Australian Government
Department of Industry, Science and Resources

National Artificial Intelligence Centre

CSIRO

Australia's artificial intelligence ecosystem: growth and opportunities

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June 2025

industry.gov.au/NAIC

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Acknowledgments

We would like to thank all interviewees for their time and their invaluable insights. In particular, we would like to thank: Professor Joanna Batstone, Monash University; Emma Burns, Microsoft; Simone Dossetor, Insurtech Australia; Ben Finkel, Australian Regional AI Network; Robert Hillard, Deloitte Asia Pacific; Professor Eun-Jung Holden, School of Computing and Information Systems, The University of Melbourne; Professor Michael Kidd AO, International Centre for Future Health Systems, University of New South Wales; Chris Kirk, Stone & Chalk Group; Professor Jie Lu, University of Technology Sydney; Fernando Mourao, Seek; Professor Jeannie Marie Paterson, Centre for AI and Digital Ethics, The University of Melbourne; Professor Simeon Simoff, Centre for Artificial Intelligence, Western Sydney University; Jordan Wilson-Otto, elevenM Consulting. We also extend our thanks to colleagues across CSIRO and the Australian Government Department of Industry, Science and Resources (DISR) for contributing their expertise during the development of this report.

Disclaimer

The purpose of this publication is to provide data driven insights into the current state of Australia's AI ecosystem.

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Executive summary

This report gives an updated analysis of Australia's artificial intelligence (AI) ecosystem. It looks at the size, structure and specialisations of the AI workforce, companies and research activities across the nation.

We published 2 earlier *Australia's AI ecosystem* reports in 2023. This report aims to provide data-driven insights into the current state of Australia's AI ecosystem. This will allow decision-makers in both the public and private sectors make informed choices about investment opportunities, upskilling pathways and growth potential in the industry.

By understanding our current position and trajectory, Australia can better harness AI to drive economic growth, address societal challenges and secure a competitive position in the global AI landscape.

Strategic positioning and distinctive characteristics

- **Alignment with traditional strengths:** Australia's AI innovation is emerging organically from existing industrial capabilities rather than developing in isolation. It has high specialisation in sectors like specialised construction and chemical manufacturing.
- **Dual-track ecosystem:** Australia shows a distinctive hybrid positioning as a developed 'AI-taker' and a developing 'AI-maker'. It balances global technology adoption with targeted domestic innovation in areas of competitive advantage.
- **Research–industry alignment:** Geographical alignment between research specialisations and regional industry strengths creates naturally specialised innovation corridors. These corridors allow academic expertise to directly enhance industrial capabilities.
- **Evolutionary rather than revolutionary:** Unlike global trends emphasising pure software or consumer technology disruption, Australia's AI ecosystem has a more evolutionary approach that enhances and extends existing economic strengths.

Trends, patterns and specialisations in Australian AI businesses

- **A sample of Australian AI companies:** This report found a sample of 1,533 AI companies that contribute to Australia's AI ecosystem, including 1,121 private companies and 412 public companies. Of the private businesses, 110 were new, founded in 2023 or 2024. While the sample does not fully capture all AI companies, it highlights the substantial and growing presence of AI businesses in the ecosystem.
- **Adoption to innovation:** The Australian AI ecosystem largely focuses on how to adopt and integrate AI to enhance existing processes. Businesses are increasingly transforming operations with AI in response to new opportunities and competitive dynamics. At the same time, a growing number of companies and research teams are developing proprietary AI tools, though much of the ecosystem remains reliant on globally developed foundation models.
- **Concentrated urban clusters:** Analysis found 25 distinct geographical clusters containing 858 AI companies (68% of geocoded firms). Melbourne's central business district emerged as Australia's largest AI cluster with 188 companies, followed by clusters in Sydney, Brisbane and Perth.
- **Regional specialisation:** Each major cluster shows distinctive specialisation patterns. Perth focusing on resource applications, Canberra on government and defence, and regional centres developing niche capabilities, like digital media in Maroochydore on Queensland's Sunshine Coast.

- **Complementary sectoral focus:** Public AI companies primarily operate as adopters instead of developers. The strongest representation is in energy, raw materials and utilities (82 companies or 20% of public AI companies in our sample) and healthcare (77 companies or 19% of the public AI company sample). Private AI companies focus more on specialised innovation, concentrated in business processes (494 companies or 44% of the private AI company sample) and information technology (IT) infrastructure (346 companies or 31% of the private AI company sample).
- **Small enterprise dominance:** Small enterprises dominate our cohort of private AI businesses, with 85% of companies employing fewer than 50 staff. This creates a vibrant but potentially fragile innovation ecosystem.

AI research and product innovation patterns

- **Rapid expansion in research and development (R&D):** Australia's AI ecosystem is experiencing significant growth, with AI-related patents nearly quadrupling from 170 in 2015 to 629 in 2024. Over the same period, AI-related research publications more than doubled.
- **Research output growth:** Australia's AI research output grew from 5.3% of total scholarly publications in 2015 to 11.6% in 2024. This indicates an increasing prioritisation of AI research in the national innovation agenda.
- **Through the global AI surge:** Despite strong absolute growth in AI publications, Australia's share of global output declined from 2.6% in 2015 to 1.9% in 2024. This trend reflects the extraordinary global expansion of AI research – rising 218% from 206,160 publications in 2015 to 655,454 in 2024 – rather than a decline in Australia's productivity.
- **Distinctive research strengths:** Australia shows unique research specialisations in AI, with particularly strong specialisation in veterinary science, arts and humanities, and dentistry, indicating distinctive national capabilities.
- **Multidisciplinary integration:** AI methods have penetrated diverse research disciplines beyond computer science (18% of AI publications) and medicine (16%), extending to environmental, agricultural and social sciences.
- **Manufacturing-led patenting:** Ten manufacturing industries appear in the top 15 patenting sectors showing strong orientation toward enhancing traditional industries.
- **Knowledge-to-commercial gap:** Despite robust research output (93,302 AI-related publications between 2015 and 2024), Australia shows a significant gap in commercialisation. While the number of AI patents has grown, it remains low, with only 4,075 patents filed over the same period. This equates to nearly 23 research publications for every patent, highlighting a disconnect between research activity and commercial outcomes.
- **Resilient growth trajectory:** Despite global economic fluctuations, including the COVID-19 pandemic, Australia's AI R&D activities maintained consistent growth in both research output and patent applications, showing the ecosystem's resilience.

Dynamics of the AI skills and labour market

- **Recruitment drive:** In 2024, 1,532 organisations (3.8% of hiring organisations) sought workers with AI-related skills, up from 483 organisations (2.7%) in 2015.
- **Growing skills demand:** Requirements for technical AI-related skills have increased across all industries, rising from 0.2% of job postings in 2015 to 0.9% in 2024.
- **Concentrated hiring patterns:** AI hiring remains disproportionately concentrated, with 100 companies accounting for 58% of all AI job postings. Additionally inner Sydney, Melbourne, Brisbane and Perth accounted for 64% of position locations.

- **Diverse skill requirements:** AI-related job postings frequently mention both technical capabilities (machine learning, programming languages, mathematics) and broader skills (communication, management, leadership), indicating the need for multifaceted talent.
- **Emerging work clusters:** We found 8 distinct clusters of AI-related work. This includes business analytics, industrial process optimisation, scientific research, medical diagnosis, and training generative AI models, showing AI's integration across economic sectors.

The data compiled in this report tell a story of a rapidly expanding AI ecosystem with more skilled workers, more companies and greater intensity of R&D activity. Australia's AI ecosystem includes companies involved in building AI tools and models. However, its main strength lies in intelligently applying these powerful technologies to create practical business value across different sectors.

1. Introduction

This is the 2025 update of the Australia's artificial intelligence (AI) ecosystem report, following 2 earlier reports published in 2023 (Hajkowicz et al. 2023a; NAIC 2023). This report describes the size, structure and specialisations of the AI-skilled workforce, companies (startups, small, medium and large) and research and development (R&D) institutes across the nation. The report aims to give data-driven insights into the current state of Australia's AI ecosystem, enabling decision-makers in both the public and private sectors to make informed choices. It aims to inform investors about where to invest, workers about how to upskill and startups about where growth opportunities lie. It aims to inform policymakers about policy levers, and how to apply them, to catalyse growth and development of Australia's AI industry.

The data compiled and analysed in this report tells a story of a rapidly expanding AI ecosystem. With this comes increasing demand for AI-skilled workers, more companies and greater intensity of R&D activity in AI in Australia. It reveals an AI ecosystem primarily focused on adoption and adaptation of AI technologies. One that is working out how to effectively integrate this evolving toolkit into existing business processes to achieve productivity gains. There is also a significant and growing number of startups and research teams building highly novel and commercially valuable proprietary AI models, tools and systems. All of this highlights the potential to build capability in both AI adoption and homegrown AI development.

We are also seeing an increasing number of Australian businesses change the way they're working as AI changes operational workflows, reshapes competitive dynamics and creates entirely new market opportunities. AI is becoming deeply integrated into business process. While Australia has developed specialised AI models and tools in certain domains, our engagement in the development of large, complex foundation models has been more limited. Much of our AI ecosystem increasingly depends on access to AI foundation models developed and operated at the global level.

This 2025 edition of the National Artificial Intelligence Centre (NAIC) AI ecosystem report builds on previous research (Hajkowicz et al. 2023a; NAIC 2023), providing deeper analysis of the Australian AI ecosystem. It draws on a larger database of AI companies and skills than we could previously identify. It has an expanded definition of AI technology, given the rapid rate of technological progress and new AI products coming to market in the past 2 years. Through quantitative analysis and insights from 15 stakeholder interviews, the report describes 3 key components of Australia's AI ecosystem:

- public and private companies developing AI products or actively adopting AI
- research and patent activity to do with AI innovation
- AI-related jobs and skills in demand across the economy.

The report begins with an overview of recent developments in AI technology capability, emerging risks, investment patterns, proposed regulations and ethical frameworks. It then analyses Australia's AI R&D specialisations through research publications and patent activity. It has an examination of business activity across public and private companies, their industry distribution and geographical clustering. We also explore the evolving landscape of AI-related jobs and skills, and present emerging themes from stakeholder interviews addressing challenges and opportunities in innovation culture, leadership and strategic investment.

2. Changes since our last report

2.1. Technological advances

AI has seen transformative technological advances over the past 2 years. New capabilities are pushing the boundaries of reasoning, efficiency and real-world application. Breakthrough models like OpenAI's o1 demonstrated enhanced cognitive abilities in problem-solving. At the same time, cost-effective solutions like DeepSeek's R1 challenged the notion that only well-funded laboratories could dominate AI innovation (Perrigo and Pillay 2025). AI capabilities now match or exceed human performance in many domains, from language comprehension to image analysis (Roser 2022), while generative AI (GenAI) is revolutionising creative tasks (Nah et al. 2023). The pace of global AI adoption is rapid, with 72% of organisations worldwide now implementing AI solutions, up from 55% in 2023 (McKinsey & Company 2024). Of people surveyed by KPMG in 2024, 2 in 3 reported intentional regular use of AI tools – for personal purposes, work or study (Gillespie et al. 2025).

Since the beginning of 2025, AI foundation models (large, general-purpose systems trained on vast datasets) have rapidly evolved and gained broad adoption across multiple sectors in Australia and globally. Recent advancements have significantly improved the speed, accuracy and versatility of these models, enabling their use in real-time applications, mobile environments and secure enterprise systems. Enhanced capabilities now include stronger multilingual understanding, more efficient document processing, advanced instruction-following, improved logical reasoning and superior performance in mathematics and coding. These models are also being more deeply integrated into productivity tools, geospatial analysis platforms and digital assistants, and increasingly support conversational interactions informed by live web data.

AI foundation models are starting to cause industry-wide changes – or even restructuring – with the professional services sector being at the forefront. As deployment expands, so is the use of these models to power:

- question answering
- document summarisation
- software development
- data analytics
- customer service
- strategic planning
- policy design
- decision support functions.

Foundation AI models are an important part of the AI ecosystem and power many of the tools, processes and applications being developed in Australia.

Australia does not yet have globally dominant foundation models comparable to OpenAI's GPT or Google's Gemini. However, there is growing momentum in both training homegrown models and fine-tuning international models for local needs. The few examples of Australian proprietary foundation models include:

- Phoenix by Leonardo.Ai (part of Canva since July 2024), developed for AI-driven image generation
- SAIGE, developed by Sapia.ai, a Melbourne-based AI company, to conduct blind, chat-based job interviews
- Harrison.rad.1 by Harrison.ai, an Australian healthcare technology company. Launched in September 2024, it is a proprietary foundation model designed to interpret X-rays and generate clinical reports.

Beyond the foundation model and large language model (LLM) space, recent years have seen major breakthroughs in other branches of AI. In robotics, companies like Figure and 1X have made strides in integrating AI with general-purpose humanoid robots. This has led to OpenAI investing in Figure's AI-powered Figure 01 and NVIDIA partnering with multiple robotics startups to advance real-world dexterity and autonomy. In computer vision, advances in multimodal AI, including video understanding, have led to real-time object recognition and scene comprehension. This is seen in tools like Perceive from Amazon and Flamingo by DeepMind. In edge AI, Apple and Qualcomm have pushed the boundary of on-device intelligence, integrating neural engines and AI accelerators into consumer devices for privacy-preserving and energy-efficient inference. In scientific discovery, AI systems like DeepMind's AlphaFold and Isomorphic Labs' newer protein-structure prediction tools have transformed drug discovery pipelines. Meanwhile, autonomous systems in sectors like logistics, defence and mining rapidly mature, and AI-powered drones, vehicles and process optimisation tools show increasing levels of real-world deployment.

Australia has seen a wave of AI technology developments beyond foundation models in the past 2 years. In robotics and autonomous systems, SwarmFarm Robotics opened a major manufacturing hub in Queensland in 2024 to scale autonomous farm machines that reduce chemical use and boost productivity. In the legal sector, MinterEllison launched an in-house AI tool, Lantern, able to review 3,500 documents per hour – 58 times faster than manual review (Tadros 2024). Meanwhile, Heidi Health, a Melbourne-based company, offers an AI-powered medical scribe that transcribes patient consultations into clinical notes, case histories and other medical documents. Launched in February 2024, by March 2025, Heidi's AI scribe was active in over one million consultations weekly (Knowles 2025).

In scientific discovery, Monash University launched a GenAI tool in early 2025 designed to simulate scientific processes and accelerate research breakthroughs. National policy efforts also ramped up, with the federal government announcing the National AI Capability Plan in December 2024 to boost investment, skills and infrastructure in the sector. In industry, Pfizer integrated AI and robotics into its Melbourne pharmaceutical facility as part of a $98 million expansion, aiming to enhance advanced manufacturing and fight antimicrobial resistance. These developments highlight Australia's growing leadership in applied AI across agriculture, health, science and industry.

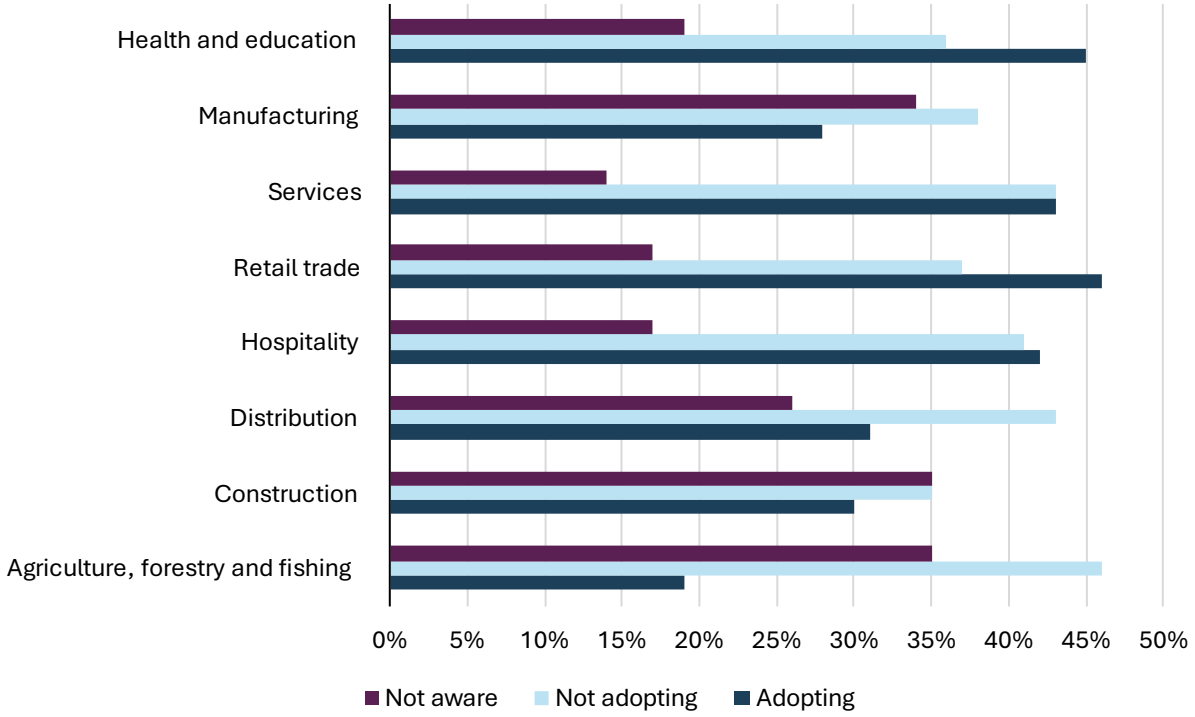
These and other such developments collectively signify a substantial shift in AI technology capability compared with only a few years ago. Even if there were no further advances in AI technology, the tools of today are sufficient to transform Australian industry. But likely, technological progress will continue apace, leading to deeper impacts. It is plausible that in the next few years, we will see the release of AI models with reasoning capabilities that exceed human comprehension.

2.2. Adoption patterns

Data on AI adoption in Australia are limited and often inconsistent across studies. However, there is a clear consensus that adoption has accelerated significantly across industries over the past 2–3 years. A study by Fifth Quadrant estimates that 37% of small and medium–sized enterprises (SMEs) have adopted AI use (NAIC and Fifth Quadrant 2025). Broader business adoption is even higher than for SMEs. A study by Australian Industry Group reported 52% adoption across businesses (AiGroup 2024). Additionally, a survey on AI deployment by the Governance Institute of Australia reported a 90% AI adoption rate among survey respondents (Governance Institute of Australia 2025).

The rise of GenAI has bolstered growing adoption: an estimated 63% of Australian businesses were using GenAI tools in 2024 (Abbott 2024). A network of AI Adopt Centres, announced in May 2024, is now operational and further supports responsible AI adoption. These centres help SMEs effectively adopt AI technologies and enhance their participation in both interstate and international trade (DISR 2024a, 2024c). The public sector is also embracing AI. The Australian Public Service Commission (APSC 2024) revealed that 60% of surveyed government agencies reported using GenAI tools in their work. While the adoption rates vary across sectors of the economy, the overall trend is a rapid increase in AI uptake across both private companies and government. This shows experimentation giving way to more concrete deployments (DISR 2024b; NAIC and Fifth Quadrant 2025).

Figure 1: Percentage rates of AI adoption across Australian industries, December 2024



Data source: NAIC and Fifth Quadrant 2025

Large enterprises in Australia have broadly embraced AI – many large firms are either using AI or actively planning to invest. In contrast, adoption among SMEs remains around one-third (DISR 2024b; NAIC and Fifth Quadrant 2025). A sizeable share of SMEs either lack awareness or have no plans for AI, 22% said they are not aware of how to utilise AI. A further 40% are not planning to use it yet. Smaller firms often stick to entry-level uses (for example, basic process automation or off-the-shelf AI services), whereas larger firms deploy more advanced, integrated AI solutions. Resource constraints and expertise gaps in the SME segment contribute to this divide. However, momentum is shifting; surveys indicate a growing number of mid-sized businesses intend to implement AI soon as tools become more accessible and the competitive need increases. One recent poll found 60% of Australian SMEs plan to use AI by 2026 (Silva 2025). Bridging this gap is a focus of policymakers, since broader SME adoption is needed for economy-wide productivity gains.

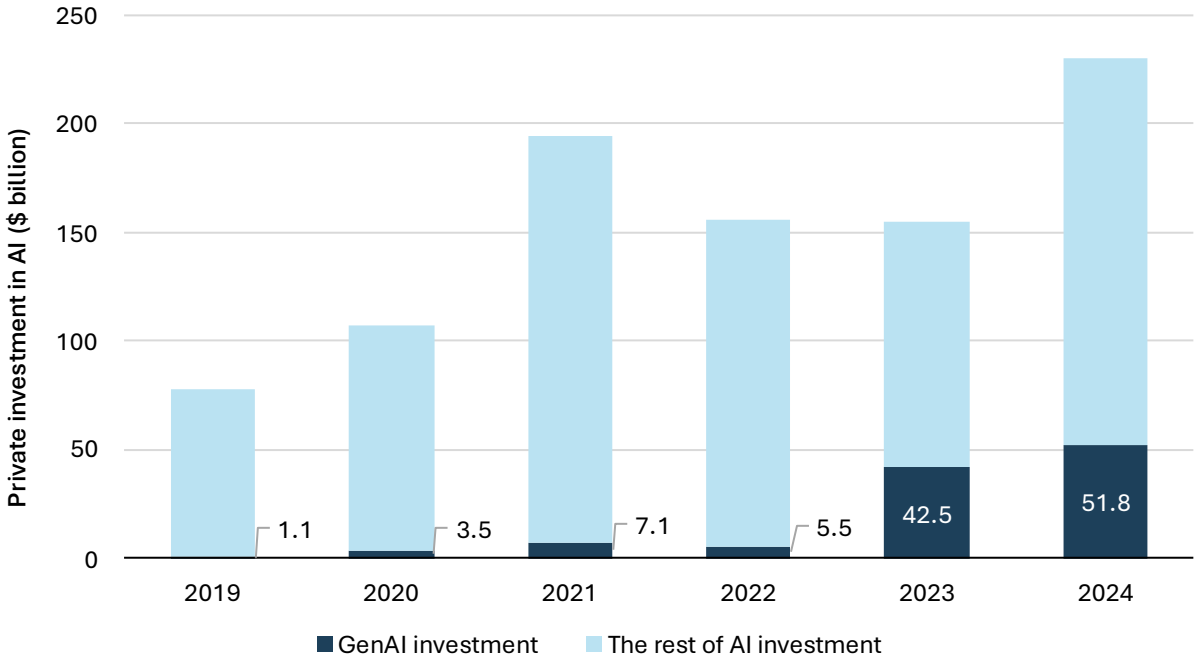
Research shows that, despite its promise, AI adoption faces significant implementation challenges. An estimated 80% of AI projects fail to progress beyond pilot stages – double the failure rate of conventional information technology (IT) projects. Among the key barriers to successful AI implementation, researchers cite insufficient governance, immature digital infrastructure, unclear human–AI roles and poorly chosen use cases (Gray and Shellshear 2024; Ryseff et al. 2024). Furthermore, 93% of business survey respondents report a lack of effective ways to measure return on investment from AI initiatives (Governance Institute of Australia 2025). In the GenAI field specifically, business surveys in 2024 identified the most recognised risks as output inaccuracy, intellectual property infringement, cybersecurity vulnerabilities, privacy concerns and regulatory compliance issues (McKinsey & Company 2024). The Governance Institute of Australia's AI deployment survey showed that 88% of respondents struggle to integrate GenAI into legacy systems (Governance Institute of Australia 2025). Business surveys highlight a notable gap between perception and practice regarding ethical AI implementation. Research by Fifth Quadrant revealed that 78% of organisations believe their AI systems align with established ethics principles. However, only 29% have implemented the necessary operational practices to ensure this alignment (Nuttall et al. 2024).

2.3. Investment trends

Global investment in AI experienced a moderate slowdown in 2023–24 following the peak funding levels of 2021. Despite this broader trend, funding for GenAI technologies surged dramatically. According to the Stanford University AI Index Report 2025, private investment in GenAI reached an estimated $42.5 billion in 2023. This is an almost 8-fold increase from the previous year (Maslej et al. 2024). This substantial growth reflects increasing global interest in the transformative potential of GenAI technologies, such as LLMs and sophisticated text-to-image systems.

Global corporate investment in AI rebounded in 2024, rising 48% from 2023 — the first increase since 2021 (Maslej et al. 2025). While overall AI investment has fluctuated since 2019, funding for GenAI technologies has shown consistent growth. This upward trend continued in 2024 following the significant surge in 2023. According to the AI Index Report 2025, private investment in GenAI reached an estimated $51.8 billion in 2024, marking a 22% increase from the previous year. This sustained growth highlights the rising global interest in the transformative potential of GenAI technologies, such as LLMs and advanced text-to-image systems.

Figure 2: Private investment in generative AI (GenAI) and total investment in AI globally



Note: United States (US) dollars have been converted to Australian dollars using the exchange rate for the end of each financial year as published by the Australian Taxation Office (ATO 2025).

Source: Stanford AI Index Report (Maslej et al. 2024, 2025)

The United States of America (USA) maintains its dominance in the global AI investment landscape. In 2024, it attracted $166.4 billion in private AI investment – 11.7 times more than China, which ranked as the second-largest recipient (Maslej et al. 2025). Aside from these 2 countries, private investment in AI remained between around $1.5 billion (for example, Italy, Japan, Netherlands) and $6.1 billion (for example, Sweden, United Kingdom). AI in Australia received $0.7 billion in 2024, concluding the list of top 20 nations by private investment in AI as tracked by the AI Index Report 2025 (Maslej et al. 2025).

