Journey to a 4th Generation University

From New Zealand, for the world

Waipapa Taumata Rau
University of Auckland

Introduction

Waipapa Taumata Rau, University of Auckland is redesigning higher education for the 21st century. Our people – staff, students and alumni – are taking on the big challenges. The University of Auckland is the leading research institution in the country. More than 60 percent of its research output involves international collaboration.

Our research does not sit on a shelf. It offers the evidence and insight to lead positive change. To make this happen the University works hard to be a trusted partner with communities, corporates and the public sector. Research is the driver of innovation, and woven into the fabric of the University.

In the Middle Ages, from the 12th century, the first universities were founded to preserve and pass on knowledge. By the 19th century universities had broadened their remit from preserving knowledge to creating new knowledge through research and the advent of the scientific method. The 20th century marked the rise of the 3rd Generation university, a place of teaching, learning and research with a major focus on transferring knowledge for the social and economic benefit of society.

The ambition for a 4th Generation university is to be an anchor for societal, cultural and economic transformation. Enabled and empowered by research excellence and as a valued partner, a truly 4th Generation university is a key driver to a sustainable and just society.

To achieve this Waipapa Taumata Rau, University of Auckland, has evolved to become a hub connecting leading researchers in New Zealand and internationally. The challenges of this century require a 21st century response. As New Zealand's largest research institution and leading globally ranked university, the University of Auckland has evolved to be the country's leading 4th Generation university.

Four characteristics form the foundation of a 4th Generation university:

- **Embedded in place, committed to community**
- **Research excellence and connectivity**
- **Societal impact and policy influence**
- **Innovation and economic impact**

The evidence for the University of Auckland's 4th Generation status has been gathered from an analysis conducted by a team from leading academic publisher and analytics business Elsevier.

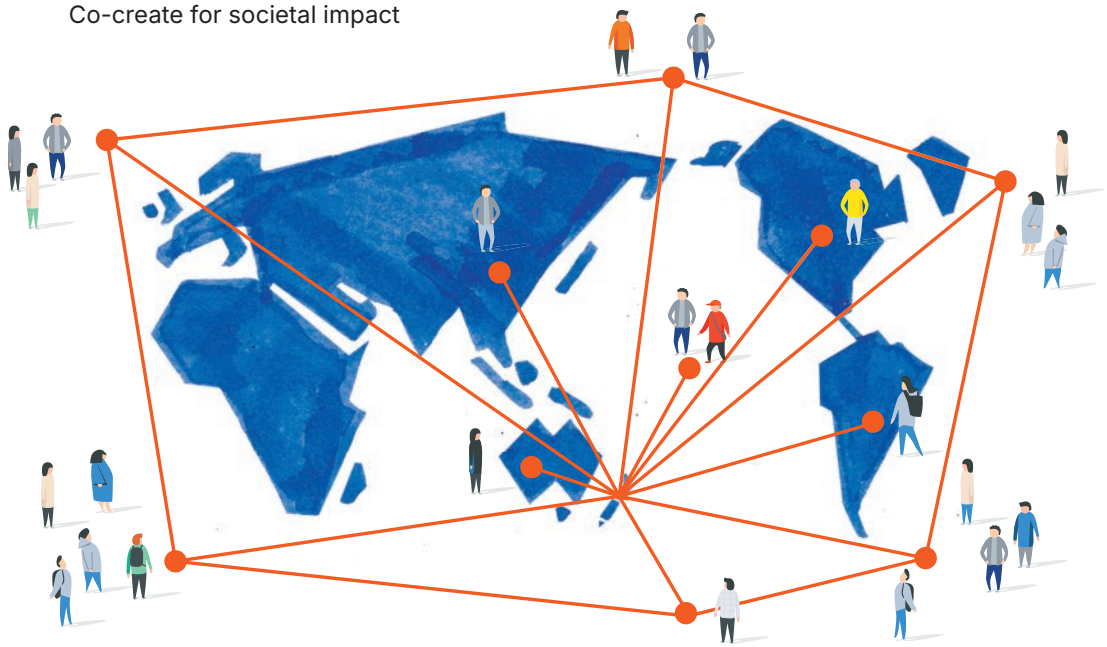
Cover image: *Colony*, 2004, sculpture by Paul Hartigan. The artist was inspired by his sense of wonder and exploration as a child drifting in a boat in darkness to see the glowworms of the Waitomo Caves, King Country, New Zealand.

