

The Integration and Reliance on Technology to Enhance the Independence and Accountability of Company Directors in South Africa

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Abstract

The most indispensable means of change in contemporary business society is technology because it offers convenience to both businesses and their clients. Almost every business has been influenced by technology. Traditional corporate governance systems have been affected as technology has ceased to be a mere business enabler but is now a source of a company's future potential opportunities. The infusion of corporate governance and technology has been quite slow in South Africa. This may either be attributed to the fact that it is costly to do so, at least in the short term, or that company directors in South Africa do not yet trust technological measures with corporate decision-making input. Consequently, the impact of decision support technology on corporate entities and their governance has received less academic interest in South Africa than in developed countries. This article seeks to discuss the integration and reliance on technology to enhance corporate governance principles in developing countries like South Africa. The article also discusses the practical challenges and the benefits to be anticipated by directors in South Africa when they integrate technology in decision making to enhance their independence and accountability.

Keywords

Big data; artificial intelligence; independence; accountability; decision making; company directors.

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1 Introduction

The most influential means of change in contemporary business society is technology because it is convenient to businesses and their clients.¹ The scarcity of literature on the integration of corporate governance and technology in South Africa makes it pertinent to define some key terms that are employed in this article. Technology comprises of the infrastructure, devices, systems and software that produce, transfer or process information to facilitate business decisions.² There is no universally accepted definition for artificial intelligence (AI).³ However, John McCarthy, who coined the term AI, defined it as the art and engineering of making intelligent machines, particularly intelligent computer systems.⁴ This definition, though archaic, remains relevant even today because it retains the key characteristics of AI.⁵ AI can also refer to a computer programme that performs tasks that normally require human intelligence such as visual perception, speech recognition, decision making and language translations.⁶

Almost every business has been influenced by technology.⁷ Traditional corporate governance systems have been affected as technology has ceased to be a mere business enabler but is now a source of a company's future opportunities.⁸ AI is a form of digital technology that has long been incorporated in the medical and business fraternities in other countries as

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¹ Bravard 2015 <https://hbr.org/2015/09/all-boards-need-a-technology-expert>.

² Part 1 of the King IV Code on Corporate Governance 2016 (IoDSA *King IV Code*).

³ Liu and Lin 2020 *Harv Int'l LJ* 413.

⁴ Petrin 2020 *Colum Bus L Rev* 965-1030, while referring to McCarthy Date unknown <http://jmc.stanford.edu/artificial-intelligence/what-is-ai/index.html>. See also Liu and Lin 2020 *Harv Int'l LJ* 407.

⁵ See Petrin 2020 *Colum Bus L Rev* 965-1030; Liu and Lin 2020 *Harv Int'l LJ* 407; Hilb 2020 *JMG* 1.

⁶ Kamalnath 2020 *Alb L Rev* 44.

⁷ Bravard 2015 <https://hbr.org/2015/09/all-boards-need-a-technology-expert>.

⁸ Foreword to the IoDSA *King IV Code*.

an aid to decision making.⁹ The infusion of corporate governance and AI has been quite slow in South Africa.¹⁰ This could be due to fact that the integration of AI is expensive and most company directors in South Africa do not trust machines with decision-making input. Although about 40% of companies in South Africa use some form of AI in general, the integration and reliance on AI technology as a decision support tool by company directors remains very low.¹¹ For example, a 2018 survey conducted by SYSPRO Private Limited in 400 South African companies revealed that only 13% of information technology (IT) companies' decision makers used big data and machine learning for decision making.¹² Consequently, the impact of decision support technology on corporate entities and their governance has received less academic interest in South Africa when compared to that in other countries.¹³

This article seeks to discuss the integration and reliance on technology to enhance corporate governance principles in developing countries like South Africa. South Africa has introduced and refined a code of corporate governance in the form of King Reports I, II, III and IV.¹⁴ Given its corporate governance advances, South Africa can serve as a leader in the

⁹ Petrin 2020 *Colum Bus L Rev* 967-968 records that in 2018 the chief executive officer (CEO) of Salesforce revealed that he was using an algorithm to comment on deliberations during the company's weekly staff meetings. In 2014 Deep Venture Capital, which is a company based in Hong Kong, was using an AI machine called VITAL to corroborate the board's decision making. Financial companies in the United States of America (USA) have also been using similar technologies to survey the markets and generate suggestions for directors. Also see Hamilton *et al* 2019 *J Oncol Pract* 277. Both developing and developed countries use the same software products. For example, apple products are sold in the USA and South Africa and most insurance companies in South Africa have bought software from the USA to deal with big data.

¹⁰ SYSPRO 2018 <https://www.researchandmarkets.com/reports/4715503/mobile-corporation-in-south-africa-2018>.

¹¹ Microsoft News Center 2020 <https://news.microsoft.com/en-xm/2020/02/19/these-are-the-skills-south-africa-needs-to-compete-in-the-4th-industrial-revolution/>. However, it must be noted that the statistics relied on did not differentiate between listed and unlisted companies. Insurance companies who are not listed on the Johannesburg Stock Exchange (JSE) make use of artificial intelligence (AI) to some extent.

¹² SYSPRO 2018 <https://www.researchandmarkets.com/reports/4715503/mobile-corporation-in-south-africa-2018>. The above statistics apply to South Africa in general. The picture would be different if consideration were to be given to the activities of a company. For example, an insurance company with more than 200 000 policy holders would more likely make use of AI.

¹³ Hilb 2020 *JMG* 2; Alalawneh and Alkhatib 2020 *EJISDC* 1-3; Dignam 2020 *Cambridge J Reg Econ Soc* 38-40. There is no difference between first- and third-world countries in this regard since all countries use similar software except from an economic perspective.

¹⁴ Muniandy and Hillier 2015 *Pacific-Basin Finance Journal* 109.

integration of technology and directorial independence and accountability.¹⁵ Some African nations such as Zimbabwe,¹⁶ Ghana¹⁷ and Kenya¹⁸ have already partially modelled their company law and corporate

¹⁵ Muniandy and Hillier 2015 *Pacific-Basin Finance Journal* 109.

¹⁶ For example, see ss 100(1) and (2) of the *Companies and Other Business Entities Act* 4 of 2019 [Chapter 24:31] provides that "The board of directors may issue authorised shares only for adequate consideration to the company, as determined by the board of directors; or in terms of conversion rights associated with previously issued shares or debentures of the company; or as a capitalisation share. Before a company issues any particular shares, the board must determine the consideration for which, and the terms on which, those shares will be issued" and ss 40(1) and (2) of the South African *Companies Act* 71 of 2008 (*Companies Act* 2008) provides that "The board of a company may issue authorised shares only for adequate consideration to the company, as determined by the board; in terms of conversion rights associated with previously issued securities of the company; or as a capitalisation share as contemplated in section 47. Before a company issues any particular shares, the board must determine the consideration for which, and the terms on which, those shares will be issued". Also see s 102(1) of the *Companies and Other Business Entities Act* 4 of 2019 [Chapter 24:31] which provides that "for any purpose of this Act, a company satisfies the solvency and liquidity test at a particular time if, considering all reasonably foreseeable financial circumstances of the company at that time the assets of the company or, if the company is a member of a group of companies, the aggregate assets of the company, as fairly valued, equal or exceed the liabilities of the company or, if the company is a member of a group of companies, the aggregate liabilities of the company, as fairly valued; and it appears that the company will be able to pay its debts as they become due in the ordinary course of business for a period of twelve (12) months after the date on which the test is applied; or in the case of a distribution contemplated in paragraph (a) of the definition of 'distribution' in section 2, twelve (12) months following that distribution" and s 4(1) of the *Companies Act* 2008 which provides that "for any purpose of this Act, a company satisfies the solvency and liquidity test at a particular time if, considering all reasonably foreseeable financial circumstances of the company at that time the assets of the company, as fairly valued, equal or exceed the liabilities of the company, as fairly valued; and it appears that the company will be able to pay its debts as they become due in the ordinary course of business for a period of 12 months after the date on which the test is considered; or in the case of a distribution contemplated in paragraph (a) of the definition of 'distribution' in section 1, 12 months following that distribution".