The divergence in investment patterns underscores the strategic importance placed on AI technologies by US enterprises and venture capital, even amid broader economic uncertainties. The investment gap suggests a widening disparity between regions in AI capability development and market readiness for advanced applications.

However, examples of recent deals highlight the growing momentum in Australia's AI startup ecosystem. Relevance AI, a Sydney-based company focused on AI agents for workflow automation, recently raised

$24 million (Park 2025). Heidi Health, based in Melbourne, is expanding its AI-powered clinical productivity tools with a $16.6 million capital injection (Knowles 2025). Harrison.ai, a leading health technology company developing AI solutions for medical diagnostics, secured $32 million through the National Reconstruction Fund to scale its technology. It is already in use across more than 1,000 healthcare facilities worldwide (NFRC 2025). These investments underscore Australia's strengthening capabilities in both AI development and commercialisation.

2.4. Ethics, policies and regulation

The year 2024 marked substantial activity in AI regulation globally and within Australia. Throughout 2023–2024, multiple countries introduced AI-specific regulatory frameworks, emphasising ethical use, fairness, transparency and human oversight in automated systems (ISED 2023; US Congress 2024). Supporting global governance efforts, the International Organization for Standardization released ISO/IEC 42001:2023, establishing the first international standard for AI management systems. It has comprehensive requirements from establishment to continuous improvement (ISO 2023).

In Australia, the government released the Voluntary AI Safety Standard in September 2024, promoting safe and responsible AI development and deployment by Australian businesses (NAIC 2024b). A paper proposing the introduction of mandatory guardrails for AI in high-risk settings applications accompanied this initiative (NAIC 2024a). These achievements, alongside broader privacy reform, exemplify a shifting regulatory landscape aimed at delivering greater regulatory certainty and addressing the risks of AI misuse and failure. Industry and government stakeholders increasingly collaborate on practical implementation guidelines, with growing commitments to oversight and accountability in AI adoption across sectors.

Responsible and ethical AI has emerged as a cornerstone of the Australian AI ecosystem since 2023. Australia currently ranks 10th globally in the Global Index on Responsible AI (Adams et al. 2024), standing out for strong government initiatives and robust engagement from private sector, academic and community organisations. Australia ranks particularly well (fourth globally) in addressing human rights dimensions of AI. This reflects significant government efforts to tackle bias and discrimination, and protect consumer and children's rights (Cantatore and Marshall 2021; Law Council of Australia 2023). However, Australia's ranking, based on federal government frameworks that address AI and approved before 1 November 2023, trails behind other leading nations in developing government frameworks. The frameworks focus on redress systems, competition authorities, impact assessment protocols and international cooperation initiatives. In contrast, European Union countries protect access to remedy and redress and impact assessments in the legally enforceable General Data Protection Regulation.

Since 2023, Australia has applied significant measures to advance responsible AI practices. The federal government introduced the *Policy for the Responsible Use of AI in Government* (2024), set clear guidelines for public-sector AI implementation. Standards Australia adopted AS ISO/IEC 42001:2023 (Standards Australia 2024), an international AI management standard that promotes transparency, ethical considerations and comprehensive risk management approaches.

Across industries, the adoption of ethical AI practices varies considerably in maturity and scope. Leading organisations are adopting a higher number of AI practices, while others remain in early developmental stages, particularly about accountability mechanisms and fairness protocols (Fifth Quadrant and NAIC 2024). The approach to responsible AI implementation remains sector-specific, with industries developing tailored strategies that effectively balance ethical considerations with innovation imperatives. A recent report highlights 5 examples of responsible AI use by Australian organisations (Governance Institute of Australia 2025), with other examples presented in Box 1.

Box 1: Examples of industry leadership in responsible AI

Public broadcasting: Public broadcasters are embedding responsible AI principles into AI workflows. A prototype GenAI platform integrates these standards into LLMs, enhancing accuracy, reducing bias and ensuring compliance, while supporting tasks like content curation and personalisation (ABC 2024; Seneque et al. 2024).

Mining: Autonomous robotics in mining improve safety by reducing risks from fatigue and weather. Remote operations centres oversee AI-driven haulage and drilling systems. They boost efficiency and adhere to Western Australia's Safe Mobile Autonomous Mining Code (Department of Mines and Petroleum 2015), based on a global model for risk management and human oversight.

Finance: Financial services are among the leaders in AI adoption nationally and globally (CBA 2024). AI enhances banking security, fraud detection and customer service while ensuring ethical compliance (Ghodosi 2024). Financial institutions use AI to detect financial abuse, strengthen cybersecurity and improve digital banking accessibility, alongside internal AI education programs to support responsible adoption (Khadem 2024; CBA 2025).

Agriculture: AI-driven farm data raise ownership and privacy concerns. The Australian Farm Data Code (NFF 2020) promotes transparency, helping farmers negotiate data terms, while national initiatives improve data-sharing practices, ensuring structured governance and collaboration (ARDC 2023).

Biodiversity and conservation: AI is supporting Indigenous-led environmental conservation by integrating traditional knowledge with analytics for biodiversity stewardship. This approach prioritises trust, data sovereignty and co-designed solutions, ensuring AI enhances – rather than replaces – cultural expertise (Rio Tinto 2025).

The adoption of safe and responsible AI governance practices can support industry to fast-track adoption, build confidence when experimenting with AI, and secure the intended benefits. The Australian AI ecosystem shows a growing desire for guardrails, clearer and timely guidance on best-practice approaches to AI governance. There is also a need for effective measurement and monitoring systems, as well as industry benchmarking frameworks to ensure alignment with ethical principles and standards. The practical translation of AI ethics frameworks into everyday operational contexts remains uneven across sectors and organisations.

High-profile cases, like the Alphabet's Wing drone trial (Naughton 2024; Phan 2024), highlight the challenges inherent in governing AI technologies. Particularly in balancing innovation objectives with public trust and accountability requirements. These incidents demonstrate the importance of robust oversight mechanisms, meaningful community engagement processes, and effective regulatory coordination across government and industry to prevent unintended consequences. Across industries, companies continue refining their approaches, with some successfully integrating AI ethics into strategic decision-making processes. Other companies navigate the complexities of implementation and compliance within evolving international and local regulatory frameworks.

2.5. Changes in our methods and data

In response to the evolving nature of AI technologies, applications and public perception, this 2025 edition of the NAIC AI Ecosystem Report introduces several key updates to:

- definitions
- data sources
- analytical methodologies.

These enhancements include expanding the scope of AI technologies analysed, broadening our definition of AI companies, and incorporating job advertisement data as a new signal of AI activity. We give more details of these changes in Box 2.

This report enhances patent analysis by linking technical classifications to industry categories. It also leverages LLMs to assess engagement with AI technologies by listed companies. The report benefits from significantly improved data platforms, including Crunchbase and The Lens (Box 2). While these

methodological changes limit direct comparability with previous reports, they deliver a more accurate, complete and contemporary representation of Australia's AI ecosystem.

Box 2: Changes in methods and data

1. *Expanded coverage of AI technologies:* We have broadened the scope of AI-related technologies included in our analysis. This will help to reflect the rapid advancements and the emergence of new tools and methodological paradigms. The number of AI-specific keyword search terms used to identify companies, patents and publications has increased to 337, enabling more inclusive identification of AI activity across diverse sectors.

2. *Revised AI company definition and taxonomy:* We have updated our definition and classification framework for AI companies to reflect market evolution. Before, our focus was limited to businesses whose core products or services were explicitly AI-related. This report recognises the growing cohort of adopter companies – organisations across diverse industries actively investing in AI capabilities as part of their operational strategy. The 1,533 companies included in this analysis represent a sample of Australian AI businesses that captures the breadth of activity across the national AI landscape. These firms contribute significantly to Australia's AI skill base and represent integral components of the national AI ecosystem.

3. *Inclusion of job advertisement data:* To enhance company identification processes, we have incorporated job advertisement data alongside traditional online company databases. Recruitment activity for AI-related roles serves as a valuable indicator of organisational AI engagement and active investment in AI capabilities. It helps to identify companies previously unaccounted for in earlier, more limited datasets.

4. *Improved patent analysis by industry*: This report includes deeper analysis of AI-related patent activity across economic sectors. Using existing concordance tables, we have translated patent data from the Cooperative Patent Classification system into International Standard Industrial Classification categories. This methodological refinement allows for more precise industry-level estimates of AI patenting activity both in Australia and global comparison.

5. *Use of large language models (LLMs) for company analysis:* We have employed advanced LLMs to analyse publicly available corporate reports and annual statements from ASX-listed companies. These models interpret natural language content to assess the extent and nature of AI adoption. They give insights into whether AI functions as a core offering or an enabling capability within company operations.

6. *Enhanced data sources:* Key data platforms including Crunchbase and The Lens have undergone substantial improvements in recent years. They have expand their coverage, analytical capabilities and classification accuracy (see Appendix A for more details). This improved data availability enables more comprehensive ecosystem mapping with greater sectoral resolution. However, these enhancements also reduce direct comparability with previous reports, as newer datasets introduce a wider and more detailed picture of AI activity.

3. Australian AI companies

Business organisations form the cornerstone of Australia's AI ecosystem, driving the development and deployment of AI solutions across sectors. Their AI-related strategies and actions respond to market competition, evolving consumer expectations, and the interplay between challenges and opportunities that AI presents. As AI transforms industries, businesses advance research, foster innovation and integrate AI-driven solutions into practical applications. This chapter analyses business activity in the Australian AI ecosystem, looking at trends, capabilities and market positioning of AI companies headquartered in Australia.

3.1. Our methods and data

3.1.1. The set of Australian AI companies

For this analysis, we define an Australian AI company as a privately owned or publicly listed firm headquartered in Australia that self-identifies as engaging in AI development or adoption. Development refers to companies actively involved in building AI models, tools or platforms. Adoption refers to firms integrating AI technologies into their core products, services or operations.

Our sample has 1,533 such companies and represents a cross-section of the broader national AI business landscape. While the sample captures 2 overlapping groups, AI developers and AI adopters, in practice the distinction between these categories is often fluid. Many companies engage in both activities to varying degrees.

Firms included in the sample are those that actively promote their products or services as being AI-driven or facilitated by AI. In the case of developers, this includes businesses that position AI as central to the delivery of their offerings. Often referencing AI in company descriptions, public communications or, in the case of listed firms, annual reports. For adopters, this typically involves deploying or customising AI systems to serve specific production environments or use cases. It also includes preparing supporting infrastructure, conducting targeted testing, ensuring regulatory and security compliance, and establishing internal governance mechanisms for AI use. We included firms when with clear evidence of meaningful engagement with AI (either through development or adoption) as defined and communicated by the companies themselves. This approach ensures the sample reflects the active and self-identified AI segment of the Australian economy.

To identify these companies, we applied AI-related keywords developed based on Organisation for Economic Co-operation and Development (OECD) and Stanford University methodologies (Baruffaldi et al. 2020; Maslej et al. 2024) to systematically search company descriptions across multiple datasets. This keyword search included 337 terms covering AI technologies and their applications (see Appendix B). Most identified companies explicitly referenced 'AI' or 'artificial intelligence' in their descriptions or names. More specialised technical terms appeared less frequently and were typically associated with software development firms.

We compiled our list of Australian AI companies using 2 core datasets, Crunchbase and ASX company reports. We supplemented this by additional sources, including Pitchbook, S&P Capital IQ, media reports, TechCrunch and Lightcast. We included only those companies that publicly report their AI involvement. Our data validation combined AI-assisted analysis with manual review of selected company records. Where Crunchbase entries lacked detail, we gathered additional information manually from company websites and LinkedIn profiles (see Appendix B for more detail on the search approach).

We classified each company into one or more industries based on business descriptions, using the OECD industry framework and an associated keyword-mapping approach to ensure consistency with international practice.

This list is neither definitive nor exhaustive (Box 3). The AI-related business domain moves quickly, companies enter, exit, rebrand or adjust their messaging frequently, making a complete inventory challenging. Many companies with limited AI involvement include AI in their descriptions to attract media attention, investment or partnerships. Conversely, some companies avoid explicitly branding themselves

as AI-focused or disclosing AI activities to protect intellectual property or to maintain human-centric market positioning. Others may signal intentions to engage with AI but have not yet actively done so.

Given these dynamics, our list may not capture the entire Australian AI business ecosystem. While not statistically representative in a strict sense, we generated, verified and validated this sample through multiple methods. We believe it gives a reasonable snapshot of the capabilities, products, services and geographical distribution of AI companies in Australia.

Box 3: A sample of Australian AI companies, not all Australian AI companies

We identified 1,533 Australian companies through a comprehensive search process. However, the full population of AI companies is unknown and fast evolving, with new companies entering and exiting regularly. AI use by Australian business is already ubiquitous and many companies can be considered partial AI companies. For example, some ICT-sector companies are increasingly heavy users of AI and will soon be (or already are) fully fledged 'AI companies'. In this report, AI companies are companies whose primary products, services, skills and capabilities are about AI. It's based on the information they've communicated to the world via their website, investor briefings, annual reports, social media (for example, LinkedIn) and so forth. But we know the time is coming soon where the phrase 'AI company' will be tautological – like 'digital company'. Our set of 1,533 companies can be considered a sample. We cannot say it meets the statistical requirements of a 'representative' sample. But it does allow us to understand the characteristics and specialisations of AI companies whose raison d'être is about AI.

3.1.2. Towards a broader view of AI integration

The AI landscape has transformed significantly since the December 2023 AI Ecosystem Report – subtitled 'catalysing an AI industry'. Technological advancements have enabled new applications and solutions, while regulatory developments, evolving business processes and shifting consumer sentiments have reshaped the ecosystem. Today's composition of AI business players looks substantially different, increasingly driven by active adopters – organisations implementing AI solutions developed domestically or sourced internationally.

In 2023, the AI ecosystem centred primarily around AI developers, which formed the core focus of the previous report (Hajkowicz et al. 2023a). This year's analysis takes a broader perspective, capturing both developers and adopters to reflect growing AI integration across industries. Our research capabilities have also advanced through AI itself. We now employ more sophisticated search and analysis algorithms, combining human expertise with AI-driven data processing and text analytics. These improvements capture a more comprehensive and dynamic picture of AI activity in Australia.

The AI ecosystem remains highly dynamic, with companies emerging, exiting and evolving to align with technological advancements. For example, 105 private and public companies identified as AI companies in 2023 are no longer operating, while over 1,000 new companies have joined the current list. Some companies refine their descriptions to reflect their focus; others add detail to attract funding and many enhance their online presence to capitalise on the AI boom.

An analysis of companies no longer traceable in the 2025 sample of AI firms identified several key factors contributing to their disappearance. In some cases, company headquarters had relocated overseas, effectively removing them from the Australian list. Others had been acquired by larger Australian or international firms, resulting in brand retirements or integration into broader corporate structures. Several companies appeared to have ceased active operations, with no evident activity following their last known funding round or participation in startup acceleration programs. While we did not conduct a case-by-case analysis for each company, the overall pattern suggests that company turnover is a normal feature of a rapidly evolving sector. Importantly, the rate of new AI company formation continues to outpace exits, reinforcing the underlying growth trajectory of Australia's AI ecosystem.

These shifts contribute to overall growth in AI business activity, though quantifying each factor's specific contribution remains difficult. The Australian AI ecosystem operates as an interrelated and constantly evolving network, making it challenging to isolate specific influences on its development.

While the numbers from 2023 and 2025 reports are not directly comparable because of substantial differences in methods and data, they offer valuable snapshots of a fast-moving landscape. Each reflects

the best available data and methods at its point in time, contributing to a broader understanding of the ecosystem's trajectory.

3.1.3. How we located AI company headquarters

We used only information available in the public domain to identify company locations. Our approach employed automated web searches to find address details for companies in our database. We then used an LLM to determine the most likely headquarters address for each company. Human testers conducted detailed validation to verify the LLM's accuracy.

We also employed a second LLM for automated verification of results from the first LLM, using different prompts and methodological approaches. After verifying addresses, we applied geocoding techniques to translate each address into latitude and longitude coordinates. All location information we report is generalised to broad clusters to protect company confidentiality.

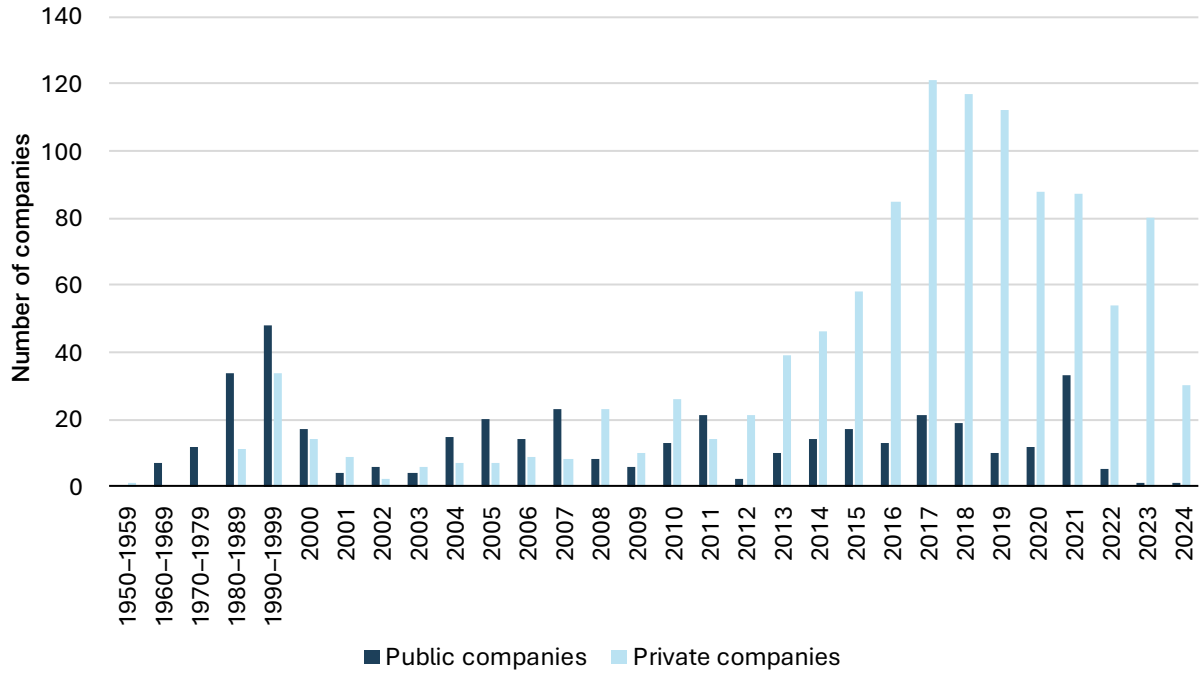
3.2. Publicly listed and private AI companies

Our sample contains 1,121 private companies and 412 public companies, all headquartered in Australia. Each of these either develops AI technologies or actively integrates AI into their operations, with most public companies listed on the ASX or NASDAQ stock exchanges. These companies represent the diverse landscape of Australia's AI business ecosystem, spanning multiple sectors and varying in their approach to AI integration.

Most public AI companies are well-established organisations that have operated in Australia for years or decades. Their expanding AI capabilities primarily stem from strategic shifts, increased investment in internal AI capabilities and acquisitions of AI-developing firms. These companies leverage AI to enhance existing business models, improve operational efficiency and gain competitive advantages in domestic and international markets.

Among private AI companies, the ecosystem continued to expand rapidly in 2024, with 110 companies in our dataset founded in 2023 and 2024. This surge highlights growing entrepreneurial interest in AI-driven innovation, with startups emerging across diverse sectors, including healthcare, finance, logistics and creative industries. Many new entrants focus on developing specialised AI applications, reflecting both the increasing commercial viability of AI and demand for industry-specific solutions.

Figure 3: Public and private AI companies by foundation year



Note: Public companies, by listing year and private companies, by founded year.

Australian AI companies offer a diverse range of AI products and services, applying AI across various domains. From AI-powered analytics to GenAI and conversational agents, these firms harness AI to drive efficiency, personalisation and data-driven decision-making. Whether in healthcare, finance, retail or government services, Australian companies integrate AI to enhance automation, predictive insights and customer engagement. Sections 3.2.1 and 3.2.2 examine technology specialisations and application domains in more detail for public and private companies, respectively.

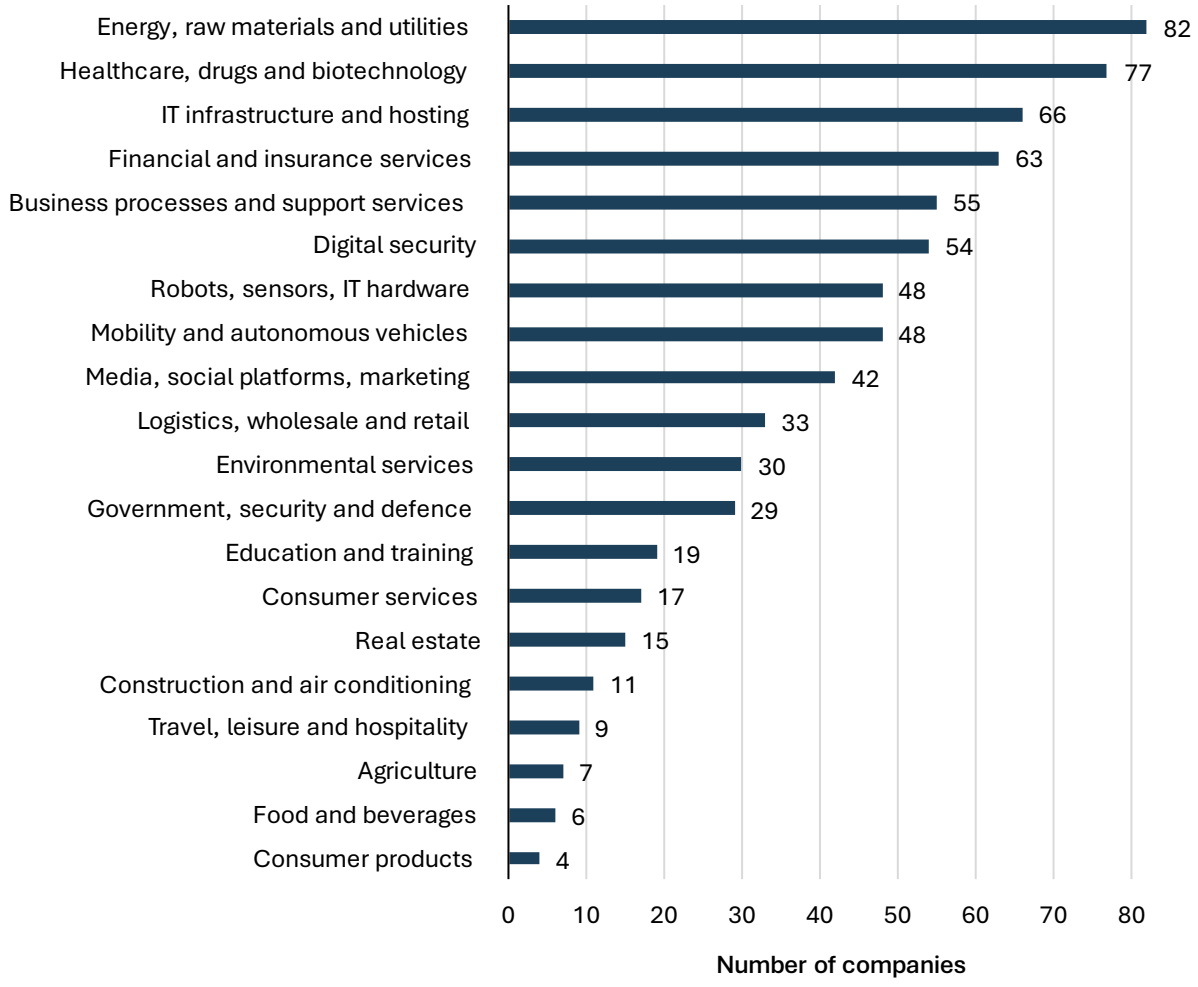
3.2.1. Public AI companies – leading adoption

Industry landscape

Analysis of company reports from publicly listed AI companies reveals that *Energy, raw materials and utilities* lead the sector with 82 companies. This figure accounts for 20% of public AI companies in our sample. This category encompasses Australia's substantial mining sector. *Healthcare, drugs and biotechnology* follows closely with 77 companies (19% of the public AI company sample). *IT infrastructure and hosting* (66 companies) and *Financial and insurance services* (63 companies) represent the next largest groups.

Australian public companies in the AI domain primarily adopt rather than develop AI solutions. They focus on creating tailored applications for specific operational or strategic industry needs. Mining companies implement AI for process optimisation. Telecommunication companies leverage AI to rethink business processes and reshape operations. Financial institutions deploy AI to enhance customer experiences (Governance Institute of Australia 2025).

Figure 4: Public AI companies by OECD industry grouping



Key technologies

The 5 most frequently mentioned AI technologies in company reports are:

- machine learning (192 mentions)
- robotics (44)
- remote sensing (41)
- autonomous vehicles (24)
- deep learning (20).

These technologies appear consistently as key growth areas. They reflect both current industry priorities and broader market trends.

