YALUMBA
FAMILY VIGNERONS c. 1849

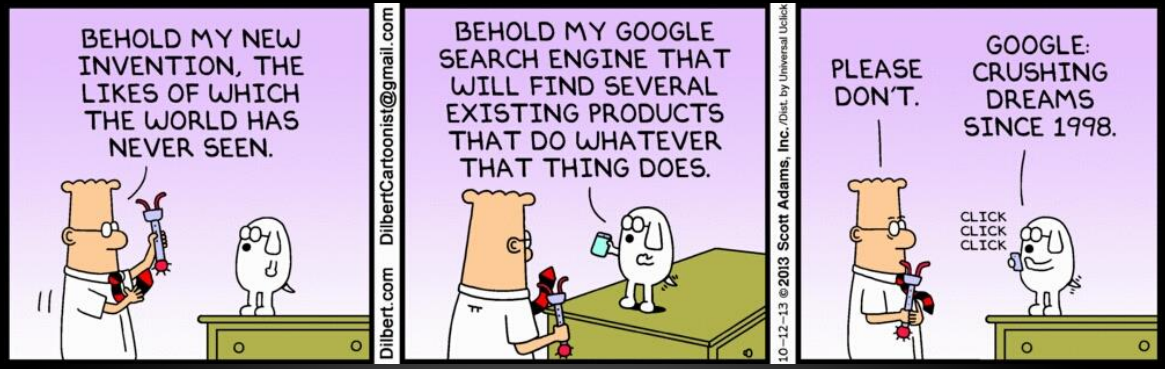
INNOVATION VS INVENTION
WHAT'S THE DIFFERENCE AND DOES IT MATTER?

Innovation is defined simply as a "new idea, device, or method".[1] However, innovation is often also viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs.[2]

INVENTION OR INNOVATION?

- **Invention** is the “creation of a product or introduction of a process for the first time.” Thomas Edison was an inventor.
- **Innovation** happens when someone “improves on or makes a significant contribution” to something that has already been invented - an existing product, process or service. Steve Jobs was an innovator.

“If invention is a pebble tossed in the pond, innovation is the rippling effect that pebble causes. Someone has to toss the pebble. That’s the inventor. Someone has to recognise the ripple will eventually become a wave. That’s the innovator.[3]”



WHAT DOES IT TAKE TO INNOVATE?

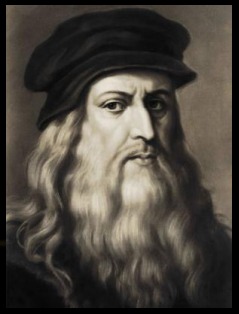
The robotics engineer Joseph F. Engelberger asserts that innovations require only three things to proceed:

- A recognized need,
- Competent people with relevant technology, and
- Financial support.[4]

Is this any different than invention?

- Creativity or discovery does not always have a need (this may become apparent later)
  - Equations to predict reflection of electro-magnetic waves (Petr Ufimtsev) – Stealth
  - Application of Fourier Transforms in Radio Astronomy (John O'Sullivan) – Wifi
- It requires a competent person, but not necessarily the technology
  - Codex Atlanticus proposed the Parachute and Helicopter – Leonardo Da Vinci
- Financial support can be required, but once again thankfully is not always necessary

It could be argued that much invention is actually an application of a discovery for a need and many things considered inventions are applications (or innovations) of a new theory.



SO DOES IT MATTER?

- Perhaps in an Engineering (Applied Physics) world it could be put that
  - invention is the application of a discovery for the first time in a new or different way
  - innovation is the improvement or combining of various existing applications for a better outcome
- They are both new applications of technology
  - The light bulb was an invention from a discovery of physical properties
  - iPhone is an innovation from evolution of the mobile phone and touch technology
- Either way for us the result is a better way to perform a need

