual care are increasing — in particular, the use of online triage tools to direct patients to the right levels of care, diverting appropriate cases away from overwhelmed acute care resources.

Obstacles

- Current systems are designed predominantly for low-acuity primary care visits and patient triage, restricting adoption to these care settings.
- A number of barriers impact clinician acceptance and adoption of digital clinical encounter solutions. These include concerns about safety and efficacy, and the perceived negative impact on the clinician-patient relationship.
- Legal and compliance risks, as well as the lack of a dedicated funding stream for digital clinical encounters, are also hampering adoption.

User Recommendations

- Increase clinician awareness and acceptance by running targeted educational campaigns focusing on how digital clinical encounters can support increased access to care across high-demand clinical areas.
- Scale implementation through pilots and proofs of concept (POCs), starting with low-complexity, high-volume encounter types.
- Measure the success of pilot implementations through a comprehensive benefits management plan that includes patient and clinician satisfaction, in addition to clinical outcome measures.
- Minimize potential legal ramifications by working with risk management, legal and clinical leadership in establishing an enterprise governance framework for digital clinical encounters.

Sample Vendors

98Point6 Technologies; AdviNOW; Babylon; Bright.md; Intellivisit; Visiba Care; Zipnosis

Gartner Recommended Reading

[Use Gartner's Virtual Care Maturity Model to Transform Care Delivery](#)

[Quick Answer: How to Address Digital Health Equity Across Virtual Care Initiatives](#)

Next-Generation Contact Center

Analysis By: Barry Runyon

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

The health system contact center connects the community with patients, providers and hospital resources. Conventional contact centers use purpose-built software and technologies, such as interactive voice response, paging, private branch exchange integration, on-call scheduling and unified communications. The next-generation contact center employs high-quality provider directories, CRM, social media integration, secure messaging, behavioral analytics, AI and total experience capabilities.

Why This Is Important

The healthcare provider business has become increasingly competitive as hospitals seek meaningful and impactful ways to engage with patients, consumers, caregivers and community clinicians. The enterprise contact center (or call center) is often their first introduction to the health system. Health systems have begun recognizing the contract center's potential to streamline communications, enhance the consumer experience, increase network utilization and reinforce a positive brand image.

Business Impact

The next-generation contact center expands the scope and impact of the conventional healthcare provider contact center. It can enhance a health system's image and brand reputation by improving the convenience and quality of constituent interactions — between consumers, patients, providers, community clinicians and the health system. The next-generation contact center can positively impact patient acquisition and retention, marketing campaign effectiveness, and key performance measures.

Drivers

- Organizations are investing more in their consumer and patient experience, and retention strategies for growth, while focusing on employee experience strategies to compete for scarce talent.
- Increased industry interest in total experience concepts and technologies pushes healthcare provider leadership to engage consumers in novel ways.
- New channels and touchpoints to communicate and collaborate on care are critical to navigating today's complex and disjointed healthcare delivery system.
- Organizations seek to improve the contact center efficiencies (e.g., decrease costs by consolidating multiple point solutions); address workforce issues (e.g., enabling greater automation to combat labor shortages); and allow work from home by moving away from legacy on-premises solutions.
- The emergence of interoperable application ecosystems (IAEs), such as care team collaboration, patient throughput, and capacity management, has created unprecedented opportunities for the next-generation contact center integration into these IAEs.
- Advances in interoperability, data science, machine learning (ML)/AI, speech analytics, computing at scale and social media integration have accelerated next-generation contact center interest and product development.

Obstacles

- Conventional call or contact centers are comfortably nestled within the healthcare provider. They are difficult to dislodge and often accompany healthcare provider leadership's "good enough" attitude.
- Point investments in patient engagement, behavioral analytics and CRM have already been made without the benefit of an overall community engagement strategy.
- Legacy integration challenges, interoperability immaturity and lagging adoption of Health Level Seven (HL7) Fast Healthcare Interoperability Resources (FHIR) impede next-generation contact center application and workflow integration.
- Confusing and misleading vendor messaging obfuscates the next-generation contact center value proposition.
- Enterprise resistance to potential workflow and process changes accompanies next-generation contact center adoption.

User Recommendations

- Revisit the contact center's strategic role within the enterprise, seeking opportunities to engage consumers, patients, caregivers, family members and community clinicians more meaningfully.
- Improve channel-based constituent engagement by investing in total experience, focusing on personalization and experience orchestration that addresses consumer and employee needs.
- Investigate sentiment and customer journey analytics to advance your personalization capabilities and your ability to deliver on the motivations and expectations of your consumers.

Sample Vendors

Change Healthcare; Healthgrades; PerfectServe; Spok; Syllable; Talkdesk

Gartner Recommended Reading

[Predicts 2023: Changing How Healthcare Provider Services and Operations Are Delivered](#)

Blockchain Platforms for Healthcare

Analysis By: Gregg Pessin

Benefit Rating: Transformational

Market Penetration: Less than 1% 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 healthcare, blockchain can facilitate the secure exchange of health information.

Why This Is Important

Blockchain platforms are the foundation on which blockchain applications are built and managed. The key aspects of blockchain — distributed ledger, immutability, transparency, tokenization and support for smart contracts — are implemented through blockchain platforms. The potential of this technology to transform economic interactions could impact the health value chain, regulators, suppliers and consumers.

Business Impact

Blockchain can enable efficiency when reaching new customers, extending relationships with supply chain partners, and offering better quality and more complete linkages between events and data. Blockchain has the potential to expand the boundaries of healthcare by connecting industry systems of record directly to end users, without the burden of centralized control.

Drivers

- Leading enterprises are starting to realize that blockchain can address multiple problems that other technologies cannot. This includes the ability to audit and provide oversight of public fund distribution, delivery and use of healthcare incentives to change public action, and decentralized identity management for contact tracing.
- Development continues to progress in design, testing and piloting across the industries. Furthermore, it has gained more traction with the digital acceleration fostered by addressing the challenges brought about by COVID-19, including digital identity validation.

