



KPMG global tech report: Life sciences insights

Beyond the hype: Balancing speed, security and value

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Executive summary

To extend the value of its digital breakthroughs, the life sciences sector should rectify some of the weaknesses affecting its business models and technology decision-making processes

At KPMG, we predict the future of life sciences will likely be shaped by tech-enabled connectivity, strategic uses of AI, and patient-centric supply chains.¹ Globally, the life sciences sector is working on improving operations and creating new value by transforming digitally. But the innovation efforts of those in the sector face tough headwinds that include economic conditions, organisational performance, geopolitics and the competition for talent.²

In a highly regulated sector where companies are often fragmented and siloed, transforming at scale can be difficult. By examining the perspectives of 123 life sciences technology leaders from around the world (based on a comprehensive survey³ of 2,450 technology function leaders, including chief digital officers, CIOs, CTOs, CISOs, chief AI officers and other executives from 26 countries, across 8 industries)

this report provides valuable insights into how organisations are balancing speed, security and value. This content also compares life science tech function decision-making against previous year's results, and a cross-sector average. KPMG life sciences technology specialists also weigh in on the findings and provide their own unique perspectives.

Our research finds that life sciences tech leaders are racing to make the most of advanced technologies, but siloed, decentralised teams and historical underinvestment in data management are limiting the benefits. There should be a balance between keeping up, and applying a strategic approach to extracting genuine value from tech. It is essential to navigate the hype using evidence-based decisions, find solutions that are resilient, and scale new tools such as AI safely and responsibly.

To better understand how life sciences organisations are navigating the complexities of digital transformation, balancing speed, security, and deriving value from their tech investments this report explores the perspectives of:

123 Life sciences
technology function leaders
from around the world

¹ KPMG International. (2023). The future of life sciences.

² KPMG International. (2024 Sept). KPMG 2024 CEO Outlook.

³ KPMG International. (2024 Sept). KPMG global tech report 2024: Beyond the hype: Balancing speed, security and value.



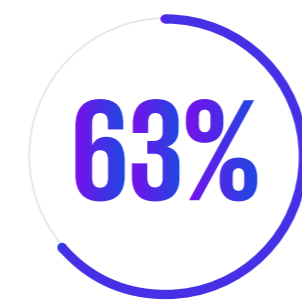
Key findings

What is on the minds of life sciences technology function leaders?

Top five challenges slowing down technology transformation in life sciences

- 1** Risk-averse cultures that are slow to embrace change
- 2** Cyber security or privacy concerns
- 3** Unaddressed tech debt blocking the path for new upgrades
- 4** Inability to agree on priorities or get stakeholder buy-in
- 5** Compliance concerns/ Skills shortages within organisations (two-way tie)

Embracing emerging technology

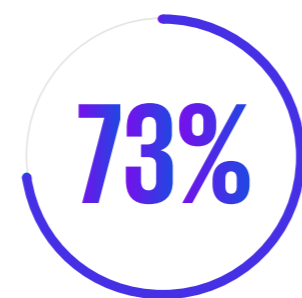


say that risk aversion by their organisations' senior leadership teams is delaying digital transformation journeys — making life sciences the sector most likely to cite this concern.



Undaunted, tech leaders in the sector are bravely embracing emerging technologies. They lead all the other industries surveyed in prioritising and investing in edge and quantum computing, VR/AR/XR and spatial computing, XaaS technology and modern delivery in the next year to support organisational ambitions.

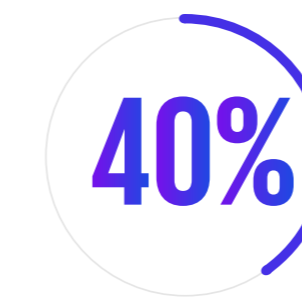
More than one-third say their organisations are using AI at scale and are achieving returns on investment.



