KPMG

Australia-Israel Chamber of Commerce

The IoT and AgTech Summit 2016

October 2016

kpmg.com.au

The growing need for food is playing out against a background of limited access to arable land, the unpredictable impacts of climate change and the environmental consequences of more intensive farming practices, as well as consumer pressure to reduce and recycle wastage throughout the supply chain. The whole world is looking to technology for a solution. Australia's agriculture industry stands at a crossroads.

For some years in Australia, smart agriculture has been helping farmers and growers to improve productivity and reduce waste. But we are rapidly moving into a world where digital agriculture will be defined by the Internet of Things (IoT). Soon, intelligence will be embedded into the design and operation of every machine and device, connecting real time farming processes with data drawn from sources as diverse as weather stations and consumers. This could enable the farmer to make more informed decisions – but, more likely, the farm will make decisions of its own.

On 7 September, 2016, the Australia-Israel Chamber of Commerce (AICC) and KPMG Australia co-hosted the inaugural IoT and AgTech Summit to discuss the opportunities and challenges associated with IoT-led innovation. Experts from the public and private sector, the agriculture industry and research institutions tackled the pressing issues around collaboration, connectivity, finance and governance that will shape our future food supply and the potential to accelerate the AgTech export market for Australia.

All photos of robotics featured in this report are provided courtesy of University of Sydney, Australian Centre for Field Robotics.

Why AgTech?

KPMG AgTech leader and head of markets Ben van Delden said that the question for Australian agribusinesses, and for governments that depend on this industry to feed people and generate over $43 billion of export earnings, is: Do we want to be builders, buyers or bystanders in the AgTech market?

AgTech – digital technologies that provide the agricultural industry with the tools, data and knowledge to make better on-farm decisions and improve productivity and sustainability – presents an exciting opportunity, in both how it could transform agriculture and the type of jobs associated with it, as well as what it can offer in its own right as an export industry.

According to van Delden, Australia needs to act quickly or risk being left behind by the rapid pace of technology advancement occurring in other countries such as the UK, Israel, USA and Canada.

"While the Australian agriculture industry has been innovative in the past, it has inherently been a latent adopter, as most digital technology is imported," he said. "What we need is a major mindset shift to align our focus and commercialise our research capability in yield optimising technology and accelerate take up on farms."

Closer to home, New Zealand has made a concerted effort to engage the agri-ecosystem through a combination of practical Government programs, quality research and investors; which has accelerated AgTech activity. The USA continues to dominate the global AgTech market through its established investor/startup community, network connectivity, significant investment in research and development and active government subsidies.

Israel is another global leader in agricultural development, spurred by the necessity to innovate in order to survive. Israel is achieving record levels of productivity across many crops, thanks to its strong technology sector and the situational context of having to produce sustainable food supply chains in a desert-like environment.

Canada is setting the sights of its strong investor community on AgTech off the back of the government's recently released Innovation Agenda. AgTech investment funds are backing the development of AgTech solutions in foreign markets to bring early adoption opportunities to Canadian food producers.

Australia, with its proud history as an agricultural nation, as well as its many strengths in research, active industry engagement, and the Government's recent National Innovation and Science Agenda, is poised to reap the benefits of AgTech.

"We need to incubate a concerted Australian AgTech focus now to achieve the National Farmers' Federation's goal to almost double the value of agriculture to a $100 billion industry by 2030," van Delden said.

"By focusing on AgTech we would attract more technology startups to develop solutions to improve agricultural yields and new export markets for Australia, contributing billions to the economy and attracting foreign capital. The global market for agricultural technology is projected to be US$189 billion between 2013 and 2022.

"AgTech will create new jobs and could also contribute significantly to reducing Australia's 4 million tonne/$8 billion to $10 billion food wastage problem, and lower the environmental impact by reducing the amount of applied chemicals and fuels used in production.

"The time is now to make the most of the opportunities and to do this we need to move from critically reviewing the challenges to charting the course we want for the future. We must mobilise Australia's AgTech ecosystem to secure our share of the hottest emerging market in agriculture."

Visit the KPMG website to watch our video on 'The state of AgTech'.

Read *Powering Growth: Realising the potential of AgTech for Australia,* a new report co-authored by KPMG, commissioned by StartupAUS and supported by the Commonwealth Bank and the Queensland Government. This report provides the most up-to-date snapshot of Australia's AgTech including an overview of government, research and investment activities plus case studies of AgTech startups. The report also critically reviews the challenges, and makes a series of recommendations on how to take advantage of key opportunities that AgTech provides for Australia.