- Today, breakthroughs are few, with enterprise pilots concentrated on blockchain-inspired or distributed ledger technology (DLT) solutions.
- For the most part, market adoption has halted recently, as the industry continues to explore how blockchain can support business process efficiency improvements. Interest in metaverse implications for healthcare has sparked some new interest.
- As digital acceleration pervades all industries and the public sector, more attention is being paid to specific use cases that blockchain platforms can support, such as credentialing, document management and supply chain.

Obstacles

- Many CIOs realize that standard distributed database-style projects do little to sufficiently boost returns.
- The transformative nature of blockchain at a process, operating and business model level (decentralization and tokenization) implies the need to break and remold decades-old healthcare industry processes, relationships, systems, and structures.
- Most projects require cooperation among different entities, but achieving governance and cooperation across multiple enterprises is difficult.
- Adopting blockchain features and capabilities to provide business value requires enterprise process adjustments, which are disruptive to today's business processes. Adoption in healthcare continues to be very slow.
- The full scope of decentralization demands that the platform solve competing demands regarding cost, performance, compliance and security, while trying to match or better traditional features of enterprise software, including ease of use, developer support, reporting, and interoperability.

User Recommendations

- Track blockchain's market readiness in healthcare, and factor these trajectories into your strategic plans and investment timing. The most transformative and impactful applications will be oriented to ecosystem services with multiple organizations involved, and they will take longer to evolve.
- Differentiate the kinds of blockchain technology providers and disruptors by establishing a map of solution providers in your healthcare industry sector.
- Use Gartner's guidance (see [Guidance for Blockchain Assessments](#)) for identifying opportunities and apply the decision framework to determine the blockchain technology approach.
- Experiment with innovative trials using blockchain and be ready for setbacks, as additional use cases emerge and the technology continues to evolve.

Sample Vendors

Enterprise Ethereum Alliance; Hyperledger Foundation; R3

Gartner Recommended Reading

[Guidance for Blockchain Assessments](#)

[Quick Answer: What Is Blockchain?](#)

[Top Five Reasons CIOs Should Care About Blockchain](#)

Sliding into the Trough

IoT for Healthcare

Analysis By: Gregg Pessin

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Internet of Things (IoT) for healthcare is a collection of devices, applications, equipment, appliances and building systems that can connect, communicate, and interoperate within an ecosystem of smart things, using industry standards. IoT for healthcare is foundational to the real-time health system.

Why This Is Important

IoT for healthcare is foundational to digital business. IoT provides the digital representation of activities and events in the provider environment, enabling situational awareness. IoT facilitates automation and smart care venues, allowing providers to do more with less. IoT will positively impact healthcare providers' ability to deliver care more efficiently and cost-effectively. Connected things will drive revenue, and improve operational efficiency and asset utilization.

Business Impact

IoT for healthcare is a core enabler for healthcare provider digital transformation. IoT provides:

- Improved operations, productivity, efficiency, logistics and coordination.
- Optimized asset utilization, reliability, predictive maintenance and performance management.
- Enhanced remote monitoring in virtual care.
- Increased engagement among care providers, patients and caregivers.
- Improved care delivery and self-care for improved patient wellness, longevity, and quality of life.

- Enhanced security for physical assets and patient safety to reduce risk.

Drivers

IoT provides the required informational input that enables digitally transformed healthcare delivery organizations (HDOs). This collected data feeds systems that address core needs of the industry:

- The need to transition clinical operations to population health and value-based models.
- Requirements to transform the orientation of operations around the patient.
- The need to improve operational bottlenecks and the patient journey, which are addressable through the implementation of real-time situational awareness technologies.
- The need to reduce clinical and administrative costs.
- Fiscal pressure to capture revenue opportunities and create new business.

Obstacles

- Lack of security and privacy measures built into IoT devices creates an additional workload for IT departments.
- IoT populations generally cannot be centrally governed through device policies as other IT devices, such as endpoint computers and mobile devices.
- Internet of Medical Things (IoMT)/cyber-physical system (CPS) selection oversight, during the clinical device acquisition process, is not an IT function. This leaves critical decisions that impact IT to functional departments that may be unable to assess security, privacy and IT operational impacts.
- Creating a patient-centric view remains difficult due to the lack of IoT data standards. Combining multisourced data requires custom integration.

User Recommendations

- Build business cases with ROI extending across core business processes.
- Engage your customers in solution development and use prototypes to help explore opportunities.

- Ensure architecture teams can incorporate IoT across IT and operational technology (OT) technology stacks.
- Find opportunities to apply IT governance principles to IoT, where the daily operation of IoT lies outside of IT.
- Increase your capabilities to leverage big data cost-effectively.
- Plan to invest in skills and technology to support healthcare-specific IoT platforms and IoT software integration, data and analytics, and managed security solutions.
- Select your technology and service provider partners, based on their technology stack and partner network.
- Ensure end-to-end compliance of your IoT solution with local health information protection legislation.

Gartner Recommended Reading

[2021 Strategic Roadmap for the Real-Time Health System](#)

[Healthcare Delivery Organization IoT Scale Demands a Platform Approach](#)

[Use RTHS Principles to Guide Digital Transformation](#)

Community Resource Network Management

Analysis By: Mandi Bishop

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Community resource network management (CRNM) is an operational model that an entity (typically a payer, provider or government agency) adopts. CRNM aims to optimize the utilization of nonmedical services and ameliorate the effects of social determinants on health status and outcomes. CRNM components include analytics, integrated workflows, service provider directories, referrals management and outcomes measurement.

Why This Is Important

Most healthcare organizations have active health-equity-focused initiatives addressing social determinants of health (SDOH). However, most are limited in their scope and focus on a certain subpopulation or a single nonmedical determinant, such as food insecurity. Organizations have struggled to succeed at an enterprise scale that encompasses all needs. CRNM combines individual initiatives and integrates data and workflows across constituencies to address these needs at scale.