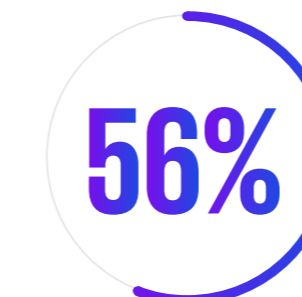
think AI will revolutionise industry practices, significantly enhancing efficiency and creating new business models.

Technology investment decision-making

When it comes to taking a balanced approach to optimising technology, the life sciences sector leads the way:



of life sciences tech leaders are planning to balance legacy systems and new tech, which is 14 percentage points higher than the cross-sector average.

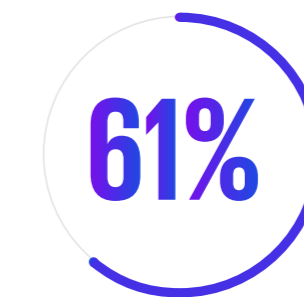


of life sciences tech leaders say they are satisfied with the amount of value they are getting from their technology investments.

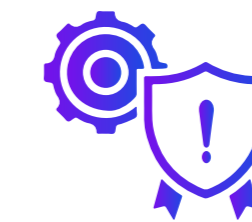


say their tech investment decision-making processes usually result in sound decisions that lead to valuable outcomes — which is 13 percentage points behind the average across all sectors surveyed.

Managing risks



worry that cyber security is frequently treated as a box-ticking exercise in staff training and isn't embedded as extensively as it could be.



Compared with most other sectors, fewer life sciences tech leaders plan to prioritise enhancing their data security.



To respond to evolving market trends and risks, life sciences is the sector that is most likely to use red teaming exercises to verify AI guardrails as the top tactic for adapting digital transformation strategies.



Securing value despite struggling with the pace of change

From a technology perspective, the life sciences industry is facing some challenges in keeping pace with advancements. Sixty-one percent of life sciences technology leaders say they often find the pace of change difficult — seven percentage points more than the average across all of the sectors in our research.

Tech function leaders in last year's research said that risk aversion was a root cause of this struggle to move fast enough, and they say the same this year: 63 percent say that risk aversion means their senior leadership teams move more slowly than their competitors when it comes to embracing new technology. Again, this is seven percentage points above the cross-sector average. This is also a missed opportunity for C-suite life sciences leaders. Another KPMG survey found that senior and line-level leaders in the healthcare and life sciences sectors said that having strong leadership and sponsors is a top factor in enterprise-wide transformation success.⁴

Risk aversion makes senior leadership move more slowly than our competitors in embracing new technology



Q: How often, if at all, do the following situations occur within your business? Frequently, risk aversion makes senior leadership move more slowly than our competitors in embracing new technology.

Source: KPMG global tech report 2024

⁴ KPMG International. (2024). Global Transformation Survey 2024. Healthcare and Life Sciences Snapshot.



Global life sciences companies are complex organisations. Often, their operations can be siloed because of a history of mergers and acquisitions, with different therapeutic divisions using different systems. To add to this complexity, the life sciences sector has long value chains that span phases including discovery, R&D, preclinical and clinical research, manufacturing, commercialisation and post-market research. Life sciences companies are also at risk of being constrained by regulatory concerns and organisational complexities that force them to digitally innovate cautiously.

There is also concern about costs. Life sciences tech leaders are more likely than those in other sectors to say that hidden costs often disrupt their digital transformation plans. “In the past, organisations in the sector have been burned from throwing money at shiny new digital tools that just don’t achieve the expected return, because these projects encounter so many



Some life science leaders may be risk adverse in adopting new technologies or processes due to fear of failure or uncertainty. Another likely cause of this hesitancy relates to the sector’s regulatory complexities in that any new IT system or technology needs to comply with regulators’ GxP or ‘good practice’ principles that control the quality and compliance of products and processes.”