Market growth patterns

Public company data reveal a sustained expansion in AI-related business activity over the past 2 decades, with notable acceleration since the mid-2010s. This trend gained significant momentum after 2015, coinciding with major technical breakthroughs in deep learning and the widespread commercialisation of machine learning applications. The most striking year to date was 2021, which recorded the highest number of AI company listings on global stock exchanges, with 33 Australian AI-focused firms going public. This peak indicates a period of high market confidence, driven by a surge in demand for automation, data analytics and intelligent systems across sectors, including healthcare, finance, logistics and software development. The increase in listings during this period also aligned with increased venture capital investment in AI startups, growing public awareness of AI's potential and a shift in enterprise technology strategies toward data-driven decision-making.

While the pace of new listings may have moderated in later years because of broader market conditions, the 2021 surge stands as a pivotal moment. It marks AI's transition from an emerging technology to a central feature of the global innovation economy. These public company trends provide a useful indicator of broader momentum in the AI ecosystem and underscore the importance of policy settings that support responsible innovation, investment and adoption.

Reporting trends

AI adoption and development feature prominently in company reports (see Box 4). Companies highlight these activities to support valuations, attract media coverage and secure investment. However, follow-up reporting on implementation outcomes remains less common.

Competitive pressures and commercial sensitivity often prevent companies from disclosing challenges. This creates difficulty in assessing real-world AI adoption impact. Greater transparency would benefit the broader AI ecosystem. Finding the right balance between collaboration and competition presents an ongoing challenge. This is especially true for companies at the forefront of rapidly evolving technology.

Box 4: Examples of AI adoption success stories reported by Australian listed companies

Consumer services: Carsales.com Ltd implemented AI-driven image recognition technology known as Cyclops. The result was an 11% higher completion rate for private seller advertisements when users chose this feature on their mobile applications. This technology, boasting a remarkable accuracy rate of 97.2%, automatically selects and assigns optimal angles to each uploaded image, significantly improving both customer experience and operational efficiency.

Real estate: Urbanise.com Ltd is a property management platform that employs machine learning to automate transactions and provide contextual analytics. Its AI-driven solution achieved 193% growth in facilities management and 110% growth in strata annual recurring revenue over 3 years.

Mobility and autonomous vehicles and industrial AI: Major mining corporation Rio Tinto has implemented AI in its automated rail network, creating the world's largest robotic rail operation. Its AI-powered Mine Automation System operates across 98% of mining sites, reducing Tier 1 safety incidents by 50%.

Travel, leisure and hospitality: Travel services company Flight Centre Travel Group incorporates AI through an enhanced chatbot assistant. This system provides real-time updates, personalised recommendations and seamless booking experiences, significantly improving customer engagement.

3.2.2. Private AI companies – delivering solutions

Industry landscape

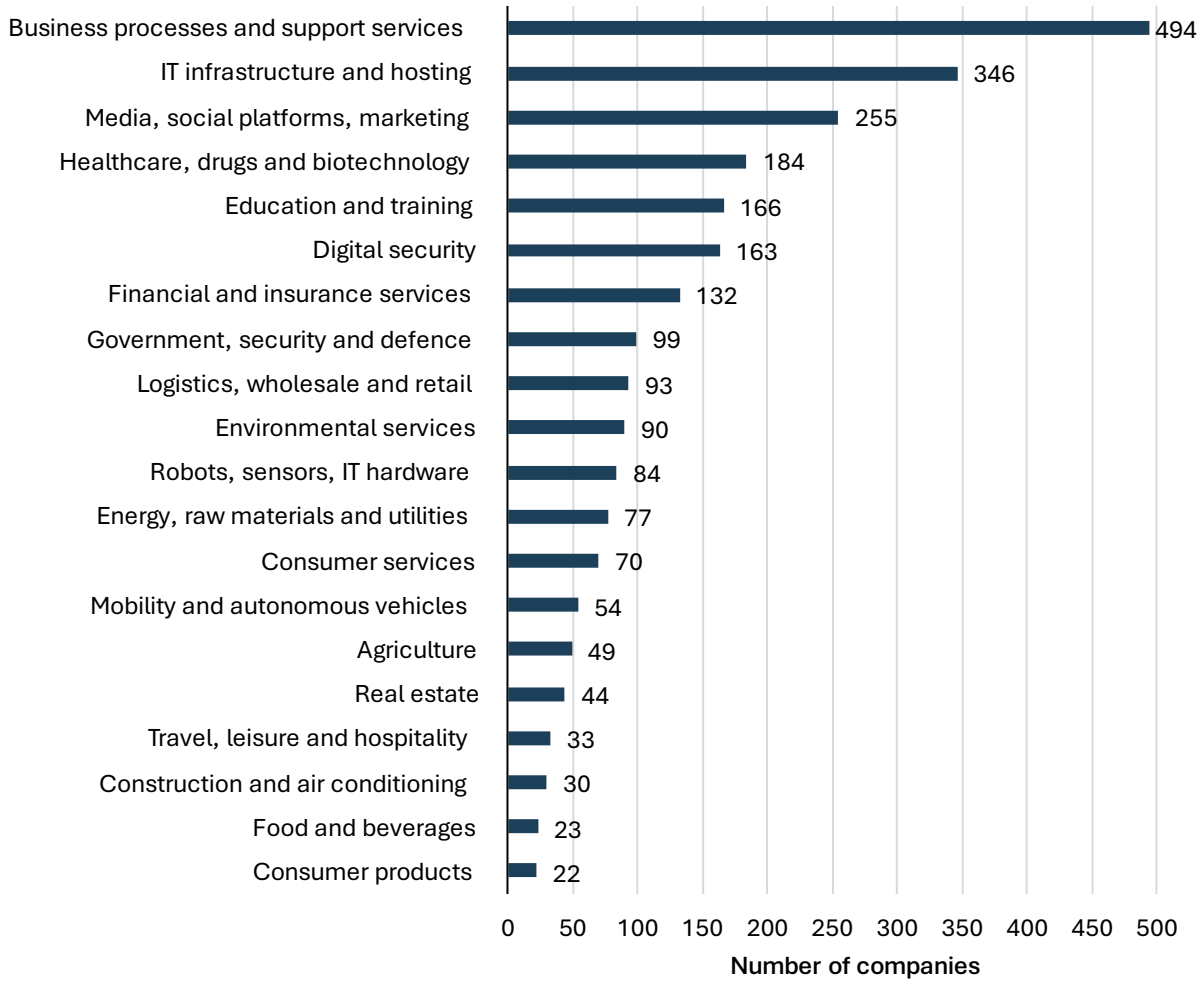
Private Australian AI companies shape specialisations across diverse industry and technology domains (Figure 5). These companies reflect both global trends and local market needs. The *Business processes and support services* sector leads with 494 companies (44% of the private AI company sample). This sector includes professional services firms, technology adoption consultants and customer interaction solution providers. Many deploy AI-driven tools to streamline workflows and improve business efficiency.

IT infrastructure and hosting emerges as the second-largest domain with 346 companies (31% of the private AI company sample). This concentration highlights the prevalence of technology firms among Australian AI startups. The pattern differs notably from public AI companies, which focus more on resource industries. Private companies primarily develop AI technologies and solutions in Australia. Their activities centre on application development, conversational AI, optimisation solutions, data management and integration tools. These innovations drive efficiency improvements across industries and enable broader AI adoption.

Media, social platforms and marketing represents the third-largest group with 255 companies. These firms offer AI products for content generation, user engagement and targeted advertising. *Healthcare, drugs and biotechnology*, *Education and training* and *Digital security* follow, indicating growing interest in personalised healthcare, learning platforms and AI-driven cybersecurity, respectively.

Private companies contribute significantly to decision support systems and environmental solutions. This shows AI's expanding role in addressing complex business and societal challenges. AI's footprint in Australia continues to broaden beyond traditional IT applications.

Figure 5: Private AI companies by OECD industry grouping



Company size distribution

At the time of the research, 96% of private AI companies in our sample had available data on employee numbers, an indicator of company size. Analysis of employee numbers reveals that most private AI companies operate as SMEs. Companies with 1–10 employees represent the largest segment (508, 45% of the private AI businesses). Firms with 11–50 staff form the second-largest group (445; or 40%). Together, these small businesses constitute 85% of private AI companies in Australia.

Medium-sized companies with 51–250 employees account for about 9% of the sector. Larger companies with over 250 staff represent only about 2% of private AI firms. This distribution indicates a vibrant startup ecosystem but suggests potential challenges in scaling operations.

Industry-specific size patterns show notable variations. *Business processes and support services* companies tend to maintain smaller teams, with 83% employing fewer than 50 people. *Education and training* shows a more diverse size distribution, with several larger entities employing over 500 staff. *Healthcare, drugs and biotechnology* and *Digital security* sectors maintain slightly larger average team sizes than other industries.

Technology specialisations

Machine learning stands as the dominant technology specialisation, with 145 companies incorporating it into their core offerings. This reflects the broad applicability of machine learning across industries and use cases. Cloud computing follows with 115 companies, highlighting the shift toward cloud-based AI deployment models. Automation technologies appear in 110 companies, addressing workflow optimisation and process efficiency needs.

Web technologies match automation with 110 companies focusing on web-based AI solutions. Software-as-a-service (SaaS) models have gained traction, with 44 companies using this approach for AI delivery. Data analytics capabilities underpin 41 companies, supporting informed decision-making across business contexts.

Mobile applications represent another significant area, with 32 companies developing AI-enhanced mobile solutions. Blockchain technology has emerged in 27 companies, indicating growing interest in secure, decentralised systems. Both robotics and computer vision appear in 26 companies each, often working in tandem for applications in manufacturing, agriculture and infrastructure inspection.

Industry-specific specialisations

The *Business processes and support services* sector focuses primarily on workflow automation and intelligent document processing. Companies develop solutions that streamline administrative tasks, enhance customer service and optimise resource allocation. Leading firms create AI-powered tools that extract insights from unstructured data, automate repetitive processes and provide decision support capabilities.

In *Healthcare, drugs and biotechnology*, AI applications centre on diagnostic support, medical imaging analysis and drug discovery acceleration. Companies deploy machine learning to identify patterns in patient data, support clinical decision-making and personalise treatment approaches. Healthcare AI firms also develop solutions for administrative efficiency, reducing documentation burdens for healthcare providers.

Education and training companies leverage AI to create adaptive learning platforms and personalised educational experiences. These systems adjust to individual learning styles, identify knowledge gaps and provide targeted support. Several companies focus on assessment technologies that provide more accurate measurements of student progress while reducing educator workload.

The *Financial and insurance services* sector deploys AI for risk assessment, fraud detection and customer service enhancement. Companies create sophisticated models that analyse complex financial data to identify patterns and anomalies. Automated advisory services help clients make informed investment decisions through AI-driven market analysis.

Digital security firms use AI to detect threats, predict vulnerabilities and respond to cybersecurity incidents. These companies develop systems that continuously monitor network traffic, identify unusual patterns and automate security responses. AI enhances threat detection through behavioural analysis and anomaly identification beyond traditional rule-based approaches.

Emerging trends

Analysis of recently founded companies (past 5 years) revealed 339 new AI ventures, representing about 30% of all private AI companies. This indicates continued strong growth in the sector despite economic uncertainties. *Business processes and support services* maintains leadership in new company formation with 146 recent startups. *Healthcare, drugs and biotechnology* shows particularly strong recent growth with 64 new companies, suggesting increased interest in medical AI applications.

Sustainability-focused AI solutions represent an emerging trend, with 22 companies explicitly incorporating sustainability in their business models. These firms address environmental monitoring, resource optimisation and carbon footprint reduction. Growth in this area suggests increasing market awareness of AI's potential to address climate challenges.

Conversational AI and natural language processing continue to gain traction, with 23 companies focusing on chatbot technologies and 17 specialising in advanced language processing. This trend supports growing demand for automated customer interactions and more intuitive human–computer interfaces.

The foundation year analysis shows an acceleration in company formation during the 2010s (639 companies) compared with previous decades. This acceleration reflects both growing market understanding of AI's potential and increasing availability of development tools that lower barriers to entry.

Private AI companies in Australia demonstrate remarkable diversity in their approach to market opportunities. They combine global technological trends with solutions tailored to local industry needs. The predominance of small companies indicates an innovative and agile sector, though potential scaling challenges remain. Technology specialisations span established approaches like machine learning alongside emerging domains such as blockchain and sustainability. This dynamic ecosystem continues to evolve rapidly, with significant new company formation reshaping the competitive landscape.

3.3. Geographical clustering

When you're in the business of growing and developing a new industry, especially a technology industry like AI, geographical patterns of company growth and formation are important. This is because companies working in related industry sectors and with similar technologies tend to co-locate in what are called industry hotspots or clusters.

US academic Michael Porter wrote a seminal book on the topic – *The competitive advantage of nations* (Porter 1990). He argues the presence of industry clusters is crucial for national economic prosperity, as they enhance productivity, drive innovation and stimulate new business formation. Patterns of technology-sector clustering have been observed in the USA (Chattergoon and Kerr 2022) and Australia (Hajkowicz et al. 2023b).

Think Silicon Valley in the USA, Silicon Fen in the United Kingdom and the Yangtze River Delta region in China. They're highly concentrated hotspots of technology companies, workers and research institutes. These hotspots form rapidly and generate wealth at the national level. In all cases, government and industry played important roles in their growth and formation.

Our analysis shows similar patterns of technology industry clustering in Australia. Industries, governments and professional organisations can take advantage of organically forming clusters, and technology specialisations, to fast-track the growth and development of technology industries. Geographical clusters are a critical key for unlocking technology industry growth and development.

3.3.1. Australia's national-level AI company clusters

Of the 1,533 companies identified in our sample of Australian AI companies, we were able to geocode (able to get longitude and latitude) for 1,262. The others had no discoverable address information publicly available online. We used a clustering algorithm called HDBSCAN to identify 25 distinct geographical clusters (Table 1) containing 858 AI companies, representing 68% of successfully geocoded companies. The remaining 404 AI companies (32%) are outside clusters, suggesting Australia's AI ecosystem includes both concentrated innovation hubs (Figure 6) and distributed individual companies operating outside major clusters.

HDBSCAN is a sophisticated clustering algorithm that automatically identifies natural groupings in data without needing predefined parameters like the number of clusters. It excels at recognising patterns of varying densities and shapes, while also identifying outliers that don't belong to any meaningful group.

Table 1: Clusters of AI companies in Australia

Location of cluster central point[1]	Company count[2]	Average distance to centre (km)[3]	Top industry specialisation (number of companies)[4]	Industry diversity or specialisation score[5]
Melbourne CBD, VIC	188	0.72	Business processes and support services (80)	941
Brisbane CBD, QLD	114	4.06	Business processes and support services (37)	730
Sydney CBD Martin Place precinct, NSW	53	0.15	Financial and insurance services (18)	811
Adelaide CBD, SA	51	16.04	Business processes and support services (15)	836
North Sydney business district, NSW	42	0.27	Business processes and support services (18)	1,105
Perth CBD, WA	39	0.24	Energy, raw materials and utilities (12)	947
Cremorne innovation precinct, Melbourne, VIC	34	0.65	Business processes and support services (12)	1,151
Haymarket/Tech Central, Sydney, NSW	33	0.25	IT infrastructure and hosting (11)	985
Sydney CBD Wynard Park precinct, NSW	32	0.03	Business processes and support services (12)	974
West Perth business district, WA	29	0.28	Energy, raw materials and utilities (17)	2,493
Parramatta CBD, Sydney, NSW	25	6.03	IT infrastructure and hosting (6)	761
Sydney CBD Central, NSW	23	0.10	Government, security and defence (6)	792
Bundall business district, Gold Coast, QLD	19	10.54	Business processes and support services (8)	983
Canberra Civic and government district, ACT	19	3.75	Government, security and defence (11)	1,769
Sydney CBD Phillip Street precinct, NSW	17	0.11	Financial and insurance services (7)	1,088
Subiaco business district, Perth, WA	17	0.25	Energy, raw materials and utilities (6)	1,183
Monash technology precinct, Melbourne, VIC	16	2.05	Business processes and support services (4)	868

Location of cluster central point[1]	Company count[2]	Average distance to centre (km)[3]	Top industry specialisation (number of companies)[4]	Industry diversity or specialisation score[5]
Albert Park business district, Melbourne, VIC	16	0.34	Business processes and support services (7)	1,426
Barangaroo precinct, Sydney, NSW	15	0.05	Business processes and support services (9)	1,262
Surry Hills precinct, Sydney, NSW	14	0.16	Logistics, wholesale and retail (5)	956
Macquarie Park innovation district, Sydney, NSW	14	1.11	Digital security (3)	784
Sydney CBD Wynyard precinct, NSW	14	0.08	Business processes and support services (5)	1,067
Newcastle CBD, NSW	13	3.39	Environmental services (4)	888
Maroochydore business district, Sunshine Coast, QLD	11	7.95	Media, social platforms and marketing (6)	1,882
Sydney CBD, Pitt/Castlereagh Streets precinct, NSW	10	0.09	Business processes and support services (6)	1,474

1 Cluster location of central point (medoid).

2 Number of AI companies in the cluster.

3 Average (mean) distance in kilometres to centre (medoid).

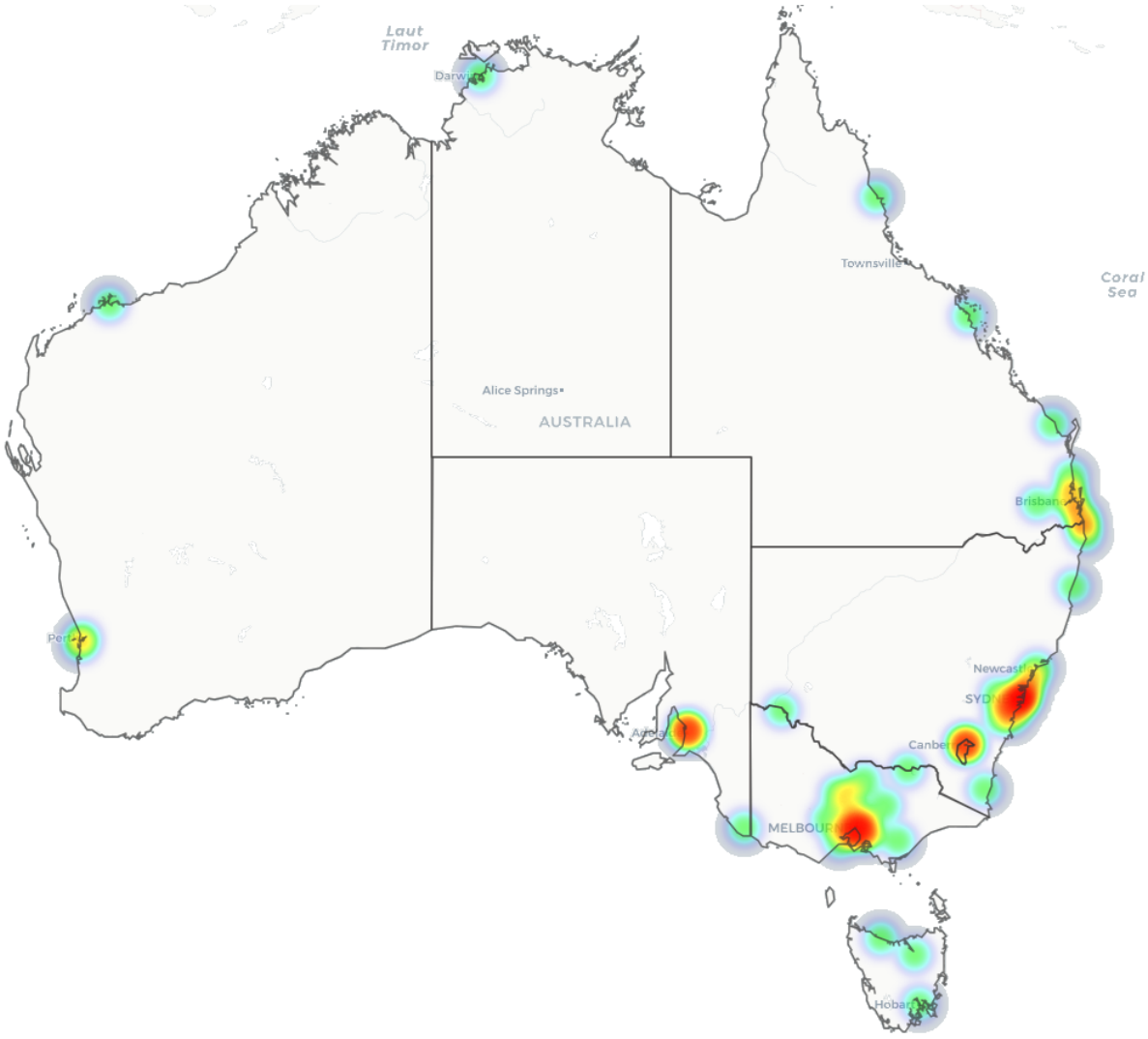
4 Industry category with the most companies in cluster (number of companies in that industry shown).

5 Uses the Herfindahl-Hirschman Index (HHI), in which a higher score represents greater specialisation. HHI score above 1,500 indicates high industry specialisation and a score below 1,000 represents high industry diversification.

The Melbourne central business district (CBD) cluster emerges as Australia's most significant single AI cluster. It hosts 188 companies, about 22% of all clustered AI firms and 12% of all AI firms. This cluster has high density, with a mean distance of just 0.72 km between companies, indicating a tightly packed innovation district. Sydney hosts multiple smaller but significant clusters across its CBD, with 184 companies distributed across several distinct clusters. The largest Sydney cluster is centred around Martin Place (53 companies), known as a financial district, which correlates with the high presence of financial services–focused AI firms.

Brisbane represents the third-largest concentration with 114 companies, while Adelaide's CBD cluster hosts 51 companies. Perth has interesting specialisation patterns with 3 distinct clusters in West Perth hosting 85 companies collectively, with a notable concentration in *Energy, raw materials and utilities* applications. Canberra's AI cluster contains 19 companies in the Civic and government district. Outside of our capital cities, we see 2 national-level clusters in Queensland. These are on the Gold Coast, centred in the suburb of Bundall and on the Sunshine Coast, centred in Maroochydore. There is another cluster in Newcastle West in New South Wales.

Figure 6: AI company clusters at the national level



3.3.2. AI industry domains – specialisation and diversification

We measure the extent of AI industry specialisation and diversification using the Herfindahl–Hirschman Index (HHI). Lower HHI values indicate greater diversity with companies spread across many industries. In contrast, higher values mean companies are concentrated in fewer industries and have high levels of industry specialisation. For the AI ecosystem in Australia, HHI scores below 800 indicate high industry diversity. Scores between 800 to 1,200 indicate moderate diversity. Scores above 1,200 show higher concentration and specialisation in fewer sectors. The HHI values reveal varying degrees of industry specialisation in clusters:

- **High diversification (HHI <800):** Brisbane CBD (730), Parramatta (761), Macquarie Park (784), George St Sydney (792) show the broadest industry mix.
- **Moderate diversification (HHI 800–1200):** Most clusters fall in this range, including Melbourne CBD (941), Adelaide (836), and Martin Place Sydney (811).
- **Higher specialisation (HHI >1,200):** West Perth (2,493), Sunshine Coast (1,882), Canberra (1,769) and Albert Park in Melbourne (1,426) show pronounced focus in specific industries.

Analysis of industry distribution reveals that *Business processes and support services* companies are the most numerous (267 companies, 31% of clustered companies). This is followed by *IT infrastructure and hosting* (201 companies, 23%). However, these percentages vary significantly across clusters, revealing important distinctions in regional AI ecosystems. Key patterns in industry distribution include:

- *Financial and insurance services* AI companies (84 total or 9.8% of clustered AI companies) show a strong preference for CBD locations. The Sydney and Melbourne CBD clusters contain 60 of these companies (71%). This indicates the importance of proximity to major financial institutions for these AI firms.
- *Healthcare, drugs and biotechnology* AI companies (56 in total, 6.5% of clustered AI companies) display a dispersed pattern across multiple clusters, with significant presences in Melbourne (15), Sydney (13) and Adelaide (11). Analysis of these companies' locations relative to major hospitals and research institutions suggests that proximity to these anchor institutions strongly influences their clustering behaviour.
- *Energy, raw materials and utilities* AI companies (42 total, 4.9% of clustered AI companies) show a pronounced concentration in Western Australia, with 35 companies (83%) located across Perth clusters. This reflects both Western Australia's resource-focused economy and the potential for AI to address specific challenges in resource extraction and energy management.
- *Government, security and defence* AI firms (17 total, 2.0% of clustered AI companies) show the clearest geographical specialisation, with Canberra hosting 11 companies (65%) in this category. This confirms the capital's central role in this strategic sector and the importance of proximity to government decision-makers.
- *Digital security* AI companies (33 total, 3.8% of clustered AI companies) show interesting co-location patterns with government clients (9 in Canberra, 27%) and financial services (12 in North Sydney, 36%), suggesting that client proximity is a key driver for this subsector.
- *Media, social platforms and marketing* AI firms (57 total, 6.6% of clustered AI companies) are located in Brisbane (24), Melbourne (12), Maroochydore (11) and Sydney (10). The greatest concentration is in Maroochydore on the Sunshine Coast in Queensland, with 55% of AI companies in this category compared with the overall concentration of 33%. This indicates that Maroochydore has a specialisation in AI for media, social platforms and marketing.

Overall, these data show regional specialisation broadly aligned with traditional industries. They also show the formation of large, highly diverse AI clusters in our major cities. The organic growth and regional specialisation of AI clusters provide avenues for policymakers to facilitate industry growth and development.

