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The tech leader's sustainability agenda

Contents

Introduction

The time for sustainability action is now. The mission to arrest climate change and drive sustainability is clear. The CIO's role, however, is often not so well-defined. In a previous publication,[1] we shared perspectives on a CIO's call to action in driving an environmentally sustainable tech agenda. This article maps where the CIO and technology leaders can likely make the most immediate impact - and help build towards a long-term legacy of positive outcomes. It focuses on five core capabilities a CIO may need to develop to lead sustainability efforts that can benefit the enterprise, the planet, and society.

The role of the CIO and the types of technology they oversee will likely increase in importance as a company's sustainability ambition and commitments progress from compliant to transformational (see sidebar) – and all CIOs have a crucial part to play as they partner across the business. Our framework is informed by the expectations of multiple external stakeholders, as well as the

Paris Climate Agreement and recent rule proposals from the US Securities and Exchange Commission and other public regulators.

Five core sustainability capabilities

The five sustainability capabilities encompass one overarching strategic dimension of sustainability, and four tactical or action-oriented functions that address sustainability capabilities specific to the CIO's role. The capabilities are mutually reinforcing, and not mutually exclusive.

Three Levels of Sustainable Organizations[2]

01 SUSTAINABILITY–COMPLIANT

Meets sustainability regulations and data reporting requirements. The CIO:

- Oversees and helps build a timely, auditable, cost-effective and transparent process for the annual collection of sustainability-data across the global organization.

02 SUSTAINABILITY–ENHANCED

Accelerates the collection and management of sustainability data, seeking near-real-time access to granular level metrics to support decision-making on a frequent basis. The CIO:

- Supports sustainability goals by greening data centers, reducing IT hardware waste, and incorporating social and governance factors into IT policies and processes.
- Helps develop data collection from company operations – including passive and IoT-enabled sensors throughout the supply chain – to drive sustainability objectives for all business units.
- Guides selection and implementation of technology that tracks, monitors, and reduces carbon and waste across the company, among suppliers, and throughout the value chain.

03 SUSTAINABILITY–TRANSFORMED

Invests in sustainability as a competitive advantage and a source for product differentiation and new growth. The CIO:

- Helps lead all sustainability-related strategies, standards, and technology selections.
- Champions major investments in sustainability-driven technologies and helps the business understand how to deploy and accelerate the use of such technologies.
- Plans and creates a solution to link sustainability metrics to product stewardship, operational implications, and reporting requirements.
- Supports efforts to better understand and leverage emerging technologies that can help the business achieve their sustainability strategies.

FIVE CORE SUSTAINABILITY CAPABILITIES

01: Charting and achieving path to net zero

Sustainability encompasses a broad challenge that goes beyond climate change, environmental health, and carbon emissions. It extends to the larger movement to reduce social inequities and economic hurdles, increase diversity and inclusion, and meet higher ethical standards for corporate governance.[3] When organizations make commitments to achieve sustainability, they tend to hold themselves accountable against these multiple goals and standards, including net-zero commitments. The problem is to set a strategic plan that is realistic, measurable, and broad enough. Many organizations struggle with this capability – and these struggles often become part of the CIO's portfolio.

For example, few public corporations have a comprehensive understanding of their carbon footprint, let alone a structured plan to decarbonize their value chain by mid-century[4] even though more than 2,000 have set science-based emissions targets since the Paris Climate Agreement.[5] Deloitte's global survey of 2,000 C-suite executives found that about one-third have difficulty measuring their organizations' environmental impact.[6] Additionally, less than 10 percent of companies are actively using technology to collect, analyze, and report on the data critical to meet ESG commitments.[7]

The CIO's ownership of (or significant influence over) reporting systems of record positions them as one prime enabler of sustainability goals. CIOs can provide crucial support to help identify, collect, analyze, and track critical data measuring their progress. For example, there will be a need for the efficient collection and accurate tracking of emissions data (e.g., via integration with data vendors) that can help with comprehensive emissions measurement. The subsequent ability to compare these results against net-zero milestones and goals often depends on a CIO's technology decisions. By leading the development of customized reporting and data analytics, CIOs can identify gaps in disclosures and make recommendations for improvements.

