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Tech Trends 2022 | Deloitte Insights

Tech Trends 2022

Life Sciences perspective

The technologies that enhance our organizations and our lives are more powerful (and more essential) than ever before. Forward-thinking life sciences organizations understand the technological forces that surround them and look for ways to harness them for the benefit of consumers and patients alike. On the pages that follow, we provide a life sciences–specific take on Deloitte's Tech Trends 2022 report, spotlighting the accelerating technology trends most likely to cause disruption over the next 18–24 months. We explore which trends may be most relevant as well as how ready life sciences organizations are to take advantage of them. From the rise of strategy and technology becoming inseparable to the rapidly disappearing boundary between the physical and virtual worlds, the trends we explore could have profound implications for business, life sciences, and society in the months and years ahead.

Tech Trends 2022
Peering through the lens of the life sciences industry

Relevance and readiness scale:
We reviewed each trend and assigned a value from one (low) to five (high) based on the trend's relevance and readiness to the biopharma and medtech segments.

Relevance:
How impactful would it be if biopharma and medtech organizations adopted the trend?

Relevance	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

Readiness:
How ready are biopharma and medtech companies to adopt the trend?

Readiness	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

Data-sharing made easy

For life sciences companies, data is the lifeblood of digital transformation. Both within and outside their walls, organizations are beginning to share noncompetitive, Health Insurance Portability and Accountability Act (HIPAA)-compliant data without privacy concerns using an application programming interface (API)-first approach. This strategy anticipates data-sharing across applications by design and allows for the standardized, programmatic connection of applications. The result? Organizations gain a secure foundation for interoperable data-sharing, both across the organization and as collaboration opportunities arise with partners, payers, patients, and providers.

Getting started

- **Build a foundation of trust:** Data-sharing platforms should facilitate trust among those who are collaborating—so that data is available, accurate, secure, easy to use, and is used appropriately.

- **Create a business case for data sharing:** For each collaboration, define a shared purpose that addresses data use, confidentiality requirements, and controls.

- **Address data privacy:** Put the proper governance, compliance, privacy, and security boundaries in place to share the right data, with the right people, at the right time. This includes a consent management plan that complies with applicable laws and regulations.

- **Tag your data:** Investigate tools to tag data type, sensitivity, and necessary controls.

Trend in action

In the biopharma sector, the real-time, secure, and rolling exchange of data between life sciences companies and multiple regulators—through cloud platforms—could streamline the application, submission, and approval process for new drugs. In fact, some large pharma companies have already come together to build such a cloud platform for exchanging data between sponsors and the US FDA.

On the medtech front, one company is using in-house R&D and manufacturing capabilities—and partnering with leading academic medical centers—to develop and test new digitally enabled care products that provide better patient experiences.

Relevance	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

| Readiness	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

> Data-sharing is just the tip of the iceberg to the broad span of potential value-added, data-driven services available to the life sciences industry—think eReferrals, ePrior Authorizations, and care plan collaboration, as well as workflow enablement across clinical, operational, and administrative functions. This is what Deloitte calls "Radically Interoperable Data," and it's poised to disrupt the health care and life sciences industries in many positive ways.
>
> **—John Conrad, principal, Deloitte & Touche LLP**

Cloud goes vertical

The life sciences industry initially deployed cloud processes for scalability—but the next frontier is industry-specific, cloud-enabled data, ecosystems, and services. Leading organizations are optimizing their cloud and data strategies to drive R&D, commercial functions, and patient engagement in three key ways:

- To share data and collaborate
- To power a digital ecosystem
- To provide feature-rich services for analytics, artificial intelligence, and machine learning
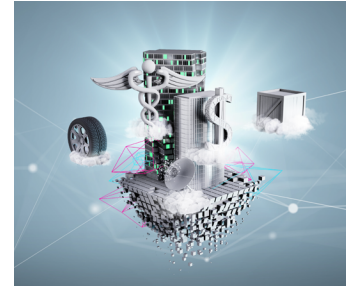
Getting started

