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How Boards of Directors Govern Artificial Intelligence

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How Boards of Directors Govern Artificial Intelligence

Artificial intelligence is top of mind, even for nontechnical business executives and board members. However, the majority of boards struggle to understand the implications of AI for their businesses and their role in governing it. We describe how some boards are addressing AI and identify four groups of board-level AI governance issues. We provide examples of effective board-level AI governance practices for each group of issues and make recommendations for establishing board-level AI governance.[1,2]

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Artificial Intelligence in the Boardroom

Artificial intelligence (AI) is top of mind, even for nontechnical business executives and board members. In 2019, more than 75% of executives had already voiced concerns that their companies might become obsolete if they failed to use AI effectively.[3] Fast forward to 2023 and the majority of boards of directors are still struggling to understand the implications of AI for their businesses and the role they have in governing it.[4]

AI, as a transformative technology, is reshaping the business landscape across many industries, generating new value-creation opportunities and redefining competitive dynamics. The broad adoption of AI requires capital-intensive investments that are often uncertain in nature and pose novel legal, ethical and reputational risks. However, AI, like other digital technologies, is often not a mainstream boardroom topic.[5]

Boards, as stewards of shareholders' interests, have the fiduciary responsibility to oversee and direct the affairs of the company. Their mandate includes strategy approval, financial oversight, assurance of adequate enterprise risk management and executive appointments.

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1 Martin Mocker is the accepting senior editor for this article.

2 The authors thank Martin Mocker, Blaize Horner Reich, Joe Peppard and the members of the review team for their thoughtful feedback and guidance throughout the review process. We also gratefully acknowledge the support of the interviewed board directors in providing insights into their AI governance practices.

3 For a discussion on the business criticality of AI technology perceived by C-level executives, see Reilly, A., Depa, J. and Douglass, G. *AI: Built to Scale*, Accenture, 2019, available at https://www.accenture.com/content/dam/accenture/final/a-com-migration/thought-leadership-assets/accenture-built-to-scale-pdf-report.pdf.

4 *Watch Board Effectiveness: A Survey of the C-Suite report*, PwC's Governance Insights Center. May 2023, available at https://www.youtube.com/watch?v=SLqBZD5zp7E.

5 The need to govern technology at the board level is not new and has also been suggested in prior studies. See, for example: 1) Nolan, R. and McFarlan, F. W. "Information Technology and the Board of Directors," *Harvard Business Review* (83:10), October 2005, p. 96; and 2) Weill, P., Apel, T., Woerner, S. L. and Banner, J. S. "It Pays to Have a Digitally Savvy Board," *MIT Sloan Management Review* (60:3), March 2019, pp. 41-45.

Given AI's transformative impact, board-level responsibilities extend to overseeing the company's use of AI to fulfill the boards fundamental duties of care and loyalty.[6]

In this article, we use the term board-level AI governance, or AI governance for short, to refer to the way boards oversee and integrate the adoption and implications of AI within corporate governance practices.

This article aims to help boards in establishing board-level AI governance. Driven by the question "How can boards effectively govern AI?", we conducted in-depth interviews with high-profile board members from diverse industries and with varying levels of digital and AI expertise (see the Appendix for details). Our observations reveal how boards are addressing AI, and provide insights into how boards are integrating AI into their corporate governance.

Our analysis identified four groups of board-level AI governance issues: 1) Strategy and Firm Competitiveness; 2) Capital Allocation; 3) AI Risks; and 4) Technology Competence (see Figure 1). The issues in each group present specific challenges and opportunities, and boards should address them according to their organization's needs and priorities. AI, as a strategic enabler, can impact business strategy by introducing new competitors and business models. Capital allocation focuses on ensuring funding for AI experiments and strategically directing investments toward AI capabilities. Directors face new challenges in risk oversight due to AI's ethical, reputational and regulatory complexities. Lastly, enhancing technology competence within boards and executive teams ensures informed AI governance decisions.

Below, we describe the issues of each group in detail, highlighting the associated challenges and opportunities, and report on the AI governance practices that were implemented within the boards of our respondents. We then provide three actionable recommendations to assist boards in their efforts to establish AI governance.

1. Strategy and Firm Competitiveness AI Governance Issues

AI is a strategic enabler and differentiator with the potential to deeply influence an organization's competitive position and business model. In response, boards are adopting two specific practices: 1) ensuring that AI is reflected in business strategy—i.e., addressing how AI is impacting the strategic landscape and 2) incorporating AI into the board's annual strategy meeting, which ensures systematic board-level discussions of AI.
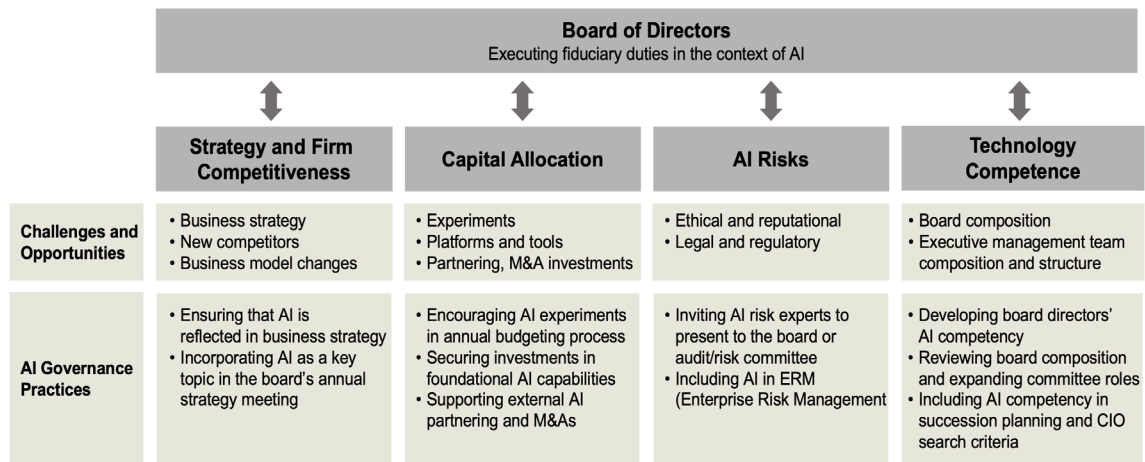
Ensuring that AI Is Reflected in Business Strategy

For many board members, AI is a new topic outside their experience and comfort zone and, as a result, boards may often view it primarily from a risk perspective. However, some boards are encouraging management to evaluate the opportunities of AI. Directors reported that their boards have reviewed, or plan to review, the potential for AI to create new offerings, evaluated the emergence of new competitors and assessed the impact of AI on their company's business model.

Several boards have asked their executive teams to evaluate how AI is integrated into the strategy for unique market positioning through new AI-enabled offerings. Though approaches varied, there was often a particular focus on how AI can create customer value or cost advantages. An example of anchoring and communicating AI in a business strategy is provided by Ping An Insurance's latest business analysis, which details how it plans to empower financial services with technologies (e.g., by using an "AI Customer Visit Assistant") and how it strategically focuses on developing AI as a core technology to empower human service representatives with AI, offering services covering lending, credit cards and insurance.[7]

The board of another insurance company requested an analysis of the use of AI by competitors so it could evaluate the emergence

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6   The duties of care and loyalty, alongside exercising business judgment, define the standards for directors' behavior and engagement as well as their legal liabilities. For more information, see Walker, G. and Madsen, T. L. *Modern Competitive Strategy* (4th edition), McGraw Hill, 2015, pp. 342-343.

7   See *Announcement of Audited Results for the Year Ended December 31*, 2022, Ping An Insurance Group, March 2023, pp. 51-55, available at https://group.pingan.com/resource/pingan/IR-Docs/2023/pingan-ar22-report.pdf.