Does it matter? – in terms of difficulty YES, in terms of the end result NO

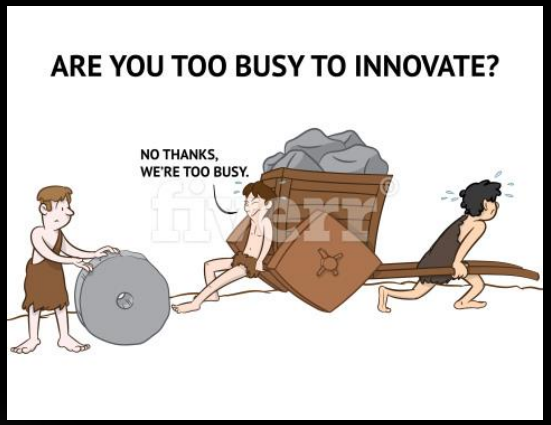
- I think the main difference is inherent greater risk of failure with invention
- Invention could be viewed as a critical subset of innovation

CULTURE OF INNOVATION

Where does innovation come from? Where does it begin? What does it look like? How does it become embodied in the people and the culture of organizations?

- Align with company values and goals (support from the top)
- Make the intent clear (define what it means)
- Structure some unstructured time for everyone (time to think and innovate)
- Provide support (culture of trust, process tools and knowledge)
- Measure innovation to improve (progress and success/failure)
- Reward and recognition (from peers and not just success) [5] [6]

When the speed of failure slows, so does the speed of innovation.



LEAD A CULTURE OF INNOVATION

- Be on purpose – Define your goals and values

  "The greater danger for most of us isn't that our aim is too high and miss it, but that it is too low and we reach it." ~ *Michelangelo*

- Question and listen – Leadership creates clarity out of chaos

  "You must have chaos within you to give birth to a dancing star." ~ *Friedrich Nietzsche (*German Philosopher)

- Risk experimentation – Accept failure

  "I have not failed. I have just found 10,000 ways that do not work" ~ *Thomas Edison (*Inventor)

- Reflect – Learn from mistakes and success

  "Life can only be understood backwards; but it must be lived forwards." ~ *Søren Kierkegaard (*Dainish Philosopher)

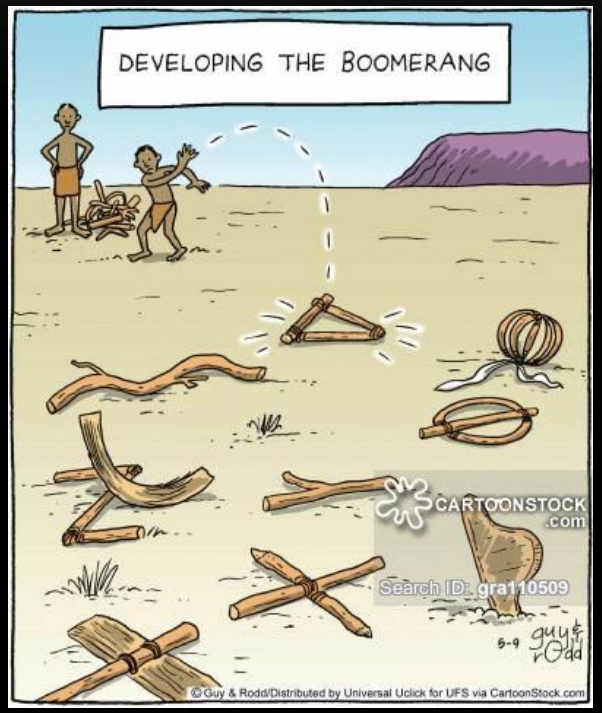
- Coach and mentor – Grow people to a culture of innovation[7]

  "Culture eats strategy for breakfast" ~ *Peter Drucker (*Management Guru

ENGINEERING TOOLBOX

- Plan Do Check Act
- Define Measure Analyse Improve Control
- Failure Mode Effect Analysis
- Continuous Improvement
- Flow Charting
- Suppliers Inputs Process Outputs Customers

All grouped under 5S, Six sigma and Lean[8]



