



Cyber technologies for SME growth – Barriers and Solutions

Dr Liming Zhu

Research Director, CSIRO's Data61

Australia's National Science Agency



CSIRO's Data61: Australia's Largest Data & Digital Innovation R&D Organisation

1000+
talented people
(including affiliates/students)

300+
PhD students
30+
University collaborators

200+
Gov &
Corporate
partners

Data61
Generated
18+ Spin-outs
130+ Patent groups

**Responsible
Tech/AI**

Privacy & RegTech
Engineering & Design of
AI Systems

**Resilient &
Recovery Tech**

Cybersecurity
Digital Twin
Spark (bushfire) toolkit

Facilities

Mixed-Reality Lab
Robotics Inno. Centre
AI4Cyber HPC Enclave

Home of
Australia's
**National AI
Centre**



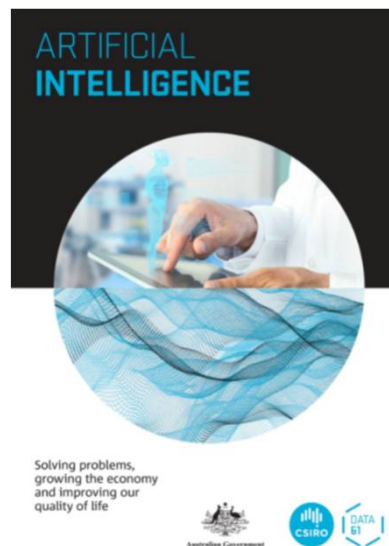
National AI Centre

\$53.8 million National AI Centre

- Lifting Australian businesses' AI capability
 - **drive business adoption** and the use of transformative AI technologies to improve productivity and lift competitiveness. [SEP]
 - **Focus on SMEs** & across multiple sectors
 - **Equipment/tools/training/links**
- Data61 to lead/coordinate – Themes
 - Responsible AI (**including cybersecurity**)
 - AI Diversity and Inclusion
 - AI at Scale (**including cybersecurity**)

Cyber technologies for SME growth – Barriers and Solutions

- **~250 scholarships, industry placements**
 - Next Generation Artificial Intelligence Graduates Program
 - Next Generation Emerging Technology Graduates Program – **Cybersecurity**
- Data61 to manage the programs
 - <https://www.csiro.au/nextgen>





Are SME Ready? SME Challenges

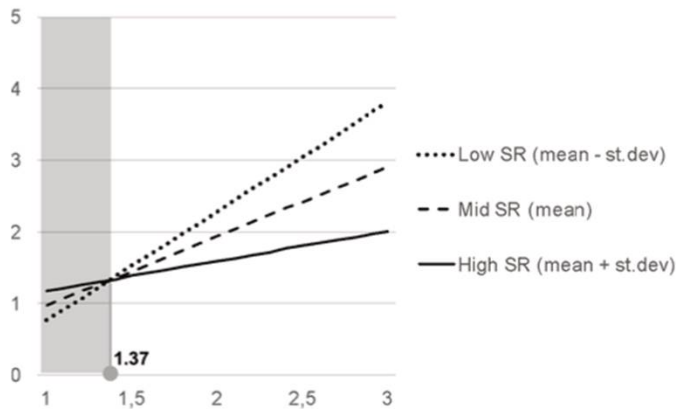
- Limited domestic demand calls SMEs to export
- Digital revolution calls SMEs to pursue innovations like AI/Cyber for competitive advantages. **Cybersecurity** key for
 - joining global digitized value chains as suppliers,
 - connecting in integrated business networks,
 - targeting global customers with competitive and personalized offers...
- Pressures for cybersecurity posture, sustainability practices/ESR and ethical, legal and social aspects (ELSA) of technologies