¹⁷ For instance, compare s 35(2) read together with item 6 of Schedule 5 of the *Companies Act* 2008 and s 43 of the Ghana *Companies Act* 992 of 2019 provide that "a share does not have a nominal or par value" and "the shares created or issued under this Act are shares of no par value" respectively. Regarding the legal nature of shares, compare section 42(1) and (2) of Ghana's *Companies Act* 992 of 2019, which provide that "the shares of a member in a company are movable property. The number of shares in a company and the rights and liabilities attaching to the shares are dependent on the terms of issue" and s 35(1) of the *Companies Act* 2008 which states that "a share issued by a company is movable property, transferable in any manner provided for or recognised by this Act or other legislation". Ghana's 2010 *Code of Best Practices for Corporate Governance* relating to independent non-executive directors is similar to principle 2.16 of South Africa's *King III Code on Corporate Governance* 2009 (IoDSA *King III Code*).

¹⁸ The Capital Markets Authority of Kenya published the *Code of Corporate Governance Practices for Issuers of Securities to the Public*, 2015 which adopted

governance codes on the South African *Companies Act 2008* and the *King Reports on Corporate Governance*.¹⁹ The article also discusses practical challenges and the benefits to be anticipated by directors in South Africa as they become more reliant on technology to enhance their independence and accountability.

The article also discusses the consideration of technology as a tool for enhancing corporate governance in South Africa. Thereafter, an analysis of the integration of AI into corporate governance as a way of optimising the independence of company directors will be provided. Furthermore, the integration of AI into directors' decision making will be examined in the context of the directors' duty of care, skill and diligence relevant to the processing of data. The question of whether the inclusion of a technology expert on every board should be mandatory in South Africa is explored. Lastly, concluding remarks are proffered.

2 Problem statement

Regardless of the influence of technology on most businesses, there has been a dearth of literature on the use of and reliance on innovative technology to promote good corporate governance standards by company directors in South Africa. As a result, the potential benefits of integrating technology such as big data, AI and cognitive computing systems to enhance directorial independence and accountability have not yet been considered in South Africa. Furthermore, the question whether companies in South Africa should have a technology expert has not been sufficiently addressed. This article addresses these two issues and seeks to trigger further research on the integration of technology to promote good corporate governance measures in South Africa.

3 Technology as a tool for enhancing good corporate governance practices in South Africa

AI could be utilised to efficiently analyse voluminous corporate data and produce results at a rate human beings cannot match.²⁰ There are three different levels at which South African company directors can integrate AI technology to enhance their independence and accountability. The first

the apply or explain approach, the same regime as under South Africa's *King III Code* of 2009. Additionally, Kenya's Code contains corporate governance provisions relating to board independence and board diversity that are similar to those contained in South Africa's *King IV Code* of 2016.

¹⁹ Muniandy and Hillier 2015 *Pacific-Basin Finance Journal* 109.

²⁰ Dignam 2020 *Cambridge J Reg Econ Soc* 38.

one is known as assisted AI, which entails the execution of certain tasks by AI without the machine becoming an independent decision-maker.²¹ Assisted AI can completely assume all administrative duties such as setting a record date for determining shareholder rights,²² calling a shareholders' meeting²³ and delivering notice of meetings.²⁴ Considering that company secretaries generally spend most of their time on administrative work such as ensuring that the minutes of all shareholders meetings, board meetings and the meetings of any committees of the directors are properly recorded, the integration of and reliance on assisted AI by South African company directors would save them a lot of time.²⁵ Company directors may also use AI to prepare for board meetings and to provide sound opinions.²⁶ Currently, applications such as Google assistant can compose emails based on voice prompts and set up and keep track of schedules of meetings. In the business context, assisted AI can be used by company secretaries to take and compile notes during board meetings, to schedule meetings and to prepare reports for directors.²⁷

The second level at which South African company directors can incorporate AI to enhance their independence and accountability is known as augmented or advisory AI. This involves the use of algorithms to aid human intelligence without the algorithm's assuming the role of an independent director.²⁸ Augmented AI can assist company directors in South Africa with judgmental decisions which require creative thinking without absolving directors of their responsibility and liability.²⁹ South African company directors can employ augmented AI as a valuable tool in their decision-making process. Augmented AI may ask and/or answer questions and develop simulations of complex models of various business scenarios.³⁰ Augmented AI could increase the productivity and quality

²¹ Petrin 2020 *Colum Bus L Rev* 981; Hilb 2020 *JMG* 11.

²² See s 59(1) of the *Companies Act* 2008. S 1 of the *Companies Act* 2008 defines a record date as the date on which a company determines the identity of its shareholders and their shareholdings.

²³ See s 61(1) of the *Companies Act* 2008.

²⁴ Section 62(1) read together with s 6 of the *Companies Act* 2008. S 88(2) provides that most administrative duties of a company are done by the company secretary.

²⁵ Section 88(2) of the *Companies Act* 2008; Petrin 2020 *Colum Bus L Rev* 984.

²⁶ Principle 1 of part 5.1 of *IoDSA King IV Code* and ss 76(4)(a)(i) and (b) of the *Companies Act* 2008.

²⁷ Petrin 2020 *Colum Bus L Rev* 981; Hilb 2020 *JMG* 11. However, s 86(1) of the *Companies Act* 2008 provides that not all companies in South Africa are required to have company secretaries.

²⁸ Hilb 2020 *JMG* 9; Petrin 2020 *Colum Bus L Rev* 982.

²⁹ Petrin 2020 *Colum Bus L Rev* 971; Hilb 2020 *JMG* 11.

³⁰ Petrin 2020 *Colum Bus L Rev* 981.

decision making of South Africa's company directors.³¹ Augmented AI does not seek to replace human beings but it aids human intelligence by providing information that would either be unavailable or very difficult or time-consuming to find for company directors.³² Augmented AI could help South African company directors to diagnose complex business problems and recommend the relevant courses of action.³³

The third option that South African directors could consider when integrating technology and their work is known as autonomous AI, which involves algorithms assuming human responsibilities as independent directors.³⁴ Autonomous AI could eliminate human directors in South Africa and replace them with artificial entities or robo-directors.³⁵ However, it would be difficult for autonomous AI to assume the full responsibilities of company directors considering South Africa's current legal framework, which allows only natural persons to be directors.³⁶

Another hurdle that autonomous AI would need to overcome for it to replace human directors in South Africa is the issue of assigning personal liability in instances of non-compliance.³⁷ Autonomous AI makes it difficult to determine the liability of the robo-directors, whether under contract or delict, since company decisions would be made by algorithms.³⁸ Moreover, it remains to be seen whether the decision would be vested in the machine itself, the designer of the algorithm or the vendor.³⁹ Additionally, the extent to which directors can delegate tasks to machines without exposing themselves to personal liability should be determined by regulators before autonomous AI takes over directors' decision making in South Africa.⁴⁰ Furthermore, autonomous AI could eliminate some key aspects of board diversity such as gender, nationality and race, which are unique to natural persons, and this could improve the quality of

³¹ Petrin 2020 *Colum Bus L Rev* 984; Hilb 2020 *JMG* 9.

