THE PERENNIAL QUEST FOR BOARD INDEPENDENCE: ARTIFICIAL INTELLIGENCE TO THE RESCUE?

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INTRODUCTION

The question of the ideal composition of company boards is unlikely to have the perfect answer. While the need for independent directors was emphasized in the early nineties[1] and continues to be emphasized even today,[2] additional new ideas have crept in. The separation of the CEO and chairperson roles is well accepted across jurisdictions.[3] The idea of board diversity, and especially gender diversity, has become popular in recent times.[4] The rationale, at least in part, for most of these proposals is to ensure that the board is active, acts independently of management, and is able to consider various perspectives that might affect the company while making decisions.[5] Could artificial intelligence (AI) help solve some of these problems? This Article argues that AI can help enhance board independence by reducing agency costs. At first, AI can be used to help directors discharge their duties, and as AI for boards become more reliable, corporate law will have to evolve to ensure that duties of officers are meant to ensure the safe and efficient use of AI. In proposing practical safeguards to the use of AI on boards, this Article

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[1] *See, e.g.*, PRINCIPLES OF CORPORATE GOVERNANCE: ANALYSIS AND RECOMMENDATIONS § 3A.01 (AM. LAW INST. 1992).

[2] *See* Brian J. Broughman, *The Role of Independent Directors in Startup Firms*, 2010 UTAH L. REV. 461, 461–62.

[3] *See* ORG. FOR ECON. COOPERATION & DEV., G20/OECD PRINCIPLES OF CORPORATE GOVERNANCE 3, 51 (2015), https://www.oecd.org/daf/ca/Corporate-Governance-Principles-ENG.pdf [https://perma.cc/3UHN-MTYC].

[4] *See* H. J., *The Spread of Board Gender Quotas for Company Boards*, ECONOMIST (Mar. 25, 2014), https://www.economist.com/the-economist-explains/2014/03/25/the-spread-of-gender-quotas-for-company-boards [https://perma.cc/ZWV4-GN6U].

[5] *See* Akshaya Kamalnath, *Corporate Governance Case for Board Gender Diversity: Evidence from Delaware Cases*, 82 ALB. L. REV. 23, 25–26, 33–34, 36 (2018/2019).

draws from processes followed in the context of cancer treatment where AI is currently being used.

AI, in simple terms, refers to a computer system "able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages."[6] Within this broad umbrella of AI is machine learning, which simply "involves teaching computer programs to learn by finding patterns in data."[7] The computer system improves as more data is input into it.[8] AI has permeated into almost every profession and activity. AI exists in law firms,[9] the healthcare industry,[10] financial advisor offices,[11] self-driving cars,[12] and virtual assistants like Siri and Alexa.[13]

So far, the board of directors has remained relatively out of the eye of the storm. However, AI is coming for all professions including that of board directors. As Richard and Daniel Susskind write, "The day will come, for most professional problems, when users will be able to describe their difficulties in natural language to a computer system . . . ," and receive a satisfactory response to the standard of an expert professional.[14] Although the Susskinds don't discuss board directors as a profession in their book, boards, too, need to prepare for and engage with AI at two levels. The first level is to be aware and able to assess and decide on AI-related issues[15] especially where

[6] *Artificial Intelligence*, OXFORD REFERENCE, http://www.oxfordreference.com/view/10.1093/oi/authority.20110803095426960 [https://perma.cc/L22F-64EY].

[7] Margot O'Neill, *Explainer: What is Artificial Intelligence?*, ABC NEWS (Aug. 7, 2017, 8:44 AM), http://www.abc.net.au/news/2017-08-07/explainer-what-is-artificial-intelligence/8771632 [https://perma.cc/9TZD-2HR6].

[8] *See id. But see* Michael Guihot et al., *Nudging Robots: Innovative Solutions to Regulate Artificial Intelligence*, 20 VAND. J. ENT. & TECH. L. 385, 394–95 (2017) (taking the view that machines that do not have all characteristics of AI, including "operating autonomously, adapting to change, and creating and pursuing their own goals," cannot be termed AI).

[9] For a detailed discussion on the use of AI by lawyers and law firms, see Andrew Arruda, *An Ethical Obligation to Use Artificial Intelligence? An Examination of the Use of Artificial Intelligence in Law and the Model Rules of Professional Responsibility*, 40 AM. J. TRIAL ADVOC. 443, 451–53 (2017).

[10] For a detailed discussion on the use of AI in medicine, see Akshaya Kamalnath, *Rethinking Liability and Licensing for Doctors in the Era of AI: Insights from Company Law*, ASIA PAC. J. HEALTH L. & ETHICS, Mar. 2018, at 33, 34.

[11] For a detailed discussion on AI in financial advisor offices, see John Lightbourne, Note, *Algorithms & Fiduciaries: Existing and Proposed Regulatory Approaches to Artificially Intelligent Financial Planners*, 67 DUKE L.J. 651, 651 (2017).

[12] Araz Taeihagh & Hazel Si Min Lim, *Governing Autonomous Vehicles: Emerging Responses for Safety, Liability, Privacy, Cybersecurity, and Industry Risks*, 39 TRANSPORT REVIEWS 103, 105 (2019).

[13] O'Neill, *supra* note 7.

[14] RICHARD SUSSKIND & DANIEL SUSSKIND, THE FUTURE OF THE PROFESSIONS: HOW TECHNOLOGY WILL TRANSFORM THE WORK OF HUMAN EXPERTS 166 (2015).

[15] *See* DAVID FINKE, ARTIFICIAL INTELLIGENCE: A PRIMER FOR CORPORATE DIRECTORS 2

decisions concern investment into business using AI. The second level of preparedness and engagement required from boards is to leverage the benefits of AI (including relevant ethical issues[16]) so as to be able to perform optimally. This Article is concerned with the latter issue.