Adapted from

Cyber technologies for SME growth – Barriers and Solutions

Internationalization, digitalization, and sustainability: Are SMEs ready? A survey on synergies and substituting effects among growth paths
Stefano Denicolai^a, Antonella Zucchella^a, Giovanna Magnani^{a,*}
^a Economics and Management, University of Pavia, Via San Felice 5, 27100, Pavia – IT, Italy

Benefits of Adopting AI/Cyber



- AI/Cyber adoption significantly improves export intensity (EI)
- Small enterprises struggle to exploit the benefits in sustainability investments.
- The turning point is at AI/Cyber = 1.37: after this threshold, AI/Cyber readiness is a strong driver for EI.
- This implies a two-speed scenario for SMEs
 - **those who are now investing significantly in AI/Cyber will be ready to benefit from future opportunities of global market and sustainability trends,**
 - whilst those who are not, will remain trapped in their lack of competencies/resources.

Fig. 2. Interaction among Artificial Intelligence Readiness and Sustainability Readiness in fostering international performance.

Internationalization, digitalization, and sustainability: Are SMEs ready? A survey on synergies and substituting effects among growth paths

Stefano Denicolai^a, Antonella Zucchella^a, Giovanna Magnani^{a,*}

^a Department of Economics and Management, University of Pavia, Via San Felice 5, 27100, Pavia – IT, Italy



SME adoption of Cyber - Barriers

Skills/Capacity shortage to explore adoption and R&D alone

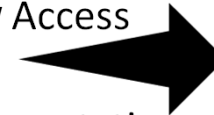
One-to-One R&D engagement model doesn't scale

1. Research projects and researcher placement via [SME Connect](#)
2. Corporate Research Centres and Projects ([CRC](#) & [CRC-P](#))
3. Ad hoc engagement
4. ...

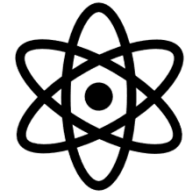


Solutions - Scaling-up **One-to-Many** R&D models

1. Open source ecosystem
2. Data commons
3. Living labs/Open Labs/Community hubs
4. Technology as a platform/Early Access
5. Shared infrastructure
6. Standards and reference implementations...
7. ...



For SMEs



Shared characteristics among all models

1. Global value chain ready
2. Connections to government, defence and bigger firms
3. Dual-use technologies
4. Multi-sided markets..

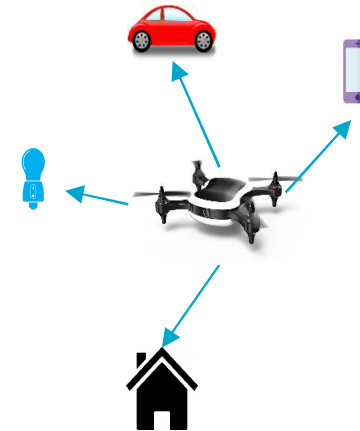


Solution 1: Open Source Ecosystem

- Data61
 - releasing open source components that are co-developed with MNCs and major global supply chain customers
 - Building local capabilities and a talent pipeline
- SMEs
 - Using the components for easier integration into global supply/value chains
 - Access to local capabilities and talents

Example

- SMIT (Secure and Modular IoT System)
 - Co-developed with a major global aerospace manufacturer
 - <https://www.smit-project.com/>



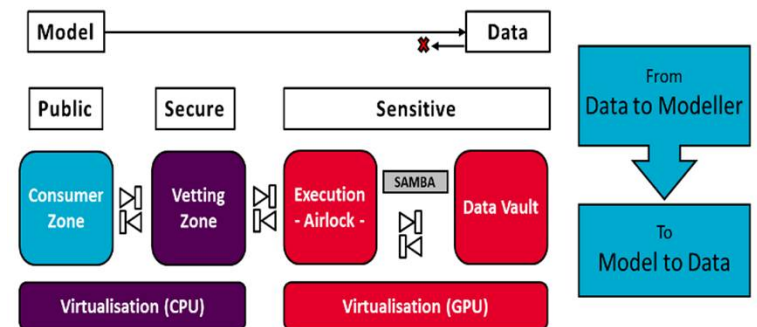


Solution 2: Data Comms for SMEs

- Data61
 - Facilitating the creation of valuable datasets among companies via data commons or other arrangements
 - Making them accessible to SMEs and researchers securely
- SMEs
 - Contributing to and accessing valuable datasets without worrying about commercial confidentiality
 - Accessing to researchers