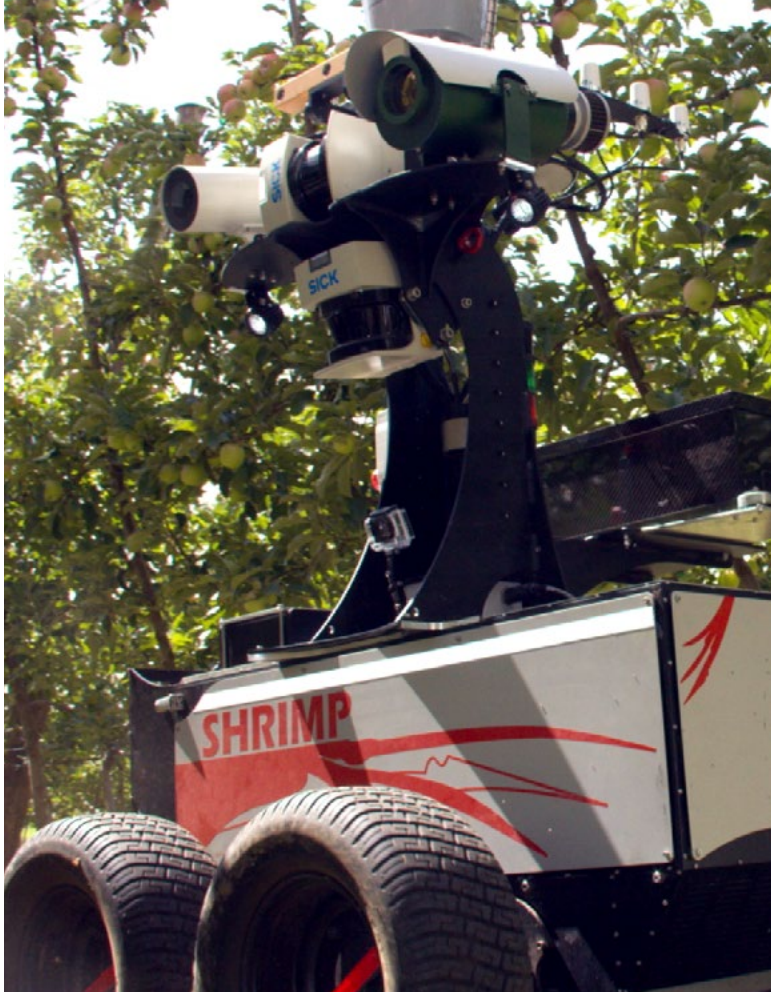
Closing the yield gap

Donna Forlin is on a mission to help feed the world without wrecking the planet. As leader of the IoT Solutions team at The Yield, an agricultural technology start-up, she identifies growers' business problems then looks for sustainable technology solutions to improve their yield.

The company's first application is helping oyster farmers to avoid unnecessary closures.

Oysters can accumulate contaminants from runoff when it rains heavily. This renders them unsafe to eat so they can't be harvested until the water is clean again – and, meanwhile, the farmer is losing between $20,000 and $100,000 a day. But Forlin's analysis found that about 30 percent of closures were unnecessary because the information available to the food regulators was often inaccurate or irrelevant.

"Our application measures in-estuary salinity, water temperature and water depth at 10-minute intervals," Forlin said. "That means both the farmers and the regulators have up-to-date and accurate information on which to base their decisions."



New generation automation

Over 130 years Bosch has been growing into one of the most dominant appliance manufacturers in the world. Then, 5 years ago, its leaders recognised the disruptive potential of the internet and decided that Bosch should become a disruptor itself, as an IoT company.

"We have been a 'things' player in agriculture for some time but we only started to see it as a strategic sector about 12 months ago," said Gavin Smith, chief executive officer of Robert Bosch Australia and a director of The Yield. "We have just sold our first machines into avocado and mango packing sheds that use a vision system to rotate and inspect the fruit. They then place it in supermarket display packaging with the most attractive side uppermost."

Most farmers would welcome the news that they can replace some of their backpacker labour with automated machinery. However, some are concerned that automation will eventually erode their own livelihood.

"I don't think that is an issue," said Dr Asher Bender, Research Associate at the Australian Centre for Field Robotics, University of Sydney. "Our aim is not to replace jobs but to help farmers to be more productive."

