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The Intel Sustainable Intelligence Index

Healthcare and Life Sciences

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Introduction

Artificial intelligence (AI) is revolutionizing the healthcare and life sciences sector. Its impartial assessment of data and predictive analytics make it an invaluable tool for improving diagnostics, personalizing treatments, streamlining operations and accelerating research and development.

If healthcare business leaders fail to leverage this rapidly advancing technology, they may miss out on tools that benefit patients and subsequently lose access to key strategic advancements. But, as the demand and use cases for AI build, so does the need for computing power, inevitably leading to increased emissions. Boards can approach these considerations as separate and competing challenges, or they can strategically leverage one to improve the other.

At Intel, we want to support healthcare and life sciences leaders in better understanding both the carbon cost of AI and its ability to accelerate sustainability strategies throughout their organization. In doing this, we hope to help businesses with two goals:

Tech zero_ 🔍

Using AI to reduce the carbon footprint of their IT function.

Tech positive_ 🔍

Using AI as a lever for the whole organization to reach its net-zero goals and to have a positive overall impact, driving business growth and accelerating innovation.

Our previous study, _The Sustainable CTO_, revealed a 'Tech Trilemma' of business leaders needing to focus on knowledge, investment, and innovation to reap the benefit of technology for sustainable progress. _The Intel Sustainable Intelligence Index_ measures sector progress across these pillars, and shows which areas boards could focus on to boost their sustainability-related AI solutions.

Examining the strategies of 'Visionaries' in the healthcare and life sciences sector uncovers valuable insights and best practices for other businesses to reach a more sustainable future through AI integration. By sharing these learnings, we aim to help others in the sector adopt more sustainable technology practices to accelerate their journey to tech positive.

Sandra Colner
General Manager, Health & Life Sciences Global Solution Sales and Center of Excellence, Intel

About the study

The Intel Sustainable Intelligence Index is based on an independent opinion research study carried out in 2024 by Intel, in partnership with Man Bites Dog. The research sample of 2,000 C-suite leaders was made up of 1,500 senior IT decision-makers, 250 CEOs, and 250 Chief Sustainability Officers. Respondents were from organizations across 11 sectors across 22 markets.

Key terms

Tech zero_ 🔍

Using AI to reduce the carbon footprint of an organization's IT function.

Tech positive_ 🔍

Using AI as a lever for the whole organization to reach its net-zero goals and to have a positive overall impact, driving business growth and accelerating innovation.

More information about _The Intel Sustainable Intelligence Index_ can be found in the full report, _found here_.

Visionaries_
Those in the top third of the scoring range (i.e. industry leaders).

Advancers_
Those in the middle third of the scoring range.

Followers_
Those in the bottom third of the scoring range.

AI for sustainable healthcare and life sciences

The intention-action gap

AI is a powerful partner for healthcare professionals and scientists. It helps researchers, aiding pattern-spotting and analysis of huge datasets from studies and clinical trials. Paired with machine learning (ML), AI can learn how to read medical images to help radiologists and pathologists detect abnormalities more quickly and accurately.

Patients benefit too; AI-powered chatbots provide 24/7 access to medical information, and smarter data analysis can help patients remain at home by tracking health metrics and medication, monitoring for changes and alerting care providers as needed.
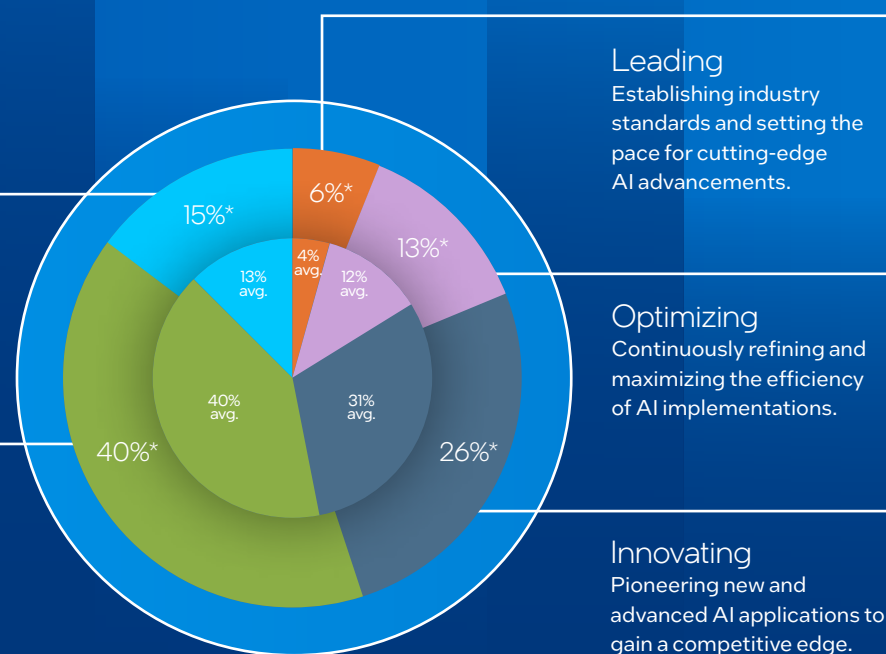
However, just over half (55%) of healthcare and life sciences organizations are still in the early stages of AI adoption – exploring its possibilities and implementing

known solutions for specific processes. While there are challenges regarding patient safety and data integrity, there is still significant opportunity for innovation and optimization. Both responsible and ethical AI will need to be front of mind for leaders when creating new standards for AI in the healthcare and life sciences space.

