Our Future World
Trends, Risks and Scenarios

Stefan Hajkowicz and James Moody
With input from over 50 CSIRO scientists and business analysts
Thinking about the future in the past…

A CSIR Council Meeting in 1935

How would their world change?

Darwin, 19 February 1942

Australian War Memorial www.awm.gov.au

National Museum of Australia

Suburbia
Everyone wants to know

Survey of 8,500 global executives and 25 futuristic planning tools.
Finds rapid growth in demand for these tools post September 11 as corporations need to handle an increasingly volatile world.

Different futures

More than forecasting...


- Actual oil price (other lines show predictions)
The Megatrends

- **More from less**
  - a world of limited resources

- **i World**
  - Digital and natural convergence

- **On the move**
  - Urbanising and increased mobility

- **A personal touch**
  - Personalisation of products and services

- **Divergent demographics**
  - Older, hungry and more demanding
More from less
a world of limited resources
More from less
Declining ore grades

Production of ore

Grade of ore

More From Less
Mining above the ground?

1 Tonne of mobile telephones yields:
- 50–150 kg copper
- 500–700 g silver
- 150–400 g gold

1 Tonne of ore yields:
- 3.7 kg copper
- 4.2 g silver
- 0.2 g gold
Evening shadows, backwater of the Murray, South Australia
H J Johnstone, Britain/Australia, 1835-1907, 1880, London
Source: The Art Gallery of South Australia
Some of the world’s leading coral reef scientists estimate that by 2030 60% of existing coral reefs will be destroyed.

Image source: Microsoft Clipart
Countries which share rivers have a statistically higher probability of military disputes. If the river basin is under drought stress the chances of war are higher again.

Image source: Microsoft Clipart
Three lines that matter …

Global Price Indices

- Energy
- Agriculture
- Metals & Minerals

Data source: World Bank, 2011

What Next?

Less Volatile

More Volatile

Index

Year

Data source: World Bank, 2011
GMO Commodity Index: The Great Paradigm Shift

Note: The GMO commodity index is an index comprised of the following 33 commodities, equally weighted at initiation: aluminum, coal, coconut oil, coffee, copper, corn, cotton, diammonium phosphate, flaxseed, gold, iron ore, jute, lard, lead, natural gas, nickel, oil, palladium, palm oil, pepper, platinum, plywood, rubber, silver, sorghum, soybeans, sugar, tin, tobacco, uranium, wheat, wool, zinc.

Source: GMO As of 2/28/11
A personal touch
Personalisation of products and services
A personal touch
Personalisation of products and services

Share of Services in Whole Economy

Source: PMSEIC Report on Services Innovation

Source: The Australian, IT News, 7 October 2009

Australia

Other OECD Countries

Source: PMSEIC Report on Services Innovation
It is estimated that 30% of a typical workday is lost processing irrelevant information.

And 42% of people admit to using the wrong information at least once a week.

Source: Basex survey, published by Xerox
Image source: Microsoft Clipart
The debt to asset ratio rose from 9% to 19% from 1990 to 2008. Australians now hold A$1.1 trillion worth of debt.

Source: Australian Bureau of Statistics (2009; Cat No 4102.0)
Image source: Microsoft Clipart
On the move
Urbanising and increased mobility
China needs to build 3 cities larger than Sydney every year until 2030 to accommodate rural to urban migration.


Don’t wait up. I’m stuck in traffic and I’ll be 2 weeks late getting home.
Ordos, China. A Modern day Ghost Town

Source: Time Magazine
Jet aircraft passengers worldwide travelled 4,621 billion kilometres in 2008 and this is forecast to rise to 12,090 billion by 2028.

This represents growth of 5% per year compared to global GDP of 3% per year.

Data source: Boeing Current Market Outlook 2009-2028
Image source: Stefan Hajkowicz
Divergent demographics
Older, hungry and more demanding
In 2005 5% of Indian citizens were middle class. It is forecast to be 20% by the year 2015 and 40% by the year 2025.

Data source: The Economist, 12 Feb 2009
Image source: Microsoft Clipart
The world must produce more food in the next 50 years than in the previous 500 years if it is to feed itself.

Data source: Dr Brian Keating, CSIRO Sustainable Agriculture Flagship
Image source: Microsoft Clipart

[Graph showing World food prices over years 1960 to 2010 with trends marked as 'Down' and 'Up']
In 2002 13% of Australians were over 65 years old.

It will be 27% by 2051.

Data source: Australian Bureau of Statistics (Cat. No. 3222.0)
Worldwide cause of death is shifting towards non-communicable diseases and accidents and away from infectious disease (Source: WHO, 2008; p8)
i World
Digital and natural convergence
Every device connected to the internet needs a unique IP address.

After 40 years we consumed 90% of 4 billion IP addresses.

A new system is planned which can accommodate $3.4 \times 10^{38}$ unique addresses.

Data source: ICANN (2007) Factsheet ipv6 – The Internet’s vital expansion
World

Digital and natural convergence
Last year’s mobile data traffic was three times the size of the entire global Internet in 2000
By 2015…

There will be 788 million mobile only internet users

And 138 million people will have mobile internet access but no electricity connection at home.
Mobile Data Traffic

Petabytes per Month

92% CAGR 2010–2015

VolP traffic forecasted to be 0.4% of all mobile data traffic in 2015.
Source: Cisco VNI Mobile, 2011
Disruptive Technologies
1. Automated mining

2. Electric travel

3. Energy efficient desalination

4. Smarter Smartphones

5. Augmented reality
6. Systemic risk analysis

7. Telomerase (biological cell immortality)

8. Deep brain stimulation

9. Artificial Intelligence

10. Natural language processing