Case studies of distinctive cluster types

Melbourne CBD: a diverse urban innovation district

Melbourne's CBD cluster of 188 companies represents Australia's largest AI concentration and shows how a major urban centre can develop a diverse AI ecosystem with substantial critical mass. The centre point of this cluster combines high density (0.72 km mean distance) with high industry diversity (HHI 941) (Table 1). Key features of this cluster include:

- **Historical development**: The cluster evolved from Melbourne's established technology and services sector, with significant growth acceleration post-2015 as AI adoption increased across industries.
- **Anchor institutions**: Major corporate headquarters, particularly in financial services and professional services, provided initial demand for AI solutions. The presence of accelerators like Stone & Chalk and university outposts created innovation infrastructure.
- **Physical infrastructure**: The cluster benefits from Melbourne's high office density, excellent public transport and purposeful innovation spaces, such as the Melbourne Connect precinct, which combines university research, startups and corporate innovation teams.
- **Specialisation balance**: While business process applications dominate (80 companies), the cluster maintains significant presence in healthcare AI (32 companies) and financial services (39 companies), enabling cross-domain knowledge spillovers.

This cluster shows how organic development in established urban centres can create diverse AI ecosystems when supported by appropriate innovation infrastructure and anchor institutions.

Canberra's Civic and government district: a specialised government–defence cluster

Canberra's Civic and government cluster (19 companies) represents a highly specialised cluster focusing on government, security and defence applications. With a high specialisation index (HHI 1,769), this cluster shows how proximity to key customers and domain expertise drives specialised AI development. Key features include:

- **Customer-driven formation**: The cluster formed in direct response to increased government demand for AI solutions in security, defence and public administration, with 58% of companies (11) focused specifically on government applications.
- **Security considerations**: Physical proximity to government departments facilitates secure development practices, with companies often setting up dedicated secure development facilities that meet government requirements.
- **Talent pool**: The cluster uses Canberra's specialised workforce with security clearances, public sector experience and domain expertise in government operations.
- **Research linkages**: Strong connections to specialised research at the Australian National University, particularly in cybersecurity, data analytics and policy applications, drive innovation in the cluster.

This case illustrates how specialised clusters can develop around specific institutional demand and regulatory requirements, even without large-scale commercial presence.

Perth's resource-sector AI specialisation

The West Perth cluster, centered on Havelock Street (29 companies), shows how regional economic specialisation shapes AI cluster development. With the highest specialisation index nationwide (HHI 2,439) and strong concentration in energy, raw materials and utilities applications (17 companies, 59%), this cluster illustrates the power of domain-specific AI development. Key features include:

- **Industry-driven innovation**: The cluster developed in direct response to resource-sector demand for AI solutions in predictive maintenance, autonomous operations and environmental monitoring.
- **Corporate-startup dynamics**: The cluster features a mix of resource company innovation laboratories, specialised AI startups and technology service providers, creating a complete innovation ecosystem focused on resource applications.
- **International connections**: Unlike other specialised clusters, this one maintains strong international connections to similar resource-focused technology hubs in Canada, Chile and South Africa, creating global knowledge networks.
- **University–industry collaboration**: Partnerships with the University of Western Australia and Curtin University, particularly with their resource engineering and data science departments, provide research support and specialised talent.

This case shows how regions can leverage existing economic strengths to develop globally competitive AI specialisations, even with relatively small absolute numbers of companies.

Maroochydore's business district: an emerging digital media lifestyle cluster

Maroochydore's cluster, centred on Plaza Parade (11 companies), represents an emerging model of AI development outside Australia's major capital cities. It shows how regional lifestyle destinations can develop specialised technology ecosystems. With a high specialisation index (HHI 1,882) and notable concentration in media, social platforms and marketing applications (6 companies, 55%), this cluster

illustrates the potential for digital-first industries to thrive in lifestyle-oriented locations. Key features include:

- **Lifestyle-driven formation**: The cluster developed as digital professionals sought Queensland coastal lifestyle advantages while maintaining connections to metropolitan markets, enabled by improving digital infrastructure and remote work trends.
- **Specialisation synergy**: The focus on media, marketing and business process applications (5 companies) creates complementary capabilities, with companies often collaborating on integrated digital solutions for clients across Australia and internationally.
- **Distributed geography**: Unlike dense urban clusters, Maroochydore's ecosystem operates with greater physical dispersion (7.95 km mean distance), leveraging digital connectivity while maintaining sufficient proximity for regular face-to-face collaboration.
- **Innovation network**: The cluster benefits from connection to the broader Sunshine Coast innovation ecosystem, including the SunCentral CBD development, Sunshine Coast Health Precinct, and university partnerships, particularly with the University of the Sunshine Coast's digital media programs.

This case shows how emerging regional clusters can develop viable AI specialisations that leverage lifestyle advantages to attract talent, while maintaining sufficient critical mass through focused specialisation and virtual collaboration models.

Analysis of companies outside clusters

While the focus of this section is on geographical clusters, the 32% of companies existing as spatial outliers warrant examination. Analysis of these non-clustered companies reveals several important patterns that complement our understanding of Australia's AI ecosystem.

Non-clustered AI companies have different industry distribution patterns compared with clustered firms. They show higher representation in agricultural technology applications (18% versus 7% in clusters) and healthcare applications (24% versus 16%). This suggests that sector-specific requirements may drive some companies to locate outside major clusters, particularly when proximity to specific customers or resources outweighs the benefits of cluster participation.

Company age analysis indicates that non-clustered companies tend to be either very young (0–2 years, 28%) or more mature (10+ years, 31%) compared with clustered companies. This bimodal distribution suggests different mechanisms may drive non-clustering: young companies may begin in founders' residences or incubators outside established clusters, while mature companies may prioritise cost considerations or customer proximity over cluster benefits.

Geographically, non-clustered companies show higher representation in regional areas (37% versus 11% of clustered companies), particularly in agricultural regions and satellite cities around major metropolitan areas. This pattern highlights the potential for distributed AI development beyond established innovation hubs, particularly in applications where domain expertise and customer proximity drive location decisions.

These findings indicate that policy approaches should consider both clustered and non-clustered development paths for Australia's AI ecosystem, rather than focusing exclusively on established innovation districts.

International comparisons

Australia's AI clustering patterns both resemble and differ from international patterns in significant ways. Comparing Australia's AI ecosystem with global leaders reveals important insights for policy development.

Unlike the dense innovation corridors found in the USA (Boston – New York – Washington, San Francisco – Silicon Valley) or China (Beijing–Tianjin–Hebei, Yangtze River Delta), Australia's geographical spread creates more isolated metropolitan clusters. This resembles the United Kingdom's pattern, where London dominates but Manchester, Edinburgh and Cambridge maintain distinct clusters.

Australia's CBD-centric clustering pattern differs notably from the USA, where suburban office parks and university-adjacent innovation districts often outweigh downtown concentrations. For instance,

Silicon Valley's AI concentration occurs primarily in suburban Santa Clara County rather than San Francisco's CBD. Australia's pattern more closely resembles Asian models like Singapore and Hong Kong, where limited land availability in the CBD drives concentration.

For cluster density, Australia's densest clusters approach the density of global leaders like London's Shoreditch and Manhattan's Flatiron District. However, Australia has fewer ultra-dense clusters. Like global patterns, Australia shows financial services AI concentration in financial districts (Sydney's Martin Place resembling London's City or New York's Wall Street). However, Australia shows less pronounced biomedical AI clustering compared with Boston or San Diego, suggesting potential for further development in this field.

Cluster development strategies

What can be done to develop AI technology industries in clusters? Identifying the best policy mechanisms for the clusters is beyond the scope of this paper. However, at a broad level, the sorts of things that can be done to boost clusters include the ideas that follow.

- **Enhance inter-cluster connectivity:** Develop programs that facilitate knowledge flows and collaboration between established capital city clusters and emerging regional clusters. This will help creat a national AI innovation network that transcends geographical isolation. Specific initiatives should include innovation missions between clusters, collaborative R&D programs need multi-region participation and digital platforms for inter-cluster knowledge sharing.
- **Leverage anchor institutions:** Strengthen the role of universities, research organisations and major technology firms in cluster development through co-location incentives, collaborative innovation spaces and industry PhD programs. Particular focus should be placed on bridging the gap between university research campuses and commercial AI clusters through intermediary organisations and shared physical spaces.
- **Build on specialised strengths:** Support the differentiated specialisations emerging in regional clusters through initiatives. This includes targeted research funding, skills programs and innovation challenges in domains like energy AI (Perth), environmental AI (Newcastle) and government and defence AI (Canberra). These programs should connect regional specialisations to global markets and knowledge networks rather than focusing solely on domestic applications.
- **Address density challenges:** For low-density clusters, create focal innovation precincts that concentrate activity and allow the face-to-face interactions critical for knowledge spillovers, while ensuring digital infrastructure enables broader participation. This could include the development of satellite innovation hubs connected to major clusters, following models like Amsterdam's network of connected innovation spaces across the metropolitan area.
- **Develop specialised AI infrastructure:** Set up shared technical infrastructure in computing resources, data repositories and testing facilities that aligned with regional cluster specialisations. Like the autonomous systems test beds in Western Australia, financial AI regulatory sandboxes in Sydney and secure development environments for government applications in Canberra.
- **Enhance the urban environment and transport connectivity:** Take actions to improve liveability, walkability, safety and transport connectivity in current or emerging clusters. Additionally, use infrastructure upgrades to better connect existing clusters. Use town plans and zoning controls and other place-based mechanisms as incentivise to develop office spaces and technology precincts in current and emerging clusters.

4. Research and development

Australia's R&D sector has been working on AI for many decades. Our scientists, researchers and engineers have developed world-leading capabilities. Our ongoing R&D activity plays a critical role in shaping Australia's AI ecosystem. It provides the foundation for understanding the nation's existing strengths, identifying areas of emerging specialisation and guiding strategic growth of AI capabilities. In this chapter, we analyse patterns in research publications and patent activity over the past decade, to gain insight into where Australia is best positioned to lead, and how we can align future investment with areas of demonstrated capability and opportunity. This evidence base is useful for informed decision-making and targeted AI ecosystem development.

4.1. Our methods and data

Estimations of research publishing and patent volumes for Australia and the world were obtained using The Lens (www.lens.org) application programming interface (API) for the 10-year period 2015–2024 (Penfold 2020). We used a list of 337 unique AI search phrases, comprising technical AI terms such as 'machine learning', 'computer vision' and 'backpropagation'. These phrases were derived from similar lists also used for bibliometric analysis (Hajkowicz et al. 2023a, 2023b) by the OECD (Baruffaldi et al. 2020) and Stanford University (Maslej et al. 2024). Publications and patents containing these phrases in the title, abstract or keywords were identified as AI-related. The full list of AI search phrases is provided in Appendix B. The data were extracted from The Lens during February 2025 (see Appendix A).

Patents are classified in The Lens with the Cooperative Patent Classification (CPC) system. We used concordance tables by the US Government Census Bureau (Goldschlag et al. 2020) to estimate patent numbers by industry groupings in the International Standard Industrial Classification (ISIC). We converted from CPC second level 3-character codes (for example, 'A01') to Revision 4 ISIC 2-character codes (for example, '01'). The ISIC system was used – rather than the Australian and New Zealand Standard Industrial Classification (ANZSIC) – because it was necessary to have an international standard to make international comparisons and decide AI specialisation in Australia. Also, there are no well-established concordance tables to translate from CPC codes to ANZSIC codes.

We used the revealed technology advantage (RTA) metric to measure technological specialisation (Bratanova et al. 2022). The RTA metric was developed by the OECD and is used to assess a country's or region's relative specialisation in different technology fields. An RTA above 1 indicates that a country has a relative specialisation in a particular technology field. Conversely, an RTA below 1 suggests that the country is less specialised in that field compared with the global average, while the value of 1 reflects alignment with the global average – neither specialised nor underrepresented.

We calculated RTA metrics using an OECD methodology (Bratanova et al. 2022; Hajkowicz et al. 2023a). We also screened industries and research fields to select only those with significant levels of patenting or publishing activity. The threshold for patenting was 50 AI patents from that industry in Australia over the past 10 years. The threshold for research publishing in a subject field was 1,000 AI publications over the past 10 years. We also used statistical tests on the RTA metrics to create ranges above or below the estimated value at the 95% confidence level (Crawley et al. 2013).

4.2. Analysis of patent data

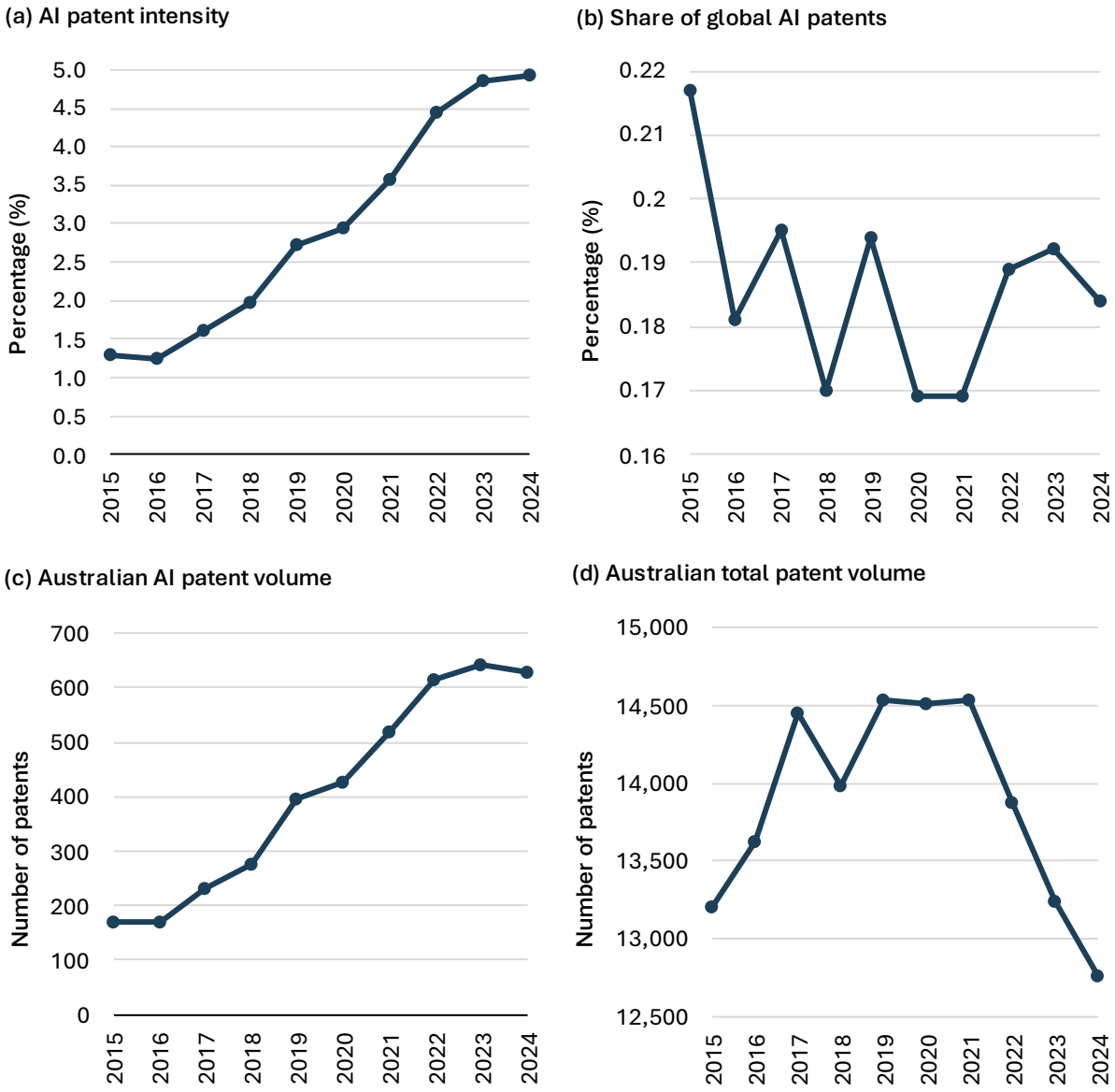
4.2.1. Trends in Australia's AI patent activity

The data reveal significant growth in AI patent activity both globally and in Australia from 2015 to 2024, with Australian AI patents nearly quadrupling from 170 in 2015 to 629 in 2024. In total, Australia generated 4,075 AI patents across the decade, representing about 2.9% of Australia's total patent output of 138,704 patents.

Australia's AI patent intensity (the proportion of AI patents to total patents) showed consistent growth, rising from 1.3% in 2015 to 4.9% in 2024 – a nearly 4-fold increase (Figure 7a). This shows Australia's

increasing focus on AI innovation, despite maintaining a relatively stable share of global AI patents at around 0.18% (Figure 7b).

Figure 7: Trends in Australian AI (and all) patent activity, 2015–2024



The global AI patent landscape experienced explosive growth, with worldwide AI patents more than quadrupling from 78,255 in 2015 to 342,744 in 2024. This rapid expansion meant that although Australia's AI patent output grew substantially, its share of global AI patents slightly declined from 0.22% to 0.18% over the period (Figure 7b). This decline is likely to reflect the intensity of global AI competition rather than any weakness in Australian AI innovation.

The COVID-19 pandemic's impact is visible in the 2020 data, where total Australian patent applications showed a slight decline to 14,507 from 14,536 in 2019 (Figure 7d). However, Australian AI patent applications continued to grow during this period, increasing from 395 in 2019 to 426 in 2020 (Figure 7c), suggesting resilience in Australia's AI R&D activities during the pandemic.

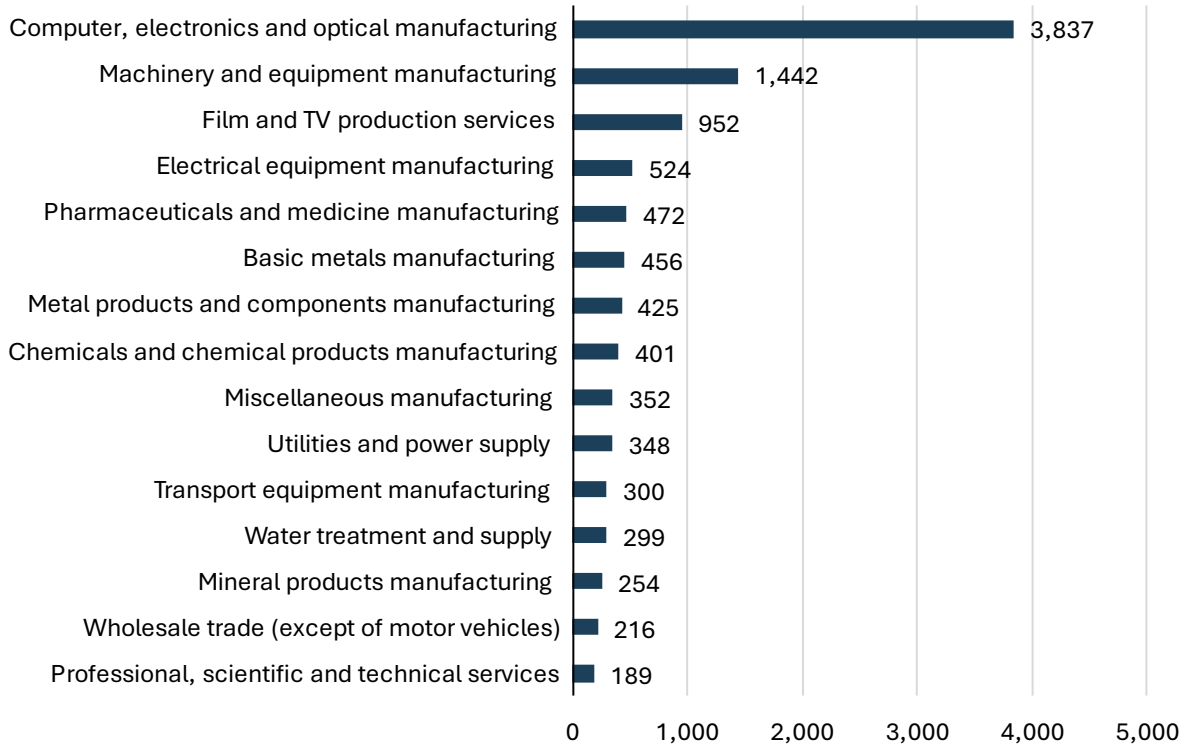
The most recent 5 years (2020–2024) account for 2,832 of Australia's AI patents, or 69.5% of the decade's total, highlighting the acceleration of AI innovation in recent years. The data show a recent plateauing in both Australian and global AI patent numbers from 2022 to 2024, with Australian AI patents levelling around 615–644 annually (Figure 7c). This may indicate a maturation of the AI patent landscape or reflect the typical lag in patent data reporting rather than a genuine slowdown in innovation activity.

Overall, the trends show Australia's growing commitment to AI innovation, maintaining steady growth in AI patent output despite intense global competition and external challenges like the pandemic.

4.2.2. Australian AI patent volumes by industry grouping

Analysis of Australian AI patent data reveals a strong concentration in technology-oriented manufacturing sectors, with computer and electronic products leading by a significant margin. The manufacture of computer, electronic and optical products accounts for 3,837 mentions across AI patents (Figure 8). This dominance highlights Australia's technological capabilities in hardware-related AI innovations.

Figure 8: Top 15 industry groups in Australia by AI patent applications over 10 years, 2015–2024



Note: The industry groups are from the Revision 4 International Standard Industry Classification (ISIC) 2-digit level. The top 15 (of 87) industry groups are shown for the sake of brevity. One patent can be assigned multiple industries.

The top 3 sectors combined – computer and electronic products, machinery and equipment, and motion picture and video production – account for 6,231 patents between them. This concentration suggests these industries are key drivers of AI innovation in Australia (Figure 8).

Manufacturing industries broadly dominate the top rankings, with different manufacturing subsectors (including pharmaceuticals, metals, chemicals and transport equipment) collectively representing a substantial portion of AI patent activity. When combined, manufacturing-related categories in the top 15 (of 87) account for almost 8,500 mentions across AI patents.

Interestingly, service-oriented sectors also show significant AI innovation, particularly in media and entertainment (ISIC 59) with 952 patents that mention one of few of the industry groups. The presence of utilities and power sector (348 patents) and water treatment and supply (299 patents), suggests that AI applications are extending into critical infrastructure management. The professional and technical services industry makes the top 15 industries, recording 189 patents. However, this may not fully represent service-sector AI innovation, as many other service categories likely exist among the remaining 72 industries not shown in the top 15.

The data indicate that while traditional manufacturing sectors lead in AI patenting, there is significant diversity in AI application across industries, reflecting the technology's broad potential for innovation across the Australian economy.

4.2.3. Australian AI specialisation by patent activity

Australia shows notable technological specialisation in several traditional and service-oriented industries when it comes to AI patent activity. The data reveal that specialised construction activities have the highest RTA at 1.90, indicating Australia is nearly twice as specialised in AI patents in this sector compared with global patterns (Figure 9). This industry group includes specialised construction activities that focus on specific aspects of building and civil engineering projects. These activities do not involve the full construction of buildings or infrastructure but rather cover distinct tasks such as site preparation, demolition, electrical and plumbing installation, heating and air-conditioning system installation, detailed finishing work, building equipment installation and other specialised construction services.

The manufacturing sector also shows strong specialisation, particularly in non-metallic mineral products (RTA 1.45), wood products (RTA 1.42) and chemicals (RTA 1.38). The non-metallic mineral manufacturing industry includes processing minerals into products like glass, ceramics, cement, concrete and stone. The wood manufacturing industry includes processing wood into products such as sawn timber, plywood, veneers, wood panels and joinery items like doors and windows. It also covers cork and straw product manufacturing, excluding furniture, supporting construction, packaging and various industrial applications. This industry uses AI for optimising wood cutting and processing to reduce waste, enhancing quality control through automated defect detection, and improving efficiency in areas such as predictive maintenance and robotic automation. And the chemicals industry covers the production of basic chemicals, fertilisers, plastics, synthetic fibres, pharmaceuticals and other chemical-based products.

Interestingly, while the computer, electronic and optical products sector accounts for a substantial portion of Australian AI patents (about 26% of the total), its RTA of 0.99 suggests Australia's specialisation in this area is slightly below the global average. This indicates that despite high absolute numbers, Australia's relative focus in this traditionally AI-heavy sector is not as pronounced as other countries.

The creative and media sector shows promising specialisation, with film, television, sound and music production achieving an RTA of 1.08. This suggests Australia has developed a competitive edge in applying AI to creative industries. Traditional manufacturing sectors like rubber and plastics (RTA 1.14) and fabricated metal products (RTA 1.07) also show above-average specialisation.

It is noteworthy that financial services and information service activities, while present in the top 15, show relatively lower specialisation (both with RTA 0.92). This might be unexpected given Australia's strong services sector, though it could reflect intense global competition in these areas. The spread of RTAs across diverse sectors suggests Australia has developed a relatively balanced AI innovation portfolio, with particular strengths in construction and traditional manufacturing applications.

Figure 9: Specialisation by industry grouping measured using revealed technology advantage (RTA) metric from patent data

Note: A high RTA means that Australian patent inventors in that industry group are using AI to a greater extent than their global peers in the same industry. Only includes the top 28 (of 88) of Revision 4 ISIC (2-digit) industry groups and only industry groups with a noteworthy level of AI patent activity of greater than 50 AI patents in total during the 10-year period 2015–2024.