Business Impact

CRNM has the potential for transformative benefits such as:

- Transcending typical ecosystem boundaries to align partnerships and incentives across public health, healthcare organizations, social services, government agencies, community organizations, retailers, digital giants and other technology service providers
- Closing health disparities and advancing health equity
- Significantly reducing future morbidity and the cost burden for medically and socially complex members

Drivers

- SDOH represents 60% or more of the contributors to health outcomes and, by extension, medical costs. Healthcare organizations are under enormous pressure to control medical costs and are looking to implement and scale CRNM to reap the rewards of its transformational business and health benefit potential.
- The economic burden of health disparities is increasing. A 2023 study ([NIH-Funded Study Highlights the Financial Toll of Health Disparities in the United States](#)) funded by the U.S. National Institutes of Health (NIH) found that racial, ethnic and educational disparities collectively cost over a trillion dollars in 2018. Race-based inequities, alone, cost \$451 billion in 2018 — a 41% increase from 2014.
- The pandemic exposed the extent of global health inequities due to SDOH, underscoring SDOH's significance to population health. For example, a March 2022 study by the international poverty research organization Oxfam, based on excess death estimates, reports [COVID-19 Death Toll Four Times Higher in Lower-Income Countries Than Rich Ones](#). Women and children in low-income countries are disproportionately affected. On a per capita basis, deaths in low-income and lower-middle-income countries are 31% higher than in high-income countries.
- Hunger has serious long-term physical and mental health effects, and the pandemic has dramatically increased the population at risk. According to [The World Is at a Critical Juncture](#) by the Food and Agriculture Organization of the United Nations, up to 811 million people worldwide faced hunger in 2020. Nearly one in three people in the world did not have access to adequate food.
- The World Economic Forum in [Time to Act: Investing in Addressing Social Determinants to Improve Health](#) estimates that interventions addressing SDOH could reduce disease burden so much that they would add \$12 trillion to global GDP by 2040.
- This global moment creates an opportunity for innovators to get in front of overwhelming and growing nonmedical needs by establishing community service provider networks and funding mechanisms to sustain them.
- As executive support for and commitments to health equity and CRNM continue to increase, the investment will accelerate.

Obstacles

- There is not yet a proven business model for operating CRNM at scale across regions. Although it is integral for advancing population health outcomes and value-based care, sustainable funding to implement and maintain community resource networks and ensure service fulfillment is still elusive.
- Consumers will be alarmed by new processes and data sharing used to address leading determinants of health.
- Social service agencies are complaining of duplicative efforts to digitize community resource directories and referral processes. The “medicalization” of certain social services could make those services more expensive overall, especially in the U.S.

Analyst Notes: Accelerating investment is expanding the vendor solution offerings and CRNM process maturation. However, the lack of best-practice examples and outcomes for large populations and lagging standards for interoperable SDOH data exchange will remain barriers to scale. Thus, CRNM is sliding into the Trough of Disillusionment and we expect it to achieve mainstream adoption within five years.

User Recommendations

- Drive urgently improving coordination with community resources by promoting CRNM with your population health and consumer experience peers. Invoke analogies from established, core competency “referral networks” or from “provider network management.”
- Evaluate the current state of CRNM within your organization to establish a baseline for program participation and performance. Assign a business analyst to document the current state of community resource network integration within your organization. Identify use cases, user stories, pain points and opportunities for improved technical and process support.
- Form a cross-functional team of population health management leaders and IT partners from your organization to assess vendors for new implementations or for scaling new capabilities. Depending on your organization’s CRNM maturity, collaborate with the team to hold product demonstrations, establish a pilot, refine an existing implementation or scale to new markets.

Innovation in Practice:

- In 2023, Finland is scaling a governance approach that appoints “well-being services counties” to administer integrated health and social service programs. By the end of the year, there will be 21 such entities that will help standardize the integrated care approach nationwide. See [Wellbeing Services Counties Will Be Responsible for Organising Health, Social and Rescue Services on 1 January 2023](#).
- In late 2022, U.S. health insurance company Blue Cross Blue Shield of Massachusetts introduced a financial model rewarding healthcare providers for closing racial and ethnic disparities in care, which will encourage CRNM investments. See [Blue Cross Blue Shield of Massachusetts Signs Groundbreaking Value-Based Payment Contracts Incorporating Equity Measures](#).

Sample Vendors

Arcadia; Cedar Gate Technologies; Cityblock Health; Findhelp; Health Leads; Lightbeam Health Solutions; mPulse Mobile; Papa; Unite Us; WellSky

Gartner Recommended Reading

[Innovation Insight for Advancing Population Health With Community Resource Network Management](#)

[What Is the Relationship Between Health Equity and Social Determinants of Health?](#)

[Use Social Determinants of Health Analytics to Inform Health Equity Strategy](#)

Wayfinding for Healthcare

Analysis By: Gregg Pessin

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

In their most basic form, wayfinding systems indicate where a user is currently located, provide a way to identify a destination, and provide detailed and continuously updated directions on how to get there. Wayfinding for healthcare enhances the value, scope and convenience of conventional wayfinding, with real-time location data, situational awareness and contextual insight to guide users (i.e., patients, family members and visitors) through their healthcare journey.

Why This Is Important

Most hospitals have complex floor plans that can create frustration for patients and visitors trying to find their way. Navigating a hospital or medical center campus should be as easy and convenient as finding your way around a shopping mall. Implementing an integrated wayfinding solution in an “experience” economy that includes consumer and patient location context is fundamental to creating engaging and memorable experiences.

Business Impact

Wayfinding for healthcare:

- Is critical for attracting, engaging and retaining patients by making their health journey easier. It solves the fundamental problem of navigating the physical care delivery world.
- Helps understand and optimize patient flow, queue management and care delivery processes.
- Supports referral management processes through improvements in patient navigation and retention.
- Engages patients in a way that enhances their healthcare journey and experience.

Drivers

- Improving patient engagement through reduced patient stress, anxiety and wait times. In addition, streamlined access to everyday destinations (cafeteria, gift shop and pharmacy).
- Improving employee engagement through decreased staff time spent providing patient directions.
- Creating operational efficiencies by optimizing patient and clinical workflows.
- The need to digitally transform the healthcare delivery organization (HDO) by demonstrating capabilities for digitally enabled consumer-centric experiences. In addition, this technology is used as an onramp to the real-time health system (RTHS).

