EMERGING TECHNOLOGY IN AUSTRALIA
THE INTERNET OF THINGS (IOT) OVERVIEW

- The IoT Alliance Australia (IoTAA) forecasts that IoT will contribute over $83 billion to the Australian economy by 2025.
  - IoT in Australia is already worth close to $13 billion, representing 22% of the current ICT market.
  - IoT-related products and services are expected to grow at 14% CAGR over the next 5 years.
- The increasing application of IoT technology and growth in the sector is being driven by:
  - Decreasing costs and improved quality of IoT hardware
  - Greater availability of internet connectivity
  - Increased computing power and a surge in cloud platform adoption and data analytics
  - Rising demand for smart devices
  - Increases in the number of government initiatives and available funding
- In 2017, the IDC Asia Pacific IoT Readiness Index ranked Australia as the 4th most capable and prepared country in the region for sustained IoT adoption.
THE INTERNET OF THINGS (IOT) OVERVIEW

- In 2017, Telsyte, an Australian technology analyst firm, surveyed a representative sample of 302 Australian CIOs and IT decision-makers. The study revealed that:
  - 90% of CIO’s believe IoT will become important or critical to their organization within 5 years
  - 29% of Australian organizations are actively investigating devices and an IoT strategy
  - 23% of organizations are in the test, development or production phase of IoT pilots or programs
- One of the most significant challenges related to IoT adoption in Australia is data and network security.
- In response to growing reports of data integrity attacks, the IoTAA developed an industry-wide Internet of Things Security Guideline to act as an industry benchmark. As such:
  - Local and international companies that endeavor to develop IoT products and solutions with a pre-emptive, in-built, security by design approach will be well received.
  - Companies must also be able to successfully demonstrate effective data and network security to potential end users of the technology.
THE INTERNET OF THINGS (IOT) OPPORTUNITIES

Smart Cities & Smart Infrastructure

- Councils and local governments are proactively developing smart city plans and embracing new IoT technologies through pilot programs and project rollouts.
- These initiatives have leveraged IoT technology to develop solutions that enhance the livability, productivity and sustainability of cities by addressing challenges concerning: Energy efficiency, Mobility, Smart buildings, Smart water and waste management.
- The federal government’s $35 million Smart Cities and Suburbs Program has provided local governments with the financial capacity to engage with local and international companies offering IoT products and services.
  - In November 2018, the outcome of the program’s second round of funding was announced, with 32 projects receiving over $14.5 million in government funding.
  - This followed the announcement of the round one results in November 2017, in which 49 projects were awarded a total of $19.5 million in funding.
  - The City of Darwin was awarded $3.5 million towards their Switching on Darwin project, involving the implementation of an open IoT platform with the capacity to integrate city-scale smart infrastructure and smart services (lighting, parking and Wi-Fi).
  - In May 2019, the City of Gold Coast announced the rollout of a national-first IoT/LoRaWAN network. The network will be used to introduce smart services including smart water meters, waste management services and parking.
THE INTERNET OF THINGS (IOT) OPPORTUNITIES

IoT at Home
- In 2018, the IoT at home market was worth $765 million, and the forecast is for the market to reach $3.7 billion by 2023.
- IoT adoption amongst Australian consumers grew by 57% in 2018.
- Over 50% of total Australian households have at least one IoT at home product installed.
- Of the 5 million households adopting IoT at home devices, 1 in 4 are ‘invested’ in smart technology (i.e. have at least 5 different home IoT products installed).

Digital Health
- The sustained adoption of IoT technology in the healthcare market is set to potentially deliver annual benefits of $23.5 - 47.5 billion to the Australian economy over the next 8 to 18 years.
- While other industries have reinvented their delivery models, technology base and value chain, healthcare delivery in Australia has remained relatively unchanged and is only now beginning to embrace emerging technologies such as IoT.
- With the previous industry models becoming increasingly unsustainable in the face of growing demand, the potential impact of IoT on the broader healthcare sector is enormous.
THE INTERNET OF THINGS (IOT) OPPORTUNITIES

Digital Agriculture, Fishing and Forestry
- In this sector, the adoption of IoT technology can aid primary producers to increase yields and reduce costs.
- Digital agriculture is a rapidly developing market with Australian farmers increasingly making use of sensor data and data analytics to overcome challenges posed by the harsh Australian environment, limited water supplies, and large distances to markets.
- The application of IoT to digital agriculture is also being driven by increasing government funding initiatives and programs.
  - The Victorian government announced an investment of $8.5 million to fund a 2 year On-Farm IoT Trial, which is currently being rolled out across the state. By the end of the trial, there will be up to 500 IoT enabled farms across 4 of the state’s largest agricultural sectors.