In 2014, a Hong Kong venture capital firm made headlines when it announced that it appointed an AI to its board of directors.[17] While this announcement made for flashy headlines, the reality was that a machine learning algorithm, VITAL (Validating Investment Tool for Advancing Life Sciences), was allowed to vote at board meetings based on processing a range of data.[18] Professor Noel Sharkey of the University of Sheffield was of the opinion that "the idea of the algorithm voting [was] a gimmick," and that it was "not different from the algorithm making a suggestion and the board voting on it."[19] Four years since then, we still have not yet reached a point in time where AI has replaced human directors or where the board is populated by a mix of AI and human directors. However, it is not such a distant possibility anymore.

AI offers real benefits that have been harnessed in other areas. For corporate law, if AI can overcome human frailties, the key benefit is to mitigate agency costs in corporate management. Board independence (along with disclosures) seems to be the chief tool thus far in the arsenal of corporate law to counter agency costs. Since these tools have not always succeeded,[20] AI might be a significant solution provided that the right set of incentives are put in place to ensure its effective and ethical use.

The Article proceeds in five parts. Part I lays out the role of the corporate board and the underlying principles behind the duties of

(2017), https://www.russellreynolds.com/en/Insights/thought-leadership/Documents/02%20-%20AI%20-%20A%20Primer%20for%20Corporate%20Directors.pdf [https://perma.cc/8YJP-J4FC]. A recent interview of Dr. Anastassia Lauterbach also provides insights on the need for boards to acquaint themselves with AI. *Is Artificial Intelligence on Your Board's Agenda?*, NASDAQ (July 28, 2017, 11:06 AM), https://business.nasdaq.com/marketinsite/2017/Is-Artificial-Intelligence-on-Your-Boards-Agenda.html [https://perma.cc/RL3X-CTLU].

[16] Tony Featherstone, *Preparing Directors for Artificial Intelligence Whirlwind*, AUSTL. INST. COMPANY DIRECTORS (Sept. 4, 2017), https://aicd.companydirectors.com.au/advocacy/governance-leadership-centre/external-environment/preparing-directors-for-artificial-intelligence-whirlwind [https://perma.cc/R22G-D7JZ].

[17] Monica Goyal, *Hong Kong VC Firm Appoints AI to Board of Directors*, IT BUSINESS.CA (May 16, 2014), https://www.itbusiness.ca/blog/hong-kong-vc-firm-appoints-ai-to-board-of-directors/48815 [https://perma.cc/LBK6-4URU].

[18] *Algorithm Appointed Board Director*, BBC NEWS (May 16, 2014), http://www.bbc.com/news/technology-27426942 [https://perma.cc/7NBG-HZ49]; Goyal, *supra* note 17.

[19] *Algorithm Appointed Board Director*, *supra* note 18.

[20] *See, e.g.*, Lauren Cohen et al., *Hiring Cheerleader: Board Appointments of "Independent" Directors*, 58 MGMT. SCI. 1039, 1057 (2012).

directors. Part II discusses the problems board face and the potential for AI to overcome these problems. Part III discusses the use of AI in oncology and identifies learnings relevant to the use of AI in corporate governance. Part IV sets out a model to integrate AI into corporate governance. Part V concludes the Article.

I. THE CORPORATE BOARD–EXPECTATIONS AND FAILURES

An analysis of the role of the corporate board, our expectations from the board of directors, and major failures will help identify the potential role and benefits of AI on the board.

The board of directors is central to the functioning of the company, and the functions they are meant to perform can largely be understood under the three heads of strategy, monitoring, and providing access to networks. The *OECD Principles of Corporate Governance*, published in 2004, states briefly that the role of the board is to provide "strategic guidance [to] the company," to be an "effective monitor[] of management," and to be "accountab[le] to the company and the shareholders."[21]

"The theoretical basis for the monitoring role of the board [comes from] agency theory . . . ."[22] According to agency theory, the separation between those who owned the company (shareholders) and those who controlled the company (managers) gave rise to agency problems since the principals (shareholders) were not in a position to directly oversee their agents (managers) in order to ensure that they were acting in the principals' best interests.[23] More specifically, there would be agency costs involved in ensuring that the agents acted in the principals' best interest.[24]

One of the main purposes of corporate law is to address the agency problems present in a corporation.[25] The agency problem in the corporate setting arises because the agent (manager) has more information about the governance issues than the principal

[21] ORG. FOR ECON. COOPERATION & DEV., OECD PRINCIPLES OF CORPORATE GOVERNANCE 58 (2004), http://www.oecd.org/corporate/ca/corporategovernanceprinciples/31557724.pdf [https://perma.cc/8ARW-XZGK].

[22] Akshaya Kamalnath, *Gender Diversity as the Antidote to Groupthink on Corporate Boards*, 22 DEAKIN L. REV. 85, 88 (2017).

[23] *See* Anthonia Omosefe Ugowe, *Monitoring Good Corporate Governance in Developing Countries: Evidence from Nigeria*, 7 NNAMDI AZIKIWE U. J. INT'L L. & JURIS. 125, 126 (2016).

[24] *See* Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305, 308 (1976).

[25] *See* John Armour et al., *Agency Problems and Legal Strategies*, *in* THE ANATOMY OF CORPORATE LAW: A COMPARATIVE AND FUNCTIONAL APPROACH 35, 35 (Renier Kraakman et al. eds., 2d ed. 2009).