Figure 1: Four Groups of Board-Level AI Governance Issues

Board of Directors Executing fiduciary duties in the context of AI			
Strategy and Firm Competitiveness	**Capital Allocation**	**AI Risks**	**Technology Competence**
Challenges and Opportunities			
• Business strategy • New competitors • Business model changes	• Experiments • Platforms and tools • Partnering, M&A investments	• Ethical and reputational • Legal and regulatory	• Board composition • Executive management team composition and structure
AI Governance Practices			
• Ensuring that AI is reflected in business strategy • Incorporating AI as a key topic in the board's annual strategy meeting	• Encouraging AI experiments in annual budgeting process • Securing investments in foundational AI capabilities • Supporting external AI partnering and M&As	• Inviting AI risk experts to present to the board or audit/risk committee • Including AI in ERM (Enterprise Risk Management	• Developing board directors' AI competency • Reviewing board composition and expanding committee roles • Including AI competency in succession planning and CIO search criteria

of new competitors. A director of this company noted:

> "AI use cases aren't typically discussed at the board level, but many of our directors wanted to understand our AI approach versus that of our competitors. Especially because AI is such a competitive weapon in insurance, both in terms of attracting new customers and managing claims and identifying potential fraud."

The analysis enabled the board to review and evaluate the company's future market positioning, ensuring that it did not risk falling behind and identifying potential competitive advantages and investment opportunities. As a result, the company made significant AI investments with a transformative impact on its business operations.[8]

In addition, several directors reported that their boards plan to discuss with management how to anticipate and address AI-driven business model changes. These include the emergence of new, evolved and potentially disruptive business models enabled by AI offerings that serve customers differently, often in a highly personalized and automated manner, while also providing cost benefits. For example, Ant Group—

an affiliate of Alibaba Group—offers AntPay, a payment technology that uses AI to assess creditworthiness, enabling Ant Group to provide microloans to consumers and businesses often overlooked by traditional banks.[9]

Another example is Siemens Mobility's offering for Renfe, the national railway company of Spain, which uses AI to accurately predict the number of train passengers. This AI-enabled intelligent mobility-as-a-service (MaaS) platform has changed Siemens Mobility's business model from selling trains to offering passenger transport capacity services and has enabled Renfe to improve its on-time performance and increase revenue by €156 million over five years, driven by a resulting shift from airline to rail travel.[10]

From our interviews, we found that many directors view understanding the role of AI for the company and engaging in decisions about AI's role in business strategy as an important board responsibility. These directors focused on both traditional AI, which primarily uses machine learning to learn patterns from data to make predictions, and generative AI, which can

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8   This insurance company currently has an annual investment of around $200 million in AI-related software.

9   For more information on Ant Group's AI use, see: Cho, Y. "How AI and vast data support Ant Group's financial empire," Nikkei Asia, November 2, 2020, available at https://asia.nikkei.com/Business/Finance/How-AI-and-vast-data-support-Ant-Group-s-financial-empire.

10   See *Siemens Mobility and Everis to Develop a Mobility as a Service (MaaS) Platform for Renfe in Spain*, Siemens, 2021, available at https://press.siemens.com/global/en/pressrelease/siemens-mobility-and-everis-develop-mobility-service-maas-platform-renfe-spain.

Table 1: Four Ways of Incorporating AI into the Board's Annual Strategy Meeting

Focus	Leader for 60-minute session
External View ● Trends and drivers of AI within the firm's industry ● Trends and drivers of AI in adjacent industries	**External industry expert**
Internal Examples of What Has and Has Not Worked ● Overview of AI initiatives and applications in use (or not) within the firm ● Overview of the current and future AI investment portfolio	**CEO, COO/CTO, CIO**
Overview of the Competitive Landscape ● Competitor positioning review and evaluation ● Traditional competitors and new entrants exploiting AI	**CEO, chief strategy officer**
CEO's AI Agenda ● Assessment of AI impact and opportunities within/beyond the business model ● Approach to creating new business value and competitive advantage with AI	**CEO**

generate new, unseen content such as images or human-like text. Board members should not rely on executive management to initiate these conversations. As one director put it: "In all the boards I am part of, the topic of AI was not opened by executive management." This quote, echoed by others, underscores the board's duty to start the AI conversation. The question is: How best to approach it?

Full board meetings provide an opportunity for board members to receive updates on AI and review and discuss the firm's strategic plans that involve AI. These full board discussions can facilitate a shared understanding and support for strategic AI-related decisions, which is important because, as one director noted: "Ultimately, board decisions are [whole] board decisions and not decisions of individual directors." Full board discussions, however, are often constrained by the limited available time, preventing the necessary depth in the conversation.

An alternative approach was adopted by the directors of a pharmaceutical company that was under pressure to drive rapid AI-enabled technological change. They established a sounding board where AI-savvy board members could meet with the CIO and other key executives. This group met at least twice a year for project-focused dialogues about the progress of AI initiatives.

Incorporating AI as a Key Topic in the Board's Annual Strategy Meeting

The annual board strategy meeting is an excellent opportunity to deeply involve the board in strategic decisions related to AI. In this way, boards can ensure that AI is addressed and integrated into the company's strategic agenda. The directors we interviewed described four types of sessions, each lasting about 60 minutes, where AI had been incorporated into their boards' strategy meetings, focusing respectively on an external view, internal AI examples (good and bad), the competitive landscape and the CEO's AI agenda (see Table 1).

External view: In some boards, an external expert outlined AI opportunities, challenges and industry-specific best practices and how these related to the company overseen by the board. These sessions included a review of nontraditional competitors (e.g., digital natives, startups) that may be at an early or even experimental stage but show significant growth in the company's market. This type of session provides insight into how AI could redefine the company's competitive space both within and outside its industry and can even identify potential investment areas or possible acquisition targets (merger and acquisition opportunities). As one director noted, an external view is particularly helpful because "most strategic disruption originates from outside an industry."

Internal examples of what has and has not worked: In this type of session, executive management provides an overview of AI

initiatives and applications within the firm, including examples where AI has and has not worked and an overview of the current and future AI investment portfolio. Often, the goal of these sessions is to provide visibility into the organization's ability to develop and deploy AI applications and to help boards understand their organization's AI capabilities and track record.

To provide ongoing board visibility into the organization's ability to exploit AI, one company has established an AI center of excellence, which maintains an AI application portfolio catalogue that provides background and details for each AI application. These details include an application's development stage, its automation and autonomy level, where it fits in the business organization and how it delivers business value or cost benefits. This level of visibility enables board members to develop a clear understanding of the company's AI capabilities or lack of them.

Overview of the competitive landscape: An overview of the competitive landscape forms part of a sound strategy and, in most instances, will serve as the basis for assessing the company's expectations of AI use in relation to its market. An overview of competitors' AI use and pipeline and their AI capabilities relative to industry standards, and an analysis of how AI is stimulating or changing competition, especially from new—often digital native—competitors with AI-enabled offerings, will enable the board to assess the company's position. It will also identify the actions management must take to ensure the company does not risk falling behind its competitors or miss opportunities for competitive advantage.

CEO's AI agenda: Following on from the three sessions described above, in this type of session, the CEO outlines to the board how AI will be used for the benefit of the organization and what future steps are envisioned, including potential shifts in business model and competitive positioning. Following the CEO's presentation, boards then discuss the implications of changes in the value chain and share their own experiences of exploring AI-enabled opportunities. For example, the board of an international healthcare company asked the CEO to link key industry trends—the digitalization of the healthcare industry and public health organizations, the shift towards patient-centric journeys and the

growing scarcity of physicians and pharmacists—to AI-related opportunities for new offerings and for improving resource allocation along the healthcare value chain. These discussions provided board members with a comprehensive view of how AI initiatives fit into the business strategy.

2. Capital Allocation AI Governance Issues

In an NACD (National Association of Corporate Directors) blog post, David Giroux stated that "one of a firm's most crucial responsibilities is capital allocation, the process by which management teams and boards deploy financial resources both internally and externally."[11] In the context of governing AI, capital allocation translates into promoting experimentation with AI, securing investment for AI platforms and tools and enhancing AI capabilities through external partnerships and mergers and acquisitions.

Encouraging AI Experiments in the Annual Budgeting Process

The most valuable AI applications typically emerge from a series of experiments and prototypes. However, boards often have limited visibility into such initiatives due to their relatively low expenditures. Moreover, when budgets are contested or short-term savings have to be achieved, these experiments may be abandoned without ever coming to the board's attention. Several interviewees highlighted the need to increase the visibility of AI initiatives at the board level and emphasized the importance of establishing a mindset of experimentation.