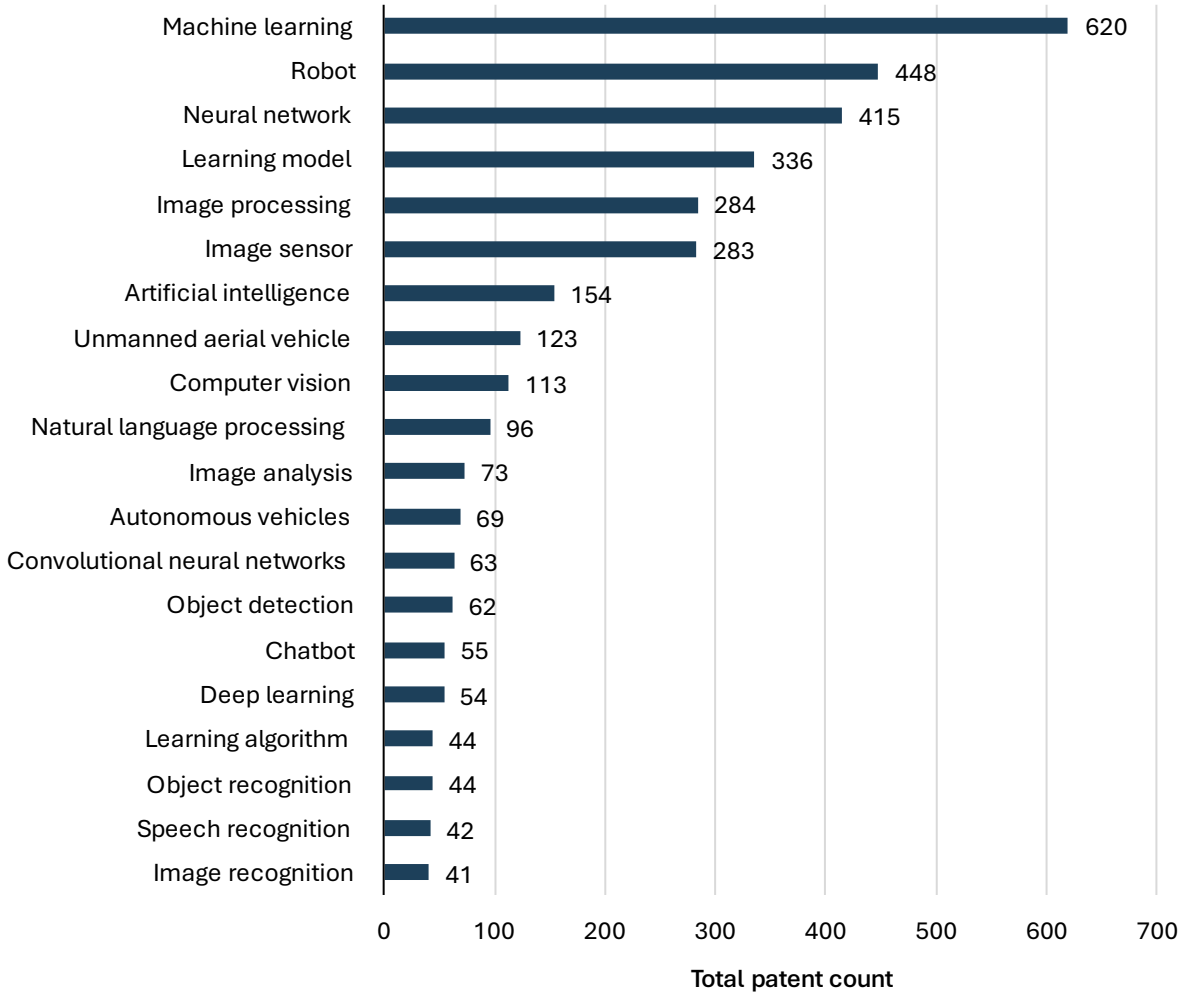
4.2.4. References to AI technologies in Australian patents

Between 2015 and 2024, Australian inventors made significant contributions to AI-related innovation, with machine learning standing out as the most active field, accounting for 620 patents (Figure 10). Robotics followed with 448 patents, indicating strong expertise in automation and mechanical intelligence. Neural networks, a foundational AI technology, accounted for 415 patents, while learning models (336 patents) and image processing (284 patents) also featured prominently, highlighting Australia's strengths in AI model development and visual computing.

Image sensors (283 patents), artificial intelligence (154 patents) and unmanned aerial vehicles (123 patents) further reflect the diverse applications of AI innovation. Other key areas include computer vision (113 patents), natural language processing (96 patents) and autonomous vehicles (69 patents), demonstrating Australian expertise in both perception-based AI and mobility technologies. Convolutional neural networks (63 patents), object detection (62 patents) and deep learning (54 patents) indicate a strong research focus on AI-driven recognition and decision-making systems.

The dataset specifically considers patents where at least one inventor is an Australian resident rather than patents filed in Australia or by Australian applicants. This approach ensures the analysis reflects where knowledge, skills and innovation reside, providing a clearer picture of Australia's AI capabilities and expertise rather than simply its role as a jurisdiction for patent filings. The data highlight Australia's particular strengths in machine learning, robotics and AI-driven image processing, reinforcing its role in the global AI research landscape.

Figure 10: Number of times AI technologies are referenced in patents (2015–2024) by Australian inventors, top 20 (of 336) AI technologies



4.3. Analysis of research publishing data

4.3.1. Temporal trends in Australia's AI research publishing

Australian AI research publications have shown strong and consistent growth over the past decade, increasing from 5,424 publications in 2015 to 12,776 in 2023, representing a 136% increase (Figure 11a). During the entire 2015–2024 period, Australian researchers produced 93,302 AI-related scholarly publications, demonstrating the country's substantial contribution to global AI research.

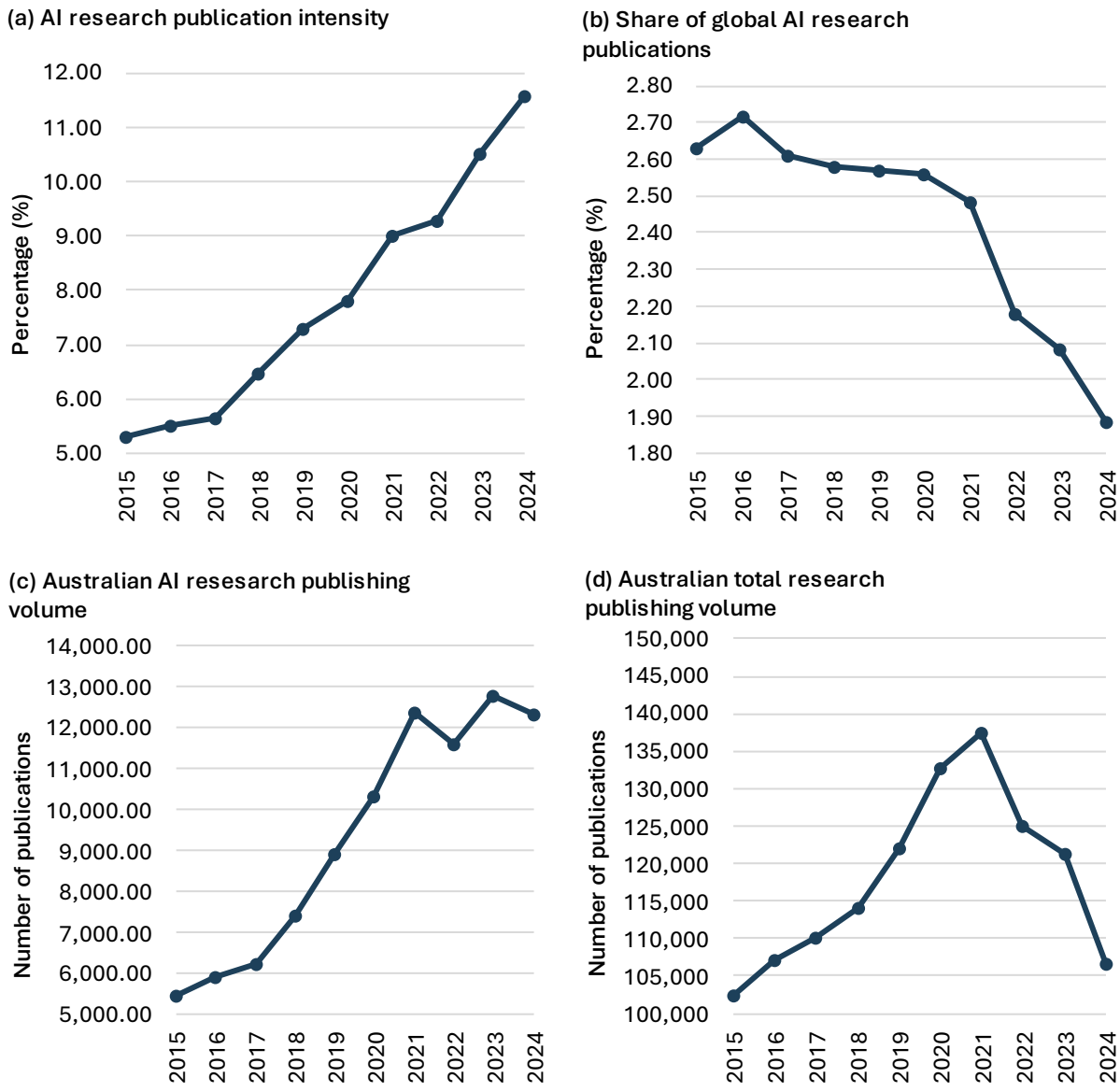
The intensity of AI research within Australia's overall scholarly output rose markedly, from 5.3% of total publications in 2015 to 11.6% in 2024 (Figure 11a), indicating AI's growing prominence in the national research agenda. This trend reflects the increasing prioritisation of AI research across Australian institutions. In 2020, Australian AI publications increased to 10,335, up from 8,900 in 2019 (Figure 11c), representing a 16% year-over-year growth. This growth continued into 2021, reaching 12,394 publications, suggesting that pandemic conditions may have intensified focus on AI research and digital technologies.

Despite Australia's robust absolute growth in AI publications, its share of global AI research output gradually declined from 2.6% in 2015 to 1.9% in 2024 (Figure 11b). However, this decline should be interpreted in the context of extraordinary global growth in AI research rather than as a decrease in Australian productivity. Global AI publications have surged from 206,160 in 2015 to 655,454 in 2024, representing a 218% increase.

Looking at the most recent 5-year period (2020–2024), Australia produced 59,467 AI publications, accounting for 63.7% of its total AI output over the entire decade. This concentration of activity in recent years underscores the acceleration of AI research in Australia. During this same period, Australia maintained an average 2.2% share of global AI publications, while AI-related works constituted 9.5% of all Australian scholarly output.

The data reveal that while Australia's absolute AI research output continues to grow substantially, the global AI research landscape is becoming increasingly competitive, with rapid expansion in research activity worldwide. This indicates that maintaining Australia's international influence in AI research may require continued strategic investment and focus on areas of comparative advantage.

Figure 11: Trends in AI (and all) research publishing by Australian authors, 2015–2024



4.3.2. AI research publishing volumes

Australian AI research demonstrates a strong multidisciplinary character, with significant contributions across various scientific domains. *Computer science* leads AI publishing with 35,847 publications (Figure 12), representing approximately 18% of Australia's total AI research output. However, what's particularly noteworthy is the substantial presence of *Medicine*, which accounts for about 16% of AI publications (31,567 papers), indicating robust integration of AI technologies in healthcare research.

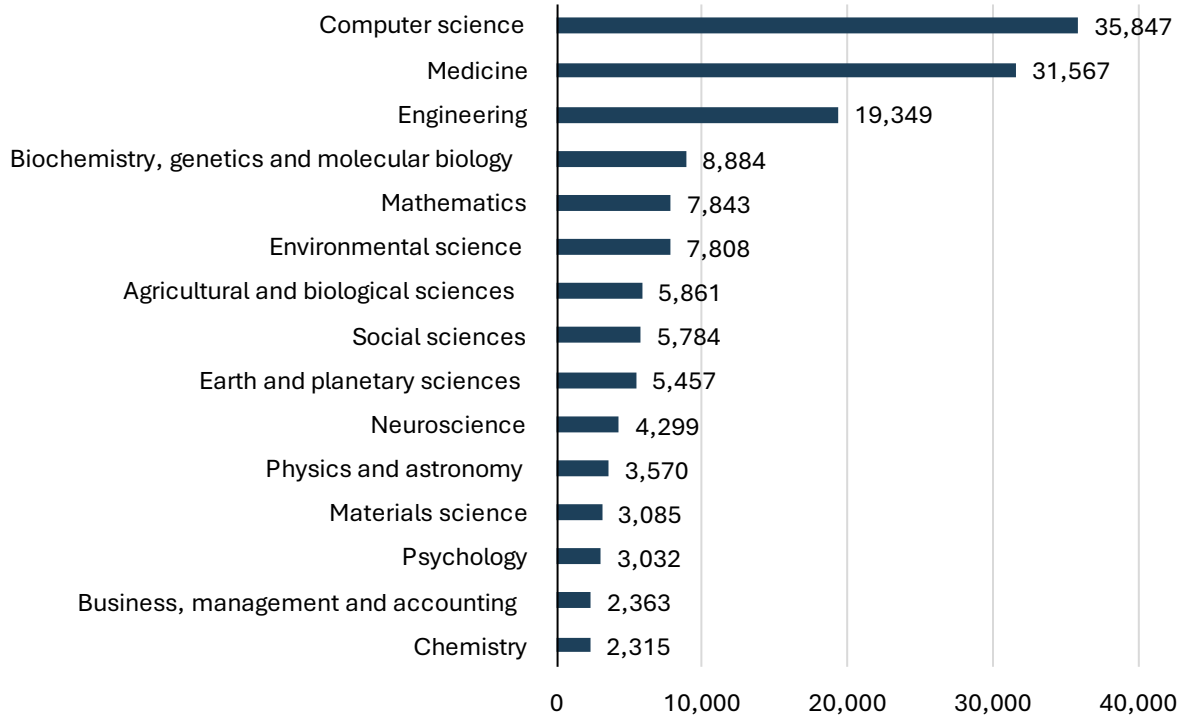
Engineering ranks third with 19,349 publications (roughly 10%), while life sciences collectively form a significant cluster – combining *Biochemistry, genetics and molecular biology*, *Agricultural and biological sciences* and *Neuroscience* – totals 19,044 publications (Figure 12), or approximately 9.5% of all AI research. This suggests strong adoption of AI methods in biological and medical research applications.

The data reveal that traditional science, technology, engineering and mathematics (STEM) fields dominate AI research, with the top 3 fields (*Computer science*, *Medicine* and *Engineering*) accounting for about 44% of all AI publications (Figure 12). However, there's notable AI integration in environmental and earth sciences, with *Environmental science* and *Earth and planetary sciences* together contributing over 13,000 publications (about 6.6% of total). This could capture Australia's strengths in geospatial technologies involving the use of AI (GeoAI).

Social sciences and business fields also show meaningful engagement with AI, though at a lower volume. *Social sciences* contributes 5,784 publications (2.9%), while *Business, management and accounting* accounts for 2,363 publications (1.2%), demonstrating AI's expanding influence beyond traditional technical domains.

These top 15 fields (of 27) represent approximately 71% of Australia's total AI publications, indicating significant concentration in these primary research areas while still leaving substantial activity across the remaining 12 fields not shown in Figure 12.

Figure 12: Top 15 research fields by AI research publishing volume by Australian-based authors in total, 2015–2024



Note: The research fields (top 15 of 27) are the mid-level All Science Journal Classification (ASJC) by Elsevier.

4.3.3. Australian AI specialisation by research publishing

RTA analysis highlights Australia's distinctive strengths in AI research across several key disciplines (Figure 13). *Veterinary science* leads with the highest RTA score (1.80), reflecting Australia's strong expertise in AI-driven animal health, biosecurity and agricultural applications. The high RTA in veterinary science is primarily driven by AI research in general veterinary science (212 publications) and food animal health (72 publications), with smaller contributions from equine (13 publications) and small animal (9 publications) subfields. The dominance of the 'veterinary (all)' category suggests that much of this research is broad in scope, possibly involving AI applications in disease detection, diagnostics and precision livestock management. The significant contribution from food animals indicates a focus on AI-driven monitoring of livestock health, biosecurity and productivity improvements in agricultural settings.

When ranked by RTA score, *Arts and humanities* (RTA 1.70) also emerges as a standout area (Figure 13), suggesting a thriving research ecosystem in digital humanities, AI ethics and creative applications of AI. The strong AI presence in arts and humanities is driven by significant research output in interdisciplinary fields such as language and linguistics (324 publications), philosophy (113 publications), and history and philosophy of science (57 publications). The steady increase in AI-related arts and humanities research since 2015 suggests growing interest in AI applications in linguistics, ethics and cultural studies. This trend may be fuelled by AI advancements in natural language processing, digital humanities and machine-assisted content analysis, aligning with global discussions on AI ethics and societal impacts.

Dentistry (RTA 1.50) is another area of strength, indicating significant AI contributions to medical imaging, diagnostics and treatment planning. Australia also demonstrates a strong AI presence in *Mathematics* (RTA 1.33) and *Pharmacology, toxicology and pharmaceutics* (RTA 1.32). These fields are critical enablers of AI innovation, underpinning advancements in machine learning algorithms, computational modelling and AI-driven drug discovery. Other disciplines with above-average AI research activity include *Chemistry*, *Computer science*, *Materials science* and *Biochemistry, genetics and molecular biology* (Figure 13), reinforcing Australia's role in AI-driven advancements in health, biotechnology and engineering.

In addition to these strengths, AI research in *Engineering* and *Environmental science* is well-aligned with global trends, indicating a solid foundation for growth in AI applications for infrastructure, sustainability and energy systems. Given Australia's strategic focus on energy technology and environmental resilience, AI-driven solutions in these areas are well-positioned for further development. The strong representation of AI research in medical, biological, and mathematical sciences provides a competitive edge for Australia's AI industry. These strengths create opportunities for innovation in precision medicine, pharmaceutical development and computational research.

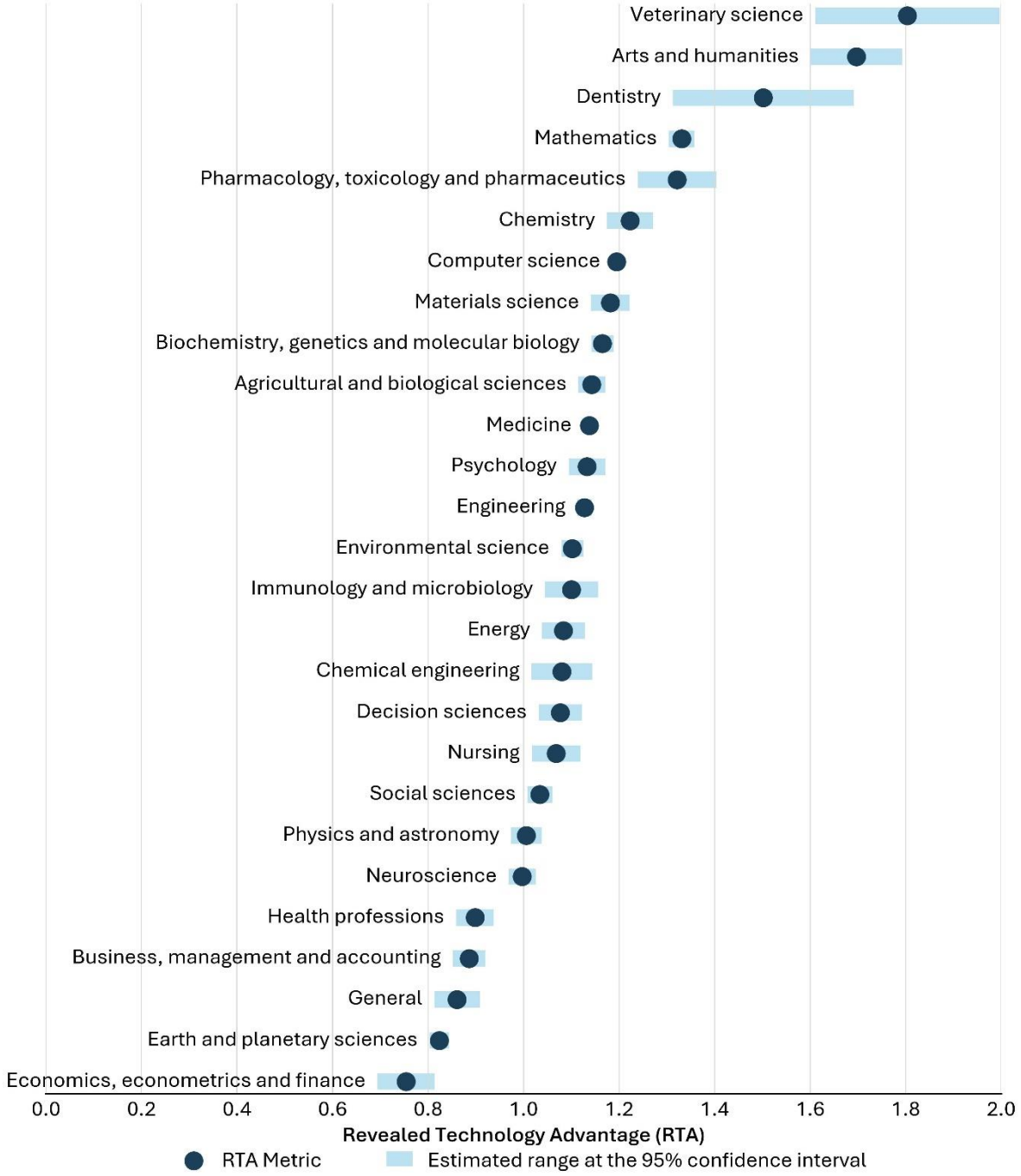
The RTA data indicate that Australia has developed AI research specialisations across a broad range of fields, with most disciplines showing an RTA above 1.0. This suggests that AI is being actively integrated into many research domains, not just traditional areas like computer science and engineering. Notably, Australia demonstrates strong AI specialisation in veterinary science (RTA 1.80), arts and humanities (RTA 1.70) and dentistry (RTA 1.50), highlighting areas where the country is building global leadership.

These high RTA scores reflect organic growth, where AI is being embedded into existing research strengths. Fields such as pharmacology, agriculture, and environmental science show significant AI activity, aligning with Australia's industrial capabilities and providing opportunities for world-leading applications. The presence of AI in these domains reinforces its role as a driver of innovation in health, sustainability and advanced manufacturing.

While some disciplines have RTA values below 1.0, this does not indicate weakness but rather that AI research in these fields is occurring at a lower intensity than in global AI hubs; hence, with room for growth. AI-related research in *Business, management and accounting* has grown from 115 publications in 2015 to 398 in 2024, totalling 2,363, with 1,618 (68%) in the past 5 years. *Economics, econometrics and finance* has produced 753 AI-related publications, with 462 (61%) in the last 5 years, indicating increasing AI adoption in financial modelling and economic forecasting. *Earth and planetary sciences* has generated 823 publications, with 499 (61%) since 2020, reflecting AI's expanding role in climate modelling and geospatial analysis. Despite lower RTA scores, these fields are rapidly integrating AI, demonstrating strong growth and increasing relevance in applied research. They just haven't yet reached the same intensity of AI use in Australia compared with the globe.

Overall, Australia's AI research landscape is well-positioned for continued growth, with clear opportunities to develop industry-leading AI applications.

Figure 13: Specialisation by research field in Australia from publishing data measured using revealed technology advantage (RTA) metric



Note: The RTA shows the research field's specialisation in Australia relative to the world. A high RTA means that Australian researchers in that field are using AI to a greater extent to their global peers in the same field. The fields are the All-Science Journal Classification (ASJC) by Elsevier (mid-level grouping).