1ST GENERATION
12th century.
Preserve and teach

2ND GENERATION
19th century.
Discover and explain

3RD GENERATION
20th century.
Innovate and transfer

4TH GENERATION
21st century.
Co-create for societal impact



Embedded in place, committed to community

The University's scholarship has a tangible impact on societal well-being. Almost one sixth of its Indigenous related research, across health, social sciences, education and environmental studies has been cited in policy.

The University aspires to be a global leader recognised for contributions to fair, ethical and sustainable societies. The strategy is built on a commitment to Te Tiriti o Waitangi (the Treaty of Waitangi), equity and inclusion, and sustainability. It emphasises embedding Māori aspirations, mātauranga Māori (Māori knowledge), and te reo Māori (Māori language), while fostering a diverse and supportive environment for all.

The University of Auckland's commitment to knowledge unique to our place in the world is reflected in its research. Between 2019 and 2024, the University produced 2,344 Indigenous-related publications, representing approximately 8 percent of its total scholarly output. This significant and growing body of work spans disciplines from health sciences, social sciences, to education, and environmental studies. The research addresses critical issues for Indigenous peoples and contributes to the revitalisation and advance of Indigenous knowledge systems.

This research has influence and impact. It has been cited in 519 policy documents by 141 policy bodies across 26 countries, resulting in a total of 778 policy citations. This significant influence underscores the University's pivotal role in shaping policies that affect Indigenous communities and highlights its contribution to informed decision-making and policy development on a global scale.

By honouring the Te Tiriti o Waitangi, the Treaty of Waitangi as the nation's founding document, the University moves beyond the traditional anchor institution model to foster a deeper, reciprocal relationship with its environment, particularly within Aotearoa New Zealand. This involves shared responsibility for the well-being of the land (whenua), people (tangata), and knowledge (mātauranga).

RESEARCH UNIQUE TO OUR PLACE IN THE WORLD

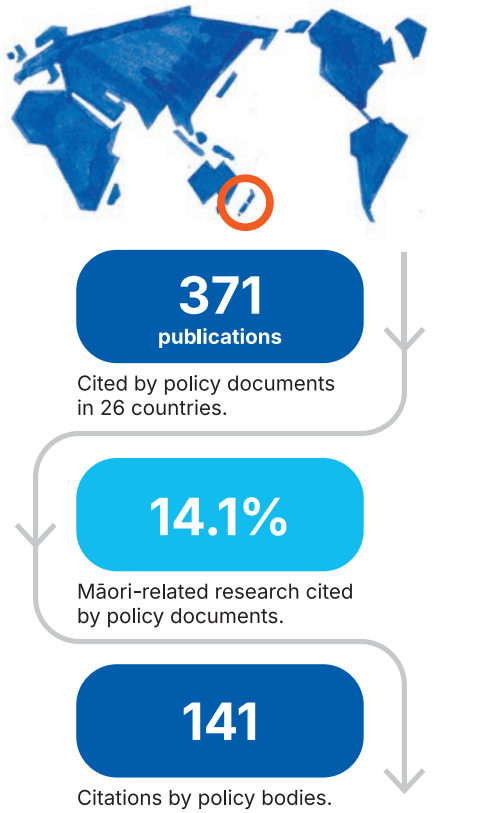


FIGURE 1.1

Key figures of Indigenous-related research outputs by University of Auckland. Source: Scopus

Waipapa marae and its meeting house or whare whakairo, Tāne-nui-ārangi, represents the major iwi or tribes of Aotearoa New Zealand.

As a guardian and responsible steward (kaitiaki) of Māori knowledge, language and culture, the University partners with the community to protect, promote, and nurture mātauranga Māori and te reo Māori. The University aims to be a champion of equity, demonstrating effective cooperation within a bi-cultural framework derived from Te Tiriti.

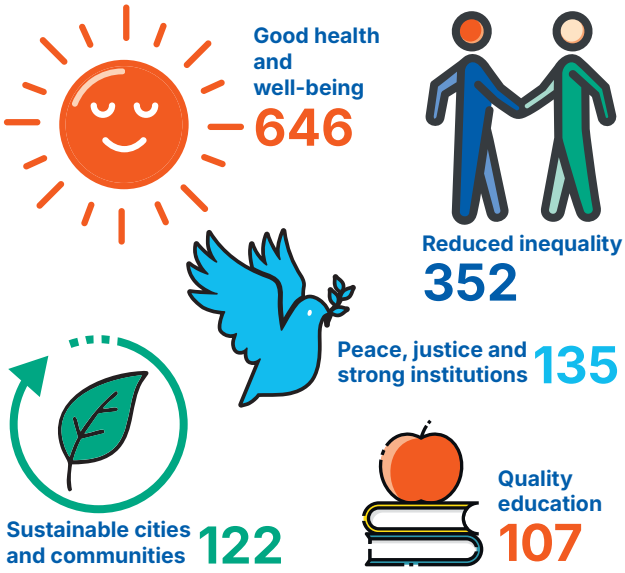
This role of the University also emerges from the analysis of Indigenous-related research impact on policies, as measured by policy citations. The University plays a vital role in translating research into policy and practice, with 14.1 percent of Indigenous-related publications cited in policy documents. The University's scholarship has a tangible impact on societal well-being.