AI maturing stage:

Exploring
Beginning to explore AI applications and possibilities.

Implementing
Actively integrating AI solutions into specific processes or functions.

Leading
Establishing industry standards and setting the pace for cutting-edge AI advancements.

Optimizing
Continuously refining and maximizing the efficiency of AI implementations.

Innovating
Pioneering new and advanced AI applications to gain a competitive edge.

15%*   6%*   13%*   26%*   40%*

13% avg.   4% avg.   12% avg.   31% avg.   40% avg.

* of Healthcare and Life Sciences businesses

As an organization's deployment of AI grows, so can its IT-related carbon emissions. In order to keep their business's overarching sustainability goals in sight, C-suite leaders will need to evaluate how AI solutions align with their strategic vision from the earliest stages of exploration.

This isn't yet embedded into practice; although two-thirds (66%) of healthcare and life sciences C-suite leaders recognize that AI solutions could have a great impact on the sustainability of their business, only 38% believe these solutions are currently being deployed. This highlights a gap between organizations' *intentions* when it comes to leveraging AI for sustainability, and its *actions.* However, this may come as no surprise within the healthcare and life sciences sector, as the top priority will always be patient safety, risk reduction, and data integrity. While achieving emissions targets is also a focus for the sector, the introduction of AI should come at no expense of the primary objectives.
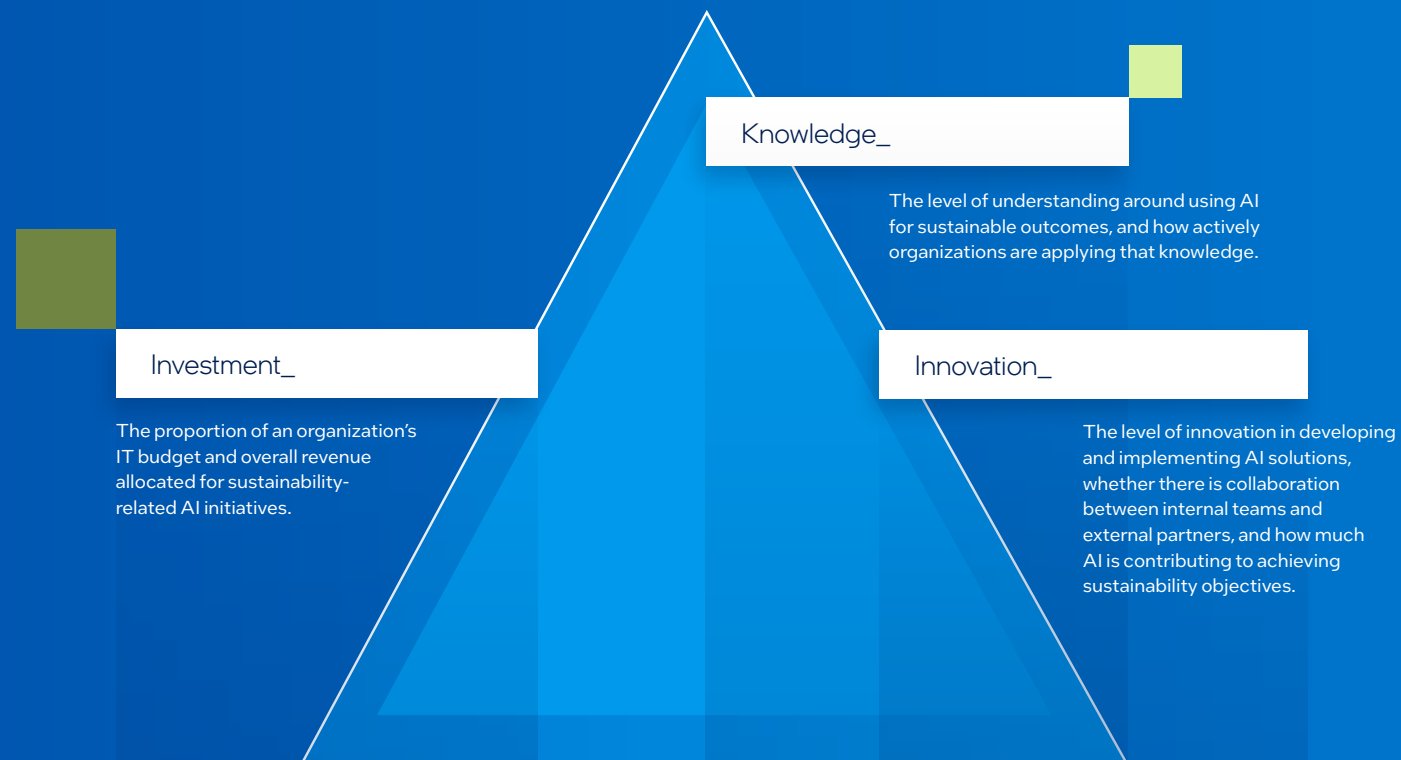
"AI is revolutionizing healthcare by enhancing diagnostic accuracy, personalizing treatment plans, and optimizing operational efficiencies. These advancements not only impact patient outcomes but also – when applied strategically – contribute to sustainability efforts by reducing waste, lowering energy consumption, and minimizing the environmental footprint of healthcare operations.