(shareholders).[26] Because of this information asymmetry, the principal cannot costlessly ensure that the agent's performance was exactly what was agreed upon.[27] Thus, the agent has an incentive to not perform at the expected quality or to divert to him or herself what was promised to the principal.[28] By imposing a monitoring role on the board of directors, it becomes one of the mechanisms through which agency costs are mitigated.[29]

Corporate law has also codified the board's role into a set of duties, a breach of which will result in liability for the directors.[30] These duties arise from the view that directors hold a fiduciary relationship to the corporation and shareholders.[31] The word *fiduciary* is typically associated with relationships of trust where one party has an "implicit dependency upon and peculiar vulnerability to another within defined parameters."[32] The role of fiduciary norms then is, on one hand, to provide beneficiaries (the dependent party) with ways to protect their trust, and on the other hand, to provide fiduciaries (the second party) with "disincentives to abuse that trust."[33]

To quote from an often-cited case, the duty imposed on directors implies a standard of behavior which is "the punctilio of an honor the most sensitive, . . . the level of conduct for fiduciaries [has] been kept at a level higher than that trodden by the crowd."[34] Professor Bernard S. Black states that the "classic statement" as articulated by common law is that "directors owe to shareholders, or perhaps to the corporation, two basic fiduciary duties: the duty of loyalty and the duty of care."[35] The content of each of these duties can be viewed as serving to address the principal agent problem between shareholders and management.

The duty of loyalty, in essence, aims to ensure that the people in control "act in the interests of the [corporation]" rather than "in their own interests."[36] This would "require[] a director to put the interests

[26] *Id.*

[27] Jensen & Meckling, *supra* note 24, at 308.

[28] Armour et al., *supra* note 25, at 35.

[29] *See* Jensen & Meckling, *supra* note 24, at 308.

[30] *See, e.g.*, FLA. STAT. § 607.830 (2019).

[31] Andrew S. Gold, *Dynamic Fiduciary Duties*, 34 CARDOZO L. REV. 491, 493 (2012).

[32] Leonard I. Rotman, *Understanding Fiduciary Duties and Relationship Fiduciarity*, 62 MCGILL L.J. 975, 986 (2017).

[33] *Id.* at 988.

[34] Meinhard v. Salmon, 164 N.E. 545, 546 (N.Y. 1928).

[35] Bernard S. Black, Professor, Stan. L. Sch., Presentation at Third Asian Roundtable on Corporate Governance: The Principal Fiduciary Duties of Boards of Directors 1 (Apr. 4, 2001), http://www.oecd.org/daf/ca/corporategovernanceprinciples/1872746.pdf [https://perma.cc/869R-FPQW].

[36] *Id.* at 2.

of the corporation and its shareholders ahead of the director's own personal interests," which might not be aligned with those of the shareholders.[37] Mostly, this duty would require directors to not engage in transactions where they have a conflict of interest; if this is not possible, to have the transaction approved by disinterested or independent members of the board.[38] Another important fiduciary duty is that of disclosure.[39] In certain circumstances, this duty requires full disclosure of all the facts and circumstances relevant to the board's decision to the corporation's shareholders, especially when they are seeking shareholder authorization for a proposed course of action.[40]

The second fiduciary duty is the duty of care, and it requires that the directors have "the duty to pay attention and to try to make good decisions."[41] In other words, directors have to "inform themselves of all material information reasonably available to them before making a business decision."[42]

Related to the duty of care is the business judgment rule, which provides that directors are not liable for losses arising from mere errors of judgment if they acted in good faith.[43] The purpose of this protection from liability is that business decisions are often made in a specific context, and it is not proper for courts to, in hindsight, "substitute their judgment for that of the directors."[44]

The duties of directors have now been codified in most jurisdictions, and courts refer to the relevant statutory provisions while deciding cases.[45] Apart from the core duties, most jurisdictions also have additional layers of regulations and "best practices" that company boards need to follow (examples are listing rules and corporate governance principles).[46] Much of these regulations further attempt

[37] William M. Lafferty et al., *A Brief Introduction to the Fiduciary Duties of Directors Under Delaware Law*, 116 PENN ST. L. REV. 837, 845 (2012).

[38] *See* Black, *supra* note 35, at 2–3.

[39] *Id.* at 1.

[40] Lafferty et al., *supra* note 37, at 848–49; *see also* Black, *supra* note 35, at 9 (stating that directors must completely disclose to shareholders "when shareholders are asked to vote," and when there is "a conflict-of-interest transaction").

[41] Black, *supra* note 35, at 6.

[42] E. Norman Veasey, *The Defining Tension in Corporate Governance in America*, *in* CORPORATE GOVERNANCE AND THE DUTIES OF COMPANY DIRECTORS 16, 22 (Ian M. Ramsay ed., 1997).

[43] Comm. on Corp. Laws, Am. Bar Ass'n, *Corporate Director's Guidebook*, 33 BUS. LAW. 1591, 1604 (1978).

[44] *Id.*

[45] *See, e.g.*, NEV. REV. STAT. § 78.138 (2019); Wynn Resorts, Ltd. v. Eighth Judicial Dist. Court of Nev., 399 P.3d 334, 342 (Nev. 2017).

[46] *See, e.g.*, NYSE LISTED COMPANY MANUAL § 303A.01 (2019).

to ensure that directors are able to discharge their duties effectively.

However, in the wake of the global financial crisis of 2008, the boards of international companies were found to have failed to adequately perform their role and exercise independent judgment.[47] An important board improvement measure proposed has focused on intellectual and/or psychological independence of the board from management.[48] Boards need to be intellectually independent to be able to have different perspectives and opinions from those of management, and psychologically independent to be able to dissent from the management's views.[49] Considering that top executives are the usual candidates for board positions, such psychological independence of board members is not always easy to achieve.[50]

II. PROBLEMS WITH BOARD INDEPENDENCE THAT AI MIGHT FIX

Despite the emphasis on the presence of independent directors on the board and on various committees, they have not always added value as expected. This section will therefore consider the problems faced by boards and independent directors to discharge their duties and consider the potential of AI to fix these problems.