- **Get business and IT on the same page:** IT and business leaders should collaborate to link business strategy with cloud-based solutions that can deliver wins across the organization.
- **Deepen partnerships with hyperscalers:** Hyperscalers continue to climb the technology stack—and offer ever-evolving industry-optimized platforms and business capabilities.
- **Manage data across the enterprise:** Consider "data-sharing neighborhoods" to generate cross-domain insights and to share data with regulators.
- **Embrace cloud services for automation, analytics, and machine learning:** Tap AI's power to drive insights and speed innovation and agility across the R&D value chain.

Trend in action

Traditionally, reporting patient adverse events (AEs) related to a life sciences company's products has involved a significant manual workload—capturing, entering, and reporting data to various global regulatory agencies. For one biopharma company, manual case processing, year-over-year increases in case volumes, an aging technology platform, and stagnant budgets resulted in an unsustainable business model and an unclear path forward. To address these challenges, the company established an end-to-end case processing automation system—featuring cognitive algorithms, artificial intelligence (AI), and data science to automate repetitive, less value-added data tasks. As a result, this company realized a 50% improvement in quality of the cases processed by the solution vs. cases processed by traditional means. The company was able to cut end-to-end case processing times in half, from 80–90 minutes per case to 35–45 minutes per case. The solution yielded a total cost savings of 60%-70% year over year. Total savings was dependent on case volume.

| Relevance	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

Readiness	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

> Life sciences companies are trying to win the digital race. Cloud technologies can significantly advance the organization's digital transformation—spurring collaboration, fueling innovation, and providing a competitive boost that puts select companies out in front.
>
> **—Raveen Sharma, managing director, Deloitte Consulting LLP**

Blockchain: Ready for business

For life sciences organizations, distributed ledger technologies (DLTs) are fundamentally transforming the nature of doing business across organizational and enterprise boundaries. Expect to see more companies using DLTs to integrate supply chains and share data using a single information superhighway. This process will bring competitors, regulators, and intermediaries together to collaborate, using common standards. The key to success lies in crafting incentive models that encourage organizations with different priorities to willingly share their data with one another.
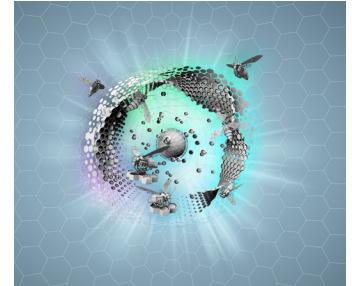
Although efficiency was initially the primary driver for DLTs, companies are now exploring higher-value uses cases that transform experiences, such as providing patients with pricing transparency. Additionally, given the authenticity and integrity of data stored in blockchain networks, the technology could bolster customer trust—inspiring patients to share their data on platforms that are blockchain-enabled.

While only 11% of respondents to Deloitte's Life Sciences Digital Innovation Survey report using blockchain in their day-to-day work, 59% have been part of a project that leveraged this technology. The takeaway? Companies are experimenting with DLTs, and blockchain is gaining traction.

Getting started

- **Think big, start small:** Given DLTs' potential, organizations should focus on tangible business and customer needs to identify use cases, then extend experimentation to move up the maturity curve.

- **ID the value:** Pinpoint new delivery models, revenue streams, business process improvements, and incentive models that could be delivered through DLT platforms and standards to create value for patients, the enterprise, and its partners.

- **Join or form a minimal viable ecosystem (MVE):** Tap or create a cross-enterprise or cross-industry consortium of participants to advance practical solutions for integrating blockchain into your business processes.

- **Establish the rules of the road:** Because DLTs enable collaboration, you'll need to refine the way you communicate, work with, and exchange data within your organization and beyond your walls.

