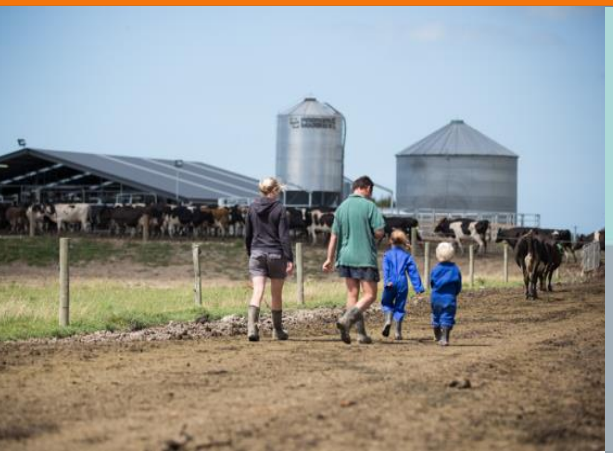
Map of Agriculture

“Managing agricultural data flows for the farmer”

World Bank Webinar: 28th Jan, 2016



Map of Agriculture Group

Built by farmers, for farmers

Forbes.Elworthy@MapOf.Ag

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1. Who are Map of Agriculture?

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1.1 Our Mission

- An integrated agricultural information and data management platform
- We offer Ag Data Tools & Solutions to the ag industry
  - Above all we offer data “integration”
- Currently operate from British Isles & New Zealand
- Aim to support farmer-controlled “AgNetwork”
  - Supporting “AgLinker” to integrate “data in” and “data out”
  - Supporting “AgStandards” for farmer data protection
  - Supporting farmer collaboration

Feel free to contact us at: Forbes.Elworthy@MapOf.Ag

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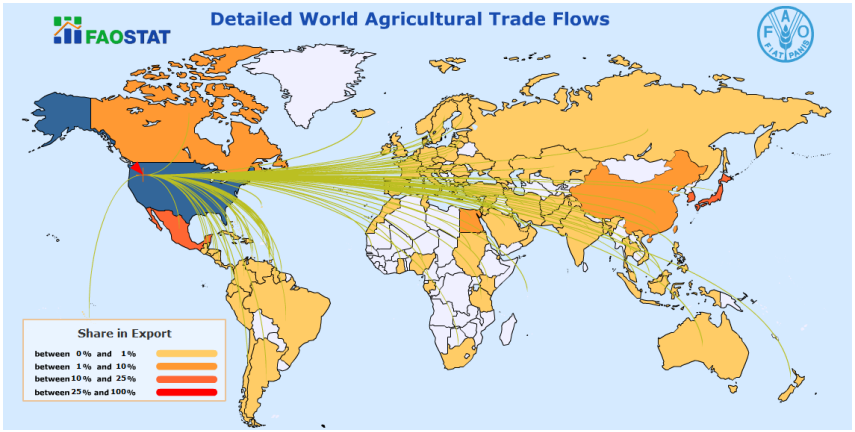
2. Ag Data Characteristics

2.1 Macro data

- Survey financial data
- Trade & production data

USDA

All Farms: TOTAL	
All Farms: TOTAL	Units
Farms	Number
Farm assets	Dollars per farm
Assets: Current	Dollars per farm
Assets: Livestock inventory	Dollars per farm
Assets: Crop inventory	Dollars per farm
Assets: Purchased inputs	Dollars per farm
Assets: Cash invested in growing crop	Dollars per farm
Assets: Prepaid insurance	Dollars per farm
Assets: Other /1	Dollars per farm
Assets: Non-current	Dollars per farm
Assets: Investment in cooperatives	Dollars per farm
Assets: Land and buildings /2	Dollars per farm
Assets: Operators dwelling	Dollars per farm
Assets: Farm equipment	Dollars per farm
Assets: Breeding animals	Dollars per farm
Farm liabilities	Dollars per farm
Liabilities: Current	Dollars per farm
Liabilities: Notes payable within one	Dollars per farm
Liabilities: Current portion of term de	Dollars per farm
Liabilities: Accrued interest	Dollars per farm
Liabilities: Accounts payable	Dollars per farm
Liabilities: Noncurrent	Dollars per farm
Liabilities: Nonreal estate	Dollars per farm
Liabilities: Real estate	Dollars per farm
Farm equity	Dollars per farm