Boards often have to make important decisions on very short notice, and thus independent directors might not be able to digest all the required information in a short period of time. Being outsiders to the company, they naturally face constraints in terms of how much time they can spend on each company.[51]

An article published by Deloitte reported, based on interviews of directors, that having to process "reams and reams of information"

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[47] *See* Claire A. Hill & Brett H. McDonnell, *Reconsidering Board Oversight Duties After the Financial Crisis*, 2013 U. ILL. L. REV. 859, 874–75.

[48] *See, e.g.*, Erica Beecher-Monas, *Marrying Diversity and Independence in the Boardroom: Just How Far Have You Come, Baby?*, 86 OR. L. REV. 373, 376–77 (2007) (proposing diversity in the board as a way to promote intellectual and psychological independence). For a classic account of the need for psychological independence, see James D. Cox & Harry L. Munsinger, *Bias in the Boardroom: Psychological Foundations and Legal Implications of Corporate Cohesion*, 48 LAW & CONTEMP. PROBS. 83 (1985).

[49] For a recent example of such conflicts being called into question, see Elizabeth Schulze, *Investor Group Demands Changes to Uber's Board Ahead of IPO*, CNBC (May 2, 2019, 04:08 AM), https://www.cnbc.com/2019/05/02/uber-ipo-ctw-demands-changes-to-board-of-directors.html [https://perma.cc/9UE7-D4JF]. In a letter to the board, investment group CtW referenced a close relationship between an Uber board member, John Thain, and Uber CFO Nelson Chai, who worked under Thain at NYSE, Merrill Lynch, and CIT Group. *Id.*

[50] *See* Cox & Munsinger, *supra* note 48, at 106–07. For a detailed study of conflicts of interest arising from close relationships between controlling and independent board members, see Da Lin, *Beyond Beholden*, 44 IOWA J. CORP. L. 515 (2019).

[51] *See* Stephen M. Bainbridge & M. Todd Henderson, *Boards-R-Us: Reconceptualizing Corporate Boards*, 66 STAN. L. REV. 1051, 1064–65 (2014).

was a challenge.[52] With increasing expectations from directors, there is a "blurring of board and management roles" thus requiring boards to be more informed than ever.[53] The article concludes that digital technologies (like data analytics and AI) can help boards process information effectively.[54] The same article, however, also found that most directors seemed hesitant about having to use advanced technologies; although, some directors seemed happy to receive continuing education on emerging technologies.[55] The latter point perhaps explains why boards have not been more actively seeking the help of AI in their activities.

The former point about the "too much information problem" is felt in other jurisdictions too. In the Australian case of *ASIC v Healey,*[56] directors had complained that crucial information was lost in a very large board packet.[57] AI might be able to help directors pick up crucial information from large stacks of data, thus aiding directors to fulfill their fiduciary and statutory obligations.

Apart from the problem of independent directors having to process a large amount of information in a short period of time, other problems impede the board from exercising independent judgment. Although most boards by 2008 were dominated by independent directors, the fact that corporate failures like Enron and WorldCom occurred made it obvious that having independent directors was not always effective. It was argued "that the problem lay in the way relevant legal rules defined 'independence' which mostly focused on 'financial' independence but not that [of independence] of 'the mind.'"[58] Further, independent directors serve long terms, which "foster what has been called 'fictive friendships' amongst directors."[59] "This sometimes leads to independent directors hesitating to challenge their 'friends' on the board."[60] Thus, the failure of board

[52] Val Srinivas et al., *Bringing Digital to the Boardroom*, DELOITTE 5 (Jan. 31, 2019), https://www2.deloitte.com/content/dam/insights/us/articles/4937_Bringing-digital-to-the-boardroom/DI_bringing-digital-to-the-boardroom.pdf [https://perma.cc/Y4XD-8YQV].

[53] *Id.* at 2–3.

[54] *Id.* at 5–6.

[55] *See id.* at 6.

[56] *Austl Sec & Inv Comm'n (ASIC) v Healey* [2011] FCA 717 (27 June 2011) (Austl.).

[57] *See id.* ¶¶ 9, 15, 297–98, 420, 435.

[58] Kamalnath, *supra* note 22, at 94; *see also* Beecher-Monas, *supra* note 48, at 391–92 (noting that board independence is usually characterized as financial disinterest rather than independence of thought).

[59] Kamalnath, *supra* note 22, at 94.

[60] *Id.*; *see also* Donald C. Langevoort, *Selling Hope, Selling Risk: Some Lessons for Law from Behavioral Economics About Stockbrokers and Sophisticated Customers*, 84 CALIF. L. REV. 627, 654–55 (1996) (discussing and applying the concept of fictive friendships); Yaron Nili, *The "New*

members to be able to challenge the management and majority thinking on the board, due to some biases/fictive friendships, seems to have been the core of the problem. In other words, most boards suffered from groupthink.[61]

Irving Janis, who first explained the phenomenon of groupthink, defined it as "a mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when the members' strivings for unanimity override their motivation to realistically appraise alternative courses of action."[62]

Often, this results in a situation wherein members of the group, or board of directors in this case, fail to question a set course of action.[63] Directors often hold multiple board positions and belong to the same social circles.[64] This is the perfect recipe for groupthink since board members would not be likely to challenge people they regard as friends.[65]

Different solutions have been proposed to help boards overcome groupthink. For instance, Delaware Vice Chancellor Travis Laster has recommended that boards be educated about this phenomenon.[66] This is a valid recommendation because it is important for directors to be aware about the problem before they can attempt to overcome it. Another suggestion is that board diversity might be a solution since it might provide more psychological independence from management than just the "independent director" requirement.[67] Diverse boards are likely to result in the availability of diverse perspectives on the board.[68] Further, if members of diverse backgrounds might be able to freely voice their views if they do not belong to the same networks or social circles as the CEO.[69] However, it is difficult to ensure that these directors of diverse backgrounds will not be socialized into the group, with time.[70]

Insiders": Rethinking Independent Directors' Tenure, 68 HASTINGS L.J. 97, 119 (2016) (discussing how board members avoid conflict to preserve friendships between them).

