CSIRO'S DATA61:
AUSTRALIA'S LEADING DIGITAL INNOVATION NETWORK

FY2016/17 **YEAR IN REVIEW**

DATA 61

CSIRO

REFLECTIONS ON OUR FIRST YEAR

As CSIRO's Data61 completes our first official year of operations, this document captures some of the key results for the period ending June 30th, 2017. With the pace of progress, we don't often take measure of our accomplishments, but fiscal year end can give us a chance to reflect. This year was a transition year. In support of our strategy to lift our impact for the country, we shifted our focus from translating our research to create startups, to seeding new industries and supporting the scaling of existing ones. We stabilised and integrated operations after a lengthy period of uncertainty, we lifted the scale of our ambition, we defined a vision that our talented team is now realising, we rebuilt stakeholder confidence, we executed well on all of our third party delivery obligations globally and seeded a culture of excellence in everything we do. Science, technology and operations.

Data61 is here for Australia, our mission is to lead in creating Australia's data-driven future at a critical time in the country's history. We are witnessing unprecedented structural changes in our economy and our industries, through the convergence of IT, biology and materials science. Some refer to this as the Fourth Industrial Revolution. It's leading to a national imperative to scale existing industries and create new ones to continue to grow our economy and create jobs for this generation and for our kids.

Together with our government, industry, CSIRO business unit and 27 university partners, we are focused on helping to change the trajectory of the country from within. We want to help make sure that Australia fully capitalises on this Fourth Industrial Revolution. Others are also entrusting us with this responsibility. We are now being asked to take on larger scale, multi disciplinary projects for the country, with global implications. It is exactly what we set out to do, in areas like cyber security, personalised health and wellness, food provenance, biosecurity, pandemic response, and smart city initiatives including geospatial modeling and storable renewable energy.

Next year is shaping up to be an even bigger one for Data61, our team, partners and the impact we are having for the country. There will be challenges, some will misguidedly see us as a threat versus a catalyst for driving scale faster with partners in areas that matter for the country. Our biggest obstacle will be cultural. We will step up our influence to drive cultural change internally and nationally around digital and data-driven insights and enterprise. We have the talent, know how and stakeholder support to execute on our strategy.

This coming year we will continue to be leaders on important technology and data-driven opportunities for Australia. We will progress our integration with CSIRO and streamline our internal processes to accelerate the effective transition of our science and technology into the market. We will also be generous collaborators in Australia and overseas, operating with a growth mindset, challenging others in the system to move faster and think bigger while making it easier for others to team with us.

Focusing relentlessly on attracting and retaining the best global talent in the domains we operate in and creating a work environment where our science, technology and operations talent can do the best work of our careers is the number one priority for the year ahead. If we do that well, everything else will follow.

To the entire Data61 team, our partners and stakeholders, thank you for your incredible efforts, results and support. We are just getting started.

Adrian Turner

Adrian Turner
CEO DATA61 | CSIRO

INNOVATION THROUGH PARTNERSHIP

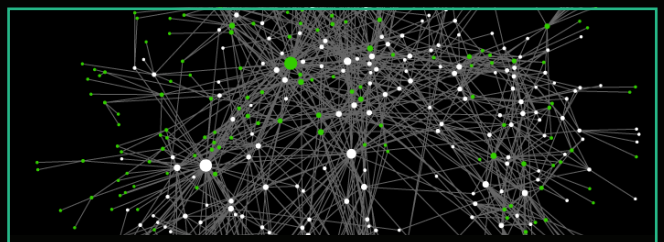
Building a digital innovation network with government, academia and industry is core to Data61's strategy. Our objective is to leverage off our deep science and technology expertise and co-create with our partners to both help them achieve their goals faster and further our mission of creating Australia's data-driven future.

Treasury facilitated Blockchain reports released

Over the past year, Data61 has engaged extensively with industry and government to deliver two reports on the regulatory, technical and societal implications of using blockchain based-systems across various industries.