DairyNZ

Table 7.6: Capital Structure and Wealth Creation

	2004-05	2005-06	2006-07	2007-08
PHYSICAL CHARACTERISTICS:				
Number of herds	218	205	323	221
Effective hectares	109.0	118.3	122.5	125.1
Peak cows milked	297	321	336	348
Stocking rate (cows/ha)	2.7	2.7	2.7	2.8
Kg milksolids sold	97,573	108,832	116,897	114,815
Milksolids sold per hectare	895	920	954	918
Milksolids sold per cow	329	339	348	330
PAYOUT RECEIVED: $/kg ms sold	4.44	4.15	4.13	7.37
DAIRY ASSETS at OPEN				
Land & buildings	2,231,261	2,697,856	3,033,281	3,640,301
Plant, machinery and vehicles	118,134	143,745	161,080	160,642
Livestock	294,053	386,369	464,453	515,595
Investments (exl non-dairy)	477,928	586,557	675,644	767,981
Current assets	73,987	99,153	115,522	95,051
Total dairy assets at open	**3,195,363**	**3,913,680**	**4,449,980**	**5,179,570**
plus non-dairy assets	55,202	117,776	203,935	176,842
Total assets	**3,250,565**	**4,031,456**	**4,653,915**	**5,356,412**
LIABILITIES at OPEN				
Term liabilities	1,063,337	1,373,322	1,618,492	1,899,032
Current liabilities	73,469	117,355	136,899	125,624
Total liabilities	**1,136,806**	**1,490,677**	**1,755,391**	**2,024,656**
Owners equity at open	**2,113,759**	**2,540,779**	**2,898,524**	**3,331,756**
DAIRY ASSETS at CLOSE				
Land & buildings	2,734,169	2,976,139	3,379,177	3,994,816
Plant, machinery and vehicles	133,087	150,377	168,884	187,817
Livestock	376,499	455,785	505,237	903,085
Investments (exl non-dairy)	553,028	662,405	738,920	758,396
Current assets	73,719	97,065	114,937	173,053
Total dairy assets at close	**3,870,502**	**4,341,771**	**4,907,155**	**6,017,167**
plus non-dairy assets	62,646	148,101	240,356	287,149
Total assets	**3,933,148**	**4,489,872**	**5,147,511**	**6,304,316**
LIABILITIES at CLOSE				

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2.2 Micro data

- Data types
  - **Financial** e.g. cash flows, P&L, B/S & budgets
  - **Production** e.g. yield, fertiliser application
  - **Agro-ecological** e.g. rainfall, soil types
  - **Social** e.g. staff FTE

