DR ALAN FINKEL AO

Australian Institute of Company Directors Governance Summit

The Innovation Imperative

Tuesday 5 March 2019

**International Convention Centre
SYDNEY**

In 2014, a venture capital outfit in Hong Kong, called Deep Knowledge Ventures, appointed the first robot director to a corporate board.

They didn't do it simply to be first, although to the best of my knowledge they were.

They didn't do it simply to impress their stakeholders, although I have no doubt they were spellbound by this appointment.

The company did it because they were sick of the high failure rate in biotech investment.

To improve their investment success rate, they built an artificial intelligence, a robot named Vital, short for "Validating Investment Tool for Advancing Life Sciences".

Vital's job was to map the predictors of risk.

She could crunch millions of data points across fifty parameters describing a target company – stock prices, clinical trials, IP holdings, personnel records, research grants and more.

Then, at the Board table, she would vote on whether or not to make the investment.

Of great significance, the human directors agreed not to go ahead without Vital's approval.

She wasn't legally allowed to be a director – but she was effectively something better, a *super*-director – holding veto power on investment decisions.

At the time, most of us probably dismissed Vital as a PR exercise. I admit, I used her story three years ago to get a laugh in one of my speeches. Given that it's five years since Vital first appeared, I thought I'd check to see what's happened.

For starters, the company is still in business. Vital is still on the Board. And waiting in the wings is her successor: Vital 2.0.

The experiment was so successful that the CEO predicts we'll see fully autonomous companies – able to operate without any human involvement – in the coming decade.

Stop and think about it: *fully autonomous companies able to operate without any human involvement*. There'd be no-one to come along to AICD summits!

Now I'm not here to prophesy the extinction of the human director...

...but I do want you to take Vital and her progeny as a challenge.

We know that our respect for human directors has taken a battering.

We've seen examples of shocking misconduct in some of our biggest companies.

The humans at the top – the CEOs and directors – are copping the blame, and, often, with good reason.

At the same time, our respect for the capacity of AI systems has been greatly enhanced.

We've seen stunning demonstrations such as AI debaters – able to form and articulate a persuasive case based on their parsing of hundreds of thousands of articles.

We've seen AI lawyers – beating the humans at reviewing non-disclosure agreements and contracts for errors and vulnerabilities.

And we've seen AI stockbrokers – now ubiquitous on Wall Street.

They're good at *your* jobs, and they'll keep getting better.

And an army of AI director-bots, with all those capabilities, could be licensed to *millions* of companies... displacing several million directors... and be upgraded every night.

But those director-bots would still lack something vital – something *truly* vital – and that's what we call *artificial general intelligence*: the digital equivalent of the package deal of human abilities, human insights and human experiences.

The experts tell us that the world of artificial general intelligence is unlikely to be with us until 2050, perhaps longer.

Thus, shareholders, customers and governments who want that package deal will have to look to *you* for quite some time.

They will rely on the value that you, and only you, can bring, as a highly capable human being, to your role.

And they will look for boards that are structured to draw that general intelligence into a high-performing unit.

The challenge is to appoint highly-capable people who think first like good humanists, and second like good engineers.

And I'm just as invested in this challenge as you are.

I've been a board member on four public companies, one in the USA, all of them in biotech – yes, I know, playing in Vital's territory... and I have chaired a number of not-for profit organizations.

I've been a successful engineer, scientist, business founder and investor, a philanthropist and a university Chancellor.

And now, I am an advisor to government. I am currently leading the National Hydrogen Strategy development, I am the executive officer of the National Science and Technology Council, Deputy Chair of Innovation and Science Australia, a member of the Climate Change Authority and several other committees, and I have led numerous government reviews.

So, drawing on that experience, let me begin with the aspiration: my definition of the good director.

It goes without saying that you want someone who's competent, intelligent, and well-meaning.

But there are lots of competent, intelligent and well-meaning people – they're just not all cut out to be directors.

We choose directors, or we *should* choose directors, because they are special, not because they are ordinary.

Good directors are not just auditors – they are fired with a sense of the company's mission and trajectory.

Good directors have their own life experience – relevant and abundant experience.

Good directors are not just passive – they make it their mission to go beyond what they're told.

Good directors know they have no excuse to be ignorant – and that competent directors only fail to see problems if they fail to look.

On a well-functioning board, about half of the directors have executive experience in the same or a related field as the company's operations.

On a well-functioning board, a majority of the directors have heightened olfactory systems. That's the sense you need to smell a rat. The sense you need to smell the smoke.

Above all, collectively the directors have to be the custodians of the vision and the culture.

In every decision, they are constantly tending to the investment in the future.

That means they have to be capable of asking and answering the question that AI systems can't answer; the question so clearly articulated by Kenneth Hayne.

The question to be asked is, *should* we do this? not, *could* we do this?