The reports provide decision makers in business and government guidance on matters they need to consider in developing a system that uses blockchain technology.

http://data61.csiro.au/blockchain



DST Group/Data61 Cyber partnership

Data61 has entered into a $9.3 million partnership agreement with DST Group around cybersecurity plus has established collaborative research projects with nine Australian universities around jointly identified priorities.

The two organisations have also collaborated on the development of Cross Domain Desktop Compositor (CDDC) technology. CDDC allows isolated computer networks to be securely accessed and viewed through a single user interface.

The technology has recently won three 2017 SA iAwards.

https://research.csiro.au/tsblog

Vision processing wins award

Bionic Vision Technologies secured a $24m capital raise, enabling the company to continue with trials of the first Australian bionic eye implant.

Data61 and partners vision processing research is a key component of the bionic eye, transforming high resolution images into a set of stimulation signals on a retinal implant.

The team won the 2017 ACT iAwards for 'Consumer Markets' and 'R&D Project of the Year' categories.

http://research.csiro.au/data61/bionic-eye

Main partners: CSIRO's Data61, The Royal Victorian Eye & Ear Hospital, commercialisation arms of University of Melbourne and University of NSW, Bionics Institute, Centre for Eye Research Australia.

Risk Lab seeks value in uncertainty

Risk Lab at Data61 is affiliated with the Risk Lab global network which focuses on delivering innovative solutions and services in quantitative risk and optimal decisions under uncertainty for finance, insurance, mining, agriculture and cyber security.

The Risk Lab global network was founded in 1994 at ETH Zurich and University of Toronto, and has nodes in Germany, Spain, Finland and now Australia. Our Risk Lab in Melbourne provides the avenue for industry to engage directly with technologists and academia.

https://research.csiro.au/risklab

PROGRESS TO DATE

NICTA / Digital Productivity Integration

- Successful integration of NICTA and Digital Productivity into Data61
- Formed Data61 Advisory Board
- On-boarded ~300 team members and ~300 students
- Key new recruits in all functional areas
- Migrated to CSIRO processes and systems
- 22 concurrent sandbox experiments ongoing (3 rolling out across CSIRO)
- Focus on cultural alignment
- Launched Data61 alumni network

Science and Technology

- Data61 Science Vision published
- Cecile Paris and Gernot Heiser elected as two of the twenty-five new Australian Academy of Technology, Science and Engineering (ATSE) Fellows for 2016
- 350 scientific papers published
- ACT iAward for Vision Processing Bionic Eye team (x2)
- NSW iAward for KEH-Sense team (kinetic energy harvesting wearable sensor) (x2)
- TAS iAward for 'Sense-T Data Platform' – collaboration between Data61 and UTas
- QLD iAward for ExoMux Sky Fibre – collaboration with EM Clarity (x2)
- VIC iAward for Dive Mechanic 3D modelling tool
- South Australia iAward – Cross Domain Desktop Compositor (CDDC), with DST Group (x 3)
- $2m Gordon Moore Foundation Grant for Amazon rainforest biodiversity monitoring
- Review of technology and IP portfolio across D61 completed
- Increased emphasis on cyber security, blockchain and privacy enhancing technologies
- RapidAIM fruit fly monitoring: Delivered cloud platform and mobile app for field trials with farmers (Collaboration with Health & Biosecurity BU)
- Ecocentric smart power meters: Delivered cloud platform and API for load identification by machine learning (Collaboration with Energy BU)
- World first scientific risk assessment for synthetic gene drives and their precursors funded by DARPA and Gates Foundation (Collaboration with Health & Biosecurity BU)
- Played pivotal role in assessment of impacts of coal mines on water assets through the Bioregional Assessments Programme (Collaboration with Land & Water BU)