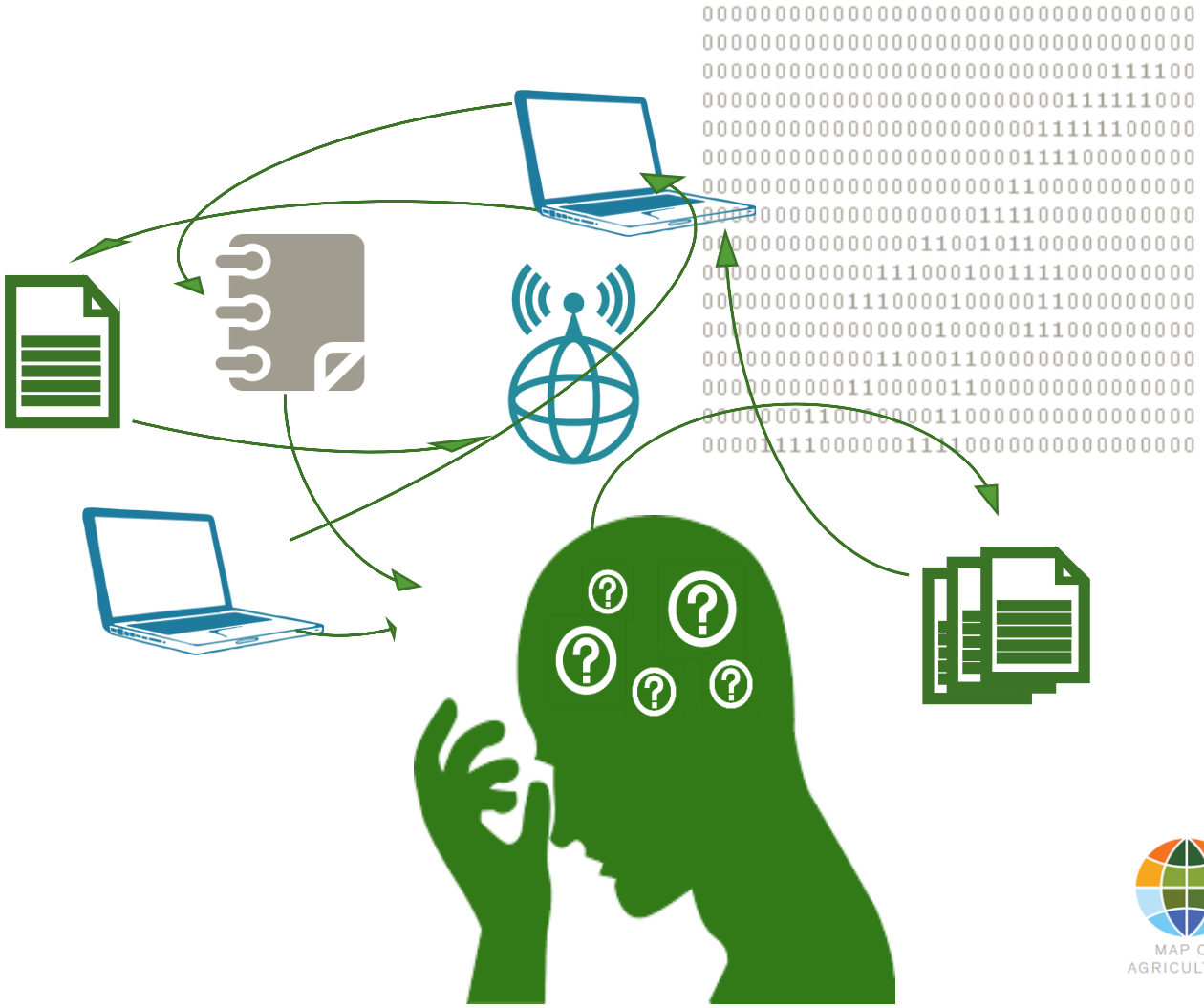
Sample Company, Inc.	Profit & Loss Statement	August 2012
Operating Revenue		
Product sales		$12,000
Service sales		3,000
Total Operating Revenue		15,000
Operating Expenses		
Cost of goods sold		7,000
Gross Profit		8,000
Overhead		
Rent		1,500
Insurance		250
Office supplies		150
Utilities		100
Total Overhead		2,000
Operating Income		6,000
Other Income (Expenses)		
Loan Interest		(500)
Earnings Before Income Taxes		5,500
Income Taxes		500
Net Earnings		$ 5,000

- Data sources
  - External partners e.g. accountants
  - Clients' internal systems e.g. Farmplan, Gatekeeper, Propman and Landmark

- Data formats
  - Excel, CSV, PDF file formats
  - SQL or REST APIs and other interfaces

2.3 Ag “Big Data”

- Vast data in disparate forms, creating a data analysis & management problem for farmers