Another concern, that cost will create a nation of tech haves and have nots, is likely to be mitigated by a shift to a pay-for-use approach to farm equipment. And while robotics devices can be expensive, some innovators are already focusing on low-cost alternatives.

"A German company has developed an application which allows you to send a photograph of your crop to a server which checks it against a horticultural database to identify any sign of disease, and if necessary, recommend the appropriate response," Bender said. "This has lowered the barrier to agricultural advice to the cost of a smart phone and internet connection."

Learning from a mature market

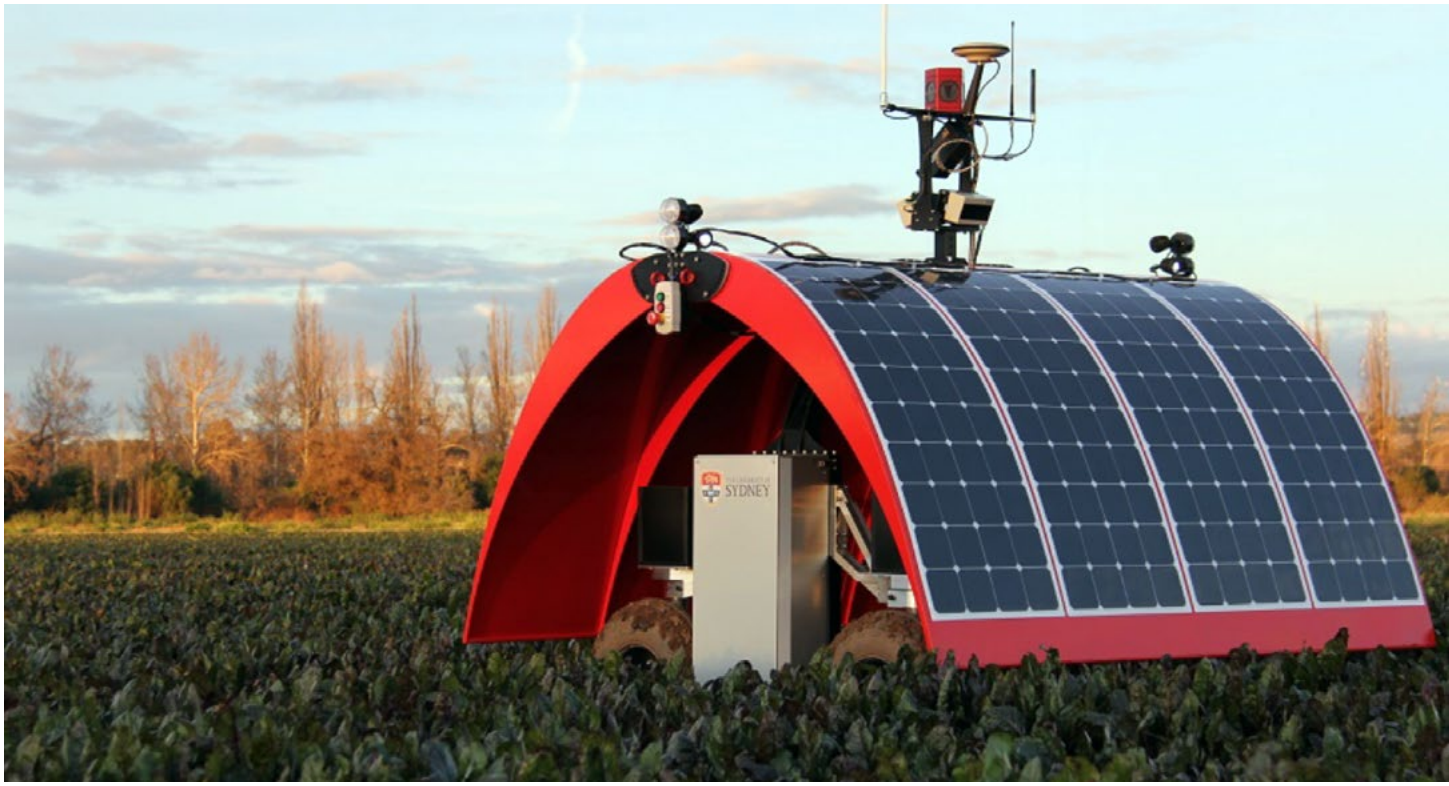
In his pioneering work in the FinTech sector, Mike Briers AO founded a number of companies and contributed to the global success of the Securities Industry Research Centre of Asia-Pacific (SIRCA). He turned his attention to agriculture, co-founding The Yield and leading the FoodAgility.com consortium. He was ideally placed to help agriculture learn from the financial markets, a wholly mature digital sector. His first question was, what would algorithmic trading look like for food and agriculture?

