Digital Agriculture: An Australian Red Meat Industry Perspective

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Australian Red Meat Industries Digital Forum – October 2016

CSIRO AGRICULTURE & FOOD
www.csiro.au

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".....there has never been a more exciting time to be an Australian."

Malcolm Turnbull PM
15 September 2015

We see it in our everyday lives already …

Emerging technology trends

Energy technologies

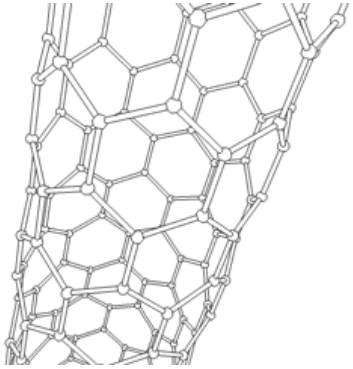
- Ultra-capacitors (high-density energy storage)
- Wireless energy transfer
- Energy harvesting (MEMS devices, organic solar cells)

Robotics technologies

- Micro/nano-scale robots
- Robot swarms

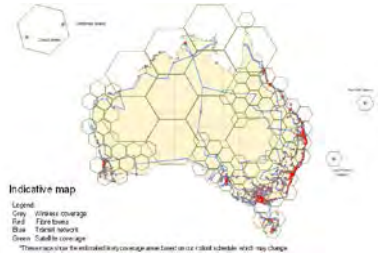
Materials science

- Programmable matter / quantum dots
- Nanomaterials / carbon nanotubes



Information technologies

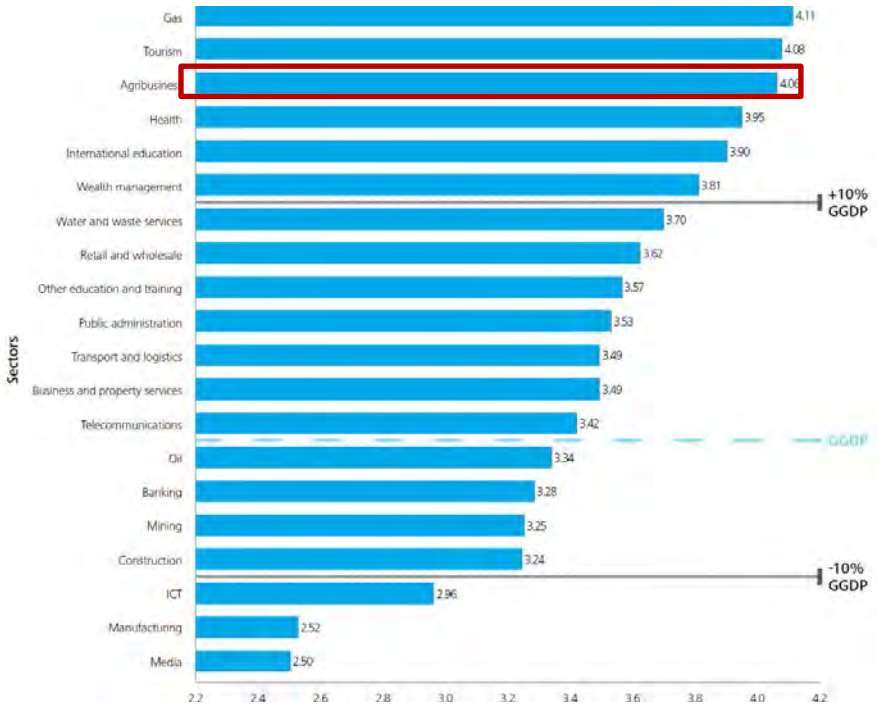
- Artificial Intelligence, machine vision & learning
- Fast or long-range wireless comms
- Low-power, distributed systems -> “Internet of Things”



The Future for Agriculture is Bright!

