



Level 3

11-31 York St

Sydney, NSW 2000

www.startupaus.org

Senator Andrew Bragg

Chair, Senate Select Committee on Financial Technology and Regulatory Technology

PO Box 6100

Parliament House

Canberra ACT 2600

**Senate Select Committee on Financial Technology and Regulatory Technology –
Submission**

Senator

Further to our discussion as part of the consultation process for the committee's proceedings, please find attached a submission from StartupAUS providing information on:

- R&D Tax Incentive - analysis
- Digital Entrepreneurship Academy - policy proposal
- ESIC tax incentives - policy proposal for expanding criteria
- Talent and skills gap reports

Yours sincerely

Alex McCauley

CEO StartupAUS

R&D TAX INCENTIVE

The Research and Development Tax Incentive is the single biggest government program supporting startups in Australia. The program as a whole accounts for around \$3 billion in Federal Government expenditure each year, of which about two-thirds is spent on companies with less than \$20m in annual turnover. Support for startups under the R&D Tax Incentive dwarfs expenditure on any other startup programs. The program is open to any business undertaking eligible research and development (R&D). For startups, who are intently focused on R&D, it is a core part of business infrastructure. Since its introduction in 2011 it has been a principal reason for startups to employ Australians to undertake R&D, and a major driver for companies to keep R&D efforts based in Australia even when the business expands overseas.

Taking a lead from companies like Atlassian and 99designs, an increasing number of young Australian tech companies are choosing to 'build local, sell global' by keeping R&D teams in Australia - even when the business has shifted its headquarters overseas to meet the expectations of customers or investors. The R&D Tax Incentive is a major reason why this model is attractive. Federal political leaders have, for some time, been rightly proud of the program's ability to support the rapid growth of new, high value employers in cutting edge technology areas.

HOW THE SCHEME HAS BEEN USED

The R&D Tax Incentive is set up in such a way that, despite its importance to startups, it has always been awkward for software firms to meet the requirements. Under the scheme, eligible R&D must follow a strict and extensively-documented scientific model (called the 'Frascati model') of hypothesis, experimentation, observation and evaluation, and logical conclusions. The results of the experiment must not be able to be predetermined, and the process must be carried out with the intention of generating 'new knowledge' (though it's worth noting that the legislation specifically identifies developing new or improved products or services as 'new knowledge').

This process is highly suitable for lab experiments and scientific research (the 'R' in 'R&D'). It is not so suitable for software development or other kinds of technology commercialisation. Nevertheless, the current iteration of the R&D Tax Incentive was designed specifically to include most software development as eligible R&D. When introducing the current legislation in 2010, the Minister said in his second reading speech to Parliament:

Recognising the pervasive nature of information technology in a modern economy, the new R&D Tax Incentive will ensure most software R&D is treated consistently with R&D occurring in other sectors.

As a result, it became established industry practice for software companies to claim activities related to the development of new, innovative products under the scheme. That practice was encouraged by specialist R&D tax advisers from reputable global accounting firms (alongside a growing number of boutique R&D tax firms). Politicians spoke openly about the positive impact the scheme was having helping exciting young technology companies grow. Implementing agencies also clearly supported the idea that software development was a core part of the scheme - in 2012, the year after the scheme was introduced, AusIndustry released formal advice to the ICT sector which said:

As a key enabler of business and innovation, ICT R&D is central to services, processes and products across virtually all sectors of the economy. Based on experiences gained from the R&D Tax Concession, AusIndustry anticipates ICT involvement in the new R&D Tax Incentive will be high.

Consistent with this advice, claims made by software companies were paid consistently for many years. The OECD updated the Frascati Manual in 2015 to explicitly acknowledge the validity of software development as a form of R&D.

Although the process outlined in the R&D Tax Incentive legislation doesn't seem particularly well-suited to software development, it was intended to cover software as a core component of the scheme. This gap between the strict letter of the law and its practical effect is not uncommon.

Government programs are enshrined in legislation, which is hard to change, but the rest of the economy moves quickly. Interpretation of the legislation, either by the courts or by the agencies implementing the law, is often at least as important as the legislation itself. Clauses that seem narrow can often take on a broad meaning as the program evolves to fulfil its purpose in changing circumstances. One of the key things courts and agencies look to when deciding how to interpret legislation is the intent of the lawmakers in designing it - and one of the key pieces of evidence for that is the Minister's second reading speech.

As the program evolved, technology companies still needed to conform to the basic requirements of the Frascati model, but there was a broad acceptance that this 'development' work was an important part of the scheme and the Act should be interpreted to take account of that. Claims weren't put under the microscope. Compliance testing in relation to the scheme was low, as part of the overall strategy to allow companies doing development to participate even though it was difficult for them to conform strictly to Frascati in the way researchers could.

COSTS ON THE RISE

The R&D Tax Incentive has been the focus of some political unrest over the last few years. The cost of the scheme has been rising, leaving policy makers concerned that it could spiral out of control. The biggest growth in cost has been among small companies (less than \$20m in turnover), which includes almost all startups. Partly in response to this concern, the Turnbull Government commissioned a review of the program, which submitted its findings to government in April 2016. The review made six recommendations to help strengthen the scheme's ability to encourage 'additionality' (R&D that wouldn't have been undertaken if the scheme didn't exist) and to reduce cost by increasing integrity.

The Turnbull Government did not formally respond to the 2016 review until more than two years later, when it introduced changes to the R&D Tax Incentive as part of the Federal Budget in May 2018.



Kris Gale
Chairman,
Michael Johnson Associates

PERSPECTIVE

In the past 18 months, I have been contacted regularly by early stage companies writing new software code to ask me 'when did the R&D tax rules change?' These calls have been prompted by publications from the regulators with titles like 'Taxpayer Alert' and language in the media (and from the Treasurer) about AusIndustry crackdowns.

My answer is always the same: the rules haven't changed. The definition of R&D activities that was legislated in 2011 is unchanged in 2018. In fact, the new R&D Tax Bill before Parliament seeks to introduce a raft of changes, but the definition of eligible R&D activities and expenditures remain untouched.

Yet it is undeniable that AusIndustry is challenging the eligibility of software R&D through its current risk assessment/audit processes and is seeking to unwind the basis upon which companies and advisers have been approaching the making of claims since 2011.

Software claims were always envisaged to be a legitimate part of the R&D Tax Incentive. Industry claiming practice has been built on a view of the legislation described in the Explanatory Memorandum to the 2011 Act and guidelines such as the September 2012 AusIndustry document, 'R&D Tax Incentive ICT Guidance'. The 2012 guidance says:

"As a key enabler of business and innovation, ICT R&D is central to services, processes and products across virtually all sectors of the economy. Based on experiences gained from the R&D Tax Concession, AusIndustry anticipates ICT involvement in the new R&D Tax Incentive will be high."

It's a view that is clearly supported in the 2015 rewrite of the Frascati Manual, which says:

"The software development of such projects, however, may be classified as R&D if it leads to an advance in the area of computer software. Such advances are generally incremental rather than revolutionary. Therefore, an upgrade, addition or change to an existing program, or system may be classified as R&D if it embodies scientific and/or technological advances that result in an increase in the stock of knowledge."

Yet it seems that claims based on the approach identified in these materials are now being rejected. Even when one reviews more recent AusIndustry guidance, there is no public explanation as to why this is occurring.

As a result of this shift, the tax risks associated with startups participating in the Federal Government's flagship innovation support program are rapidly becoming unacceptable. A moratorium on audits for small software companies is a sensible idea until the situation is clarified.

We need a public debate on the correct interpretation of the prevailing legislation so that Australian startups can continue to participate in Australia's digital transformation initiative with confidence that they will be supported by the R&D Tax Incentive.

TIGHTENING IN THE PROGRAM: SOFTWARE CLAIMS GET SQUEEZED OUT

In the meantime, concerns about the cost of the scheme continued, and the program came under pressure. In February 2017 the ATO and AusIndustry issued a Taxpayer Alert seeking to clarify the position on the eligibility of software claims under the R&D Tax Incentive.¹² The Alert noted that the ATO and AusIndustry were 'reviewing the arrangements' for software companies claiming the R&D Tax Incentive. It referenced concerns held by the ATO and AusIndustry that software companies were not conforming to the 'stringent requirements of the laws that govern the R&D Tax Incentive'.

StartupAUS cautioned vocally about this shift when the Alert was first issued.¹³ The Government responded by saying that nothing had changed: the law remained the same as it always had, and the Alert was simply meant to provide guidance on how claimants could conform with the law. Senior administrators were adamant on this point. Partly, this was true - the letter of the law hadn't changed. But its interpretation certainly had, and startups began to feel the effects right away.

Eligibility of claims started to be called into question. Companies who had been claiming, on sound advice from seasoned R&D Tax Incentive advisers, similar activities for multiple years in a row began to be told their software development activities didn't qualify. This is particularly concerning as audits can reach back up to seven years, retroactively disallowing multiple years of already-paid claims and putting companies under extreme financial pressure. And - perhaps most significantly at a system level - companies began to see R&D claims as risky, and started to self-censor. A common experience right across the sector is that R&D claims for legitimate software development are being pared back substantially to try to reduce the risk of facing a potentially catastrophic clawback.

Gradually, the R&D Tax Incentive has been slipping away from startups.

This has been compounded by an overall reduction in the scheme for all claimants. In September 2016 entitlements under the scheme were reduced by 1.5%, to 43.5% for refundable claimants and 38.5% for offset-eligible claimants.¹⁴ In the 2018 Budget, further constraints were proposed, including the introduction of a new 'intensity threshold', and a cap on claims at the refundable end of the scheme.¹⁵ Under these changes, R&D payments are also set to be tied to company tax rates - which means if the Government is successful in reducing small business tax rates to 25%, R&D payments will drop even further. For many loss-making startups (who don't yet pay tax), that could amount to yet another reduction.¹⁶

CRACKING DOWN

During his Budget speech in May 2018, Scott Morrison (then the Treasurer) announced that there would be a crackdown on R&D claims. Additional resources were allocated to allow more audits and reviews to be conducted:

We are cracking down to ensure that R&D tax incentives are used for their proper purpose, with enhanced integrity, enforcement and transparency arrangements, saving taxpayers \$2 billion over the next four years.

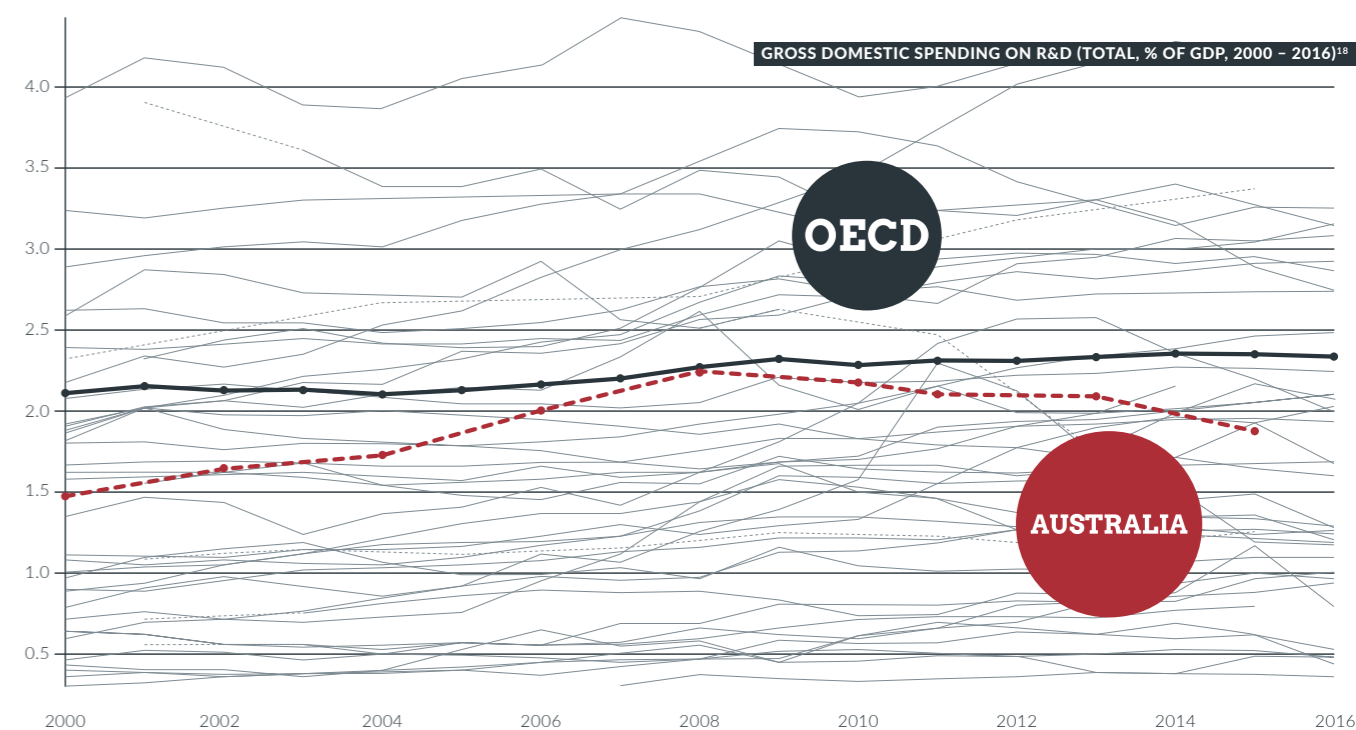
Software companies are rightly concerned. The result has been that many legitimate software claimants have fallen out of the system, with founders worried by the increased risks associated with making a claim for software development.

A SMALLER PIECE OF A SHRINKING PIE

All of this amounts to a significant cut to the R&D Tax Incentive. In fact, we know the quantum: Morrison's Budget speech notes that Treasury has estimated that the crackdown alone is worth about \$2 billion over four years - reducing the overall value of the scheme by about 17%. But this reduction is not being framed as a cut, because the context is that Australia's total spend on R&D is already well below the OECD average at around 1.87% of GDP (OECD average around 2.3%) and is falling. Australian businesses spent \$16.7 billion on R&D in 2015-16 compared to \$18.9 billion in 2013-14, a decrease of 12%.¹⁷ Instead, this tightening of the scheme is being framed as 'boosting integrity,' a process which the Government says will benefit claimants in the long run by keeping costs in check and allowing the scheme to stay alive.

In practice it is a way of reducing costs without making the case for it to the public - a political result without a political cost.

At a time when Australia needs to be thinking ambitiously about how to encourage more R&D, we are tightening the belt.