Trend in action

PharmaLedger is a 36-month project that brings together 12 pharmaceutical companies and 17 public and private entities—including technical, legal, regulatory, academia, research organizations, and organizations that represent patients.[1] Sponsored by the Innovative Medicines Initiative (IMI) and the European Federation of Pharmaceutical Industries and Associations (EFPIA), PharmaLedger's goal is to provide a widely trusted platform that supports the design and adoption of blockchain-enabled health care solutions while accelerating delivery of innovation that benefits the entire ecosystem, from manufacturers to patients.

Relevance		1	2	3	4	5
	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

Readiness		1	2	3	4	5
	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

> The pandemic forced life sciences companies to prioritize digital innovation, instill it into every aspect of work, and use it to transform the experiences of patients and partners. But the momentum won't slow down—it will accelerate. It's time to meet the moment and double down on digital innovation investments, including blockchain.
>
> **—Aditya Kudumala, principal, Deloitte Consulting LLP**

IT, disrupt thyself: Automating at scale

In life sciences, there's still an enormous amount of repetitive work done by people. It's not just happening in the IT back office—it spans research, development, manufacturing, supply chain, and commercial. As life sciences organizations accelerate digital transformation, they are beginning to address repetitive work by automating processes across the board, using technologies including AI and machine learning (ML). In fact, according to Deloitte's Life Sciences Digital Innovation Survey, more than a third of survey respondents reported using AI in day-to-day operations, and 31% have been part of a project that leveraged this technology. Expect to see more companies not only automating processes inside their organizations but amping up automation to deliver precision experiences for patients and partners as well.

Another consistent trend is around key characteristics of the technology supporting RWD and RWE. There has been a clear shift to cloud-based platforms that provide tools that not only meet the needs of traditional data scientists but also those of business stakeholders and citizen data scientists. Three-quarters of respondents in a recent RWE survey reported having a central analytics platform to manage and analyze RWD, of which almost all say their platforms are hosted in the cloud. More than half also reported having in place self-service tools that allow users to conduct commonly requested analyses such as defining a cohort, generating descriptive statistics, understanding treatment pathways, or calculating incidence and prevalence of a disease, on demand.

Getting started

- **Start small, then scale:** For organizations just getting started, it may be helpful to create a prototype to validate the approach, to learn, and move forward. Available frameworks enable users to automate with ease and transform more processes over time.

- **Identify low-hanging fruit:** Zero in on processes that are highly repetitive but won't require significant change management to automate. Then, evaluate proven plug-and-play automation solutions that can be implemented with low risk to deliver high value.

- **Choose your platforms wisely:** Ensure that new automation technologies provide the level of security and certification needed to protect personal identifiable information (PII) and protected health information (PHI), if necessary.

- **Extend automation beyond your walls:** Think through how the automation technologies you're using internally can be leveraged to drive patient and provider engagement.

Trend in action

Cloud-based AI technologies can now be used to help life sciences leaders automate data management across the trial life cycle.

These tools intelligently interpret data elements, feed downstream systems, and auto-populate required reports and analyses. These tools can also leverage existing systems to seamlessly integrate the data flow—providing a single, collaborative touchpoint for all interactions during a clinical trial. They can even use AI to generate insights from past and current trials to inform and improve future trials.

AI is also driving more innovative ways of collecting clinical trial data and reducing reliance on in-person trial sites. For example, by capturing data from body sensors and wearable devices—such as bracelets, heart monitors, patches, and sensor-enabled clothing—researchers can monitor a patient's vital signs and other information remotely and less invasively. AI algorithms, in combination with wearable technology, can reveal real-time insights into study execution and patient adherence.