Dr. Jayne Goble

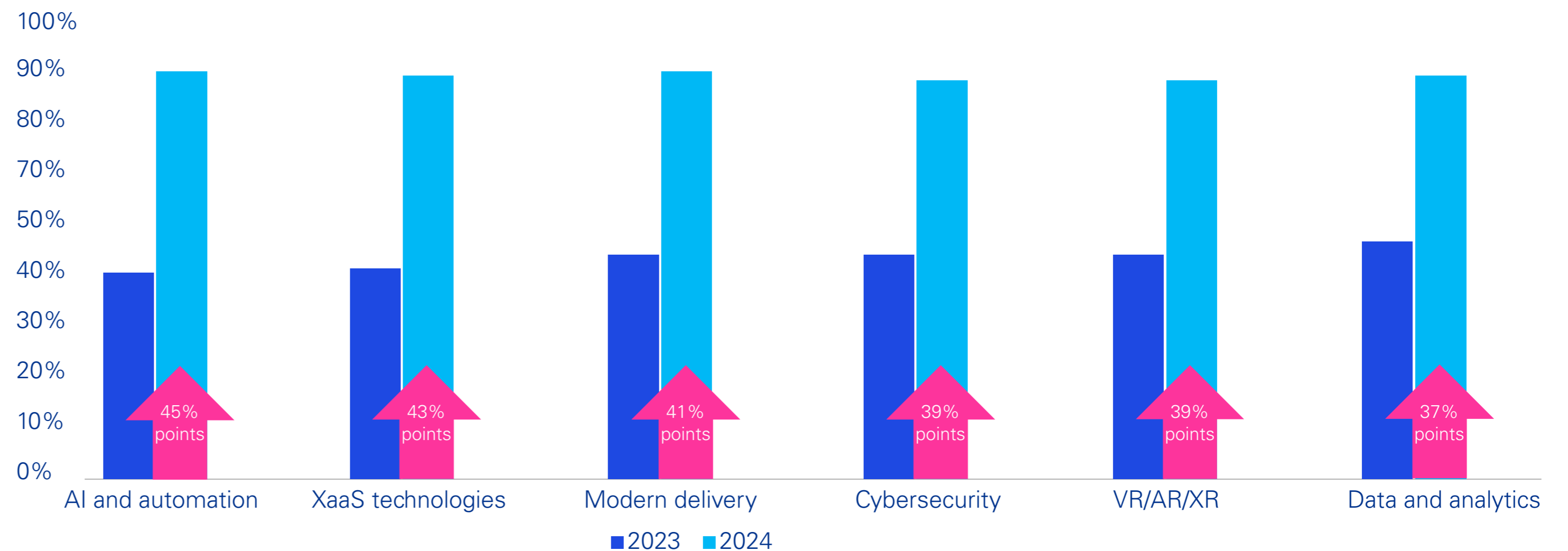
Partner, IoT OT Cyber Security Services
KPMG in the UK

complexities along the way,” says Mike Krajecki, Partner, Advisory, KPMG Lighthouse Center of Excellence for Data and Technology, KPMG in the US. “So now they spend a lot more time upfront measuring potential value and de-risking the process.”

Despite the concerns about life sciences company leadership being risk averse, tech leaders in the sector are being brave. Out of the

eight industries surveyed, life sciences is the most likely to say that having the courage to strategically embrace emerging technologies is an essential attribute of thriving in a digital economy. The sector is also making progress in deriving value from digital innovation. Life sciences technology leaders say that investment in key technologies has improved profitability markedly in the last year.

Technologies that have positively impacted life sciences company profitability over the past 24 months



Q: Over the past 24 months, have your digital transformation efforts with the following technologies positively impacted your organisation’s profitability? AI and automation (including generative AI) have increased profitability.

Source: KPMG global tech report 2023 and 2024



There is also evidence of an increase in tech maturity. In areas including XaaS technologies, modern delivery methods such as no code and low code, and VR/AR/XR and spatial computing, life sciences is one of the industry's most likely to say they are taking a proactive approach and constantly evolving.