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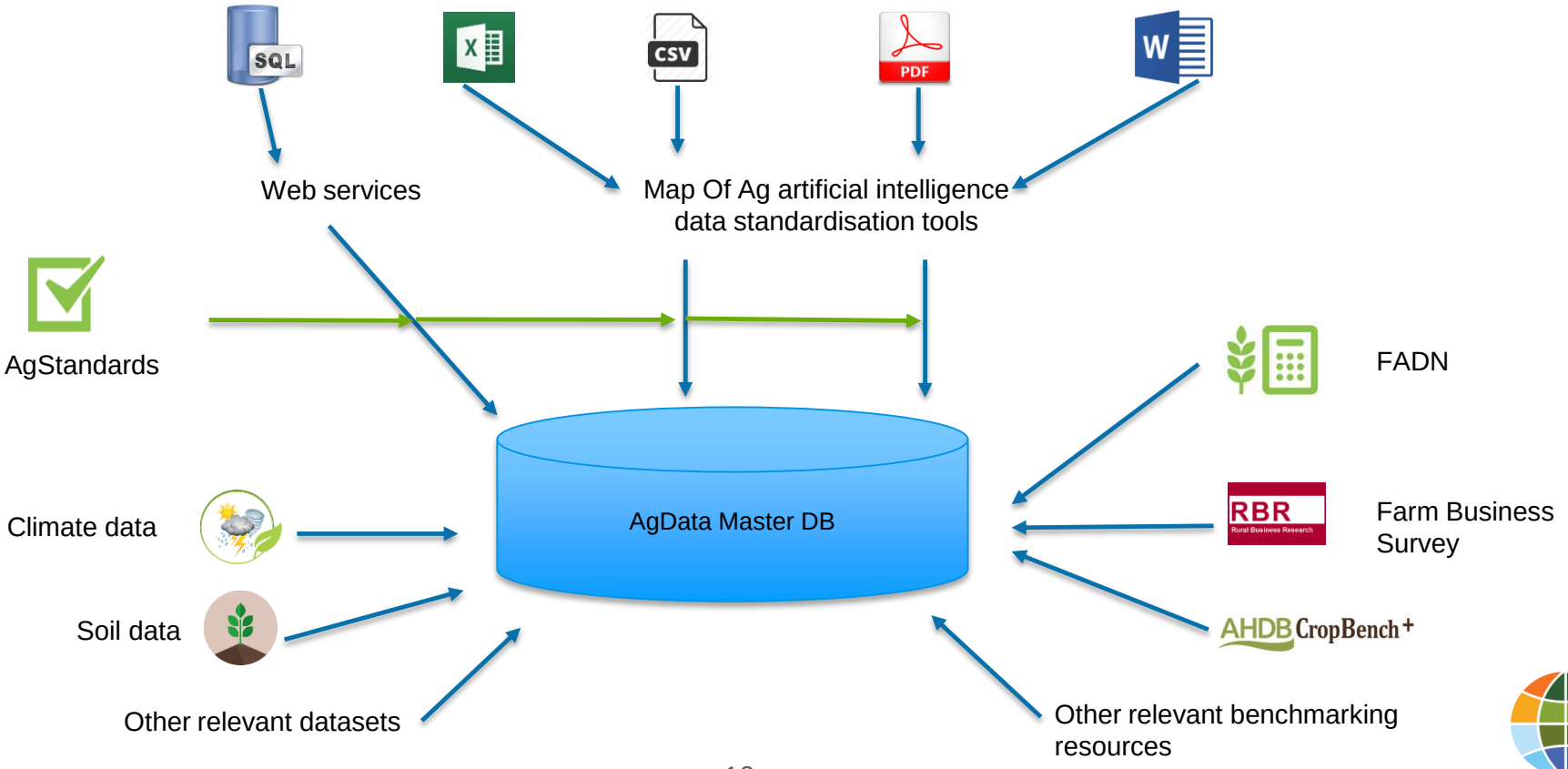
3. Ag Data Management Need

3.1 Capturing data

- Capturing data into analysable format with Semantic technology
  - from survey or direct data, region, land-use, farm size, governance form ...