Construction
- Construction has been one of the slowest industries to adopt process innovations. As such, there remains significant opportunities in the sector with the sustained adoption of IoT technologies forecast to deliver $52 - 67 billion annually.
THE INTERNET OF THINGS (IOT) OPPORTUNITIES

Manufacturing
- The stable and controlled setting of manufacturing operations, combined with the number of ‘things’ involved (i.e. machines and sensors), creates the ideal environment for the deployment of IoT technologies.
- Forecasts suggest the industry could realize potential annual benefits between $35 – 61.5 billion over the next 18 years.

Mining
- Australia is a world leader in mining IoT applications.
- Rio Tinto employs IoT technologies in its AutoHaul autonomous heavy-haul rail system and Mine of the Future design in Pilbara.
- Competitor BHP Billiton deploys IoT technology in the design of its Mount Whaleback and South Flank projects.
- There are still significant opportunities for IoT adoption within the sector, which remains asset-heavy, device-rich and physically intense.
ROBOTICS & ARTIFICIAL INTELLIGENCE OVERVIEW

- Robotics and AI represent Australia’s biggest economic opportunity over the next 30 years.
- Between 25 and 46% of work activities in Australia could be automated by 2030.
- The robotics industry is comprised of more than 1,100 companies. It is estimated to employ over 50,000 Australians and generate more than $8.5 billion in revenue.
- Australia is a world leader in research into cyber-physical systems, computer vision, field robotics, simulation and robotic vision.
- The uptake of robotics and AI remains some distance from full potential:
  - In 2018, Australia ranked 18th in the world in the application of industrial robots.
  - Although awareness is high with more than half of organizations starting to adopt AI, Australia has begun to lag behind its regional neighbors:
    - Automation strategies and capabilities remain immature
    - 50% fewer Australian firms are engaged in automation compared to leading countries
- The government has recognized the need to invest in its robotics and AI capabilities.
  - The government has designated the development and implementation of automation technologies as a critical priority of both:
    - The National Strategic Innovation and Science Plan, Australia 2030: Prosperity through Innovation
    - The National Digital Economy Strategy, Australia’s Tech Future
  - The federal government has also announced a number of funding initiatives designed to develop and speed industry uptake of robotics and AI.
In June 2018, the government-funded Australian Centre for Robotic Vision released a Robotics Roadmap for Australia, the nation’s first robotics plan detailing how Australia can best harness the benefits of the new robotic and AI driven economy. The key recommendations made by the Roadmap include:

- **Industry**: encourage the formation of new high tech firms and automation in existing firms; encourage global tech giants to invest in Australia; assist SMEs in developing skills and capabilities to take advantage of robotics
- **Education**: build national capability through education, training and research
- **Government**: lead the region in catalyzing robotics activity by setting ethical, legal, regulatory and standards frameworks, and adopting robotics in government services
- **Culture**: develop a national robotics strategy, support an entrepreneurial culture, and harness the nation’s imagination through aspirational goals solving challenges

One by-product of the Roadmap has been the formation of the Sixth Wave Alliance (SWA).

- The SWA consists of government agencies, university and industry joining forces to create the critical mass needed to tackle robotics and automation challenges.
- Its aim is to put Australia on the map as the global leader in robotics.
In the last 3 years, the federal government has announced a number of funding initiatives as part of its push to increase the development and industry implementation of AI and robotics technology. These include:

- The 2018 – 2019 federal budget announced $21 million over 4 years to go towards strengthening Australia’s capability in AI and machine learning.
- The 2019 – 2020 budget announced a Streamlined Incentives Program worth $30.5 million over 4 years, as well as a further $109 million for the Additional Identified Skills Shortage Payment. Both programs are aimed at making it easier for employers – especially SMEs – to meet current and future workplace skill needs.
- In November 2018, CSIRO announced $24.5 million of funding for frontier research in space technology and AI.
  - AI and machine learning will received $13.5 million to target AI-driven solutions for areas including food security and quality, health and wellbeing, sustainable energy, and resources, resilient and valuable environments, and Australian regional security.
- In March 2019, CSIRO announced the building of a new purpose-built Robotics Innovation Center in Brisbane.
ROBOTICS & ARTIFICIAL INTELLIGENCE OPPORTUNITIES

Robotic Process Automation (RBA)
- RPA – the replacement of humans with software to perform repetitive rule-based tasks – have rapidly evolved to being increasingly central to real-world business practices.
- In 2017, the Australian and New Zealand RPA market was worth $150 million, and was forecast to grown annually at 45% over the next 4 years to reach $605 million by 2020.
- The Australia market presents significant growth opportunities, with businesses aware of the benefits of RPA, but most still in the early stages of adoption.