In short, CIOs can deploy technology to measure the organization's own progress and compare it to efforts against other, comparable organizations – providing a real-time view for stakeholders and guiding future efforts.

FIVE CORE SUSTAINABILITY CAPABILITIES

02: Building and enabling value chain responsibility

For most companies, the biggest portion of emissions — as much as 90 percent — comes from their value chains.[8] However, this information is often challenging to access and even more difficult to address given that it falls outside the organization's purview.

Some ways CIOs can play a critical role in addressing this challenge is by building partnerships, sharing information, and communicating with other stakeholders and counterparts. For instance, CIOs can deploy technologies that open opportunities to suppliers and vendors to participate in sustainable power-purchase agreements.

Also, with the right technology, a company can better detect and avoid suppliers who don't meet ethical standards on bribery, corruption, slavery, or human trafficking. These same technologies also can track raw materials and products and enable organizations to focus on responsible sourcing strategies. Consumers clearly favor companies who take such measures; 88 percent of global consumers who were surveyed say they prefer to buy from companies with ethical sourcing strategies.[9]

FIVE CORE SUSTAINABILITY CAPABILITIES

03: Making quality and transparent disclosures

Stakeholders – especially regulators and investors – are often demanding accurate and timely data on sustainability initiatives. In March 2022, the SEC proposed rule changes that would require publicly traded companies to disclose climate-related data such as greenhouse gas emissions.[10] New Zealand, the UK, and Switzerland enacted regulations or established timetables for doing so. Multiple stakeholders will use global standards to gauge an organization's worthiness as an investment and its risk profile.[11]

The CIO can lead on the effort to improve the quality, accuracy and timeliness of disclosures.

New and current platforms and solutions can support the validation, screening, and analysis of data to identify gaps and areas for improvement. In turn, these tools can help CIOs and the entire C-suite develop better plans to meet sustainability goals like net zero.

