



**A2EP – 2xEP Energy Productivity Summit**  
**04-05 April, 2017**  
**Australian National Maritime Museum**  
**Darling Harbour, Sydney**

**Session 03**

**2xEP by 2030 by sector – Agriculture**

*Peter Carter > presentation follows*

Andrew Chamberlin

Phil Shorten

Leigh Rostron

*Chair: Tony Westmore*



*Doing more. Using less.*



# WE ARE ON A MISSION TO CREATE OUR DATA-DRIVEN FUTURE

Peter Carter  
Data61 / CSIRO Commercial Engagement  
Digital Service Transformation & Innovation Partnerships

[www.data61.csiro.au](http://www.data61.csiro.au)



# THE OPPORTUNITY

**87%** OF COMPANIES  
THINK THEY WILL BE  
DISRUPTED IN THE  
NEXT **5 YEARS.**

ONLY **7%**  
HAVE A PLAN.

# AUSTRALIA'S DIGITAL INNOVATION POWERHOUSE

DATA  
61



**1100<sup>+</sup>**  
employees  
[including students]

**415<sup>+</sup>**  
students

**31**  
Government  
partners

**91**  
Corporate  
partners

**38**  
University  
partners

**190<sup>+</sup>**  
data-driven  
projects

**172**  
patents



# WE FOCUS ON EVERY ASPECT OF DATA R&D



- 1 Data capture and consumption
- 2 Communications and networking
- 3 Infrastructure
- 4 Hardware and software
- 5 Cybersecurity
- 6 Data statistics, modeling and analytics
- 7 Decision sciences
- 8 Behavioural economics and cognitive sciences

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CASE STUDY 

# FOOD SECURITY

Global Initiative for Honeybee Health

## IMPACT:

-  Intelligence and insights into the worldwide bee decline
-  Ensuring food security, the future of sustainable agriculture and the global economy
-  Continue to meet our food needs
-  Winner of the Tas iAward for Research & Development in 2014



# WIRELESS TECHNOLOGY

WiFi

## IMPACT:

- A **global revolution** in mobile computing and communication
- Wireless technology is used in an estimated **5 billion** devices
- Licence agreements generated **over \$430 million** in revenue
- European Patent Office Non-European Inventor Award for 2012
- Australian Prime Minister's Prize for Science in 2009.



# NEXT WAVE WIRELESS TECHNOLOGY

Wireless Broadband (Ngara)

## IMPACT:

- Increased data capacity up to 10Gbps Point-to-Point
- Reduced network infrastructure costs
- Fewer wireless infrastructure sites
- Increased value from our limited spectrum with spectral efficiency of up to 67bits/s/Hz Point-to-Multipoint
- Reductions in the digital divide



SCIENCE AND  
INDUSTRY  
ENDOWMENT  
FUND





# CYBERSECURITY

Trustworthy Systems: Secure Microkernel (seL4)

## IMPACT:

- **US\$7 million** US Government funding + **US\$17 million** for projects using seL4
- Boeing autonomous helicopter protected from cyber-attacks
- Rapid development of a seL4 ecosystem
- Will likely eclipse that of its predecessor (L4, which is deployed in the billions)
- **1000** citations of the kernel verification work