STARTUPS ARE IMPACTED MORE THAN MOST

Startups - particularly software startups - find themselves in a particularly difficult position here. They're engaging in a form of development that doesn't always neatly fit the process outlined in the legislation. They're also generally small and short on cash runway, which means even the threat of an ATO clawback can have very serious (often existential) business ramifications. Few are likely to hire armies of lawyers to fight any adverse ruling (something larger claimants would do as a matter of course). As a result, if they perceive that software is no longer welcome in the R&D Tax Incentive program, it's reasonable to expect that lots of these businesses will drop out of the scheme entirely, or substantially reduce their claims regardless of their merits.

We are already beginning to see this occur. To many large corporate claimants, whose R&D claims might form a small percentage of annual revenue, talk of a 'crackdown' may be run of the mill. But cash-strapped startups are often counting on these payments, with many even borrowing against their future R&D Tax Incentive earnings to cover immediate cash shortages. The consequences of an adverse audit would, in many cases, be dire: businesses could fail or be crippled by debt and the personal risk for founders is extremely high.

But despite the huge individual consequences of businesses failing because of adverse audit findings, it may be that system-wide under-claiming is even more problematic across the program as a whole. Huge sums of money, tens or hundreds of millions of dollars, that would otherwise be supporting the growth of Australia's startup sector may be forgone. For a group of businesses that are always on a knife-edge financially, that puts a large number of other companies - those not subject to an audit but whose claims are diminished by the downwards pressure on the sector - at risk.

12 ATO Taxpayer Alert 2017/5
www.ato.gov.au/law/view/document?DocID=TPA/TA20175/NAT/ATO/00001&PiT=99991231235958
13 www.innovationaus.com/2017/02/ATO-RD-advice-is-a-bombshell
14 www.ato.gov.au/General/New-legislation/In-detail/Direct-taxes/Income-tax-for-businesses/Research-and-development-tax-incentive---offset/
15 www.budget.gov.au/2018-19/content/factsheets/6-tax-integrity.html
16 www.afr.com/news/policy/uniseed-ceo-peter-devine-urges-rethink-on-rd-changes-20181015-h160hu
17 www.publications.industry.gov.au/publications/australianinnovationsystemreport2017/documents/ais-2017-chapter-5.pdf
18 www.data.oecd.org/rd/gross-domestic-spending-on-r-d.htm

THE COST: JOBS (AND GROWTH)

Reducing expenditure on software R&D is not just bad for startups - it's a bad idea for the economy as a whole. The R&D Tax Incentive is a program used extensively by many of Australia's most forward-thinking businesses to help fund new research and development programs that employ thousands of high skill workers.

Startups are no exception. In fact, they are some of the scheme's highest-value claimants, representing genuine return on taxpayer dollars, particularly when it comes to jobs. The R&D Tax Incentive makes up a critical part of the funding landscape for Australia's emerging software sector. StartupAUS data suggests almost 9 in 10 startups (89.2%) rate the program as either 'very important' or 'critical' to the success of their business.

We also know that startups use the funding from the R&D Tax Incentive disproportionately to hire more staff. When asked in a 2016 survey how they would spend an increase in R&D Tax Incentive, founders overwhelmingly said 'hire more staff doing product-related research and development' (82.4%).

The definition of startups referred to here is broader than software or even tech companies, and the numbers are correspondingly larger. But the broad point remains absolutely fundamental: young, high growth businesses create all the jobs. They are therefore some of the highest-value recipients of this sort of support.

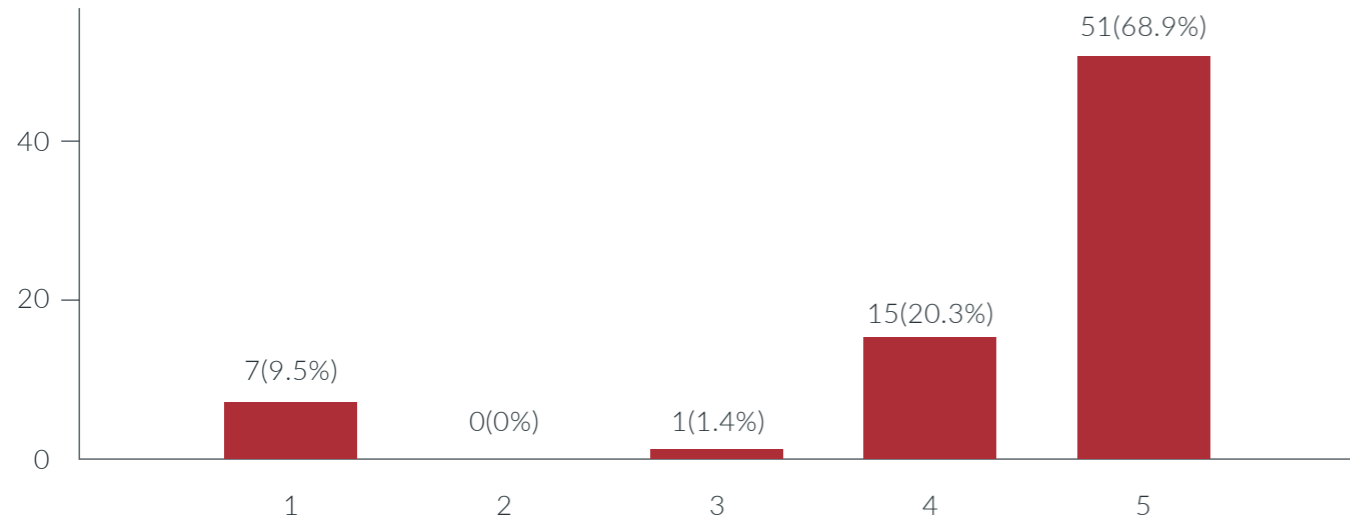
This should not come as a surprise. We know that young companies are by far the biggest drivers of job growth across the economy. Data from the Australian Department of Industry shows that new firms create substantially more jobs than established ones, and that in Australia firms up to three years old created 1.44m jobs over the six years to 2011 compared with a net loss of 400,000 jobs by established firms over the same period.¹⁹

This is not a uniquely Australian characteristic - it is true of economies across the developed world. A study by the Kauffman Foundation in 2015 found that 1.5m new jobs are added to the US economy each year by new firms, while over an extended period existing firms have been net job destroyers, losing a total of 1m jobs per year. The report emphasises that it is not small businesses that are the primary engine of job creation, but rather young businesses.²⁰

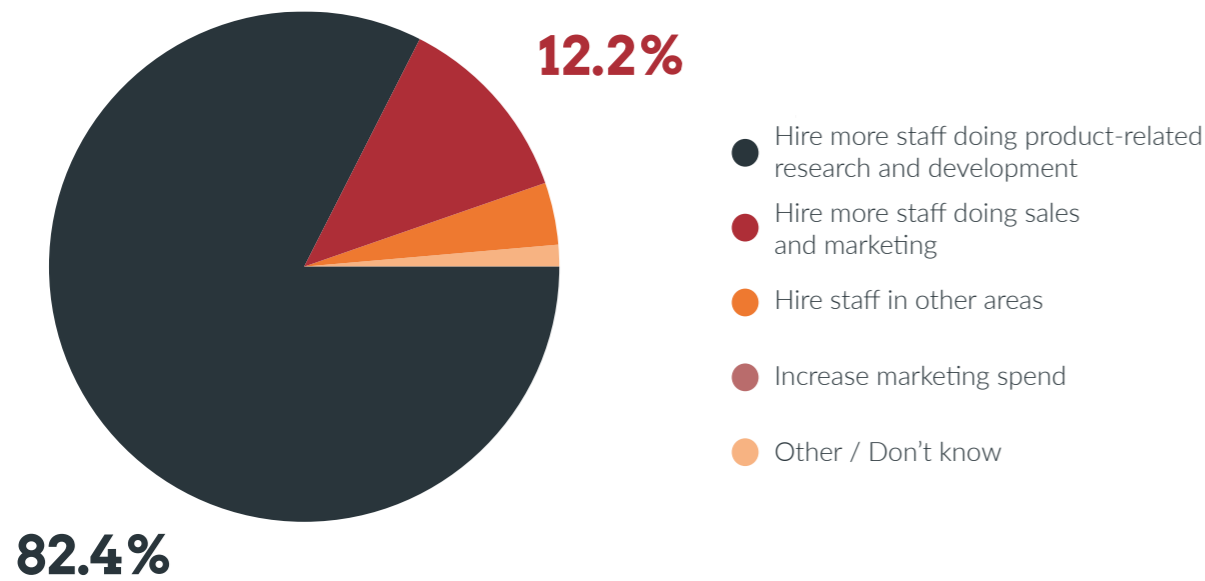
The report notes that 'the bulk of this employment growth is driven by a relatively small number of high-growth-orientated startups'. It goes on to say that 'while innovative entrepreneurship can disrupt competitive markets, it also has the potential to nurture business dynamism and economic growth. Like many OECD countries, Australia is in the midst of an economic transition. Australia's situation is different in that it is not so much seeking recovery from a downturn as searching for new sources of growth to balance the relative decline in resources sector investment. The role of the entrepreneur is central to this process.'

In fact, figures from across 15 OECD countries show that over an extended period, including during the global financial crisis, new businesses have consistently been net job creators whilst existing business have been net job destroyers.

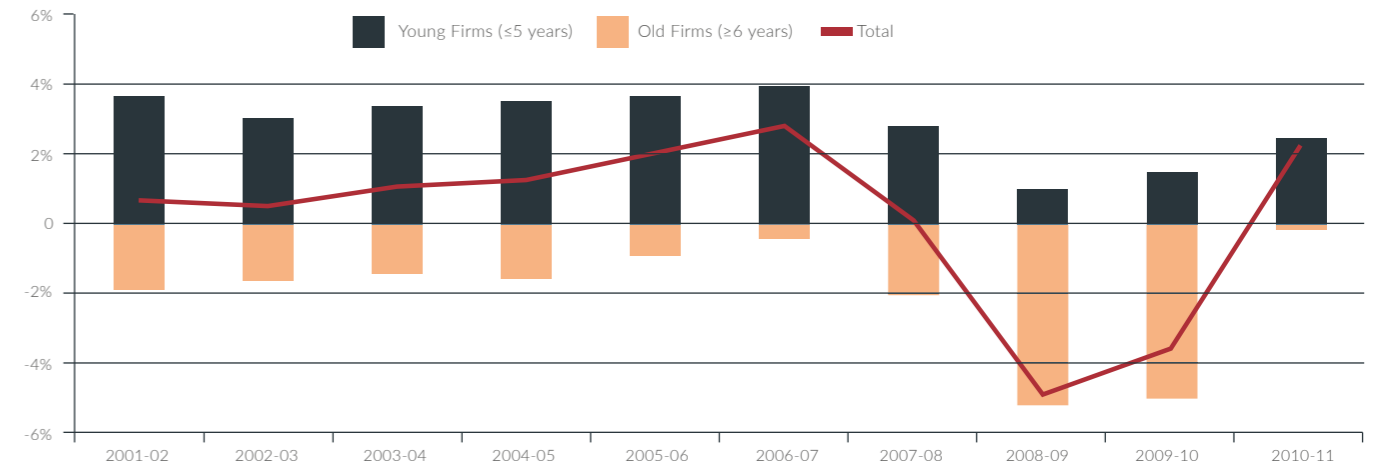
HOW IMPORTANT IS THE R&D TAX INCENTIVE TO YOUR BUSINESS?



STARTUPS' INTENTION TO USE R&D RECEIPTS



NET JOB GROWTH: NEW VERSUS ESTABLISHED FIRMS, 2001-11 (AVERAGE OVER 15 OECD COUNTRIES)²¹



¹⁹ Office of the Chief Economist, Australian Innovation System Report 2015 (industry.gov.au)
²⁰ www.industry.gov.au/data-and-publications/australian-innovation-system-report/australian-innovation-system-report-2015
²¹ www.highgrowthsmallbusiness.co.uk

BAD ACTORS

There remains a concern among some policy makers that bad actors - specifically fraudulent over-claimers - are a significant source of the growth in cost of the scheme. We've already seen that it's clear from the history of the scheme, the intention of the government when it brought the scheme into operation, and the way it's been implemented to date that software companies form a legitimate part of the program. But are there some bad apples ruining it for everyone?

The projection of savings based on the 'crackdown' is some \$2 billion over four years, or roughly one sixth of the total value of the scheme. It is highly unlikely that genuine fraud accounts for such a large percentage of claims, especially when considering the barriers to entry (i.e. anyone attempting to defraud the scheme must first form a company, spend significantly on some activity, and often have that claim prepared by a professional R&D Tax Incentive adviser.) While there may be some bad actors - as there are in almost any scheme - the vast majority of software claimants are acting in good faith, on advice from qualified professionals, and in line with expectations set by government since the introduction of the scheme.

Even if genuine fraud were a significant factor, reducing expenditure on software R&D across the board is not the right way to fix this problem. It is a blunt-instrument response to a very specific problem which has the effect of undermining the scheme's effectiveness as a whole.

THE RISK

There is a serious risk that a depleted R&D Tax Incentive could begin to cripple Australia's burgeoning startup sector at a critical time. The program has become a vital piece of infrastructure in the startup and innovation landscape. Reduced access for startups is likely to result in:

- A reduction in working capital for high growth technology startups
- Lower growth rates for affected companies
- Lower hiring rates for software development firms
- Decreased R&D output as support diminishes
- Failure of some companies, including particularly R&D intensive businesses counting on a reliable source of R&D support
- A reduction in Australia-based R&D by global companies
- A contraction in the number and quality of Australia's new technology businesses

THE FIX

There is no easy fix here. Administrators maintain that there has been no change in how the scheme operates, making it difficult to identify ways to halt the damage.

In the immediate term, there needs to be some assurance for vulnerable software companies. Companies with turnover of less than \$20m that have been claiming the incentive, in good faith and on credible professional advice, need an assurance that they are not going to be subject to audit processes unless their claims are manifestly unreasonable or have had sharp unfounded increases. Such a moratorium should remain in place until the introduction of a clear legislative fix to the way the R&D Tax Incentive operates or a new scheme that directly supports software development is implemented. This would help address uncertainty and reduce existential risk for good-faith claimants.

Specifically the moratorium should:

- Be applied to all software claimants with turnover less than \$20m.
- Prevent new audits and halt existing audits as long as
 - the claim in question is similar in scope to claims submitted in previous years (i.e. similar technology area);
 - the claim is not more than 50% larger than the previous year; and
 - the claim has been developed by a specialist R&D advisor (professional services firm).