On several boards, directors have secured the allocation of funds for tactical AI projects and experiments and then requested regular updates on key AI use cases. Not every use case was expected to be successful but, as one director noted, a key objective of his board was to "identify lighthouses[12] and then fund them to ensure their success." That is, further funding was tied to scaling these AI experiments to become part of

11   Giroux, D. *Navigating Capital Allocation: Best Practices for Boards*, National Association of Corporate Directors (NACD) Board-talk, November 30, 2021, available at https://blog.nacdonline.org/posts/capital-allocation-best-practices.
12   Lighthouse projects are small-scale but big-picture projects. They represent a beacon for future digital transformation and development.

the company's regular products and marketable offerings. Through this approach, boards learned how their organizations are approaching AI in terms of skill building, collaboration and fostering an experimental culture while recognizing that experiments lay the groundwork for future AI adoption and development. One board asked each business unit to propose two AI use cases and report progress over the following year. This not only raised the visibility of AI in the company and the boardroom but also encouraged a "certain degree of decentralized anarchy," as a board member put it, because each business unit could innovate in its own way.

Securing Investment in Foundational AI Capabilities

After successful early AI implementations, the focus of companies and boards shifts from experimentation to building an AI-scaling capability. Investments in data platforms and AI tools are essential for the operational deployment and scaling of AI from both technological and organizational perspectives. Additionally, organizational development and learning programs play a crucial role in supporting these efforts.

To ensure that his company was investing in foundational AI capabilities, one director began asking questions like "Has the company demonstrated successful transitions from AI experiments to standard offerings?" and "Are there plans to build platforms that will enable AI projects to scale?" After these questions revealed gaps, the board members with AI skills and digital transformation experience asked executive management to fund a series of AI initiatives. These included data literacy programs, a portfolio of analytics and AI applications, and the establishment of centers of excellence for particular AI technologies. Notably, this company's merger and acquisition activities had resulted in significant growth, accompanied by an expansion of legacy infrastructure. Over the years, the legacy infrastructure had required a continuous effort from both the board and executive management to prioritize IT harmonization and integration projects, which prompted the board's AI-focused intervention.

Some directors shared insights about their evaluation process for investments in foundational AI capabilities. AI expenditures compete with other capital allocations, such as returning capital to shareholders (through dividends or share buybacks) or pressing operational investments. Many directors find it challenging to assess IT investments, particularly in the context of boards with limited digital and IT proficiency. Moreover, quantifying the direct benefits of foundational AI investments is difficult. Preparing business cases for foundational investments is challenging because the returns are generated by future value-adding AI applications that capitalize on these investments.

In comparison, directors expressed more confidence in making decisions on traditional IT harmonization investments. This was even more pronounced in organizations struggling with complex legacy IT systems. As one director noted: "Many mid-cap companies go through so much M&A that there is never a situation where the integration of systems doesn't require significant investments." Similarly, traditional IT investments, such as upgrades to ERP systems, can often be a more tangible proposition for boards than investments in AI.

The board of a pharmaceutical company faced a trade-off between allocating limited funds for IT harmonization and investing in future AI capabilities. To avoid an undue focus on IT harmonization–which the board was historically more comfortable with–the directors asked the executive team to evaluate AI opportunities in core areas of the company such as sourcing, distribution and customer partnerships. There were also regular dialogues between selected directors and executives to assess AI opportunities. By actively creating transparency and deepening their understanding of the value potential of AI, board members could more confidently allocate resources to drive AI-enabled business model changes.

Boards need to ensure they actively discuss long-term capital-intensive investments that support the development of envisioned AI capabilities. They can do this by considering future opportunities and evaluating investments based on projected, scaled AI value creation. In this way, when approving the annual budget, boards can ensure that competing investments do not risk the company's AI-enabled future.

Supporting External AI Partnering and Mergers and Acquisitions

As one director noted: "The urgent question we have to answer is: how do we implement AI in our current IT landscape and how do we do it faster than the competition?" If timing and speed matter, organic experimentation and capability building might not suffice; partnering and targeted mergers and acquisitions (M&As) need to be included among the strategic options. Both come with specific challenges: partnering can have long-term drawbacks (e.g., delaying the build-up of the company's own core capability) and attractive M&A targets in the AI space often have pricey valuations.

Both partnerships and M&As offer the opportunity to learn faster, but companies should first identify the critical AI capabilities they need and then decide which ones need to be built organically or brought in-house through M&As and which ones can be provided by external partners. Board members can actively support the exploration of these options and engage appropriately in related M&A decisions.

Partnerships are mostly absent from many board conversations–but should not be, given that technology infrastructure investments are often prone to lock-in effects. For instance, the leading tech providers provide cloud-based data platforms crucial for AI. Though these platforms are highly scalable and their advanced toolkits improve the implementation of AI workflows, they come with a powerful lock-in effect, making it complex and expensive to switch providers in the short to medium term.

Take Amazon as an example. Amazon has not only developed tools for in-house experimentation with AI but also sells these tools as a service.[13] One of our interviewees used the "Hotel California" metaphor to describe the powerful "stickiness" of these tools: "You can check out, but you can never leave." Once certain toolsets are implemented and broadly adopted, entrenchment and long-term dependencies can emerge. As a result, board directors are beginning to pay more attention to assessing the impact of technology partnerships to avoid costly and potentially unintended lock-in effects, for example, by working with (at least) two leading partners and not relying too heavily on external expertise but rather building in-house expertise. These early additional efforts ensure strategic independence in later stages of AI implementation.

M&As present a viable strategy for acquiring AI capabilities, especially when they can't be matched by organic, in-house development or partnerships. AI-centric acquisitions can accelerate AI adoption, secure exclusive access to AI products, services or talent, and offer scalability potential, particularly if the acquisitions are smaller organizations within the company's broader ecosystem.

Two directors pointed to the need to assure themselves of the AI performance potential of targets before deciding on an acquisition. One, a director of a biotech company, described his board's approach to verifying that the performance of the target's AI-enabled offering met the most advanced scientific standards. To do this, his company's scientific experts created a benchmark based on the latest scientific literature to develop an estimate of how accurate AI predictions need to be to meet the current scientific gold standard. The board of directors required this verification in AI-related M&A deals to ensure that acquisitions meet the performance targets and capability requirements that justify the respective investments.

3. AI Risks Governance Issues

Risk oversight is a key board duty. Publicly discussed cases of AI bias and discrimination occur even at highly advanced technology companies and prompt directors to recognize

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13   Tanke, M. L. Abhishek, A., Benson, D., Khanuja, M. and Qi. D. "*Next Generation Amazon SageMaker Experiments—Organize, Track, and Compare Your Machine Learning Trainings at Scale*," Amazon Web Services, Inc., December 16, 2022, available at https://aws.amazon.com/blogs/machine-learning/next-generation-amazon-sagemaker-experiments-organize-track-and-compare-your-machine-learning-trainings-at-scale/.

how AI adds complexity to risk management.[14] Because AI is prone to bias, and therefore legal issues, it significantly increases an organization's risk exposure. Directors must therefore actively ensure the implementation of effective management of AI risks. Directors tend to be particularly concerned about ethical and reputational risks, along with legal and regulatory risks, arising from the use of AI.

Ethical and reputational AI risks include data- and algorithm-generated outcomes that discriminate against individuals or groups, facilitate unfair or unethical behavior or decision-making, or amplify human or AI biases. Their root cause is often the black-box nature of AI, making it challenging to trace and explain an AI system's outcome.[15] Harm can arise from AI systems trained on unrepresentative data or when biases in the data are inadvertently learned, generalized or amplified by an algorithm.[16] Legal and regulatory AI risks involve potential violations of privacy and data protection laws, noncompliance with AI-specific regulations, intellectual property issues and legal implications of AI biases.[17]

The lack of established AI risk management frameworks leaves boards uncertain about how to effectively address AI risks in their governance.

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14 Examples of AI risks include: 1) Amazon's hiring algorithm, which put women at a disadvantage in Amazon's application process. See Dastin, A. *Amazon Scraps Secret AI Recruiting Tool that Showed Bias against Women*, Reuters, October 11, 2018, available https://www.reuters.com/article/us-amazon-com-jobs-automation-insight/amazon-scraps-secret-ai-recruiting-tool-that-shoewd-bias-against-women-idUSKCN1MK08G; and 2) Google's image classification algorithm, which discriminated against people of color. See: *Google Apologises for Photos App'S Racist Blunder*, BBC, July 1, 2015, available at www.bbc.com/news/technology-33347866; and Grant, N. and Hill, K. "Google's Photo App Still Can't Find Gorillas. And Neither Can Apple's," *New York Times*, May 22, 2023, available at https://www.nytimes.com/2023/05/22/technology/ai-photo-labels-google-apple.html#:~:text=And%20Neither%20Can%20Apple's.,-Image&text=Eight%20years%20after%20a%20controversy,still%20fear%20repeating%20the%20mistake.