Example

- Data61 is the Australian coordinator for collecting and sharing industry data for research, organised by US DHS
- Enabling technologies such as Data Airlock for accessing data securely in a model-to-data paradigm





Solution 3: Living/Open Labs & Hubs

- Data61

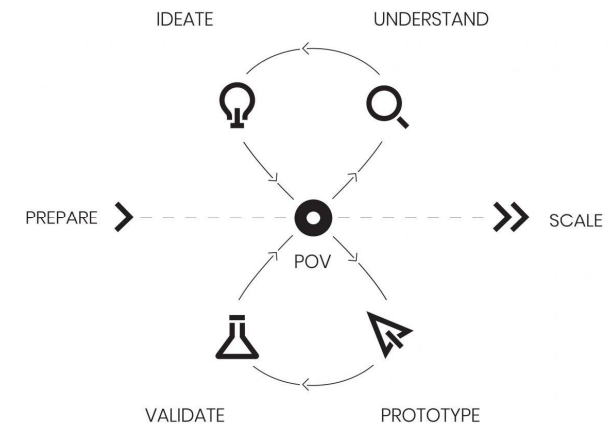
- Similar to MIT Media Lab and other successful living labs around the world
- Benefits
 - Access to D61+ network, top researchers, exclusive events, research results...
 - Send visiting fellows and employee-in-residence
 - Free trials of new technologies
 - Royalty-free licensing rights for some IP
 - Influence future technology and roadmaps
 - Access to student talent and co-definition of projects
 - ...

- SMEs

- All the benefits + interaction with other key members of the labs

Examples

- Supply chain
- Digital trust
- Mixed reality
-





Solution 4: Technology as a platform/Early access

- Data61
 - Building technology platforms with APIs and integration points for “applications” on top
- SMEs
 - Building “applications” on top of proven technology platforms
 - Leverage the platform’s competitive advantage and the Data61 brand
 - Access to expertise and special features

Examples

- Macrokey <https://www.macrokey.io/>
 - self sovereign identify for business and critical supply chain
- Supply chain compliance platform





Solution 5: Shared infrastructure

- Data61
 - Shared research infrastructure
 - Shared trusted digital infrastructure to connect SMEs with wider business network
- SMEs
 - Accessing to advanced digital infrastructures for R&D or transactions

Examples

- HPC for Cyber/AI
- “Virtual Hub/Lab” for AI/Cyber
- Blockchain-based trusted infrastructure
 - Critical supply chain for SME
 - Smart money for SME service providers
 - Smart contracting infrastructure for SMEs





Solution 6: Reference implementation of Stds

- Data61
 - Providing reference architecture, reference implementations and exemplars for complex standards for SME context
 - Automated conformance/compliance assistance
 - Operationalising high-level ethical principles
- SMEs
 - Using reference architecture, implementations and exemplars to reduce conformance cost and accelerate time to market.

Examples

- [Automating compliance for Trusted Agrifood Exports](#)
- Consumer Data Right [standards](#) for Fintech and other SMEs
 - security profiles
- Cybersecurity standards and conformance
- [Operationalising ethical and Responsible AI](#)
 - [AI and Cybersecurity](#)
- ...



How to Begin Your Journey





Collaborating with Data61/D61+ Network

Collaborative **R&D projects** with Data61 & its network

Trialling and licensing technologies

Trying one of the **scaled-up models**

Deep **partnership via shared technology roadmaps**

Provide **feedback** on models

Contact:

Liming.Zhu@data61.csiro.au

Wilma.James@data61.csiro.au