Collaboration

- New multi-year partnerships with VIC, ACT, QLD and NSW Governments
- Opening of Victorian CyberSecurity and Innovation Centre in Melbourne
- University collaboration agreements with 4 new universities (total now 27 unis)
- 329 ICT PhD students under scholarship
- Hosted 110 undergrad students in Data61's summer vacation program
- 3-year strategic partnership with DST Group around cyber-security
- Launched CISCO Innovation Centre in Sydney
- D61+ capability discovery platform "Expert Connect" launched
- Ribit platform is a growing community with over 10,000 students and 1000 startups and innovative companies and around 450 students matched for jobs
- Established Queensland Functional Programming Open Lab
- Established a new office within 'The Precinct', Queensland's new innovation facility in Fortitude Valley
- Released major new versions of the Australian Renewable Energy Mapping Infrastructure (AREMI) developed for the Australian Renewable Energy Agency (ARENA)
- Successful monthly releases of NationalMap for the Dept of Prime Minister and Cabinet
- Completed the SIEF-funded Big Data Knowledge Discovery project
- Launch of Treasury blockchain reports
- PM&C / Data61 dashboard launch to track state government performance
- Sydney Transport congestion planning with Transport for NSW
- Launched search and discovery platform for data.gov.au
- Hosted 9 APS Data Fellows
- Expanded the Girls Programming Network (with National Computer Science School) to provide coding mentorship for 100s of female school students
- Delivery of 9 innovation projects with Commonwealth Government agencies through the 'Platforms for Open Data' initiative
- Established Risk Lab at CSIRO as the Australia node of the global Risk Lab network

Breakthrough Innovation

- Established Product Management function
- Established Commercialisation function
- Emphasis on scaling existing and new industries v startups
- $75m capital raised by portfolio companies
- $24m capital raise by Bionic Vision Technologies
- $7.2m in equity divestiture transactions
- One planned portfolio company IPO
- 2 options granted to spin outs
- 3 major licensing deals
- 8 ventures in incubation
- 50 participants / 20 teams in the ON Accelerator Program, ON Prime (incl. in partnership with other business units)
- 51 patents granted and 72 applications filed
- Released first version of Regulation-as-a-Platform for government agencies

Customer First

- $135m of new multi-year contracts*
- $50m of new contracts in negotiation
- 273 project milestones completed (further 76 due by June 30)
- 128 new commercial engagements
- Targeted corporate accounts: Cisco, Boeing, Unisys, PwC
- Boeing Supplier of the Year Award (in collaboration with broader CSIRO)
- 20+ collaborator workshops run

Market Leadership

- Leading the National Data Innovation Group
- Additional national roles: Australian Cyber Security Growth Network, AeHRC BoD, ISA, NSW Digital Gov Advisory Panel
- Published 'Future of Work' report
- Keynote talk at AFR Business Summit
- AICD partnership, cyber webinar: ~1000 registrants, 480 attendees
- SINET61 (~200 attendees) + Melbourne SINET Investment Forum (~50 attendees)
- Established the Yow! Data Conference – a data-focused conference for software engineers
- 2nd annual D61+ Live event in Melbourne (700+ registered)
- Launched 'Sci+Tech in the City' weekly public tech seminar series in Melbourne
- Co-brand strategy results: 3,215 press mentions in 12 months to June 2017

Global Outlook

- US: Boeing, DARPA commercial engagements
- Singapore A*Star collaboration around Sunrise industries commencing
- Workshops run with Singapore National Research Foundation and Australian Academy of Science/universities
- MIT Media Lab Faculty / D61 partnership commenced
- 223 international conference trips
- 90 international keynote talks

*Includes NISA funding which started on 1 July 2016

EMERGING PLATFORMS

Platform business models are disrupting many existing industries around the world and will underpin much of the global economic transformation over the next decade. A key plank in our strategy around helping scale existing industries and seeding new industries is to seek to create the new platforms and services that will underpin new networked markets of the future.

Regulation as a Platform (RaaP)

We're currently working with government stakeholders to transform their rules into digital logic which can then be made available through Application Programming Interfaces (APIs) for companies to develop software and services.