15 For more information on the challenges of explaining AI black-box behavior, see Asatiani, A., Malo, P., Nagbøl, P. R. and Penttinen, E. "Challenges of Explaining the Behavior of Black-Box AI Systems," *MIS Quarterly Executive* (19:4), December 2020, pp. 259-278.

16 For a business-oriented introduction and overview of AI bias and possible mitigation methods, see van Giffen, B., Herhausen, D. and Fahse, T. "Overcoming the Pitfalls and Perils of Algorithms: A Classification of Machine Learning Biases and Mitigation Methods," *Journal of Business Research* (144:6), May 2022, pp. 93-106.

17 For an overview of recent developments in global AI legislation and AI-related legal cases, see "Policy and Governance," *Artificial Intelligence Index Report 2023*, Institute for Human-Centered AI, Stanford University, April 2023, available at https://aiindex.stanford.edu/wp-content/uploads/2023/04/HAI_AI-Index-Report-2023_CHAPTER_6-1.pdf.

As one director suggested: "Without a framework, board members do not want to deal with AI risk." And despite the media hype, some directors are still unpersuaded that AI entails risks: One told us "AI risks are not yet that broadly present." The difficulty of addressing AI risks is amplified by limited board-level AI experience, emerging regulatory requirements and AI's inherent complexity. However, boards are not inactive. We observed two board practices: acquiring risk management expertise from experts and ensuring that AI risks are integrated into enterprise risk management.

Inviting AI Risk Experts to Present to the Board or Audit/Risk Committee

AI risk oversight requires an understanding of applicable laws and regulations. Engaging with management and subject matter experts to openly discuss potential AI risks is often the first step toward effective oversight. Directors interviewed shared several pressing issues they have discussed within their boards: for example, ethical principles and standards, the testing of AI systems, the use of customer data and liability issues. To address these issues, boards need to ensure they have a comprehensive and up-to-date overview of the applicable laws and regulations.

One board tackled this need by ensuring that the company's legal counsel was up to date on AI developments that could impact the firm. With the support of external advisors, the legal counsel generated an overview of the legal, regulatory and compliance requirements that apply and must be considered in the company's context. Based on this overview, the board demanded clarity on where the organization already used AI and where it planned to use it. Such clarity is a prerequisite for formulating policies and processes to capture and assess AI's legal and compliance risks. In a similar case, one board requested that management establish a policy on access to and use of customer data and another requested a policy on the role of data sharing and its impact on intellectual property and copyright issues.

Specialized AI boards or committees can also provide useful information to the board of directors and executive management. For example, IBM has established an AI Ethics Board to support the governance, review and

decision-making process for IBM's ethics policies, practices, research, products and services.[18] This board reports to the highest level of leadership and provides insight and guidance about how ethical principles for AI are being operationalized across the organization.[19] Similarly, Hewlett Packard Enterprise (HPE) has created an AI Ethics Advisory Board to ensure "that the use, development and deployment of AI products and solutions by HPE"[20] aligns with its ethical standards.

Integrating AI in Enterprise Risk Management

Boards are becoming more vigilant about their companies' adherence to regulatory frameworks governing AI. They are not just soliciting expert guidance but are also requesting that AI risk considerations be added to enterprise risk management (ERM), including enhancing existing committee charters. Several directors reported they have required, or intend to require, that their executive management adds an AI category to their companies' ERM or at least include AI-specific risks in their ERM.[21] Adding AI to ERM means that directors can request executive management to systematically assess the company's AI risk exposure and require implementation of necessary mitigation measures.

Other companies have enhanced existing committee charters to review AI risks at the board level. Microsoft, for example, has established an Environmental, Social and Public Policy Committee to assist the board in overseeing risks, policies and programs related to key environmental and social issues, including responsible artificial intelligence.[22] Another example is the AI-driven Ping An Insurance, which set up an AI Ethics Management Committee, chartered to guide its ethics policy and address ethical AI concerns.[23] One director noted that "boards must ensure that diverse teams rigorously stress test AI systems, mitigating ethical and reputational risks to ensure unbiased results." Hewlett Packard Enterprise, for example, has generated AI principles for the ethical development, deployment and use of AI, and requires that AI systems are quality tested, have safeguards in place, and minimize misuse and the impact of failure.[24]

Several board audit committees have expanded their scope to include consideration of emerging AI risks. Moreover, AI risks are becoming an integral part of corporate reporting, in, for example, annual reports, and 10-K and proxy statements,[25] all of which typically require audit committee approval. In many cases, these reports and statements include details about specific AI risks, ranging from legal, ethical and reputational to broader business and operational concerns. For instance, Oracle recognizes in its 2023 10-K statement that, while machine learning and AI are pivotal to tech innovations, their malfunction could jeopardize the firm's standing and reputation.[26] Similarly, Accenture highlights the potential operational, ethical and regulatory risks associated with expanding into

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18   For an overview of and guidance on how boards of directors can integrate business integrity and compliance-related issues, especially ethics, see Bonime-Blanc, A. and Brevard, J. E. *Ethics & the Board*, The Conference Board, 2009, available at https://www.conference-board.org/pdf_free/councils/TCBCP013.pdf.

19   *AI Ethics*, IBM, 2023, available at www.ibm.com/impact/ai-ethics.

20   *Innovation in the Ethics of AI at HPE*, Hewlett Packard Enterprise, April 27, 2021, available at www.hpe.com/us/en/newsroom/blog-post/2021/04/innovation-in-the-ethics-of-ai-at-hpe.html.

21   The audit and risk committees of boards are adept at evaluating risk through defined processes. When reviewing ERM, these committees classify critical business risks—such as financial, operational, technological, human resources and reputational risks—according to their probability of occurrence and impact. All of these risks may be significantly affected by enterprise deployments of AI.

22   *Environmental, Social, and Public Policy Committee Charter*, updated July 2022, Microsoft Corporation, available at https://view.officeapps.live.com/op/view.aspx?src=https://c.s-microsoft.com/en-us/CMSFiles/Environmental,%20Social,%20and%20Public%20Policy%20Committee%20Charter.docx?version=d8690c7d-21db-bfd4-2fd5-9bb417de99e1.

23   Ping An Insurance Group, op. cit., March 2023, p. 100.

24   See: 1) *AI ethics: The Moral and Ethical Implications of Using Artificial Intelligence*, Hewlett Packard Enterprise, April 14, 2022, available at https://community.hpe.com/t5/tech-insights/ai-ethics-the-moral-and-ethical-implications-of-using-artificial/ba-p/7163353; and 2) *HPE Supports AI Ethics for Good*, Hewlett Packard Enterprise, available at https://www.hpe.com/us/en/solutions/artificial-intelligence/ethics.html?media-id=%2Fus%2Fen%2Fresources%2F6f7e8 7b2-ba3b-4246-aa12-c33f91b5e8f7%2F_jcr_content.details.json

25   A 10-K statement is a comprehensive report filed annually by a publicly traded U.S. company about its financial performance and is required by the U.S. Securities and Exchange Commission (SEC). A proxy statement is filed with the SEC in advance when a firm is soliciting shareholder votes.

26   *10-K Statement 2023*, Oracle, available at https://s23.q4cdn.com/440135859/files/doc_financials/2023/q4/10-K.pdf.

new areas such as AI,[27] and Adobe recognizes the reputational challenges and liabilities linked to ethical issues arising from emergent AI technologies in its offerings.[28] Lastly, Alphabet's 2022 annual report highlights the ethical, technological, legal and regulatory risks posed by new AI-powered products, all of which could influence its brand reputation and product demand.[29]

In summary, in an uncertain environment with fragmented and expanding regulatory and legal frameworks, establishing board oversight of AI risks is not trivial. But despite all the challenges, one thing is certain: The pressure on boards to ensure transparency on the use of AI and the rules that address its inherent risks are critical issues that must be addressed.