Obstacles

- The value delivered by an enhanced patient experience may be difficult to quantify when establishing a business case or calculating a hard ROI.
- Facilitieswide infrastructure requirements for a fully successful wayfinding implementation are challenging due to large campus locations with a mix of facilities, such as parking garages, clinics and hospitals.
- Data streaming can be complex due to infrastructure constraints like multigenerational construction with poor wireless transmissibility.
- HDOs conflate wayfinding with other geospatial data technologies, such as real-time location systems (for example, asset and people tracking), which can mask its differentiating value.

User Recommendations

- Examine ways to use wayfinding technologies to sense, collect, correlate, analyze and act upon event information, to guide patients from their homes to the provider facility — throughout their entire continuum of care.
- Use wayfinding to make it easy, convenient, and less stressful for patients and consumers to access care and common provider locations, particularly in complex and multifacility campuses. This technology is one way providers can bring consumers to their digital front door.
- Watch for and measure the impact wayfinding technologies have on delivering a positive and memorable consumer and patient experience.
- Technologies, such as Bluetooth low energy (BLE), have been applied to wayfinding, improving accuracy and affordability, and simplifying implementations — look for these solution alternatives.

Sample Vendors

Everbridge; Eyedog Indoor Navigation; Gozio; Inpixon; Pole Star; Purple Health; Wifarer

Gartner Recommended Reading

[2021 Strategic Roadmap for the Real-Time Health System](#)

[Use RTHS Principles to Guide Digital Transformation](#)

[Magic Quadrant for Indoor Location Services](#)

Consumer Journey Analytics in HCLS

Analysis By: Kate McCarthy, Faith Adams

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Consumer journey analytics is the process of building a complete understanding of a healthcare and life science (HCLS) consumer's journey, and using analytics to optimize the value of that journey. Consumer journey analytics collects data by tracking and analyzing the way consumers interact with their health and wellness over time.

Why This Is Important

HCLS organizations continue to accelerate the use of digital touchpoints for consumer engagement. These member, patient, provider and clinical trial participant journeys yield vast amounts of information that can be used to construct and analyze the consumer's experience. Consumer journey analytics enable HCLS CIOs to analyze and optimize consumer experiences across engagement touchpoints.

Business Impact

Healthcare and life science organizations stand to benefit from customer journey analytics due to:

- Higher customer satisfaction from seamless, personalized interactions across touchpoints.
- Increased visibility into consumer interactions.
- Better allocation of investment in functionality and capabilities for each engagement touchpoint.
- Refined consumer segments that increase the effectiveness of campaigns.
- Improved data-driven personalization that gives a more complete view of the consumer.

Drivers

- Consumer journey analytics is an essential tool for optimizing and personalizing HCLS consumer journeys. Leading HCLS organizations are increasingly using it to improve the attraction, conversion and activation of members, patients, providers, and clinical trial participants.
- In recent years, several tools and techniques for assessing and reimagining consumer experiences have gained significant adoption in healthcare. These include persona development, voice of the customer applications and journey mapping. The output of these efforts among leading organizations has helped foster an enterprise understanding of both the current and target state vision of consumer experience.
- Consumer journey analytics yield valuable insights into an HCLS consumer's needs and preferences. This enables the identification of the next best action for the consumer and the appropriate nudge to encourage the consumer to take this action, through analysis of data collected from engagement touchpoints. These touchpoints include human interaction (call centers, care manager, provider encounters), digital (websites, mobile, voice, wearables), assisted help (live chat and co-browsing) and virtual care.
- HCLS organizations can obtain increased revenue tied directly to satisfaction measures, medical risk and channel utilization.
- They can gain a better understanding of how improvement in experience relates to improved clinical and financial outcomes.
- They can also gain a direct line of sight into how the following are either supporting or preventing the ideal customer journeys — business partners within the sector (e.g., physician to physician), business partners across sectors (e.g., retail clinics and payers providers) and business partners across industries.

Obstacles

- HCLS organizations lag other industries in their use of consumer journey analytics. While comparable benefits are available to the industry, the complexity of HCLS journeys, continued dependence on face-to-face interactions, and the vast amount of data required remain barriers to widespread use and adoption.
- HCLS IT business leaders fail to use the minimum necessary touchpoints to build complete consumer analytics.
- Lack of data fluidity across siloed systems adds complexity to implementation and execution of journey analytics.
- HCLS organizations are overly reliant on today's legacy systems, such as electronic health records (EHRs) and core administration platforms. These technologies slow down progress in advancing both touchpoints and consumer journey work. As a result, this year, the innovation advanced further into the Trough of Disillusionment with two to five years before reaching maturity.

User Recommendations

- Adopt a total experience approach to address the insights employees need to support diverse healthcare and life sciences consumers.
- Prioritize projects that gather and analyze consumer journey data within new digital products and services.
- Examine opportunities to implement consumer journey analytics as a part of digital projects that transition call volumes from a call center.
- Use agile analytics approaches to quickly pilot consumer journey analytics for important personas. This will give business and IT leaders a sense of what is possible, and will guide investments in capabilities.
- Use consumer journey analytics to build a longitudinal understanding of consumer experience that includes encounters with other enterprises (e.g., external specialists); interactions with healthcare industry sectors (e.g., out-of-pocket costs for a procedure, life science patient support programs); employers (e.g., wellness incentives); social media; and consumer wearables.

Sample Vendors

[24]7.ai; Adobe; Genesys; Mercury Healthcare; Salesforce; SAP; Teradata; Virgin Pulse

Gartner Recommended Reading

[Emerging Technologies and Trends Impact Radar: Customer Analytics for Customer Experience](#)

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

[Quick Answer: How Can U.S. Payers Overcome Consumer-Centric Product Complexity to Grow Revenue?](#)

[Where to Find Data to Inform Customer Experience Personas and Journey Maps](#)

Healthcare Consumer Persuasion Analytics

Analysis By: Kate McCarthy, Faith Adams

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Healthcare consumer persuasion analytics uses consumer, clinical, experiential, engagement, social, environmental and behavioral data to derive and understand needs and preferences, key motivators and influencers of individual health behaviors and outcomes. It combines this insight with advanced analytics technologies and data sciences to identify techniques and tactics to persuade consumers to undertake actions that benefit their individual health.