³² Petrin 2020 *Colum Bus L Rev* 982; Hilb 2020 *JMG* 9. For example, insurance companies in South Africa use AI to perform certain future calculations or administrative work. These companies use the same software that is used by most insurance companies around the world. Even though South Africa is not yet a developed country, South African companies are on an equal footing with the companies of other first-world countries.

³³ Petrin 2020 *Colum Bus L Rev* 988; Hilb 2020 *JMG* 11.

³⁴ Petrin 2020 *Colum Bus L Rev* 988. However, autonomous AI can be a reality in 2030.

³⁵ Petrin 2020 *Colum Bus L Rev* 988. Hilb 2020 *JMG* 11.

³⁶ Section 69(7) of the *Companies Act* 2008.

³⁷ Petrin 2020 *Colum Bus L Rev* 970-971. Hilb 2020 *JMG* 9.

³⁸ Ameer-Mia, Pienaar and Kekana "South Africa" 257.

³⁹ Petrin 2020 *Colum Bus L Rev* 982. Hilb 2020 *JMG* 9.

⁴⁰ Petrin 2020 *Colum Bus L Rev* 970-971. Hilb 2020 *JMG* 9.

decisions.⁴¹ However, an AI algorithm may not be able to simulate the emotional intelligence that comes with gender and race diversity.⁴²

South African companies should employ augmented AI or synergic intelligence where natural persons and algorithms work together to enhance directors' independence and accountability. The incorporation of augmented AI fits well within the purposes of the *Companies Act* 2008. Section 5(1) of the *Companies Act* 2008 provides that the Act must be interpreted and applied in a manner that gives effect to the purposes set out in section 7 of the *Companies Act* 2008. Some of the purposes of the *Companies Act* 2008 include promoting the development of the South African economy by encouraging enterprise efficiency, encouraging transparency and high standards of corporate governance and balancing the rights and obligations of shareholders and directors in companies.⁴³ Therefore, the use of augmented AI would encourage the balancing of shareholders and directors' rights and obligations in South Africa by minimising bias, since an algorithm's analysis cannot be influenced by the emotions of directors. Consequently, the use of augmented AI would enhance the independence of directors, since directors with dissenting opinions might be encouraged to contribute their views by simply relying on decision-support AI recommendations as the basis of their dissent.⁴⁴ Furthermore, augmented AI allows an algorithm to generate initial recommendations on questions presented to it and such recommendations will be subject to the directors' approval. The directors can also provide additional insight into the algorithm's recommendations.⁴⁵ Augmented AI entails that decision-making power remains vested in company directors in line with section 66(1) of the *Companies Act* 2008 to maintain the traditional separation of ownership and control dichotomy.⁴⁶ In circumstances where the board of directors fails to explore other

⁴¹ The JSE listing requirement 3.84(i) states that the board of directors or the nomination committee, as the case may be, must have a policy on the promotion of gender diversity and the promotion of race diversity at board level. Also, directors' background and the environment can shape their approach to problems. Having directors of different races, nationality and gender on the board of directors therefore brings diversity to how they decide various corporate issues.

⁴² Petrin 2020 *Colum Bus L Rev* 1002; Viviers and Mans-Kemp 2019 *IJDG* 70.

⁴³ Sections 7(b)(i) and (ii) of the *Companies Act* 2008.

⁴⁴ Kamalnath 2020 *Alb L Rev* 52. Therefore, augmented AI and big data analytics would offer South African directors an opportunity to consider alternatives that might have been missed either due to time constraints, groupthink or structural bias.

⁴⁵ Hilb 2020 *JMG* 11.

⁴⁶ Also see Ameer-Mia, Pienaar and Kekana "South Africa" 255.

alternatives, directors could consider the recommendations of the AI system.⁴⁷

Due to its ability to analyse huge volumes of complex information in a very short space of time, decision-support AI can be employed by directors to align companies to the *Companies Act 2008* and the relevant regulations so as to impartially protect several stakeholder interests.⁴⁸ The *Companies Act 2008* reflects a shift from the shareholder primacy approach to the enlightened shareholder value approach to corporate governance.⁴⁹ The shareholder primacy approach has been criticised and blamed for the 2007-2008 global financial crisis (GFC) and the other corporate collapses that followed.⁵⁰ It is argued that some of these corporate collapses were a direct result of the shareholder primacy approach.⁵¹ Augmented AI can easily cater for multiple stakeholder interests concurrently and it is not easily susceptible to bias.

Another form of digital technology that South African company directors could rely on to enhance independence is big data analytics. Big data refers to huge volumes of data which cannot be processed by the traditional data processing methods.⁵² For example, Walmart processes about 2.5 petabytes of data per hour from customer transactions.⁵³ Big data analysis refers to analytics technology that stores, analyses and processes huge amounts of data in a short space of time to enhance decision making.⁵⁴ It can also be defined as the employment of analytic techniques and technologies to analyse voluminous data in order to acquire valuable information for making decisions by directors.⁵⁵ Big data analytics includes descriptive, predictive and prescriptive analytics.⁵⁶

⁴⁷ Kamalnath 2020 *Alb L Rev* 52.

⁴⁸ Principle 8.3 of *IoDSA King IV Code*; ss 7(a), (d) and (i) of the *Companies Act 2008*; Petrin 2020 *Colum Bus L Rev* 970.

⁴⁹ Esser 2005 *Obiter* 722-723.

⁵⁰ Mans-Kemp, Viviers and Collins 2018 *IJDG* 210.

⁵¹ United States Senate *Role of the Board of Directors in Enron's Collapse* concluded that one of the contributing factors to Enron's collapse was a lack of directors' independence.

⁵² Motau and Kalema "Big Data Analytics Readiness" 2; Ridge, Johnston and Brian 2015 *Afr J Bus Manage* 688.

⁵³ Ridge, Johnston and Brian 2015 *Afr J Bus Manage* 688.

⁵⁴ Alalawneh and Alkhatib 2020 *EJISDC* 2; Motau and Kalema "Big Data Analytics Readiness" 2.

⁵⁵ Ridge, Johnston and Brian 2015 *Afr J Bus Manage* 690.

⁵⁶ Ridge, Johnston and Brian 2015 *Afr J Bus Manage* 690. According to Davenport descriptive analytics describe past events and are essentially a form of reporting, while predictive analytics employ statistical and other models on past data to create empirical predictions about the future, see Davenport 2015 *The Wall Street Journal* 1-3. South African company directors could employ predictive analytics to

There is a need for companies to consider efficient ways of sorting out useful data from that which is useless since too much information is being generated nowadays from devices such as cellphones, laptops, radio-frequency identification tags, customer transactions and personal sensors.⁵⁷

Big data analytics could improve corporate decision-making by directors in South Africa at all levels of a company including human resources, marketing, pricing, distribution and procurement.⁵⁸ South African company directors could also apply big data analytics to gain competitive advantages *inter alia* through the determination of customer preferences regarding their real-time products and services.⁵⁹ Therefore, it is submitted that real-time data analysis has become a major business resource for directors in South Africa.⁶⁰ Nonetheless, most South African companies are yet to fully embrace the use of big data analytics for decision making and to realise its benefits regarding quality decisions.⁶¹ The *Companies Act* 2008 already provides a platform for employing big data analytics by allowing the storage of corporate information in electronic form.⁶² It is submitted that big data analytics and augmented AI could help South African company directors to process large volumes of information effectively and make informed decisions.⁶³ If company directors are overwhelmed by the amount of information they have to consider before making a decision then they may fail to make an informed decision.⁶⁴ In

make decisions pertaining to the probable consumer reaction to a new product or the expected sales volumes for their products. Davenport further states that prescriptive analytics combine data and algorithms to determine the best alternative to advance corporate performance by directors. South African company directors could use prescriptive analytics to decide whether or not to undertake certain projects taking into account the best interests of the account, see Davenport 2015 *The Wall Street Journal* 1.