Regulation as a Platform is a project that aims to maximise the value of regulation, as the key data set of government.

www.data61.csiro.au/RaaP

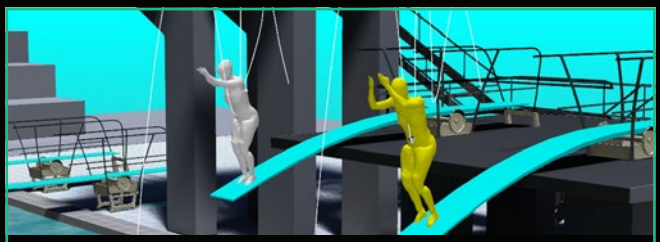
N1 Confidential Computing

N1 enables insights to be learnt from data in a confidential and encrypted manner.

A recent KPMG survey has revealed 82 per cent of respondents are no longer comfortable to trade their personal details for free services online.

Data61 scientists have developed a way to analyse data without seeing all the data, in such a way that preserves privacy and confidentiality while enabling richer data insights to be derived.

www.n1analytics.com



Workspace

Our Workspace platform offers scientists, researchers and business an easy way to analyse, model and visualise scientific data with a low cost path to commercialisation of the resulting software.

In 2016, our scientists worked with the Australian Institute of Sport and Diving Australia to produce Dive Mechanic which is a 3D interactive software tool for visualising and adapting dive technique.

Dive Mechanic won the R&D Project of the Year at the 2017 Victorian State iAwards.

https://research.csiro.au/workspace

Determinant: smart data acquisition

Determinant is a software platform that uses a technique called active learning, to make accurate predictions by estimating the information content of new data before it is acquired, so that each new data-point provides the maximum possible improvement to making predictions.

The technology can be applied to many industries; financial services, mining, government services, agriculture. This year, we have built the Determinant algorithms into a cloud-hosted software service.

http://data61.csiro.au/Determinant

MOVING FORWARD

Data61's mission is to lead in creating Australia's data-driven future at a time where we are seeing unprecedented structural change across the nation. Our vision is to see the scaling of existing industries and creation of new industries that will grow the economy and create the jobs for future generations.

We believe the solutions that are required will be directly underpinned by advances in data, science and technology. None of this will be possible however, without strong collaboration and partnership across the nation to build the collective ambition, capabilities and platforms needed to take on this challenge.

Building on the strong progress made in our first year, our 2nd year will be focused around the following strategic priorities:

- **Achieve Operating Metrics**: Deliver on CSIRO/Data61 Science and Technology excellence objectives and attract the best possible talent in Australia.
- **Grow the D61+ Network**: Strengthen our ties with Government, University and Corporate Partners as well as other CSIRO Business Units.
- **Seed new industries**: Develop new programs with corporates and SMEs and proactively work with our partners to build and implement strategies for seeding new industries.

MISSION	Lead in creating Australia's data-driven future in domains where we have competitive advantage to ensure our future prosperity and independence			
STRATEGY	Seed new data-driven industries for Australia through deep science and technology research and development			
DOMAINS/ ECOSYSTEMS	SAFETY AND SECURITY	SMART CITIES	DATA-DRIVEN HEALTH	
*PLATFORMS	AUTOMATED COMPLIANCE	CONFIDENTIAL COMPUTING	SMART CONTRACTS	CAPABILITY DISCOVERY
	FOOD PROVENANCE	SPATIAL INTELLIGENCE	ENVIRONMENTAL AND ASSET RISK	OPEN DATA MANAGEMENT
TECHNOLOGIES	Formal methods, privacy enhancing technologies, distributed ledgers, federated data integration, spatio-temporal inference, sensing and localisation, robotics, computer vision, machine learning, natural language processing, modelling and simulation, computational trust			
RESEARCH PROGRAMS	CYBER PHYSICAL SYSTEMS	MACHINE LEARNING AND ANALYTICS	SOFTWARE AND COMPUTATIONAL SYSTEMS	DECISION SCIENCES
#SCIENCE VISION	Data you can trust. Technology that works for you			

