

Digital (IoT) agriculture in Victoria

A transformational change opportunity

Craig Hough
Policy Manager
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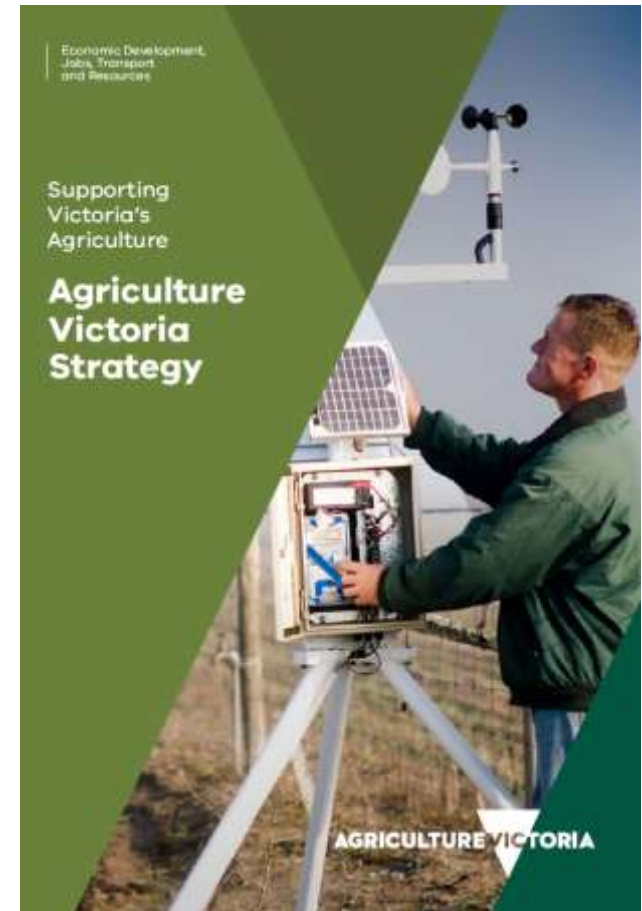


Agriculture Victoria – strategy & budget

(\$ million)

	2016-17 budget	2016-17 revised	2017-18 budget	Variation ^(e) %
More productive, competitive, sustainable and jobs-rich food, fibre and resources industries				
Agriculture ^(b)	351.9	433.1	401.3	14.0
Resources ^(c)	106.3	56.4	126.5	19.0
Sustainably Manage Fish, Game and Forest Resources	87.7	87.5	89.9	2.5
Increase the economic, social and cultural value of tourism, major events and creative industries				
Creative Industries Access, Development and Innovation	78.3	78.9	75.1	(4.1)
Creative Industries Portfolio Agencies ^(d)	328.8	365.5	365.8	11.2
Cultural Infrastructure and Facilities	102.5	104.6	102.5	..
Tourism, Major Events and International Education ^(e)	109.0	204.3	142.9	31.1
Grow Victoria's economy and Victorian jobs by working with the private and public sectors to foster investment, trade and innovation				
Industrial Relations ^(f)	5.4	6.7	4.8	(12.0)
Industry and Enterprise Innovation ^(g)	153.0	141.6	217.0	41.8
Jobs and Investment ^(h)	205.5	214.4	222.7	8.4
Major Projects ⁽ⁱ⁾	19.5	20.7	8.6	(56.0)
Regional Development ^(j)	180.3	189.9	230.7	28.0
Trade ^(k)	21.8	21.8	26.6	21.9
More productive and liveable places, towns and cities through integrated and user-focused transport services and better infrastructure				
Bus Services	1 119.3	1 119.0	1 169.2	4.5
Integrated transport	65.5	68.9	64.4	(1.7)
Port and Freight Network Access ^(l)	116.6	114.9	104.0	(10.8)
Road Asset Management ^(m)	440.3	460.5	604.3	37.3
Road Operations and Network Improvements ⁽ⁿ⁾	982.9	1 023.6	1 037.6	5.6
Taxi and Hire Vehicle Services ^(o)	89.2	321.7	269.4	202.0
Train Services ^(p)	2 952.6	3 028.3	3 143.9	6.5
Tram Services ^(q)	652.2	664.9	685.9	5.2
Transport Safety, Security and Emergency Management	354.1	331.3	363.9	2.8
Total	8 522.7	9 058.5	9 457.0	11.0