Alongside this, a clear path to supporting technology companies doing genuine development work in Australia should be formulated. It has become apparent that the language of the R&D Tax Incentive, as it stands, cannot be relied upon to produce consistent results for software companies. New language in the R&D Tax Incentive legislation that caters to the specifics of the software development process would help revitalise the program as a vehicle for the sort of support emerging tech companies need. Failing that, an alternative program focused on the development of innovative technology and driven by job creation as a primary metric would help decouple the 'research' and 'development' aims of the scheme while rewarding growing tech businesses for the additive economic value of their development activities.

AT A TIME WHEN AUSTRALIA NEEDS TO BE THINKING AMBITIOUSLY ABOUT HOW TO ENCOURAGE MORE R&D, WE ARE TIGHTENING THE BELT.



Level 3
11-31 York St
Sydney, NSW 2000
www.startupaus.org

Policy proposal - National entrepreneurship academy

Policy objective

To equip Australians with the entrepreneurial skills that are the bedrock of the innovation sector.

Problem

Human intellectual capital is the foundation of the modern innovation economy, including both the entrepreneurs who envision solutions to problems and the technologically skilled talent who make those solutions a reality. Tech businesses create high value products almost exclusively from human intellectual capital.

Currently, Australia lags behind its global and regional peers in entrepreneurial education. The 2017-18 Global Entrepreneurship Monitor report ranks Australia 30th out of 54 countries in entrepreneurial education in primary and secondary school, and 50th out of 54 countries in entrepreneurial education post-school, both significantly behind the Asia-Pacific average but on par with Iran and Morocco. A shortage of entrepreneurial and skilled tech talent risks severely limiting growth in Australian startups and crippling Australia's economic future.

Moreover, entrepreneurship has yet to achieve full legitimacy as a career choice in Australia. The GEM report ranks Australia only 39th out of 54 countries in terms of the social value given to entrepreneurship. A higher public profile for Australian entrepreneurship and more vocational prestige would inspire greater aspiration and emulation from young Australians.

Solution

Australia should make a concerted effort to give more young Australians a firm foundation in what it means to be a digital entrepreneur, by establishing a national academy that trains, inspires, and propels the most promising young entrepreneurs to reach their potential.

Detail

A national academy of digital entrepreneurship should act as a central clearinghouse and cheerleader for educational entrepreneurship programs, including:

- A highly selective, intensive one-year program focused on developing founders: whereas most accelerators focus on the business, this would focus on upskilling people to become world-class digital entrepreneurs
 - With accelerated coursework focused on startup business fundamentals (such as how and when to raise capital, how to recruit and retain exceptional tech talent, IP legal frameworks, etc), technological skills (coding platforms, digital product management, etc), problem solving and critical thinking, and Australian startup business case studies
 - With the involvement of leading Australian entrepreneurs as mentors and educators
- A variety of other courses open to the public on a fee-paying, one-off basis

- Short, intensive courses targeted at university students to expose them to the fundamentals of entrepreneurship
- Other educational programming intended to be incorporated into primary and secondary school curricula

Rationale

The academy's selective, prestigious program will help those with high ambition and demonstrated aptitude develop their skills so that they can fully realise their potential. They will have mentorship, peer role models, and courses that ground them in the practical mechanics of startups as well as creative problem solving. It will give Australia's most promising entrepreneurial talent the right skills to successfully build and run global businesses.

At the same time, by taking the lead in developing and advocating for entrepreneurship education at all levels, the academy will contribute to a more deeply rooted, thorough understanding of innovation (allowing more people to buy into the benefits).

Another key benefit of an academy will be to inspire more Australians to consider technology entrepreneurship as a legitimate career path. Many of the best computer science and business school graduates from Stanford, for example, aspire to establish their own companies whereas in Australia most aspire to corporate careers in financial or professional services firms. Much like AIS, NIDA, or AFTRS for aspiring sports professionals, performing artists, and media professionals, a national academy would raise the profile of entrepreneurship and help establish a clear path and model to follow.

International examples

The Stockholm School of Entrepreneurship (<https://www.sses.se/>) provides free courses, experiences, and incubation for students and alumni of Stockholm's top five universities. This model is currently in an early stage in Australia through the Sydney School of Entrepreneurship (<https://sse.edu.au/>).

Risks and mitigation

Some have questioned whether entrepreneurship can be taught. There is a risk that establishing an academy might be characterised as throwing money after a problem that can only be solved with genius rather than ticking boxes. There is of course an extent to which creativity and natural talent cannot be taught—but it can certainly be given the right conditions to flourish. Giving more Australians a solid foundation in the critical thinking skills necessary to spot and solve problems, in the dynamics of startups that will allow them to put those solutions into practice, and the confidence to know that their career choice will be validated, will encourage those Australians with the solutions to the next big problems of the future to take the step into entrepreneurship.



Level 3
11-31 York St
Sydney, NSW 2000
www.startupaus.org

Policy proposal - Early Stage Innovation Company amendments

Policy objective

Broaden the Early Stage Innovation Company (ESIC) qualification criteria to provide streamlined access to genuine startups.

Problem

The initial qualification criteria for ESIC were, justifiably, established with a narrow scope. The scheme offers generous tax incentives, and there was some uncertainty as to its popularity and the mechanics by which it would operate. A narrow scope allowed oddities and quirks in the scheme to be ironed out and reduced the potential for abuse.

Nevertheless, this narrow scope has led some genuine startups to be excluded from the scheme, or increased uncertainty by pushing companies to use the principles-based assessment method. In an environment where early stage capital remains a concern for the startup ecosystem, this is an area where improvement could yield valuable results.

More could also be done to boost awareness and understanding of the scheme, helping boost uptake and impact.

Solution

Expand the early stage test and initiate a review of the innovation test criteria in consultation with industry for determining status as an Early Stage Innovation Company.

Detail

i) Innovation test

Currently the 100-point innovation test consists of a series of activities indicating innovative activity. A review of these activities, both to add activities that may indicate an entity is a startup and also to increase the points-value of very strong pieces of evidence, could increase certainty and access to the scheme by innovative businesses.

Examples of areas which could be expanded include:

- Membership of a recognised accelerator or incubator is clear proof that the industry considers the business to be a legitimate startup and could be increased to 100 points.
- Receipt of an Accelerating Commercialisation grant, with its corresponding process of thorough due diligence by a panel of industry experts, could similarly be increased to 100 points.

- Some consideration of points allocated for membership of co-working spaces that specialise in startups like Fishburners, Inspire9 or Tank Stream Labs.
- Minor consideration could be given to startup-specific community events, like hackathons and competitions.

ii) Early stage test

Currently, the early stage test consists of four criteria:

- a) The company must have been incorporated or registered in Australia within the last three years
- b) The company must have total expenses of \$1 million or less in the previous income year
- c) The company must have assessable income of \$200,000 or less in the previous income year
- d) The company can't be listed on a stock exchange, either in Australia or elsewhere.

The age requirement of three years serves little functional purpose and can easily disqualify a startup that simply started slowly, or one which has spent a significant period developing and testing the technology underpinning the business before seeking to raise capital. We recommend this limit be increased to five years to help mitigate these issues.

The restriction on expenses and income could also be expanded. Some startups may be forced into an undesirable situation where they lose ESIC status as a result of hiring more staff, spending more on R&D or acquiring a significant customer base.

An increase to the expenses threshold to \$2.5 million and the assessable income to \$500,000 keeps the scheme firmly in the domain of an early stage business while not causing startups to be hamstrung while raising their initial rounds of capital.

iii) Promote and educate

Some investment of resources to promote the scheme and educate both startups and investors is required for the full value of the scheme to be unlocked. A series of open sessions and events, including in partnership with coworking spaces or other organisations, discussing the incentives and the eligibility criteria could help close a gap and increase targeted participation in the scheme.

Risks and mitigation

The biggest concern in expanding the ESIC definition is the increased potential for the tax offset to be directed in a manner not originally intended by the scheme. Limiting claims to genuinely innovative companies is critical, as is avoiding misuse of the scheme.

In this case, however, the modest existing subscription to ESIC status indicates that the current scheme is well protected and the changes to the qualifying criteria are sufficiently nuanced to maintain the broader integrity of the scheme.

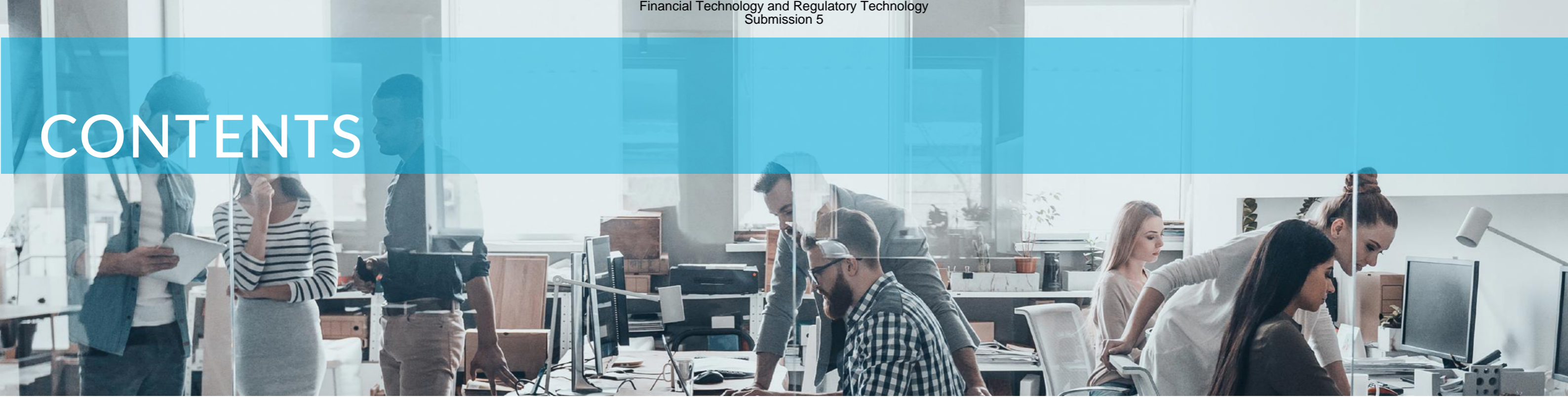
STARTUP TALENT GAP

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INTRODUCTION

PURPOSE

Talent is an important part of any business. For tech businesses, where high value products are created almost exclusively from human intellectual capital, talent is particularly critical. A shortage of talent therefore risks severely limiting growth in any emerging tech sector. People with the skills and experience necessary to rapidly grow a startup from a small group of founders into hundreds or even thousands of employees are rare. That rarity has led to fierce global competition for the world's best talent. Australian startups are not just competing with each other; they are vying with the world's most promising young companies and established global tech firms.

There are two key ways to inject talent into our startup ecosystem: education, and migration. Education can help us generate a pool of talent locally, building a digitally enabled workforce in the medium term. Migration can help us attract international talent from overseas in key roles in the immediate term. But for either immigration or education to be effective we must first have a clear understanding of which skills are missing.

This report was commissioned to add a layer of detail and depth to our understanding of the key talent shortages in Australia. It seeks to pinpoint those skills which are in immediate high demand, develop an understanding about the broader talent context of the Australian technology sector and profile some of the archetypal roles that are in high demand on the cutting edge of the technology sector.

SCOPE AND METHODOLOGY

The focus of the report is Australia's high-growth tech sector.

This document is intended to be a data-driven look at particular skills gaps in Australia. To help it remain relevant for a range of audiences we have deliberately avoided providing recommendations. Nevertheless, we are working with governments and private organisations on specific talent-focused strategies and programs.

The research for the report consisted of qualitative and quantitative components.

QUALITATIVE PRIMARY RESEARCH

Qualitative research was carried out by conducting a detailed survey of 23 Australian scale-ups¹. This was augmented by conducting follow-up interviews with 7 prominent scale-up founders.

To qualify, each company needed to:

- Use technology to address a large market
- Have a high-growth business model
- Be founded in Australia
- Have a current valuation of over \$20 million
- Be less than 12 years in operation

In depth interviews were then conducted with the CEOs of seven of these organisations. Quotes from those interviews appear throughout the report.

- Bridget Loudon, CEO Expert360
- Martin Hosking, CEO RedBubble
- Didier Elzinga, CEO Culture Amp
- Jonathan Barouch, CEO Local Measure
- Patrick Llewellyn, CEO 99designs
- Tim Fung, CEO Airtasker
- Dr Marcus Tan, CEO HealthEngine

QUANTITATIVE SECONDARY RESEARCH

We partnered with LinkedIn to provide a bespoke data set for the analysis in this report.

The data set was based on a custom filter designed to catch as many startups as possible. It looked at organisations that were under five years old, listed as operating in the 'Computer Services', 'Internet' or 'Financial Services' industries, and had fewer than 200 employees. Conscious of the fact that this was merely a proxy for a cohort of startups, we called this filtered group of companies 'Upstarts'.

The LinkedIn data we analysed was comprised of both 'hiring' data, and 'jobs' data. Hiring data was taken from LinkedIn's user profiles - self-described skills, job titles and transitions. Jobs data was taken from LinkedIn's recruitment marketplace, analysing ads and applications for particular roles.

Input and expertise was also provided by the report's commissioning partners:

- Microsoft
- University of Technology Sydney (UTS)
- Google

EXECUTIVE SUMMARY

KEY FINDINGS

- Critical skills gaps right now include:
 - Coders - including full stack developers, front-end, back-end, and mobile
 - Startup-focused sales roles - account managers and business development managers
 - User experience designers
- Additionally, emerging skills gaps are likely to develop in the following areas:
 - Product managers
 - Data scientist
- There is strong global competition for highly-skilled technology roles, and companies in more mature ecosystems are already recruiting strongly for talent in Australia's growth areas
- Particular high-skill roles have the potential to 'unlock' growth, and therefore local employment, for Australian tech firms

This report takes a novel approach to identifying Australia's tech startup talent gap. We combined in-depth interviews with successful scale-up founders with a custom LinkedIn data set looking at roles and hiring among young Australian tech firms. We then looked at the same data from a range of other countries around the world.

This process yielded interesting results. As expected, there was a reasonable degree of overlap between positions scale-up founders told us were hard to fill and the key roles that emerged from the LinkedIn data set. But the much stronger correlation was between the responses we had from scale-up founders and the data we collected from more mature startup ecosystems including Israel, Switzerland and the US. The scale-up founders, who are in a relatively small group of more mature Australian tech firms, are likely acting as lead indicators of local demand for skills in the years ahead. This provides a potentially powerful insight to help businesses and policy makers get ahead of the demand curve.