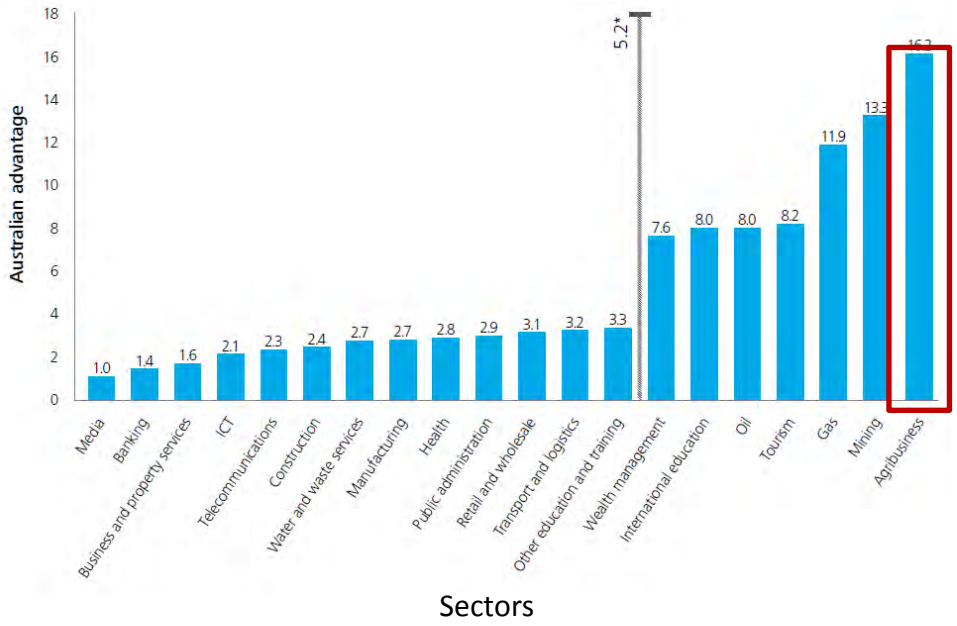
Agribusiness is 3rd fastest growing sector and 1st for Australian advantage

Annual Global Industry Growth 2013-33



Global Growth Rate (%)

Sectors of Australian Comparative Advantage



Sectors

Deloitte Access Economics Projections

Some amazing things are emerging from the digital "revolution"

Many more to come and they <u>will</u> transform agriculture …..

What will be truly disruptive ?

Disruption – the issue of connectivity

Googles Project Loon

Facebooks Aquila drone

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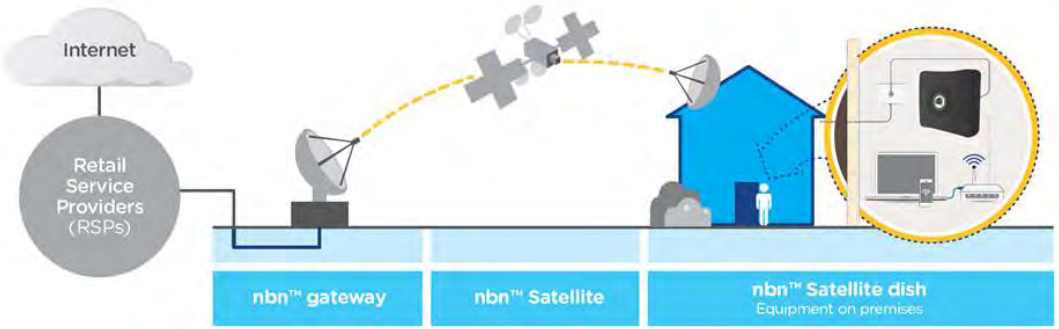