⁵⁷ Alalawneh and Alkhatib 2020 *EJISDC* 2; Motau and Kalema "Big Data Analytics Readiness" 2 states that only processed data is useful for decision making.

⁵⁸ Alalawneh and Alkhatib 2020 *EJISDC* 2.

⁵⁹ Mneney and Van Belle "Big Data Capabilities" 281.

⁶⁰ ITWeb Staff Writer 2013 <https://www.itweb.co.za/content/nkLgB1MebBbq59N4>. In this regard, it is noted that JSE listed companies are better than unlisted companies.

⁶¹ ITWeb Staff Writer 2013 <https://www.itweb.co.za/content/nkLgB1MebBbq59N4>.

⁶² For example, s 1 of the *Companies Act* 2008 defines accounting records as information in written or electronic form concerning the financial affairs of a company. S 24(1)(a) of the *Companies Act* 2008 provides that any documents, accounts, books, writing, records or other information that a company is required to keep in terms of this Act or any other public regulation must be kept in written form, or other form or manner that allows that information to be converted into written form within a reasonable time.

⁶³ Kamalnath 2020 *Alb L Rev* 49; Alalawneh and Alkhatib 2020 *EJISDC* 2-3.

⁶⁴ Kamalnath 2020 *Alb L Rev* 49.

Australian Securities and Investments Commission (ASIC) v Healey,⁶⁵ the respondent directors noted that some vital information was lost "in a very large board packet".⁶⁶ Digital technologies like AI and big data could assist South African directors to keep and process crucial information in order to discharge their fiduciary and statutory obligations effectively and to enhance their independence.

Companies from almost every industry and sector are committed to exploiting data to gain a competitive advantage because technological advances in the Internet have made available huge amounts of data to the directors.⁶⁷ The volume and diversity of data available to companies in South Africa cannot be analysed manually, and in most cases it exceeds the capacity of conventional databases.⁶⁸ The ultimate goal of capturing, processing and analysing big data for company directors in South Africa should be to enhance decision-making through establishing trends in people and organisations from different perspectives.⁶⁹ Some of the benefits of data-driven decision making which South African companies can enjoy if their directors employ big data analytics include higher market value, increased return on assets and equity, and optimum asset utilisation.⁷⁰ Scholars such as Provost and Fawcett also submit that data-driven decision-making increases firm productivity by 4 to 6 percentage points.⁷¹ Some of the big data technologies that could be employed by company directors in South Africa to enhance decision making and independence include Hadoop, Hbase and CouchDB.⁷²

However, AI can be subject to bias, which is usually a result of two factors. Firstly, AI bias can be a result of human bias; that is, it can be a product of the algorithm designer/programmer's preferences.⁷³ This is known as designed bias. Designed bias could lead to distorted AI recommendations. Ultimately directors' independence will be compromised since they will be relying on biased AI recommendations. AI designers and programmers

⁶⁵ *Australian Securities and Investments Commission v Healey (No 2)* [2011] FCA 1003.

⁶⁶ Section 5(2) of the *Companies Act* 2008 provides that to the extent appropriate, a court interpreting or applying this Act may consider foreign company law.

⁶⁷ Provost and Fawcett 2013 <https://pubmed.ncbi.nlm.nih.gov/27447038/>.

⁶⁸ Provost and Fawcett 2013 <https://pubmed.ncbi.nlm.nih.gov/27447038/>; Ridge, Johnston and Brian 2015 *Afr J Bus Manage* 688.

⁶⁹ Provost and Fawcett 2013 <https://pubmed.ncbi.nlm.nih.gov/27447038/>; Brennan, Subramaniam and Van Staden 2019 *British Accounting Review* 4.

⁷⁰ Provost and Fawcett 2013 <https://pubmed.ncbi.nlm.nih.gov/27447038/>.

⁷¹ Provost and Fawcett 2013 <https://pubmed.ncbi.nlm.nih.gov/27447038/>.

⁷² Provost and Fawcett 2013 <https://pubmed.ncbi.nlm.nih.gov/27447038/>.

⁷³ Dignam 2020 *Cambridge J Reg Econ Soc* 39; Hilb 2020 *JMG* 10.

may deliberately develop software and algorithms to achieve certain intended goals.⁷⁴ For example, since more men than women are involved in the production of algorithms, it has been alleged that Internet job searches have been biased towards men.⁷⁵ Another practical example of designed bias relates to online retailers such as Amazon, which are capable of using differential pricing based on algorithm bias.⁷⁶ The problem of designed bias can be addressed through public interest regulation, as AI should not be elevated to assume the position of an autonomous decision-maker that determines the price of goods and interest rates.⁷⁷ The second source of algorithmic bias can be linked to the type of information fed into the system, since algorithms can process only the information that has been fed into them.⁷⁸ If biased information is fed into the AI system, biased results will be produced. In the second scenario, correct and accurate data is key.⁷⁹

Section 66(1) of the *Companies Act* 2008 provides that the business and affairs of a company must be managed by or under the direction of its board, which has the authority to exercise all of the powers and perform any of the functions of the company.⁸⁰ Company directors are appointed to reduce shareholders' agency costs by monitoring and scrutinising corporate management's conduct to ensure that they act in the company's best interests.⁸¹ The current unpredictable economic landscape coupled with some recent corporate challenges has led to high demand for competent directors in South Africa.⁸² As a result, reputable directors tend to serve on several boards at the same time.⁸³ The problem of busy directors is further compounded by the fact that South Africa has a limited pool of eligible black female directors.⁸⁴ Furthermore, legislation such as

⁷⁴ Dignam 2020 *Cambridge J Reg Econ Soc* 42. Hilb 2020 *JMG* 10.

⁷⁵ Dignam 2020 *Cambridge J Reg Econ Soc* 39.

⁷⁶ Dignam 2020 *Cambridge J Reg Econ Soc* 42.

⁷⁷ Dignam 2020 *Cambridge J Reg Econ Soc* 43.

⁷⁸ Hilb 2020 *JMG* 10; Petrin 2020 *Colum Bus L Rev* 1005.

⁷⁹ Hilb 2020 *JMG* 15; Petrin 2020 *Colum Bus L Rev* 1005.

⁸⁰ Section 66(1) of the *Companies Act* 2008.

⁸¹ Terjesen, Couto and Francisco 2016 *JMG* 449; Viviers and Mans-Kemp 2019 *IJDG* 69; Mans-Kemp, Viviers and Collins 2018 *IJDG* 210; McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 4; OECD *Principles of Corporate Governance* Art IV.

⁸² McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 3.

⁸³ McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 8; Chiranga and Chiwira 2014 *Economics World* 379; Jiraporn, Singh and Lee 2009 *JBF* 820.

⁸⁴ Mans-Kemp, Viviers and Collins 2018 *IJDG* 211; McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 2.

the *Broad-Based Black Economic Empowerment Act*⁸⁵ has further restricted the pool of qualifying directors by demanding the inclusion of directors from historically disadvantaged backgrounds.⁸⁶ A director who serves on multiple boards simultaneously can be described as an interlocked or a busy director.⁸⁷ Busy directors' independence might be compromised due to the possibility of their having conflicting interests because of their numerous connections and interests.