The University's Indigenous-related research aligns closely with the Sustainable Development Goals (SDGs), particularly those addressing health (SDG 3), inequality (SDG 10), and governance (SDG 16). More than half of the publications related to Indigenous research map to the SDGs. The University of Auckland's focus on partnership and its commitment to contributing to fair, ethical, and sustainable societies reflect the 4th Generation University's goal to co-create research that responds to societal challenges.

INDIGENOUS RESEARCH CONTRIBUTES TO PEACE, JUSTICE, STRONG INSTITUTIONS

Top five goals

Indigenous-related research contributions to the UN Sustainable Development Goals, 2019-2024. Publications may be mapped to multiple goals.



Research excellence and connectivity

Our researchers have influence nationally and globally. The University's research ranks at 82 percent above the global average for impact.

The University of Auckland is the country's powerhouse of research excellence, with strengths spanning a broad spectrum of disciplines to address local and global challenges.

Research expertise encompasses critical areas such as complex diseases, health technology, Indigenous studies, climate and biodiversity, infectious diseases, and fields including artificial intelligence and space science. These research areas are strategically aligned with national and global challenges, reflecting the University's commitment to locally relevant and globally impactful research.

In the health sciences, the University excels in research on complex diseases such as cancer, cardiovascular conditions, and metabolic disorders. Complementing this work are cutting-edge health technologies, including medical devices, diagnostics, and digital health solutions that already make a difference to people's lives.

The University's environmental researchers are key contributors and leaders in the response to climate change, the loss of biodiversity and ecosystem resilience. The University brings that expertise and knowledge together in the national effort to support New Zealand's unique natural heritage.

Technologies such as artificial intelligence (AI), automation, robotics and space science represent areas of growing investment and capability.

The University's research addresses local and global challenges, producing 24,704 peer-reviewed publications between 2019 and 2023. Our researchers have influence nationally and globally. The quality and impact are reflected in a Field-Weighted Citation Impact (FWCI) of 1.82, indicating citations 82 percent above the global average for impact.

By combining established strengths with strategic investments in emerging fields to address complex societal challenges, the University has become a health-innovation hub and a prominent collaborator in international research consortia.

RESEARCH WITH NATIONAL AND GLOBAL SIGNIFICANCE

Field-Weighted Citation Impact is an index for how often a publication is cited compared to the average for similar publications in its field. It is a measure of the excellence of the research.
Average global output = 1

FIGURE 2.1

Key figures for University of Auckland's research output, 2019–2023. Source: Scopus

The Photon Factory is a research platform with high-level expertise in photonics and quantum technologies.

Indigenous research

The University's research output in this area is over ten times the global average, with a citation impact nearly twice the world norm.

Health technology

Research activity is significantly above global levels, with a citation impact exceeding 1.5, indicating strong influence in this rapidly evolving field.

Climate and biodiversity

The University demonstrates a robust research presence, with activity and impact metrics above global averages, underscoring its leadership in environmental science.

Artificial intelligence and automation

These areas show accelerating growth in output and impact, positioning the University to capitalise on emerging opportunities. Enhancing capabilities in automation is essential for South Auckland's high-tech manufacturing sector and aligns with the nation's Digital Technologies transformation plan.

Advanced materials and space science

Growing research in advanced materials supports New Zealand's emerging space sector. Supported by investments in infrastructure and partnerships the University is training the highly qualified people New Zealand needs to harness opportunities in the global space economy estimated to be worth US$1.8 trillion by 2035.

The University's research is characterised by strong cross-sector collaboration, with nearly 20 percent of outputs involving government partners, and significant engagement with the medical and corporate sectors.

The University engages with a diverse range of industry partners, including Fonterra, Orion Health, and Fisher and Paykel Healthcare. The integration of academic expertise with market drivers boosts the regional innovation ecosystem, translating research to practice.

Aerodynamics: researchers explore ways to make a yacht or athlete go faster and how wind patterns affect streetscapes.

COLLABORATION AND CONNECTION ACROSS AOTEAROA NEW ZEALAND

Shared publications and their FWCI, between University of Auckland and other research institutions.