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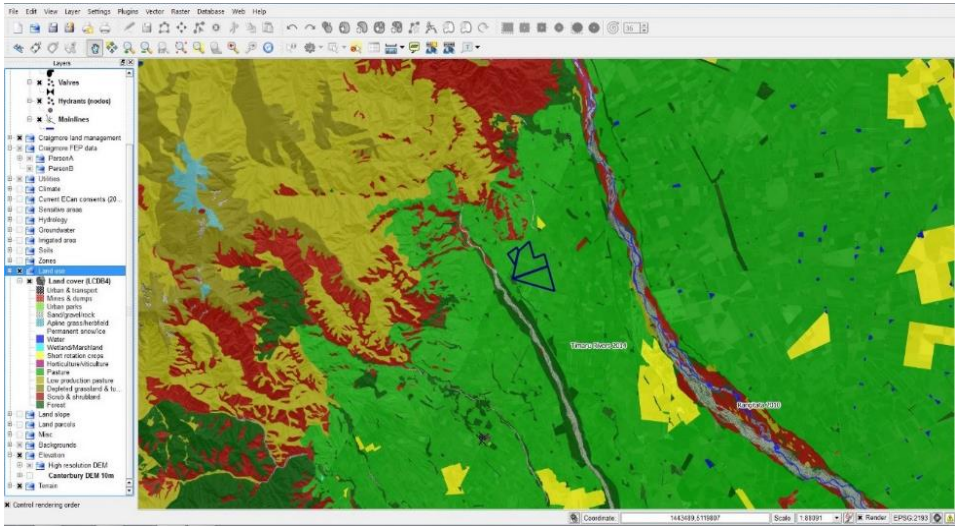
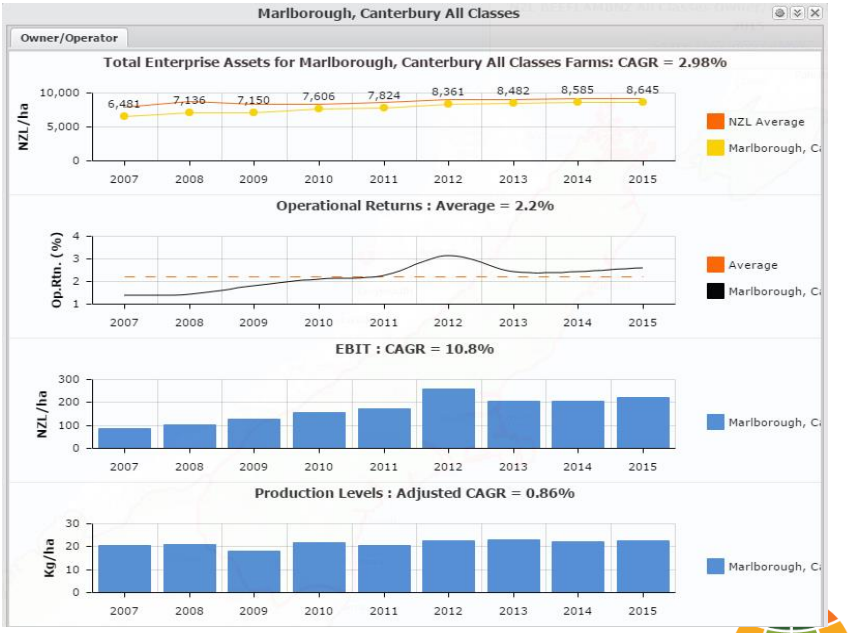
3.2 Applying a Data Taxonomy

- Level of detail
  - Taxonomies are detailed enough in order to separate, for example, variable from fixed costs, and to identify whether costs arise from fertilizers or pesticide purchases, feed, wages or irrigation
  - However it's possible that some very detailed data can be "lost" (the value will be accounted for, but the user may not be able to see the very detail information about it)
    - For example, some datasets contain a detailed list of every fertilizer used.
  - It is important to note that, strictly speaking, no data is lost, as the "base" dataset is still be part of the database

3.3 Generating Information

- Data Analysis and modelling algorithms
- Utilise Geographic Information System “AgFrame”
- Create e.g. Benchmark farmer vs average KPIs