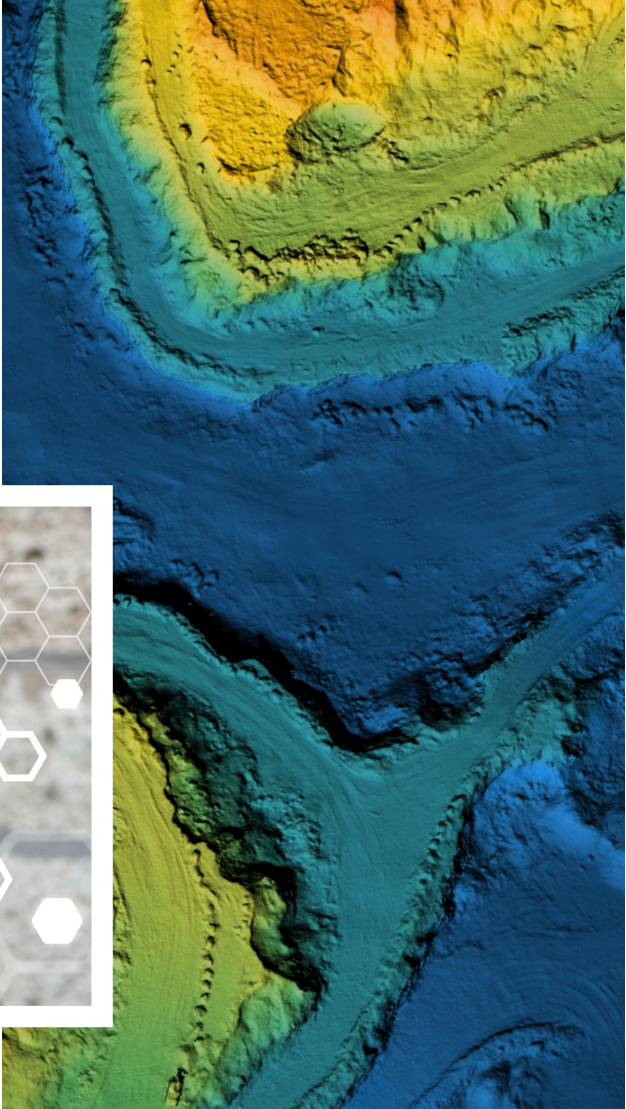**FIVE CORE SUSTAINABILITY CAPABILITIES**

04: Managing physical and transition risk

In the next 30 years, it is expected that two-thirds of global companies will have at least one asset threatened by climate change.[12] Climate-related risks are of increasing concern to executives, regardless of their industry or geography. More than three-fourths of surveyed CEOs and CFOs say their companies are unprepared for the climate risks their companies face.[13]

Moreover, not all risks to the enterprise come in the form of climate events. During the COVID-19 pandemic, many organizations realized the need to develop systems for identifying, assessing, and addressing global biological threats faster and more effectively. These same systems can build resiliency within an organization's supply chain.

CIOs need to assess the likelihood of climate hazards and their impact on the organization's assets, operations, and reputation. Supply chain simulations and the use of digital twins test an enterprise's resiliency and ability to respond to disruptions. For example, a CIO, by using a digital twin, can test supply chain resiliency in response to potential climate-related disasters or rising sea levels. These scenario-planning tools can be useful to an array of internal and external stakeholders including regulators, investors, suppliers, risk managers, sustainability teams, operation departments, and asset managers. A well-constructed simulation can help focus attention on the need to have plans to reduce downtime of key systems due to a climate event – it can also contribute to the organization's sense of urgency on climate issues as a whole.
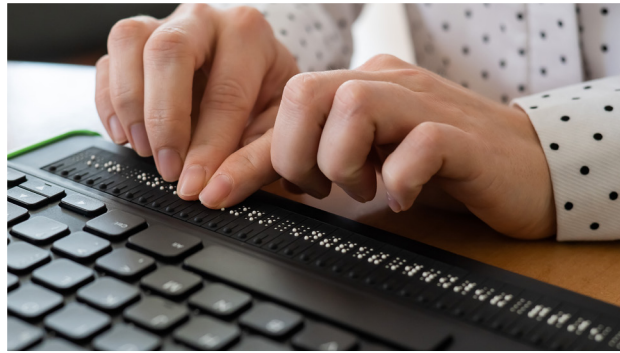
FIVE CORE SUSTAINABILITY CAPABILITIES

05: Activating equity inside and outside the organization

As more organizations address structural inequities and transform long-held beliefs and behaviors, CIOs can lead on several equity-related efforts. For example, CIOs can contribute meaningful ways to track the recruitment, retention, promotion, and growth opportunities of an organization's people, with a goal of improving diversity, equity and inclusion outcomes.

CIOs can also address ways in which technology can sometimes be a source of inequality. Certain technologies, such as AI, analytics, and robotics, can raise ethical considerations,[14] amplify bias[15] and uneven treatment of individuals in the way they are designed and used.[16] For example, some software used to evaluate resumes or even conduct interviews have been known to contain racial and ethnic bias against people of color.[17] Many technologies should be built to account for people of varying backgrounds – for example, AI-enabled voice recognition technologies should accommodate people with diverse language and speech patterns. A CIO attuned to these risks can actively seek out technologies that are more inclusive, ethical, accessible, and free of bias.

Highlighting emerging players across the key capabilities

The market for sustainability and ESG solutions is complex. There is significant capital being invested in start-ups, and legacy players are making moves beyond their core offerings. CIOs will decide how much of their ESG capabilities reside with third party solutions, but that decision may be complicated due to the extent of providers and this young and highly fragmented market.

To assist, Deloitte has focused specifically on the start-up aspect of this ecosystem. We leveraged a data-driven approach to identify non-public, VC-backed startups and grouped them by capability areas. For the full objective criteria to list the companies, see Appendix.

The vendor map on the next page is an initial way to see how CIOs can categorize vendors for specific requirements. It is for informational purposes only and does not serve as an endorsement by Deloitte of any of the mentioned suppliers, nor does it imply any existing business relationship with Deloitte.

