

## Life Sciences Industry Technology Insights Primer for 2024

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By Analyst(s): Healthcare and Life Sciences Research Team

Initiatives: [Life Sciences Industry Technology Insights](#)

The life science industry continues pushing scientific boundaries to improve patients' lives. CIOs must leverage digital transformation to enhance the research, clinical development and commercialization of pharmaceuticals and medical devices, and streamline business strategy execution.

### Scope

This initiative covers life science sector trends and technologies to drive innovation, plan for the future, and create value from new business and operating models.

Topics in this initiative include:

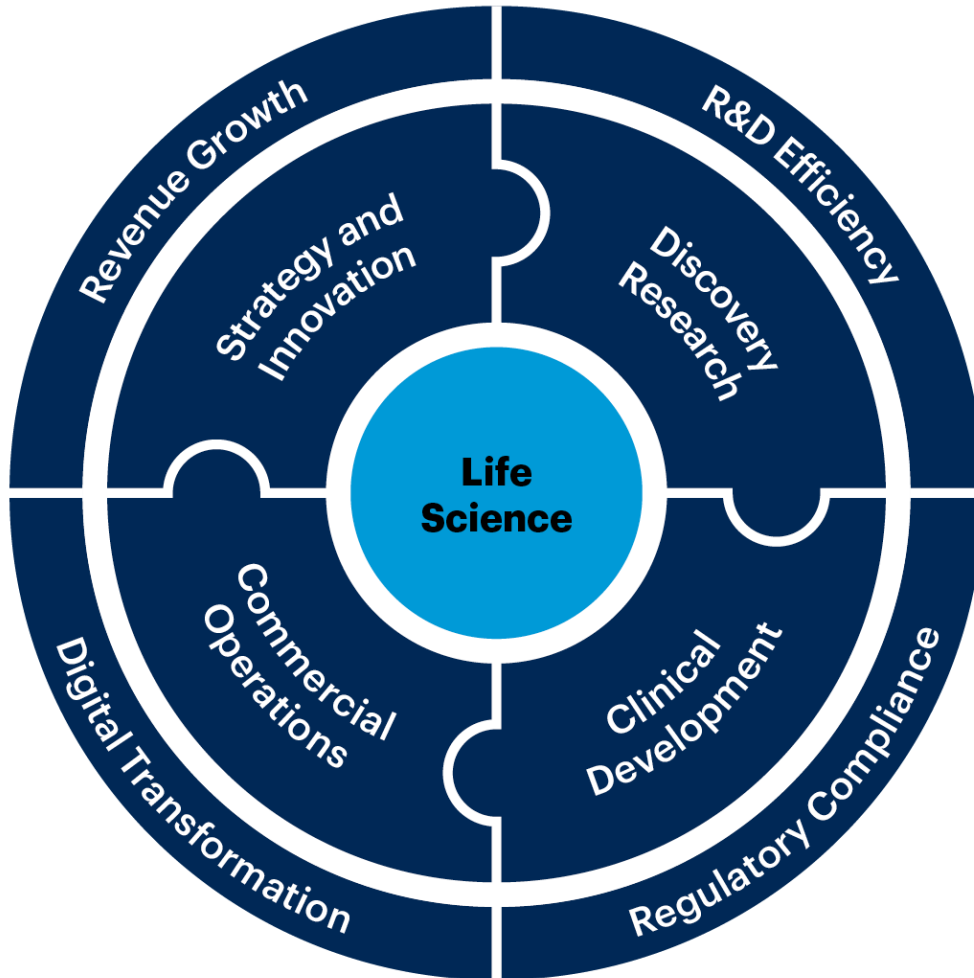
- **Strategy and Innovation:** Transform life science through an adaptable digital strategy that leverages new and emerging technologies to support innovative therapeutics and medical products and enable new business models.
- **Discovery Research:** Unearth scientific breakthroughs by implementing cutting-edge informatics platforms, advanced analytics, AI-powered insights and collaborative data platforms to transform exploration into precise innovation.
- **Clinical Development:** Develop best-in-class technology strategy and operations by leveraging game-changing technology, IT governance best practices, and the solution vendor ecosystem to accelerate and optimize clinical development outcomes.
- **Commercial Operations:** Explore best practices, strategies and core capabilities from all facets of life science commercial operations, including people, processes, platforms and vendors to drive optimal commercial outcomes and business growth.

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## Analysis

Figure 1: Life Science Industry Technology Insights Overview

### Life Science Industry Technology Insights



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In the rapidly evolving landscape of life science (such as pharmaceuticals, biotechnology and medical device organizations), technology innovation plays a crucial role. Breakthroughs in biotherapeutics, alongside advances in data science and digital technologies, present massive opportunities for industry disruption. Industry challenges continue with adapting legacy processes to novel therapeutics such as gene therapies, connected medical devices and digital therapeutics. Moreover, the industry is facing rising data volumes and the need for accelerated insights, as well as ongoing changes to regulatory and privacy regulations. Missteps often slow progress and give competitors advantages.