Research institution collaborator	*Co-authored publications*	*Field-Weighted Citation Impact*	*Key fields*
Auckland University of Technology (AUT)	1,088	**5.05**	Engineering, Health sciences, innovation
University of Otago	2,014	**3.53**	Health sciences, Environmental studies
University of Canterbury	1,119	**1.98**	Engineering, Physical sciences
Victoria University of Wellington	830	**3.75**	Medicine, Social sciences, Earth sciences
University of Waikato	698	**1.48**	Medicine, Social sciences, Engineering, Environmental research
National Institute of Water and Atmospheric Research (NIWA)*	420	**1.53**	Environmental research, Climate research, Disaster management
Manaaki Whenua – Landcare Research*	336	**1.31**	Horticultural research, Biodiversity

FIGURE 2.2

**The former Crown Research Institutes have been re-structured as Public Research Organisation*

International collaboration

The University of Auckland has a broad and deep network of collaborations with leading global institutions. Partnerships with the French National Centre for Scientific Research (CNRS), Imperial College London, Harvard University, Johns Hopkins University, and others position the University within a global nexus of scientific excellence. These collaborations enable the exchange of knowledge, joint research initiatives, and access to cutting-edge facilities and expertise, enhancing the University's research impact and visibility on the global stage.

Asia-Pacific

In the Asia-Pacific region, Australia emerges as the leading collaborator with 236 institutions resulting in 6,027 publications co-authored with the University of Auckland, spanning diverse fields from healthcare, environmental science to engineering.

China stands out, with 640 collaborating institutions and 4,774 co-authored publications, indicating a significant and rapidly growing research partnership. This collaboration is crucial for addressing large-scale challenges such as climate change, technological innovation, and public health issues. Other notable partnerships in the Asia–Pacific region include India, with 331 collaborating institutions and 1,050 co-authored publications, and Japan, which has 280 institutions contributing to 943 joint publications.

The University of Auckland's collaborations with Pacific nations are important for regional development and capacity building. The University has engaged in research with institutions in Fiji and French Polynesia, focusing on areas critical to island nations such as marine science and climate resilience. Partnerships in Sri Lanka (17 institutions, 501 publications) and Indonesia (53 institutions, 214 publications) highlight the University's commitment to addressing regional challenges through collaborative research.

The University of Auckland has produced 18,333 research publications involving international collaboration, representing 61.8 percent of its total output. The University of Auckland's share of publications with international collaboration is the highest of the Australasian comparators.[1]

1. Australasian comparator universities: University of Otago, UNSW, University of Queensland, University of Adelaide (pre-merger).

Societal impact and policy influence

The University's research not only advances academic understanding and creates new knowledge, it also informs the high-level decision-making shaping national and global policies.

Broad engagement underscores the University's vital role in shaping policies across health, environment, economy, and social sectors, aligning with its 4th Generation University vision. The University of Auckland's research exerts significant influence on policy and societal well-being at local, national, and international levels. Approximately 9.5 percent of its publications are cited in policy documents, demonstrating active engagement with policymakers and contributing to evidence-based decision-making. This broad engagement underscores how the University aligns with its 4th Generation vision.

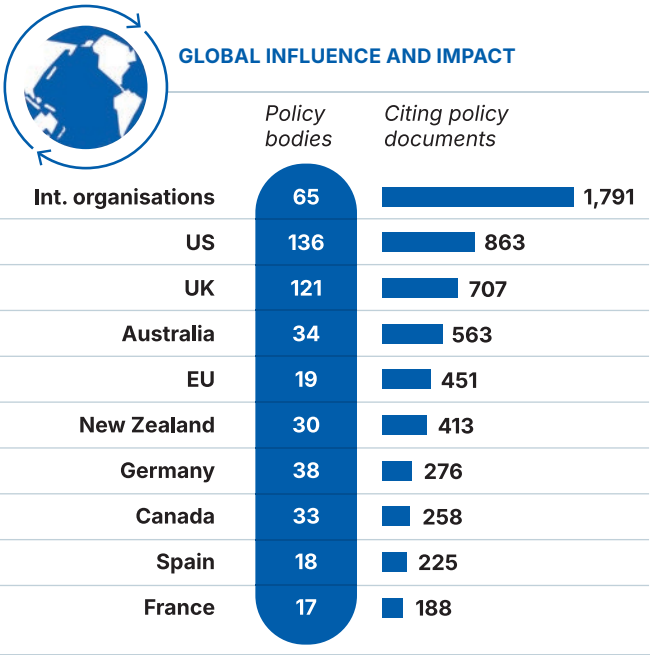


FIGURE 3.1

Number of policy bodies and policy papers globally citing the University of Auckland's research output 2019–2024. Only the top 10 policy bodies are shown. Source: Scopus

Global influence

The University's research is cited extensively in policy from leading international organisations.