4. AI Technology Competence Governance Issues

The final group of board-level AI governance issues focuses on the technology competence both of the board and the executive management team. To ensure competent engagement in critical AI governance decisions, board directors need to have at least a foundational level of AI competency, and the board's competency profile must be structurally aligned with the emerging business needs created by AI, which will mean expanding the role of board committees. The board must also ensure that the CEO and executive management are ready to execute the company's AI agenda. The way to achieve this is to include AI competency in succession planning.

Developing Board Directors' AI Competency

Though business and leadership experience will always be the key qualifications for board members, digital and AI competencies are increasingly important. One director stressed:

"My board assignments primarily stem from my business understanding and my experience with AI and digital technologies." Some boards even consider director candidates who do not have any direct board experience but do have digital expertise.[30] However, having one or two individual directors knowledgeable about AI is not enough. Every director needs at least a foundational understanding of the technology to fulfill their fiduciary duties and comply with the board's one-voice principle. As Jim Snabe (chairman of the boards at Siemens and Northvolt) put it, "At the end of the day, the importuant decisions are board decisions and not one individual board member decisions; so there needs to be a minimum knowledge base."

Board members require a minimum level of AI competency to enable them to carry out the necessary oversight. Boards must be capable of determining if and where AI is mission-critical and, if it is, implementing reasonable monitoring and reporting systems.[31] Many individual directors we interviewed have already taken steps toward developing their own AI competency. Some were inspired by learning about specific AI applications in and beyond their industry. Others have taken online courses for a foundational understanding of AI and machine learning algorithms. Several found reverse mentoring—regular exchanges with more junior AI leaders inside or outside the company—very effective. These directors emphasized the importance of a safe environment for firsthand exploration of AI. For example, General Electric (GE) encourages each independent director to visit at least two GE businesses each year, typically without the presence of corporate management. These visits have provided an excellent opportunity for GE's directors to see, firsthand, AI applications and experiments in the different GE businesses.

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27 *Annual Report Fiscal 2022*, Accenture, available at https://www.accenture.com/content/dam/accenture/final/capabilities/corporate-functions/growth-and-strategy/document/Accenture-Fiscal-2022-Annual-Report.pdf.

28 *10-K Statement 2022*, Adobe, available at https://www.adobe.com/pdf-page.html?pdfTarget=aHR0cHM6Ly93d3cuYWRvYmUuY29tL2NvbnRlbnQvZGFtL2NvL2VudlzdG9yLXJlbGF0aW9ucy9wZGZzL0FEQkUtMTBLLUZZMjItRklOQUwucGRm.

29 *2022 Annual Report*, Alphabet, available at https://abc.xyz/assets/d4/4f/a48b94d548d0b2fdc029a95e8c63/2022-alphabet-annual-report.pdf.

30 For example, see Anderson, G., Kale, R. S. and Hembrock Daum, J. *How Next-Generation Board Directors Are Having an Impact*," SpencerStuart, April 2018, available at https://www.spencerstuart.com/research-and-insight/how-next-generation-board-directors-are-having-an-impact.

31 See *Delaware Supreme Court Reinforces Directors' Oversight Obligations on Mission-Critical Subjects*," Jones Day, August 2019, available at https://www.jonesday.com/en/insights/2019/08/delaware-court-reinforces-directors-oversight.

Reviewing Board Composition and Expanding the Role of Committees

The board's responsibility includes regular refreshment of board members in a way that ensures alignment of the board's competency profile with the business requirements. In the U.S., the NACD explicitly includes AI among the new competencies that are needed to ensure that the board can act with due care and diligence. AI competence, however, is not about building purely technical AI knowledge, but about being able to use business judgment when overseeing AI-related strategic decisions, investments and risks.[32] Boards define a competency matrix, comprising the strategic skills and core competencies that are considered valuable to effective governance and oversight. This matrix assists in evaluating the competency profile of the current directors and, by identifying gaps with business requirements, provides input for the board recruitment process.

Reviewing board composition: Some organizations have recognized that AI is a key competency for board directors. Oracle, for instance, appointed the CEO of a software and services firm specializing in AI and machine learning as a non-employee director, valuing his profound AI expertise.[33] Similarly, Hewlett Packard Enterprise appointed a board director specifically citing her experience in "increasingly important technology disciplines such as [...] artificial intelligence."[34]

Nomination and governance committees, which propose suitable candidates for election to boards and maintain the competency matrix, have revisited and expanded the scope of required technology competencies to include AI. For instance, Figure 2 shows Lockheed Martin Corporation's competency matrix, which includes AI as a strategic skill for directors aiming to understand the company's technology priorities and overseeing key investments in these areas.[35] Similarly, BMW Group has formulated targets for the composition of its board and included AI in the competency profile.[36]

When evaluating the board's collaboration and effectiveness during the annual assessment, some boards have reflected on whether their working practices sufficiently account for AI governance. For example, they consider whether board members discuss the potential impact of AI in enough depth. The annual assessment also suggests where committee charter updates are needed to ensure effective AI governance. Accordingly, some boards have expanded the roles of their committees or created new ones to tackle AI-specific challenges.

Expanding the role of committees: Boards are expanding the role of their committees to address emerging AI needs. As mentioned above, some audit committees have expanded their scope to include emerging AI risks, and nomination and governance committees have reviewed the board's composition to include directors with AI competency. These examples highlight the increased importance of reviewing and, where necessary, expanding other board committees. For example, the compensation committee's primary responsibilities and duties are to review and approve compensation arrangements of the CEO and the board of directors, and to review and monitor how executive management plans to attract and retain the AI talent required by its strategy.

Some compensation committees have incentivized and rewarded executive management for advancing AI in their companies. For example, IBM adjusted the governance of its compensation scheme to reflect the company's evolution into a hybrid cloud and AI-focused entity. The CEO's compensation rewarded efforts to expand a "privacy program to add AI impact assessments in response to new AI regulations," while the senior vice president

32 *See The Future of the American Board: A Framework for Governing into the Future*, National Association of Corporate Directors, October 13, 2022.
33 *See Notice of 2022 Annual Meeting of Stockholders*, Oracle, September 23, 2022, available at https://s23.q4cdn.com/440135859/files/doc_downloads/proxy-voting-material/2022/Bookmarked-PDF-Proxy-Statement.pdf.
34 See *Hewlett Packard Enterprise Names Regina E. Dugan, Technology Leader and Former DARPA Director, to Board of Directors*, Hewlett Packard Enterprise, September 22, 2022, available at https://www.hpe.com/us/en/newsroom/press-release/2022/09/hewlett-packard-enterprise-names-regina-e-dugan-technology-leader-and-former-darpa-director-to-board-of-directors.html.
35 See *Proxy Statement & Notice of Annual Meeting 2023*, Lockheed Martin Corporation, March, 14, 2023, available at https://www.lockheedmartin.com/content/dam/lockheed-martin/eo/documents/annual-reports/2023-proxy-statement.pdf.
36 See *Statement on Corporate Governance 2022*, BMW Group, March 9, 2023, p. 12, available at https://www.bmwgroup.com/content/dam/grpw/websites/bmwgroup_com/ir/downloads/en/2023/hv/5.1.E05.pdf.