However, the substantial energy demands of AI technologies will increase a hospital's carbon footprint. This is where a focus on efficiency must come in across all technologies, from each individual hospital's data center and cloud operations, to AI and Machine Learning tools. By taking action on sustainable technology strategies and focusing on efficiency, hospitals can reduce their emissions and improve the resilience of their operations."

Alex Flores
General Manager - Health and Life Sciences Vertical, Health, Education, and Consumer Industries Business Unit at Intel

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The Intel Sustainable Intelligence Index

The Intel Sustainable Intelligence Index measures **the use of AI to drive sustainability across 11 key sectors.** Organizations are scored on their responses across the three pillars of the Tech Trilemma (identified in The Sustainable CTO as the areas that need board-level attention for organizations to fully leverage technologies to drive sustainable progress):
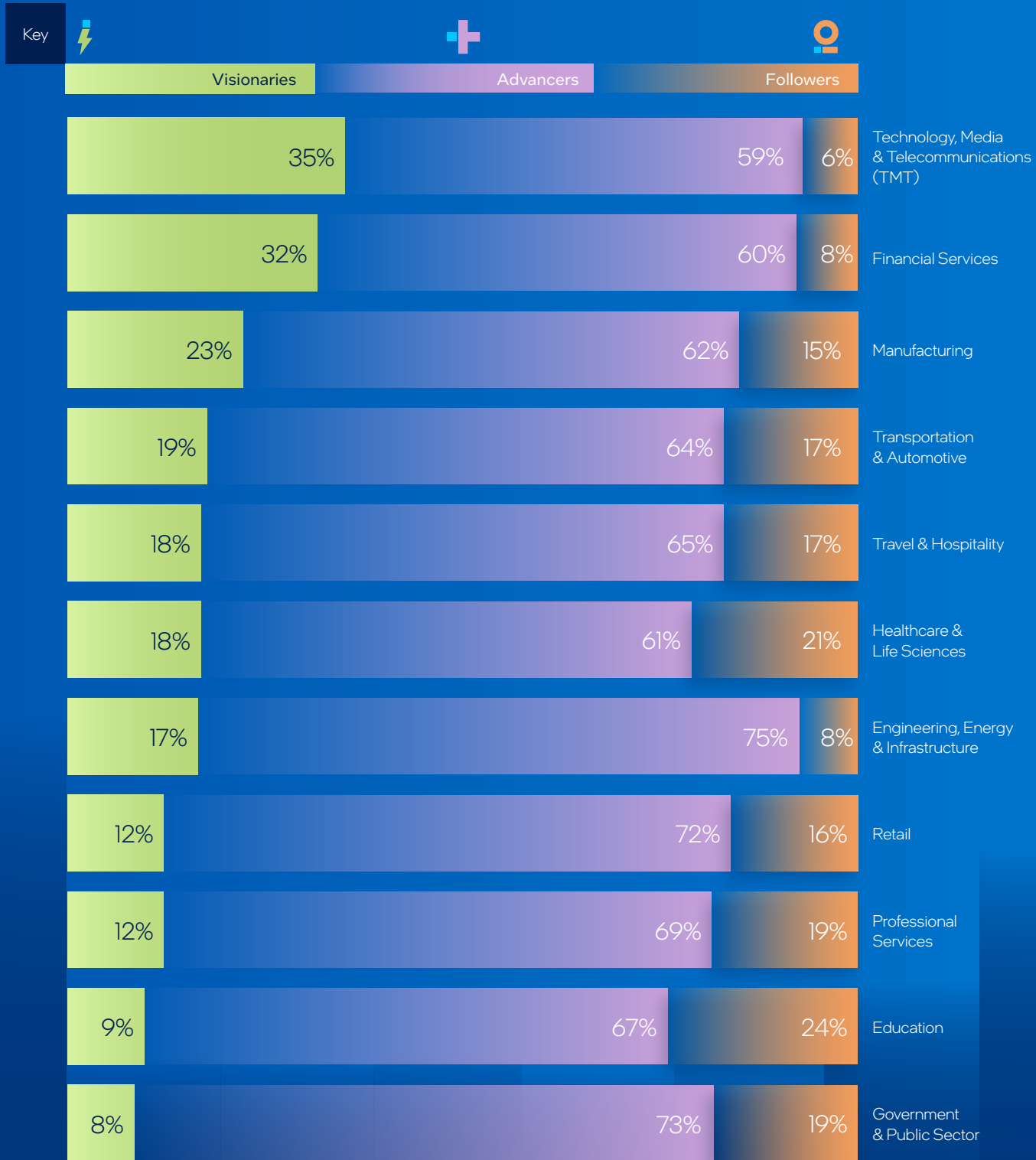
Knowledge_