The World Health Organisation (WHO) frequently references research from the University in its guidelines and reports, underscoring the global relevance of the University's contributions to public health, infectious disease control, and health equity. Similarly, the World Bank and the Organisation for Economic Co-operation and Development (OECD) cite University research in their analyses and policy recommendations related to economic development, social policy, and environmental sustainability.

These citations demonstrate that the University's research not only advances academic understanding but also informs high-level decision-making processes that shape policies worldwide.

At the national level, the University's research is frequently cited by New Zealand government agencies, including the Ministry of Health, the Ministry for the Environment, and Te Whatu Ora. These citations reflect the University's contributions to addressing pressing national challenges, including health inequities, environmental sustainability, and social well-being.

The University's Indigenous research, with its strong policy citation record, exemplifies the integration of cultural knowledge and scientific inquiry to promote equity and wellbeing. This research informs policies that support Māori and Pacific communities, contributing to the revitalisation of Indigenous knowledge systems worldwide and the advancement of social justice.

Government and civil society frequently call on the expertise of academics from Auckland Law School, including as Commissioners on Royal Commissions of Inquiry, key advisers to the Law Commission and the Office of the Privacy Commissioner. Major conferences hosted by Auckland Law School bring together international scholars, the judiciary and Māori and industry leaders.

Māramatanga is a six-metre tall video installation in the University's Arts and Education building by celebrated New Zealand artist Lisa Reihana. The towering work references Pacific navigators and the diverse peoples of Aotearoa New Zealand on their journey of learning and knowledge.

NATIONAL INFLUENCE AND IMPACT

Policy papers citing University research

Ministry of Health	77
Ministry for the Environment	59
Ministry for Primary Industries	53
Te Whatu Ora	33
Treasury	21
Office of the Prime Minister's Chief Science Advisor	19
Ministry of Social Development	15
Koi Tū*	14
Motu*	13
He Pou a Rangi, Climate Change Commission*	13
New Zealand Institute of Economic Research	10
Centre for Family Violence and Sexual Violence Prevention	10

* *Think tank*

FIGURE 3.2

Number of New Zealand's policy documents by policy body citing University of Auckland's research output, 2019–2024. Table limited to bodies citing at least 10 papers. Source: Scopus

Innovation and economic impact

The University of Auckland is the leading hub for commercial spinout companies in Australasia, with a strong early-stage start-up ecosystem across a broad range of sectors, orientated towards global opportunities and markets.

Key to the University's mission is translating research into tangible societal and economic benefits. Initiatives like the Newmarket Innovation Precinct and MedTech-iQ exemplify the University's role in fostering industry collaboration, driving product development, and supporting workforce growth.

The University of Auckland serves as the engine room, through its robust research capacity and dedicated commercialisation offices, and the accelerator, via the Centre for Innovation & Entrepreneurship (CIE) entrepreneurial programmes, nurturing ideas from inception to global market readiness.

The University has supported 82 active spinouts, spanning medical technology, digital innovation, biotechnology, and clean technology. The CIE has assisted its alumni in raising more than US$4.2 billion and creating 292 ventures across more than 195 countries during its 21-year history.

From ideation in CIE Velocity programmes to global partnerships facilitated by UniServices, this ecosystem aligns deep academic research with real-world commercial imperatives. The University is emerging as a leading spinout hub in Australasia, with a strong early-stage engine, sectoral diversity, and global orientation.

The spinouts from the University of Auckland encompass a wide range of sectors.

Medical and Health Technologies lead the spinout portfolio with 21 ventures, covering areas such as implantable devices (Kitea Health), AI diagnostics (Toku Eyes, HeartLab), biofluorescent detection (ISpyNits), surgical tools (Avasa), and neurosurgical support (Neurofanos).