4.3.4. References to AI technologies in Australian publishing

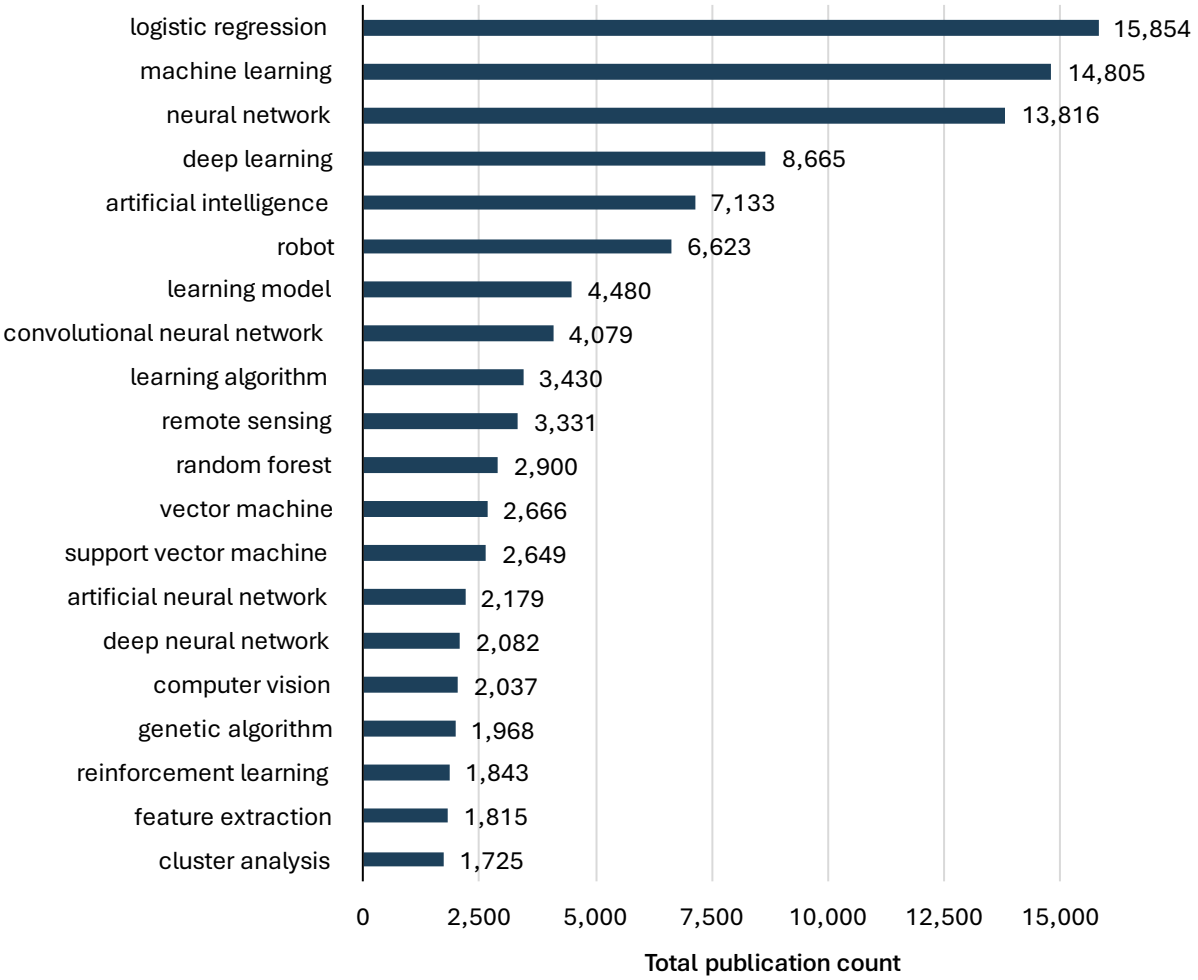
Between 2015 and 2024, Australian researchers contributed significantly to peer-reviewed AI-related scholarly publications, with 'logistic regression' emerging as the most frequently mentioned field, appearing in 15,854 research publications (Figure 14). Logistic regression is a well-established machine learning technique widely used in classification, predictive modelling and as a baseline in AI research. It is also a broader statistical technique that may lie beyond the field of AI, but we've taken a more inclusive approach as per the Stanford University AI search phrases (Maslej et al. 2024). 'Machine

learning' followed closely with 14,805 publications, underscoring its foundational role in AI research. 'Neural network' was the focus of 13,816 papers, highlighting the ongoing exploration of artificial neural architectures. 'Deep learning also saw strong interest, with 8,665 publications.

Beyond these core AI methodologies, 'artificial intelligence' as a broad category appeared in 7,133 papers, and 'robot' was covered in 6,623 publications, reflecting Australia's engagement in automation and intelligent systems (Figure 14). Other notable areas included 'learning model' (4,480), 'convolutional neural network' (4,079) and 'learning algorithm' (3,430), showing a strong emphasis on model development and training techniques.

Interestingly, 'remote sensing' (3,331) and 'computer vision' (2,037) suggest strong applications in geospatial and image-based AI research. 'Reinforcement learning' (1,843), despite being a major field globally, appeared in a relatively lower number of papers. The data illustrate Australia's broad and deep expertise across AI fields, with particular strengths in fundamental algorithms, machine learning and applied AI areas such as robotics and remote sensing.

Figure 14: Top 20 AI technologies referenced in peer-reviewed publications by Australian authors, 2015–2024



Note: Top 20 (of 336) AI technologies used as search terms, as detailed in Appendix B

4.4. Australian AI R&D specialisation

Australia's AI R&D sector is experiencing strong, organic growth, driven by its established industrial and research strengths. The data demonstrate that AI innovation is not developing in isolation but is emerging naturally in areas where Australia has long-standing expertise. This reinforces the idea that AI can act as an enabler, deepening technological capabilities in core industries while fostering new opportunities for growth and transformation. The rise in AI patenting – from 170 in 2015 to 629 in 2024 – along with a doubling of AI research output, highlights a sustained and accelerating trajectory of AI capability development.

Australia's AI specialisation is forming in industry domains where it already holds competitive advantages. The patent data reveal strong AI integration in advanced manufacturing, resources, construction and healthcare – sectors that historically have been pillars of the Australian economy. Similarly, AI research publishing is thriving in applied fields such as veterinary science, medical diagnostics and environmental sciences. This alignment suggests that rather than needing to build an AI industry from scratch, Australia is seeing AI naturally embedded into its strongest sectors, reinforcing economic resilience and innovation.

This organic growth presents a significant opportunity. Australia has the potential to develop world-leading AI capability in the application of AI to established industries. AI-driven advancements in materials science, automation, precision agriculture and digital health can position Australia at the global forefront of industry-specific AI innovation. The strong presence of AI in logistics, energy and creative industries further highlights the technology's role in supporting economic diversification and industrial transformation. Notably, Australia's high specialisation in AI research within the arts and humanities indicates that AI is also driving innovation in areas such as digital humanities, language and linguistics, and the ethical and societal dimensions of AI adoption. This presents further opportunities to shape global AI governance, policy and cultural applications.

However, while Australia has built strong AI research specialisations, it lags behind in AI commercialisation and intellectual property generation. Over the 2015–2024 decade, Australia accounted for 2.3% of global AI research publications but only 0.18% of global AI patent inventions, indicating a significant gap between knowledge creation and technology commercialisation. This equates to nearly 23 research publications for every patent.

While Australia has developed strong AI research specialisations, it lags in commercialisation and intellectual property generation. Between 2015 and 2024, Australia produced 2.3% of global AI research publications but just 0.18% of global AI patent inventions – nearly 23 publications for every patent. This highlights a disconnect between research activity and commercial outcomes, suggesting challenges remain in translating AI knowledge discoveries into market-ready innovations. The lower share of global AI patents may stem from structural barriers in research commercialisation, limited venture capital for AI startups or weaker industry–research collaboration. Tackling these challenges will help Australia better capitalise on its research strengths to drive AI-driven economic growth and global competitiveness.

Rather than aiming to compete directly with global AI giants in general-purpose AI development, this analysis suggests Australia's strategic advantage lies in leading the world in AI applications tailored to its economic strengths. By continuing to foster AI-driven innovation in key industry domains, Australia can unlock new efficiencies, drive productivity growth and create high-value export opportunities in AI-enabled products and services. Supporting this trajectory will require ongoing investment in research translation, industry partnerships and workforce development to ensure that AI expertise continues to scale alongside industry demand. However, it is important to note the role of sovereign capability in AI, which may drive increased engagement in areas currently dominated by large global technology corporations.

The evidence is clear; Australia's AI R&D capability is growing in a way that is deeply connected to its traditional industries and economic foundation. By embracing and accelerating this natural evolution – while strengthening pathways to commercialisation – the country can solidify its position as a leader in industry-specific AI applications, securing long-term competitiveness in an AI-driven global economy.

5. AI jobs and skills

Job postings data reveal how employer demand for different types of workers and skills evolves over time. Recent analysis shows that demand for workers with AI-related skills has increased in many advanced economies, including Australia (Maslej et al. 2024). In 2023, Australia ranked around the middle of advanced economies in terms of AI hiring intensity (Maslej et al. 2024). This section provides insights into the demand for AI-related skills across occupations, industries and locations in Australia over time. It also examines the types of skills required for AI-related jobs and the nature of AI work undertaken in Australian organisations.

5.1. Our methods and data

We used Lightcast (see Appendix A) job postings data from 2015 to 2024 to measure AI hiring in Australia. These data provide comprehensive coverage of job postings and have been used to analyse skills and labour demand in various contexts, including AI skills (Acemoglu et al. 2022; Maslej et al. 2024).

Our analysis primarily focuses on the proportion of postings requiring AI-related skills rather than raw counts. This approach offers a better indicator of underlying AI hiring trends over time. It is less sensitive to macroeconomic conditions that strongly influence total job posting volumes (Evans et al. 2023, 2024).

We defined a posting as requiring AI skills if it mentioned at least one keyword from our AI-related keywords list. After initial analysis, we refined this definition by removing 3 keywords that incorrectly identified large proportions of postings as requiring AI skills within certain categories (Appendix B).

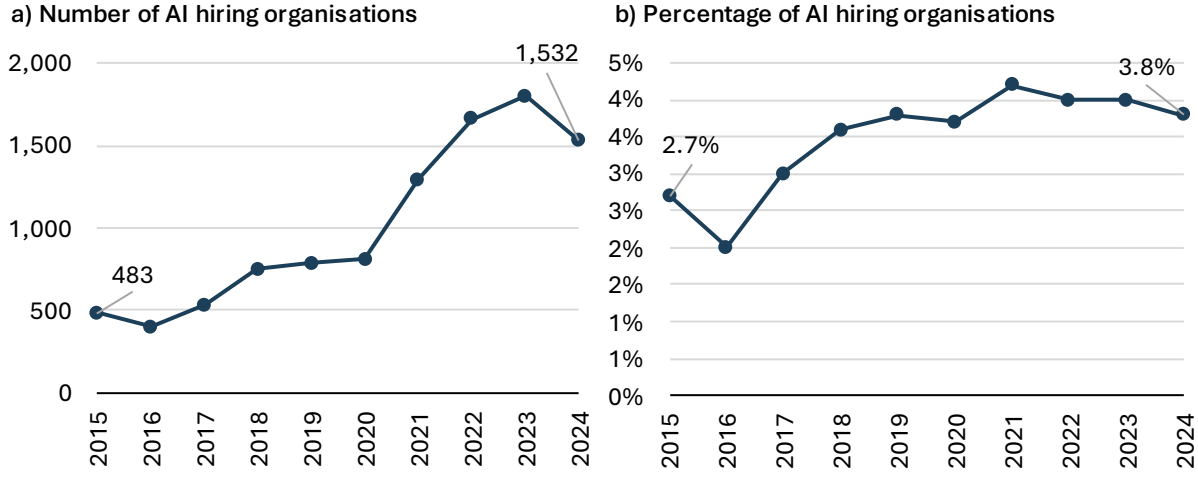
We analysed AI hiring trends across industries, occupations and regions using Australia's standard taxonomies (ABS 2013, 2021, 2022). To identify skills needed in AI jobs, we looked at the most frequently mentioned skills in AI-related job postings based on the Lightcast skills taxonomy.

To illustrate AI-related work in Australian organisations, we further analysed the text of AI job postings from 2024. We identified occupations with high proportions of AI-related skills requirements. For each occupation, we sampled postings mentioning AI skills and used ChatGPT to generate descriptions of the AI-related tasks. After reviewing these descriptions, we identified several broad clusters of AI-related work (see Table 4, in Section 5.6).

5.2. Growing demand for AI-related skills

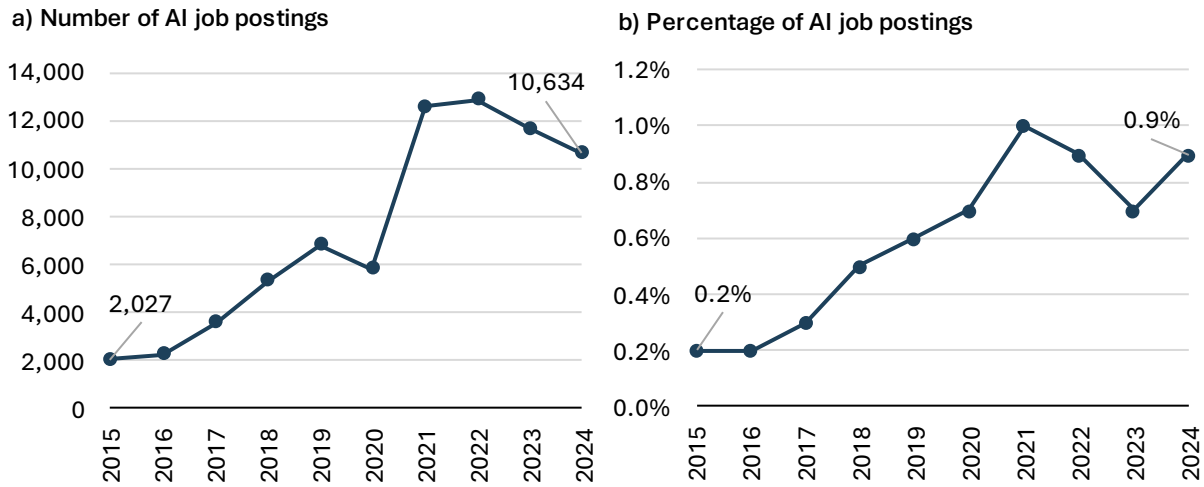
The Australian job market shows clear signs of increasing demand for AI talent. In 2024, 1,532 organisations (3.8% of hiring organisations) sought workers with AI-related skills, up significantly from 483 organisations (2.7%) in 2015 (Figure 15).

Figure 15: Number (a) and percentage (b) of hiring organisations that posted job ads seeking AI-related skills, 2015–2024



The percentage of all job postings requiring AI-related skills has grown more than 4-fold, rising from 0.2% in 2015 to 0.9% in 2024 (Figure 16). This steady growth demonstrates employers' increasing recognition of AI's value across various functions and sectors. The sharp rise in AI job postings during 2021 aligns with the broader economic recovery following the COVID-19 pandemic. The subsequent gradual decline since 2022 mirrors the overall decline in total job vacancies during this period.

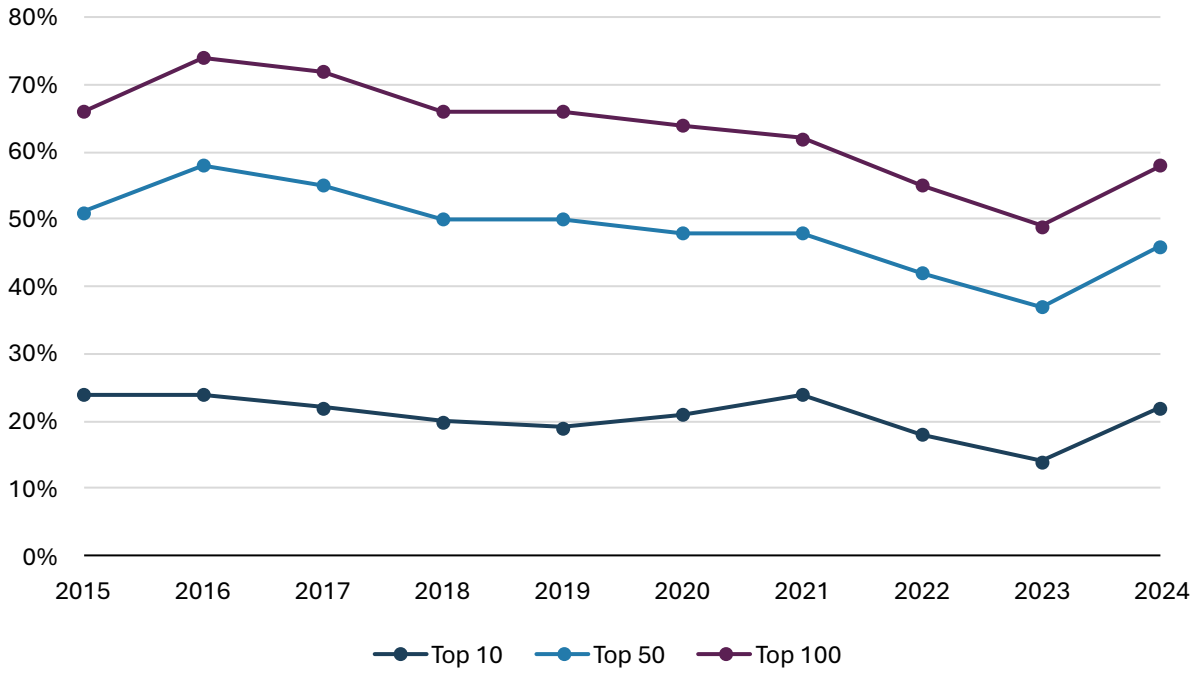
Figure 16: Number (a) and percentage (b) of job postings seeking AI-related skills, 2015–2024



5.3. Spatial and organisational concentration

While AI hiring continues to expand, it remains highly concentrated among a small number of organisations. In 2024, the top 10 AI-hiring organisations accounted for 22% of all AI job postings, while the top 50 and 100 organisations accounted for 46% and 58%, respectively. These concentration levels have remained relatively stable since 2015, indicating persistent patterns in the AI talent market (Figure 17).

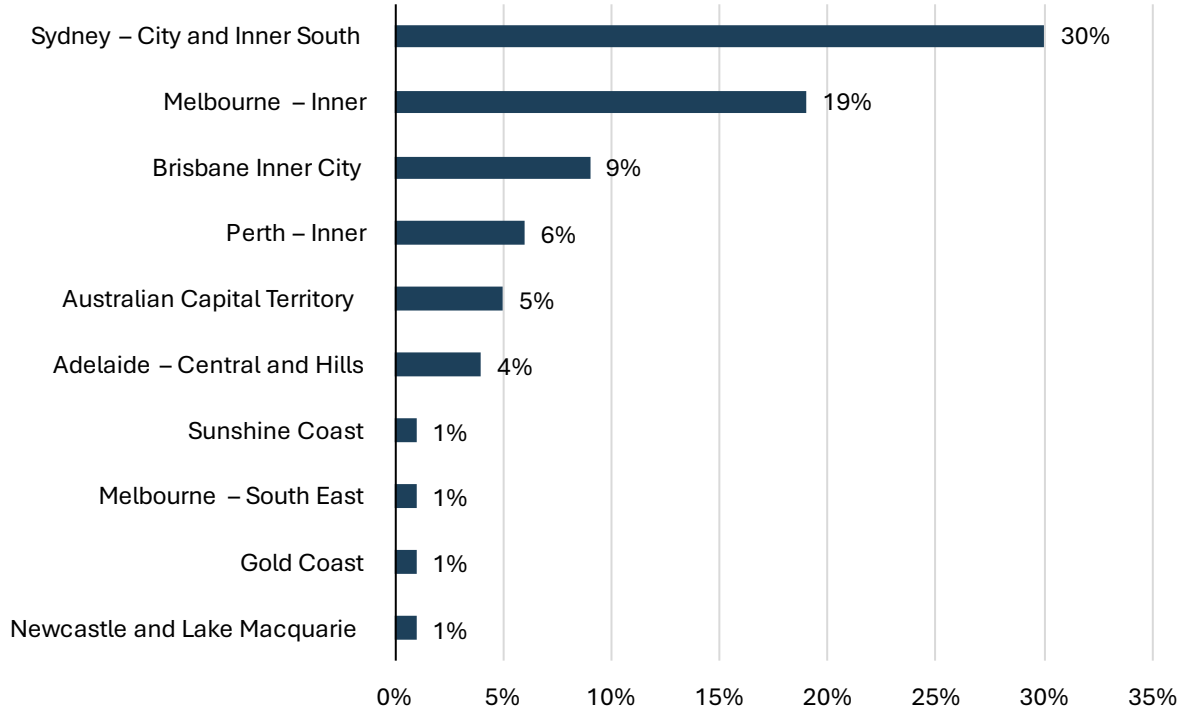
Figure 17: Percentage of total AI job postings held by the top 10, 50 and 100 AI-hiring organisations, 2015–2024



AI hiring shows strong geographical concentration in urban centres. In 2024, 64% of job postings requiring AI-related skills were located in inner Sydney (30%), Melbourne (19%), Brisbane (9%) and Perth (6%) (Figure 18). These proportions have remained relatively stable since 2015, highlighting continued metropolitan dominance in AI employment opportunities.

Outside major cities, the Sunshine Coast, Gold Coast, and Newcastle and Lake Macquarie labour markets each accounted for 1% of national AI-related job postings in 2024 (Figure 18). AI hiring intensity reached its highest levels in inner Sydney and Melbourne, where 2.1% and 1.4% of job postings required AI-related skills, compared with the national average of 0.9%.

Figure 18: Labour market (statistical area level 4) shares of total AI-related job postings in Australia, 2024

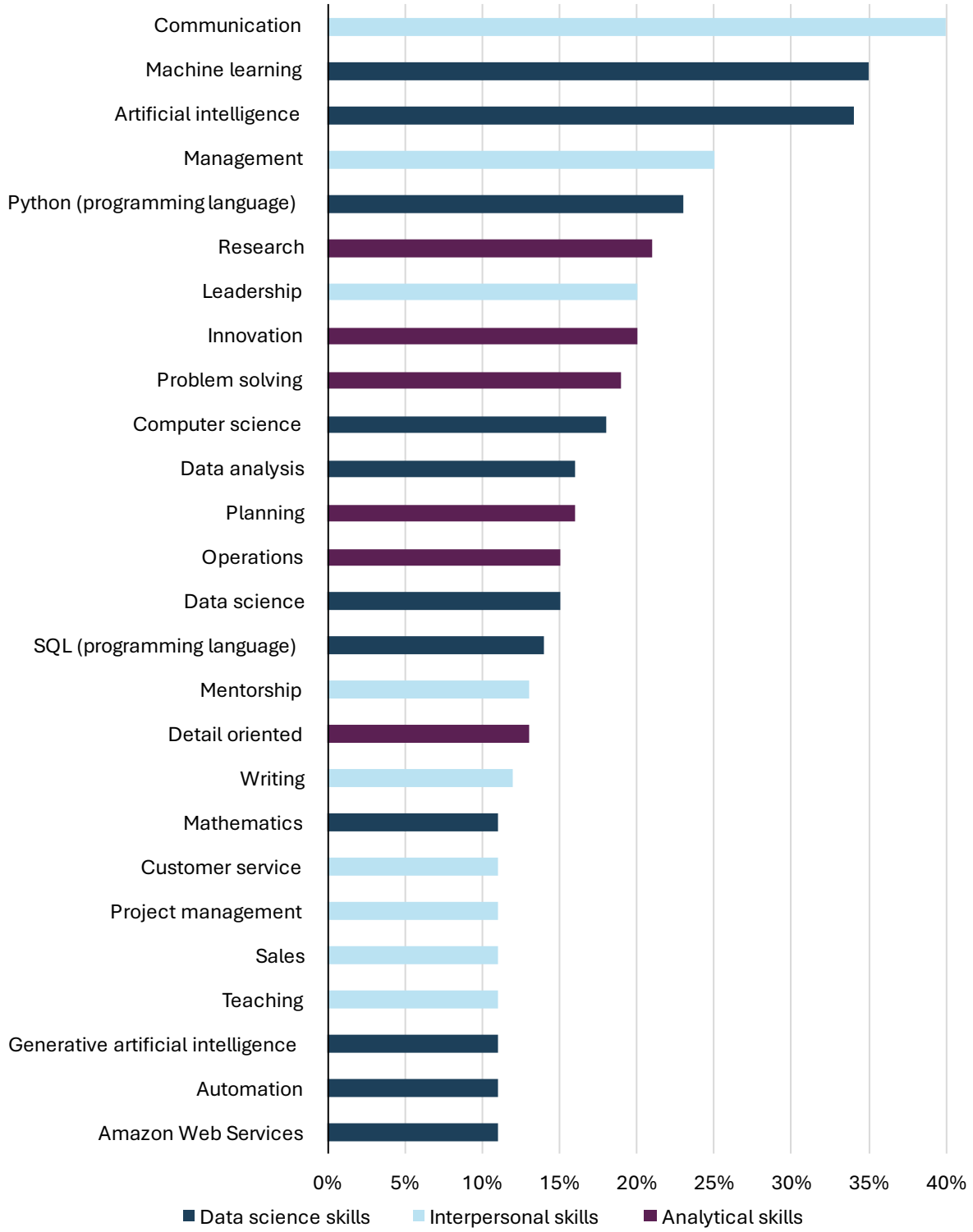


5.4. Skills underpinning AI-related jobs

Organisations seeking AI talent require a diverse mix of technical and non-technical skills. In 2024, AI-related job postings frequently mentioned data science capabilities, including machine learning, programming languages and mathematics. These technical requirements appeared alongside broader analytical skills, such as research, problem-solving and planning (Figure 19).

Interpersonal abilities featured prominently in AI job requirements, with communication, management and leadership skills frequently mentioned. This skill blend highlights that successful AI implementation depends not only on technical expertise but also on the ability to collaborate effectively, translate technical concepts for non-specialists and lead teams through technological change.

Figure 19: Percentage of AI-related job postings in 2024 by most frequently mentioned skills



Note: Skills are as defined by Lightcast and are shown if they were mentioned in at least 10% of AI-related job postings in 2024.

5.5. Demand for AI skills across industries and occupations

Between 2015 and 2024, demand for AI-related skills increased across all industries. The *Information media and telecommunications* sector showed the strongest growth, with AI skill requirements rising from 1.3% of postings in 2015 to 4.2% in 2024 (Table 2).

Other sectors experiencing substantial increases include *Professional, scientific and technical services* (from 1.0% in 2015 to 2.3% in 2024), *Financial and insurance services* (0.6% to 2.1%) and *Education and training* (1.4% to 2.6%) (Table 2).This broad-based growth demonstrates AI's expanding relevance across diverse sectors of the Australian economy.

AI hiring intensity varies considerably across occupation groups (Table 3). Professional and managerial roles show the highest demand for AI skills, while labourer and machinery operator positions show the lowest. The period from 2015 to 2024 saw particularly strong growth in demand for *ICT professionals* with AI skills, with requirements rising from 0.9% to 5.1% of postings.