Source: Department of Economic Development, Jobs, Transport and Resources



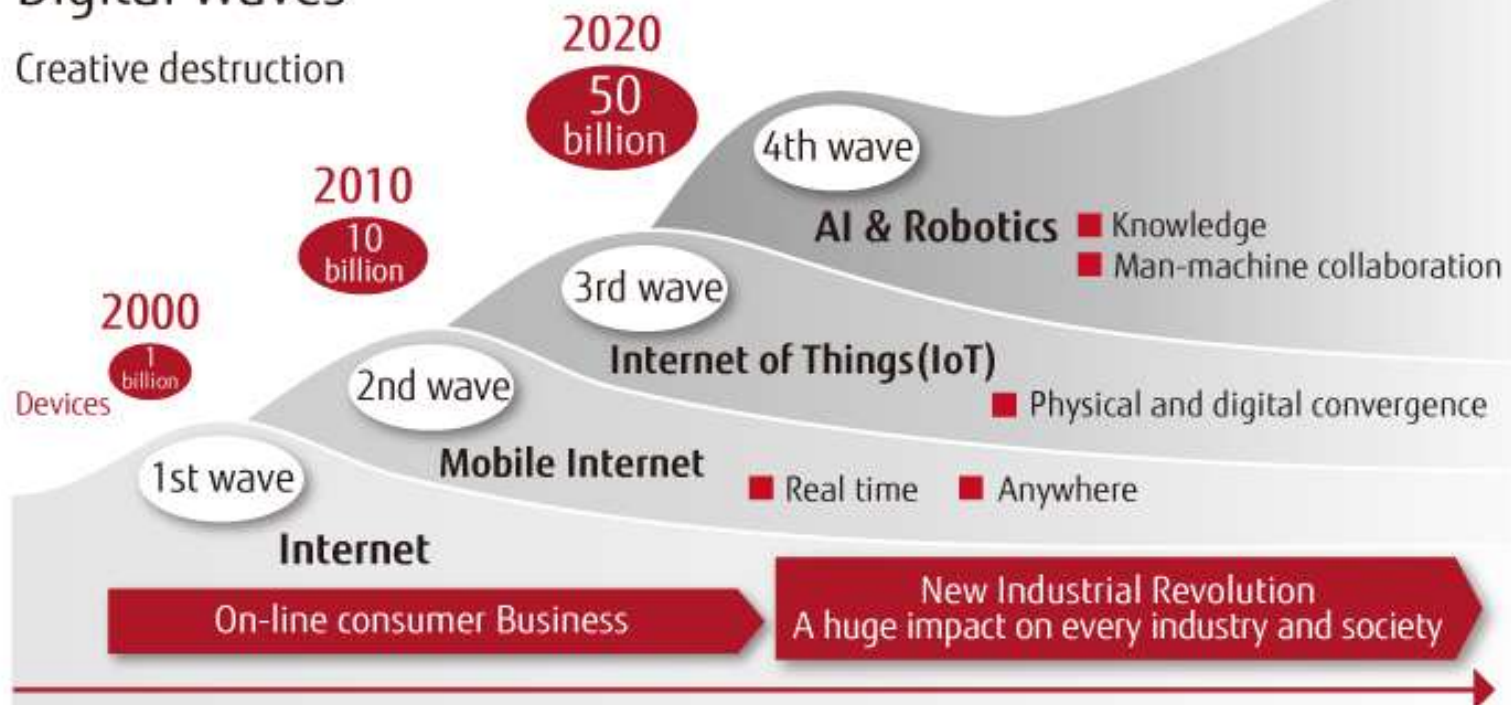
Agriculture Victoria - sites and staff



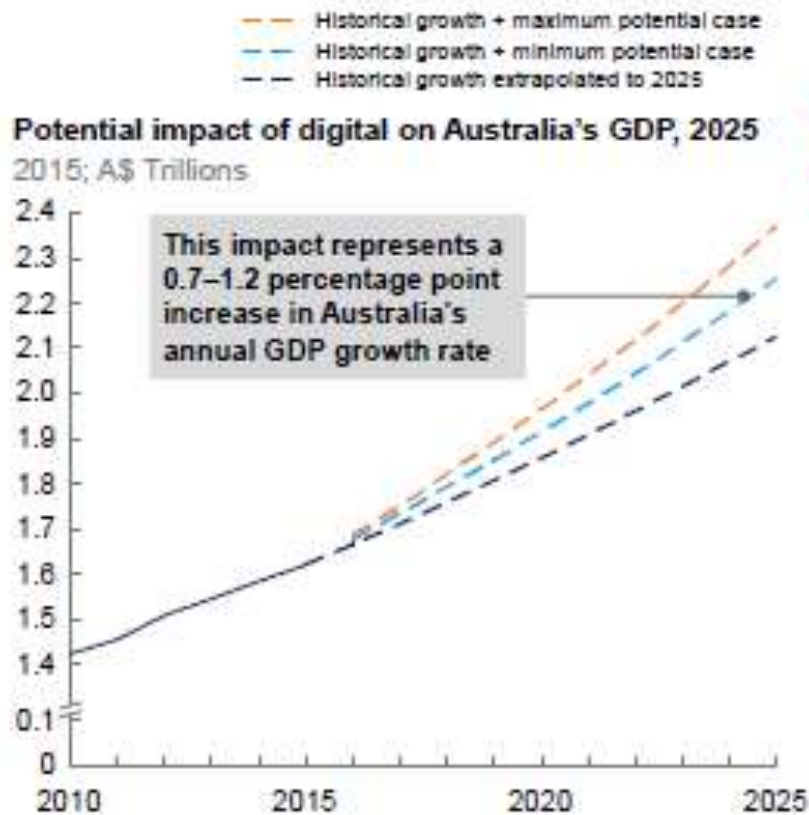
The digital revolution

Digital Waves

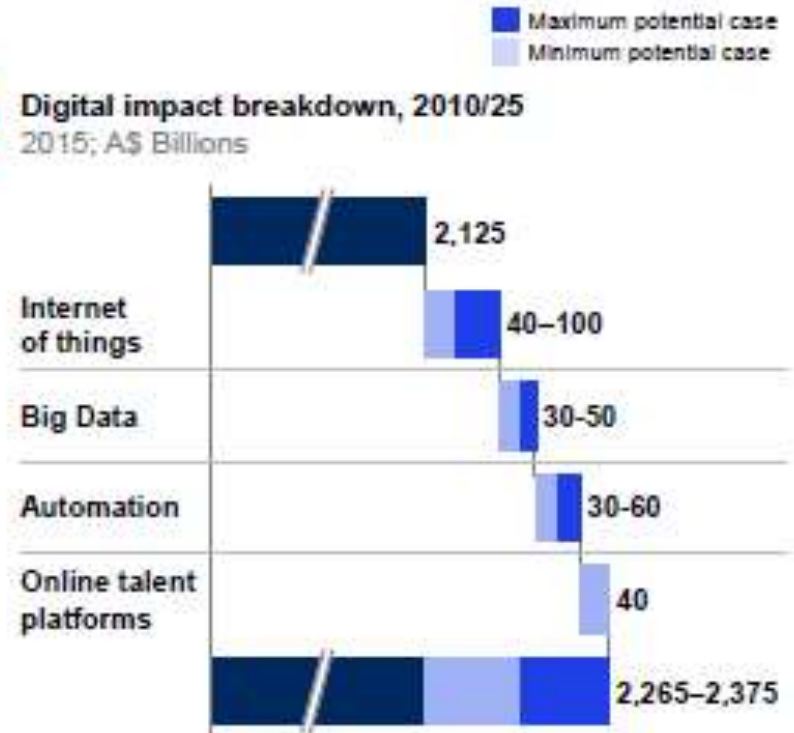
Creative destruction



The digital revolution



Digital impact breakdown, 2010/25
2015; A\$ Billions



Digital agriculture – Internet of Things

Soil, air & water sensors



Livestock biometrics



Crop sensor



Infrastructure sensor



Wireless Local Network



Dashboard



Digital agriculture - benefits

SECTOR	APPLICATION	BENEFIT	SOURCE
Livestock	Remote watering & walk over drafting systems	>10% reduction in mustering costs	Big Data report
Dairy	Activity meters as back up to visual cow heat detection	\$7k p/a for 450 cow herd	Dairy Australia 2015
	Wireless IoT network	<50% water reduction	Zulkifi University