"One lesson I learned in the financial markets is that it's easy to forget the heavy lifting that has to be done – the analytics on the data itself – before you can have a machine trade on it," Briers said.

"If you have an algorithm deployed into a system that's making real-time decisions on a millisecond basis, the underlying system has to be trustworthy."

The same thinking can be applied to the farm.

"We're moving from a system which helps farmers decide whether to treat for downy mildew to one which automatically turns on the spray. As the computer effectively takes over that decision the dependability of the underlying system becomes critical," Briers said.



Solving problems on a global scale

Dr Tristan Armstrong's role is to bring about innovative partnerships to help solve some of the world's big, intractable problems. As Agriculture Sector Specialist at the Department of Foreign Affairs and Trade (DFAT) he helped to design and implement Australia's $300 million agriculture-focused international aid program.

"Most of the 800 million people in the world who are hungry are farmers or rural dwellers," Armstrong said. "Two-thirds of the poorest are in our region. An investment in agriculture is up to four times more effective at lifting people out of poverty than investment in any other sector.

"People say, and rightly so, that Australian farmers need more investment in productivity and innovation but we also need to invest in those that will become the markets for our farmers in the future."

Visit the KPMG website to watch our video on 'Closing the yield gap'.

Open innovation in agriculture

Collaboration and sharing are at the heart of open innovation – collaboration in developing ideas and sharing knowledge, intellectual property and data to achieve better outcomes. Open innovation brings together businesses of all sizes, governments, universities, local and global talent and sources of capital.

"No one company or individual can possibly be the source of all innovation in any industry or sector," said James Mabbott, Partner, KPMG Innovate.

Mark Blum, General Manager of Cisco's two Australian innovations centres, agreed that collaboration is critical.

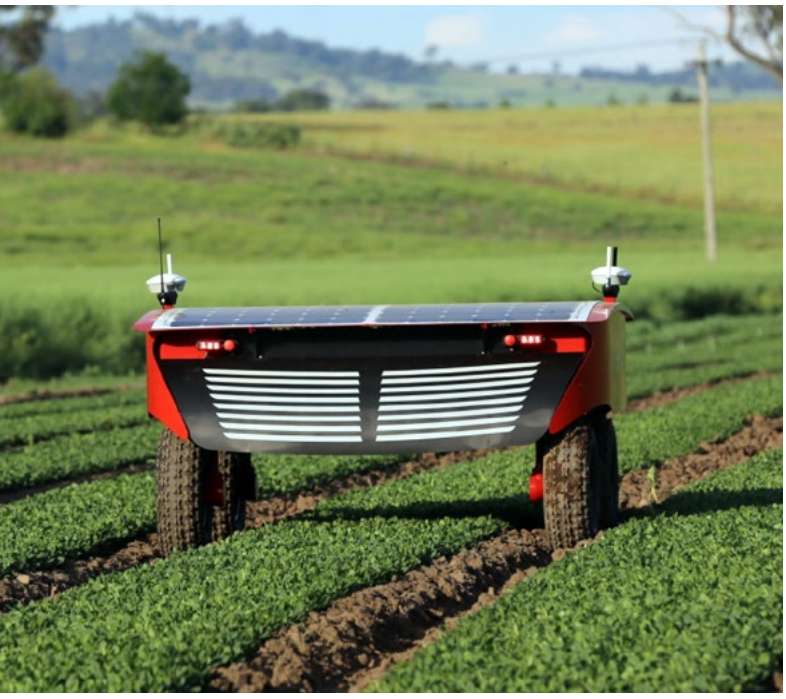
"Technologists don't necessarily understand the nature of the problem," Blum said. "When our centre in Sydney opens next month we'll be focusing on agriculture because we see that as an area where Australia has a real competitive advantage. But we don't pretend to be experts, so we're partnering with people such as the University of New South Wales, CSIRO's Data61, the NSW Farmers Association and the NSW Department of Primary Industries."