The level of understanding around using AI for sustainable outcomes, and how actively organizations are applying that knowledge.

Investment_

The proportion of an organization's IT budget and overall revenue allocated for sustainability-related AI initiatives.

Innovation_

The level of innovation in developing and implementing AI solutions, whether there is collaboration between internal teams and external partners, and how much AI is contributing to achieving sustainability objectives.

Organizations are divided into three groups based on their scores:

Visionaries_
The companies blazing a trail in sustainability-related AI (i.e. in the top third of the scoring range).

Advancers_
The companies making headway in this space (i.e. in the middle third of the scoring range).

Followers_
The companies at risk of falling behind the curve. (i.e. in the bottom third of the scoring range).
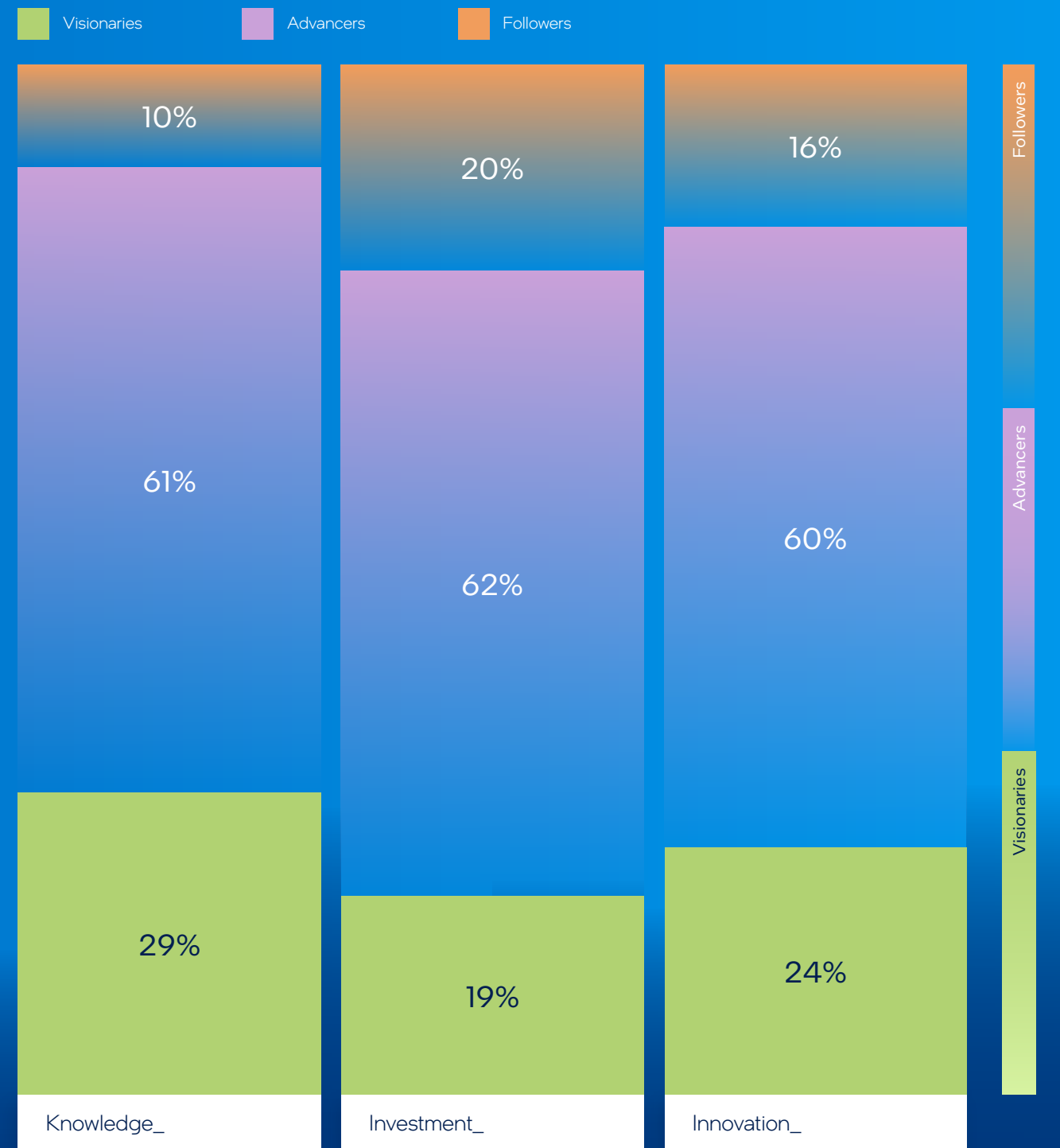
Despite almost a fifth of its organizations being categorized as 'Visionaries', the healthcare and life sciences sector includes one of the highest proportions of 'Followers' out of the sectors in our research. On average, the sector is strongest when it comes to AI knowledge, while investment poses the greatest challenge.