Figure 2: Lockheed Martin Corporation's Board Competency Matrix

			ELLIS	BURRITT	FALK	AKERSON	CARLSON	GORDON	HOLLUB	JOHNSON	TAICLET	REED-KLAGES	DUNFORD	YARRINGTON	DONOVAN
Strategic Skills	**Lead**	21st Century Security / Def. Ind. Transformation	●			●				●	●		●		●
		5G.MIL / Digital & Networking Open Archit.									●				●
	Innovate	AI, Autonomy, Advanced Comms, Hypersonics, Space	●				●				●		●		●
		Business and Digital Transformation			●	●					●			●	
	Drive	Operational Execution and Efficiency	●	●	●	●	●	●	●	●	●	●	●	●	●
		Supply Chain Excellence		●	●	●			●		●	●			
	Grow	International Business Expansion	●	●	●	●		●	●	●	●		●	●	●
		Business Model / Commercial Partnerships		●	●	●		●	●		●	●			●
		M&A Expertise			●	●		●	●	●	●	●		●	●
Core Competencies		Senior Leadership Experience (most senior position held)	Four-Star Admiral	CEO	Chair and CEO	Chair and CEO	Four-Star General	Chair and CEO	CEO	Cabinet Sec.	Chair and CEO	Chair and CEO	Four-Star General	CFO	CEO
		Financial Expertise		●	●	●		●	●		●	●		●	●
		Environment, Social and Governance Expertise		●	●	●	●	●	●	●	●	●		●	
		Cybersecurity Expertise								●			●		●
		Senior Military / Government Experience	●				●			●			●		
Attributes		Race / Ethnicity	White	White	White	White	White	White	White	Black	White	White	White	White	White
		Veteran of the U.S. Armed Forces	●			●	●				●		●		
		Gender (Male / Female)	M	M	M	M	M	F	F	M	M	F	M	F	M
		Age	75	67	64	74	73	69	63	65	62	66	67	66	62
		Tenure (rounded years)	18	15	13	9	8	7	5	5	5	3	3	2	1

11+ years	6-10 years	1-5 years

and general counsel were compensated for enhancing "IBM's cybersecurity, privacy, data governance, and AI ethics posture" in response to heightened regulatory focus on these issues.[37] Similarly, Microsoft's vice chair and president were compensated for releasing the "Responsible

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[37] See 2023 *Notice of Annual Meeting and Proxy Statement*, IBM, March 6, 2023, pp. 42-49, available at https://www.ibm.com/annual-report/assets/downloads/IBM_Proxy_2023.pdf.

AI Standard," a comprehensive guideline for ensuring that AI technologies developed were in line with the company's AI principles, ranging from fairness to accountability.[38]

The compensation committee's role also includes overseeing talent acquisition and retention efforts. For example, Nasdaq recognized and rewarded its executive vice president and CIO/CTO for spearheading a strategic initiative to "develop artificial intelligence talent and technology."[39] Dr. Michael Müller-Wünsch, executive board member and chief information officer at European e-commerce retailer OTTO, emphasized: "We need to do everything in our power to attract, engage, and retain AI talent to be successful with the AI-enabled transformation of our company." Because of these talent-related responsibilities, many directors told us they are planning to address AI talent scarcity within their compensation committees and evaluate compensation packages for data scientists and digital natives while also monitoring employee turnover, especially among digital talent.

Setting up technology and innovation committees: Some boards have set up specific technology and innovation-oriented committees to address the many facets of AI governance at the board level. For example, one pharmaceutical company established a Strategy, Capital Allocation, and Innovation Committee to devise a long-term strategy for the opportunities presented by AI and other key technologies. The purpose of this committee was to ensure in-depth discussions. As the chairman of the committee said: "It's not just about listening to presentations; it's about collaboration, discussion and sharing information and allowing direct interaction between board members and management."

In another example, Citigroup updated the charter of its technology committee to not only review and assess significant technology investments but also to consider "trends that may affect the Company's strategy," including the governance for emerging technologies such as

AI and machine learning.[40] Similarly, Santander Bank's innovation and technology committee is tasked with assisting the board of directors in its technology oversight responsibilities. This committee has reviewed the bank's key strategic technology priorities, AI included, and verified that ethical principles necessary for the proper use of AI are in place.[41] And Cisco's board of directors has refined the charter of its environmental, social and public policy committee to include responsibilities such as reviewing and discussing responsible AI with management and ensuring that related issues are brought to the board's attention.

Including AI Competency in Succession Planning and CEO Search Criteria

The CEO and the executive management team must be well-equipped to consider the implications of AI for shaping business strategy. The board members interviewed were in agreement: including AI in business strategy is the responsibility of top management, especially the CEO. As Anna Catalano, a board director and NACD chair of the board, Texas TriCities chapter, put it: "It starts with the CEO. You need to have a CEO [who] understands AI and machine learning."

Some boards now have AI competency as a critical component of their succession planning and CEO search criteria. Moreover, AI competency takes center stage during the annual succession planning discussion, during which boards critically assess the future competence and composition of the executive leadership. Particularly when appointing new CEOs, boards often work with executive search firms to identify suitable candidates. A partner from one such search firm, which focuses on recruiting board directors and C-level executives, revealed that "companies are desperate for candidates with AI competency, combined with a general business background." A partner from another search firm agreed: "Indeed, everyone asks for this [AI competency] currently." By incorporating AI competency into succession planning and CEO

38   See *Notice of Annual Shareholders Meeting and Proxy Statement 2022*, Microsoft Corporation, December 13, 2022, p. 49, available at https://www.sec.gov/Archives/edgar/data/789019/000119312522270484/d318171ddef14a.htm.

39   See *Proxy Statement 2023*, Nasdaq, p. 94, available at https://ir.nasdaq.com/static-files/a67a4033-510b-42f5-a1a8-b1bbab129e7e.

40   See *Technology Committee Charter: As of April 25, 2023*, Citigroup Inc., available at https://www.citigroup.com/rcs/citigpa/akpublic/storage/public/technologycharter.pdf.

41   See *2022 Annual report*, Santander, pp. 222-224, available at https://www.santander.com/content/dam/santander-com/en/documentos/informe-financiero-anual/2022/ifa-2022-consolidated-annual-financial-report-en.pdf.

Table 2: Guidance for Implementing AI Governance Practices Within the Board's Working Environment (Full Board Practices)

Full Board Practices			
AI Governance Group	**Regular Board Briefings**	**Strategic Planning and Budgeting**	**Annual Strategy Meeting**
Strategy and Firm Competitiveness ● Include AI in business strategy ● Identify new competitors ● Changes to the business model	● Create a moment of impact to open dialogue ● Receive regular updates on AI activities and hold focused discussions ● Invite external experts to share unbiased views of AI in the industry	● Review and approval of strategic plan (including strategic initiatives, competitive landscape, business model changes) ● Establish CEO accountability for AI	● Include external and internal views, experience sharing and the CEO's AI agenda in an AI strategy workshop
Capital Allocation for: ● Experiments ● Platforms and tools ● Partnering and M&A investments	● Report progress of capital expenditure on AI experiments, tools and platforms	● Approval of annual budget (including investments in AI experiments and foundational capabilities) ● Support exploration of external AI partnering ● Review M&A candidates' AI capabilities	● Include examples of AI experiments and lessons learned in strategy workshop
AI Risks ● Ethical and reputational risks ● Legal and regulatory risks	● Receive updates on AI risks as necessary (via AI ethics board or similar functions) ● Add AI category to ERM (enterprise risk management)		
Technology Competence ● Review board and committee composition ● Review the management team composition ● Develop AI competency	● Encourage AI education for board members and executive management ● Receive updates on developing AI competency as necessary		

search, boards position themselves to ensure that future leadership is equipped to formulate and execute an AI strategy relevant for the organization's industry.

Implementing AI Governance within the Board's Working Environment

In summary, boards can begin to establish AI governance within the formats of the board's working environment—i.e., at regular full board meetings, strategic planning and budgeting meetings and the annual strategy meeting, and at meetings of designated board committees (nomination and governance, audit, compensation, risk). In Table 2 and 3, we have mapped the AI governance practices identified in our analysis to each of these formats of the board's working environment. The practices are spelled out in more detail in the recommendations that follow.

Table 3: Guidance for Implementing AI Governance Practices Within the Board's Working Environment (Board Committee Practices)

	Board Committee Practices			
AI Governance Group	**Nomination and Governance**	**Audit**	**Compensation**	**Risk (if applicable)**
Strategy and Firm Competitiveness ● Include AI in business strategy ● Identify new competitors ● Changes to the business model			● Review executive compensation arrangements to ensure they support AI initiatives	
Capital Allocation for: ● Experiments ● Platforms and tools ● Partnering and M&A investments		● Include AI capability investments in prediscussion of annual budget		
AI Risks ● Ethical and reputational risks ● Legal and regulatory risks		● Invite experts to audit/risk committee to inform on AI risks ● Review AI risks in reports/filings		● Create overview of legal, regulatory and compliance requirements ● Add AI category to ERM (in preparation for review by the ERM board) ● Assess the merit of AI risk evaluation policy
Technology Competence ● Review board and committee composition ● Review the management team composition ● Develop AI competency	● Update competency matrix to include AI ● Update annual self-assessment to include AI governance efficacy ● Include AI competency in annual succession planning		● Discuss digital/AI talent remuneration with compensation consultants ● Monitor employee turnover with focus on digital talent	

Recommendations for Initiating Board-Level AI Governance Practices

We found that no board represented in this study has addressed all the AI governance issues or implemented all practices in its corporate governance, and many directors are currently looking for ways to take the first steps. Below, we provide three recommendations for boards to get started by assessing their AI readiness, capitalizing on moments of impact and guiding

board conversations about AI by asking the right questions.