NBN

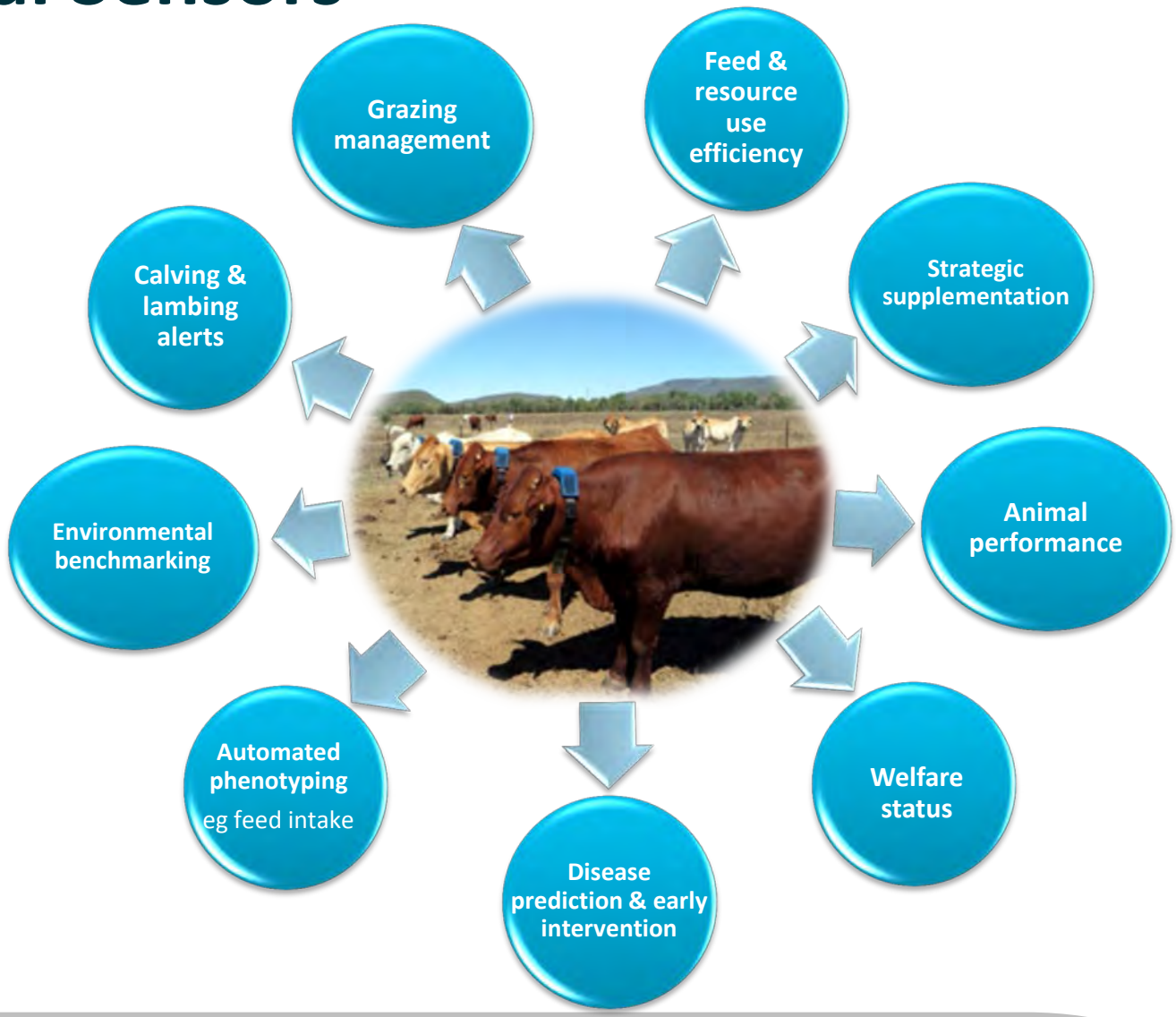
Disruption – the issue of connectivity

What does it mean for the producer?