Overall sector ranking

	Visionaries	Advancers	Followers

Technology, Media & Telecommunications (TMT)	35%	59%	6%
Financial Services	32%	60%	8%
Manufacturing	23%	62%	15%
Transportation & Automotive	19%	64%	17%
Travel & Hospitality	18%	65%	17%
Healthcare & Life Sciences	18%	61%	21%
Engineering, Energy & Infrastructure	17%	75%	8%
Retail	12%	72%	16%
Professional Services	12%	69%	19%
Education	9%	67%	24%
Government & Public Sector	8%	73%	19%

Overall pillar performance for Healthcare and Life Sciences

Visionaries · Advancers · Followers

	Knowledge_	Investment_	Innovation_
Followers	10%	20%	16%
Advancers	61%	62%	60%
Visionaries	29%	19%	24%

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Tech zero vs. tech positive

The Index also assesses organizational progress through the lenses of tech zero and tech positive – i.e., AI for sustainable IT, and AI for sustainable organizations.

Tech zero_

58%

of leaders in healthcare and life sciences say their organization is utilizing AI to reduce the carbon footprint of the IT function.
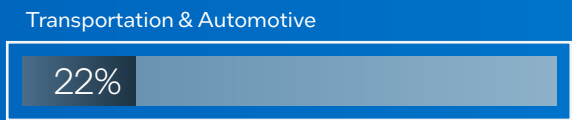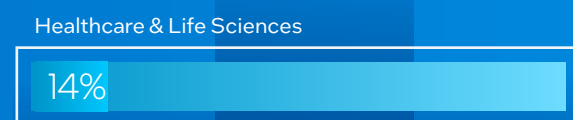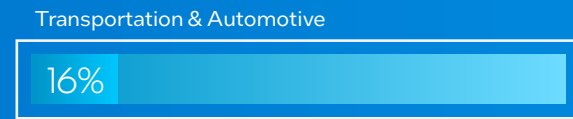
Tech positive_

63%

of leaders say their organization is using AI as a lever for the whole organization to reach its net-zero goals and to have a positive impact.

Tech zero_

TMT	38%
Financial Services	31%
Transportation & Automotive	22%
Engineering, Energy & Infrastructure	20%
Manufacturing	19%
Healthcare & Life Sciences	19%
Travel & Hospitality	17%
Retail	11%
Professional Services	10%
Government & Public Sector	9%
Education	9%

Tech positive_

TMT	27%
Financial Services	22%
Manufacturing	19%
Travel & Hospitality	16%
Transportation & Automotive	16%
Engineering, Energy & Infrastructure	15%
Professional Services	15%
Healthcare & Life Sciences	14%
Retail	13%
Government & Public Sector	11%
Education	9%

There is considerable room for more sustainability-related AI in the healthcare and life sciences sector, with just 19% and 14% considered to be Visionaries for their tech-zero and tech-positive indicators respectively.

Business leaders might be finding far-reaching applications for AI more generally, from clinical decision support and personalized patient care to robotics and automation in surgeries and laboratories, and diagnostics and predictive analysis. However, sustainability-related AI isn't yet being widely adopted in the IT function or throughout the organization.

As demand for AI grows in the sector, healthcare and life sciences organizations have an opportunity to build-in sustainability and benefit from the widespread cost, energy, resource, and time efficiencies the technology can offer.