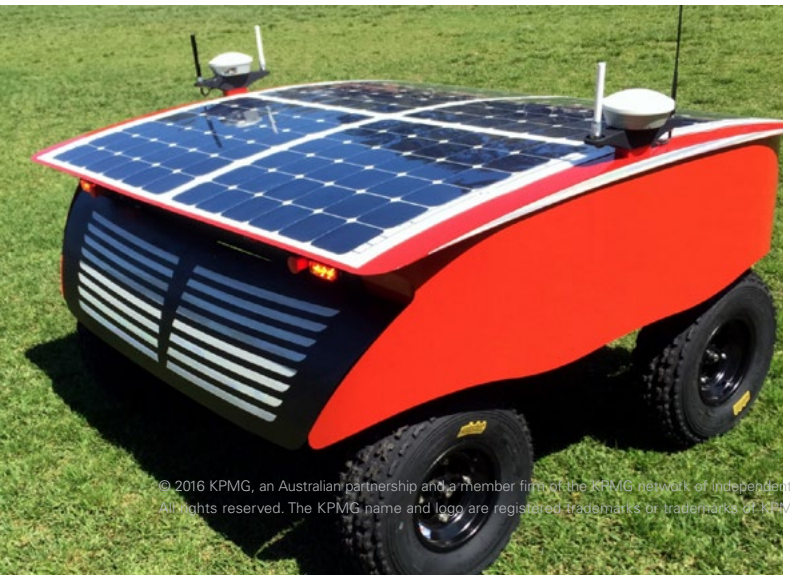
He believes that an established pathway to commercialisation will also make Cisco attractive to innovators.

"We only bring in projects that we believe can move from rapid prototype to a real product and then put on a price book," Blum said. "Cisco is a strong sales and marketing organisation and we have the potential for distribution across 160 countries."

The projects will all be developed on an open platform.

"Innovation is like a parachute," Blum said. "It's a hell of a lot more effective when it's open."





A strategy for the future

Meat and Livestock Australia (MLA) is very deliberately designing the future around emerging technology.

"We have just appointed Hamish Gow, Professor of Agribusiness at Massey University, to help us with this," said Dr Christine Pitt, General Manager of MLA's subsidiary Donor Company. "He has a very strong history of identifying what producers need."

In the IoT space, a new I+E platform – Innovation plus Entrepreneurship – has been designed to attract AgTech, food technology and, more broadly, food innovation solution providers from around the world.

"We want to fast-track big ideas in this space, including innovation in investment models," Pitt said.

The MLA's design-led innovation approach was inspired by the IDEO precept that any solution must meet three basic criteria – desirability, viability, and feasibility.

"Desirability is what the end user wants," Pitt said. "AgTech must always solve an end-user problem."

They have also set themselves an audacious goal.

"By 2025 we want our industry to lead the world in digital solutions across the whole value chain," Pitt said.

Visit the KPMG website to watch our video on 'Open innovation in agriculture'.