Disruption – the issue of connectivity

*Use case: Connectivity **across** the farm*

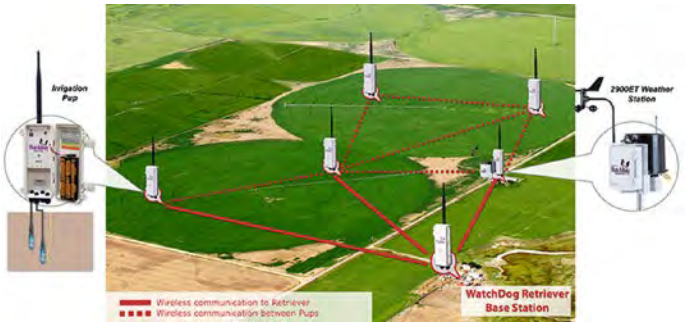
Animal Sensors

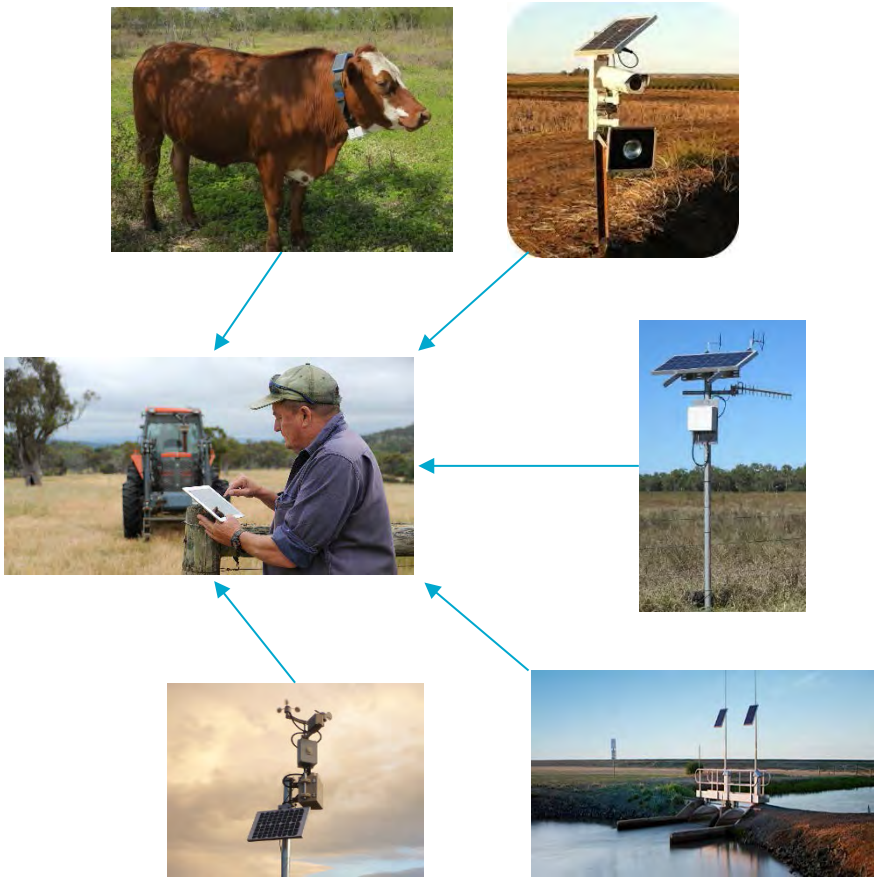


Disruption – the issue of connectivity

*Use case: Connectivity **across** the farm*

- Data stream integration (sensors)
- Local connectivity
- Predictive analytics
- Interpretation & visualisation





The Gap ?

- Business model
- Integration (prediction analytics)
- Complex analytics on simple devices

Disruption – the issue of connectivity

*Use case: Connectivity **beyond** the farm (the Internet of things)*

Internet

Climate

Markets

Bench-marking

Service Providers

Inputs

Connectivity is central to traceability and guaranteeing provenance to the consumer

Disruption – the issue of connectivity

*Use case: Connectivity **beyond** the farm (the Internet of things)*

- Within-farm data
- Service providers
- Supply Chains
- Markets
- Benchmarking
- Advice sources

The Gap ?