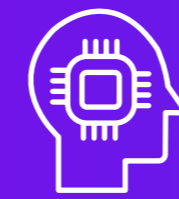
"I think we are starting to see life sciences organisations tackling the challenges standing in the way of value," says Krajecki. "For example, we are seeing a more centralised approach to technology investment, scaling successful projects across teams and regions." But there is more work to do. Overall, only 56 percent of life sciences tech leaders say they are satisfied with the amount of value they are getting from their technology investments. This is 13 percentage points lower than the cross-sector average.

Life sciences tech leader rate of tech investment value satisfaction:

56%

Key recommendations

To help support transformation at scale in fragmented and siloed organisations, life sciences companies should:



Examine their existing technology capabilities by conducting comprehensive assessments to identify strengths and weaknesses and determine future state capabilities.



Develop enterprise-wide digital transformation strategies that seamlessly integrate technology aimed at capturing more value, improving business performance and increasing enterprise flexibility and agility.

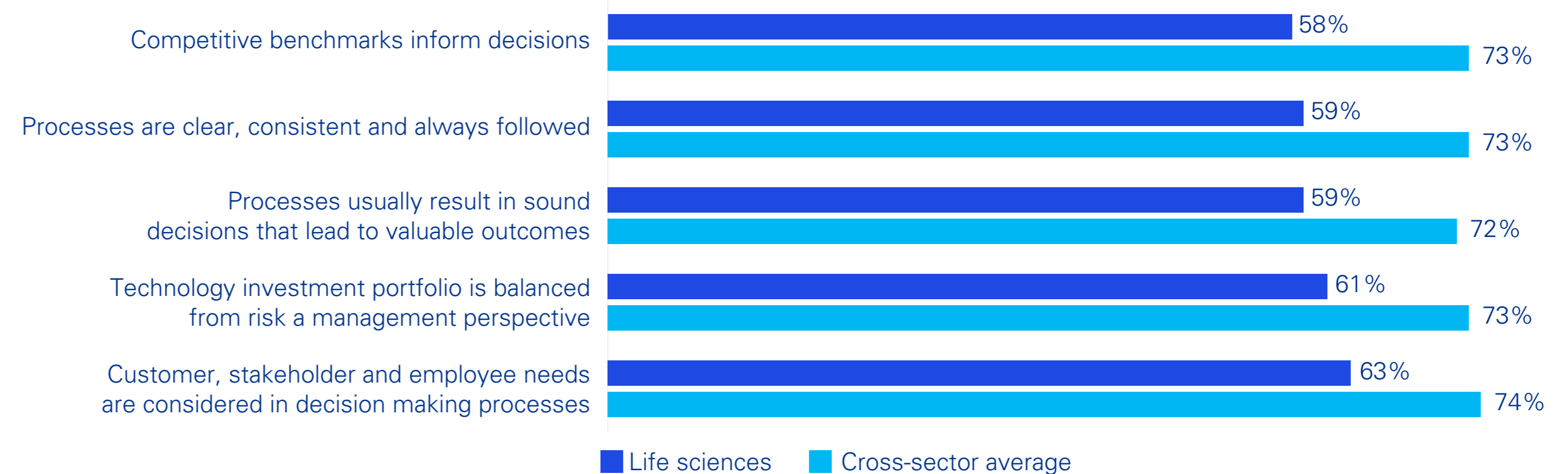


Improving technology investment decision-making

To maximise the value of their digital transformation journeys, life sciences companies will likely need to enhance their due diligence on the likely returns from their investments — especially as the pace of their technology adoption accelerates. Compared with every other sector in the survey, in the next year life sciences is the industry that is most likely to be planning further investment in five of the nine technology categories considered: XaaS, quantum computing, edge computing, VR, AR and XR, and low code/no code.