We examined migrant hiring patterns from international peers including New Zealand, Canada and Finland, alongside data from countries with top-tier technology ecosystems, including the US, Germany and Israel. Australia's current level of imported talent as a percentage of total workforce is very close to the mean of the nations we analysed. We also found that young tech firms from all the countries we analysed were looking for similar roles to recruit internationally, and that those roles were typically highly skilled, high-impact positions.

[This indicates there is strong global competition for many highly-skilled roles in technology.](#)

Both the quantitative and qualitative data showed that more traditional roles such as marketing, sales and customer service play an important role in the employee profile of young tech companies. Yet these roles were significantly less likely to be directly cited as difficult to hire for, and less likely to be imported from overseas amongst the companies we analysed.

[This indicates that some highly-skilled positions serve as bottlenecks for growth, and therefore act as enablers for local jobs when hired.](#)

The final section of the report looks at four archetypal positions that have emerged from the research as critical to the high growth technology sector. The aim is twofold; to outline the role within the organisation and show the value provided by these positions, as well as to provide a career pathway by tracing the skills, areas of study and previous experience were typical of those who currently hold these positions in the marketplace.

[The report profiles a data scientist, product manager, UX designer and a business development manager as high-demand positions in the startup ecosystem.](#)



SKILLING AUSTRALIANS FOR THE JOBS OF THE FUTURE

NATIONAL SKILLS PROGRAM

The nature of work is changing. An extraordinary convergence of digital technologies is creating new roles, augmenting existing ones and rendering others redundant. While workers have proven resilient during previous industrial revolutions, many Australians will be affected by the automation of manual and routine tasks, and the resulting changes in jobs.

Microsoft has long advocated that if Australia is to remain globally competitive, it needs to be more innovative, become more successful at commercializing its many great ideas and creating an environment where startups and other entrepreneurial businesses can grow and flourish.

Microsoft believes that equipping the nation to succeed in the digital age – and ensuring all Australians are carried along – must be an urgent national priority. Through the launch of our National Skills Program in 2018 our priority is to ensure adults already in work can navigate the threats and opportunities presented by the digital revolution, which is being driven by the growth of cloud computing, artificial intelligence (AI) and machine learning, the Internet of Things (IoT), 3D printing, blockchain and other powerful innovations.

This includes our approach to ensuring workers in Government sectors can transition their skills. Earlier this year Microsoft announced an initiative to deliver critical cloud computing skills to 5,000 Australian public sector workers by 2020, with the aim of boosting the digital capabilities of public sector workers at the forefront of delivering digital services to Australian citizens.

Whilst reskilling and retraining is critical we know that almost all net new job creation comes from businesses less than five years old, so our future prosperity is going to be dependent on Australia continuing to foster and support startups and ensuring these growing businesses can access workers with the right skill sets.

MICROSOFT FOR STARTUPS

In early 2018 Microsoft announced it is bringing its globally recognized accelerator program *Microsoft ScaleUp* and, its physical start-up space Reactor to Australia. Both will be located in the newly opened Sydney StartUp Hub in the Sydney CBD.

The *Microsoft ScaleUp* program is designed for Series A startups and offers access to sales, marketing and technical support. Eligible startups partake in the immersive program at one of our eight global locations followed by ongoing support from a dedicated team of success managers.

The program takes a unique approach to connect qualified startups with new customers and channel partners. Microsoft has over 40,000 sales representatives and hundreds of thousands of partners whose goal is to drive adoption of Microsoft cloud solutions into companies of all sizes and industries worldwide. The program provides dedicated resources to prepare startup marketing and sales teams to effectively sell their cloud solutions to enterprise organizations in partnership with Microsoft's global sales organization and partner ecosystem.

The Sydney program is expected to run in the second half of 2018. Applicants can express their interest in participating by contacting startups@microsoft.com or find out more about the program at www.startups.microsoft.com

Reactors are developer community hubs. They will host technical events as well as community networking and collaboration. The spaces will support HoloLens, mixed reality, software engineering, coding, tech meetups, hackathons, and more.

SPONSOR

Microsoft Australia Managing Director Steven Worrell announces the decision to open Reactor and Microsoft Scaleup programs at the Sydney Startup Hub



EMPOWERING EVERY PERSON

Microsoft's mission is to empower every person and every organization on the planet to achieve more. And that is true in the startup world.

In addition to the presence in the Sydney StartUp Hub, Microsoft has its Innovation Centres in Adelaide and Brisbane with local managers to help support startups.

Microsoft also has a strong focus on supporting indigenous entrepreneurs such as Mikaela Jade, founder of Indigital and Dean Foley, founder of Barayamal – an indigenous business accelerator and is a Red Ochre partner of Supply Nation which seeks to build a sustainable, vibrant and prosperous Indigenous business sector

Indigital is using mixed and augmented reality to translate, preserve and celebrate Aboriginal and Torres Strait Culture, language and history. The company has used drones, 4D mapping and augmented reality smart phone apps in the past to share indigenous insights - but is now turning to Microsoft HoloLens to bring to life indigenous stories, culture and beliefs.

Jade is also partnering with indigenous social enterprise, Shared Path, to run a program funded by Microsoft to train 30 indigenous women from across Australia in digital skills including AI, Blockchain, mixed realities and Minecraft, enabling them to develop technology solutions that work for their communities and create economic opportunities.

Barayamal seeks to inspire, educate and support First Nations youth and budding entrepreneurs through technology and entrepreneurship and in bridging the skills and employment gap between non-indigenous and indigenous youth.

Microsoft and CSIRO are sponsoring Barayamal's inaugural First Nations Youth Summit to empower participants through technology, leadership and entrepreneurship workshops and discussions and to gain important insights on what skills are needed for the jobs of the future and to be successful in life

CONTENT

SCALE-UP FOUNDER DISCUSSIONS

THE MULTIPLICATIVE EFFECT OF THE RIGHT ROLE

When startups grow, they can grow fast, providing jobs for a variety of disciplines. So to trigger job growth in the sector, one first needs to trigger high growth in startups so they are able to reach an inflection point and start to scale.

Highly-skilled positions are often able to trigger that high growth. People with the skills and experience to scale a business are the ones that are likely to lead a redevelopment of a startup's product, sign a major client, analyse user behaviour to improve business performance - make a tangible difference in a core area of the business that then unlocks the ability for that business to grow.

In short, these roles are able to act as growth multipliers. That's why they are regarded in such high esteem by business founders, who are attempting to grow their businesses, and it's also why they're so important to the local economy, because closing that talent gap for local businesses is a powerful net creator of jobs.

Patrick Llewellyn told us a story about one such moment for 99designs. They were having an issue with the business's sales funnel - they knew that their business had some traction and people thought it was a valuable service, but they weren't able to consistently spend money on advertising and convert that spend into customer growth. Without that ability, it was difficult to secure investment.

So we had just hired a new user experience (UX) designer to work with us to further round out our their team and bring new skills to our engineering team.

The breakout for us was a combination of two things: we hired a UXer at a very similar time to when I started. I was doing some basic research because I come from a business background - I was looking at the competitive landscape, understanding them and various business models and looking at traffic. I identified one competitor that I thought was maybe doing better at converting traffic than we were.

They were a lot smaller than we were but they seemed to be doing something right. I talked to the team and the UX guy and he said we'd test it. He flew over to the States and we tested our flows with real users, our competitor's flows with real users - just in our little office in Pier 38, and we learned a great deal from that. For me, that was a breakout moment. You can learn a tonne from real indepth and well executed user research.

By learning what we did through this experience we completely reshaped our top of funnel, and this was a dramatic change. We went from basically getting people to fill out the [design brief] post payment to getting them to fill out a brief first and then pay at the end.

The reason I mention that as a breakout point is we'd really struggled to spend money to acquire customers and that's because our conversion rate was actually pretty poor. Our conversion rates improved by four times - this was quite a big shift, and all of a sudden we could start spending to acquire customers profitability.

We were in a great position and we could demonstrate that last year we'd done okay, but this year we're off to the races and these changes made a big impact.

After the intervention from the UX designer, 99designs secured a large funding round and proceeded to grow rapidly. The company employed 15 people at that time; it now has over 120 employees and is continuing to grow. This is the very real consequence of hiring the right person at the right time in a startup - growth for the organisation, and job creation for the economy in which it sits.

TALENT CRITICAL FOR SCALING UP

The technology sector has been uniform in publicly speaking out about its demand for talent, particularly since the abolition of the 457 visa was announced in April 2017. Australian job search website Indeed found that the number of skilled work visas dropped by one third from July-December after the announcement².

Our research suggested suggested scaleups were thinking globally about their workforce, with a small number of key hires often being sourced from outside Australia. The median company in our data reported 5% of their Australian-based workforce were on skilled migration visas, and this aligned with employee data across the cohort of all companies in the study.

Efforts are under way in both the public and private sector to provide solutions, key amongst them the Global Talent Scheme, which is a pilot program to allow startups to take advantage of a more flexible and faster skilled visa stream.

"An excellent engineer or marketer will come in and help upscale and grow their peers, and impart best-practice knowledge. That makes our company a better place and it makes the Australian market more globally competitive." - Bridget Loudon, Expert360

ASIDE FROM CEO

What was the most important employee role for achieving the growth of your business?

SPECIFIC SKILLS

This need for talent does beg the question - exactly what talent is required? Australia has an excellent education system and a highly skilled workforce. Yet we are failing to meet demand for some of the most important jobs in the technology sector, stifling an important growth area for the economy more broadly.

Startups move quickly. They need to act quickly, iterate, and skill up quickly on new technologies and techniques. Many of the roles they are looking for, like Patrick's UX designer, are not traditional business roles, and have only recently emerged even in the technology sector, yet are critically important for enabling growth.

To get a sense of which roles are important to leading Australian tech startups, and which roles are difficult to fill, we parsed the responses to talent-related questions from our cohort of 23 leading scaleups and developed a visual representation of their answers. Larger text equates to more mentions in their answers.





PAST

As your business has grown, what has been the most difficult role for you to hire locally?

FUTURE

In the next 5 years, what do you anticipate will be the hardest role for you to fill locally?

PRESENT

For your business right now, what has been the most difficult role for you to hire locally?





3. TRADITIONAL ROLES ARE STILL IMPORTANT

Despite the focus on newer startup-specific skills, there is still strong recognition of the value of traditional business roles. Sales and marketing are two of the top three components cited as important for reaching the scale-up phase.

Interestingly, despite being seen as critical to business growth, these more traditional roles were rarely mentioned in the questions relating to difficulty of hiring. Startup and technology sales and marketing jobs are certainly distinct from their counterparts in more traditional businesses, but the evidence suggests the skills base is transferable. The part of the the talent gap that is most difficult for hiring businesses to solve appears to centre on technical skills. The data suggests closing that gap could open significant growth potential for businesses looking to hire in these important but less technical roles as the growth potential for companies is unlocked.

"As we started to grow we were hiring customer service, B2B sales people, more product and design and UX. It was a real mixture." - Jonathan Barouch, Local Measure

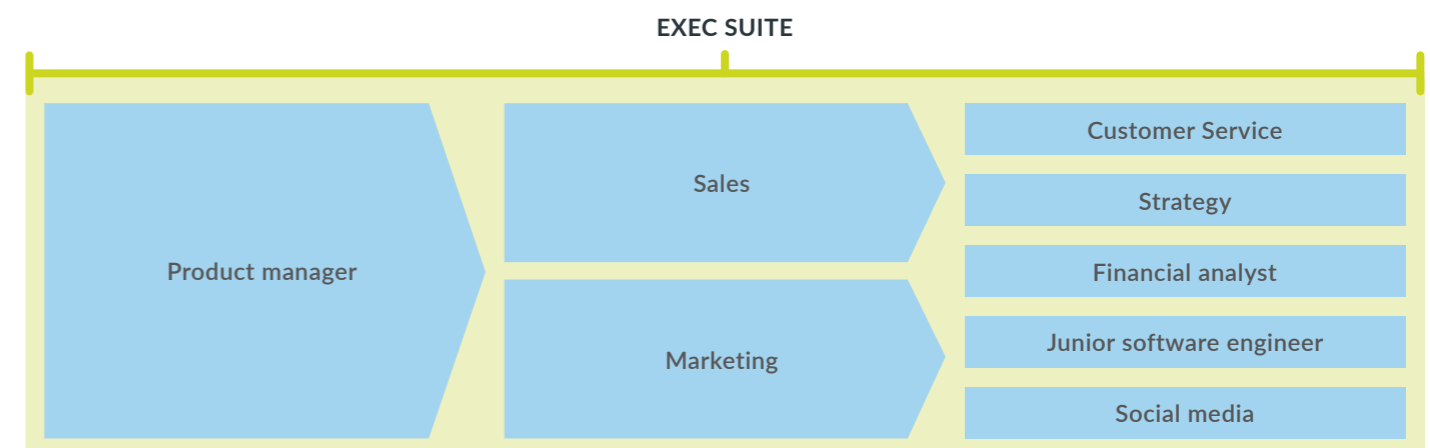
4. THE EXECUTIVE SUITE LINGERS ON THE MINDS OF FOUNDERS

While the executive suite isn't an overwhelming concern at any stage, it does consistently appear across the responses at each stage. Even the CEO is listed as an expected concern for future hires, indicating that some founders are anticipating hiring themselves out of the position as the company becomes truly global.