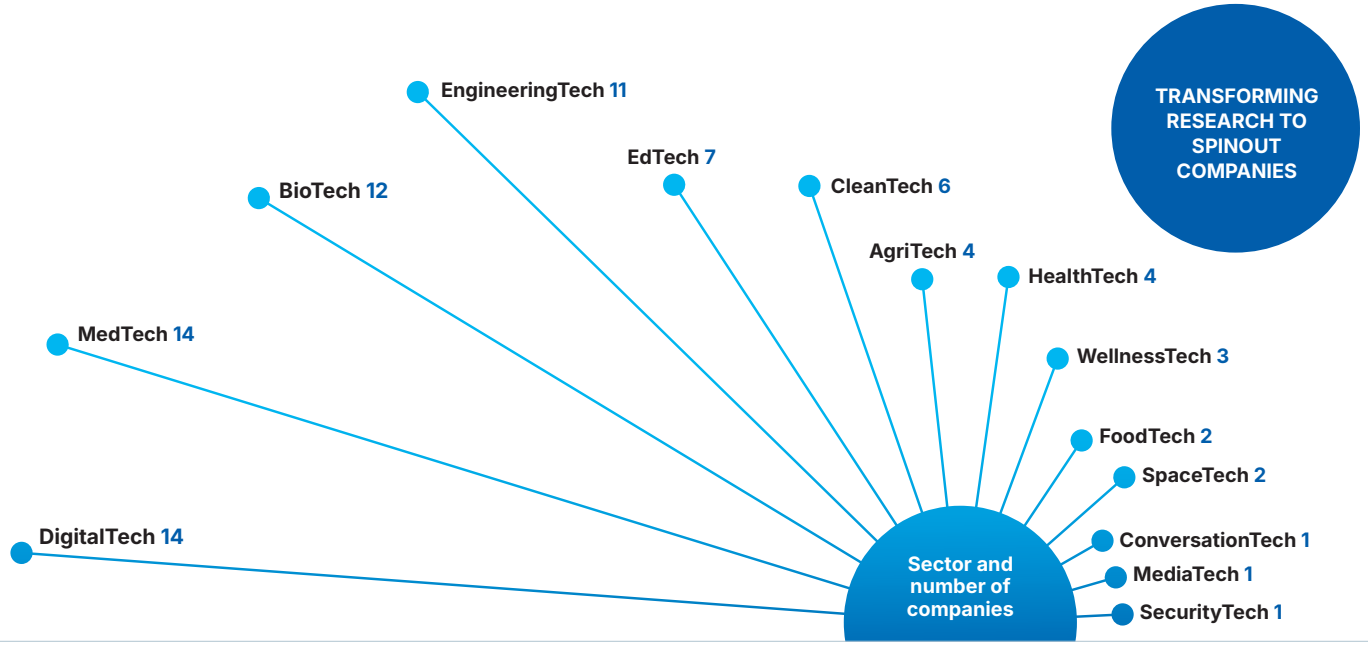


FIGURE 4.1

INNOVATION PIPELINE FOR ECONOMIC GROWTH

Maturity by stage of spinouts/start-ups supported by the University of Auckland.