CIOs must navigate this technology-driven race and utilize disruptions to benefit their organizations. The 2024 Gartner CIO and Technology Executive Survey indicates that 79% of respondents expect to increase investment in business intelligence/data analytics and 77% expect to increase investment in artificial intelligence/machine learning. <sup>1</sup> Organizations successfully integrating transformative technologies will also realize new levels of efficiency and effectiveness, leveraging AI and hyperautomation across drug discovery, clinical development, manufacturing and commercialization. Additionally, hype around generative AI (GenAI) has surfaced key areas for improvement in digital infrastructure and data management capabilities to fully harness innovations.

This initiative supports CIOs as they prepare their organizations for major in-progress and emerging changes, and guides them to deliver tangible value in R&D optimization, operational efficiencies and business growth.

## Topics

As custodians of data and technology, life science CIOs enable R&D discoveries, accelerate clinical trials, boost manufacturing productivity, and provide commercial insights that improve patients' lives and drive business growth. By proactively monitoring innovations in AI, automation, cloud and advanced analytics, CIOs can design flexible architectures to rapidly deploy new solutions for greater speed, efficiency and compliance across the product life cycle. Building bridges across IT and the business fosters a collaborative culture of digital transformation that positions the organization for continued innovation and growth.

Our research in this area addresses the following topics:

## Strategy and Innovation

Success in today's increasingly competitive and fiscally constrained life science industry environment requires an IT strategy that embeds business strategy and clearly defines the role that information and technology will play in accomplishing organizational strategic objectives. Stay abreast of new and emerging technologies, continuously adapting this strategy, in order to support product innovation in a highly regulated environment and enable new business models.

### Questions Your Peers Are Asking

- What key life science industry dynamics and trends should shape our enterprise and digital strategies?
- What emerging technologies and innovations will enable life science transformation?
- What data, analytics and AI strategies can organizations deploy to maximize business outcomes?
- How do we respond to rapidly changing business needs through a digital life science platform architectural approach?

### Recommended Content

🔒 Some recommended content may not be available as part of your current Gartner subscription.

- [Infographic: 2024 Top Technology Investments and Objectives in Life Sciences](#)
- [Innovation Insight for Digital Life Science Platforms](#)
- [2023 Life Science Business Drivers of Technology Decisions](#)
- [Use-Case Prism: Generative AI for Life Sciences](#)

## Planned Research

- Vision for the future of life science — and the CIO's role in its realization
- Insights into emerging and disruptive life science technologies, including Hype Cycle technology trends
- Survey data on the shifting priorities, objectives, technology investments and more of life science CIOs
- Key life science data, analytics and AI trends and use cases

## Discovery Research

Integrating advanced technologies into discovery research requires a strategic and collaborative approach. Advanced computational tools, in-silico research approaches, and data, analytics and AI empower scientists, enabling virtual simulations and predictive modeling. At this intersection, where science and technology are intersecting, trailblazing organizations are taking advantage of the opportunity to accelerate target discovery, enhance research efficiency and fortify laboratory informatics infrastructure for innovative drug development.

## Questions Your Peers Are Asking

- What key life sciences trends should shape my R&D strategy?
- How should we evaluate and select life science R&D-focused solutions and vendors?
- How do we apply data, analytics, and AI to deliver research efficiency and innovation?
- How should we support the development of next-generation therapeutics?

## Recommended Content

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- [4 Imperatives to Resolve the Data Bottleneck for AI Drug Discovery](#)
- [Quick Answer: How Is AI Being Used in Preclinical Drug Development?](#)
- [Emerging Tech: Tech Innovators for Generative AI Novel Drug Discovery](#)

## Planned Research

- Revolutionizing laboratory workflows with leading-edge laboratory informatics solutions aligned to a lab of the future strategy
- Facilitating the shift to in-silico-first research approaches to accelerate preclinical drug discovery
- Accessing, harmonizing and analyzing multimodal biomedical data to enable machine learning-based approaches

## Clinical Development

Cost and complexity of clinical trials continue to escalate. Life science organizations are looking to improve efficiency and optimization of clinical development across trial operations, data analysis, regulatory compliance, clinical quality and safety. Clinical development is being supercharged by advances in platforms, AI, automation and real-time data for informed decision making. With advances in the digitalization of clinical processes, leading biopharma organizations are generating robust evidence to ensure comprehensive safety and efficacy assessments — laying a foundation for successful regulatory submissions.

## Questions Your Peers Are Asking

- What regulated technologies should we be in now, and in the future, to optimize clinical development efficiency?
- How do we manage the opportunities of exploiting disruptive trends and technologies in a highly regulated industry?
- How can we leverage life-science-specific ecosystem partners to provide new capabilities, products, services and interactions?