There is no statutory limitation on how many boards a company director can serve on in South Africa.⁸⁸ This allows company directors to serve on as many boards as they want, and this could inadvertently impair their independence. The *King IV Code 2016*⁸⁹ and the JSE listing requirements are also silent on this issue.⁹⁰ However, there seems to be a local and international academic consensus that when a director serves on more than three boards concurrently, he or she is busy.⁹¹ Almost a third of South Africa's 100 largest JSE-listed companies' directors are busy.⁹² Busy directors face time constraints and tend to be too busy to discharge their duties effectively, which may affect the quality of their decisions.⁹³

⁸⁵ Sections 2(b) and (d) of the *Broad-Based Black Economic Empowerment Act* 53 of 2003 provide that this Act seeks, *inter alia*, to achieve "a substantial change in the racial composition of ownership and management structures and in the skilled occupations of existing and new enterprises and to increase the extent to which black women own and manage existing and new enterprises".

⁸⁶ McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 2.

⁸⁷ Viviers and Mans-Kemp 2019 *IJDG* 68; Mans-Kemp, Viviers and Collins 2018 *IJDG* 212; Chiranga and Chiwira 2014 *Economics World* 379; McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 3.

⁸⁸ Mans-Kemp, Viviers and Collins 2018 *IJDG* 210; McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 4.

⁸⁹ JSE listing requirement 3.84 states that the effect of incorporating certain practices from the King Code in the Listings Requirements is to make their implementation mandatory. Additionally, it has to be noted that the courts keep developing the law relating to the enforceability of IoDSA *King IV Code* principles (Part 3). In this respect, the North Gauteng High Court in the case of *OUTA NPC v Myeni* 2019 ZAGPPHC 957 (12 December 2019) averred that in future, courts may refer to IoDSA *King IV Code* to determine directors' compliance with their fiduciary duties. Also see *SABC v Mpofo* 2009 4 All SA 169 (GSJ) para 61, where the court held that the boards of directors of public companies are enjoined to consider their responsibilities in terms of the *King Report*.

⁹⁰ McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 2.

⁹¹ Viviers and Mans-Kemp 2019 *IJDG* 68; Mans-Kemp, Viviers and Collins 2018 *IJDG* 210; McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 3, 4.

⁹² Viviers and Mans-Kemp 2019 *IJDG* 75.

⁹³ Mans-Kemp, Viviers and Collins 2018 *IJDG* 213; Viviers and Mans-Kemp 2019 *IJDG* 68; McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 3.

Busy directors usually miss board meetings, thus weakening the board's monitoring role and ultimately leading to ineffective corporate governance.⁹⁴ Empirical research conducted on almost 200 South African listed companies revealed that there is a strong positive relationship between the frequency of company board meetings and corporate performance.⁹⁵ Consequently, it follows that if a director misses some board meetings then the company's performance will be negatively affected. The independence of busy directors is questionable in that sometimes, due to time constraints, they may fail to consider all the relevant information before making a decision. Ultimately this results in conflicts of interest being overlooked, thereby impairing directors' independence. Big data analytics may assist and create more time for busy directors by processing huge amounts of corporate data in a short space of time.

3.1 Technology and the independence of company directors

The ability of directors to discharge their duties independently is one of the pillars of corporate governance in South Africa.⁹⁶ In South Africa all company directors are expected to exercise an independent judgment in their decisions and to act in the best interests of the company when discharging their duties.⁹⁷ The independence of company directors includes the exercise of objective, unfettered judgment, and the absence of an interest, position, association or relationship which, when judged from the perspective of a reasonable and informed third party, is likely to cause directors to be biased in decision-making.⁹⁸ The agency theory of corporate governance states that one of the traditional and primary ways to strengthen the independence of company directors is by including non-executive directors on the board.⁹⁹

⁹⁴ Viviers and Mans-Kemp 2019 *IJDG* 70; Mans-Kemp, Viviers and Collins 2018 *IJDG* 210-211; McNamee, Misha and Bouwer *Fine Line between "Overboarded" and Overburdened* 4; Chiranga and Chiwira 2014 *Economics World* 379; Jiraporn, Singh and Lee 2009 *JBF* 820.

⁹⁵ Ntim and Osei 2011 *AREF* 97. Also see Chiranga and Chiwira 2014 *Economics World* 379; Jiraporn, Singh and Lee 2009 *JBF* 820.

⁹⁶ Section 76(3) of the *Companies Act* 2008; Principle 7 of part 5.3 of *IoDSA King IV Code*.

⁹⁷ Section 76(3)(b) of the *Companies Act* 2008; Principle 7 of part 5.3 of *IoDSA King IV Code*.

⁹⁸ Section 76(2)-(4) of the *Companies Act* 2008; Part 1 of *IoDSA King IV Code*.

⁹⁹ Rosenstein and Wyatt 1997 *Journal of Financial Economics* 229-250; Terjesen, Couto and Francisco 2016 *JMG* 459; *IoDSA King IV Code*. However, it is noteworthy that the *Companies Act* 2008 does not differentiate between executive and non-executive directors. See ss 1 and 76(1) of the *Companies Act* 2008. The

The *King IV Code* 2016 does not specifically prescribe the number of non-executive directors corporate boards should have except to state that the board should comprise a majority of non-executive members, most of whom should be independent.¹⁰⁰ The *King IV Code* 2016 further calls for company boards to comprise of an appropriate number of independent directors to improve company directors' independence.¹⁰¹ What is appropriate depends on the circumstances of each company, taking into consideration factors such as the company's capacity, resources and impact.¹⁰² Furthermore, all companies whose securities are publicly traded on the JSE are required to either have an independent non-executive board chairman or to appoint a lead independent director to enhance corporate independence.¹⁰³

Although companies with more independent directors tend to be more profitable than those with fewer independent directors. Petrin and Kamalnath argue that the longer independent directors stay in a company, the more they lose their independence.¹⁰⁴ Independent directors usually serve long terms and this sometimes create collegiality and even friendships with other executive directors, which affects their independence.¹⁰⁵ Groupthink and structural biases or friendships could undermine the independence of company directors.¹⁰⁶ This will ultimately affect the quality of decisions made. One way of minimising groupthink

only executive director the *Companies Act* 2008 makes reference to is one who is appointed in terms of s 200 of the *Companies Act* 2008 to lead the Takeover and Regulations Panel. The JSE listing requirement 3.84(e) defines executive directors as those that are involved in the management of the company and/or in full-time salaried employment whereas non-executive directors are neither involved in the day-to-day management of the business nor are they full-time salaried employees. Regarding diversity, there has been a gradual increase in studies advocating for race and gender diversity on company boards as another tool to enhance directorial independence. For more on this see Terjesen, Couto and Francisco 2016 *JMG* 453. Principle 7 of part 5.3 of IoDSA *King IV Code* recommends that the board should set targets for race and gender representation in its membership.

¹⁰⁰ Principle 7 of part 5.3 of IoDSA *King IV Code*.

¹⁰¹ Principle 7 of part 5.3 of IoDSA *King IV Code*.

¹⁰² Principle 7 of part 6.5 of IoDSA *King IV Code* takes cognizance of the fact that some companies might not afford the services of independent non-executive directors due to resource constraints. To counter this, the *King IV Code* encourages companies to consider consulting with experienced and competent executive directors on an *ad hoc* basis and inviting them to attend board meetings when the need arises.

¹⁰³ JSE listing requirement 3.84 states that the effect of incorporating certain practices from the King Code in the Listings Requirements is to make their implementation mandatory.

¹⁰⁴ Petrin 2020 *Colum Bus L Rev* 1005; Kamalnath 2020 *Alb L Rev* 48. See also Muniandy and Hillier 2015 *Pacific-Basin Finance Journal* 122.

¹⁰⁵ Petrin 2020 *Colum Bus L Rev* 1005.