For now, the sector's technology investment allocation process appears to be falling short. Life sciences tech leaders are 13 percentage points less likely than the cross-sector average to say that their organisational decision-making processes usually result in sound decisions that lead to valuable outcomes. The sector also significantly lags behind the cross-sector average on tech investment decision-making leading practices across the board (see adjacent chart). These tech leaders are less likely to follow clear and consistent processes, less likely to consider the needs of key stakeholder groups when investing, and less likely to use competitive benchmarks.

Organisational tech investment decision making processes



Q: Which of the following are true about your organisation's decision-making processes for tech investments?

Source: KPMG global tech report 2024



Greater data maturity is one way to improve the quality of the sector’s digital transformation decisions. “Traditionally, pharma, med tech and life sciences have under invested in how they govern data,” says Mike Krajecki, Partner, Advisory, KPMG Lighthouse Center of Excellence for Data and Technology, KPMG in the US. “This, combined with siloed data between departments and divisions, has created a lack of shared standards and interoperability that makes it harder to achieve returns from digital technologies at an enterprise level.”

The life sciences sector is doing better when it comes to data: more are now at a mature stage of adoption of real-time and predictive analytics, and strategies for monetising data. But the sector is still behind others in overall data maturity.



In life sciences there needs to be a renewed focus on establishing centralised data governance, data management and other capabilities that have often been federated to individual business teams. To derive value from data you need to have strong guardrails from the top.

Mike Krajecki

Partner, Advisory

KPMG Lighthouse Center of Excellence for Data and Technology

KPMG in the US

Life sciences does, however, show leadership qualities in being even-handed with spreading its attention across legacy systems and new tech. It performs above the cross-sector average on the number of tech leaders who plan to balance advanced technology and existing tech systems: 40 percent plan to keep this approach, which is 14 percentage points above the cross-sector average.

Life sciences tech leaders recognise that unaddressed technology debt holds back innovation. They rank this as one of their top three most pressing digital transformation challenges, which is in line with the leader group of high-performing organisations in our global research.

Key recommendations

To help improve technology investment decision-making, life sciences companies should:



Put a value stream-based lens on transformation strategies to identify technology solutions that help to increase the flow of value along the end-to-end value stream; connect the organisation to its customers, employees, business partners and suppliers; and connect the silos among different divisions within companies and within functions such as the front, middle and back offices.



Improve their data maturity by developing the data strategies and governance models needed to translate large, complex data landscapes into real, actionable insights, and consider establishing enterprise-level data platforms or centralised repositories for organisational data across an array of functions and needs.



Moving quickly on AI

Life sciences tech leaders are moving quickly to refine their AI policies and approaches as Generative AI sweeps the business world. AI has been embedded in various life sciences processes for at least the past decade — R&D innovation cycles, for instance — and that experience is paying off. It is one of the top three sectors in our survey for maturity of AI adoption: 34 percent of tech leaders now use AI at scale and are achieving returns on their investments.

“AI has increased the speed and volume of R&D activities in life sciences,” says Dr. Jayne Goble, Partner, IoT OT Cyber Security Services, KPMG in the UK. “Which is likely to lead to new therapies being developed faster and more inexpensively in the future.” From a patient perspective, the Harvard School for Public Health projects a 50 percent reduction in treatment costs and a 40 percent improvement in health outcomes when using AI for diagnosis.⁵

AI also plays a crucial role in the sector’s ability to transform. Life sciences is the sector that is most likely to see red teaming exercises to verify AI guardrails as the top way to adapt its digital transformation strategies to evolving market risks and trends. Concerns about compliance, intellectual property loss and the possibility of flawed data sets will likely mean that many life sciences firms may limit their Generative AI use to creating operational efficiencies in back-office functions. These functions include finance, compliance and clinical trials management, as well as front-office areas such as sales and marketing.

One trend across all sectors is prioritising a decentralised approach to finding new use cases for AI, and almost half of life sciences tech leaders (46 percent) say they are using this “democratised experimentation.” This is a greater proportion than in any other sector surveyed. This will change as the use of AI scales up — particularly because of governance, trust and cyber security concerns.