How do you define the "should"? I have my own often-repeated mantra that gives me simple guidance, and that is: the two reasons to be in business are fun and profit.

And it applies to all organisations, not only for-profit businesses.

The word "fun" can stand in for "collegiality", "fame", "excitement" or "fulfilling your duty".

The word "profit" obviously stands for "monetary returns", but it could also stand for "societal and environmental impact".

Very importantly, the "and" is non-negotiable – fun AND profit, not fun OR profit.

Without fun, employees are not motivated to drive profit.

Without profit, you really can't have fun.

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In that context, there's a particularly important role for the Chair.

The Chair should be a mentor, a sounding board, a guide for the CEO.

The separation of roles is clear.

Management runs the company.

The CEO and senior management live and breathe strategy and budget. Thus, it's management's job to develop the draft strategy and the draft budget for consideration by the board.

It's the board's job to constructively challenge management's assumptions and directions.

It's the Chair's job to respect the voice of every director and get to a decision without bulldozing through the debate.

Earlier on I mentioned the importance of thinking like an engineer.

If an engineer compromises in the design of a bridge, tragedy ensues.

If an engineer seeks perfection in the design of a bridge, it will be too expensive to build.

Instead, engineers know that their job is the art of optimisation. A good engineer optimises the design to satisfy multiple parameters.

A good Chair should do the same.

Optimisation is making the best or most effective use of a situation or resource.

So much better than *compromise*, which is the settlement of differences by mutual concessions.

So much better than the *pursuit of perfection,* which is arguably doing nothing, nobly, in pursuit of your ideals.

At a higher level, in a nutshell, the role of directors is *governance* and *guidance*.

There I've used another all-important 'and'.

If you just focus on governance, you're an auditor.

If you just focus on guidance, you're a life coach.

If you achieve both, you're a future-proof director. AI, eat your heart out.

That sort of leadership can occasionally emerge by luck – but in the best organisations, it emerges by design.

So, let's set out some of the design parameters I've learned from experience.

At this point I note that my most salient experience comes from being Chancellor for eight years at Monash University, a well managed and successful entity as large and complex as many of our major public companies.

First design parameter, culture cannot be a passive thing. You have to act it, you have to talk it, and you have to teach it.

Safety is a good analogy. Consider Rio Tinto. Like other mining companies, Rio Tinto has been constantly improving its safety practices. The number of injuries of any type has been steadily falling for decades, and dropped again in the decade to 2017 by another two thirds.

Mining companies didn't achieve exemplary safety records by luck or by resolving to have fewer accidents. They didn't get there simply by installing safer machinery.

Their achievement was possible because they changed human behaviour to focus on safety all the time.

This goes beyond the workplace. Rio Tinto, along with other mining companies, asks employees to report accidents that happen at home as well as at work. Not to be included in the corporate KPIs, but to raise awareness of the importance of safety in all aspects of employees' lives.

Here are four practices of organisations that make an active commitment to safety.

1) They teach safety procedures to new employees
2) They reinforce safety practices to existing employees
3) They make sure employees are not penalised, directly or indirectly, for following safety procedures as their priority
4) They avoid any incentives that would inadvertently lead to risky behaviours.

To actively commit to integrity, just take those four practices and simply replace the word 'safety' with the word 'integrity'. These, then, are the practices to which exemplary organisations constantly commit:

1) They teach *integrity* procedures to new employees
2) They reinforce *integrity* practices to existing employees
3) They make sure employees are not penalised, directly or indirectly, for following *integrity* procedures as their priority
4) They avoid any incentives that would inadvertently lead to *dishonest* behaviours.

That is, it takes much more than an occasional declaration of good intentions to achieve an exemplary safety or integrity record. Good boards ensure that the commitment is disseminated by management throughout the organisation.

My second design parameter for effective boards is that transparency and trust are critically important.

Board members have to be confident to put issues on the table.

My one bruising experience was many years ago, trying to help management implement a significant redundancy package.

I was Chancellor of the University Council, meaning that I was Chair of the Board.

Unlike most companies, we had elected staff on the board. That is, we had some board members who were elected to represent particular constituencies, with potentially conflicted interests.

The conflict arises because it is not humanly possible for a representative board member to leave their staff constituency behind at the boardroom door.

As a result, we found it extremely difficult to discuss the redundancies at the regular board meeting. It was terribly awkward and not consistent with good governance.

In response to that difficult period and some other uncomfortable interactions on Council, I felt that we needed to *anticipate* these conflicts rather than *react* to them.

After seeking advice, I learned that a powerful way to maximise trust and transparency is to capture the expectations for confidentiality, courtesy and other board behaviour in a written 'charter', adopted and owned by the board. A charter is not a legal document. Instead, it is an informal, plain English playbook.