¹⁰⁶ Petrin 2020 *Colum Bus L Rev* 1005.

and structural bias is the integration and reliance on augmented AI and big data analytics. An AI decision support system will be influenced by data and not by feelings of collegiality.¹⁰⁷

Information asymmetry also negatively affects non-executive directors' monitoring and advisory roles, since they are not involved in the daily management of the company.¹⁰⁸ Furthermore, the independence of directors in South Africa could be compromised by structural bias, corruption and the presence of financial interest.¹⁰⁹ Since augmented AI minimises human weaknesses, it could improve the independence of company directors by reducing agency costs in corporate management.¹¹⁰ The independence of company directors is a key corporate governance tool which could counter agency costs.¹¹¹ Augmented AI could deal with structural bias among company directors in South Africa.¹¹²

The business and affairs of a company must be managed by or under the direction of its board of directors.¹¹³ The board of directors has the authority to exercise all of the powers and perform any of the functions of the company.¹¹⁴ Exercising such responsibility entails that directors perform various fiduciary duties to the company.¹¹⁵ Directors' duties have now been partially codified in South Africa to enhance legal certainty.¹¹⁶ Breach of the common law and statutory provisions on directors' fiduciary duties may result in the relevant director incurring personal liability.¹¹⁷ Apart from the directors' duties found in the *Companies Act 2008* South African directors also need to adhere to additional requirements set out in regulations and best practice directives such as the JSE listing rules and corporate governance principles.¹¹⁸ These regulations are additional

¹⁰⁷ Kamalnath 2020 *Alb L Rev* 52.

¹⁰⁸ Muniandy and Hillier 2015 *Pacific-Basin Finance Journal* 113.

¹⁰⁹ Sections 75 and 76(2) of the *Companies Act 2008*; Petrin 2020 *Colum Bus L Rev* 1005.

¹¹⁰ Section 76(3) of the *Companies Act 2008*; Kamalnath 2020 *Alb L Rev* 43.

¹¹¹ Kamalnath 2020 *Alb L Rev* 45. It is noteworthy that purchasing AI could be very expensive as well. Therefore, companies may make monthly instalments to pay for AI.

¹¹² Kamalnath 2020 *Alb L Rev* 45.

¹¹³ Section 66(1) of the *Companies Act 2008*.

¹¹⁴ Section 66(1) of the *Companies Act 2008*.

¹¹⁵ Sections 76(2) and (3) of the *Companies Act 2008*; Van Tonder 2018 *Obiter* 303.

¹¹⁶ Sections 75, 76 and 77(2) of the *Companies Act 2008*; Cassim 2019 *Stell LR* 212 who further notes that those partial codification of the directors' duties means that common law duties that have not been expressly replaced by the Act remain applicable. Also see Van Tonder 2018 *Obiter* 302-303.

¹¹⁷ Sections 77(2)(a) and (b) of the *Companies Act 2008*.

¹¹⁸ JSE listing requirement 3.84.

attempts to ensure that directors discharge their duties effectively.¹¹⁹ Directors must fully consider all the statutory provisions and other self-regulatory mechanisms before making any decision. Failure to comply with the provisions of the *Companies Act* 2008 could lead to the personal liability of the affected company directors.¹²⁰

In the aftermath of the GFC, the boards of some companies were found to have failed to adequately exercise independent judgement in their decisions.¹²¹ Previous discussions on the independence of company directors seem to have focussed more on financial interest, probably due to the shareholder wealth maximisation approach.¹²² However, it must be noted that directors need to be intellectually and psychologically independent to perform their duties optimally.¹²³ The presence of independent directors on the board and various committees has not always added the expected value due to information asymmetry and structural bias.¹²⁴ Furthermore, company directors usually have to make important decisions in a short space of time and independent directors might not be able to read through all the relevant information on short notice.¹²⁵ Being *de facto* corporate outsiders, independent directors face constraints as they usually serve on several boards of companies concurrently.¹²⁶ The integration of AI and big data analytics could enhance director independence by minimising bias in decision making.

3.2 Technology and the accountability of company directors

Accountability occurs when a party is held responsible for something and is able to explain its actions and/or decisions.¹²⁷ According to the agency theory of corporate governance, directors should be accountable to the company shareholders. The accountability of company directors is one of

¹¹⁹ Section 5(6) of the *Companies Act* 2008; Kamalnath 2020 *Alb L Rev* 48.

¹²⁰ Section 77 of the *Companies Act* 2008.

¹²¹ United States Senate *Role of the Board of Directors in Enron's Collapse*.

¹²² Section 75 of the *Companies Act* 2008; Kamalnath 2020 *Alb L Rev* 48.

¹²³ Part 1 of *IoDSA King IV Code*; Kamalnath 2020 *Alb L Rev* 48.

¹²⁴ Kamalnath 2020 *Alb L Rev* 48.

¹²⁵ Kamalnath 2020 *Alb L Rev* 48. Principle 1 of part 5.1 of *IoDSA King IV Code* and ss 76(4)(a)(i) and (b) of the *Companies Act* 2008 require company directors to adequately prepare for meetings.

¹²⁶ Kamalnath 2020 *Alb L Rev* 48. However, this does not suggest that independent directors are the only ones who serve on several boards of directors. The emphasis on independent directors stems from the fact that they are the ones who usually enhance corporate independence.

¹²⁷ Part 1 of *IoDSA King IV Code*; Hilb 2020 *JMG* 9.

the key principles of corporate governance in South Africa.¹²⁸ There are various internal and external accountability mechanisms which companies in South Africa can employ to enhance director accountability. Shareholders' power to appoint and remove directors is one of the primary accountability mechanisms employed by companies in South Africa.¹²⁹ The ability of shareholders to amend the memorandum of incorporation and access to shareholder meeting minutes are further accountability mechanisms.¹³⁰ Board meeting frequency, adequate reporting and easy circulation of corporate information, access to the shareholders' register, and directors' ability to request a meeting at any time are additional director accountability mechanisms.¹³¹

The liability of company directors in South Africa stems from their accountability.¹³² In turn, director accountability emanates from the duties directors owe to the company. The *Companies Act* 2008 has enhanced directors' accountability by partially codifying the directors' duties, and a breach of these duties will result in liability.¹³³ These duties arise from the fact that directors hold a fiduciary relationship to the company and shareholders.¹³⁴ The *Companies Act* 2008 provides that a company director must act with a degree of care, skill and diligence.¹³⁵ The requirement of diligence is a novel addition to the directors' partially codified duties of care and skill.¹³⁶ Diligence implies caution and attention.¹³⁷ Therefore, a diligent director attends board meetings, pays attention to relevant paperwork and is devoted to the company's business, affairs and practices.¹³⁸ AI could be integrated into South African corporate governance to enhance director diligence by compiling notes during board

¹²⁸ Part C of Chapter two of the *Companies Act* 2008; part 1 of *IoDSA King IV Code*; Hilb 2020 *JMG* 9.

¹²⁹ Sections 68 and 71 of the *Companies Act* 2008.

¹³⁰ Section 24(3)(d) of the *Companies Act* 2008.

¹³¹ Section 73(1)(a) of the *Companies Act* 2008 states that a director authorised by the board of a company may call a meeting of the board at any time. South African companies could employ prescriptive analytics to prepare reports and financial statements. This would enhance director accountability by ensuring that information is readily available to the various corporate stakeholders.

¹³² Section 77 of the *Companies Act* 2008; Hilb 2020 *JMG* 9.

¹³³ Section 77 of the *Companies Act* 2008. Also see Hilb 2020 *JMG* 9.

¹³⁴ However, in the recent case of *Hlumisa Investment Holdings (RF) Limited v Kirkinis* 2019 4 SA 569 (GP) para 91, it was held that the special remedy provided for in s 77(2) of the *Companies Act* 2008 with respect to the contravention of s 76(3) of the same Act emanates from a fiduciary duty to the company and not to shareholders.

¹³⁵ Section 76(3)(c) of the *Companies Act* 2008.