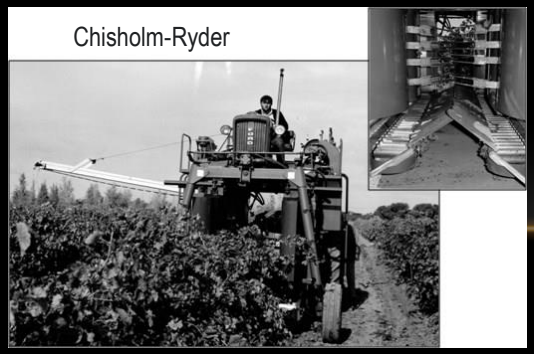
WINERY PROCESS INNOVATION

GENERAL INDUSTRY

- Mechanical harvesting
- Storage vessels
- Red Fermentation

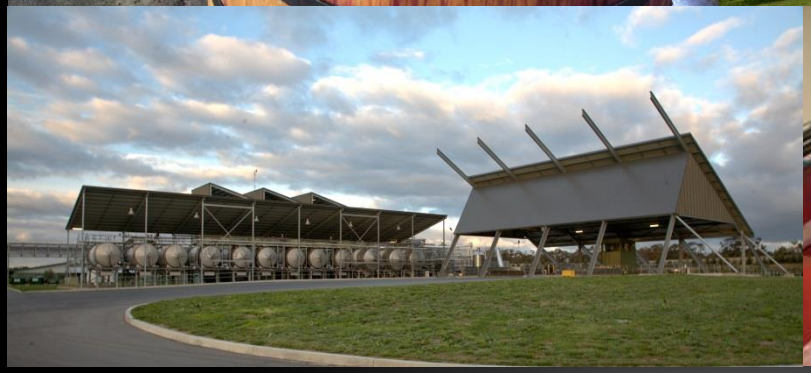
MECHANICAL GRAPE HARVESTING

- Need – for mechanised harvesting due to lack of labour after WW2 and the Korean War
- Competency, Technology and Finance
- UC Davis Harvester built by Up-Right Inc California (CSIRO – ship)
- Profs. Stanley Shepardson and Nelson Shaulis of Cornell University straddling mechanical harvester built by Chisholm-Ryder Company of Niagara Falls, N.Y (CSIRO - RAAF)
- Riply, N.Y., grapegrowers Max and Roy Orton developed a horizontal-action machine, which beat the trellis rather than shook the vines
- John Deere dealership owner Vito Mecca of North Collins, N.Y., developed the Mecca-Nized harvester, which he manufactured in Buffalo, N.Y. [9]
- First two imported from the US by CSIRO (Peter May) in 1964 to Merbein, Victoria[10]



STORAGE

RED FERMENTATION



WINERY PROCESS INNOVATION AT YALUMBA

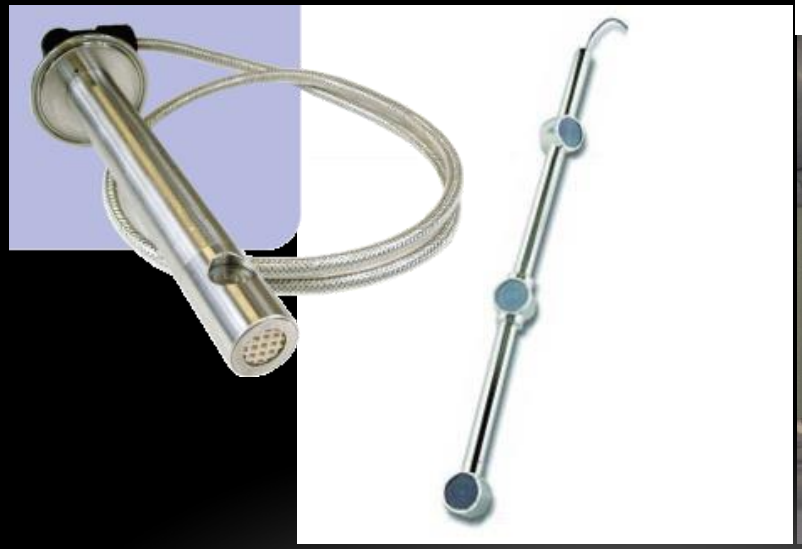
- Ice Pigging
- Ferment Density Measurement
- Crossflow filtration
- Barrel line
- Product innovation