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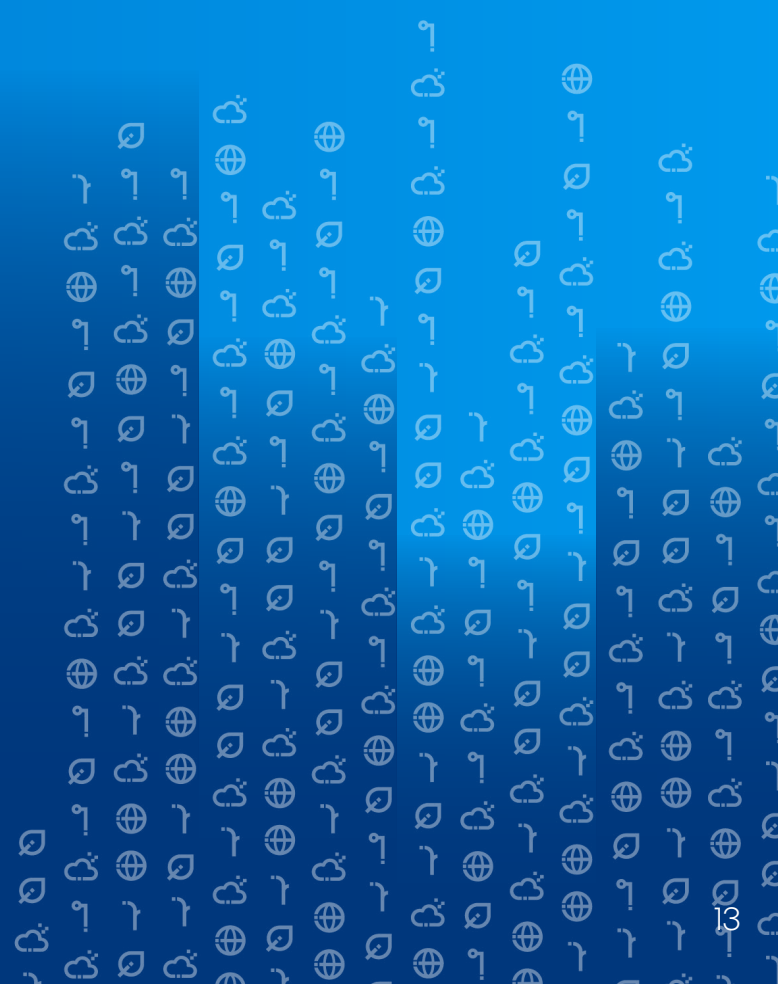
"To meet the rising compute power required for new equipment, processes and masses of data, each hospital and lab now tends to have its own data center. This digitalization is causing emissions to surge across the whole network, contributing to a rapidly-growing energy footprint.

Intel can be a valuable partner to healthcare organizations as they build out their tech ecosystem, supporting facility managers in improving the efficiency – and lifespan – of their hardware and software. We help our customers realize the full potential of their data centers and implement AI solutions to monitor equipment and reduce operating costs through enabling "lights-out" labs, facility consolidation and much more."

Blake Harlan
Head of Strategy - Health, Education and Consumer Industries Group, Intel

Knowledge

'Visionary' organizations are those that understand how AI can be used for sustainable outcomes and are actively implementing this knowledge to help their business achieve sustainability targets.

They provide regular training for the entire workforce – not just IT roles – and have (or are actively recruiting for) AI-focused roles throughout the organization.

Despite this being the strongest pillar for healthcare and life sciences organizations, C-suite leaders admit they are facing some obstacles. Two-thirds (67%) of C-suite leaders believe that a lack of AI skills is a significant barrier to achieving their organizational goals, and 69% cite internal resistance to AI adoption and a lack of understanding among employees as challenges that their organization is facing.

However, leaders are actively managing their skills gaps; seven in 10 (72%) of C-suite leaders believe their organization is dedicated to ensuring its employees are not only skilled in current AI technologies but are also prepared for future advancements in the field, and 68% see their organization as being at the forefront of AI education, investing significantly in training its employees.

This may improve if healthcare and life sciences organizations see the value in dedicated AI leadership; currently, just 32% have a Chief AI officer in position, but active recruitment is most focused on AI operations manager roles (39%) and sustainable product design engineers (37%). For the sector to reach tech zero and tech positive, it's important that recruitment for AI expertise is prioritized.

Tech zero: AI for medical management

For those within the healthcare and life sciences sector, there is often no room for error or delay as medical management needs to be provided at the right time and to the right effect. This is where AI applications can provide great benefits:

Medical data processing

AI can optimize and streamline the task of processing large volumes of medical data. This could be anything from imaging to genomic data. When time efficiencies are essential, AI can also help to process data at speed, which can reduce the computational power, and therefore, the energy consumption that's required.

Equipment uptime

Predictive maintenance can play a huge role when it comes to medical equipment, particularly for those connected with sensors and other technology. Enabling AI to proactively schedule maintenance can reduce the energy wastage that's produced as a result of malfunctioning or failed equipment, ensuring that resources are used sustainably.

Case study

KFBIO Accelerates Cancer Detection Workloads with Intel AI Technology

Pillar 2

Investment

Visionary organizations are dedicating a significant portion of their IT budget and annual revenue to sustainability-focused AI research and development. They have already implemented various AI technologies within their IT operations and across the business, and are working on more applications.

Investment is the weakest pillar across all 11 sectors, including healthcare and life sciences. This could be impacted by a number of factors, including regulatory hurdles, and the complex process of ensuring that patient safety, data privacy and international compliance are protected. There are also integration issues; AI performs best with high-quality, standardized data sets, which can be difficult to achieve through disjointed data sources across healthcare systems – leading to technical challenges that can be prohibitively expensive to overcome. Businesses face internal challenges too – 61% of leaders believe there is scepticism among stakeholders, stemming from a lack of clarity within the organization about the tangible benefits of AI investments.