The charter captures the key board practices and expected behaviours without having to go back to layers and layers of company constitutions, corporate law, ASIC regulations and ASX requirements.

Not only does the charter avoid cross references and footnotes, it's actually written by the Chair and directors, without input from corporate lawyers.

It's owned by the people who pledge to adhere to it.

And a suggestion recently put to me is that another good way to build consistency of purpose is to include the Board's Purpose and Values statement at the start of every Board pack.

Third design parameter for effective boards – pay attention to the skills matrix.

Board positions should never be offered as a retirement option for friends, or a reward for loyalty.

Instead, every new appointment should meet the skill needs of the Board. These needs should be specified in a skills matrix incorporated into the terms of reference of the Membership Committee.

The skills matrix itself should be reviewed as the organisation pivots or evolves.

It sounds so obvious, but when I led the review of the National Electricity Market in 2017, I was shocked to find that the board of the Australian Energy Market Operator, the company that actually runs the physical electricity system, one of the biggest and most complex electrical machines in the world, included only one technically trained person.

I had expected at least a third of the board members to have power systems expertise in a company with such a technology oriented and critically important role. Needless to say, in our formal review, one of our fifty recommendations was to remedy this problem. I am pleased that the electricity market operator today has a better Board skills mix and is functioning much more effectively.

Fourth design parameter – work within the bandwidth of humans.

Your bandwidth.

Being a Chair takes a lot of time – it would stretch human bandwidth to breaking point for a person to be Chair of more than two public companies.

Being a director takes a lot of time – it would stretch human bandwidth to breaking point for a person to be a director of more than three or four public companies.

And all of that human bandwidth is precious. So, one of the roles of the Chair is to ensure that the directors are not snowed with documents.

A good way to do that is to break the board papers into two packs – essential documents and background documents. Every director should read every word of the essential documents pack but should only need to refer to the background documents if there is a specific question.

A particular irritant for me is blow-by-blow committee minutes. They take too long to read and the key issues are buried in the details.

One of my Monash University Council Members recommended that instead of presenting detailed transactional minutes to the full Council, the Committee Chair should provide a *narrative* report, containing insights into what was discussed, and advice to the Council. The details should be provided separately in the background papers.

This worked a charm and I have ever since required this for all board committees.

There is a trend now towards digital distribution of board papers. Digitally distributed papers save trees but they do not reduce the demand on the precious human bandwidth of board members.

Saving trees and reducing the physical weight in the briefcase are important, so going electronic is a good thing.

Unless! Unless shifting to electronic papers is seen as making it easier to include hundreds of unnecessary pages. The Chair must remain vigilant and avoid the temptation to provide more than is necessary, just because it is easy to do so.

There will be times when management will want to bring forward a special initiative – such as starting up a new product line or a major joint venture – a special initiative that's obviously going to eat up bandwidth.

In my Monash University days, for example, one such project was building the case for starting a new overseas campus.

A special project you might face in your company today could be how to capture the transformative opportunities made possible by artificial intelligence and machine learning throughout your organisation, so that the next Vital 2.0 equivalent might be a tool that improves your organisation's agility and competitiveness.

When these major projects arise, it can be helpful to appoint a *task-and-finish* committee consisting of just two or three board members. This

special committee can meet as often as necessary, so the planning can progress, the board remains informed, and other business can proceed.

When the project is completed, the special committee automatically terminates.

If you get it right... you'll shrink the meeting packs, heighten the focus, and boost the attendance.

For example, when I started as Chancellor at Monash University, we had 21 Council members, hundreds of pages per meeting, six two-hour meetings per year, plus an annual two-day offsite strategic planning conference.

But is it reasonable to only think strategically once per year?

Eventually we decreased to 15 Council members, split the papers into two packs, increased the number of meetings to eight per year and increased their duration to three hours.

All of a sudden there was sufficient time in every meeting to think strategically and we found that the two-day offsite strategic planning conference was no longer required.

My final design parameter – don't be afraid to actually *talk* to people.

Board members should have access to senior executives, to occasionally hear straight from the horse's mouth. Of course, board members should never issue instructions to executives or even hint at doing so, but there is something powerful that is learned by speaking to the troops.

With the blessing of successive Vice Chancellors – the CEOs – at Monash University, once a year as Chancellor I did a tour of all the faculties and had a fireside chat with each of the deans. It gave me an expanded perspective that I shared with the Vice-Chancellor and deepened my understanding of the challenges and opportunities for the University.

So where does this bring us? My conclusion is that the sort of director you want to be, is not the sort of director Vital and her AI progeny are going to displace.

Remember, robots don't have noses.

Robots can't have fun – or understand what motivates others.

And above all, robots can't tell humans what they ought to do.

That's on *you* – the human director.

So go forth and be vital – truly vital – and the future is yours.

THANK YOU