Life sciences is more likely than other sectors to plan to centralise its approach once it has reached a critical mass of ideas. Looking ahead, 73 percent of leaders in the sector expect AI to revolutionise industry practices, significantly enhancing efficiency and creating new business models. There are also exciting opportunities for further AI deployments in life sciences, including in drug discovery and the potential to tackle some of the sector’s regulatory workload.

More than 1/3

of life sciences tech leaders say their organisations are using AI at scale and are achieving returns on their investments.



Compliance work in life sciences is currently done manually, with companies spending hundreds of millions of dollars mining information to send to regulators. AI has the potential to automate a substantial amount of data-related compliance efforts.”

Mike Krajecki

Partner, Advisory

KPMG Lighthouse Center of Excellence for Data and Technology

KPMG in the US

⁵ Harvard Medical School. (2024) Harvard Medical School Program — AI in Health Care for Impact.



In this survey, life sciences tech leaders also share views about AI's ability to reshape the industry in the future.

In life sciences, AI in the next decade will:

Redefine the future of knowledge, from knowledge creation to knowledge sharing

80%

Drive a significant restructuring of job roles, with substantial investments needed in upskilling and reskilling employees

75%

Pose challenges to current operational structures, potentially leading to job reduction and ethical concerns

80%

Remain a 'black box' for many, with AI inner workings not fully understood by most users, which will pose transparency and trust issues

74%

Automate routine tasks, shifting the focus of knowledge workers toward more strategic and creative roles

77%

Revolutionise industry practices, significantly enhancing efficiency and creating new business models

73%

Q: To what extent, if at all, do you anticipate AI disrupting the roles of knowledge workers and the broader landscape of your industry over the next 10 years? To some/great extent

Source: KPMG global tech report 2024

When it comes to AI and workforces, it's not only tech function leaders who have concerns. The [2024 KPMG Life Sciences CEO Outlook](#) found that CEOs in the sector have clear concerns about their organisations' readiness to take on new forms of AI. In this survey, only 37 percent thought their companies had the right skills to fully make the most of the technology.⁶

⁶ Pothier, K., Liddell, P., and Haynes, J. (2024 Nov). KPMG 2024 Life Sciences CEO Outlook, KPMG International.

Key recommendations



Look to design, build and deploy analytical models and AI at scale organisation-wide to help their teams to make better and faster decisions, find new opportunities for growth, reduce operational costs, and improve customer, stakeholder and partner experiences.



Adopt policies and practices so that they can responsibly and confidently deploy AI enterprise-wide as scrutiny and regulation of AI increases.



Alleviate workforce concerns by equipping staff with tools that can enhance their work today, while offering development opportunities such as reskilling or upskilling to prepare for the future.



Filling cyber risk gaps

Our research finds that tech function leaders in the life sciences sector intend to make targeted improvements to data infrastructure and competencies, including data accessibility, interoperability and insight identification. This investment is likely to increase the maturity of data analytics and support the roll-out of more AI initiatives. But the sector should stay mindful of risk: it is among the least likely sectors in our survey to say that improving data security (protecting the data stored by organisations through the security of systems, standards and governance processes) is a top data priority for the next 12 months.

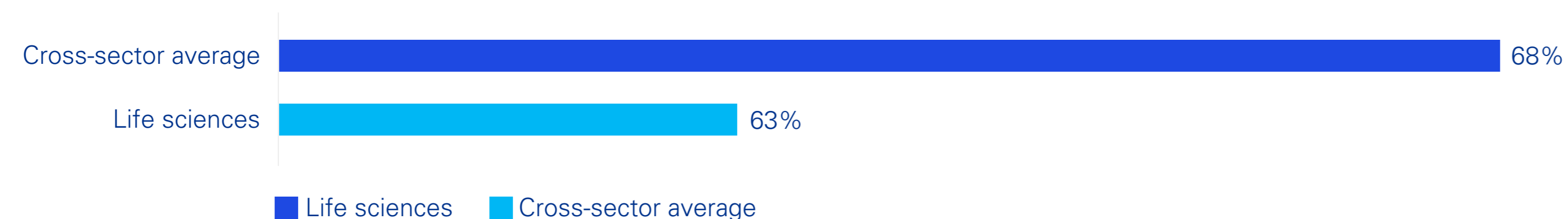
As demonstrated in the KPMG global tech report 2024, having an end-to-end security mindset is a hallmark of a digital leader. The research found that risk and cyber security metrics are some of the most important performance indicators for measuring the value of technologies (e.g. failure rate, compliance