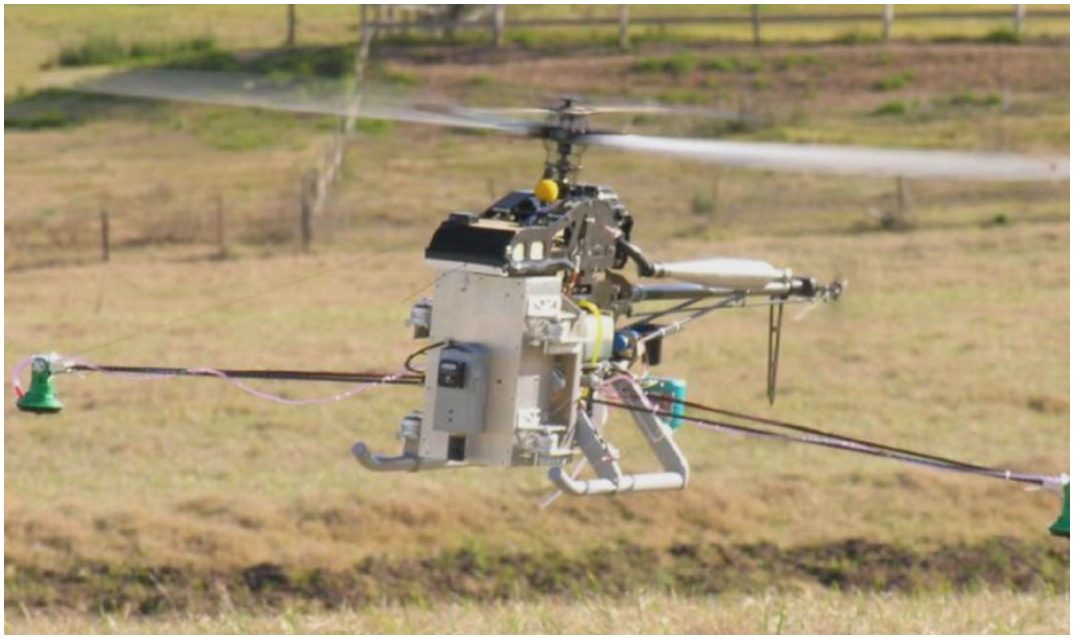
The right to use data

As part of its research into the strategic issues facing Australian agriculture, The Australian Farm Institute is considering the usage rights of data.

"We talk about usage rights rather than ownership because ownership is a nonsensical concept for something that's instantly replicable and transmissible anywhere in the world for zero cost," said Executive Director Mick Keogh. "Usage rights are important because farmers need the comfort of knowing they aren't locked into a technology or product system – a particular tractor manufacturer, for example – simply because they have progressively built up a lot of digital information in that system."

Clarification of usage rights is also fundamental to gaining open access to data and the integration of public and private data.

"The U.S. Department of Agriculture has moved to an open access data protocol where all trial results and associated statistics are available to anyone who can make use of them," Keogh said. "In Australia, public sector organisations such as the CSIRO and universities hold a great deal of data collected from many years of research and development. Whether that can be made more accessible is an interesting question."



Challenging the culture

As Global Agribusiness Leader, KPMG, Ian Proudfoot has first-hand experience of innovation around the world. He believes that, in Australia, limited connectivity is getting in the way.

"Our farmers need to be connected so that they can better manage what they put on their farm and what comes off the farm," Proudfoot said. "They need to be connected to their customers and, more importantly, connected as communities. It's a big problem that needs smart thinking from public private partnerships – thinking about how we can leverage existing infrastructure to reduce cost, at the same time as recognising that the environmental, economic and social benefits from connecting people are so significant that we can't afford not to do so."

However, he has found that the biggest block to innovation is often culture.

"That's culture in the boardroom, at farm level and in the resistance of people in an industry that is more comfortable with incremental innovation than dramatic change."

Today's organisations need a culture that supports innovation and their role in the value chain. And poor culture is often the consequence of poor governance.

"Good governance puts the wind under the wings of the leaders of an organisation and inspires them to change," Proudfoot said.

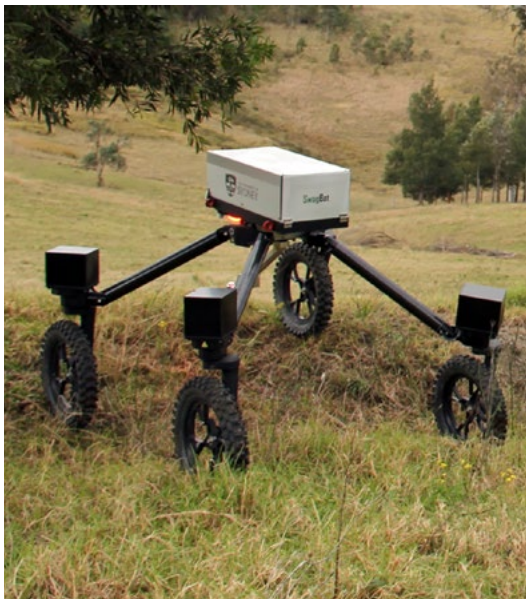
Governance in the disruptive world of agriculture

A board governing by the traditional rules will destroy value for investors. A government that continues to govern in the traditional way will destroy the economy. These may seem provocative statements – but Jonathon Gregory, Executive Director Business Operation, NSW Department of Primary Industries, believes that digital disruption really is that significant.

"Every day we're seeing value being destroyed, particularly across the agricultural sector, where boards are ticking the boxes, lodging their reports, doing the right things but failing to grasp the market they're in," he continued. "Today's boards must be able to think, act and manage digitally. Whether or not you have the information yourself, someone else is calculating what your business is worth, how it should operate and whether you are delivering a good outcome for your stakeholders – and you need to integrate that reality into your decision-making. This is not about augmented reality, artificial intelligence or the IoT, but augmented judgement."