Manufacturing
- 80% of the value of the manufacturing sector comes from 4 major subsectors:
  - Food, beverage and tobacco products (27%)
  - Petroleum, coal, chemical and rubber products (19%)
  - Machinery and equipment (18%)
  - Metal products (15%)
- Australia leads the world in niche manufacturing for several high-value industries including medical technology and aerospace.
- There is a growing awareness among SMEs of how robotics and AI can increase their business capabilities and how technologies can be implemented step by step and without extensive upheaval.
- Areas of significant growth include:
  - Advanced manufacturing
  - Collaborative robots, the market for which is expanding rapidly with a CAGR of 40 – 50%
ROBOTICS & ARTIFICIAL INTELLIGENCE OPPORTUNITIES

Distribution Services
- Australia’s distribution services sector is worth $190 billion.
- In the digital landscape, their retail and logistics challenges are becoming more complex, and the sector requires robotics and AI solutions to improve:
  - Warehousing
  - Transport
  - Custom-facing retailing
- In May 2019, Australian supermarket giant Coles announced a deal with British firm, Ocado, to bring 2,000 robots as part of Cole’s decision to build 2 highly automated fulfillment and distribution centers.

Food & Agribusiness
- Australia’s agriculture sector generates $41.7 billion in annual revenue and is one of the country’s most productive sectors technologically.
- In April 2019, the establishment of Future Food Systems Cooperative Research Center was announced, involving:
  - $24.5 million of federal government funding over 10 years
  - $104.5 million from the Center’s 50 supporting commercial and research partners
  - The Center’s R&D focus: planning and logistics in linking growers to their market, developing smart indoor cropping, and creating hybrid and nutrient-dense foods and medical goods tailored to growing domestic and export markets.
ROBOTICS & ARTIFICIAL INTELLIGENCE OPPORTUNITIES

Construction
- Australia’s construction industry is worth $86.2 billion. It is heavily fragmented with over 328,000 businesses operating in the industry.
- While the industry remains labor intensive, AI and robotics technology is increasingly being integrated into operations in order to boost efficiency and improve safety.
- AI technologies are being used for managing projects, fields, risk, schedules, supply chains, equipment and materials, resources, subcontractors and costs.
- Increased demand for robotics solutions is being driven by the construction industry’s move towards pre-fabrication.

Space
- The space industry generates revenues of $2 – 2.8 billion and is comprised of 388 companies, 56 education/research institutions and 24 government agencies.
- There are significant opportunities for robotics and AI in activities relating to space manufacturing, space operations, and space applications and ancillary services.

Resources
- Australia is the world leader in mining automation technologies.
- Rio Tinto and BHP Billiton are leaders in remote mining & mining automation systems.
- There are significant opportunities for further application of robotics and AI in driving better safety outcomes, higher productivity, and providing more economical solutions for remote and small-scale extraction.
SOFTWARE OVERVIEW

- Australian IT spending will grow by 3.5% to $64.6 billion in 2019, and is then projected to increase further to $73.5 billion by 2022.
- Gartner has forecast enterprise software to be the fastest growing category of IT spend between 2018 and 2022.
- Improved online connectivity and the growing adoption of the subscription-based SaaS business model will continue to drive industry growth.
- The Australian software industry is dominated by large, global players.
- SMEs need to identify niche areas of expertise either through the delivery of new or advanced technology, or industry specific applications tailored to local conditions.
- Although the remote delivery of software solutions is becoming more readily accepted, those companies that have on-the-ground or in-country systems integration and support services appear to be more successful in winning business.
SOFTWARE OPPORTUNITIES

Cloud-Based SaaS
- Digital transformation and the rapid adoption of cloud computing services by corporations and government has created significant growth in the cloud-based SaaS sector.
- 84% of Australian organizations have cloud computing strategy.
- In 2018, a 25% increase in SaaS spending, saw Australian organizational expenditure on cloud services rise to $3.2 billion.
- For all the projected growth in the sector, entering the Australian SaaS market is challenging as the market is highly globalized and extremely competitive.
- SMEs looking to enter the market need to identify a niche, establish a local presence, and are likely to require capital investment.

Procurement – Government as a key software consumer
- Federal government agencies have spent nearly $7 billion annually on ICT products and services in recent years.
- Since 2015, the government has been progressing a Digital Transformation Agenda.
  - They have sought to streamline and simplify the procurement process, establishing the ICT Procurement Portal, an online marketplace that connects government buyers with eligible ICT suppliers.
SOFTWARE OPPORTUNITIES

Fintech
- Software products for the fintech sector – such as those which can analyze spending behaviors and offer automated financial advice – are anticipated to generate significant interest from major banks and other financial services institutions in the next 3 years.
- KPMG’s fintech industry head predicted there was more opportunity to come as new open banking laws come into effect, creating opportunities for entrepreneurial tech-based companies.