## Recommended Content

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- [Life Science CIOs, Accelerate Clinical Development With New Applications of Artificial Intelligence](#)
- [Life Science CIOs: Build a Foundation for Highly Effective Trial Participant Recruitment](#)

- [Quick Answer: How Can Life Science CIOs Maximize Trial Recruitment Vendor Capabilities?](#)
- [Navigate a Path to Digital With the Life Science Clinical Development Landscape and Definition of Terms](#)
- [Life Science CIOs Reduce Runaway Costs With Innovative Safety Vigilance Technology](#)

## Planned Research

- Examining new digital trial modalities with a hyper focus on trial subjects, expanding the window of research insights with continuous monitoring technologies and following patient lives post-trial by leveraging real-world data
- Reviewing the state of regulatory automation and content development, and exploring disruptive technologies that will make regulatory and safety data and content flow continuous and collaborative
- Looking at the state of digital transformation in life science development, and establishing a maturity model for digital organizations to enable life science companies to self-assess and support roadmap planning to drive digital excellence

## Commercial Operations

The landscape of commercial operations in life science is evolving – encompassing business areas such as sales, marketing, market access, medical affairs, patient engagement and digital therapeutics. Trends are essential to identify and understand, and strategies, technologies and best practices are crucial for successfully growing existing products and therapies, as well as launching new ones. Strategies, platforms and ecosystems are driving superior patient and customer engagement, highlighting the importance of harnessing the power of analytics, AI and data insights to achieve commercial outcomes.



## Questions Your Peers Are Asking

- What trends in the life sciences industry will transform commercial strategies and pave the way for novel business and operational models?
- How can we institute a digital strategy that promotes innovation in drug launches, agility in response to market dynamics, and drives superior patient and customer engagement?
- How can we leverage technology and innovation to optimize commercial outcomes and align with strategic imperatives?
- How should we leverage analytics, AI and data insights to strengthen our market position and enhance our decision-making processes?
- How should we accelerate manufacturing innovations to support product success in the market?

## Recommended Content

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- [Life Science CIOs: Embrace Personalization to Transform the Healthcare Provider Experience](#)
- [Life Science CIOs: Reinvigorate Your D&A Capabilities With a Modern Commercial Intelligence Platform](#)
- [Change Organizational Mindsets to Succeed With Modular Content in Commercial Life Sciences](#)
- [Infographic: How to Start Building Dynamic Personas for Life Sciences](#)

## Planned Research

- Investigating emerging trends and innovations that are shaping commercial strategies and execution models
- Developing frameworks for implementing effective strategies in therapeutic or product launches and market responses as well as enhancing patient, payer and provider engagement
- Analyzing the role of technology and innovation in optimizing sales, marketing and other commercial business functions – and aligning them with organizational goals
- Exploring the use of analytics, artificial intelligence and data insights in bolstering market positioning and informing strategic decisions
- Assessing manufacturing innovations and their impact on product success in the market, from development to distribution

## Suggested First Steps

- [Tool: Life Science CIO's Executive Presentation for Building the Composable "Digital Therapeutech"](#)
- [Your Lab of the Future Strategy Must Enable Life Sciences Digitalization](#)
- [Top Healthcare and Life Science Technologies – Gartner Symposium/Xpo Presentation](#)

## Essential Reading

- [Predicts 2024: Generative AI Brings New Value to Life Sciences](#)
- [Hype Cycle for Life Science Discovery Research, 2023](#)
- [Hype Cycle for Life Science Clinical Development, 2023](#)
- [Hype Cycle for Life Science Manufacturing, Quality and Supply Chain, 2023](#)
- [Hype Cycle for Life Science Commercial Operations, 2023](#)

## Tools and Toolkits

- [Tool: Gartner Essential Frameworks for Life Science Organizations](#)

## Evidence

<sup>1</sup> 2024 Gartner CIO and Technology Executive Survey. This survey was conducted online from 2 May through 27 June 2023 to help CIOs determine how to distribute digital leadership across the enterprise and to identify technology adoption and functional performance trends. Ninety-seven percent of respondents led an information technology function. In total, 2,457 CIOs and technology executives participated, with representation from all geographies, revenue bands and industry sectors (public and private), including 53 from life sciences. Disclaimer: The results of this survey do not represent global findings or the market as a whole, but reflect the sentiments of the respondents and companies surveyed.

## Related Priorities

Initiative Name	Description
<a href="#">HC Provider, Payer Life Sy Ind Ecosystem</a>	To compete and differentiate amid disruptive industry changes, organizations need strategies to respond with agility and create value from new business and operating models.
<a href="#">Healthcare Provider Technology Insights</a>	This initiative covers healthcare provider industry trends and technologies, enabling development and execution of digital strategies to deliver clinical and business value through digital investment.
<a href="#">U.S. Healthcare Payer Insurance Industry Insights</a>	This initiative focuses on staying ahead of U.S. healthcare insurance payer trends and dynamics to plan and execute on strategies that deliver business value through digital technologies.
<a href="#">Create Tech Solutions for the HC Provider Ind</a>	Use this initiative to support successful healthcare provider industry vertical product strategy, development and growth.

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<a href="#">U.S. Healthcare Payer Insurance Industry Insights</a>	This initiative focuses on staying ahead of U.S. healthcare insurance payer trends and dynamics to plan and execute on strategies that deliver business value through digital technologies.
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