MARKET CONTEXT

SCIENCE AND TECHNOLOGY

* Platform focus areas will continue to be refined during FY17/18 as we build momentum

www.data61.csiro.au/en/who-we-are/our-science-vision

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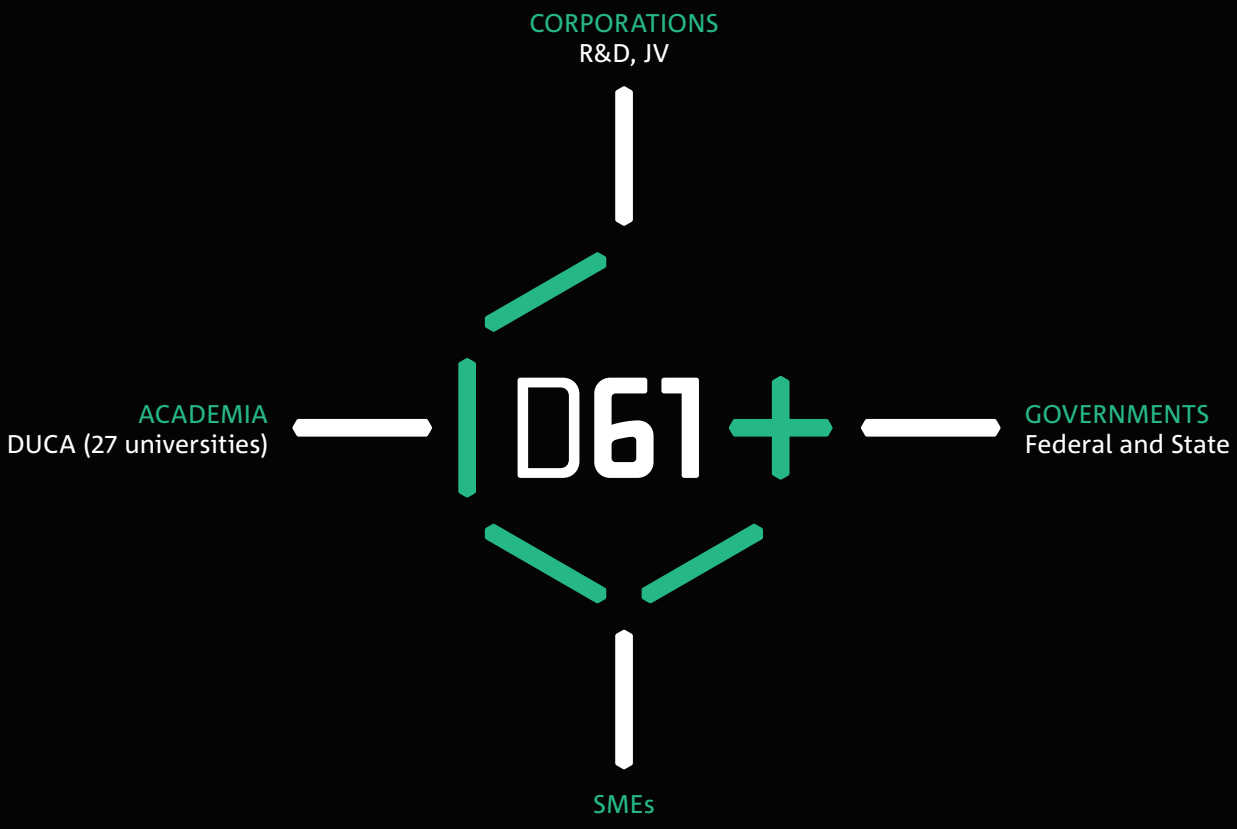
WE DO THE EXTRAORDINARY EVERY DAY

We innovate for tomorrow and help improve today – for our customers, all Australians and the world.

WE IMAGINE
WE COLLABORATE
WE INNOVATE



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