¹³⁶ Section 76(3)(b) of the *Companies Act* 2008; Van Tonder 2018 *Obiter* 306.

¹³⁷ Garner *et al Black's Law Dictionary* 1375.

¹³⁸ Sections 66(1), 73 and 76(4)(b) of the *Companies Act* 2008; *Charitable Corporation v Sutton* (1742) 26 ER 642; Van Tonder 2018 *Obiter* 306.

meetings and could help company secretaries schedule meetings and prepare reports for directors.¹³⁹

Since the *Companies Act 2008* already allows the storage of company information in electronic form, it is submitted that a diligent director could employ digital technologies such as augmented AI and big data analytics to discharge his or her duties well.¹⁴⁰ The duty of care and diligence entails an objective test whilst the duty of skill requires a subjective test, since the type of skills that individuals possess differ from person to person.¹⁴¹ Considering the amount of information that is available in this technology-driven age, it is not far-fetched for the courts to consider the objective test of section 76(3)(c) of the *Companies Act 2008* to include the fact that a reasonable director would rely on augmented AI and big data analytics when discharging his duties. It is submitted that section 76(3)(c) of the *Companies Act 2008* is wide enough to allow the integration and reliance on technology by company directors.

Another important aspect that is closely linked to the directors' duties in section 76(3)(c) of the *Companies Act 2008* is the business judgment rule. The business judgment rule is provided for in section 76(4)(a)(i) of the *Companies Act 2008*. This provision states that a director will have satisfied the obligations of subsections (3)(b) and (c) of the *Companies Act 2008* if the director has taken reasonably diligent steps to become informed about the matter.¹⁴² Company directors in South Africa are obliged to have all relevant material information available to them before making a decision.¹⁴³ The business judgment rule states that directors are not liable for corporate harm arising from mere errors of judgment if they acted in good faith in the best interests of the company.¹⁴⁴ A director who acts in the best interests of a company exercises independent judgment. South African company directors could integrate and use AI measures to enhance their independence. The business judgment rule protects honest directors from hindsight bias and presents the decision-making function of the duty of care, skill and diligence as a measure of directors' conduct.¹⁴⁵

¹³⁹ Section 88 of the *Companies Act 2008*; Petrin 2020 *Colum Bus L Rev* 981.

¹⁴⁰ See s 1 of the *Companies Act 2008* for the definition of accounting records read together with s 24(1)(a) of the same Act.

¹⁴¹ Mongalo 2016 *Journal of Corporate and Commercial Law & Practice* 5-6; Du Plessis 2010 *Acta Juridica* 263-289.

¹⁴² Section 76(4)(a)(i) of the *Companies Act 2008*; Cassim *et al Contemporary Company Law* 508.

¹⁴³ Section 76(4)(i) of the *Companies Act 2008*; Kamalnath 2020 *Alb L Rev* 47.

¹⁴⁴ Section 76(4) of the *Companies Act 2008*; Havenga 2000 *SA Merc LJ* 28-30.

¹⁴⁵ Section 76(4) of the *Companies Act 2008*; Cassim *et al Contemporary Company Law* 565; Havenga 2000 *SA Merc LJ* 28; Van Tonder 2018 *Obiter* 302-316.

One of the underlying values of the business judgment rule is the fallibility of people and the recognition that directors have limited memories and computational skills.¹⁴⁶ By integrating and relying on augmented AI and data analytics, South African directors would make better quality and better-informed decisions through leveraging the superior computational and analytical capabilities of technology.

Company directors may struggle to take into account all the relevant corporate governance principles and other voluminous published articles before making decisions due to time constraints. One of the excellent digital technology systems that company directors could employ to enhance their independence and accountability is IBM Watson's (Watson) cognitive computing systems.¹⁴⁷ Watson is already being used by companies in some first-world countries for medical diagnosis, financial advice and legal due diligence.¹⁴⁸ In Sweden, Standard Bank uses Watson to address customer queries.¹⁴⁹ Watson is versatile since a director can communicate with it through voice, image and text, without internet connection.¹⁵⁰ With such capabilities, Watson can be employed as a platform to interact with or account to various corporate stakeholders. Directors can feed corporate information into Watson and stakeholders can access it anytime. Stakeholders can ask Watson any question related to their company and get their responses in real-time. Shareholders can access minutes of the annual general meetings more conveniently. They can further ask the algorithm any question concerning the contents of the meeting and it will explain it to them.

Watson's ability to process natural language facilitates advanced interaction between human beings and algorithms which can assist South African company directors to make better decisions.¹⁵¹ Watson is

¹⁴⁶ Bainbridge 2004 *Vand L Rev* 121.

¹⁴⁷ Guidi 2016 *Future Internet* 1-16; Chen, Argentinis and Weber 2016 *Clinical Therapeutics* 690, defines cognitive computing as an element of digital technologies that can perform human acts such as reading, reasoning and learning, and that have the ability to draw inferences from large sets of unstructured data.

¹⁴⁸ Petrin 2020 *Colum Bus L Rev* 982; Dignam 2020 *Cambridge J Reg Econ Soc* 41-42.

¹⁴⁹ Memeti and Pillana 2018 *Journal of Computational Science* 276.

¹⁵⁰ Memeti and Pillana 2018 *Journal of Computational Science* 276; Collinaszy, Bundzel and Zolotova 2017 *Acta Electrotechnica et Informatica* 58.

¹⁵¹ Memeti and Pillana 2018 *Journal of Computational Science* 276; High 2012 <https://developer.ibm.com/watson/wp-content/uploads/sites/19/2013/11/The-Era-of-Cognitive-Systems-An-Inside-Look-at-IBM-Watson-and-How-it-Works.pdf> 2-3.

designed to integrate and analyse huge volumes of data.¹⁵² It can teach itself a new subject from both structured and unstructured data by categorising related information in its database.¹⁵³ When asked a question or presented with a scenario, Watson searches its database to generate and evaluate hypotheses to provide an answer.¹⁵⁴ Company directors could feed information into Watson and it would categorise it into financial statements, annual meeting reports, notices of meetings, minutes of meetings and so forth.¹⁵⁵ Various stakeholders could access the information that they are legally entitled to access.¹⁵⁶ Easy access to company records through augmented AI would enhance directors' accountability in South Africa. As a cognitive system, Watson can comprehend technical, industry-specific nomenclature and apply advanced reasoning, predictive modelling and machine learning procedures to advance research in real time.¹⁵⁷ In essence, Watson simulates aspects of human thought processes to analyse large volumes of data in a very short space of time and without bias.¹⁵⁸ Unbiased recommendations from Watson would promote directorial independence. Empirical research by Hamilton *et al* has shown that the use of decision support tools such as Watson is cost-effective and improves the quality of the decisions made.¹⁵⁹

3.3 Do boards of South African company directors need technology experts?

Quality informed decisions at board level are a result of accurate expert advice. Some companies such as Kodak, which at some point seemed to be too big to sink, came to an unprecedented demise because they could not keep up with technological changes.¹⁶⁰ Technology governance has become so essential to business models and practices that it should be

¹⁵² Chen, Argentinis and Weber 2016 *Clinical Therapeutics* 688; Doyle-Lindrud 2015 *Clin J Oncol Nurs* 31.

¹⁵³ Examples of structured data include data kept according to some specific fields in spreadsheets and other relational databases, whilst unstructured data refers to raw data such as images, text, audio and video recordings. See Ridge, Johnston and Brian 2015 *Afr J Bus Manage* 689.

¹⁵⁴ Memeti and Pillana 2018 *Journal of Computational Science* 276; Collinaszy, Bundzel and Zolotova 2017 *Acta Electrotechnica et Informatica* 59; Doyle-Lindrud 2015 *Clin J Oncol Nurs* 31.