Why This Is Important

Consumer persuasion analytics have potential to break through one of the biggest hurdles in the improvement of health outcomes — how to change behavior within individuals who may be uninformed, unmotivated or biased against changing unhealthy behaviors. Though this technology is in its early stages within HCLS, the use of similar technology within other consumer-oriented industries, such as retail and entertainment, has demonstrated success in nudging consumer behavior.

Business Impact

We expect the efforts of digital therapeutic companies, and the wellness and chronic care management efforts of HCLS organizations, will demonstrate the value of persuasion analytics within the next five years. Factors like use case and level of customer understanding will influence maturity and results. This trend is evidenced by progressive organizations investing in leaders to direct behavioral change and economics.

Drivers

- The increased use of digital touchpoints has driven HCLS organizations to invest in solutions that enable them to leverage persuasion techniques effectively.
- Estimates vary, but [according to research published by the U.S. National Institutes of Health](#), consumers' physical environments account for up to 10% of health outcomes, while clinical care accounts for up to 20% of outcomes. Health behaviors account for 30% of outcomes, and social/economic factors account for 40% of outcomes. These health determinants matter more as value-based care programs shift risk and modify business model incentives.
- Population health and consumer health risk models, or chronic condition management such as obesity and diabetes, require more effective consumer behavior interventions and modifications. HCLS organizations and public health agencies seek to become as sophisticated as other consumer-oriented industries in analyzing consumer data that helps uncover both root causes of human behavior and effective nudges to change it.
- The ability to influence behavior and motivate action will be the key to transformative long-term management of cost and quality outcomes, while also improving consumer satisfaction.
- Life science and startup company growth is observed in the creation of digital therapeutics that capitalize on behavioral science. We also see interest among healthcare providers that are embracing value-based care models, and within healthcare payers who are using persuasion analytics to nudge members to undertake preventative, wellness and risk assessment activities.
- There have been demonstrated successes. For example, gamification with continuous monitoring to encourage diabetics to smooth out their A1C levels during the day has helped reverse Type 2 diabetes.
- This year, this profile continues further into the Trough of Disillusionment as adoption increases, but the anticipated behavior change and results don't always follow. It is expected to reach maturity in two to five years.

Obstacles

- While there is progress deploying consumer persuasion analytics that can successfully identify and nudge people to take a next best action, HCLS adoption continues to lag more mature industries, like retail and banking.
- Most HCLS companies lack sufficient data elements on their own to effectively build persuasion analytics, and struggle to scale digital behavior change, due to insufficient technologies and processes.
- Progress will be hindered by digital ethics issues that complicate the use of healthcare data for persuasion.
- We expect the complexity of persistently influencing consumer behavior over their journey will delay the maturity of healthcare consumer persuasion analytics technologies.
- Many organizations find legacy environments limiting, given the volume and velocity of data necessary to make persuasion analytics successful.
- Emotion AI and large language models like ChatGPT are apt to be more effective than consumer persuasion analytics, and will ultimately replace these solutions.

User Recommendations

- Evaluate your legacy platforms and architectures to determine the best deployment strategy. Persuasion analytics can be deployed through a variety of platforms, including EHR, CRM, MXDP and marketing technologies.
- Begin experimenting with incremental solutions, while preparing for investment in enterprisewide data fabric.
- Identify opportunities for persuasion analytics by focusing on use cases that require incremental nudges and lead to measurable outcomes.
- Develop trials that exploit short-term opportunities, while establishing long-term potential for personalized engagement.
- Engage vendors with the data that combines epidemiology, economics and consumer behavior insights, as well as the data scientists who serve the same function.
- Raise organizational awareness by teaming with marketing on education and influence campaigns.

Sample Vendors

CareCentra; Happify; Indegene; Lirio; ProChange; Softheon; Thrive Global; Virgin Pulse

Gartner Recommended Reading

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

[U.S. Healthcare Payer CIOs Improve Member Engagement in Health and Wellness Programs](#)

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

Genomics Medicine

Analysis By: Reuben Harwood

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Definition:

Genomics medicine enables the use of genetic information for medical research and treatment (for example, diagnosis, therapy, risk management). It is a component of precision medicine and focuses on leveraging a patient's genomic data and clinical insights derived from it. Technologies include gene sequencing, variance calling, high-performance computing, AI-informed risk assessment and clinical decision support.

Why This Is Important

Genomics medicine is already saving lives, and its promise to improve health outcomes is driving adoption in healthcare. Upstream technologies supporting research and gene sequencing data collection are well-developed and yield increasing amounts of efficiency in genomics. Technologies that use genetic information in clinical care delivery are progressing toward delivering quick, reliable and actionable patient-specific insights.

Business Impact

Genomics medicine's business and population health impact is substantial and an essential component of precision medicine. The value of genomics medicine is demonstrated across multiple areas, including:

- Targeted therapies for cancer and rare diseases
- Accurate and patient-specific clinical diagnosis and treatment decisions
- Patient-genetics-based diagnostic tests to eliminate or reduce extra costs during treatment
- Precision care for prenatal and genetics-directed therapies

Drivers

- Next-generation sequencing (NGS) and third-generation sequencing (such as nanopore sequencing, single-molecule real-time [SMRT] sequencing) have enabled vendors to bring new capabilities at the end-user level, broadening the utilization of genetic information across multiple clinical specialties (such as chronic disease management) and beyond oncology.
- Achievement of key milestones has brought additional momentum to genomics medicine, such as the Broad Institute's launch of a \$1,000 sample-to-report clinical whole-genome sequencing service and the new Guinness World Record awarded to a team at Stanford University in California, U.S. for the fastest DNA sequencing at five hours and two minutes.
- Technology and services related to genomics are progressing as the cost of genomic sequencing decreases. Research has identified more practical uses in diagnosing and treating patients, for example, companion diagnostics that indicate an individual's likely receptivity to a specific medicine by measuring a specific genetic biomarker. Other uses of genomics range from genetic testing for rare and undiagnosed diseases, next-generation therapeutics including gene therapy and RNA therapy, testing for treatment receptivity, to precision cancer treatment.
- Adoption will continue to grow as researchers identify more correlations between genetic biomarkers and health, disease prevention and treatments. The adoption of electronic health records (EHRs) globally creates rich sources of health data ripe for epigenomic exploration.
- EHR vendors have begun incorporating discrete genomic data into the patient record, enabling genomics medicine via point-of-care pharmacogenomic clinical decision support (CDS).
- Data analytics, including AI and machine learning, now have great potential to aid in discoveries leveraging that data. For these reasons, we move this innovation further along on the Hype Cycle with five to 10 years to the mainstream.