violation incidents).⁷ But the life sciences sector is six percentage points more likely than the cross-sector average to admit they lack confidence in using these metrics.

Sixty-one percent of life sciences tech leaders say that cyber security is often treated as a box-ticking exercise in staff training, while 59 percent of life sciences tech leaders say cyber security is typically involved at the earliest planning stage of new projects. This lags 13 percentage points behind the cross-sector average.

In life sciences, cyber security and privacy concerns are among the factors seen as most likely to slow down transformation programs. This is in line with the cross-sector average. And when it comes to security, a few delays could be a sacrifice worth making. But addressing security and privacy by design upfront will likely take less time than having to retrofit protections later on.

Confidence in company ability to quantitatively measure value being generated by its risk and cybersecurity related metrics



Q. Please indicate how confident you are in your company's ability to quantitatively measure the value being generated by your technologies?

Source: KPMG global tech report 2024

⁷ KPMG International. (Sept 2024). KPMG global tech report 2024: Beyond the hype: Balancing speed, security and value.



These findings are not surprising as security within life sciences has historically been about infrastructure, protecting processes, systems and people. Some early movers in the sector have begun to take a more comprehensive approach to protecting infrastructure, data and their broader ecosystems.



At KPMG, we are seeing several trends that are causing some life sciences organisations to move in protecting their ever-expanding digital ecosystems. These trends include cyber criminals using AI and machine learning to create continuously evolving ransomware, and the need to track and secure an explosion of BYOD and corporate-owned devices. However, one of the most significant trends affecting the sector now is R&D and manufacturing approaches that combine traditional methods with advanced technologies such as AI, 4D printing, digital twins and microrobots.”

Dr. Jayne Goble

Partner
IoT OT Cyber Security Services
KPMG in the UK

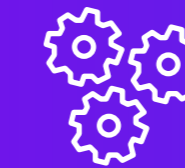
The very nature of how life sciences companies function also contributes to significant endpoint complexity. To develop new medicines and therapies, companies in the sector collaborate with partners, third-party vendors, research institutions and clinicians at clinical trial sites. In the coming year, Goble predicts zero trust cyber security approaches will continue to gain popularity. This approach enables organisations to fortify security posture by being proactive in safeguarding systems and data against insider threats, external breaches, and lateral movement within networks.

Key recommendations

To help fill in cyber risk gaps, life science companies should:



Reframe the way cyber security is viewed, rather than a factor that slows down transformation; cyber security can be a key driver of growth and resilience, as well as customer, stakeholder and employee trust.



Adopt more comprehensive approaches to protecting infrastructure, data and ecosystems.



Integrate AI and machine learning into cyber security solutions to enhance system efficiency and enable predictive analysis, and utilise cloud platforms to significantly enhance monitoring and alerting capabilities.



Enact robust backup and recovery strategies, and tailored education programs that bring cyber security to the forefront of staff and stakeholder minds.



How KPMG can help

KPMG firms have deep experience in life sciences and business technology. We are a global network of professional services firms whose consultants provide support to the world's leading pharmaceutical, biotech, medical device and other companies in the sector.