Within each of the five capabilities, technology start-ups are organizing around different sub-capabilities based on market needs.

The sub-capabilities are not an integrated view on how to solve the capabilities; they are indicative of how the market is dynamically shaping itself, driven by Venture Capital funding.

STRATEGY

CHARTING & ACHIEVING PATH TO NET ZERO

E (ENVIRONMENT) STRATEGY COMPONENT OF ESG				S (SOCIAL) STRATEGY COMPONENT OF ESG	
Clean energy transition, planning & execution Enercoop, 3Degrees, Arcadia	26	**Emissions benchmarking and assessment** 3Degrees, One Concern, Persefoni	8	**Sustainability/social impact assessment** Clarity AI, Submittable, Benevity	9
Sustainability financing Aspiration, TagEnergy, Scale Mirogrid Solutions	19	**Dashboards and data visualization** Cool Planet, LevelTen Energy, Greenly	7	**DE&I learning & development** Mathison, Praxis Labs, Eskalera	4
Emissions baselining, target setting, & road mapping 3Degrees, MioTech, Deepki	15	**Verification and certification** Project Canary, SustainCERT	2	**Aligning business strategy with social impact goals** Submittable, Benevity, Givewith	4

EXECUTION

BUILDING & ENABLING VALUE CHAIN RESPONSIBILITY		MAKING QUALITY & TRANSPARENT DISCLOSURES		MANAGING PHYSICAL & TANSITION RISK		ACTIVATING EQUITY WITHIN & OUTSIDE THE ORGANIZATION	
Carbon accounting Aspiration, MioTech, FourKites	28	**Reporting & disclosure process, development & support** Insightsoftware , Alter Domus, MioTech	20	**Sustainability risk management** Insightsoftware, EcoVadis, MetricStream	16	**Inclusive products/services, financing, or design** LEAD School, WaterHealth, BlocPower	18
Carbon capture/conversion CarbonCure, Climeworks, CarbonBuilt	28	**ESG reporting & governance** Greenstone, Alter Domus, MioTech	17	**Financial planning for climate risks** OneStream, One Concern, Jupiter Intelligence	12	**Diversity recruiting** Untapped, SkyHive, PowerToFly	11
Carbon offsets 3Degrees, Aspiration, LanzaTech	24	**Disclosure & reporting audit** Greenstone, MetricStream, Deepki	9	**Climate risk strategy & assessment** One Concern, Jupiter Intelligence, Climate X	10	**Corporate philanthropy platform** Submittable, Benevity, Groundswell	9
Supply chain resiliency Project44, Assent Inc., ISN Software	17	**Data and application security** Assent Inc., BigPanda, MetricStream	7	**Catastrophe insurance & claims mngnt.** Descartes, Tractable, Jupiter Intelligence	6	**Employee health, wellness, & safety** StrongArm Tech, Arevo Health, Innovu	8
Circular economy & energy-efficient products/raw materials Wheelabrator Technologies, Trove, Uplight	7	**ESG rating** Alter Domus, EcoVadis, MioTech	4	**Emergency response & disaster recovery** AlertMedia, Assent Inc., RapidSOS	6	**Supplier diversity & ethics** Constrafor, Prevalent, scoutbee	6
Supply chain visibility mapping Project 44, Assent Inc., QIMA	6	**Tax platform & data integration** Insightsoftware, Loctax	2			**Workplace DE&I analytics** Untapped, Mathison, Joonko	6
Sustainable sourcing Assent Inc, Orbital Insight, Project Canary	6					**Patient-centric healthcare data platforms** Clarify, Nuna, Osmind	5
Organizational and supply chain ethics Assent Inc., Prevalent, QIMA	4						
Energy consumption optimization Envio Systems, Cool Planet, Optimum Energy	3						
Supply chain modeling Cosmotech, Normative	2						

LEGEND

The number in the sub-capability box refers to the number of companies in that sub-capability (e.g., 28 companies were identified under Carbon Accounting)

The three companies listed in the sub-capability box refer to the top three most funded companies in that sub-capability (source: Pitchbook)

GOOD GOVERNANCE + DATA & ANALYTICS

This research was completed in July 2022. This market survey is for informational purposes only and does not serve as an endorsement by Deloitte of any of the mentioned suppliers, nor does it imply any existing business relationship with Deloitte.