Grains	Precision / decision software program	\$35 per acre profit increase	Precision Ag Report
	Digital agriculture	10-15% productivity increase	Big Data report
Environment	Precision agriculture	30% burden reduction	Precision Ag Report

Australia Industry Digitisation Index

2016 or latest available data¹

Relatively low digitisation  Relatively high digitisation



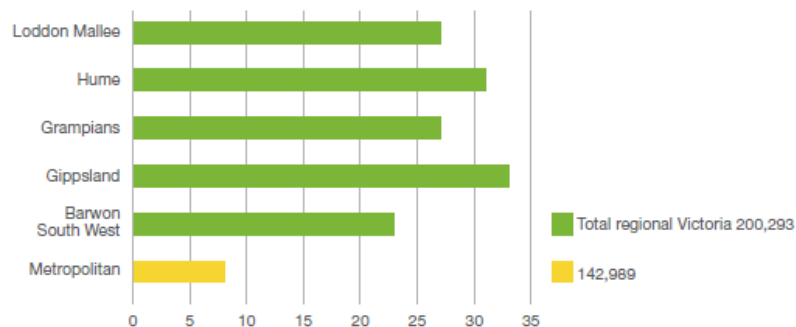
Source: McKinsey Global Institute Analysis

¹Based on a set of metrics to assess digitisation of assets (5 metrics), usage (5 metrics), and labor (5 metrics); see technical appendix for full list of metrics and explanation of methodology
SOURCE: ABS; CSIRO; ASX2000 annual reports; Facebook; Twitter; AppStore/iTunes; Google Play Store; LinkedIn; McKinsey analysis

Digital agriculture - barriers

Internet connectivity

Proportion of premises with unmet demand for broadband



Capability

Australia must address skills gap to capture the golden age of farming.

March 21, 2015

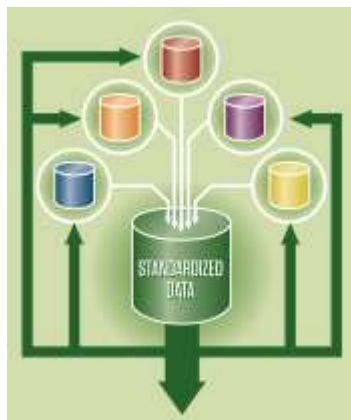
Agriculture, HR, Industry, News, Recent News

Disruption comes to agribusiness! And according to our most recent report, the [2015 Agrifood Talent Report](#), new technology, changing business structures and new ways of marketing are opening up a skills gap that could actually hurt Australia's agricultural competitiveness.

Agricultural Appointments, Managing Director, Dr Ray Johnson, says the 2015 Agrifood Talent Report highlights a trend toward niche production of differentiated products, large-scale production as well as a new wave of digital technology, adoption of new business structures and innovative marketing by farmers.

"We are seeing a shift away from the traditional way of doing things to ways that require new skills and knowledge."