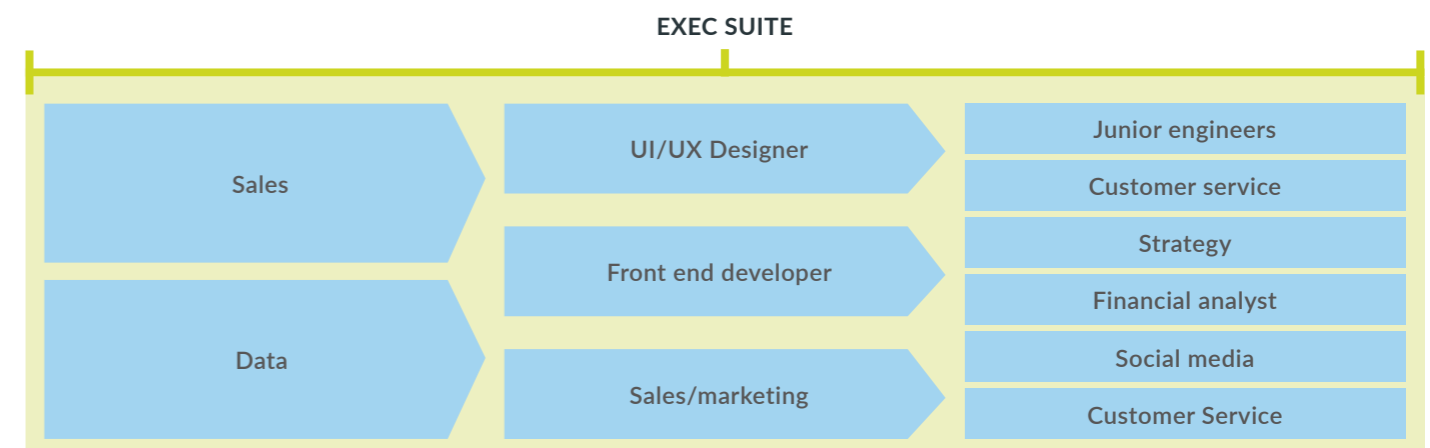
Notably, COO and CTO feature as important roles in growing into the scale-up phase. These high level positions early in the life of a startup are typically co-founder roles, and their influence is obviously felt strongly in the early stages. Strong experience and leadership in the growth stage appears to have been important in reaching the scale-up stage.

"Oftentimes it's not like they're coming in as juniors and then growing. What's happening is they were very successful at what they were doing. They believed in what we were doing and they were taking a huge risk to come join us when we were a 20 person company, so as the company grew, it grew to the point where they were able to use their old skills again." - Didier Elzinga, Culture Amp

TECH SKILLS AS ENABLERS FOR EARLY STAGE JOB GROWTH:



TECH SKILLS AS ENABLERS FOR MID STAGE JOB GROWTH:



INDUSTRY MEETS EDUCATION TO TACKLE THE TECH TALENT GAP



The StartupAUS Talent Gap report shows an advanced technical skillset is driving the most in-demand roles. Yet tech will only take people so far, and an entrepreneurial mindset is needed to unlock new possibilities.

How then are universities helping businesses to innovate? We take a look at University of Technology Sydney's (UTS) partnership with JobGetter, which involved trawling through two million job postings to come up with new ways for the organisation to do business.

"The first day we came into class, we had a non-disclosure agreement to sign," recalls UTS Bachelor of Technology and Innovation (BTi) student Sophie Hawkins. *"When we saw that, we thought, 'This is real – this project can't be done overnight!'"*

The challenge for Sophie and her classmates in the Data-Driven Design Challenges subject was to comb through JobGetter's data to find insights into new ways to engage users. Australian scale-up JobGetter is one of the country's leading recruitment and job-finding services, with more than 1.5 million users and two million job postings.

Working in groups to pitch, develop and deliver these changes made up the entirety of the teaching session's content, with other subjects covering the tech skills and theory needed to complete the work.

Sophie says, *"The whole purpose of this course is that you develop soft skills, rather than just your hard, technical skills. So, you'll develop skills with teamwork, leadership and problem solving."*

"The subjects we do are teaching us different methodologies like design thinking, but then we also learn about data, coding and emerging technologies, like in the biotech space or robotics."

The lack of formal lectures in Data-Driven Design Challenges was a revelation, she adds. *"It's not until you start doing that real-world work that you see how much you've changed. You find yourself knowing how to do interviews and presentations, knowing about human-centred design methodologies and even basic coding."*

USING DATA FOR GOOD

The BTi students came up with six pitches for JobGetter which focused on improving the user experience and the company's data management. Sophie's group used the data to enhance the sign-up phase so people with a disability or special requirements were better supported.

Her ultimate aim is to work in human-centred design or health and data science *"to actually help people and improve upon things, rather than just be creating for the sake of it. I have an Indigenous background and I see how people can be stereotyped."*

RETHINKING THE STATUS QUO

Another group's solution actually landed them internships with JobGetter. Lachlan Gregory (pictured right) and fellow BTi students Aaron Bland, Charlie Schacher, Monty Martin-Weber and Vincent Anthony were in a team who rethought the JobGetter app.

Lachlan says the company's previous app had a "clunky sign-up process", so the team aimed to make it more appealing to jobseekers, increasing the number of users and how often they visited.

"We set ourselves the target of users accessing personalised jobs within three clicks, but we actually achieved this in two," enthuses Lachlan.

"We wanted to go a level deeper than a job seeker's physical qualifications though. Our app considers jobs and companies you wouldn't have originally thought of, but for which you suit the company culture and have the skills to make an impact. Most job sites ask for the jobs you want, but not for the jobs you don't want. We've made an effort to incorporate this."

FRESH EYES FOR A NEW DIRECTION

For JobGetter co-founder and director Fiona Anson (pictured above), the opportunity to open up the business to a room of BTi students was *"simply irresistible"*.

"Having the students look at our app from a user's perspective was invaluable," she affirms. *"We ended up with something incredibly user-centric and visually appealing to our target demographic."*

Working with tech-savvy, entrepreneurially-minded students was also a refreshing change to working with the "same old" consultants, Fiona adds.

"The students were really granular and applied not only new and critical thinking, but also their individual areas of expertise – UX, Internet of Things, design, research. The BTi is developing exactly the skills we see employers clamouring for – critical thinking, creativity, enthusiasm, innovation, communication and collaboration skills. I think this course is something really special and is certainly grooming the next generation of thinkers, innovators and game changers."

Senior lecturer Natalia Nikolova, subject coordinator for Data-driven Design Challenges, emphasises that the BTi prepares students for the future of work by focusing on digital and technological literacy, as well as enterprise skills.

"Normally, such experiences are offered in capstone subjects, at the end of degrees," explains Natalia. *"BTi is different – we want students to have the opportunity to work with real clients and problems early on. I'm a great believer in the need for industry to collaborate more closely with universities; not just in research, but also in teaching and learning. As this collaboration has shown, the transdisciplinarity of the BTi has been instrumental to the outcomes achieved."*

Students like Sophie and Lachlan are certainly now a step ahead of your average graduate, with not just a suite of invaluable tech skills up their sleeves, but an adaptable, resilient mindset that make them real industry assets.

As Sophie reflects: *"It's not about the work at the end of the degree, it's about learning and experimenting. This course has taught me that even when technology experiments don't work, if I can express what I've learned and how I might improve it next time, that's enough."*

BROADER DATA

TOP OCCUPATIONS



THE AGENDA



HIRING TRENDS

Who are upstarts hiring currently?



JOBS TRENDS

What roles are in demand for upstarts, what roles are growing, what roles are hard to hire?



MIGRATION TRENDS

Are upstarts looking internationally to meet their talent needs?

To continue to explore the talent gap in a wider context, we engaged LinkedIn to help provide data about the economy more broadly in Australia, and provide a comparison to our international peers.

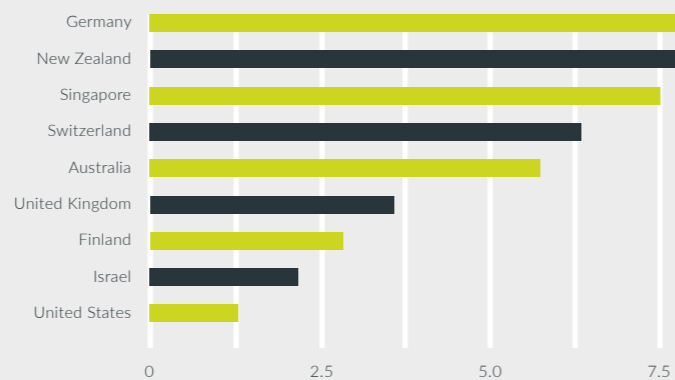
We wanted to look at the startup and technology sector as a whole and identify hiring trends to see if the concerns raised by scale-up founders are reflected in the data - and how Australia differs to the rest of the world.

While there's no one definition for exactly what qualifies as a 'startup', we wanted to create a series of filters across the data to create a reasonable approximation. While it is possible that some startups will be missed in our analysis, and some non-startups will be included in the data, we think our filter is mostly successful in narrowing down a huge set of data into the high growth technology sector.

We have characterised organisations that pass this filter as 'upstarts'. These are organisations that are less than five years old, listed as 'Computer Services', 'Internet' or 'Financial Services', and have less than 200 employees.

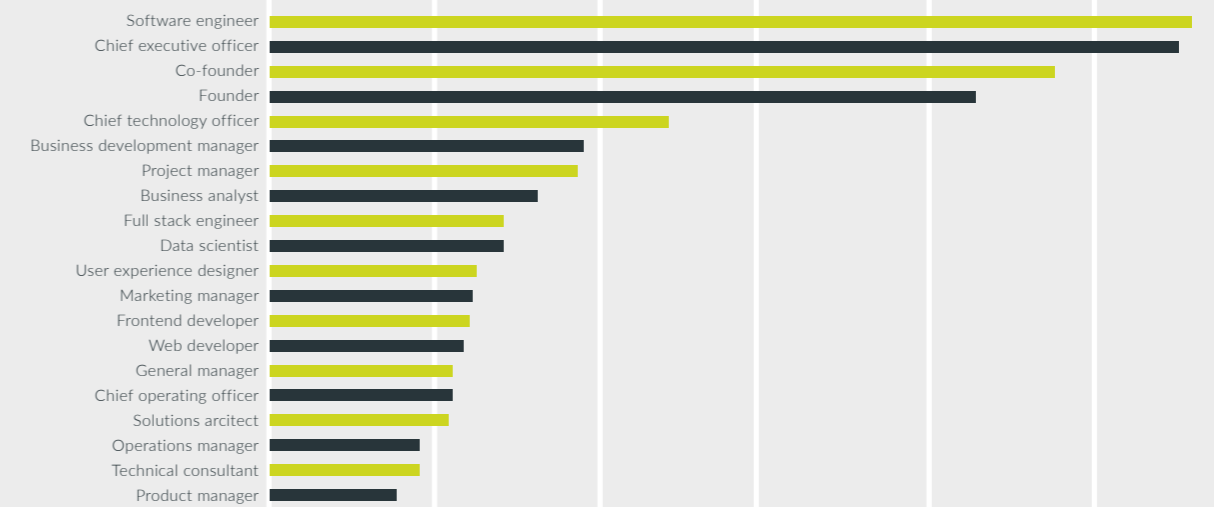
The data is comprised of both 'hiring' data, and 'jobs' data. Hiring data is taken from LinkedIn's user profiles - self-described skills, job titles and transitions. Jobs data is taken from LinkedIn's recruitment marketplace, analysing ads and applications for particular roles. This provides an excellent broad overview, but is still subject to the quirks of the marketplace (ie, LinkedIn may be seen as a valuable recruiting tool for some positions more than others).

COUNTRIES BY SHARE OF MIGRANT HIRING IN 2017



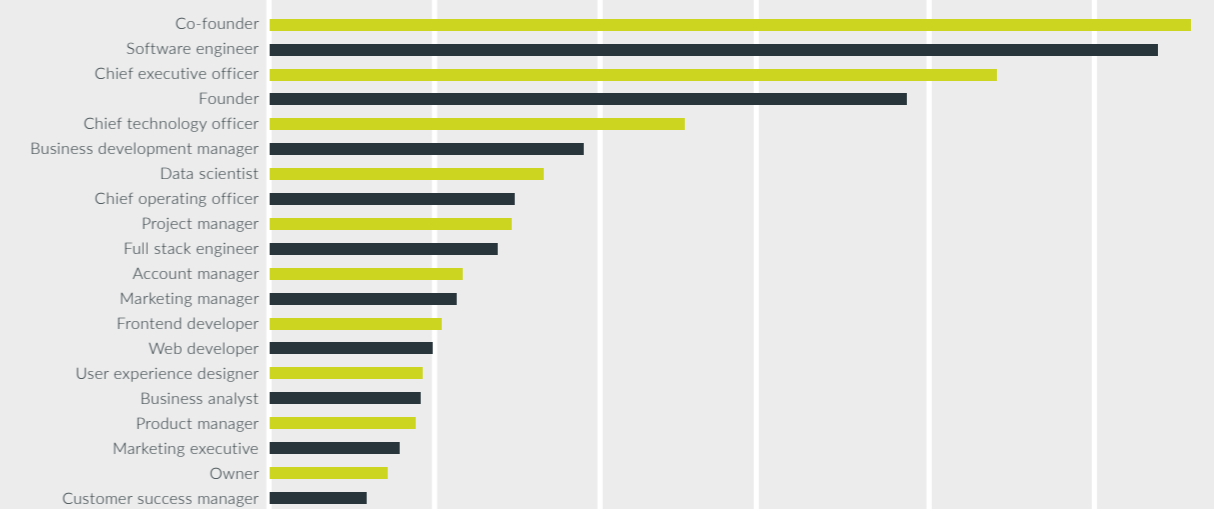
AUSTRALIA

Top occupations by % of hires - 2017



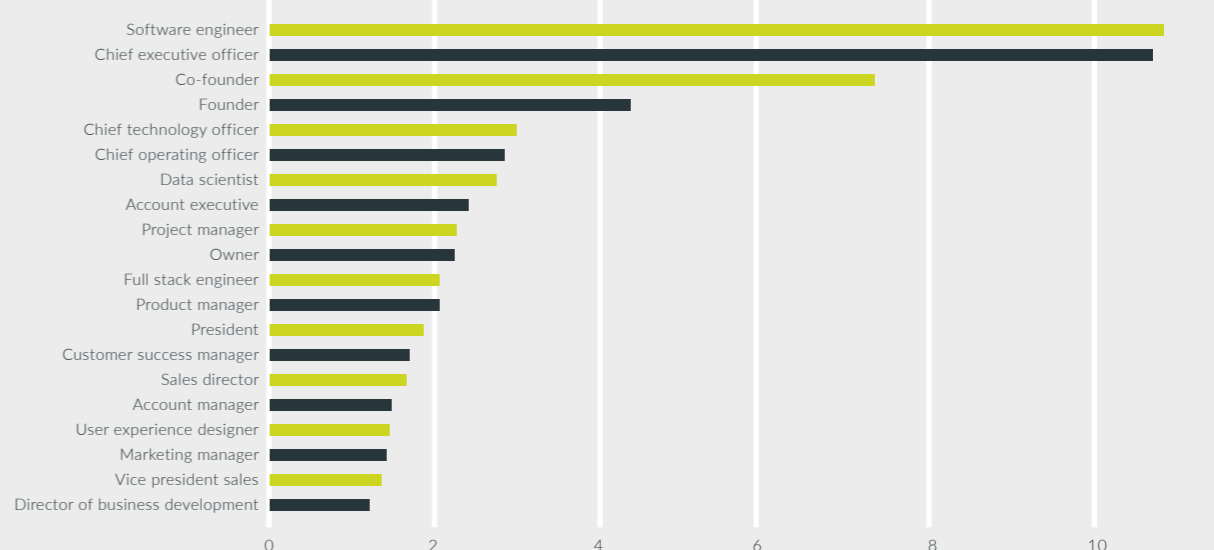
UNITED KINGDOM

Top occupations by % of hires - 2017



UNITED STATES

Top occupations by % of hires - 2017



AUSTRALIAN JOB POSTINGS

UX AND UI FEATURE PROMINENTLY

Both user experience (UX) and user interface (UI) roles feature in volume for job postings, and are near the top of the list for growth as well. These are both product-related roles, and correlate with our qualitative data.