[61] For a detailed discussion of groupthink and its applicability to company boards, see Kamalnath, *supra* note 22, at 95–103.

[62] IRVING L. JANIS, VICTIMS OF GROUPTHINK 9 (1972).

[63] *See* Travis Laster, *Cognitive Bias in Director Decision-Making*, CORP. GOVERNANCE ADVISOR, Nov.–Dec. 2012, at 1, 5.

[64] *See* Cox & Munsinger, *supra* note 48, at 106–07.

[65] *See* Laster, *supra* note 63, at 5.

[66] *Id.* at 9.

[67] *See* Beecher-Monas, *supra* note 48, at 404–05.

[68] *Id.* at 405.

[69] *But see id.* at 397 ("[A] lone member of a minority demographic group that historically held less power or social status is not likely to express . . . dissent.").

[70] *Cf. id.* at 404 ("[P]eople in a small group influence each other's judgments. . . . Consensus becomes more important than dissent because dissent threatens the group's cohesion.").

Along with the solutions discussed above, AI can be a useful aid to counter groupthink. Even if it is merely used as a tool to analyze information and provide an opinion that the board of directors then considers, it will be able to provide its input without being influenced by groupthink. The AI would not be susceptible to human biases, unless it is programmed into the system.[71] As an algorithms and big data commentator has said, an AI system will be influenced by data and not by feelings.[72] It will not be afraid to upset its friends.

The board, in a scenario where it has failed to consider alternate courses of action (either because there was no time to read all the relevant information or because they were hesitant to challenge management), will have to then evaluate the AI system's suggestions. Further, any board member that is initially hesitant to voice a dissenting view might be encouraged to use the AI recommendation as the basis for voicing an opinion. Thus, the board would be able to consider aspects of a situation/courses of action that might have been missed either because of paucity of time or blind spots caused by groupthink or other biases.

Of course, it is still up to the directors to act upon these recommendations. Yet, the AI's recommendation will ensure that such aspects might not be overlooked by the board while making a decision.

III. LESSONS FROM AI IN ONCOLOGY

Based on the above discussion, an early application one might fathom is that of an AI system, into which management enters information that is normally provided to directors. The AI system then picks up patterns, trends, and themes for directors to look at. In this way, directors can make sure that important information is not lost in large board packets. To advance this a little further, an AI system could come equipped with industry trends on the one hand

[71] As an example where an AI system is used to overcome bias in a business context, Mark Benioff, the CEO of Salesforce, an American cloud computing company, reportedly already uses an AI assistant called Einstein Guidance, which he brings to his Monday morning briefings to verify his executives' updates. Julie Bort, *How Salesforce CEO Marc Benioff Uses Artificial Intelligence to End Internal Politics at Meetings*, BUS. INSIDER (May 19, 2017, 9:33 AM), https://www.businessinsider.com.au/benioff-uses-ai-to-end-politics-at-staff-meetings-2017-5 [https://perma.cc/KV3F-WVNJ]. Einstein Guidance is designed to do forecasting and modeling, thus being able to point to specific areas of company performance. *See id.* According to Benioff, it has pointed to one executive as someone who needs specific attention. *Id.* Benioff also notes, "Einstein comes with no bias. It's just based on the data." *Id.*

[72] Mark van Rijmenam, *How AI Will Change Corporate Governance*, ALGORITHMS BLOG (Jan. 8, 2018), https://vanrijmenam.nl/ai-change-corporate-governance [https://perma.cc/WHR6-8HH7].

and instances of board liability on the other hand. It should then be able to point to possible problems and exposure to liabilities in each situation, thus making recommendations that directors may have overlooked due to groupthink or other reasons. This section will consider how AI has worked in the field of oncology to assess whether there can be lessons for using AI on corporate boards.

IBM Watson has developed an AI that is a clinical decision support platform in oncology.[73]

> The platform essentially provides support to healthcare practitioners working in oncology by identifying treatment options suitable to each patient's clinical history. Further, it provides relevant studies that support its recommendations. This way, the healthcare practitioners can supplement their own knowledge with the vast amount of data, including the latest research that Watson provides, while treating patients.[74]

One of the hospitals using the AI platform, Manipal Hospital in India, has a team of oncologists that makes decisions about what treatment protocol is to be followed in each case based on the individual experiences of doctors in the team.[75] Factors that are considered in choosing the optimal treatment protocol "include fitness level, age, the state of body functions, genetic profile, the stage of cancer, and the type of cancer."[76] While the team of oncologists typically takes a day or more to choose the treatment protocol, the AI platform only takes two minutes to process the patient's details and make recommendations.[77] It provides various options in order of priority, along with the bases of such recommendations, side effects, and chances of survival.[78] Discussing the results of one such case,

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[73] *See* Jessica Kim Cohen, *Can AI Improve Cancer Care in Remote Areas? 3 Questions with Dr. Andrew Norden of IBM Watson Health*, BECKER'S HEALTHCARE (Aug. 29, 2017), http://www.beckershospitalreview.com/artificial-intelligence/can-ai-improve-cancer-care-in-remote-areas-3-questions-with-dr-andrew-norden-of-ibm-watson-health.html [https://perma.cc/S4PP-RGTM].