- Predictive analytics
- Integration of required parties/service providers
- Business Model

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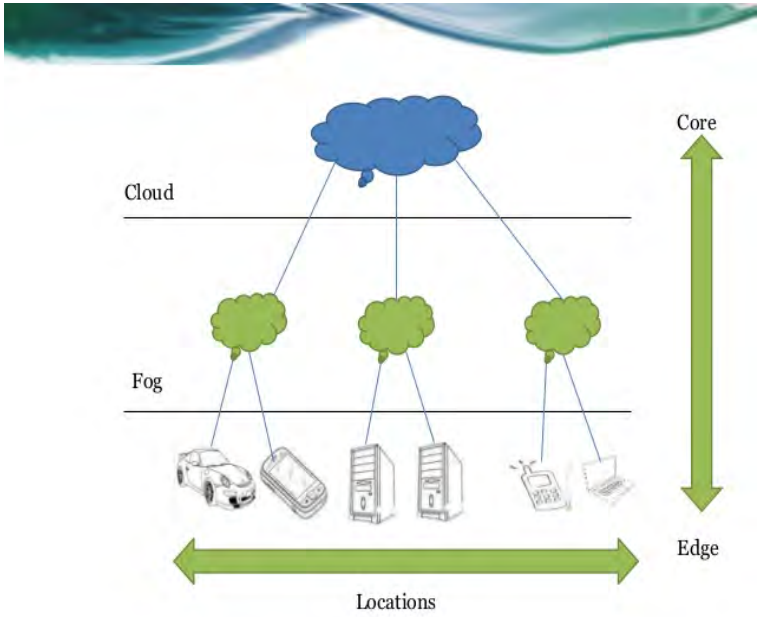
Disruption – the issue of connectivity

What does it mean for the producer?

- Some use-cases enabled by local connectivity
- Benefit greatly enhanced by broader connectivity

Connectivity is an enabler, but value capture will be driven by what we do with it

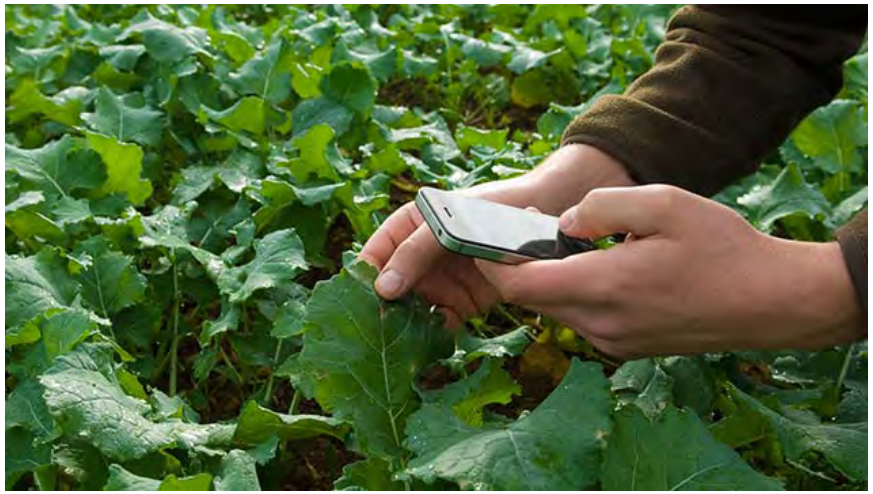


Disruption – where farmers get their knowledge

Could farmers get help from the most knowledgeable expert at a moment's notice no matter where they were ?

Picture this:

- Farmer takes a picture in his crop of an unknown disease symptom
- Adds some of his own descriptive words
- Automatically locates



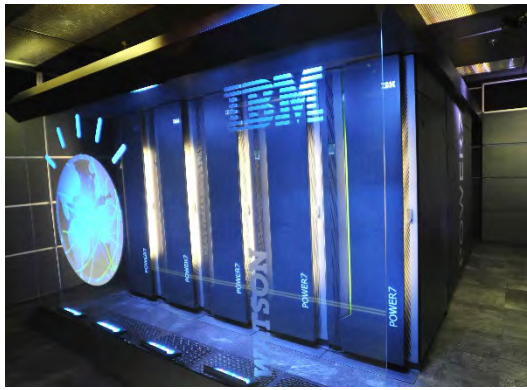
- System trawls through extension material, factsheets, research papers, media streams …