Obstacles

- Translating genomic data into actionable clinical insights has required decades of research. However, the maturation of AI and machine learning approaches will accelerate the pace of scientific discovery and translation into clinical action.
- It is equally challenging to make this knowledge actionable by physicians. Many are not well-trained to incorporate actionable insight from genomics within their workflows.
- Although new genetic markers are constantly being discovered, they require frequent reanalysis of patients' sequencing data. This comes with high costs that hinder the development of new tests, drugs and therapies.
- Researchers, life science and healthcare providers demand more genomics information integrated into the EHR, including raw sequencing data, analysis and clinical recommendations. Interoperability remains a barrier to information exchange among scientists, providers, patients and families for collaboration and counseling.

User Recommendations

- Establish a surveillance process to stay updated with the practical use of genomics in diagnosis and treatment and the implications for IT. Initiate discussions with peers as to whether it is worth pursuing an in-house genomics center of excellence or outsourcing this function.
- Outline business process, compliance, laboratory, regulatory and IT implications when including genomics medicine disciplines for decisions about research, therapies and business opportunities, while ensuring patient privacy.
- Architect an IT infrastructure, inclusive of outside services, that supports the acquisition, storage, collaboration and analytics requirements demanded by genomic datasets and therapy delivery.
- Evaluate your EHR vendor for their plans to support genomics medicine needs. Determine if the EHR can record, store, secure and access genetic marker data from patients, and their ancestors and family members at the point of care.

Sample Vendors

DNAexus; Genedata; Helix; Igenbio; Illumina; L7 Informatics; NantHealth; Velsera

Gartner Recommended Reading

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

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

[Healthcare and Life Science CIO's Genomics Series: Part 2 — Formulating an Omics Vision](#)

[Healthcare and Life Science CIO's Genomics Series: Part 3 — Prioritizing Omics Investments](#)

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

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](#)

Top Tech Trend: Total Experience for Healthcare Providers

Healthcare Consumer Insight as a Service

Analysis By: Kate McCarthy, Faith Adams

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Definition:

Healthcare consumer insight as a service (HClaaS) refers to applications that accelerate organizations' consumer data and analytic capabilities. HClaaS is able to source data from multiple sectors or industries and employ advanced analytics techniques, to derive predictive or prescriptive health-related insight. These insights are computed in real time, at the individual and population levels, and delivered into a workflow application via APIs.

Why This Is Important

Healthcare and life science organizations must build consumer insight to drive increasing digital engagement. Today's enabling technologies, such as electronic health records (EHRs), claim systems and enterprise data warehouses are limited in their ability to drive relevant insights. Thus, CIOs are increasing investment in HClaaS as a way to establish more efficient paths to derive value from data.

Business Impact

HClaaS is valuable to healthcare and life science organizations because it drastically lowers the barriers to adoption for advanced analytics (including AI). It reduces the size requirement for many population health or care management use cases, where sufficient samples are needed to generate meaningful insight. Furthermore, it presents a less risky, more agile solution path for small analytics groups taking their first steps into consumer analytics and reducing impact to talent.

Drivers

- The applications that control healthcare workflows contribute to today's inefficiencies. EHRs, claims processing, revenue cycle management and care management applications universally lack the analytic deployment agility found in the best workflow systems across industries, such as digital commerce or logistics.
- HClaaS offers a mechanism to gain and apply the unique value of advanced analytics at the individual consumer level to critical healthcare workflows. It can alleviate the requirements of large datasets, integration of partner data sources, in-house data science talent, advanced analytics technology and decision hub architecture for putting predictions into workflow.
- In some cases, a middle ground of analytic marketplaces from industry cloud providers, commercial data resellers and public data aggregators will provide the best foothold for further progress.
- In the future, the HClaaS space is well-suited to becoming a "packaged business capability" in the model of the composable healthcare enterprise. HClaaS is especially important to small or midsize healthcare payers and providers that often lack internal resources to execute advanced data and analytic strategies.
- Early use cases for HClaaS will advance current analytic capabilities. For example, at-risk entities engaging in care management activities will replace their batch loads of "chase lists" and stratification scores with case-level API calls. These consumer risk and stratification scores will replace or supplement the scores often generated from conventional licensed predictive models.
- The addition of consumer and sociodemographic data will provide better targeting and intervention strategies, especially in addressing leading determinants of health and healthcare costs.

Obstacles

- There is little consistency in vendor offerings for HClaaS, which are available from diverse vendors, including EHRs, analytic platforms and martech solutions. Healthcare and life science organizations can struggle to identify the best solution for their needs.
- Data aggregation can be challenging for organizations with siloed, departmental-level data repositories.
- HClaaS delivered through martech are frequently limited to the marketing use case they are implemented to support, rather than being extensible to cross-enterprise use cases (care pathway management, care management, quality improvement).
- HClaaS continues to advance through the Trough of Disillusionment in acknowledgment of the enormous challenges any organization faces in delivering pervasive analytic insight into the most crucial healthcare workflows.

User Recommendations

- Evaluate HClaaS solutions as an emerging, and potentially crucial, component in their enterprise analytics strategy to accelerate or replace internally developed healthcare consumer analytics.
- Prioritize use cases that are experimental and stand to gain the most lift from multisector data sources combined with advanced analytics techniques, and that can be delivered directly into a workflow application.
- Differentiate next-generation care management by infusing analytics into workflows and applications.
- Meet with the chief medical officer or the chief medical informatics officer to discuss the care management use case and jointly attend an exploratory call with one of the representative vendors.