Data management



Capital

	unit	2012-13	2013-14	2014-15	2015-16	2016-17 s
Net returns and production						
Net value of farm production b	\$m	11,490	13,537	15,990	18,158	23,237
Real net value of farm production c	\$m	12,380	14,199	16,491	18,837	23,702
Net farm cash income d	\$m	16,687	18,882	21,434	23,684	28,862
Real net farm cash income c	\$m	17,979	19,806	22,105	24,570	29,439
Institution						
Rural debt						
All banks a	\$m	59,749	61,778	62,461	64,966	66,912
Other government agencies b	\$m	2,076	2,236	2,451	878	973
Pastoral and other finance companies	\$m	1,801	1,569	1,486	1,463	1,622
Large finance institutional debt c	\$m	63,626	65,583	66,397	67,307	69,508

Key initiative – \$45m CRCP (\$12m Ag IoT trial)



- \$11million for the Mobile Black Spots program
- \$7m for regional enhanced broadband projects in Morwell, North Geelong and Horsham
- \$7m for Digital Economy Plan
- \$7m for free public Wi-Fi in Shepparton and Geelong
- \$1m to improve regional services through access to government communications infrastructure
- **\$12m for projects to support adoption of internet enabled on-farm technologies in Victoria's North-West, Macalister Irrigation District, Murray-Darling Basin and Serpentine regions**



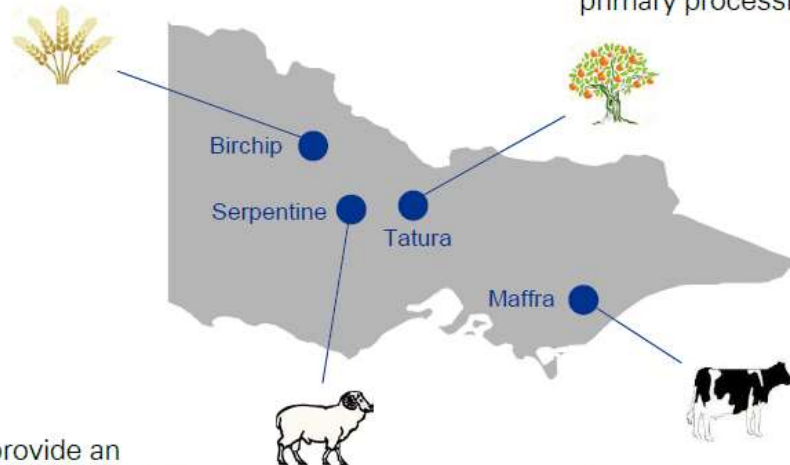
\$12m Ag IoT trial – regions, sectors & needs

Birchip trials (Grains)

Connectivity, data interoperability and cost per sensor are the major impediments to IoT enabled, real-time technology adoption by farmers who are already using highly sophisticated vertical data sets but in isolation and not business decision focused.

Tatura trials (Horticulture)

High capacity for optimisation through adoption of IoT enabled industrial farming process from field or orchard to primary processing and logistics to point of consumption.



Serpentine trials (Sheep)

Compulsory ear identification tags provide an opportunity for digitisation with low understanding of digital enabled optimisation around animal management including water access, feed quality, genetics and contractor management.

Maffra trials (Dairy)

A fully IoT enabled, integrated and operational dairy supply chain needs to demonstrate ROI against capital costs, work in real-time to allow timely decisions between milking, and not rely on a transient/temporary workforce to operate.

\$12m Ag IoT trial – actions

Proposed role of government for successful trials:

1. **Rapid Adoption** – Government intervention is necessary to accelerate adoption of Internet of Things enabled farming at scale and to encourage a market offering to service the industry and support farmer engagement in the trials.
2. **Standards** – Publish standards for food and agriculture IoT on farm implementations to enable market led solutions.
3. **Datasets** – Enable universal access to core data sets as a single source of truth.
4. **RegTech** – Transform regulation through RegTech to drive productivity gains for IoT enabled farms.

Summary

1. The digital revolution is an opportunity for agriculture
2. The \$12m on-farm IoT project is seeking to stimulate transformational change