➢ "most probably cause (with probability %) is …..
…… without action, likelihood that you will get a YY% yield decrease
…… remedial options:
A. 90% chance of 70% yield
B. 75% chance of 90% yield

Disruption – where farmers get their knowledge

Using Artificial Intelligence (AI) to answer semantic questions

- IBM Watson can read 40 million documents in 15 seconds.
- Analyzes unstructured data
  - 80% of all data today is unstructured
    (eg news articles, research reports, social media posts, enterprise system data).
  - Volume of unstructured data is growing by 62 percent each year
  - Expected to reach nine times the volume of structured data by 2020.
- Uses natural language processing – means more data from more sources



Disruption – where farmers get their knowledge

A farmers personalised google search

Today, AI is used to for interactive Care Insights for Oncology and provides suggestions for treatment plans for lung cancer patients

Enabling farmers to receive help from the most knowledgeable expert at a moment's notice.

Disruption - Automation

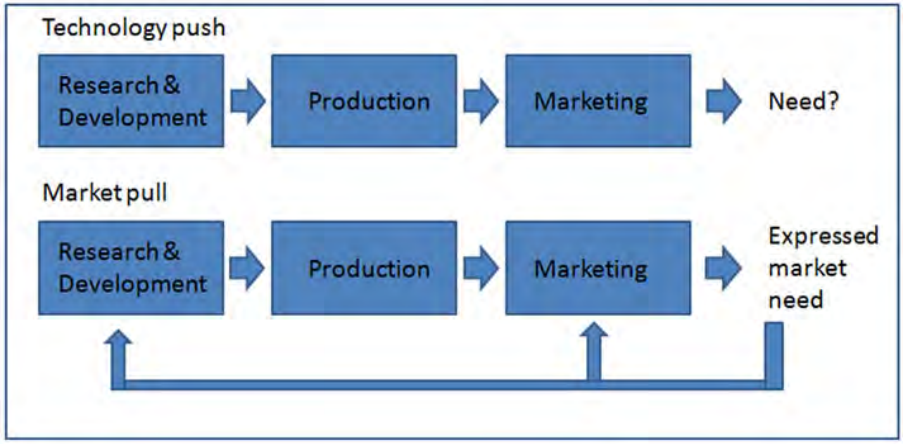
Disruption – Automation

Use case: Autonomous control of livestock

- We know we can autonomously control livestock without the need for an actual fence, using coordinates, wireless technologies and sensors
- Technology advances
- Commercialisation pathway (Agersens)
- Industry ‘pull’

Some things to consider……

- Problem definition
  - Does it need a technology solution?
- What's the value proposition?
- Barriers to adoption
  - **Technological** (access, reliability, ease of use, cost etc.)
  - **Human** (demographics, education, value perception etc.)