KPMG firms' tech consulting practices have extensive experience in key tech capability areas and a global delivery network to support digital transformation in life sciences organisations. To jumpstart transformation and help organisations use the latest tech, we offer leading products, solutions and accelerators, and a broad set of tech services across strategy, platforms, cyber security, data, AI and emerging tech, cloud, and risk. We also have [alliances](#) with some of the world's leading technology, data and services companies that allow us to approach the most pressing tech-based challenges and offer broad solutions and services via expanded product offerings and increased capabilities.

To understand the impact of technology on workforces, KPMG people and human resources consulting specialists can conduct workforce shaping and strategy exercises to help organisations ensure that they have enough employees with the right skills to fully use evolving technology now and in the future. These specialists can also help create tailored learning strategies to help reskill and upskill employees in using advanced technology.

Get in touch to learn more about how KPMG can support transformation in your organisation.

kpmg.com/lifesciences



Methodology

The insights in this report were derived from the [KPMG global tech report 2024](#), a survey of 2,450 technology leaders from 26 countries across 8 industries: financial services, technology, retail and consumer packaged goods, industrial manufacturing, life sciences, healthcare, government and public sector, and energy.

Survey respondents represented organisations with annual operating budgets or revenues above US\$100 million and included a diverse group of technology leaders, such as chief digital officers, CIOs, CTOs, CISOs, chief AI officers, and others.

About the life sciences respondents

The life sciences insights are based on the views of:

123 life sciences technology function leaders

A significant portion of these respondents were senior leaders:

40% were at the C-suite level

45% were at the department head or EVP, SVP or VP level

16% were at the managing director or senior manager level

86% of respondents represented multi-billion-dollar organisations (US\$10B to US\$50B+)



About the authors

**Mike Krajecki**

Partner, Advisory
KPMG Lighthouse Center of Excellence
for Data and Technology
KPMG in the US
mkrajecki@kpmg.com

Mike is a technology executive with 17 years' diverse experience across emerging technologies, digital platforms, and traditional IT systems. As an advisory partner with the KPMG Lighthouse Center of Excellence for Data and Technology, he leads clients through complex business transformation and technology modernisation initiatives, designing fit-for-purpose strategies that help achieve desired business outcomes. Mike is passionate about digital health technology and leads work around KPMG emerging technology solutions for healthcare and life sciences. This includes the Internet of Medical Things, precision medicine, 5G, modern data platforms, artificial intelligence, cloud transformation, and digital design.

**Dr. Jayne Goble**

Partner, IoT OT Cyber Security Services
KPMG in the UK
jayne.goble@kpmg.co.uk

Jayne leads the Internet of Things (IoT) and Operational Technology (OT) Cyber Security Services team for KPMG in the UK. She has almost 20 years' technical experience across industries that include government, defense, healthcare, life sciences, manufacturing and others. During this time, she has worked with a range of global organizations to oversee and deliver capital projects, ranging from responding to critical security failures of national infrastructure, to deployment of interception and intelligence platforms. A career highlight for Jayne was designing the UK's first Data Security and Protection standard that more than 50,000 health and social care and pharmaceutical organisations are mandated to comply with in order to gain access to National Health Service systems and or data. Jayne is the author of several KPMG publications and is a well-regarded speaker on the topics of complex (state) projects, including medical device product security, IT/OT convergence across petrochemical and manufacturing plants and defense systems. She holds a Doctor of Philosophy — PhD, IT Communication from Newcastle University.



KPMG Ireland Contacts



Brian Egan,
Partner and Head of Life Sciences,
KPMG in Ireland
e: brian.egan@kpmg.ie
t: +353 870504249



Cian Kelliher,
Partner,
KPMG in Ireland
e: cian.kelliher@kpmg.ie
t: +353 871115938



Eoin McAtamney,
Managing Director,
KPMG in Ireland
e: eoin.mcatamney@kpmg.ie
t: +353 873456119



David Lynch,
Managing Director,
KPMG in Ireland
e: david.a.lynch@kpmg.ie
t: +353 872751557



Alan Reid,
Director,
KPMG in Ireland
e: alan.reid@kpmg.ie
t: +353 871117998



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