Recommendation 1: Assess Whether Your Board Is Ready

The current hype about AI may tempt board directors to jump on the AI bandwagon, but we recommend that boards first consider whether they are open to a dialogue about AI and willing to learn about the technology. They should also assess if they are prepared to allocate the time necessary to process the breadth and complexity of AI issues in relation to the specific situation of their companies. Directors should therefore first ask themselves: "Are we, as a board, ready to discuss AI?" To gauge their board's readiness to discuss AI, directors should assess the relevance of AI to their company, identify the board's natural starting point and available bandwidth, and their willingness to engage with management to address the topic in depth.

For example, if AI is increasingly mentioned as a differentiator or risk element in management presentations during board or strategy meetings, this is a clear sign that AI is relevant to the company. Similarly, if directors are hearing about other companies or competitors in their industry successfully using AI, that is another clear sign. Directors should also trust their experience, often developed over years, for identifying new opportunities to assess whether AI is or will be relevant to their company in the future and should be open to signals from other board members and executives.

Once the need to discuss AI has been recognized, directors should identify the board's natural entry point. Every board has unique strengths, often specific to the company's industry; some may focus on risks, others on strategy or talent. For example, if the board of an insurance company sees AI applications for fraud detection or claims processing becoming standard in the industry, this could be the board's natural entry point to inquire about the role of AI in its strategy. And the trigger for the board of an online retailer discussing new AI-related risks and exposures might be regulations restricting the use of customer data, leading to a request to update risk policies or mitigation strategies. Recognizing where AI is most relevant to the core of the business can ensure a smoother integration

of the topic into the boardroom conversation and increase directors' willingness to engage in AI discussions.

Directors should also check if operational prerequisites are present. Genuine interest from at least a few board members can trigger AI discussions, but equally important is the board's capacity to make time for these discussions to evaluate the business relevance of AI. Consider whether the board can prioritize AI given its current commitments and whether the board's business situation allows for the exploration of AI's potential.

Directors should also ensure that the board and executive management are "on the same page" with respect to AI. AI governance can only be effective and efficient if it falls on fertile ground. This means that directors should ensure, or create, alignment between the board and executive management on the relevance and priority of AI, and ensure that the board's AI ambitions are not overshadowed by, for example, an existential financial crisis, external acquisition or other competitive developments that would make it impossible for executive management to address the topic with the intended diligence.

Recommendation 2: Seize a Moment of Impact

A definitive catalyst—a "moment of impact"—is essential to transition from merely acknowledging AI's importance to actively discussing it and initiating board-level AI governance. Tech-savvy directors can effectively capture the board's attention with compelling examples of AI applications that are highly relevant to their company. Often, eye-opening experiences are the precursor to meaningful technical and business discussions.

Directors have many different ways of creating a moment of impact. The traditional way is to showcase an inspiring AI "lighthouse" project with high relevance and potential impact on the company or its industry.[42] An example in the pharmaceutical industry is provided by Novartis, which partnered with Microsoft to transform its drug development process–the core of its value

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42   We note that lighthouse projects often also target talent ("come and work for a leading AI company"), customers ("if you work with us, you will be in good hands because of our ability to innovate") and shareholders ("we are ready for the future").

Table 4: Questions on AI's Role in Strategy and Firm Competitiveness

Business Strategy
- How is the company evaluating opportunities for enhancing its offerings through data analytics and AI predictions?
- Are customers requesting or competitors already providing AI-driven services and solutions?
- How is AI being integrated into the company's product and system roadmaps?
- Can you provide an overview of the company's AI capabilities and their projected development? How do our business partners' AI capabilities complement ours?
- Which sectors pose the most significant potential disruption to the company, and are there specific products or systems at risk of becoming commoditized?

New Competitors
- Are our customers being targeted by emerging or digital-native competitors with strong AI capabilities as a key differentiator?
- How does the value proposition of these new entrants, particularly in terms of deploying AI, compare to our company's current value proposition?

Business Model Changes
- How might AI influence changes to the company's existing business model? In the context of AI-driven changes, how might the products or services we offer, the stakeholders we engage with and our revenue streams be affected?
- How would such business model changes affect the value delivered to customers and the company's participation in the value-creation process?

creation–by leveraging AI.[43] Another example, mentioned earlier, is Siemens Mobility, which used AI to improve train availability and to devise a new business model that relies on assuring on-time performance for train operators, instead of only selling equipment.

Another option is to share a relevant cautionary story of a company that was rendered obsolete by AI-driven competitors because it lacked the necessary AI and digital capabilities. Such stories can help board members envision AI's potential to change their company's value creation, business model or competitive position, and spark a discussion about the implications for their own firm.

A more direct way to create a moment of impact for the board is to demonstrate the application of a generative AI tool to a conventional board task. For example, the nomination and governance committee typically identifies the competencies the board requires to oversee the defined business strategy, and then assesses the skills and experience of each director, identifying gaps and conducting a search to fill them. A generative AI tool could be used to infer the relevant skills and experiences from the company's strategy and, given a summary of existing director skills and experience, create a statement of the remaining gaps.[44] In this example, the focus is less on what AI means for the business and more on making the power of AI tangible to board members and showing that even regular board tasks can be transformed by AI.

Regardless of the chosen way or example, the primary purpose of creating a moment of impact is to elevate AI from a general discussion point to a relevant and tangible initiative for the board members. Directors should anticipate and guide the ensuing discussion, establish the significance of AI in relation to their own company, highlight the opportunities and risks for the firm and,

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43   *Novartis and Microsoft Announce Collaboration to Transform Medicine with Artificial Intelligence*, Novartis, October 1, 2019, available at https://www.novartis.com/news/media-releases/novartis-and-microsoft-announce-collaboration-transform-medicine-artificial-intelligence.

44   This and several other inspiring examples of how generative AI tools can be used in the boardroom (or tweaked to create a moment of impact) are described in Lawrence A., Cunningham, L. Maskin, A., Carlson, J. and Brown, M. *Generative Artificial Intelligence and Corporate Boards: Cautions and Considerations*, Harvard Law School Forum on Corporate Governance, June 21, 2023, available at https://corpgov.law.harvard.edu/2023/06/21/generative-artificial-intelligence-and-corporate-boards-cautions-and-considerations/.

Table 5: Questions on Capital Allocation

Experiments
- Is a designated budget for AI experimentation included in the financial plans?
- Are processes in place to explore AI value systematically and to avoid reinventing the wheel with each initiative?
- Is the company successfully scaling AI experiments into regular offerings?

Platforms and Tools
- Does the company plan to create or acquire platforms that allow AI projects to scale?
- What is the current investment strategy for AI-relevant infrastructure and support structure (e.g., data cleaning)
- Does the AI strategy and budget enable value-creation scaling?

Partnering and M&A Investments
- Do we evaluate partnering approaches strategically? Is partnering transitory or are we engaging in long-term partnerships? Do we evaluate lock-in effects?
- How are we assessing the benefits of AI-related acquisitions, including the advantage of possibly saving time?

Table 6: Questions on AI Risks

Managing AI Risks
- Is a risk management framework in place to systematically identify latent risks of envisioned or deployed AI systems?
- What are the risks of the planned and envisioned AI systems that are in the experimental and deployment stage?

Ethical and Reputational Risks
- Are policies/structures in place to evaluate ethical risks (e.g., through diverse and independent teams)?
- Are AI systems tested by groups that represent the diversity of the systems' user populations to prevent bias unnoticed by development teams?

Legal and Regulatory Risks
- What is the current and anticipated legal and regulatory framework that our AI systems must adhere to?
- What is the regulatory framework in which the company operates AI and are there any new policies and guidelines? Which regions have especially stringent regulations in place or planned?
for AI experimentation?

where appropriate, make connections to the four groups of board-level AI governance issues.