Stuart Black AM has boardroom experience at both ends of the corporate spectrum. He is chairman of the Audit and Risk Management Committee of the Australian Agriculture Company (AACo), the oldest operating company listed on the Australian Stock Exchange. He is also a director of TPI Enterprises, a young and relatively small company that supplies poppies to the pharmaceutical industry.

"A large, well-established company has more resources but it can also be held back by history and legacies," Black said. "Smaller companies don't have the resources but they do have a desperation to succeed."



Is there a business case for investment in AgTech?

By world standards Australia is a tiny production platform. We have about 130,000 farm businesses and 90 percent or more of the production comes from small farms. Only about 6,000 could be described as large, and perhaps a handful that are properly and professionally run with staff and capital assets. But there are good reasons for investing in digital innovation for Australia's agriculture.

"Australia is a fabulous demonstration platform," said David Eyre, General Manager, Research and Innovation, at NSW Farmers. "We've got every single problem you can possibly imagine so, if you crack it here, you can crack it anywhere. Algorithms developed here are highly valuable around the world."

But, for the individual farmers, the biggest question must be: What's in it for me?

"A lot of money has been spent on technology that is sitting in the shed," Eyre said. "In general, agricultural technology has not been developed with clear use cases that have direct commercial value for the farmer. Applications can do one thing extremely well without adding much value to the whole farming operation."

However, digital disruption could make it possible for smaller businesses to capture value further up the value chain.

"At the moment people are making money by buying stuff as cheaply as possible from farmers and either trading it with a margin or adding value to it in some way," said Eyre. "There are too many people clipping the ticket between the farmer and the customer. And this is a threat to what is possibly our best marketing angle – farmers who care about what they produce and offer a boutique premium product rather than churning out a commodity."

Developing a digital strategy

"The first thing I ask my clients is whether the board has articulated what a digital strategy actually means," said Kate Shaw who, as Director, Governance and Risk Consulting at KPMG, helps boards of companies of all sizes to develop a digital strategy that is fit for purpose. "Are you talking about the way your people work, the way you share information or the way you do what you do, whether that's manufacturing or providing a service?"

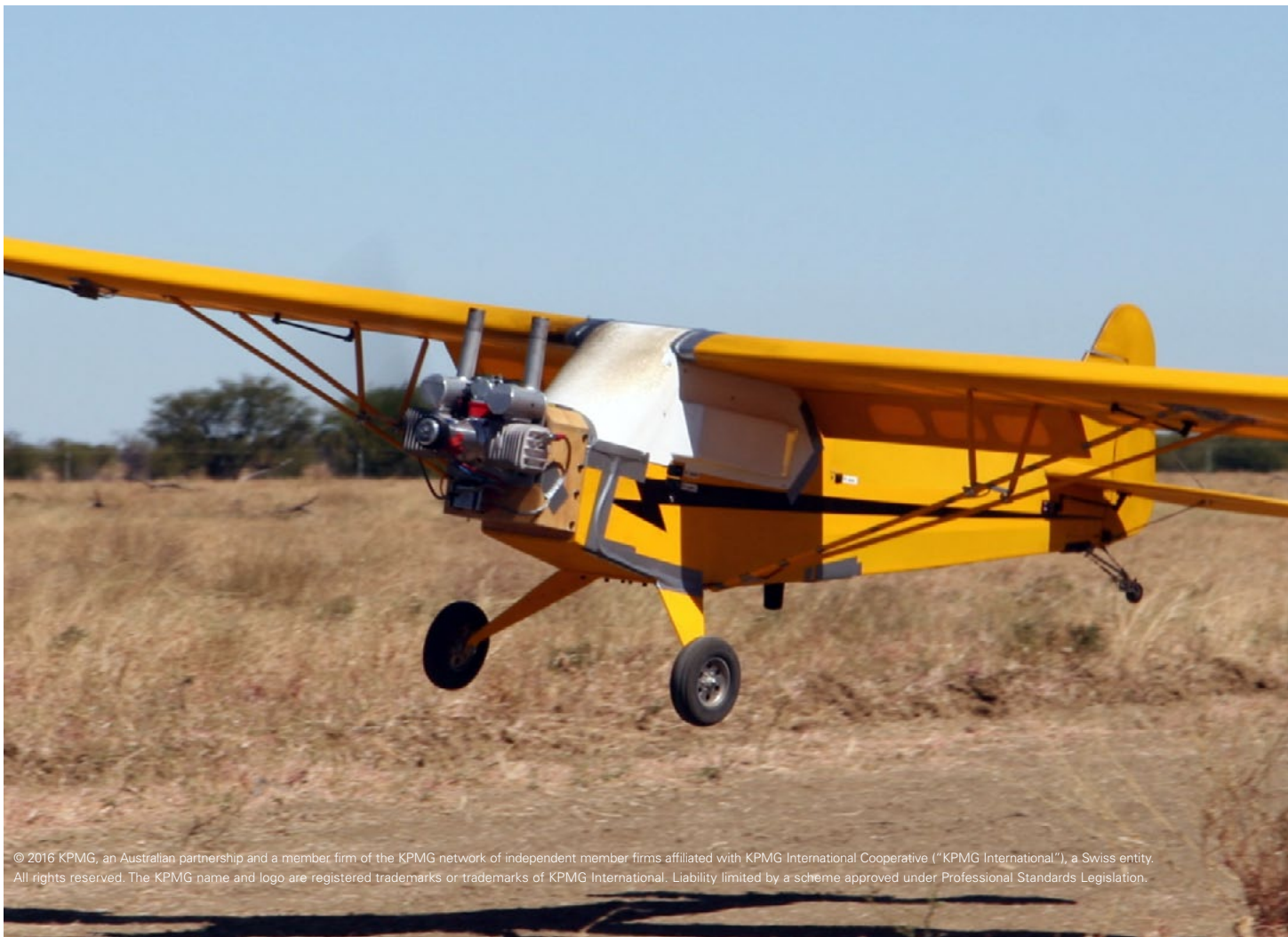
The board must be sure that the digital strategy is aligned with the broader, corporate strategy. For example, a low cost provider might decide that digital is not for them when it could be the key to a competitive advantage. The board should function as a seat belt rather than a brake, giving management the confidence to take measured risks. And, in today's fast-moving environment, directors should be quick to seek advice.