Other
- In general, most sub-sectors of the Australian software market are dominated by large, multinational technology companies.
- SME software developers looking to enter the Australian market are recommended to follow the lead set by successful local operators:
  - Identify and focus on niche market segments and areas of expertise.
  - Seek to differentiate themselves by developing products that are tailored and better cater to the specifics of the Australian market.
    - Leading accounting software firm MYOB modified its software packages to adhere to Australian reporting requirements and incorporate local regulations and tax laws.
  - Establish a local presence or partnership with a local partner in order to provide on-the-ground systems integration and support services.
DIGITAL HEALTH OVERVIEW

- Australia’s expenditure on health in 2016 – 2017 was close to $125 billion.
- Combined, the Australian Government and state/territory governments account for over two-thirds of health spending.
- Other major funding sources include individuals, private health insurance funds, workers compensation and third-party insurance.
- Medicare provides universal health insurance that delivers affordable, accessible and high-quality healthcare for most residents. Individuals can also choose to obtain private health insurance to give themselves more options and cover extra costs (ex: dental, physio).
- While Australia's health sector is still digitally immature, research trials and digital health initiatives such as the My Health Record EHR system and establishment of fully-integrated digital hospitals, are contributing to and facilitating growth.
- ANDHealth’s CEP recommends that key stakeholders within the Australian healthcare sector focus on technology development, regulation, investment and implementation.
The key federal government agency responsible for improving health outcomes by enabling the delivery of digital health services is the Australian Digital Health Agency. In August 2017, the agency released the National Digital Health Strategy. It aims to achieve the following 7 strategic priority outcomes by 2022:

- Health information that is available whenever and wherever it is needed through My Health Record
- Health information that can be exchanged between healthcare providers and patients through secure digital technologies
- High-quality data with a commonly understood meaning that can be used with confidence
- Better availability and access to electronic prescribing and dispensing
- Digitally-enabled models of care that drive improved accessibility, quality, safety and efficiency
- That all healthcare professionals can confidently and efficiently use digital health technologies to deliver healthcare
- A thriving digital health industry that delivers world-class innovation
DIGITAL HEALTH OVERVIEW

Digital Hospitals
- Australia’s first hospital with fully integrated, digital eHealth capability, St. Stephen’s Private Hospital, was opened in December 2014. Since then, several other private and public hospitals have undergone digital transformation.
- Queensland’s integrated electronic medical record (ieMR) program was introduced in 2016 with the goal of implementing the ieMR solution in 27 public hospitals by 2021.
- As of June 2018, 8 hospitals/community health services had this digital capability.
- According to the Queensland Government, the rollout of their digital hospital program and implementation of ieMRs is reducing errors, improving patient outcomes and safety, and decreasing operating costs.

My Health Record
- The My Health Record EHR system provides access to the following types of healthcare documentation: shared health summary, event summary, discharge summary, specialist letter, eReferral, prescription and dispense records.
- Between July 2018 and January 2019, Australians had the opportunity to opt out. As of February 2019, 2.5 million Australians had opted out of the system, predominately due to concerns over the system’s security and data integrity.

Preventative Healthcare
- According to a report published by the Commonwealth Science and Industrial Research Organization (CSIRO), the adoption of innovative medical technologies and the development of a more diverse approach to collaboration will improve the Australian healthcare system and enable a sector-wide shift from illness treatment towards precision, preventative, and holistic health and wellbeing management.
DIGITAL HEALTH OVERVIEW

Remote Patient Monitoring
- The trend towards home-based healthcare and remote patient monitoring indicates that technologies such as mobile health apps, wearable fitness monitoring devices, and proactive wellness technologies will be used to improve patient monitoring.
- In December 2018, the Australian Digital Health Agency announced a $5.9 million Digital Health Test Beds trial to test the impact of digital technologies on the care of chronically ill patients.
  - One of the test beds will assist patients with chronic illness to better manage their own health using the MediTracker app, which links directly to their GP medical records and My Health Record.

Internet of Medical Things (IoMT)
- According to Vodafone, healthcare is one of the fastest industries to adopt to IoT technology. IoT enabled wearables, ingestibles, implantables and stationary devices are being used to track heart rates, issue medication reminders, send out emergency alerts, etc.
- CEO of the Australian E-Health Research Center agrees that there is evidence of a real increase in people using measuring devices to monitor their own health.
- In the aged care sector, IoT represents a powerful tool that can assist older Australians to live at home longer. Low-cost, non-invasive sensors, monitoring and support systems are being used in the home environment, however the uptake of the IoT by healthcare and aged care providers is expected to increase.