Arts and media professionals experienced a dramatic increase in AI skill requirements in 2024, jumping to 7.6% of postings from just 0.8% in 2023. This spike primarily reflects increased hiring of authors and editors to train GenAI models, highlighting the emerging importance of human expertise in developing and refining AI systems.

Table 2: Percentage of job postings requiring AI-related skills in each industry (ANZSIC division), 2015–2024

Industry (ANZSIC)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Accommodation and food services	0.1%	0.2%	0.3%	0.5%	0.4%	0.3%	0.4%	0.3%	0.5%	0.3%
Administrative and support services	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%	0.3%	0.4%	0.4%	0.4%
Agriculture, forestry and fishing	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%	1.2%	1.2%	1.2%
Arts and recreation services	0.1%	0.2%	0.3%	0.6%	0.6%	0.4%	0.7%	0.6%	0.7%	0.6%
Construction	0.1%	0.4%	0.2%	0.1%	0.2%	0.4%	1.0%	1.0%	1.1%	1.0%
Education and training	1.4%	2.2%	1.9%	2.4%	2.1%	2.6%	2.7%	2.5%	2.8%	2.6%
Electricity, gas, water and waste services	0.2%	0.6%	0.7%	0.7%	1.0%	1.3%	1.2%	0.9%	1.5%	1.1%
Financial and insurance services	0.6%	1.3%	1.2%	1.5%	1.8%	1.9%	1.7%	2.0%	1.9%	2.1%
Healthcare and social assistance	0.1%	0.2%	0.1%	0.2%	0.3%	0.3%	0.3%	0.6%	0.4%	0.8%
Information media and telecommunications	1.3%	1.4%	1.7%	2.2%	2.9%	2.5%	2.8%	4.1%	2.9%	4.2%
Manufacturing	0.2%	0.5%	0.3%	0.3%	1.7%	1.5%	0.9%	0.6%	1.0%	0.7%
Mining	0.3%	0.4%	0.8%	1.0%	1.1%	1.2%	1.1%	1.0%	1.2%	1.0%
Other services	0.1%	0.2%	0.1%	0.1%	0.3%	0.4%	0.4%	1.5%	0.4%	1.6%
Professional, scientific and technical services	1.0%	1.8%	1.7%	1.7%	2.9%	2.6%	1.9%	2.2%	2.0%	2.3%
Public administration and safety	0.3%	0.5%	0.5%	0.6%	0.8%	0.7%	0.6%	0.7%	0.7%	0.7%
Rental, hiring and real estate services	0.1%	0.4%	0.1%	0.2%	0.4%	0.6%	0.7%	0.6%	0.7%	0.6%
Retail trade	0.1%	0.4%	0.5%	0.9%	0.9%	0.6%	0.5%	0.4%	0.6%	0.5%
Transport, postal and warehousing	0.3%	0.5%	0.6%	0.4%	0.4%	0.4%	0.4%	0.5%	0.4%	0.6%
Wholesale trade	0.1%	0.5%	0.7%	1.5%	2.0%	1.6%	0.4%	0.2%	0.5%	0.3%

Table 3: Percentage of job postings requiring AI-related skills in each occupation group (ANZSCO level 2), 2015–2024

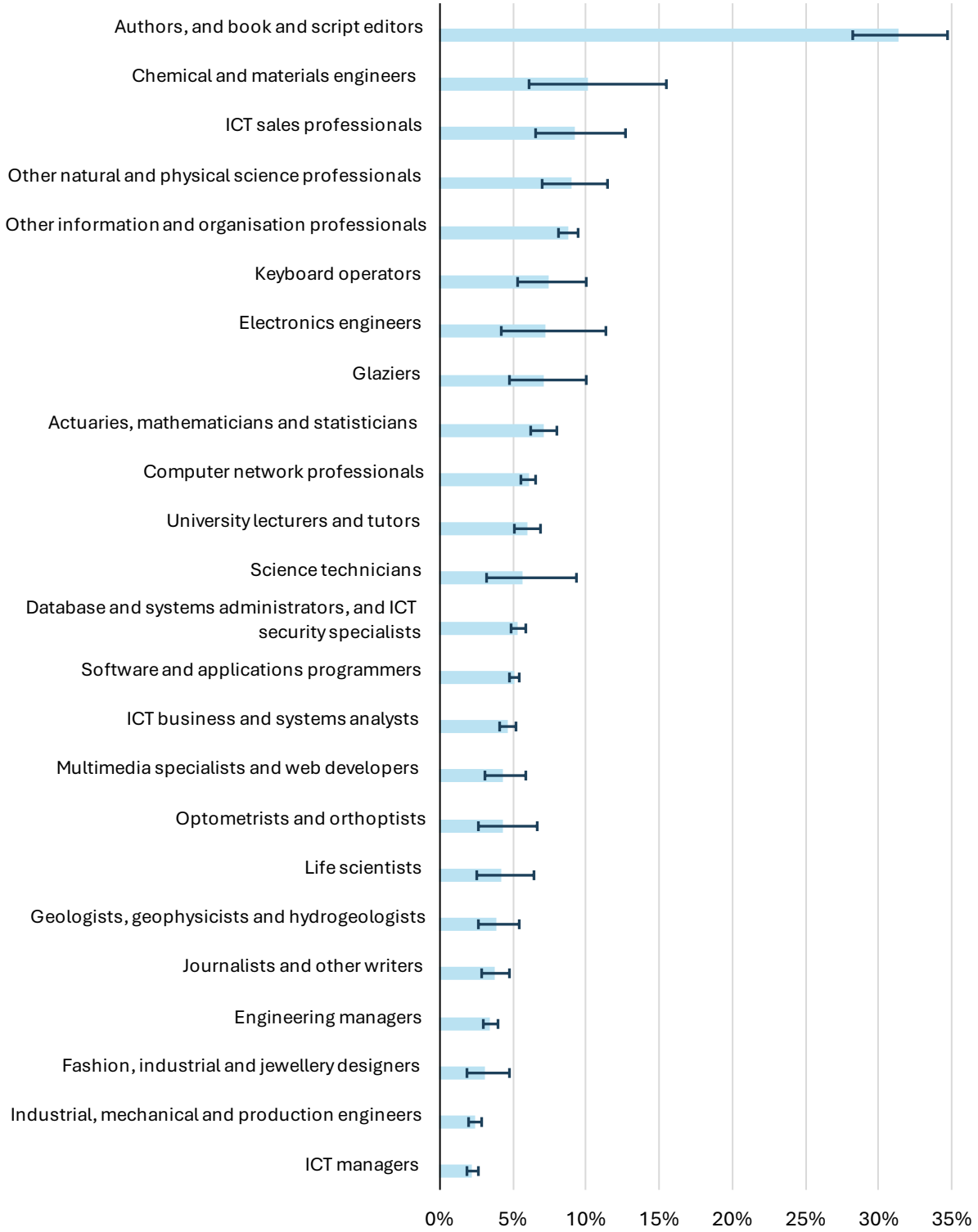
Occupation group (ANZSCO level 2)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Managers										
Chief executives, general managers and legislators	0.2%	0.2%	0.4%	0.6%	0.6%	0.7%	1.1%	1.3%	0.9%	1.1%
Farmers and farm managers	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%	0.1%	0.0%
Specialist managers	0.1%	0.1%	0.2%	0.4%	0.6%	0.6%	1.1%	1.1%	0.8%	0.9%
Hospitality, retail and service managers	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%
Professionals										
Arts and media professionals	0.1%	0.1%	0.2%	0.1%	0.5%	0.6%	0.8%	0.9%	0.8%	7.6%
Business, human resource and marketing professionals	0.3%	0.4%	0.8%	1.3%	1.5%	1.5%	2.1%	1.9%	1.6%	1.8%
Design, engineering, science and transport professionals	0.3%	0.3%	0.4%	0.6%	0.6%	0.8%	1.2%	1.4%	1.3%	1.4%
Education professionals	0.8%	0.5%	0.6%	1.4%	1.2%	1.1%	1.1%	2.1%	1.9%	2.8%
Health professionals	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
ICT professionals	0.9%	1.2%	1.8%	2.7%	3.0%	3.6%	4.8%	5.0%	4.3%	5.1%
Legal, social and welfare professionals	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.3%	0.5%	0.3%	0.4%
Technicians and trades workers										
Engineering, ICT and science technicians	0.2%	0.1%	0.2%	0.3%	0.3%	0.4%	0.7%	0.7%	0.7%	0.6%
Automotive and engineering trades workers	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.3%	0.8%	0.8%
Construction trades workers	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.8%
Electrotechnology and telecommunications trades workers	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.3%	0.3%	0.3%
Food trades workers	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%

Occupation group (ANZSCO level 2)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Skilled animal and horticultural workers	0.1%	0.0%	0.0%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%
Other technicians and trades workers	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%	0.1%	0.2%	0.3%	0.4%
Community and personal service workers										
Health and welfare support workers	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%
Carers and aides	0.2%	0.3%	0.2%	0.1%	0.1%	0.1%	0.1%	0.3%	0.4%	0.4%
Hospitality workers	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%
Protective service workers	0.0%	0.2%	0.1%	0.4%	0.2%	0.4%	0.7%	0.9%	0.6%	0.7%
Sports and personal service workers	0.0%	0.0%	0.1%	0.0%	0.2%	0.2%	0.1%	0.2%	0.1%	0.2%
Clerical and administrative workers										
Office managers and program administrators	0.1%	0.1%	0.1%	0.3%	0.3%	0.4%	0.6%	0.7%	0.5%	0.5%
Personal assistants and secretaries	0.1%	0.0%	0.1%	0.1%	0.1%	0.2%	0.3%	0.3%	0.4%	0.4%
General clerical workers	0.4%	0.1%	0.0%	0.1%	0.1%	0.2%	0.1%	0.1%	0.5%	0.7%
Inquiry clerks and receptionists	0.1%	0.0%	0.0%	0.1%	0.1%	0.1%	0.3%	0.3%	0.2%	0.2%
Numerical clerks	0.1%	0.0%	0.1%	0.2%	0.0%	0.1%	0.2%	0.2%	0.2%	0.2%
Clerical and office support workers	0.4%	0.0%	0.1%	0.1%	0.1%	0.2%	0.3%	0.3%	0.5%	0.6%
Other clerical and administrative workers	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.2%	0.4%	0.4%	0.3%
Sales workers										
Sales representatives and agents	0.1%	0.1%	0.2%	0.3%	0.6%	0.7%	1.2%	1.4%	1.0%	0.9%
Sales assistants and salespersons	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Sales support workers	0.0%	0.0%	0.0%	0.1%	0.0%	0.4%	0.3%	0.3%	0.2%	0.4%

Occupation group (ANZSCO level 2)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Machinery operators and drivers										
Machine and stationary plant operators	0.2%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.3%	0.1%	0.1%
Mobile plant operators	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.4%
Road and rail drivers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.1%
Storepersons	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.3%	0.3%
Labourers										
Cleaners and laundry workers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Construction and mining labourers	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%	0.1%	1.0%
Factory process workers	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.2%	0.2%	0.3%	0.4%
Farm, forestry and garden workers	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Food preparation assistants	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
Other labourers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.6%

In 2024, several occupations showed AI hiring rates significantly above the national average of 0.9% (Figure 20). *Authors, and book and script editors* led with 31% of postings requiring AI-related skills, primarily for training GenAI models. Various ICT professionals, scientists, and analysts also demonstrated high rates of AI skill requirements, reflecting the technical foundation of many AI roles.

Figure 20: Percentages of job postings requiring AI-related skills in occupations (ANZSCO level 4) with the highest rates of AI hiring in 2024



Note: The error bars indicate 95% confidence intervals (CIs). Occupations are shown if the lower bound of this CI exceeds twice the national AI hiring rate of 0.9%.

5.6. Types of AI-related work

Job postings for occupations with high AI hiring rates in 2024 reveal diverse applications of AI across the Australian economy (Table 44). Organisations seek talent to leverage AI for multiple purposes across various roles. Business analytics professionals use AI and machine learning to analyse data and build predictive models. They extract insights for decision-making and optimise business processes.

Engineers apply AI to industrial processes. They develop systems that optimise manufacturing, detect anomalies and control autonomous vehicles. Scientists employ AI for data analysis and predictive modelling across domains; these include bioinformatics, environmental monitoring, healthcare and agriculture.

Medical professionals integrate AI tools for more efficient diagnosis. This is particularly evident in specialties like optometry, where AI assists in detecting eye conditions and optimising treatment plans. ICT specialists focus on developing AI applications for various domains. These range from financial fraud detection to healthcare, predictive maintenance and military operations.

Content creators work on training GenAI models. They provide human feedback, rank AI-generated responses and improve prompt design. Technical specialists, such as glaziers, perform specialised tasks. These include recalibrating advanced driver-assistance systems after windshield repairs. Educators teach and research AI, preparing the next generation of AI professionals.

This diversity of AI-related work demonstrates the widespread integration of AI technologies. They create new roles while transforming existing ones across industries and occupational categories.

Table 4: AI-related tasks and task clusters of occupations (ANZSCO level 4) with the highest rates of AI hiring, 2024

Task cluster	Occupations	Tasks
AI for business analytics	Actuaries, mathematicians and statisticians ICT business and systems analysts Other information and organisation professionals	Using AI and machine learning to analyse data, build predictive models, extract insights for decision-making and optimise business processes
AI for industrial processes	Chemical and materials engineers Industrial, mechanical and production engineers	Using AI and machine learning to optimise manufacturing processes, develop predictive models for anomaly detection and develop AI-driven control systems for autonomous vehicles
AI for science	Geologists, geophysicists and hydrogeologists Life scientists Other natural and physical science professionals Science technicians	Using AI and machine learning for data analysis and predictive modelling in areas such as bioinformatics, environmental monitoring, healthcare and agriculture
AI for medical diagnosis	Optometrists and orthoptists	Using AI tools to detect eye conditions more efficiently and optimise treatment for patients

Task cluster	Occupations	Tasks
Developing AI applications and systems	Computer network professionals Database and systems administrators, and ICT security specialists Electronics engineers Engineering managers Fashion, industrial and jewellery designers ICT managers ICT sales professionals Multimedia specialists and web developers Software and applications programmers	Developing, designing and selling AI tools for application in a wide range of domains, including financial fraud detection, healthcare, predictive maintenance in asset management, customer analytics and military operations
Training generative AI models	Authors, and book and script editors Journalists and other writers Keyboard operators	Training GenAI models by providing human feedback, ranking AI-generated responses and improving prompt design.
Calibrating AI systems	Glaziers	Recalibrating advanced driver-assistance systems after windshield repairs
Teaching AI	University lecturers and tutors	Teaching and researching AI, machine learning and data science

6. What interviewees told us

We conducted 15 in-depth interviews with people who hold insightful perspectives on the full range of aspects that comprise today's Australian AI ecosystem. Interviewees included developers, investors, advisors, researchers, educators and regulators. We asked them to reflect on current development, usage and investment in AI technologies within their own sphere of expertise. Further, we sought comments on how they see AI being adopted across Australia more broadly. We were also interested to hear their views on Australia's potential future relationship to AI, both in terms of development and use. In relation to this, what we might need to do in the coming months and years to fully – and responsibly – leverage the benefits that AI can offer? Finally, we asked interviewees to identify any unique characteristics of Australia's position in the global AI landscape, and whether they could see ways to leverage our core strengths to accelerate our contribution to AI innovation. The following themes represent the sum of these interviews. They are highly interconnected and together contribute to an understanding of the current state of Australia's AI ecosystem.

A call for a culture of innovation and collaboration: The acceleration of AI technology development and the associated product outputs that we have seen over the past 2–3 years have reshaped, and continue to transform, our societal landscape. This is happening from the boardroom to the classroom, the shop floor to the surgical theatre. For the Australian AI ecosystem to fully capitalise, both financially and socially, on these developments, all our interviewees talked about the need to enhance our culture of innovation. Currently, up-and-coming innovators are not only struggling with uncertainties about how to proceed, but also grappling with knowing that their ideas could receive more support outside of Australia. Further, interviewees felt the current situation lacks transparency, openness and productive cooperation. This presents challenges because it does not foster a culture of collaboration and shared learning, which were seen as the essential ingredients with which to support innovation. The downstream impacts of not providing a nurturing, scaffolding and reinforcing innovation culture were perceived as 2-fold. First, we lose our talent pipeline. Second, we are not able to capture the immense value of this current wave of AI revolution.

Strengthening AI leadership in Australia: There was strong consensus among our interviewees that Australia's AI ecosystem would benefit from clearer and more strategic leadership. While progress is being made, there remain opportunities to enhance governance, coordination and coherence, and cultural momentum around AI. Gaps in leadership are felt across multiple levels – from government policies to organisational strategies, as well as broader societal discourse. The need for stronger leadership extends beyond innovation alone; it also impacts financial planning, risk management and long-term strategic direction. Many interviewees emphasised that now is the time for Australia to move beyond a 'wait and see' approach. Rather than remaining primarily a consumer of AI technologies developed elsewhere, Australia has the potential to position itself as a global AI creator and innovator.

To achieve this, leadership must not only understand what AI can do, and is already doing; it should also provide a vision for how Australia can seize future opportunities. Confidence in AI-driven transformation is key. Interviewees highlighted the importance of leadership in fostering trust and ensuring organisations are prepared for the cultural and structural shifts that accompany AI adoption. Many interviewees looked to building an innovation culture as a way to embed better leadership.

Leadership was also called on to overcome hesitancies among many Australian organisations to embrace AI. This is often linked to the human side of technology implementation – where established ways of working can make change difficult. Effective leadership could help navigate these challenges, its purpose to reassure both AI developers and users while encouraging a proactive and engaged approach.

A whole-of-society program of high-quality AI literacy: All interviewees described the need for a new type of AI literacy. This next generation of AI education does not involve just talking about 'prompt engineering' or 'hallucinations'. While these are important, what we need right now – from students to teachers, civil servants to entrepreneurs – is a thorough and critical understanding of AI. People need to know what AI can do today, how it does it, and what we might want to do with AI tomorrow. This need for a more in-depth grasp of the technology was described in terms of both end users and key decision-makers in industry or policy. The commentary also related to a converse risk that technology is being developed or deployed without an adequate grasp of how and why. Many interviewees described the need to work back from the problem to the solution, rather than finding out too late that the AI solution doesn't in fact

solve the problem. The consensus was that Australians need to advance their understanding of the technology's workings and implications. Data were cited as one aspect in need of attention. Levels of data literacy should be improved so that we can confidently ask (and answer) questions like:

- where are the various data sources coming from
- who has access to them, are they being responsibly managed
- how do we validate their quality
- what can we responsibly do with the data?

Interviewees consider that this level of education will be essential to help Australians move from a place of concern and uncertainty about AI's role in our future, to a place of confidence and agency. From here, the pathway towards developing an AI enabled future will be clearer and easier to tread.

Transitioning Australian society from fear to confidence: Interviewees shared an observation that the current public sentiment towards AI is shaped by a mix of fascination and apprehension. This response is not misplaced. Given the complexity of the emerging socio-technical landscape, the Australian public's concerns reflect a reasonable reaction to a technology about which many have limited understanding. In the absence of clear information and experience, uncertainty is a natural outcome. This negative spin, however, is creating friction for the design, development and deployment of AI in Australia. Alongside the need described above to increase Australian levels of AI education, our interviewees noted a need to increase public trust in AI technologies. One important way to do this is to see a stronger human presence and oversight of our AI stories. Providing real-world stories that showcase people's AI journeys is a way for both those working with AI and those using AI to feel more positive and confident in this socio-technical revolution. Interviewees also commented on there being plenty of ideas about how to integrate AI into existing industries, but little evidence-based reflection on the practicability, viability or often legality of that integration. This front loading of the AI pipeline is not building confidence, and there is a lack of tested uses of AI with which to provide demonstrable evidence of return on investment or societal benefit. Building trust in AI will not only shift the dial on public opinion, but also set the backdrop for our innovation culture. The shift will allow people and organisations to feel inspired, guided and encouraged to try AI for themselves, and in ways they can feel proud to share.

Harnessing AI to solve Australia's grand challenges: When it came to identifying Australia's unique AI pathway, most interviewees agreed that we need to align AI innovation with our own well-established 'grand challenges'. Australia's societal values are built into our existing prioritisation of healthcare, agriculture, infrastructure, the environment and social equity. Hence, it is in solving these ongoing challenges that we should look to the revolutionary potential of AI. The benefit of such an approach is that the challenges can become unifying models of funding, collaboration and innovation. Bringing diverse stakeholders around the table to look at the role that AI can, and should, play in each sector can provide a basis of shared motivation, value alignment and goal coalescence. It also means that the emphasis is on asking the right questions, including welcoming diverse insights. This facilitates finding the appropriate solution, rather than only finding a place in which to exploit a technology. Interviewees commented that this collaborative model allows plenty of scope for both innovation and the economic benefits that come with that – both nationally and abroad. Moreover, it ensures Australian progress is not overshadowed by economically profitable imperatives in ways that can derail the innovation process and erode public trust. All interviewees agreed, however, that the application of AI solutions to solve Australia's grand challenges cannot be done by relying on products made and maintained outside of Australia. To guarantee a robust Australian AI ecosystem, interviewees described the need for sovereign technology to ensure that our products and systems are not vulnerable to geo-political shifts and do not result in unsustainable dependencies.

To develop AI or to use AI? Australia's startup ecosystem is performing strongly, with many ventures developing AI-based or AI-enhanced solutions. The focus on *the application layer* – leveraging existing off-the-shelf AI technologies to construct new AI products or propositions – is both valuable and well-aligned with current market needs. Encouragingly, there is significant talent and momentum in this space. However, Australia's presence in foundational AI R&D remains limited. Interviewees consistently emphasised the importance of investing in both application-level development and foundational AI research. Relying solely on the application layer risks limiting Australia's long-term innovation capacity and economic return. As foundational AI capabilities continue to be developed offshore, Australia's

dependency on external technologies is expected to grow – further constraining our national competitiveness.

There was broad agreement that Australia has a strong academic base in foundational AI, and this is a strength we should recognise and build on. However, interviewees highlighted the need for greater support – through strategic funding and forward-looking collaborative models that better integrate research with industry. Across all sectors, interviewees expressed concern about Australia's limited control over its AI ecosystem and stressed the urgency to fill this gap.

The best ideas in the world need financial support: Becoming a leader of the national AI ecosystem requires more than just innovation, collaboration, support and knowledge. Underpinning all of these is a critical enabler: substantial and sustained investment. This means reassessing current spending priorities and directing resources more strategically. Interviewees emphasised that this is not simply a question of how much we invest, but how we invest. They pointed to initiatives as critical levers to strengthen Australia's innovation culture towards one that better supports AI advancement. This includes:

- national AI summits
- conventions
- growth centres
- talent incentives.

Central to this shift is the collaboration between research and industry. Many highlighted that while there has long been rhetoric around universities becoming more outward-facing, little progress will be made without foundational change at the organisational level. Researchers must be confident that partnering with industry will not compromise their academic careers. On the industry side, investment is needed to build trust, foster experimentation and support risk-taking. Without this kind of strategic scaffolding, Australia may remain fragmented, protectionist and overly risk-averse – conditions that will ultimately inhibit collaboration and innovation.

Ensuring that access to the benefits of AI is shared by all; All interviewees were very aware of the need for responsible AI. This was talked about in relation to literacy, data and model bias. The issue of equity of access and resources was also raised and was situated in the broader context of ongoing concerns over societal equality. The point being made was that although individual inequities – whether in terms of financial resources, education or social capital – are not a new challenge, the speed with which AI is changing our societal landscape has the potential to exacerbate the gap between those who have and those who have not. When it comes to equity at organisational levels, like the differences between small or large industries, interviewees commented on the vulnerabilities of SMEs. Acknowledging that AI support is being provided at this level, the concern was that organisations with fewer resources were not only less able to invest in AI adoption, but their ability to manage the clarity, accountability and enactment of responsible AI puts them at a disadvantage. It was also noted that moving into a defensive mode of SME protection risks isolating these industries from the larger global players, thus further contributing to a culture of competitive non-collaboration. Finally, interviewees commented that this competitive culture is evident amongst the SMEs themselves whose mindset is often one of self-protection in the face of resource shortage. This breakdown in collegiality means that smaller enterprises are not capitalising on shared knowledge from each other or from larger players in the AI ecosystem. This risks further tipping the playing field away from a level ground.

7. Key characteristics

In summary of all the material covered in this report, we can identify a set of characteristics that collectively describe the nature of Australia's AI ecosystem. These will be relevant to industry, government, academia and community organisations as they grow and develop the national AI technology sector. The characteristics we identify are as follows:

1. **Dual-track ecosystem – startups driving innovation, corporates powering adoption:** Australia features a dual-track AI structure where private startups fuel innovation through rapid experimentation, while larger companies drive adoption across established industries. Private companies, particularly those founded in 2023–2024, are emerging rapidly, with specialised, sector-specific AI solutions in healthcare, logistics and creative industries. Simultaneously, public companies – many with decades of operational history – are integrating AI to modernise operations and enhance competitiveness in energy, mining, finance and healthcare. This balanced ecosystem allows agile startups to explore frontier technologies while mature firms translate innovations into scalable applications, reinforcing sectoral strengths and economic resilience.