[74] Kamalnath, *supra* note 10, at 35 (citing Mallory Locklear, *IBM's Watson is Really Good at Creating Cancer Treatment Plans*, ENGADGET (June 1, 2017), https://www.engadget.com/2017/06/01/ibm-watson-cancer-treatment-plans/ [https://perma.cc/PF7W-FC9P]).

[75] Sujit John & Shilpa Phadnis, *How IBM Watson is Helping Doctors Diagnose & Treat Cancer in India*, ET TECH (Aug. 23, 2016, 9:52 AM), http://tech.economictimes.indiatimes.com/news/technology/how-ibm-watson-is-helping-doctors-diagnose-treat-cancer-in-india/53821515 [https://perma.cc/Z377-KNK2].

[76] *Id.*

[77] *Id.*

[78] *Id.*

one of the doctors explained that the AI platform's first recommendation was an oral drug, whereas doctors usually think of chemotherapy as the first option.[79]

However, AI has not reached the level of accuracy in oncology where the need for doctors might be dispensed with.[80] In fact, IBM's internal documents have revealed that the AI system had recommended "unsafe and incorrect" cancer treatments in some instances.[81] This is why, as the practice in Manipal Hospitals in India suggests, "[t]he [AI] system is being used in conjunction with human medical judgment."[82]

Directors, like doctors, operate in a fiduciary capacity, and so until highly effective AI platforms for boards are developed, it is likely that AI in corporate governance will also be used only as a tool or aid by boards. Yet, the benefits cannot be ignored. Based on the use of AI systems in decision-making in the context of oncology, some parallels can be drawn with the corporate board. Directors, too, draw from their backgrounds, qualifications, and experience to decide on a particular matter. While the doctors in this example have a specific list of factors, they consider in making treatment decisions; for directors, the factors might vary based on the context of the company and the matter on hand. Thus, the right kind of data needs to be fed into the AI system being used.

The doctor's statement about how there was a glaring difference in the AI's recommendation, as compared to what the doctors usually recommended in such cases,[83] harkens back to the sub-optimal board decisions made during the financial crisis.[84] Clearly, it is possible that AI might be able to provide better decisions based on data, especially in situations where directors (or doctors as in the example) are influenced by personal experiences and/or biases based on actions of other professionals. The significant point from the experience of oncologists using an AI system is that the system provides them with the studies on which its recommendation is based.[85] Much of the criticism for using AI systems is that it is not possible to see the

[79] *Id.*

[80] *See* Faye Flam, *IBM's Watson Hasn't Beaten Cancer, But A.I. Still Has Promise*, BLOOMBERG OPINION (Aug. 25, 2018, 11:00 AM), https://www.bloomberg.com/opinion/articles/2018-08-24/ibm-s-watson-failed-against-cancer-but-a-i-still-has-promise [https://perma.cc/5TC7-R2TQ].

[81] *Id.*

[82] *Id.*; John & Phadnis, *supra* note 75.

[83] *See* Flam, *supra* note 80.

[84] *See* Bainbridge & Henderson, *supra* note 51, at 1063.

[85] *Watson for Oncology Key Features*, IBM, https://www.ibm.com/us-en/marketplace/clinical-decision-support-oncology/details [https://perma.cc/2EVE-TUUQ].

reasoning behind the AI system's decisions.[86] However, if the system is citing studies based on which it has made its decision, the oncologists who find that the AI recommendation is different from theirs can see the basis for the different recommendation and then decide if there is merit to it.

It is imperative that any system designed for the use of corporate boards is similarly able to explain its reasoning. Ultimately, directors, like doctors, have fiduciary duties and are liable for breaching their duties.[87] While this means that it is important to use the best technology available, it is also not possible to simply delegate decision-making to an AI system and absolve oneself of responsibility in both the medical and corporate governance contexts.

IV. AI ON THE BOARD—WHAT MODEL IS APPROPRIATE?

The current architecture of corporate law conceives of directors on the corporate board as natural persons, and thus imposes a framework of duties based on fiduciary standards to ensure that shareholder interests are protected.[88] Thus, the model followed by the Hong Kong firm of giving an AI (or robot) a vote on the board does not fit into the current legal framework. Professors Bainbridge and Henderson have set out a compelling argument for allowing corporations to provide board services.[89] However, liability for breach of duties can be imposed on corporations, while this is not possible with AI under existing laws.[90]

Even if a liability regime for AI is worked out, it is also important to remember that AI platforms are not likely to be completely accurate when they are first designed. It has been suggested that AI will evolve to an extent where human directors will altogether be eliminated, and the board will consist only of one AI system, which can then be replaced by a different AI system if shareholders so desire.[91]

However, we must be cautious in predicting that AI will gain the level of accuracy desired in the context of board decision-making

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[86] *See* Yavar Bathaee, *The Artificial Intelligence Black Box and the Failure of Intent and Causation*, 31 HARV. J.L. & TECH. 890, 891–92, 897, 905 (2018).

[87] *See, e.g.*, Darian M. Ibrahim, *Individual or Collective Liability for Corporate Directors?*, 93 IOWA L. REV. 929, 935–40 (2008) (collecting cases in which courts imposed individual liability on corporate directors for breach of fiduciary duties).

[88] *See* Bainbridge & Henderson, *supra* note 51, at 1056, 1074.

[89] *See id.* at 1068–69.

[90] *See* Martin Petrin, *Corporate Management in the Age of AI*, COLUM. BUS. L. REV. (forthcoming 2019) (manuscript at 40–41), https://ssrn.com/abstract=3346722.

[91] *Id.* (manuscript at 5).

since corporate law itself does not always have answers for what is "accurate" in a given situation. The business judgment rule allows for directors to make business decisions and allows for a degree of error as long as the decision was made in good faith.[92] While AI is unlikely to suffer from conflicts of interest, it will not have the business instincts and entrepreneurial flair of business persons. Similarly, while directors have to make decisions in the interests of the corporation and shareholders, there is some fluidity in terms of how directors weigh various considerations while coming to a decision.[93] Leaving decisions entirely to AI might result in a lack of consideration of interests of stakeholders like employees or perhaps society in general in instances of decisions having adverse environmental impact.