Barriers to investment become barriers to sustainability progress. Although three-quarters (74%) of C-suite leaders predict their organization's investment in AI will triple in the next 12 months, fewer leaders (69%) expect that their *sustainability*-related AI budget will increase, and anticipate an average increase of just 7%.

This represents a huge, missed opportunity; based on the healthcare and life sciences businesses in our research, investing in AI for sustainability could save organizations up to $53m per year by creating widespread operational efficiencies.

The ROI of AI in healthcare and life sciences:

$11.9m
Average annual cost savings per company

$53m
Maximum annual savings per company

The top AI use cases healthcare and life sciences organizations are currently deploying for tech zero and tech positive:

Tech zero:

1. Resource management
2. Algorithm and data efficiency
3. Regulatory compliance
4. Computer Vision for improved quality or reduced waste
5. Cloud computing optimization

Tech positive:

1. Resource management
2. Process automation
3. Energy consumption / efficiency
4. Environmental monitoring and compliance
5. Sustainable supply chain optimization

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Pillar 3

Innovation

Visionaries in the innovation pillar collaborate extensively with internal teams and external partners to share ideas and best practices for using AI to promote sustainability.

Visionary organizations are already seeing AI solutions contribute to their sustainability goals, and many have successfully filed patents for AI tools or solutions related to sustainability within the past 12 months.

As a sector that is defined by research and advancements, it's not surprising that healthcare and life sciences C-suite leaders are open to AI innovation. Almost three-quarters (73%) say their organization has an AI innovation centre or lab, and 75% are confident that AI-driven advancements have enhanced the customer experience and led to increased satisfaction and loyalty in their organization's customer base.

But unless AI is utilized for sustainability benefits, there is limited scope for widespread change. Almost half of business leaders (47%) don't believe their organization is particularly innovative when it comes to using AI as a lever for the whole company to reach its net-zero goals and have a positive impact. And, in terms of their organization's sustainability goals, 28% say that AI is making a minimal contribution, or no contribution at all.

Tech positive: AI for tailored medicine

For a sector as complex as healthcare and life sciences, there are plenty of areas where AI can help to increase the sustainability of an organization's operations.

Tailored medical plans

AI is at the center of creating tailored medical plans for patients, it can help to optimize resource use as well as improve patient treatments. AI can analyze the vast amount of patient data that sits behind a tailored patient plan, enabling it to predict personal health trajectories and next steps in ongoing medical care. This will reduce unnecessary tests, procedures and wasted medicines, which, consequently will reduce the overall carbon footprint per patient.

Remote patient care

Being able to treat patients at home through insights and tailored plans driven by AI can significantly reduce the need for travel, and therefore, reduce carbon emissions associated with patient visits. By continuously monitoring patient health, AI can pose timely interventions, making the diagnosis and treatment process more efficient and reduce the burden on medical resources.

Case study

Intel's work with the Cell Image Project, improving efficiencies of cell manufacturing with image-based AI.
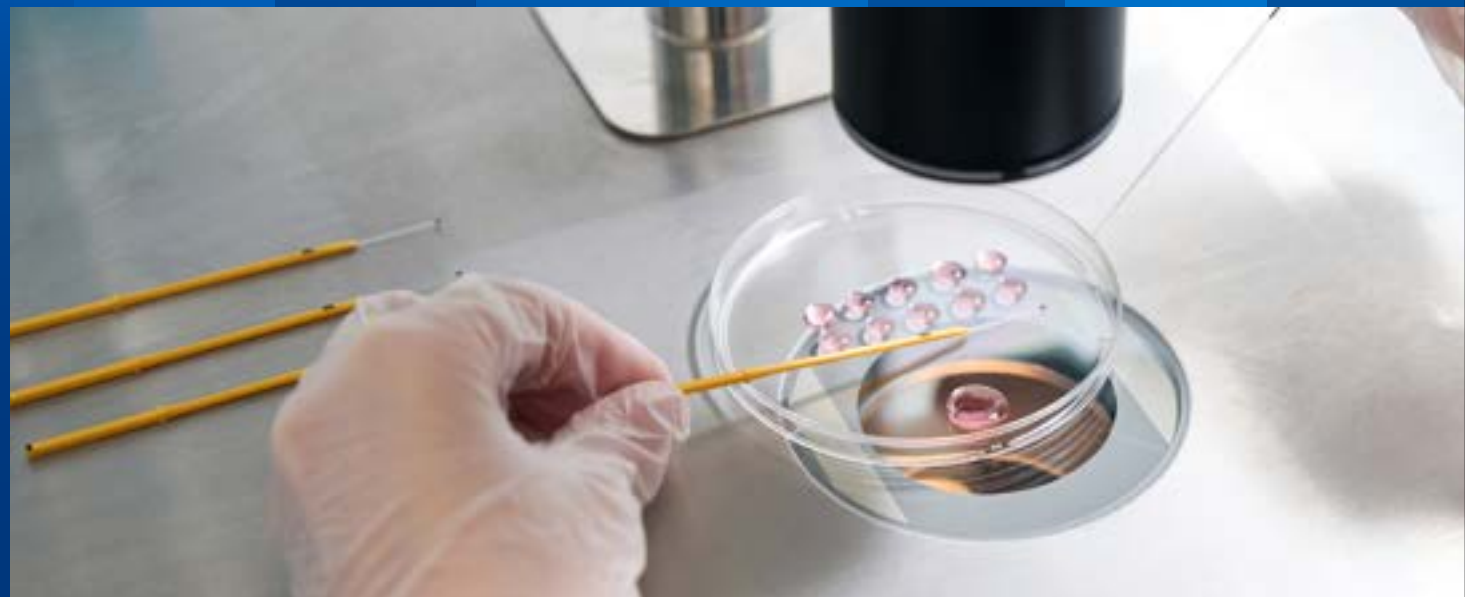
Conclusion