Recommendation 3: Guide the Boardroom Conversation by Asking the Right Questions

The difference between working at the management and board levels is that management is concerned with execution, while the board's focus is very much on asking the right questions. As Jim Snabe put it: "As a CEO you have to answer questions; as a board chairman you have to ask questions–in the right sequence."

We recommend that board members guide the AI dialogue both within the board and with executive management by asking questions to understand how AI capabilities can materially impact the company's business. This approach provides a dual advantage: first directors retain the board's governance role; second the board can assess the importance of AI to the executive team and signal the board's willingness to prioritize AI discussions to ensure that issues are adequately addressed by the executive team. To help directors ask the CEO and the executive team the right questions, we provide a set of questions

Table 7: Questions on Technology Competence

Board and Committee Composition
● What competencies should board members have in the area of AI?
● What does a competence profile look like for someone suitable for advising and overseeing the governance of AI in our company?
● Have we discussed the expansion of committee charters and the potential creation of a new committee (e.g., innovation committee)?

CEO and Executive Management
● Does the CEO have the competence to lead the company in a future impacted by AI?
● Is AI competency adequately considered in the succession planning of the company?

Competence Development at the Board
● Has a systematic approach been established to enhance AI competence within the board?

for each of the four groups of board-level AI governance issues.[45]

Strategy and firm competitiveness: Boards should approach the role of AI in strategy with the aim of making a significant impact on the company's value creation. We recommend that directors gain a comprehensive understanding of the potential of AI to enhance the company's competitive position, reexamine or adjust its business model, and encourage management to embrace AI opportunities with confidence and foresight. To facilitate this, directors should ask the questions listed in Table 4.

Capital allocation: Boards should seek to understand how the company navigates the trade-offs of determining capital expenditures on AI with competing alternatives (e.g., other IT investments, M&As, distribution of cash to shareholders via dividends or share buybacks). To ensure effective capital allocation for AI, directors should ask the questions listed in Table 5.

AI risks: Boards have a crucial role in understanding and governing the added complexities of AI risks within the company. Despite challenges in identifying and classifying AI risks, we recommend that boards actively ask management to integrate AI into the company's ERM. Ethical, reputational, legal and regulatory risks arising from AI deployments require systematic assessment, mitigation and oversight. Table 6 lists the questions that directors should ask the CEO about AI risks.

Technology competence: Boards encounter a variety of challenges when it comes to governing AI effectively. We recommend that directors proactively encourage AI competency building at both the board and executive management levels. To ensure AI competency building, directors should ask the questions listed in Table 7.

Concluding Comments

In this article, we have investigated the ways in which boards are addressing AI and identified four groups of board-level AI governance issues: *strategy and firm competitiveness, capital allocation, AI risks and technology competence*. These groups and issues, along with examples of implemented governance practices and recommendations for implementation (see Table 2 and 3), offer comprehensive guidance for directors on integrating AI into their governance and fulfilling their fiduciary responsibilities.

Though the journey for many boards toward board-level AI governance is still in its early stages, the recommendations we provide can serve as a framework. Establishing AI governance at the board level is not only a critical fiduciary responsibility of increasing urgency but also a tremendous opportunity to create value for customers, employees and shareholders by advancing the productive, professional and responsible use of AI.

However, implementing board-level AI governance should not be viewed as a one-time initiative; it is a continual process that requires continual learning and adaptation. Given

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45 In these questions, "you" refers to executive management and "we" or "our" encompasses the board, executive management and the company collectively.

Overview of the 16 Interviewed Directors

Executive/Director Roles	Industries of Interviewee's Board Memberships
CEO and COO	Software and Technology
CEO/Senior Director	Pharmaceutical, Medical, Healthcare
CSO, CHRO, Managing Director	Financial Services, Retail
CEO	Sports and Entertainment
Vice President	Oil and Gas, Pharmaceutical, Medical, Healthcare, Sports and Entertainment
CEO, COO	Industrial Automation and Electronics
President, CEO	Industrial Automation and Electronics, Insurance
CEO Software Provider	Industrial Automation and Electronics, Software and Technology, Energy, Shipping and Logistics, Sports and Entertainment
CEO	Shipping and Logistics, Retail, Construction Engineering, High-Tech Equipment Manufacturing, Engineering and Manufacturing, Food and Beverage
CIO	Pharmaceutical, Medical, Healthcare
Chief Legal Officer	Engineering and Manufacturing, Sports and Entertainment
CEO/Managing Director	Pharmaceutical, Medical, Healthcare
Chief Innovation Officer, CIO	Financial Services, Telecoms, Shipping and Logistics
CEO	Engineering, Manufacturing
CTO, CIO	Retail, Food, Cybersecurity, Shipping and Logistics
CEO	Software and Technology, Pharmaceutical, Medical, Healthcare, Financial Services

the rapid advancements in AI, its integration with various digital technologies, the surge in investment in innovative AI applications and the evolving societal concerns about AI, boards must adopt a forward-thinking and dynamic approach to AI governance. This evolving landscape not only adds layers of complexity but also presents unique opportunities. As boards start to establish AI governance practices, their companies may find it easier to extend the board's attention to other digital technologies.

Appendix: Research Methodology

This article is based on an exploratory research study that involved 22 interviews,

16 with high-profile board members[46] who have comprehensive digital and AI expertise and experience, two with representatives of a board association and four with directors of two executive search firms (two from each) specializing in the recruitment of board members and C-level executives. Our research also included six focus group workshops. Most of the interviews lasted between 45 and 60 minutes. The interviewed directors[47] and attendees at

[46] Several of the directors interviewed serve or have served on the Business Roundtable, some in leadership roles for governance. The Business Roundtable is a highly respected organization, especially in the context of establishing governance practices. For more information on this organization, see https://www.businessroundtable.org/. Other directors interviewed were active in advancing corporate governance knowledge through active involvement in the National Organization of Corporate Directors (NACD).

[47] For details on interviewing techniques in qualitative research, see Myers, M. D. and Newman, M. "The Qualitative Interview in IS Research: Examining the Craft," *Information and Organization* (17:1), December 2007, pp. 2-26.

Overview of Focus Group Discussions on Board-Level AI Governance

Description	Topics	No. of Participants
Panel discussion at NACD Chapter Meeting (Dallas, April 2023)	Future proofing your board	29 (4 panelists)
Workshop with board members on AI governance (Frankfurt, April 2023)	Digital literacy in the boardroom	25
Workshop with CIOs on board-level AI governance, (Lisbon/Porto, May 2023)	AI governance in the boardroom: strategy, capital allocation, risk, technology competence and the role of the CIO	35
Working group with board members on AI governance (Frankfurt, June 2023)	Status quo of AI governance in boards (achievements, deficits, barriers), AI technology competence, questions to executive management	16
Working group with board members on AI governance (online, September 2023)	Key recommended actions for boards to address AI governance	14
Panel discussion at NACD Annual Summit Meeting (Washington, October 2023)	How boards govern artificial intelligence	320

the workshops collectively serve or have served on 96 boards across various industries (see the tables above for details). Where appropriate, we also analyzed corporate reports—such as annual reports, proxy statements and corporate filings—to develop a comprehensive understanding and identify relevant examples of AI governance.

In the first step of our data analysis, we identified board-level AI governance issues. This involved extracting data from the interviews and secondary sources to identify governance issues, practices and examples, which we cross-checked against the collected materials. This step yielded the four groups of board-level AI governance issues (see Figure 1) and a list of AI governance practices and examples.

In the second step of our data analysis, we analyzed and mapped board-level AI governance activities to the four groups. This involved analyzing the purpose and board activities within each AI governance group. Many of the examples used were brought up by the interviewed directors. Wherever possible, we complemented this information by drawing on secondary publications (e.g., media publications, press releases, annual reports or board charters) to acquire further details. We also identified and grouped similar activities into clusters to derive common board practices.

In the third step, we developed initial guidance on how boards can effectively implement AI governance by mapping the identified practices and examples to the board's working environment (see Table 2 and 3). To do so, we leveraged publicly available documents and white papers of the National Association of Corporate Directors (one of the largest and most established director-level associations globally) and the interview data itself and drew on the experience of one of the authors, who serves on three corporate boards.

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