NO PRODUCT OR DATA ROLES FEATURE

Despite a focus on data science and product management in the qualitative research, 'product manager' and 'data scientist' roles do not feature here. It is possible that:

- i. LinkedIn is not the platform by which these roles are found in Australia
- ii. Other positions are taking on this responsibility as part of their existing duties - ie, project managers or developers are acting as de facto product managers in Australian upstarts, or
- iii. These high impact roles are not needed in enough volume to show in the Australian data at this stage, compared to ecosystems with a more mature high growth technology sector.

TECH SKILLS DOMINATE JOB POSTINGS

Technical roles saw by far the largest volume of job postings in the Australian cohort. 9 of the 15 top most advertised positions for Australia were for developers, software engineers and UX/UI roles. It is clear that for these early stage businesses with fewer than 200 employees a pipeline of STEM talent is critical.

SALES ROLES SHOW STRONG GROWTH

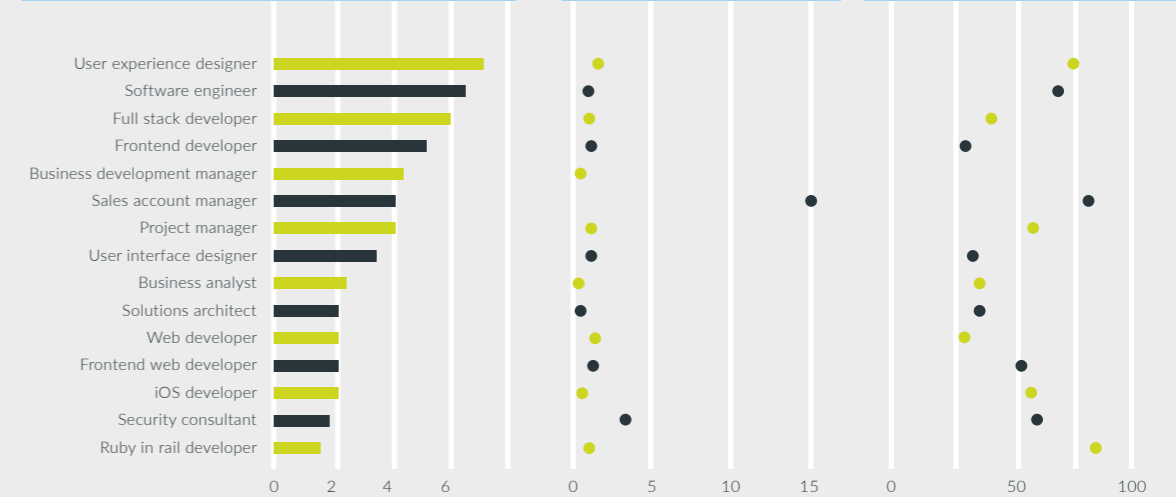
Sales roles were reasonably represented in total volume, but notably dominated the 'growth' numbers since 2016. Sales account managers led the growth charts. This correlates with a significant growth in venture capital in Australia over the same period, indicating an increase in businesses looking to scale rapidly.

Postings for business development managers were open longer than any other role.

Strong volume and growth in the sales and business development roles for Australia when compared to international markets may reflect a focus by Australian startups on enterprise sales, which typically require more significant investment in experienced sales expertise.

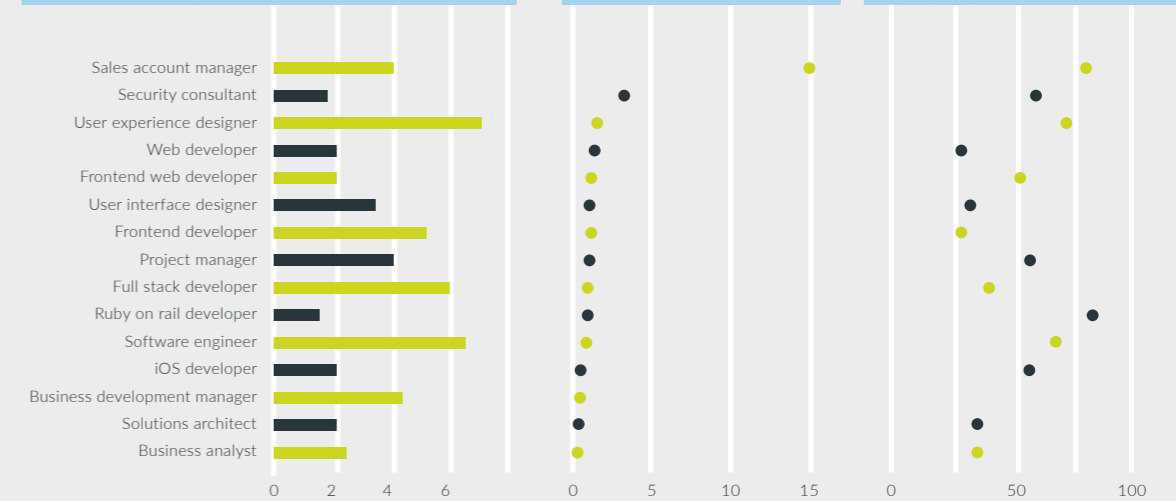
AUSTRALIA (SORTED BY SHARE OF JOB POSTINGS)

Share of Job Postings in 2017



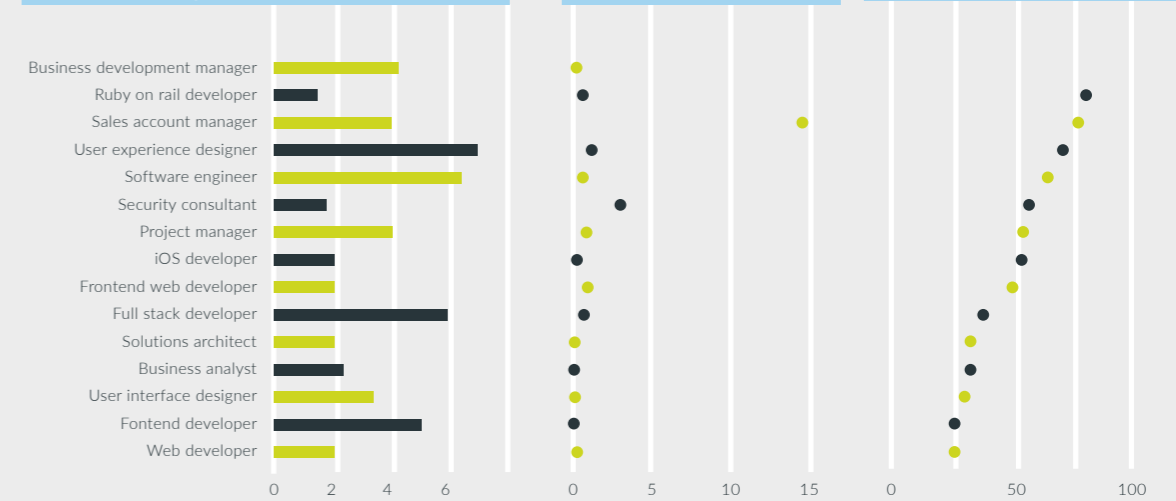
AUSTRALIA (SORTED BY GROWTH FACTOR)

Share of Job Postings in 2017



AUSTRALIA (SORTED BY AVG DAYS OPEN)

Share of Job Postings in 2017



INTERNATIONAL JOB POSTING COMPARISONS

TECH SKILLS ARE IN UNIVERSAL DEMAND

The international comparison highlights sustained high levels of demand for tech skills globally. High volumes of technical roles were seen in every country in our study, with lots of overlapping roles. Different markets may have a stronger focus on particular types of technical expertise (expertise in mobile platforms was in much higher demand in Israel than Australia, for example) but the demand for broadly high skilled technical talent was clear everywhere.

DATA SCIENCE AND PRODUCT WITH MUCH GREATER REPRESENTATION

The international job postings show product management roles come into the mix, and data scientist roles in high numbers across the board. Product managers showed the highest growth in Switzerland amongst all roles, while product owners (a related role) had the largest open period.

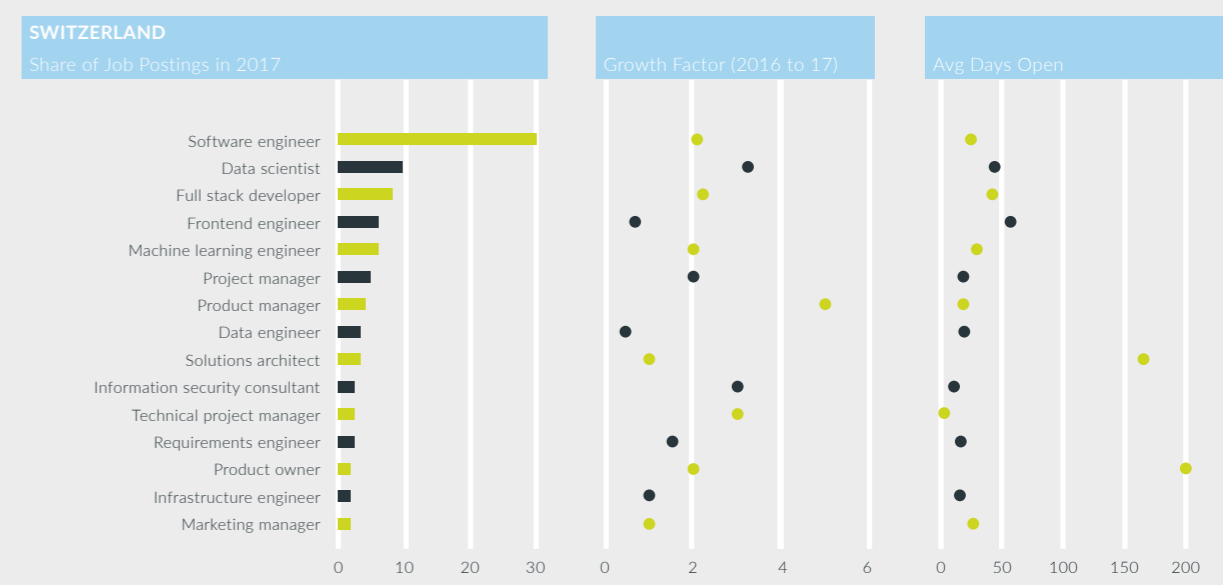
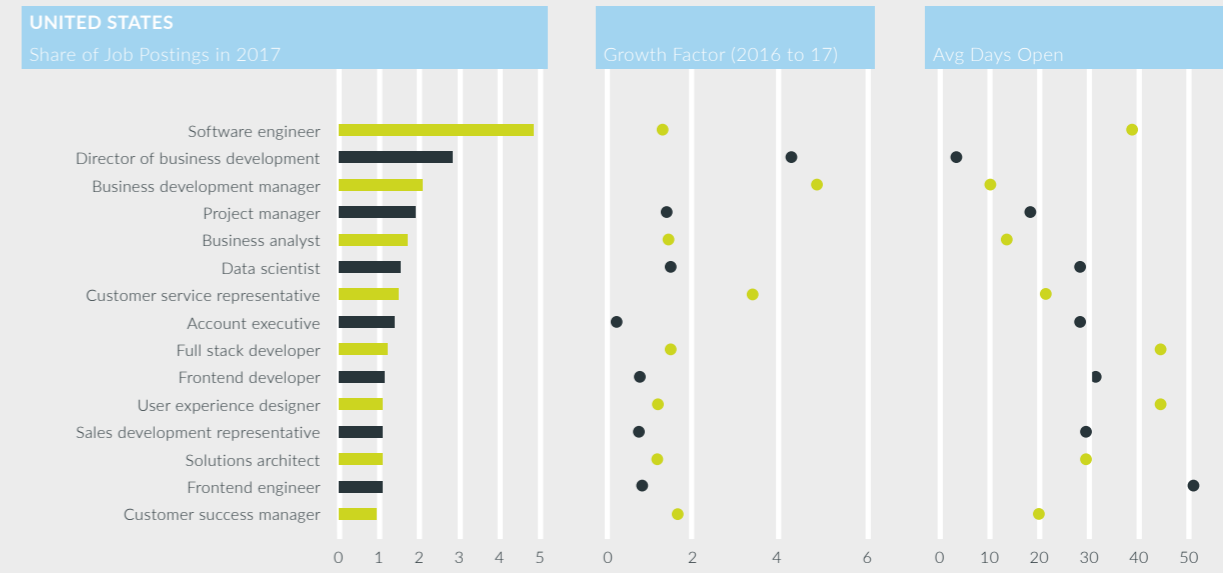
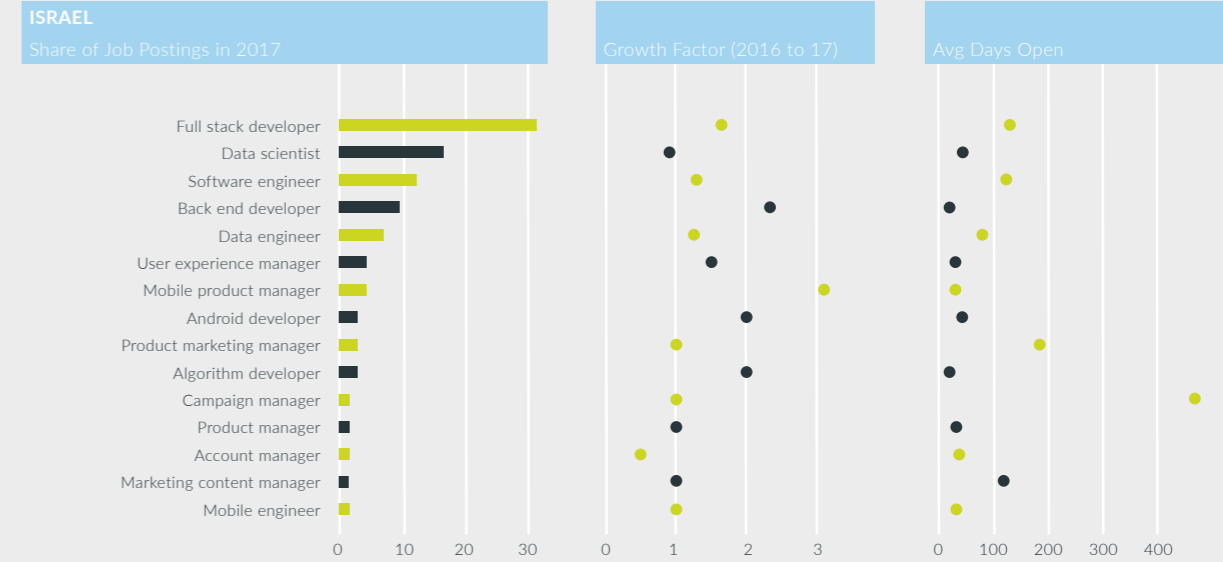
In all three examples, data scientist was one of the most in-demand roles, and data engineer was often not far behind.