Closing the intention-action gap for healthcare and life sciences

The healthcare and life sciences sector is facing significant barriers when it comes to using AI to progress organizational sustainability.

Although organizations are implementing a wide range of AI solutions, day-to-day efficiency is taking priority over long-term sustainability. Businesses are adopting – or are ready to adopt – AI for patient care, diagnostics and research support, but the lasting environmental implications of extensive technology deployment are not a focus.

To fast-track organizational change, leaders will need to bridge the current investment gap and build stakeholder confidence in AI's potential ROI. This suggests that the sector could strengthen all three pillars; further improving their knowledge and education about AI to unlock greater investment, and emphasizing innovation to realize more cost-efficient AI solutions across healthcare and life sciences applications.

With decisive leadership, strategic vision, and a commitment to collaboration and responsible innovation, AI can bridge the gap between digitalization and sustainability. If leaders in healthcare and life sciences recognize that AI can improve their current processes, leading to increased sustainability, it can become a powerful accelerator for growth and transform the sector for a greener future.

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Disclaimer, authorship, and acknowledgments

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Resources

For more information about Intel's sustainability goals and progress please visit:
www.intel.com/sustainability

About Intel

Intel (Nasdaq: INTC) is an industry leader, creating world-changing technology that enables global progress and enriches lives. Inspired by Moore's Law, we continuously work to advance the design and manufacturing of semiconductors to help address our customers' greatest challenges. By embedding intelligence in the cloud, network, edge and every kind of computing device, we unleash the potential of data to transform business and society for the better. To learn more about Intel's innovations, go to *newsroom.intel.com* and *intel.com*.

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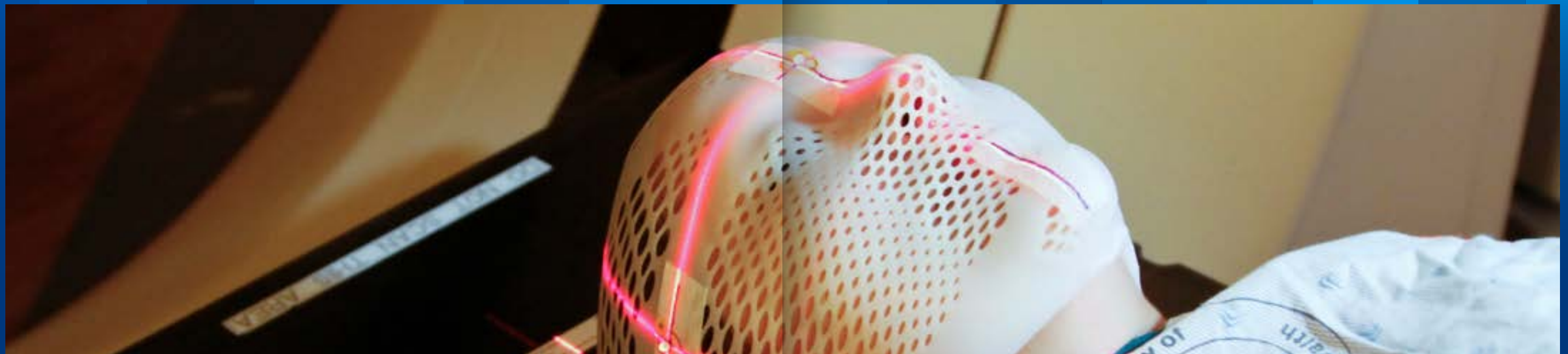
To find out more

For further information please contact:

**Alex Liu, Sustainability Lead,
Sustainability Center of Excellence**

alex.liu@intel.com

For media enquiries, please contact:

**Chelsea Hughes, Senior Corporate
Communications Manager: Global Impact**

chelsea.hughes@intel.com

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