¹⁵⁵ Section 26(1) of the *Companies Act* 2008.

¹⁵⁶ Sections 26(2) and (3) of the *Companies Act* 2008.

¹⁵⁷ Chen, Argentinis and Weber 2016 *Clinical Therapeutics* 688.

¹⁵⁸ Chen, Argentinis and Weber 2016 *Clinical Therapeutics* 690; Doyle-Lindrud 2015 *Clin J Oncol Nurs* 31.

¹⁵⁹ Hamilton *et al* 2019 *J Oncol Pract* 277.

¹⁶⁰ Valentine and Stewart 2013 *IJDG* 347.

elevated to board level in South Africa.¹⁶¹ Issues such as business stability and disaster recovery require technological expertise at board level.¹⁶² To be able to make quality decisions, directors must be able to ask the right questions when presented with technology-related proposals.¹⁶³ One of the accountability mechanisms in South African corporate governance is an annual general meeting (AGM). An AGM presents a platform for shareholders to question directors regarding the business and affairs of the company. A technology expert at board level could enhance the directors' accountability to the shareholders at AGMs. The use of AI measures could enhance the disclosure of relevant information to all the corporate stakeholders at AGMs.¹⁶⁴

Companies have traditionally opted to rely entirely on general technical advisers for technology-related aspects.¹⁶⁵ Consequently, companies have not bothered to have a technology expert on their boards of directors.¹⁶⁶ This presents a challenge, however, since the absence of a technology expert at company director level deprives the board of informed decisions regarding technological matters.¹⁶⁷ As companies in South Africa adopt the above-mentioned technologies such as big data analytics, descriptive analytics, prescriptive analytics and cognitive systems, there is a need to have a technology expert at board level who understands such technology. A technology expert could contribute to the enhancement of director accountability and independence in South Africa. According to the resource-based theory (RBT), distinctiveness and competitive advantage is a result of a gradual development of dynamic competences, in this case, the technological capabilities of the relevant company.¹⁶⁸

The adoption of digital technologies such as AI and big data as suggested above requires a technological expert at board level to effectively enhance company directors' independence and accountability. It is submitted that companies in South Africa should elect technology experts to the board of company directors on a rotational basis rather than relying on general technical advisers, who in most cases offer merely general advice.¹⁶⁹

¹⁶¹ Andriole 2009 *CAIS* 375.

¹⁶² Andriole 2009 *CAIS* 375.

¹⁶³ Valentine and Stewart 2013 *IJDG* 348.

¹⁶⁴ Valentine and Stewart 2013 *IJDG* 348.

¹⁶⁵ Bravard 2015 <https://hbr.org/2015/09/all-boards-need-a-technology-expert>.

¹⁶⁶ Bravard 2015 <https://hbr.org/2015/09/all-boards-need-a-technology-expert>.

¹⁶⁷ Bravard 2015 <https://hbr.org/2015/09/all-boards-need-a-technology-expert>.

¹⁶⁸ Barney *et al* "Role of Resource-Based Theory in Strategic Management Studies" 112.

¹⁶⁹ Bravard 2015 <https://hbr.org/2015/09/all-boards-need-a-technology-expert>; Andriole 2009 *CAIS* 374.

General technical advisors focus only on ensuring that companies are performing better than their rivals.¹⁷⁰

4 Concluding remarks

The integration and reliance on technology by company directors in South Africa to enhance their independence and accountability is necessary to keep up with the dynamic and data-driven nature of contemporary society. A combination of digital technologies such as AI, cloud computing, big data analytics and cognitive systems has the potential to improve director accountability and independence in South Africa. Other possible benefits of incorporating technology into the South African corporate governance structure include greater market value, increased return on assets and equity, and optimum asset utilisation.¹⁷¹ The *Companies Act 2008* generally allows directors to rely on technology to enhance their independence and accountability. For example, sections 1 and 24(1)(a) of the *Companies Act 2008* allow companies to keep board minutes and any other documents in electronic or any other format for seven years. This facilitates the use of big data analytics and other decision-support tools to enhance company directors' independence and accountability.

As established above, there are some loopholes in current South African company law regarding the independence and accountability of company directors. It is submitted that the lack of proper guidance in terms of the *Companies Act 2008* and self-regulatory instruments such as the King Codes allows directors to serve on numerous boards of directors. This results in busy directors who often face time constraints, and their independence may be compromised in the process. Moreover, the lack of trust in AI measures could be another barrier to the use of technological measures to enhance company directors' accountability and independence in South Africa. Difficulties in accessing company records by stakeholders may also undermine company directors' accountability. Human fallibility and natural computational limitations are some of the weaknesses of company directors that may result in a call for augmented AI to improve their decision making.

Given the flaws described above, it is recommended that there should be a clear provision in the *Companies Act 2008* regarding the maximum number of boards that a director can serve on concurrently. This could be done through a legislative amendment to the *Companies Act 2008*. It is

¹⁷⁰ Bravard 2015 <https://hbr.org/2015/09/all-boards-need-a-technology-expert>.

¹⁷¹ Provost and Fawcett 2013 <https://pubmed.ncbi.nlm.nih.gov/27447038/>.

further recommended that all companies should integrate and utilise innovative technology to enhance the accountability and independence of directors in South Africa. Furthermore, AI and other innovative technological measures could promote the accountability of directors by making corporate records more readily available to all the relevant stakeholders. It is also submitted that the Institute of Directors of South Africa (IoDSA) should conduct regular technological literacy workshops and seminars that are mainly aimed at equipping directors, with the relevant knowledge and skills. This could ensure that company directors keep up with any latest decision-making support technologies. Additionally, such educational programmes by the IoDSA could also help to encourage company directors to learn to trust and utilise AI measures when executing their duties and responsibilities.

It is further recommended that all South African companies should appoint a technological expert to their boards of directors. Board chairpersons should also evaluate their companies' preparedness to handle technological integration by mapping the technological expertise required to their current non-executive directors' pool.¹⁷² This should be done to determine if there is anyone from the current board who qualifies to be a technological expert or if there is a need to hire someone external. However, some small companies might not possess the financial capacity to acquire the services of a technology expert. In this regard, it is submitted that such companies might commence by inviting experts in technology to attend their board meetings on an *ad hoc* basis until such a time as they are capable of appointing a full-time technology expert.

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List of Abbreviations

Afr J Bus Manage	African Journal of Business Management
AGM	annual general meeting
AI	artificial intelligence
Alb L Rev	Albany Law Review
AREF	African Review of Economics and Finance
ASIC	Australian Securities and Investments Commission
CAIS	Communications of the Association for Information Systems
Cambridge J Reg Econ Soc	Cambridge Journal of Regions, Economy and Society
Clin J Oncol Nurs	Clinical Journal of Oncology Nursing
Colum Bus L Rev	Columbia Business Law Review
EJISDC	Electronic Journal of Information Systems in Developing Countries
GFC	global financial crisis
Harv Int'l LJ	Harvard International Law Journal
IBM	International Business Machines
IEEE	Institute of Electrical and Electronics Engineers
IJDG	International Journal of Disclosure and Governance
IoDSA	Institute of Directors of South Africa
IT	information technology
J Oncol Pract	Journal of Oncology Practice
JBF	Journal of Banking and Finance
JMG	Journal of Management and Governance
JSE	Johannesburg Stock Exchange

OECD	Organisation for Economic Co-operation and Development
OUTA	Organisation Undoing Tax Abuse
RBT	resource-based theory
SA Merc LJ	South African Mercantile Law Journal
Stell LR	Stellenbosch Law Review
USA	United States of America
Vand L Rev	Vanderbilt Law Review
VITAL	Validating Investment Tool for Advancing Life Sciences