2. **Strong organic clustering with geographical diversity:**

   Australia's AI ecosystem demonstrates pronounced clustering behaviour, with 68% of geocoded AI companies (858 firms) operating in 25 distinct geographical clusters. This pattern, similar to global innovation hubs like Silicon Valley, creates critical mass driving innovation through knowledge spillovers, shared talent pools and enhanced collaboration. While major clusters concentrate in capital cities, significant clusters also exist in regional centres like the Gold Coast, Sunshine Coast and Newcastle, each with distinctive specialisations. The clustering phenomenon transcends simple urbanisation, representing organic innovation-district formation. These patterns suggest policies should enhance natural ecosystem dynamics while recognising the critical role of the 32% of companies operating outside formal clusters.

3. **Alignment of AI specialisations with traditional industry strengths:** Australia's AI ecosystem shows remarkable alignment between emerging AI specialisations and traditional industrial strengths. Patent analysis reveals high specialisation in sectors like specialised construction (RTA 1.90), chemical manufacturing (RTA 1.38) and mineral products (RTA 1.45). Perth's AI cluster demonstrates pronounced specialisation in energy and resources applications (59% of companies), reflecting Western Australia's mining heritage. Research specialisation follows comparable patterns, strongly supporting traditional industries, including environmental and agricultural sciences. This creates a distinctive national AI profile where technical innovation enhances rather than disrupts established capabilities. Unlike nations where AI development often occurs separately from traditional industries, Australia demonstrates organic integration. This indicates evolutionary rather than revolutionary innovation pathways.

4. **Knowledge discovery – product innovation imbalance:** Australia exhibits an imbalance between knowledge discovery and commercial product innovation in AI. Despite contributing 1.88% of global AI publications, Australia accounts for only 0.18% of global AI patents, highlighting commercialisation challenges. We do more publishing than commercial product making. This imbalance appears particularly acute in emerging AI fields like deep learning and reinforcement learning, where Australia shows strong research output but limited patent activity. These patterns suggest structural barriers in the innovation pipeline between academic research and industry applications, potentially limiting the economic impact of Australia's considerable AI knowledge production.

5. **Complementary public- and private-sector specialisation:** Australia's AI landscape shows distinct public- and private-sector roles. Public organisations primarily adopt AI rather than develop it, with energy, raw materials and utilities (82 companies), healthcare (77) and IT infrastructure (66) leading implementation of machine learning, robotics and remote sensing. Meanwhile, private companies drive specialised innovation, dominated by business processes (494 companies), IT infrastructure (346), and media and marketing (255). Small enterprises comprise 85% of the private sector, focusing increasingly on sustainability, conversational interfaces and cloud deployment. This complementary ecosystem leverages public companies for implementation at scale while private firms deliver specialised innovation and technological

advancement. Government procurement is already playing a role in developing Australia's AI ecosystem, and this can continue to increase.

6. **Robust growth amid global competition:** Australia's AI ecosystem has maintained impressive growth despite intensifying global competition. AI publications increased 135% from 2015 to 2023, while AI patent applications nearly quadrupled in the same period. The ecosystem showed remarkable resilience during COVID-19, with continued growth in both publications and patents. In the 2015–2024 decade, AI patent intensity has risen significantly from 1.3% to 4.9% of total patents, indicating a strategic shift toward AI innovation. However, Australia's global share of AI publications has gradually declined from 2.6% to 1.9%, reflecting extraordinary worldwide expansion rather than diminished Australian activity. This paradoxical combination of strong absolute growth and relative position decline characterises an ecosystem maintaining robust development amid global AI acceleration, with growth patterns concentrated in sectors aligned with Australia's traditional economic strengths.

7. **Broad-based AI adoption across research disciplines:** Australia's AI ecosystem shows progressive integration across diverse research disciplines beyond core technical domains. While computer science (18% of AI publications) and medicine (16%) lead, AI methods have penetrated fields ranging from environmental science (7,808 publications) to agriculture (5,861) and social sciences (5,784). The data reveal strong AI specialisation in unexpected disciplines like veterinary science (RTA 1.80), and arts and humanities (RTA 1.70). AI's intensifying presence is evidenced by publications growing from 5.3% of total scholarly output in 2015 to 11.6% in 2024. Such cross-disciplinary integration creates a distinctive ecosystem in which AI technologies flow between domains. This fosters innovative applications that enhance traditional Australian industries while building capabilities in fields not typically associated with AI development.

8. **Manufacturing-led patenting with traditional industry applications:** Australia's AI patenting activity reveals strong orientation towards enhancing traditional manufacturing and resource industries. Manufacturing industries occupy 10 positions in the top 15 patenting sectors. Computer, electronic and optical product manufacturing dominates (3,837 patents), followed by machinery and equipment manufacturing (1,442 patents). This patenting pattern aligns with Australia's traditional economic strengths, with significant innovation in resource-adjacent sectors like chemical manufacturing, mineral products and specialised construction services. Unlike countries where AI patents concentrate in pure software or consumer technology, Australia's ecosystem focuses on enhancing productivity in established industrial strongholds. This creates distinctive technological specialisations that reflect Australia's comparative advantages.

9. **Research–industry alignment with regional specialisation:** Australia's AI ecosystem shows notable alignment between research specialisations and regional industry strengths, creating geographically distinctive innovation patterns. Canberra's strong government and defence AI focus (58% of clustered companies) pairs with specialised security and policy research. Perth's concentration in resource-sector AI applications correlates with research strengths in resource engineering and environmental monitoring. Research specialisation in mathematics (RTA 1.33) supports Australia's financial services AI applications, while specialisation in veterinary science (RTA 1.80) aligns with agricultural technology development in regional clusters. This geographical–sectoral alignment creates naturally specialised innovation corridors where research capabilities directly enhance regional industrial capabilities through proximity and shared priorities. This differs from countries where research and industry operate in parallel but separate tracks.

10. **Broadening demand for AI skills:** Australia's labour market has seen a steady rise in employer demand for AI-related skills, with job postings referencing these skills growing from 0.2% in 2015 to 0.9% in 2024. This demand has increased across all industries and almost all high-level occupation groups, suggesting increasing integration of AI into diverse organisational functions. The growth pattern indicates a maturing ecosystem where AI capabilities are becoming essential across sectors rather than remaining confined to specialised technical domains. This broadening demand creates opportunities for workforce development while also highlighting the need for expanded AI education and training pathways to ensure skills supply can meet the diversifying market requirements. The trend suggests AI is transitioning from a niche technological specialty to a mainstream business capability.

11. **Demand for non-technical AI-related skill sets:** Job postings for AI-related positions frequently mention analytical, interpersonal and managerial capabilities alongside technical skills in data science, programming and machine learning. This indicates that both core AI skills and complementary skills are important in many AI-related roles, with workers requiring diverse capabilities for effective performance. The pattern suggests successful AI implementation depends not only on technical expertise but also on abilities to communicate complex concepts, manage interdisciplinary teams, and translate between technical and business domains. As AI becomes more integrated into organisational processes, this demand for hybrid skill sets is likely to intensify. This will create opportunities for professionals who can bridge technical and operational contexts while posing challenges for traditional training programs.

12. **High concentration of AI hiring by organisation and location:** Despite broader growth in AI adoption, hiring remains disproportionately concentrated among a small group of organisations and geographical areas. In 2024, just 100 organisations accounted for 58% of all AI job postings, with nearly two-thirds of AI-related positions located in inner Sydney, Melbourne, Brisbane and Perth. These enduring concentration patterns indicate centralisation of AI talent and capability in existing innovation districts and a small employer base. This geographical and organisational concentration creates challenges for equitable AI development across the economy, potentially limiting technology diffusion to regional areas and smaller enterprises. The pattern suggests targeted interventions may be needed to broaden access to AI talent and ensure benefits extend beyond current centres of concentration.

13. **Emergence of diverse AI work clusters:** Analysis of 2024 job postings reveal AI deployment across occupations well beyond traditional ICT domains. Organisations are hiring workers to use AI for business analytics, industrial process optimisation, scientific modelling and medical diagnosis. Simultaneously, roles have emerged for training GenAI models, calibrating vehicle AI systems and teaching AI concepts in universities. This diversification reflects a maturing ecosystem where AI is embedded across various economic sectors. The emergence of specialised work clusters suggests AI adoption is progressing from general-purpose implementation to domain-specific applications requiring specialised knowledge combinations. This trend creates opportunities for workers with hybrid skill sets. It also highlights the need for education systems to produce graduates capable of applying AI in specific industry contexts.

14. **A culture shift towards innovation, collaboration and confidence:** Stakeholders across development, investment, research, regulation and education unanimously emphasised the need for Australia to foster a more supportive culture of innovation and collaboration. Current ecosystems often stifle experimentation and discourage cross-sector knowledge sharing, with promising talent and ideas at risk of migrating offshore. A national culture shift – underpinned by strategic leadership, public trust and robust public storytelling – is essential to convert societal apprehension into confidence, and to empower Australians to engage with AI constructively. This cultural transformation requires coordinated effort across government, industry and education sectors to celebrate success stories, normalise responsible risk-taking and create safe spaces for experimentation. Without this shift, Australia risks remaining a hesitant adopter rather than a confident contributor in the global AI landscape.

15. **Strategic investment and sovereign capability are seen as cornerstones of future leadership:** The stakeholders we interviewed told us Australia needs to move beyond a reactive, consumer-based AI posture toward a proactive role as a global AI contributor. This would require sustained, targeted investment in foundational research, sovereign technologies and public-good AI aligned with national priorities, such as health, environment and education. While a strong academic base and entrepreneurial energy exist, without strategic funding, cross-sector partnerships and equitable resource access (especially for SMEs), Australia risks deepening internal divides and losing global relevance. Interviewees felt developing sovereign AI capability has become essential, as control over these technologies increasingly defines economic and geopolitical power. They indicated strategic investment must balance immediate commercial applications with longer term foundation-building to ensure Australia can shape AI development pathways aligned with national values and interests.

What we don’t know

The points above summarise what is known about the Australian AI ecosystem, or at least understood with confidence based on current datasets. We also highlight several critical knowledge gaps in a rapidly evolving landscape. Key areas of uncertainty remain around how:

- AI adoption translates into measurable benefits
- Australia can safeguard its digital sovereignty
- to accurately map the structure and dynamics of the AI industry.

In summary, gaps and uncertainties include:

1. **Productivity and return on investment from AI adoption:** There is still limited evidence on how AI projects are impacting productivity or delivering returns on investment in real-world Australian contexts. This is not well understood at the firm level or the national level.
2. **Size, structure and nature of AI education and training:** We don’t have a good dataset on all the courses, school to tertiary level curricula and education and training offerings relating to AI by Australian institutes. There’s no comprehensive dataset about what’s on offer or the quality/relevancy of training and education.
3. **AI sovereignty requirements and risks:** We know little about Australia’s ability to manage and control its digital infrastructure, technology and data. This is under increasing scrutiny as reliance on foreign-built systems grows, raising concerns about sovereignty and data exposure.
4. **Developer versus adopter roles:** The distinction between AI developers and adopters remains blurry. This limits the understanding of value is creation and diffusion across the ecosystem, and if our sample is overrepresenting or underrepresenting certain groups of activities.
5. **Mapping of ecosystem dynamics:** The sharp increase in the number of AI-related companies since our 2023 report shows a fast-changing ecosystem. It also underscores how little is known about the structure, growth patterns and interdependencies in the sector.
6. **Jobs, skills and labour impacts:** Ongoing monitoring is needed to understand workforce trends, job displacement risks, and how well educational and training programs align with market needs. This includes the risk of ‘AI skill leakage’ as Australian-trained professionals or tasks move offshore.
7. **Innovation outputs:** Improved monitoring of AI patents and research publications is needed to understand innovation trends, the translation of R&D into commercial outcomes and Australia’s comparative positioning in global AI research.
8. **Geographical patterns and spatial dynamics:** There is limited understanding of the spatial distribution of AI-related activity. This includes how companies, infrastructure, skilled workers, universities, training programs, transport and energy networks interact across regions. We also know little about whether clusters are attracting workers to co-locate and if this differs between sectors. A clearer picture of these dynamics is needed to inform place-based policy levers at local, state and territory, and federal levels.

Conclusion

The data analysed in this report reveal growth of Australia's AI ecosystem across key indicators and geographies. Australian companies are actively adopting AI and developing AI solutions, with AI patent applications nearly quadrupling and research publications more than doubling between 2015 and 2024.

The ecosystem exhibits several defining characteristics:

- complementary specialisation between public and private sectors
- a dual-track structure where startups drive innovation while corporates power adoption
- strong geographical clustering with regional diversity
- manufacturing-led patenting focused on enhancing traditional industries rather than pure software innovation.

This expansion has concentrated in 25 geographical clusters (containing 68% of AI companies) that show remarkable alignment with Australia's traditional industrial specialisations. Perth's AI cluster, for example, shows pronounced specialisation in resource-sector applications (59% of companies), directly supporting Western Australia's mining heritage.

A significant imbalance exists between knowledge production and commercialisation, with Australia generating about 1.88% of global AI publications but only 0.18% of global patents. This is a ratio of nearly 23 publications per patent. This disparity significantly exceeds global averages and indicates persistent challenges in translating research into commercial applications.

The labour market shows broadening demand for AI skills across industries. However, hiring remains disproportionately concentrated among a small group of organisations (100 companies accounting for 58% of AI job postings) and geographical areas (two-thirds of positions in inner metropolitan areas). Employers increasingly seek both technical and complementary non-technical skills, reflecting AI's integration into diverse organisational functions.

Australia's distinctive approach to AI development aligns with existing industrial capabilities, creating evolutionary rather than revolutionary innovation pathways. This integration of adoption excellence and targeted development represents a pragmatic response to global AI acceleration in the constraints and opportunities of Australia's broader innovation environment.

Appendix A – Data sources

Lightcast (formerly Burning Glass)

Lightcast is a labour market analytics platform that provides real-time and historical data on job postings, workforce trends and skills demand. It aggregates data from millions of online job advertisements, offering insights into employer demand, occupational trends, industry skills needs and regional workforce dynamics. Lightcast is widely used by governments, education providers and economic development agencies to inform workforce planning, policy development and training investments.
We used Lightcast to track:

- trends in artificial intelligence (AI)-related job postings
- emerging occupational roles
- the geographical distribution of AI skills demand in Australia and internationally.

Crunchbase

Crunchbase is a commercial database that tracks private and public companies, with a particular focus on startups, funding rounds, key personnel, mergers and acquisitions, and technology sectors. It is frequently used by investors, analysts and researchers to monitor business formation, innovation trends and the flow of venture capital. We used Crunchbase to:

- identify companies with a primary focus on AI
- track AI company formation rates
- analyse funding trends
- monitor public listings of AI firms globally since 2007.

The Lens

The Lens is an open-access platform developed by Cambia. It gives free access to over 140 million patent records and 300 million scholarly works. The platform has tools for linking innovation, like patents, to research literature and analysing global trends in science and technology. We used The Lens to:

- explore publication and patenting activity related to AI and machine learning
- identify trends in research and innovation outputs
- assess involvement of public research organisations and private firms in AI development.

Appendix B – AI search terms

Researchers in the artificial intelligence (AI) domain employ various techniques to ensure full coverage of AI companies, publications and innovations. One of the most common is the use of keyword-based searches. The selection of AI-related keywords, however, varies across different studies and publications. For example, the Centre for Security and Emerging Technology (CSET) (Schoeberi et al. 2023) at Georgetown University employs a curated set of 35 Chinese and 104 English search terms to identify AI-related publications.

In the 2023 *AI Ecosystem Report* (Hajkowicz et al. 2023a), we adopted a framework based on 105 keywords and search phrases recommended by the Organisation for Economic Co-operation and Development (OECD). The framework helps to identify AI companies, goods and services. While this list gave a solid foundation, there have been advancements in technology and changes in the industry landscape since the OECD publication. These changes required updates to reflect the current state of AI development and adoption.

For this report, we expanded the keyword list by integrating terms applied by the Stanford University research team for the Stanford AI Index Report 2024 (Maslej et al. 2024). The AI Index Report is one of the most widely referenced resources in academic and industry literature. The report is renowned for its comprehensive analyses and data-driven insights into the global AI landscape. The keyword list used in the Stanford AI Index Report 2024 report is built on the Lightcast AI Skills Taxonomy. This provides an existing framework for understanding AI-related skills and activities (see Appendix A for more information about Lightcast).

To ensure consistency and accuracy in our analysis of the Australian AI ecosystem, we merged the Stanford (Lightcast) keywords with the OECD list. This combined approach enabled us to capture up-to-date search terms that reflect the latest technological advancements while maintaining a focus on fundamental AI-related terms. By adopting this inclusive strategy, we aimed to create a comprehensive list that would minimise the risk of missing key players or research outputs.

At the same time, we recognise the potential risk of 'bycatch' – the inclusion of non-AI-related publications or companies due to the broader or alternative meanings of certain terms. To mitigate this, we applied Claude AI (Sonnet 3.7) to analyse the expanded keyword list, identifying terms and phrases that were more likely to generate false positives. The search results were cross-checked and validated to ensure the risk of bycatch is minimised. Our final list comprised 337 terms, as provided in Table B1.

Table B1: The AI keywords used to identify AI companies included in the analysis

Keywords		
AI	servomotor	instance-based learning
aiops	slam algorithms	intelligence augmentation
applications of artificial intelligence	3d reconstruction	intelligent classifier
artificial general intelligence	activity recognition	intelligent geometric computing
artificial intelligence	computer vision	intelligent infrastructure
artificial intelligence development	contextual image classification	intelligent software agent
artificial intelligence markup language	digital image processing	intuitionistic fuzzy set
artificial intelligence systems	eye tracking	kernel learning
azure cognitive services	face detection	k-means

Keywords		
baidu	facial recognition	large language model
cognitive automation	gesture recognition	latent semantic analysis
cognitive computing	image analysis	latent variable
computational intelligence	image matching	layered control system
cortana	image recognition	learning algorithm
ethical ai	image segmentation	learning automata
expert systems	image sensor	learning model
explainable ai	imagenet	legged robot
ipsoft amelia	machine vision	link prediction
intelligent control	motion analysis	logistic regression
intelligent systems	object recognition	logitboost
interactive kiosk	omnipage	long short term memory
knowledge engineering	pose estimation	lpboost
knowledge-based configuration	action recognition	machine intelligence
knowledge-based systems	adaptive boosting	machine learning
multi-agent systems	adversarial network	madaboost
open neural network exchange	ambient intelligence	mapreduce
openai gym	ant colony optimisation	markovian
operationalizing ai	artificial bee colony algorithm	memetic algorithm
reasoning systems	artificial neural network	meta learning
watson conversation	association rule	multi task learning
watson studio	autoencoder	multi-agent system
weka	autonomous vehicle	multi-label classification
advanced driver assistance systems	autonomous weapon	multi-layer perceptron
autonomous cruise control systems	backpropagation	multinomial naive bayes
autonomous system	bayesian learning	multi-objective evolutionary algorithm
autonomous vehicles	bayesian network	multi-objective optimisation
guidance navigation and control systems	bee colony	multi-sensor fusion
light detection and ranging	biped robot	naive bayes classifier
opencv	blind signal separation	natural gradient

Keywords		
path analysis	bootstrap aggregation	natural language understanding
path finding	brain computer interface	nearest neighbour algorithm
remote sensing	brownboost	neural network
unmanned aerial systems	classification tree	neural turing
chatgpt	cluster analysis	neural turing machine
generative adversarial networks	cognitive insight system	neuromorphic computing
generative artificial intelligence	cognitive modelling	non negative matrix factorisation
large language modelling	collaborative filtering	object detection
prompt engineering	collision avoidance	obstacle avoidance
variational autoencoders	community detection	particle swarm optimisation
ai copywriting	computational pathology	pattern recognition
antlr	connectionism	pedestrian detection
amazon textract	connectionist	policy gradient methods
apache opennlp	convolutional neural network	q-learning
bert	cyber physical system	quadruped robot
chatbot	data mining	random field
computational linguistics	deep belief network	random forest
conversational ai	deep convolutional neural network	rankboost
dialog systems	deep neural network	recommender system
fuzzy logic	dictionary learning	regression tree
handwriting recognition	differential evolution algorithm	reinforcement learning
hugging face	dimensionality reduction	relational learning
hugging face transformers	dynamic time warping	robot
intelligent agent	emotion recognition	rough set
intelligent virtual assistant	ensemble learning	rule learning
kaldi	evolutionary algorithm	rule-based learning
language model	evolutionary computation	self-organising map
latent dirichlet allocation	expert system	self-organising structure
lexalytics	extreme machine learning	semantic web
machine translation	face recognition	semi-supervised learning
microsoft luis	facial expression recognition	sensor data fusion

Keywords		
natural language generation	factorisation machine	sensor fusion
natural language processing	feature engineering	sentiment analysis
natural language programming	feature extraction	service robot
natural language toolkits	feature learning	similarity learning
apache mxnet	feature selection	simultaneous localisation mapping
artificial neural networks	firefly algorithm	single-linkage clustering
autoencoders	foundation model	social robot
caffe2	fuzzy c	sparse coding
chainer	fuzzy environment	sparse representation
convolutional neural networks	fuzzy number	spectral clustering
cudnn	fuzzy set	speech recognition
deep learning	fuzzy system	speech to text
deep learning methods	gaussian mixture model	stacked generalisation
deeplearning4j	gaussian process	statistical relational learning
evolutionary acquisition of neural topologies	generative adversarial network	stochastic gradient
fast.ai	generative pre-trained transformer	supervised learning
keras	genetic algorithm	support vector machine
long short-term memory	genetic programming	support vector regression
openvino	gradient boosting	swarm behaviour
paddlepaddle	gradient tree boosting	swarm intelligence
recurrent neural network	graphical model	swarm optimisation
tensorflow	gravitational search algorithm	t s fuzzy system
adaboost	hebbian learning	takagi-sugeno fuzzy systems
adversarial machine learning	hidden markov model	temporal difference learning
apache madlib	hierarchical clustering	text mining
apache mahout	high-dimensional data	text to speech
apache singa	high-dimensional feature	topic model
apache spark	high-dimensional input	totalboost
association rule learning	high-dimensional model	trajectory planning
automated machine learning	high-dimensional space	trajectory tracking
autonomic computing	high-dimensional system	transfer learning

Keywords		
aws sagemaker	human action recognition	transformer architecture
advanced robotics	human activity recognition	trust region policy optimisation
bot framework	human aware artificial intelligence	unmanned aerial vehicle
cognitive robotics	humanoid robot	unsupervised learning
motion planning	human-robot interaction	variational inference
nvidia jetson	image classification	vector machine
robot framework	image processing	virtual assistant
robot operating systems	image retrieval	visual servoing
robotic automation software	independent component analysis	wheeled mobile robot
robotic liquid handling systems	inductive logic programming	xgboost
robotic programming	inductive monitoring	
robotic systems	industrial robot	

Adjustments to the Table B1 list were made for separate sections of the analysis. The adjustments are defined below.

Patent and publication analysis

'Chainer' was excluded due to capturing a large number of papers in manufacturing fields not related to AI. The abbreviation 'AI' was also excluded from patent and publication searches as it created too much bycatch. Due to the stricter requirements for journal paper titles, abstracts and patent descriptions (subject to peer or legal review), a greater number of terms could be used in patent and publication analysis compared with, for example, company descriptions on a website.

Jobs and skills analysis

We initially defined a posting as requiring AI skills if it mentioned at least one keyword from our list of AI-related keywords. To refine this definition, we analysed temporal trends in the proportion of postings requiring AI-related skills at the occupation, industry and spatial levels. For any significant deviation from an existing trend we manually reviewed a random sample of postings to check if certain AI keywords had incorrectly tagged a high number of postings as requiring AI skills. For example, we looked for a spike in the number of postings requiring AI skills in a certain occupation. Through this process we identified 3 problematic keywords and excluded them from the list of terms used to identify postings requiring AI-related skills:

- 'robot', as many postings in the retail industry in 2020 and the rental, hiring and real estate industry in 2018–2019 included the phrase 'confirm you are not a robot'
- 'data mining' as many postings for the sports and personal service workers occupation group in 2015 included the phrase 'you may not use data mining to scrape from this site'
- 'deep learning' as many postings in the education and training industry in the Hunter Valley (excluding Newcastle) labour market noted the delivery of 'deep learning' experiences for students.

Company analysis

To identify companies actively engaging in AI innovation, adoption or development, we applied our curated set of AI-related keywords (Table B1) across 2 primary datasets.

For the private company dataset, data was sourced from Crunchbase (see Appendix A), with each record required to include an associated website. We used ChatGPT-4o to evaluate the website content by confirming that the website was accessible and had sufficient content. We also verified that the content mentioned the company name along with evidence of AI usage, adoption or innovation. A random audit of 30 companies confirmed that this process achieved 100% accuracy. We shortlisted companies meeting these criteria for further human validation.

For the public company dataset, we collected annual and quarterly reports of companies listed on the New York Stock Exchange (NYSE) and Australian Securities Exchange (ASX). These reports were scanned using the keyword list to extract content potentially related to AI activities. Following this, ChatGPT-4o was employed to evaluate whether the extracted content provided concrete evidence of AI usage, adoption or innovation. A manual review of 10 randomly selected reports confirmed that the labels assigned by ChatGPT-4o were accurate and free from significant errors.

Following the above, the research team manually reviewed both the private company list and public company list. We improved our analysis by sourcing additional companies from Pitchbook, S&P Capital IQ, media reports, TechCrunch and Lightcast.

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