These highly-skilled, specialised roles have been adopted into the culture of startups in the most advanced technological economies in the world.

SIGNS OF FUTURE DEMAND FOR AUSTRALIA

The representation of data and product roles in the data correlate strongly with our qualitative data from Australian scale-up founders, but were not reflected in our quantitative picture of the Australian sector more broadly. This is a strong indication that Australia's ecosystem is not as mature as some of the international comparisons. Here, the responses from scale-up founders are likely acting as a lead indicator that demand for data and product roles is set to increase substantially.

As Australia's high-growth tech ecosystem matures and more startups continue to scale, it is likely that their demand will begin to mirror the experience of the scale-up founders we spoke to in this research. If so, we will see a shift in Australia's talent gap, moving more in line with our international peers.



TOP MIGRANT HIRES

AUSTRALIA'S INTERNATIONAL RECRUITING IS RELATIVELY VARIED

For talent coming into Australian upstarts from overseas, frontend developers feature strongly. But they are joined by a wide array of other roles, many of them non-technical. Business analysts, marketing managers and operations managers are all commonly sourced from overseas.

Compared to the other countries analysed, Australia's talent imports are significantly less technical in background. One reason for this may be that, in an emerging ecosystem such as Australia's, businesses are looking to import people with experience growing successful startups - and that experience is useful across a wide range of roles.

DATA SCIENCE IN GLOBAL DEMAND

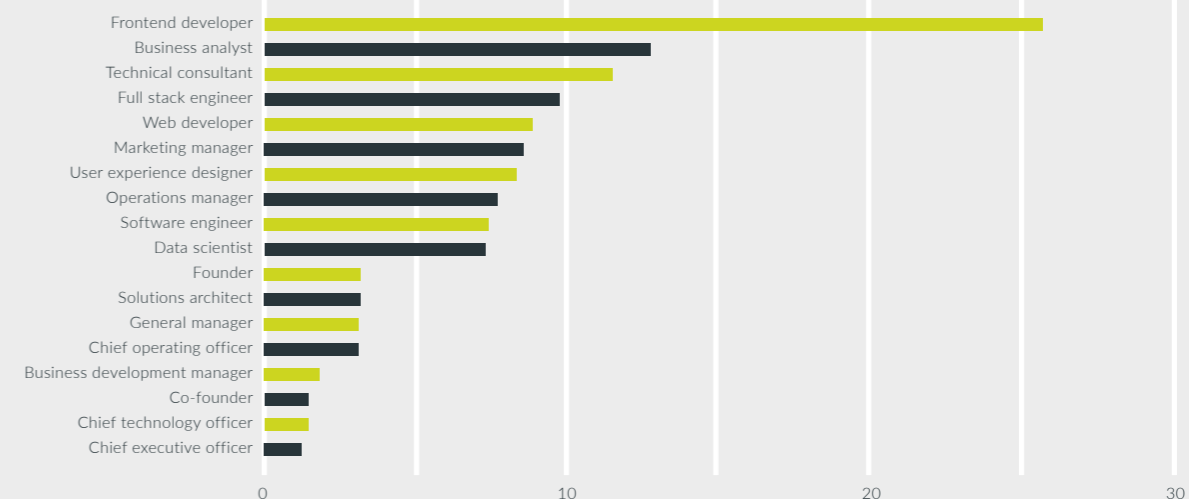
It is noteworthy that data scientists for upstarts in both the United States and Singapore topped the list of job roles sourced from overseas. This gives a clear trend of not only the strong international demand for data scientists in the technology sector, but also the trend of recognition of the value of data in this sector more broadly.

PRODUCT GLOBALLY COMPETITIVE, UNSEEN IN AUSTRALIA

In each of the international comparisons, product managers feature prominently, but again it doesn't show in Australia's data. Anecdotally, startups have indicated for some time that obtaining Australian visas for product managers has been difficult because product management has not been a recognised role in the Australian visa system. This may change somewhat with the introduction of the startup stream of the Global Talent Scheme.

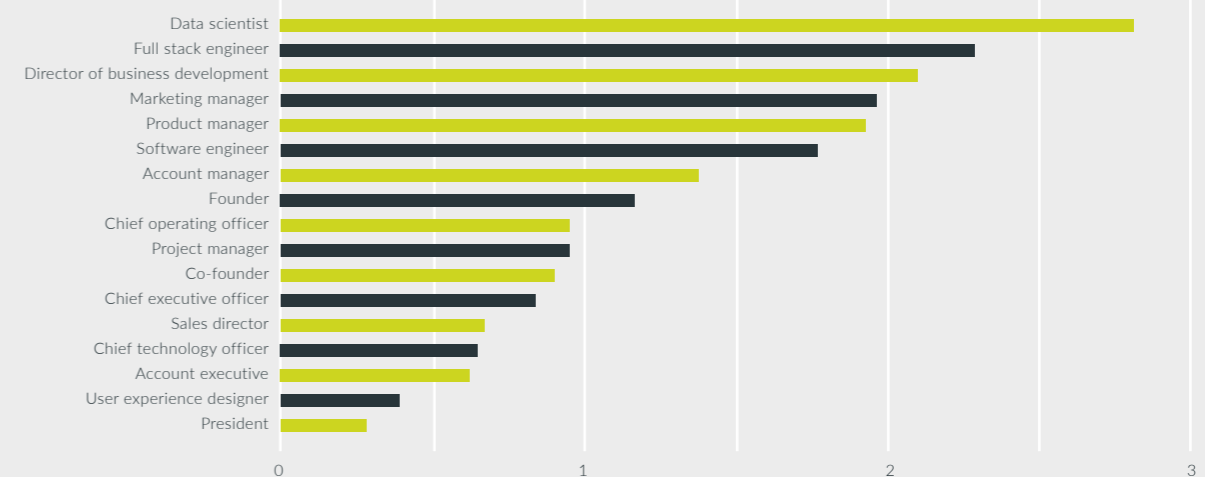
AUSTRALIA

Top occupations by % of migrant hires - 2017



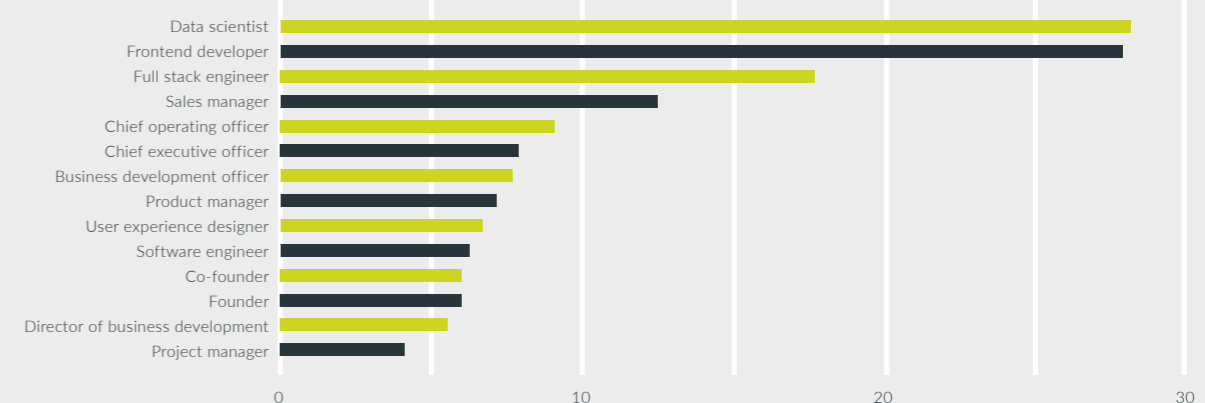
UNITED STATES

Top occupations by % of migrant hires - 2017



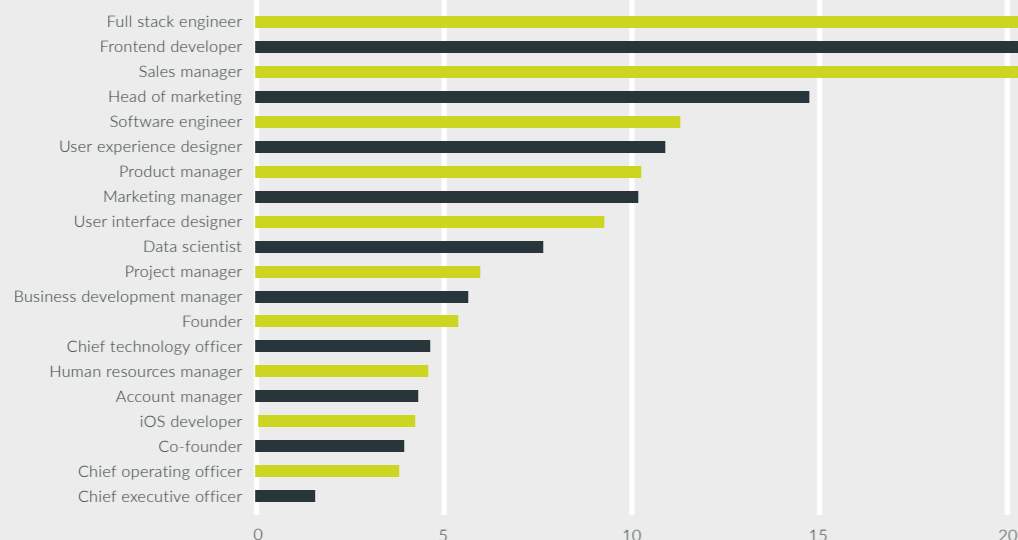
SINGAPORE

Top occupations by % of migrant hires - 2017



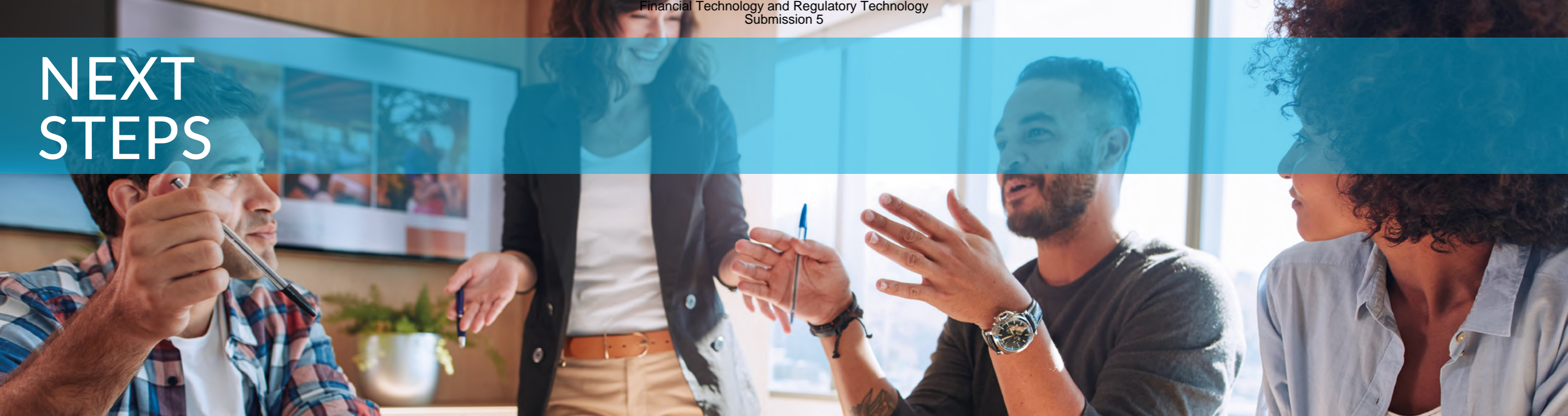
GERMANY

Top occupations by % of hires - 2017



Graphs are measuring the percentage of people in each role that have been sourced internationally. It is not an additive measure of total immigration.

NEXT STEPS



The effort to identify, understand and address the talent gap in the Australian high growth technology sector is only just beginning. It is a sector that experiences constant change - many of the skills and jobs that have appeared in the data we've looked at are cutting edge positions, specific to the tech sector and less than a decade old.

The potential rewards for addressing the talent gap are huge. Many high-value positions have a multiplicative effect on the employee count of the startups and scale-ups in which they operate. We want to be able to equip local technology companies with the tools and understanding required to find and attract people with these skill sets. And we want Australian workers to be trained and developed in these positions so that they have access to high-paid, rewarding jobs in the sector.

FURTHER RESEARCH TO DEFINE MISSING SKILLS IN THE ECONOMY

This report has taken the first steps towards using a data-based approach to identify the skills gap, but it is by no means comprehensive. The larger the set of data we can sample, the better our understanding will be of exactly which roles are in high demand, and the better our predictions will be for what roles are likely to be the most in demand roles of the future.

There is also the question of how often this data is sampled and updated. Rolling reviews of the talent picture over a period of years would uncover trendlines and shifts that a simple snapshot in time cannot.

We could also do more to measure the impact of addressing the gap - quantifying the multiplicative effect and demonstrating the value building a high quality talent pipeline for technology businesses.

LOW-HANGING FRUIT

While many of the roles identified in this paper are specialised and technical, there may be people with solid baseline skills that require minimal additional training or education to transition into a more specialised and valuable technology position. This should be an area of focus for future research.

Additionally, the level of practical experience of applicants is a variable that is difficult to track. A more thorough understanding of where experience is most valuable and what we can do to increase experience gain in those areas would increase the supply of excellent talent to our technology sector and the value of our workforce more broadly.