Sample Vendors

Cotiviti; Decision Point; EarlySign; HMS Networks; LexisNexis; Softheon (NextHealth Technologies)

Gartner Recommended Reading

[Innovation Insight for Continuous Intelligence](#)

Innovation Insight for Consumer Experiences in Healthcare and Life Sciences

Deliver Business Outcomes for Customer Analytics With Our Practical Data and Analytics Strategy and Operating Model

Climbing the Slope

CRM in HCLS

Analysis By: Kate McCarthy, Faith Adams

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

CRM systems facilitate, support and enable relationships with individuals by planning, tracking, recording and delivering moments of engagement. CRM capabilities across healthcare and life sciences (HCLS) are a feature of multiple systems including marketing, patient and member engagement, claims payment, provider network management, clinical trial management and commercial operations as well as independent CRM systems.

Why This Is Important

CRMs create and support building relationships with individuals over multiple communication touchpoints, episodes of care and settings. Investments in CRM systems continue to accelerate as many healthcare organizations seek to improve consumer engagement initiatives. Advanced healthcare organizations are recognizing the proliferation of CRM systems and have begun adopting an enterprise approach to CRM deployment by implementing consolidated CRM platforms.

Business Impact

Healthcare CRMs offer a seamless user interface that incorporates diverse datasets and orchestrates touchpoints for intelligent consumer engagement. CRMs make it easier to attract and engage members, patients, providers and trial participants. Organizations that deploy CRM observe increased consumer satisfaction scores and reduced complaints. They can also improve chronic disease and population health management outcomes by ensuring visits at appropriate intervals.

Drivers

- CRM has advanced from a tool to engage individuals in wellness, prevention and chronic care management to a must-have enabler of stakeholder engagement, for instance, donor relations. The attraction, conversion and retention capabilities of CRM systems have become a minimum requirement for competitive healthcare organizations.
- There is demand for systems that can create a 360-degree view of the healthcare consumer. This is the benchmark for other highly consumerized industries that HCLS organizations aspire to emulate.
- CRM can help lower costs and improve outcomes by enabling engagement across touchpoints for healthcare consumers as they traverse wellness, prevention and chronic care management efforts.
- CRM enables improved relationship management and total experience. In healthcare, CRM can enable a variety of relationships. It can optimize delivery networks through the management of provider relationships and interactions and enable precision marketing efforts to attract and convert consumers for specific service lines or facilities.
- When successfully deployed, CRM enables deeper relationships with affiliated physicians, business partners, suppliers and benefactors, as well as improved recruitment and retention of patients as they navigate complex healthcare ecosystems. CRM can also improve the employee experience by providing better tools and touchpoints to do their jobs.
- The growing importance of AI bots, RPA and speech interfaces accelerates the need for a CRM system to document and manage an increasingly digital relationship with consumers. The use of AI and machine learning (ML) enables the analysis of engagement across the multiple communications channels, care settings, episodes of care and business partners that are part of the health journey. AI allows healthcare organizations to gain unprecedented insight into the behavior of healthcare consumers and how to influence them.

Obstacles

- Integrating CRM into legacy systems, such as electronic health records (EHRs) and core administration platforms, is challenging and can result in unnecessary data replication and cost.

- Many organizations already have CRM for marketing or other programs and struggle to reconcile multiple environments, often with multiple vendors.
- Full-stack CRM solutions are at risk of becoming the next monolith and are often cost-prohibitive to organizations with essential, high-cost legacy technologies, such as an EHR.
- Increasing numbers of organizations are considering next-generation, AI-based technologies in place of a full-stack CRM such as Microsoft, Nuance Communications and Epic Systems partnership around GPT-4.
- Healthcare organizations continue to accelerate the adoption of CRM solutions. We advance this profile up the Slope of Enlightenment with maturity expected in the next two years.

User Recommendations

- Identify opportunities to use CRM whenever a relationship must be established, such as in chronic disease management, sales and provider network management.
- Reduce the risk of having multiple systems attempting to manage a relationship with a consumer by creating a framework for longitudinal relationships that harmonizes engagement across an increasing number of disparate CRM systems.
- Leverage an implementer, such as a systems integrator (SI), that has demonstrated success with the vendor you have selected. This will ensure improved reconciliation of systems and processes and speed up time to value.

Sample Vendors

Creatio; Mercury Healthcare; Microsoft; Oracle; Pegasystems; Salesforce; Sequence Health; Veeva Systems; Zipari

Gartner Recommended Reading

[The Eight Building Blocks of CRM: Strategy](#)

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

[The Elusive CRM Magic Quadrant](#)

[Use Gartner's Generations Model in Planning Healthcare Consumer Engagement Initiatives](#)

OpenNotes

Analysis By: Sharon Hakkennes

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

OpenNotes is an initiative to give patients convenient access to their clinical notes stored within electronic health records (EHRs). This is accomplished through local healthcare provider initiatives — using a portal tethered to the EHR or a patient's preferred third-party application — or through regional and national initiatives that enable patient access to shared care records.

Why This Is Important

OpenNotes is an international movement, rather than a product. Clinical notes document the interactions that patients have with doctors, nurses and other clinicians, and make up the “story” of a person's healthcare. The types of notes made available to patients, the timing of release of notes, which roles are included and which clinical areas participate vary across health services and geographical regions.

Business Impact

OpenNotes supports improvements in healthcare delivery through greater information transparency. Many studies have demonstrated the value of OpenNotes in:

- Empowering individuals to become active participants in their own care
- Enhancing patient understanding of their health and medical conditions
- Increasing collaboration and trust between patients and clinicians
- Improving adherence to treatment and care plans (for example, medication management)
- Increasing the accuracy of clinical documentation

Drivers

- The 21st Century Cures Act's Interoperability, Information Blocking and the ONC Health IT Certification Program Final Rule, in effect, mandates adoption of OpenNotes in the U.S. The rule applies to all healthcare providers across all clinical settings. In October 2022, the restrictions were lifted that limited the required information for sharing to the United States Core Data for Interoperability (USCDI) data classes. As a result, patients now have the right to access, without delay, all of their electronic health information (EHI), including clinical, billing, enrollment, payments, claims adjudication and case management records.
- In other regions across the globe, government-led regulations and initiatives are driving adoption of OpenNotes. For example, in the U.K., general practitioners have until the end of October 2023 to ensure all patients have prospective access to their full health records (including free text). National e-health records have also been established in countries such as Australia, Austria, Denmark and Estonia.
- As adoption of OpenNotes grows, efforts are evolving to further enable communication and shared decision making between patients, their care partners (often, family members or close friends), and clinicians. For example, OurNotes is a shared documentation initiative in which patients compose and submit an interval history, goals and questions prior to their visits. Similarly, OurNotes for Care Partners is a care partner version of OurNotes. The aim is to identify care partners and assess their needs to enable delivery of care partner resources and support.