Relevance	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

| Readiness	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

> When it comes to automation, it doesn't need to be all or nothing. Using proven solutions on the market, you can begin the journey with minimal risk and disruption. Once you've created a framework for automation, it becomes easier to replicate and automate at scale.
>
> **—Sanjeev Sharma, managing director, Deloitte Consulting LLP**

Cyber AI: Real defense

Artificial intelligence (AI) is already helping improve process efficiency in the life sciences industry. The next three to five years are likely to prove AI's value across the value chain and in managing risk, including cyber threats. The use of AI-enabled capabilities for preventing, detecting, and responding to cyberattacks is highly relevant to the life sciences sector for multiple reasons, including:

• Increasing volume and sophistication of cyberattacks on life sciences companies

• Stringent regulatory and legal obligations for data protection

• Proliferation of Internet of Things (IoT) and edge computing, resulting in a larger attack surface

• A remote and mobile workforce, especially in pandemic and post-pandemic environments

• Bigger budgetary and talent pressures on security teams
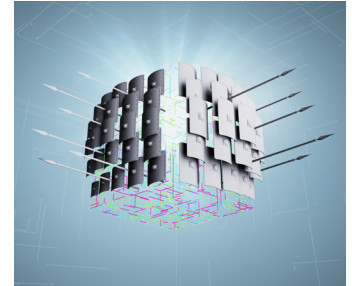
Getting started

• **Work from the ground up:** Start building AI as a formal capability within the security organization, with a clear strategy, governance, and talent models.

• **Create a strong base:** Build foundational capabilities that enable data-driven decision-making—such as collecting and aggregating data from multiple sources.

• **Map it out:** Redesign security processes and tasks to incorporate AI-enabled insights, and identify scenarios where human-interventions must be made.

• **Balance risk and reward:** Understand the risks and implications associated with AI, and implement controls to ensure the ethical and trustworthy use of AI.

Trend in action

Life sciences companies can use AI to help detect and predict previously unseen threats by leveraging techniques such as autoencoders to identify patterns in large multidimensional data sets—spotting behaviors that are like, but not the same as, known threats. These patterns can be further investigated by security analysts.

Using this approach, companies gain the ability to identify complex unknown threats and derive increasingly better outputs over time. They can improve detection accuracy and the ability to augment results from traditional detection mechanisms to provide richer insights. And they can "probabilistically" prioritize critical events, allowing the company's analysts to focus on events that are most likely to result in breaches.

Relevance	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

Readiness	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

> My advice for life sciences companies is to act now. Start investigating cyber AI to gradually improve your defenses and improve your ability to detect and respond while helping to protect your customers and their data—rather than reacting when it's too late.
>
> **—Larry Samano, principal, Deloitte & Touche LLP**

The tech stack goes physical

The COVID-19 pandemic has forced many companies to move to a remote working paradigm that is not only here to stay but also has expanded the feasibility of introducing connected devices into the ecosystem. Companies are now conducting clinical trials enabled by remote monitoring or virtual patient check-ins. They're enhancing treatment regimens with medication companion applications or digital therapeutics supplemented by wearables or medical devices like glucometers and medication distribution devices. And they've introduced tracking devices into the cell therapy process. These new personalized solutions require a technically complex ecosystem to support the multiple integration points and interoperability of data. This new level of connectivity provides competitive advantage when serving the empowered patient but also demands the added accountability of providing a safe and secure environment for patient data, device governance, and adherence to government regulations.

Getting started

- **Put patients in the driver's seat:** Explore ways to use smart devices and Internet of Things (IoT) to enable patients to take greater control of their health.

- **Rethink the operating model:** Bring business and technology stakeholders together to address device cost, quality, governance, compliance, and oversight—and make decisions as a unified team.

- **Address ethics:** Implement guardrails to address consent, accountability, bias, and transparency related to data and metadata produced by network-connected devices.

- **Embrace regulations:** Conduct an assessment of regulatory guidance on data security standards, considerations, and controls.

- **Uplevel policies:** As devices proliferate and move into the hands of employees and customers, ensure that your policies and procedures keep pace.

Trend in action

With a digital companion application, patients can conduct COVID-19 testing at home, upload the results on a mobile device, and receive a validated status (a QR code) that they have tested negative.

The QR code can be used to show a negative test result at places like restaurants, theatres, and airports. The companion app also allows the patient to share test results with other third parties, such as their employer or primary care physician. In addition, the companion app empowers the patient to scan someone else's QR code (from the same app) to confirm that he or she also has a negative COVID status.