PROMOTE BETTER UNDERSTANDING

The more we are able to publicise the skills and experience that are in demand by Australian startups, the more organic efforts to address the talent gap can occur across the economy. A more public understanding of the nuances of cutting edge skills can allow their development to be incorporated into education, government policy and the private sector.

To that end, in the next section we have provided four archetypes of some of the more specialised startup roles that have come out of our research, providing an overview of their skills, showing their key roles and responsibilities within a startup and painting a picture of the typical career pathway of someone taking up the position.



TRULY LOCAL TALENT



Google has long been a fixture of Australia's technology ecosystem. Since 2002 Google Australia has grown from a handful of employees gathered in an apartment lounge room into an organisation that has created more than 1,300 local jobs, including an engineering division that employs more than 600 of Australia's top computer science professionals.

Google now invests more than \$500 million per year in Australia and is estimated by the economists at AlphaBeta to support over \$15 billion dollars worth of economic activity across the country, as well as providing more than \$14 billion worth of consumer benefits to Aussies for free. This includes helping them find the needle they're looking for within the haystack of human knowledge, making it easy to plan safe and efficient travel, and hosting and protecting the Gmail and YouTube accounts that let Australians speak to one another and the world.

We're often asked what attracted Google to this country; Australia was, after all, the second international office location Google opened after Japan. The answer is simple: Australians. As ANU Professor Brian Schmidt said after receiving his Nobel Prize, Australians have a free spirit and an ability to think outside the box. These attributes are vital in the fast moving world of technology.

With access to the right training and resources, the Australian people will form the foundation for this country's success in an era where tens of millions of people across our region are joining the Indo-Pacific digital economy every year. For Google, this means ensuring we can bring highly skilled individuals to Australia from around the world to teach new skills to our Australian team and build the capacity of the engineers we recruit locally.

Outside Australia more than 550 Australians work for Google around the world. This global mobility is good for both company and country. When Google brings a new worker to Australia, whether they were born in Australia or overseas, they bring knowledge and skills that are necessary for us to maintain a globally competitive Australian workforce.

BUILDING AUSTRALIA'S CAPABILITY

Google's local teams also play a role in helping young Australians acquire the skills they need to work at Google.

Since 2011 more than 10,000 teachers in Australia have completed Google's Educator Professional Development (formerly Computer Science for High School) program. The professional development training for teachers helps educators build the skills needed to teach children foundational computer science concepts and build confidence in logical thinking.

More than 20,000 Australian teachers have also enrolled to participate in the Computer Science Education Research (CSER) Digital Technologies Massive Open Online Course (MOOC), a University of Adelaide program funded by Google, which helps educators learn about teaching technology skills in their classrooms.

Over 3,300 students in Australia have also participated in FIRST Robotics program, in which Google's funding is focused on Australians underrepresented in science and technology with the aim of helping young Australians develop skills in engineering, mathematics, design, innovation, teamwork, communication, and leadership - all of which are critical for young Australians preparing to join the workforce of the future.

KEEPING SKILLS CURRENT

Google works with universities to ensure Australian computer science courses produce candidates with the skills required by industry, and our engineering division provides internship opportunities for more than 70 computer science students from Australian universities every year. We seek out top engineers and digital technology specialists from across Google globally to mentor and train locally recruited staff.

The productive capability of 12.3 million employed Australians is shaped primarily by their experiences at work. That experience, including both formal and informal training, is among the most significant forms of education Australians receive. It is informed by the leaders and mentors with whom they interact, the technology and digital systems they use, the organisational culture they operate in, and their collaboration with colleagues and business associates within Australia and in other economies and around the world.

The challenge of keeping our skills relevant will only grow in the coming years. Australia's leaders across all sectors have a responsibility to ensure Australians have access to the skills they need to compete globally.

KEY ROLE ARCHETYPE

Many of the roles required by the technology sector are do not yet feature in the public discourse in Australia about the makeup of the workforce. Founders of startups and scale-ups are adamant about their value, there is clear global competition for the skill sets, but there is little written outside the sector about what specific role they perform within a startup and why it is so important.

As a result, we've put together a series of archetypes of some of the cutting edge positions that startups in Australia are looking for. We've described the mechanics of how each of these roles brings value to a tech business and what sort of skills and background startups are looking for in candidates for these roles. We hope these archetypes can shed some light on why some of these positions are so critical, and help aspiring tech sector workers understand the types of career paths required to enter some of the most in demand, modern jobs in the economy.

Each of these archetypes have been informed by a mixture of founder interviews and analysis of aggregated LinkedIn profiles of employees in these fields.



DATA SCIENTIST

Data scientists mine large amounts of structured and unstructured data to inform strategic business decisions



PRODUCT MANAGER

Product managers use market research, data and design to create a product that is valuable, usable and achievable



USER EXPERIENCE (UX) DESIGNER

UX involves delivering the best possible experience to the end user of a product or service



BUSINESS DEVELOPMENT MANAGER

Business development managers create long-term value from customers and markets by identifying new business opportunities that drive the growth of a company

DATA SCIENTIST

PRODUCT MANAGER



CORE SKILLS

- Statistics
- Algorithms
- Computer science
- Machine learning
- Programming languages
Python
- Data visualisation software
MatLab

OVERVIEW

Data scientists mine large amounts of structured and unstructured data to inform strategic business decisions. With a core background in statistics, modern data scientists also integrate machine learning to uncover insights from very large data sets with many variables. Data scientists combine business understanding and data visualisation skills to convert data into an impactful business story.

BACKGROUND

Common transitional positions include both technical and non-technical roles, such as research assistant, postdoctoral researcher, algorithm developer and data engineer. Top areas of study for a data scientist are computer science, mathematics, physics and electrical engineering.

PURPOSE

Startups generate and store masses of unstructured information from user accounts, transactions, social media data and usage statistics that can be used to help improve a company's product and make better business decisions.

Jay Samit, vice chairman at Deloitte Digital, speaking to Bloomberg said, 'Every company collects mountains of data: some valuable, most not. It's the data scientist's job to distinguish between the two.'

TYPICAL RESPONSIBILITIES WITHIN A STARTUP

TEST THE CORE ASSUMPTIONS OF THE STARTUP

Finding ways to validate assumptions is core to the success of a startup. In early-stage startups, a considerable amount of time is spent probing the market looking for the right product offering. Disproving assumptions early on and making informed decisions allows a startup to survive and thrive.

ITERATIVE IMPROVEMENT

Data scientists are able to look at broad trends to iteratively improve a company's core product. They analyse a wide array of variables, from the patterns of consumption and demographical data of their users to how external conditions such as time of day or weather might affect the business. All of this analysis can lead to significant improvements in the product or business processes.

DATA STRUCTURING

Startups generate both structured and unstructured business data. Structured data is organised and categorised in areas such as website traffic, sales figures, bank accounts or GPS coordinates. Unstructured data from human input like customer reviews, emails and social media posts need to be structured so that it can feed into the data analysis.

COLLABORATION AND STORY-TELLING

Data scientists collaborate and problem solve with a range of people to inform and support business decisions. A data scientist works with software and data engineers to improve and validate existing business models and explore product ideas. They also work with product managers and executives on how to tell a compelling story with data - usually by developing visualisations of findings in a way that is convincing for a company to make strategic business decisions.

"RedBubble has always been at its core a technology company, so we always recognise the criticality of technology. We started investments in data science and making sure we had very strong learning systems. It did impact the way we thought about the team and the ways things got done."

Martin Hosking, RedBubble

OVERVIEW

Product managers use market research, data and design to create a product that is valuable, usable and achievable.

At the intersection of business, technology and user experience, a product manager may not be doing the coding, but they do need enough of a technical background to understand the product and to pull and process data.

They are the ambassadors for a product, internally and externally - setting the strategy and vision, communicating its needs to the teams who are building it and ensuring its success through research, development and engineering.

BACKGROUND

Product management in technology firms is a relatively new role, and backgrounds vary substantially. In our data, previous positions varied by country - German product managers typically transitioned from a project manager role, whereas Israeli project managers came into the position from a software engineering role.

This effect is also seen in typical areas of study. German product managers were more likely to come from a business background, with degrees in business administration and management, marketing, international business and economics. In Israel, however, they were typically more technical, with degrees in computer science and industrial engineering - although overlap exists in both cases.

PURPOSE

Product managers bring clarity, structure and focus to the startup process. They hold the ultimate responsibility for the design, development and iteration of the products offered by the startup.

"We just need more companies that need product managers, and then we need to judiciously pull people in and find the best, smartest people we can and train them." - Didier Elzinger, Culture Amp

TYPICAL RESPONSIBILITIES WITHIN A STARTUP

DEVELOPING A UNIQUE VALUE PROPOSITION

Startups must be able to identify a clear value proposition for their company's offering. Product managers need to test the market to understand the needs of their customers and address them using the startup's products. Product managers incorporate information and feedback from clients, quantitative data from web analytics, research reports and market trends to inform the vision for the product.

PRODUCT ROADMAP

Once the vision has been set, product managers develop a roadmap to create an actionable plan for the development, testing and iteration of a product. Product managers must work with engineering, design, customer service, business analysts, sales, marketing, operations and finance - as well as the company's leadership - to ensure their products align with the vision and are delivered effectively and on time.

UNDERSTANDING THE CUSTOMER

Product managers work to understand the market and their competition by collecting information from clients. They design solutions to customer problems, to do so they are iterative and never stop deepening their understanding of their customer base and needs. They ensure feedback is measurable, and communicate that through an iterative design and development cycle for existing products.



CORE SKILLS

- Design
- Agile software
- Content development
- Product roadmapping
- Competitive analysis
- Market research
- Data analysis
- Project management
- Communication
- Lean startup operation

"Talent like engineering and product - there's just not enough in the country"

Bridget Loudon, Expert360

USER EXPERIENCE (UX) DESIGNER

BUSINESS DEVELOPMENT MANAGER



CORE SKILLS

- Visual design
- Interaction design
- Information architecture
- Usability
- User testing
- Branding
- Wireframing

OVERVIEW

UX involves delivering the best possible experience to the end user of a product or service. A UX designer creates user interface designs and mockups that mimic user interactions and are involved in the overall strategy to increase engagement and adoption to ultimately provide a more effective and successful product.

User experience design is related to user interface (UI) design, with some clear distinctions. UI designers tend to focus on the visual elements of a product - style and layout of visual elements of a particular screen or menu, for example. UX tends to take a broader multidisciplinary view, and encompasses the whole user experience, including the interface (often working alongside UI specialists). The product's 'flow', ease of use, responsiveness, and usability are all part of UX design.

BACKGROUND

UX designers typically came from a design or visual communications background. We also saw representation from those with degrees in computer science, information technology and media studies.

The most common job transitions are typically from other areas of design - user interface design and graphic design.

PURPOSE

A startup lives or dies by its ability to attract and retain users for its technology. A UX designer studies every aspect of a user's interaction with the interface, layout, visual design, text, brand and sound of a product or service and optimises accordingly.

TYPICAL RESPONSIBILITIES WITHIN A STARTUP

USER EXPERIENCE RESEARCH

A UX designer works to test whether real users can successfully find and navigate the product and reach a defined end goal. They will test how intuitive, engaging and functional the product is.

WIREFRAMING AND DESIGN

Combining expertise, experience and testing, the UX designer will provide mockups, sketches and plans for how the product will look and function. This will effectively become the blueprint for development of new iterations of the product.

CUSTOMER ADVOCATE

A UX designer needs to understand, anticipate, and communicate the user's needs, wants and must-haves, and ensure these are reflected effectively in the final product. They can create customer profiles and share data visualisations to effectively communicate the principles by which development needs to continue to satisfy the user's needs.

"The early thing we had to do was bring in UX and product management. We also then had to focus on customer focus, that was a large piece."

Tim Fung, Airtasker



CORE SKILLS

- Solution selling
- Direct sales
- Sales management
- Customer relationship management
- Contract negotiation
- Lead generation

OVERVIEW

Business development managers create long-term value from customers and markets by identifying new business opportunities, either externally or internally, that drive the growth of a company. Experience in sales is valuable, however business development is highly strategic and is often driven by networking and relationship-building over transactional relationships.

BACKGROUND

The diverse manner in which a business developer operates allows for an equally diverse background in skills. Common job transition to this role are from an account manager, project manager, customer service representative, business development executive and sales executive. The most common backgrounds are primarily business-focused and include studies in: business administration and management, marketing, business/commerce, economics and finance.

PURPOSE

Early stage business development is focused on establishing a firm footing for product by evaluating the best paths to pursue growth. Growth opportunities may become apparent through supporting existing users in their adoption of the startup's solution, pursuing customers in new markets, investing in marketing or distribution efforts to attract users or early adopters, strategic partnerships with other businesses or ideas for developing new products. Pursuing strategic growth opportunities initially validates the product market fit, and eventually allows for growth at scale.

TYPICAL RESPONSIBILITIES WITHIN A STARTUP

NETWORKING AND RELATIONSHIP BUILDING

Business development involves selectively targeting partners that can bring growth to a business. Networks can be built via attending events and networking, building expertise and leadership within an industry and exhibiting products at exhibitions, trade shows and conferences.

CUSTOMER RETENTION

Managing and retaining relationships with clients is especially important when a company starts to scale as these relationships can give insight into how others in the ecosystem are thinking about the problem the business is trying to solve, providing valuable information for business strategy and planning.

TRADITIONAL SALES AND LEAD GENERATION

Business development managers will also engage in traditional sales methods when appropriate - cold calling and emailing prospective customers, responding to possible leads on the phone or at meetings to communicate the company's value to potential partners. They may have enterprise sales experience, too, helping them navigate lengthy or complex sales processes with large customers.

MONITORING COMPETITION

Business development involves monitoring the competitive landscape by researching major initiatives by competitors and new tech and industry trends that can impact a startup's growth and success.

"Often a lot of early stage tech companies underestimate the value of a solid sales and marketing discipline. I think that's so critical for your ability to scale."

Jonathan Barouch, Local Measure

CONTRIBUTORS



REPORT AUTHOR:

Alex Gruszka
COO, StartupAUS

THANKS TO ALL OUR CONTRIBUTORS:

Sarah Bond
MaryLou Costa
Belinda Dennett
Kate Dezarnaulds
Akash Kaura
Alex Lynch
Margaret Maile Petty
Alex McCauley
Emily Mundzic
Nick O'Donnell
Denham Sadler
Ann Schoefer

REPORT DESIGN & ART DIRECTION:

Chris Brown - Freelance Design
www.imchrisbrown.co.uk



If you would like to discuss any of the findings in the report please contact info@startupaus.org



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