Key Points

So, what should CIOs do with this complex picture? We recommend first that CIOs identify their requirements and level of maturity by each capability and relevant sub-capability area. Then, identify the timeframe and urgency of the requirement. Based on these criteria, the CIO should assess the current capability and roadmap of the major vendors in their existing tech stack and decide where it is advantageous in the business to address the most urgent gaps and whether a start-up vendor can satisfy the need.

For example, in a category like *Charting and Achieving Path to Net Zero*, established vendors may still need to develop their solutions further, and therefore the selection of a start-up vendor may be warranted. In a capability area like Making Quality and Transparent Disclosures, the existing vendors are more mature, and the requirements

driven by impending regulations are extremely urgent, so selection of a start-up vendor to address limited gaps may be warranted. We think of this as a "platform and extend" approach.

There are two additional considerations. In areas where companies are on the *Transform* end of maturity, CIOs should be more willing to consider innovative, best of breed startup vendors. For example, financial companies may be more willing to consider innovative start-ups for transition risk. Lastly, CIOs should prioritize startups that are in the ecosystems of their established vendors since these best of breed players are more likely to have tested integrations, access to vendor roadmaps, and to be potential acquisition targets. The capabilities that matter most to the larger enterprise will most often lie squarely within the CIO's influence – data collection and reporting.

From there, a CIO can develop a portfolio of sustainability initiatives that are more proactive and where they can have direct influence, such as value chain analysis for ethical sourcing requirements. And beyond that, CIOs can take on transformational initiatives such as digital twins to build resiliency and awareness.

Ultimately, however, all CIOs should understand that true progress and significant outcomes on the sustainability portfolio – a legacy to be proud of – won't be clear until well beyond their tenure. That is the nature of the work of sustainability, because what we do and the investments, we make today will make life better for our planet, our people, and our prosperity for decades to come.

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Appendix

Vendor Landscape Research Methodology, completed in July 2022.

01. Based on the description/definition of the five capabilities, surfaced relevant startups from CBInsights, Pitchbook, and Tracxn.

02. Shortlisting criteria:

   – Identified startups with total funding of $10M or more, using Pitchbook.

   – Further shortlisted companies by verifying their offerings against the five *capabilities*.

   – Mapped each startup to one or more relevant sub-capabilities based on offering/use case descriptions in CBInsights/ Pitchbook/Tracxn and vendor websites.

03. Note: While there are multiple public companies that have these sub-capabilities, the focus of this research was startups. We did not include startups acquired by public companies.

Endnotes

01. CIOs and sustainable technology | Deloitte Insights

02. Based on Deloitte research

03. What is "sustainability"? Is it the same thing as taking action on climate change? | MIT Climate Portal

04. Deloitte CxO Interviews

05. Companies taking action | Science Based Targets Initiative

06. CxO survey on sustainability in business | Deloitte Insights

07. The No. 1 ESG challenge organizations face: data | World Economic Forum

08. Supply Chain Guidance | US EPA

09. Do Consumers Care About Ethical Sourcing? | Forbes

10. SEC to Require Companies to Disclose Emissions in New Plan | Bloomberg

11. Building Brand Integrity Through ESG Reporting | Forbes

12. Physical Risks Essential Sustainability | S&P Global

13. More than 3 in 4 of world's top CEOs and CFOs say their companies are underprepared for climate-related financial risks, finds FM Global | FM Global

14. Ethical dilemmas in technology | Deloitte Insights

15. Thinking Through the Ethics of New Tech…Before There's a Problem | HBR

16. Making ethical tech a priority | Deloitte Insights

17. ANALYSIS-AI is taking over job hiring, but can it be racist? | Reuters

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