Relevance	Biopharma:	1	2	3	4 ▼	5
	Medtech:	1	2	3	4	5 ▲

Readiness	Biopharma:	1	2	3 ▼	4	5
	Medtech:	1	2	3 ▲	4	5

> " The age of digital health using physical assets is here—and life sciences companies that identify a clear place for themselves within this burgeoning ecosystem will likely see a competitive advantage. The traditional commercialization and acquisition playbook may not be enough, however. Companies may need to build relationships with new stakeholders or change relationships with existing ones; and business development opportunities should take digital medicine products into account.
>
> **—Connie Ritchey, managing director, Deloitte Consulting LLP**

Field notes from the future

Three technologies will likely dominate the digital landscape a decade or more from now: quantum, exponential intelligence, and ambient experience. These technologies, although still in their early stages, have the potential to accelerate digital innovation and transformation for life sciences organizations. For example:
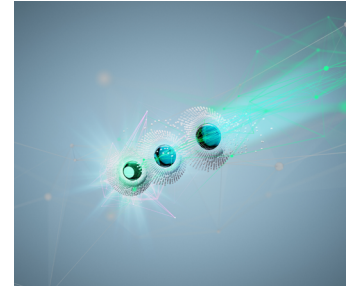
- With quantum computing, researchers could improve the speed and accuracy of drug discovery and develop customized medicines and interventions. According to Deloitte's Life Sciences Digital Innovation Survey, 10% of respondents are currently investing in quantum computing for drug discovery, while 24% of respondents plan to invest in the next five years. When it comes to drug development, 9% of respondents have current investments, and 13% plan to invest.

- Exponential intelligence technologies could fuel behavioral nudges that improve clinical trial retention and adherence—and enhance digital companions that improve medication adherence. Our survey indicates that, within the commercial function, most organizations are already prioritizing investing in AI (82%) or plan to invest in the next five years (86%) to create a foundation for precision patient experiences.

- Ambient technologies, such as digital assistants with AR/VR, can facilitate hands-free work by displaying steps of a lab procedure and notes from previous experiments while automatically recording all audio and video observations. Our survey reveals that 23% of respondents already use AR/VR to facilitate day-to-day work while 33% have researched the technology, and 39% have been part of a project that leveraged this technology.

Getting started

- **Understand the impact:** Think through the potential problems these technologies could help you solve—and prioritize use cases that can deliver high value.

- **Monitor developments:** Pay attention to how others are investing and experimenting, keeping tabs on developments from tech vendors, startups, and independent and academic research labs.

- **Get a game plan:** Develop an emerging technologies strategy and determine a trigger event—such as an announcement from a competitor—that will prompt further investments.

- **Start small and experiment:** Don't wait for the technology or use case to be mature—get going now or it will be too late.

Trend in action

In biopharma, existing standardized therapies and treatment protocols don't consider individual genetic and biological factors, behaviors, socioeconomic considerations, or environmental factors that can boost or diminish treatment impact. By helping shed light on the correlations and dependencies of various contributing factors, quantum-enhanced machine learning could advance medical research. With it, research teams could predict the efficacy of drugs and treatments, design individual treatment plans that could improve patient outcomes, and even forecast the risk of future diseases to allow for earlier or preventive treatments.

In medtech, one company's well-known robotic surgery platforms continue to make headway in the marketplace with novel capabilities like pre- and intraoperative AR guidance, delivering 3D images of a patient's anatomy.

Relevance		1	2	3	4	5
	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

Readiness		1	2	3	4	5
	Biopharma:	1	2	3	4	5
	Medtech:	1	2	3	4	5

> These emerging technologies are expected to bring significant advantages to early movers. By strategically beginning to explore opportunities today, life sciences organizations can get a head start that turns into a competitive edge.
>
> **—Jonathan Fox, managing director, Deloitte Consulting LLP**

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Endnotes

1. PharmaLedger "Enabled Healthcare" accessed February, 2022.