These issues are increasingly becoming significant, and a lack of consideration of these issues might harm the corporation and shareholders in the long run. While AI enthusiasts have argued that AI can manage multiple goals unlike human directors, the success of such goal management will depend on some pre-decided policy choices in terms of which stakeholders' interests to prioritise at what instances.[94] Since the policy choices desirable in each possible instance cannot be predicted beforehand, this seems to be an unlikely expectation from AI.

Thus, at the first instance, when AI is developed for corporate governance, it must be used as an aid or tool to board decision-making like in the case of oncologists using the AI platform. Directors will get the AI to process information so as to benefit from it in two ways. First is to ensure that the AI highlights the most important information with respect to any given question. This will solve the "too much information" problem, especially for independent directors. The second benefit is for directors to be able to consider and assess the recommendation of the AI along with the reasons for such a recommendation, also provided by the AI. In this way, directors would use their own judgment to make decisions, but also benefit from, what may be considered an external view that is not beholden (consciously or subconsciously) to the CEO.

For this model to work, there are also considerations that developers of AI and directors must consider together while AI for boards is being developed. First and foremost, deciding what information would be relevant for board decision-making is

[92] *See* Gold, *supra* note 31, at 499.
[93] *See id.* at 495.
[94] *See* Petrin, *supra* note 90 (manuscript at 46–47).

important. Relatedly, care must be taken not to code biased perspectives into the AI. Second, securing the information within the AI should be prioritized. Third, while we await legal regulation regarding AI, directors and developers must ensure that the AI's decision-making process is transparent.

While boards might suffer from groupthink, if the information input into AI consists of past board decisions, they are also susceptible to internalizing the biases present in those decisions. Thus, there is also a danger that AI might "exacerbate human error" because AI learns by finding patterns in data and thus are reliant of the quality of data that they are "trained" with.[95] This must be guarded against, and assigned technology officers or committees must regularly check the AI for any bias. The rules for optimally appointing technology officers will then become important because such officers being close to top management might result in management bias being incorporated into, or if already present, allowed to remain in, the AI.[96]

Categories of information that are relevant to boards must be identified. One important category for the AI to be trained with is information detailing instances of board liability. While boards obtain legal advice while making important decisions, it might be useful if the AI can identify similar facts in cases where the board was held to be liable. Another vertical fed into the AI could be data about shareholder lawsuits against directors even if the outcome is not available.[97] If the AI can indicate to board members that a similar decision has resulted in lawsuits, board members could use that information while considering their course of action. Thus, lawyers will also play an important role in the development of AI platforms for boards.

The second consideration is that of information security. Confidential company data being input into the AI system will inevitably open the company to the risk of hacking and companies have to invest in data security.[98]

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[95] *See* William J. Magnuson, *Artificial Financial Intelligence and the Future of Finance*, FINTECHPOLICY.ORG (Mar. 13, 2019), https://fintechpolicy.org/2019/03/13/artificial-financial-intelligence-and-the-future-of-finance/ [https://perma.cc/42D2-MYLH].

[96] *See* Luca Enriques & Dirk A. Zetzsche, *Corporate Technologies and the Tech Nirvana Fallacy* 58 (European Corp. Governance Inst., Law Working Paper No. 457/2019, 2019), https://ssrn.com/abstract=3392321.

[97] *Cf.* Lauri Donahue, *A Primer on Using Artificial Intelligence in the Legal Profession*, JOLT DIGEST (Jan. 3, 2018), https://jolt.law.harvard.edu/digest/a-primer-on-using-artificial-intelligence-in-the-legal-profession [https://perma.cc/6TMD-HE47] (discussing how AI is used to predict the viability of personal injury suits and the outcomes of Supreme Court cases).

[98] *See* Shani R. Else & Francis G.X. Pileggi, *Corporate Directors Must Consider Impact of*

Third, since the model proposed here has emphasized the need for corporate directors to make the final decision after considering the AI system's recommendation, it becomes important to stress the need for transparency in the AI system's decision-making process. To be able to rely or even assess the AI's recommendation, directors must know the reasons for it. In the case of IBM Watson for Oncology, the studies that the recommended treatment is based upon are mentioned.[99] This helps the oncologists to assess the recommendation based on the merits of the supporting studies. This issue has been stressed upon in the model governance framework for AI that was recently released by Singapore.[100] The two main principles underpinning the framework are that (i) "[d]ecisions made by or with the assistance of AI should be explainable, transparent, and fair" to consumers; and (ii) AI solutions "should be human-centric.[101]

The former principle relates to the need for AI systems to show the basis for its recommendation. While these principles are merely guidelines from the Singapore government, they would form an important guide globally. Companies intending to use AI on their boards might insist on AI developers complying with these principles. Since directors have to comply with their fiduciary and statutory duties, it is imperative that they only use AI systems that offer reasons for their recommendations.

The latter principle simply means that AI solutions should keep the interests of the consumer in mind. While in the context of self-driving cars they might refer to the need for avoiding harm to humans, in this context, the consumers would be company directors who use AI to perform their duties effectively.[102] Since directors would still be in the driver's seat, they will be able to ignore the AI system's decision where they believe it is wrong. However, this principle becomes crucial when considering the harm that can result in a scenario where the AI system is hacked, and confidential

Artificial Intelligence for Effective Corporate Governance, BUS. L. TODAY (Feb. 12, 2019), https://businesslawtoday.org/2019/02/corporate-directors-must-consider-impact-artificial-intelligence-effective-corporate-governance/ [https://perma.cc/UJ93-FFM2].