ICE PIGGING – 2008 [11]

- Anti-freeze material for ice formation
- Speed of formation vs cost of pre made ice
- Number of pigs required per day
- Volume of ice required
- Funding for development
- Savings in lost product

FERMENT DENSITY MEASUREMENT – 2009

- Fermentrol – Psitec 2005 to 2007
- OptiDens – Liquosystems 2006 to 2007
- DMA 35 – Anton Parr 2007
- Liquiphant M – Endress & Hauser 2009 to 2012



CROSSFLOW FILTRATION OF LEES – 2010 [12]

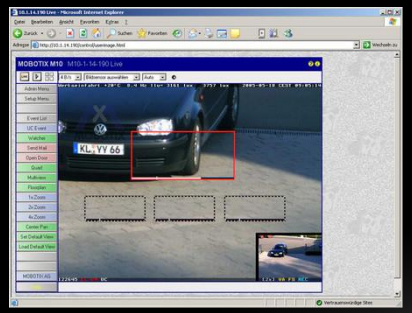
AUTOMATED BARREL LINE – 2012 [13]

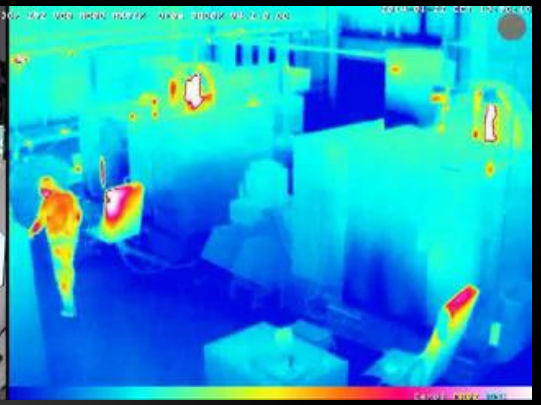
PRODUCT INNOVATION

- New Varieties Program
  - Viogner
  - Tempranillio
  - Vermentino
  - Pinot Grigio
  - Sangiovese
- Natural fermentation
- Low Alcohol wines
- Screw cap closure
- 2L cask

FUTURE INNOVATION = QUALITY AND SAVINGS

- Phone apps with data surfacing and interaction with SCADA and wine management systems
- Online metric data collection and reporting
- Wi-fi and Bluetooth replacing control wiring
- Ferment density measurement
- Harvest scheduling with GPS location of harvesters, trucks and load size prediction
- Thermo vinification for red must
- Vision systems through digital camera technology (visible and IR capture)
- Internet of Things

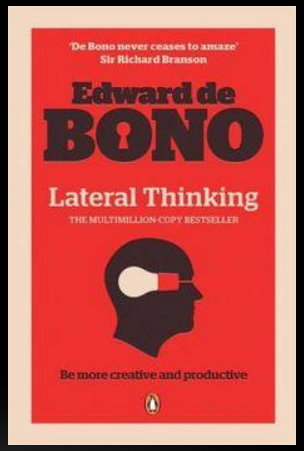


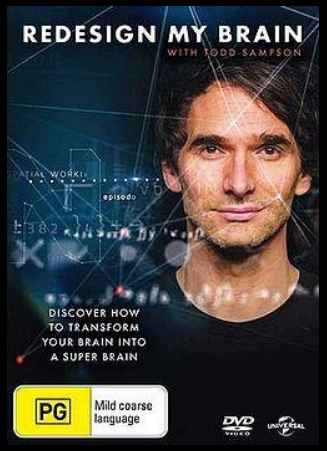


WHAT IMPEDES INNOVATION - ONLY OUR MINDS!

- Rockwell Automation – The Connected Enterprise
- Todd Sampson – Redesign My Brain
- Brain Games – National Geographic
- Edward DeBono – Lateral Thinking

"The chains of habit are too light to be felt until they are to heavy to be broken." Warren Buffett





"Nothing is too wonderful to be true, if it be consistent with the laws of nature." Michael Faraday

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