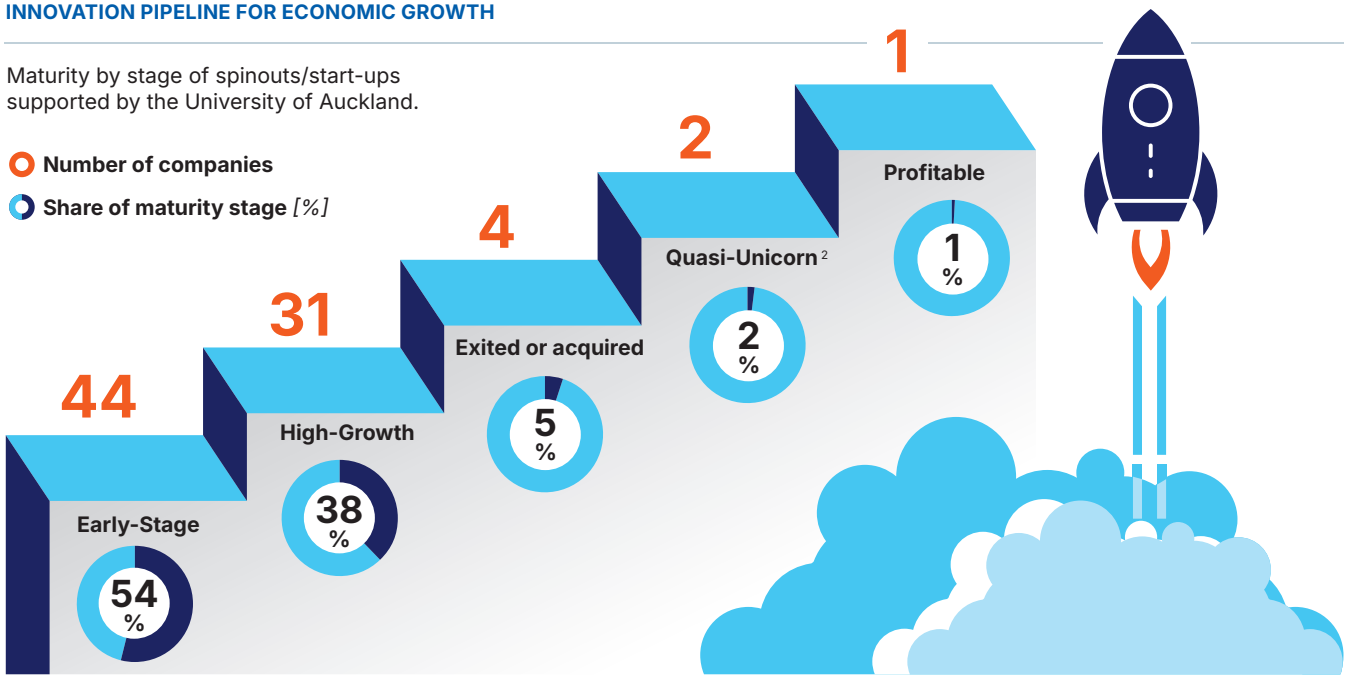


FIGURE 4.2

Digital Platforms and AI follow closely with around 20 ventures, spanning EdTech (Kami, Eskwelabs, iCanStudy), SafetyTech (Auror, CAS, HEIA) alongside Applied AI & Automation (ElementX, RosterLab, eVouch).

Engineering and Cleantech ventures, total 18, leveraging strengths in materials, energy, and precision instrumentation, with examples like advanced coatings (Cirrus), waste-heat turbines (Vortex), hydrothermal waste processing (Nurox), and wireless charging (HaloIPT).

A further 16 Biotech and Agritech ventures draw on the Auckland Bioengineering Institute and Biological Sciences capabilities, including microfluidics (Engender), cell therapies (TamoRx, AdAlta), precision ag sensors (Cropsy, AgriOpt), and circular-economy food ingredients (Green Spot, Mushroom Material).

Artificial Intelligence and Autonomous Systems are a growing sector, with ventures like Wayve (autonomous vehicles), and AI-driven healthcare (HeartLab, Neurofanos).

Digital Health and Wearables are also on the rise, with innovations in implantables (Kitea), gastric diagnostics (Alimetry), motion capture wearables (StretchSense), and mental wellness apps (MindEar).

Sustainability and Circular Economy ventures include bio-manufacturing (Mushroom Material, Green Spot), waste-heat power (Vortex), and lab-grown meat inputs (Opo Bio).

In AgriTech, precision technologies such as orchard management (Hectre), vineyard imaging (Cropsy), and livestock IoT (Halter) are gaining traction.

A significant proportion of the spinouts, around 54 percent, are in the early-stage phase. Approximately 38 percent have advanced to the high-growth stage, while about 5 percent have been exited or acquired. There are two quasi-unicorns[2] and one profitable venture.

Patent citations show how the University's research translates to the development of new technologies and products. The World Intellectual Property Organisation (WIPO) leads with 446 patents published 2019–2024 citing University of Auckland's research, followed closely by China (440), the United States (374), and the European Patent Office (269).

These figures demonstrate the university's strong presence in the most prominent international patent systems. Other significant contributors include Japan (147), Canada (116), and Australia (102). Collectively, these citations underscore the University's role in driving global innovation and its contributions to advancing technology across diverse fields.

In the pharmaceutical and biotechnology industries, major companies like Hoffmann-La Roche, Eli Lilly, GlaxoSmithKline, Bayer, and Taiho Pharmaceutical frequently cite Auckland's research, highlighting its contributions to drug development and medical treatments. Smaller innovative firms such as Small Pharma and Iterum Therapeutics also rely on the University's research for emerging therapies.

2. While the term 'unicorn' typically refers to start-ups with a valuation of $ 1 billion or more, 'quasi-unicorn' refers to start-ups with a valuation of close to, but below, this threshold.

In the healthcare and medical research sectors, Cancer Research Technology and Somerset Therapeutics underscore the University's impact on cancer research and therapeutic advancements. Companies like Genomics plc further demonstrate Auckland's influence on genetic research and new healthcare treatments.

ADVANCING TECHNOLOGY AND INTELLECTUAL PROPERTY

Top 10 companies citing outputs of University of Auckland by number of citing patents.

Hoffmann La Roche	38
Société Des Produits Nestlé	27
Small Pharma	27
Lilly Co Eli	22
Glaxosmithkline Biologicals	20
Iterum Therapeutics International	17
Cancer Research Tech	17
Bayer Aktiengesellschaft	17
Taiho Pharmaceutical	16
Genomics Pl	15

FIGURE 4.3

Source: Scopus

Innovation ecosystem

The focus on innovation and entrepreneurship has led to the University's ranking as the top institution in New Zealand and Australia for active start-ups and spin-out companies in 2024 and 2025 according to the Survey of Commercialisation Outcomes from Public Research (SCOPR). The University is also the 2025 Innovative and Entrepreneurial University of the Year, (*ACEEU, Accreditation Council for Entrepreneurial and Engaged Universities*).