Obstacles

- Clinician resistance due to the perception that workloads will increase as a result of additional time required to write each note or to respond to increased communication from patients reading the notes.
- Clinician concerns that access to EHI may create undue patient anxiety due to misinterpretation of information or through access to distressing information, such as real-time patient access to laboratory and imaging test results.
- Lack of access to medical record information in an electronic format. This limits the adoption of OpenNotes for healthcare providers outside of the U.S., in geographies where EHRs have not yet achieved universal adoption.
- EHR systems vary in maturity in enabling OpenNotes initiatives, particularly in relation to providing controls required to restrict sharing for legitimate reasons, such as concerns over privacy or potential harm.

User Recommendations

- Position OpenNotes as a strategic priority by ensuring that transparency in data sharing is a core component of your organization's consumer engagement strategy.
- Enable seamless patient access to their EHI by partnering with your EHR and digital front door vendors to map current capabilities against your organization's requirements. Agree on a development roadmap for identified gaps.
- Address clinical concerns and minimize risks of adverse impacts to patients by developing policies and processes that exempt patients from online access to parts of their records where access would be detrimental to the individual.
- Maximize patient value derived through OpenNotes by establishing systems and processes to support patients in their access to and use of their EHI.

Sample Vendors

Altera Digital Health; Apple; CommonHealth; Epic; Evergreen Life; MEDITECH; OneRecord; Oracle Cerner; Patients Know Best (PKB)

Gartner Recommended Reading

[Quick Answer: The Expanding Universe of Patient Safety Risks](#)

[Top Healthcare Provider HIPAA Questions and Answers](#)

Appendixes

See the previous Hype Cycle: [Hype Cycle for Consumer Engagement and Experience in Healthcare and Life Sciences, 2022](#).

Hype Cycle Phases, Benefit Ratings and Maturity Levels

Table 2: Hype Cycle Phases

(Enlarged table in Appendix)

<i>Phase</i> ↓	<i>Definition</i> ↓
<i>Innovation Trigger</i>	A breakthrough, public demonstration, product launch or other event generates significant media and industry interest.
<i>Peak of Inflated Expectations</i>	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.
<i>Trough of Disillusionment</i>	Because the innovation does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
<i>Slope of Enlightenment</i>	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.
<i>Plateau of Productivity</i>	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.
<i>Years to Mainstream Adoption</i>	The time required for the innovation to reach the Plateau of Productivity.

Source: Gartner (July 2023)

Table 3: Benefit Ratings

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

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

Source: Gartner (July 2023)

Evidence

¹ [2023 Edelman Trust Barometer, Special Report: Trust and Health](#)

² [Digital Minimalism – An Rx for Clinician Burnout](#), Nina Singh, B.S., Katharine Lawrence, M.D., M.P.H., Christine Sinsky, M.D., and Devin M. Mann, M.D.

Document Revision History

[Hype Cycle for Consumer Engagement and Experience in Healthcare and Life Sciences, 2022 - 27 July 2022](#)

[Hype Cycle for Consumer Engagement With Healthcare and Wellness, 2021 - 6 August 2021](#)

[Hype Cycle for Consumer Engagement With Healthcare and Wellness, 2020 - 12 August 2020](#)

[Hype Cycle for Consumer Engagement With Healthcare and Wellness, 2019 - 26 July 2019](#)

[Hype Cycle for Consumer Engagement With Healthcare and Wellness, 2018 - 20 July 2018](#)

[Hype Cycle for Consumer Engagement With Healthcare and Wellness, 2017 - 19 July 2017](#)

[Hype Cycle for Consumer Engagement With Healthcare and Wellness, 2016 - 13 July 2016](#)

[Hype Cycle for Consumer Engagement With Healthcare and Wellness, 2015 - 23 July 2015](#)

[Hype Cycle for Consumer Engagement With Healthcare and Wellness, 2014 - 31 July 2014](#)

Recommended by the Authors

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

[Understanding Gartner's Hype Cycles](#)

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

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

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

[Healthcare CIOs Must Turn Retailers' Care Delivery From Liability to Asset](#)

[Creating the Composable Healthcare Organization for Healthcare and Life Science CIOs](#)

[What Are Healthcare Organizations Looking For in a Total Experience Solution?](#)

[Drive Application Innovation Using CX CORE With Total Experience](#)

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Table 1: Priority Matrix for Consumer Engagement and Experience in Healthcare and Life Sciences, 2023

Benefit ↓	Years to Mainstream Adoption			
	Less Than 2 Years ↓	2 - 5 Years ↓	5 - 10 Years ↓	More Than 10 Years ↓
Transformational		Community Resource Network Management IoT for Healthcare Large Language Models in HCLS Total Experience for HCLS	Data Fabric in HCLS Digital Clinical Encounters Emotion AI in HCLS Genomics Medicine Industry Cloud Platforms Personalized Health	Blockchain Platforms for Healthcare
High	CRM in HCLS	Consumer Journey Analytics in HCLS Healthcare Consumer Persuasion Analytics Virtual Health Assistants	Next-Generation Contact Center Patient-Centered CDS	
Moderate	OpenNotes	Consumer Healthcare Wearables Healthcare Consumer Insight as a Service Medication Adherence Management	Immersive Technology for Care Delivery Wayfinding for Healthcare	
Low				

Source: Gartner (July 2023)

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Phase ↓

Definition ↓

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