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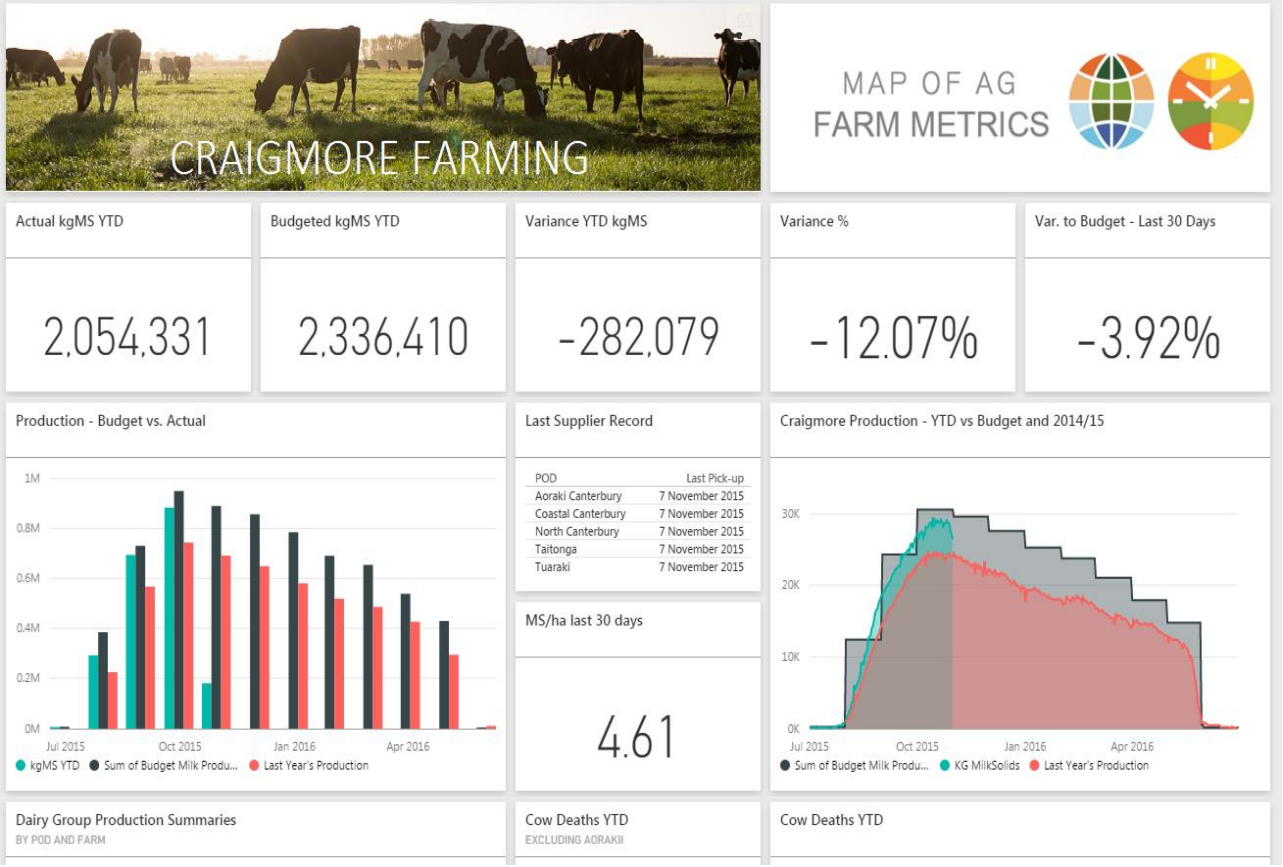
3.4 Visualisation

- Decision making for the farmer, in real time
- To improve financial performance and sustainability



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3.5 CASE STUDY

Craigmore Dairy Partnership



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3.5.1 Data sources for a Craigmore dairy farmer

- Production – Milk data, feed budgeting & animal health
- Financial – accounts
- Human resource – Staff requirements
- Inventory – Supplement feed & stock data

Existing disparate data solutions

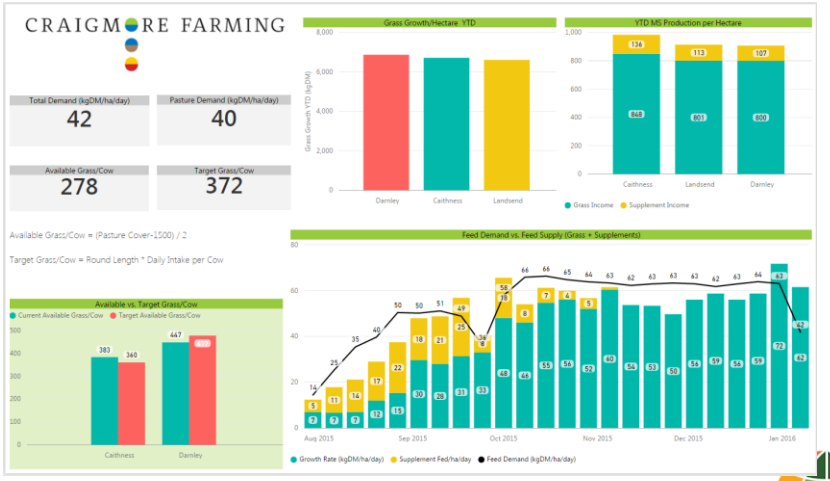
- Farm source, AgHub, Pplus+
- Rural Cash Manager, Xero
- Excel
- Paper based reports

Key issue:

A lack of integration between software's means frequent repetition of data entry between solutions

3.5.2 Map Of Ag's FarmMetrics

- FarmMetrics is a mobile dashboard for farm KPI reporting. Tracking on-farm production and financial performance in near real time
- On dairy farms a daily cycle of farm KPI's – with data contrasted ("benchmarked") across farm, peer and regional levels
- Limited requirement for farmer data entry – integration with processor & farm service organisations for data acquisition