The University's well-developed innovation and entrepreneurship eco-system offers expertise, mentoring and teaching, with multiple pathways for students and researchers to build an entrepreneurial mindset.

UniServices, the University's research commercialisation and growth team creates and grows spinout companies and manages the University's $40m Inventor's fund, the largest university fund in Australasia. The UniServices team connects government, industry and startups with research and expertise from University researchers.

TURNING RESEARCH INTO COMMERCIAL IMPACT

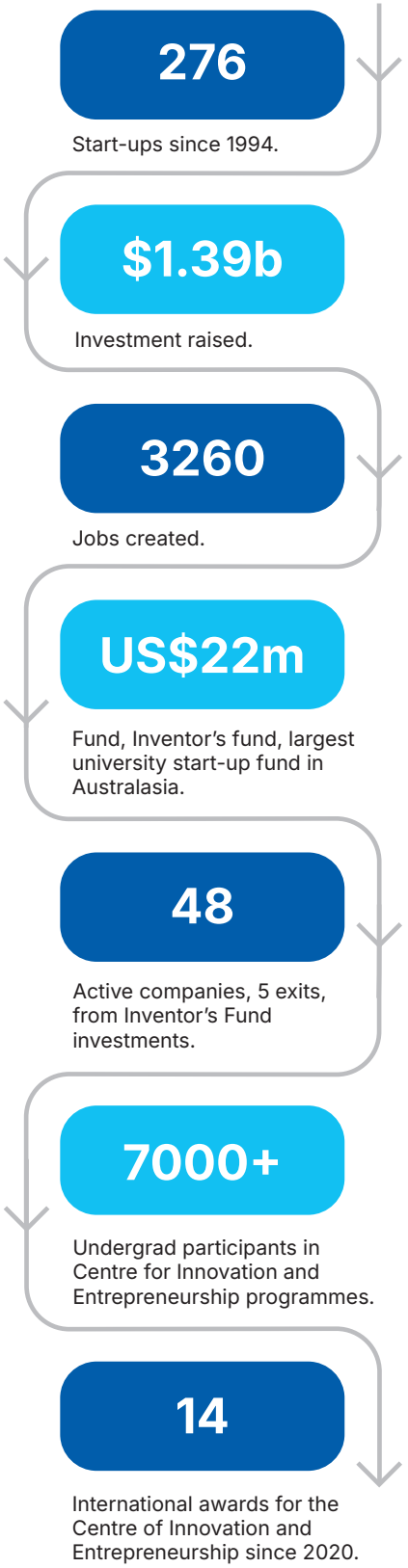


FIGURE 4.4

University spinout Kitea Health has pioneered a novel implantable brain sensor to manage chronic disease. Prototypes were tested on sheep at the University's Ngapouri research farm, a facility with an international reputation for biomedical research.

Alongside UniServices is The Lighthouse, a centralised commercialisation hub. The Lighthouse lifts research into commercial impact through multiple pathways. Return On Science supports deep tech and research commercialisation. Momentum nurtures young founders and Te Kōara supports Māori-led commercialisation.

The University also hosts the national innovation hub MedTech-IQ Aotearoa and two start-up incubators. The Newmarket Innovation Precinct, a key part of the Auckland City Deal to boost economic growth and innovation, hosts 48 start-up companies. Cloud 9, hosted at the Auckland Bioengineering Institute nurtures fledgling spin-out companies in the MedTech sector.

The New Zealand Product Accelerator (NZPA), based at the University's Newmarket Innovation Precinct, is a key part of the country's innovation ecosystem. NZPA serves as a national platform that connects academia and industry to foster innovation in advanced manufacturing and materials. It has facilitated over 600 R&D projects, resulting in the introduction of more than 300 new products and processes to the market, with approximately 77 percent of projects involving industry co-funding. Over four years to June 2023, NZPA clients estimate the potential value of commercially funded projects at $NZ984m.

Conclusion

The University has committed to evolving into New Zealand's leading 4th Generation university. Our focus on research excellence and societal relevance empowers the University as a key leader in addressing contemporary challenges. The University is eager and ready to advance knowledge, foster innovation and to be a major contributor and valued partner for sustainable development locally and globally.

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This report has been commissioned and funded by the University of Auckland.

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