Some things to consider……

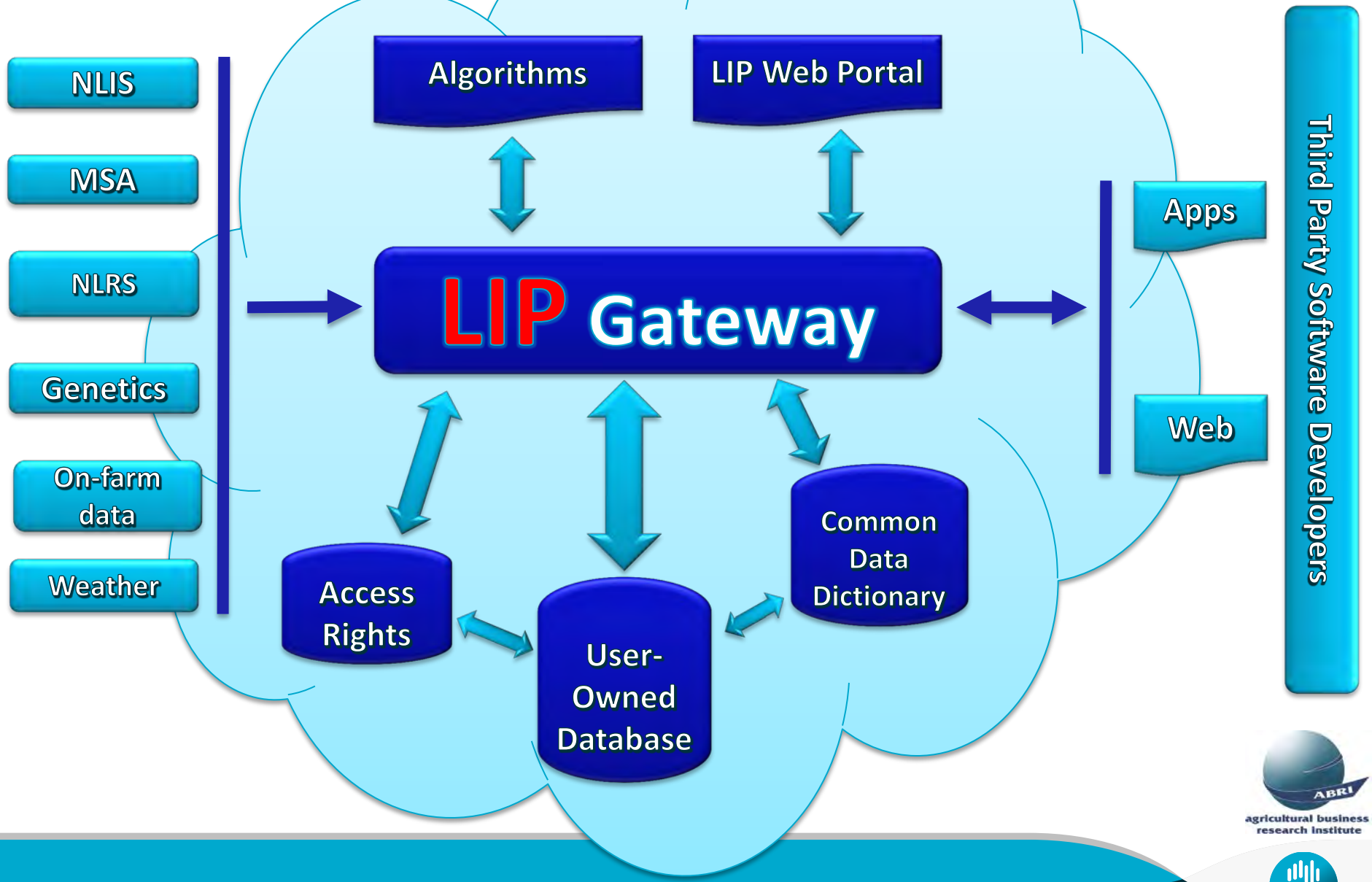
The Realm of "Big Data"

- It not about the data, its about capturing value from the data!

Data → Decisions → Actions

Data Access, Ownership and Security

LIP – Livestock Information Platform

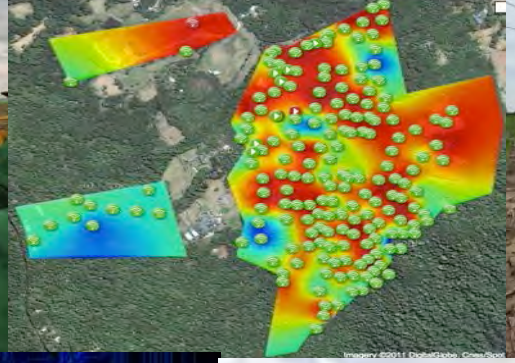


Some things to consider……

AgTech

- Realising the potential of the digital revolution in agriculture requires a vibrant AgTech sector.
- Closer engagement between R&D providers and AgTech Companies (engage early and often)







Summary

- Digital technologies will transform the red meat industries
- Its about how we connect
- Its about how we utilise and capture value from data
- Its how we automate and create efficiencies in the system