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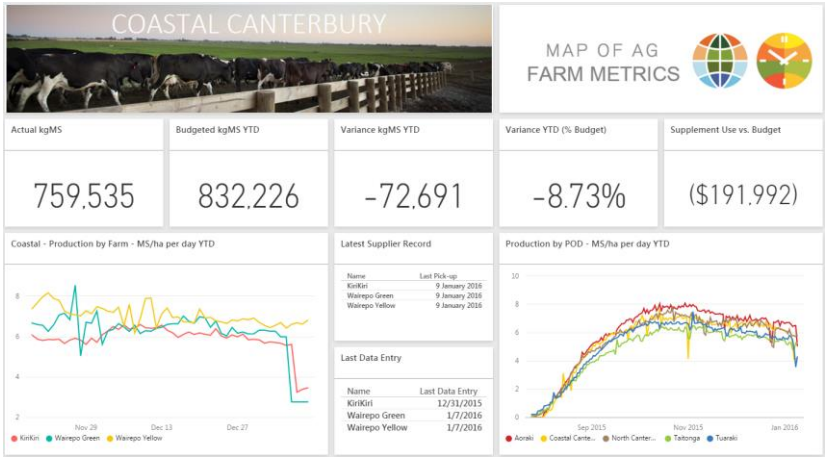
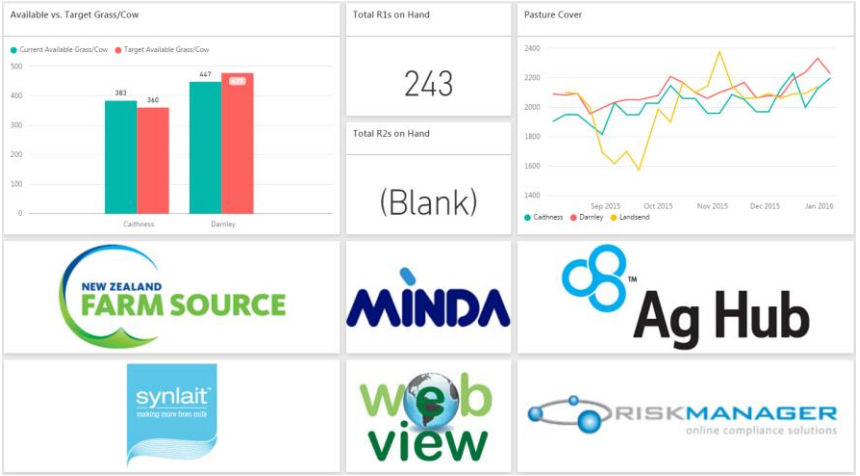
3.5.3 FarmMetrics

- Hierarchical reporting structure for multi-farm managers or companies servicing multiple farms. ‘Drill down’ reports for monitoring.
- Farmers / Users define the interface to their needs – frequent updates





- Sources include production statistics, pasture growth, health & safety, herd structure and financial information

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4. Data in emerging market agriculture

4.1 Challenges of data in emerging markets

- Access – reliability of internet access (also an issue in OECD!)
- Data culture – Under developed data record and analysis
- Fragmentation – Often subsistence scale farming
- Extension – many emerging economies maintain centralised extension – partner with this for flow of progressive farming techniques
- Input suppliers – important entry point for data decision making and improved technology inputs
- Literacy – Need to create effective avenues of communication – voice and imagery as well as written materials

- But highly motivated producers! – It's their livelihood

4.2 Implications

- Partnerships – With government supply industries (multi national & local distributors), multi lateral organisations (WB, IFC etc.) critical

- Technology partnerships – opportunity to jump legacy infrastructure issues by working with leading mobile providers (SafariCom etc.)

- Distribution of available technology

- Data integrity and ownership is vital – simple, practical standards essential to build trust and confidence

- Early wins: Creating product that improves crop production via disease and pest control, crucial to gaining traction. Results matter

5. Improving management of agricultural risk

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Better information = Better decision making

- **Better information at the right time, in the right place, in the right format leads to better decision making**
- Increased degree of risk mitigation through improved management and decision making
- Higher management of risk with fore planning
- Increased strategy and contingency plans – being well prepared with effective data
- Effective diversification – improvements in a multitude of farming areas – revenue streams
- Quality precision data – resulting in higher knowledge of price sensitivity when selling stock

Please feel free to contact us at:

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