"Most importantly, the board should be prepared to ask challenging questions," Shaw said. "It's very easy to fall into 'group think' – to agree because everyone else is nodding. But, in the digital arena, you're dealing with new material all the time and no-one knows all the answers. It's vital that the directors apply critical thinking."

Some experts believe that at least one director should have specific digital expertise but, when technology is changing so rapidly, it could be dangerous to rely on one person's opinion.

"I believe that the board needs people who understand the principles," Black said. "You also need people who are very open to innovation, prepared to take controlled risks and are capable of driving a culture of learning through every level of the organisation."

Visit the KPMG website to watch our video on 'Governance in the distributive world of agriculture'.



Presenters and panel speakers

Ben van Delden
Partner
Head of AgTech
KPMG

Dr Asher Bender
Research Associate Australian
Centre for Field Robotics
University of Sydney

Donna Forlin
IoT Solutions Lead
The Yield

Dr Tristan Armstrong
Agriculture Sector Specialist
Department of Foreign Affairs
and Trade

Mark Blum
General Manager
Cisco IoE Innovation Centres
Australia

Jonathon Gregory
Executive Director
Department of Primary Industries

David Eyre
General Manager
Research & Innovation
NSW Farmers

Ian Proudfoot
Global Agribusiness Leader
KPMG

Dr Mike Briers AO
Chief Executive Officer
Food Agility

Gavin Smith
President and Chairman
Robert Bosch
Australia

Dr Christine Pitt
CEO, Meat & Livestock Australia
Donor Company

Mick Keogh OAM
Executive Director
Australian Farm Institute

Stuart Black
Chairman
Audit and Risk Management
Committee
AACo

Katherine Shaw
Director
Governance & Risk Consulting
KPMG

Contact us

Ben van Delden
Head of Markets and AgTech Sector Leader
+61 3 9288 5894
bvandelden@kpmg.com.au

Trent Duvall
National Sector Leader, Consumer Markets
+61 2 9335 8871
tduvall@kpmg.com.au

Paul McDonald
National Sector Leader, Agribusiness
+61 3 9288 5795
pjmcdonald@kpmg.com.au

Piers Hogarth-Scott
National IoT Leader
+61 2 9346 5551
piershs@kpmg.com.au

James Mabbott
Head of KPMG Innovate
+61 2 9335 8527
jmabbott@kpmg.com.au

kpmg.com.au

October 2016. VICN14728LOB