[99] *See Watson for Oncology Key Features*, *supra* note 85.

[100] *See Singapore Releases Model Governance Framework on AI,* EDB SINGAPORE (Jan. 31, 2019), https://www.edb.gov.sg/en/news-and-resources/insights/innovation/singapore-releases-model-governance-framework-on-ai.html [https://perma.cc/8YSL-9HRF].

[101] PERS. DATA PROT. COMM'N SING., DISCUSSION PAPER ON ARTIFICIAL INTELLIGENCE (AI) AND PERSONAL DATA – FOSTERING RESPONSIBLE DEVELOPMENT AND ADOPTION OF AI 5 (2018), https://www.pdpc.gov.sg/-/media/Files/PDPC/PDF-Files/Resource-for-Organisation/AI/Discussion-Paper-on-AI-and-PD---050618.pdf [https://perma.cc/QV2R-DM6G].

[102] *See id.*

information of a company is leaked. AI developers should pay attention to data security, and companies must insist on this as a priority.[103]

A related consideration for the assigned technology officer or committee is to be able to check for any problems in the code that might support built-in bias, but also that might produce inaccuracies, as it was found with IBM Watson's recommendations in oncology.[104]

On a futuristic note, both corporate law and AI governance frameworks must also prepare for an eventuality where companies appoint AI systems as board directors.[105] Until developers of AI systems can provide conclusive proof that AI systems are effective, this scenario will be near impossible.[106] Even if AI systems are effective, the question of pinning liability on a legal person will be difficult to answer since AI systems are not legal persons as yet.[107] Scholars have attempted to provide a solution to this conundrum that corporate law is likely to face in the future. Considering whether legal personhood should be granted to AI, Professor Solum explained, in an essay published in 1992, that the question of whether to grant personhood to an entity was "reducible to other questions about whether or not the entity can and should be made the subject of . . . legal rights and duties."[108] The applicable rights and duties would vary depending on the type of entity.[109] For instance, "both corporations and natural persons are legal persons, but they have different sets of rights and duties."[110] Thus, if AI were to be granted legal personality, it will be important to decide which rights and duties to bestow on it, and to ensure that there is a mechanism to hold AI to account for breaching those duties.[111] Sergio Gramitto draws an analogy with the liability assigned to slaves in ancient Rome who did not have legal personality and yet could make

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[103] Digital security is one of the risks of AI. *See* Helen Toner, *Interventions*, *in* THE MALICIOUS USE OF ARTIFICIAL INTELLIGENCE: FORECASTING, PREVENTION, AND MITIGATION 50, 53 (2018), https://img1.wsimg.com/blobby/go/3d82daa4-97fe-4096-9c6b-376b92c619de/downloads/1c6q2kc4v_50335.pdf [https://perma.cc/NE65-SKZJ].

[104] Flam, *supra* note 80; *see also* Shaanan Cohney et al., *Coin Operated Capitalism*, 119 COLUM. L. REV. 591, 598 (2019) (discussing the impact of coding errors and omissions in smart contracts related to cryptocurrency offerings).

[105] *See* Petrin, *supra* note 90 (manuscript at 26).

[106] *See id.*

[107] *See* Matthew U. Scherer, *Of Wild Beasts and Digital Analogues: The Legal Status of Autonomous Systems*, 19 NEV. L.J. 259, 262 (2018).

[108] Lawrence B. Solum, *Legal Personhood for Artificial Intelligences*, 70 N.C. L. REV. 1231, 1239 (1992).

[109] *Id.*

[110] *Id.*

[111] *See* Petrin, *supra* note 90 (manuscript at 42).

decisions for the *peculium*, a "bundle of assets organized for a single business."[112] In this system, AI need not be granted legal personality.[113]

Ultimately, as Professor Möslein rightly argues, the rules regulating directors and their business decisions would need to be adapted and refined if AI systems, as legal persons, are allowed to hold director positions on the board.[114] Future work will have to grapple with these issues and with issues where the board consists only of AI systems or an AI system.

V. CONCLUSION

The model proposed in this Article is tailored for the current situation where an effective AI for board governance has not been developed and tested. Although the Article has identified issues that need to be addressed in corporate law and also liability framework for AI when AI in this area becomes more sophisticated, the initial phase of human directors working with AI has been the main focus.

In this initial phase, it is important to note that the potential benefits of AI are limited to the willingness of directors to use and benefit from it. AI could possibly highlight gaps in information and recommend a different approach to that of management's, but ultimately it will be the directors' responsibility to act upon these recommendations. Educating boards about groupthink would perhaps make boards more willing to seriously consider the AI's recommendations. It might also be worthwhile for institutional investors to engage with boards to ensure that they are using and paying attention to the AI system's recommendation and turning their minds on the merits of the recommendation. Further, other proposed solutions to counter groupthink, like diversity, must be used in conjunction with an AI system, so that boards are willing to discuss alternative or even opposing views.

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[112] Sergio Gramitto, *The Technology and Archeology of Corporate Law* 39–40 (Cornell Law Sch. Research, Paper No. 18-40), https://ssrn.com/abstract=3232816.

[113] *But see id.* at 40 ("Because slaves did not have legal personality[,] . . . [a] slave's co-owners acquired all the rights and profits arising from the *peculium*, while remaining largely shielded from the corresponding liabilities. (Analogously, this policy would imply that a business corporation could not be liable for any actions of AI directors—a regulation too one-sided to ever be workable.)").

[114] Florian Möslein, *Robots in the Boardroom: Artificial Intelligence and Corporate Law*, *in* RESEARCH HANDBOOK OF THE LAW OF ARTIFICIAL INTELLIGENCE 649, 666 (Woodrow Barfield & Ugo Pagallo eds., 2018).