# AUTONOMOUS SYSTEMS

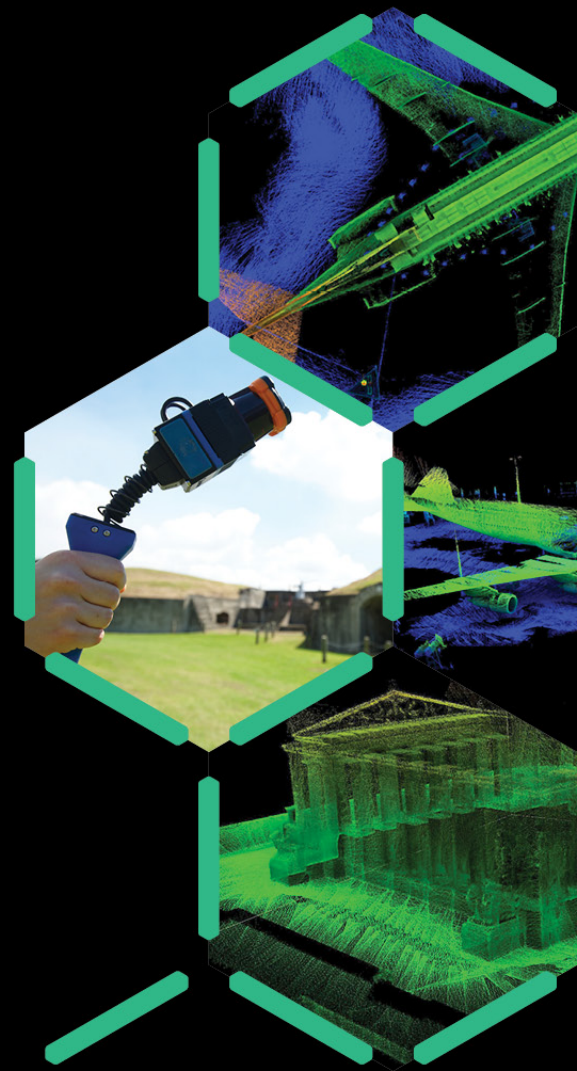
3D Mapping (Zebedee)

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## IMPACT:

- Off-limit environments that can now be mapped
- Technology has been demonstrated in a wide range of applications
- Licensed to GeoSLAM and used around the world
- Eureka Prize for Innovative Use of Technology in 2013
- Australia iAwards in the R&D category in 2013
- CSIRO Medal for Scientific Excellence in 2014








CASE STUDY 

# BIG DATA

Knowledge Discovery



## IMPACT:

-  World's first digital map of seafloor geology
-  Delivery of the GPlates Web Portal
-  Development and public release of the GPlates API, "PyGPlates"

ROZETTA



**MACQUARIE**  
University



THE UNIVERSITY OF  
**SYDNEY**

CASE STUDY

# TRANSPORT & LOGISTICS OPTIMISATION

Cost to Serve Project

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## IMPACT:

- Removed **11% of their fleet** from the road
- Drove **13.5 million** kilometres less
- Gross profit **improved by 10%**
- Winner 2013 Smart Award for Excellence in Transport and Logistics



CASE STUDY 



# FEDERATED SPATIAL DATA

Terria Software & Services

## IMPACT:

-  Used for NationalMap—3000 data sets from 30 Government agencies
-  Used by Australian Parliament House Library
-  Used by Australian Renewable Energy
-  Used in UN Environment Program initiative
-  Winner NSW iAward for Government Services in 2015



# ENGAGE WITH US



- **ACADEMIA**  
Enhanced industry-relevant PhDs  
Contributed academic staff
- **CORPORATIONS**  
Collaborative R&D  
Contract R&D  
New technology licensing
- **STARTUPS**  
Business and tech mentoring  
New technology licensing
- **FEDERAL AND  
STATE GOVERNMENT**  
Trusted advisor for policy  
and technology  
Contract R&D
- **Investors and entrepreneurs**  
Access to deep tech startups



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# A MOMENT IN TIME OPPORTUNITY

# CSIRO - POSITIVE IMPACT



- 5300 staff
- Over 2000 hold doctorates
- \$1.2 billion annual operating budget
- 2000+ industry partners totaling \$220 million+ per year

GLOBAL  
RANKINGS

**TOP 10**

applied research  
agencies globally

**WIFI**

ULTRABATTERY

**WASP**

INNOVATIONS

**TOP  
1%**

of global research  
institutions in 14 of 22  
research fields

**TOP  
0.1%**

of global research  
institutions in 4 of 22  
research fields

EXTENDED  
WEAR  
CONTACT  
LENSES

BUILDING  
IQ

**ZEBEDEE**



# WHAT SUCCESS LOOKS LIKE

## OUR TRIPLE BOTTOM LINE

AUSTRALIA'S  
INNOVATION  
ECOSYSTEM

ECONOMIC  
IMPACT

ENVIRONMENTAL  
AND  
SOCIAL IMPACT

# A GLOBAL INNOVATION NETWORK

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# D61



- ACADEMIA
- CORPORATIONS
- STARTUPS
- FEDERAL AND  
STATE GOVERNMENT
- INVESTORS
- ENTREPRENEURS